

BOROUGH OF EMERSON STORMWATER MANAGEMENT PLAN



June 15, 2021

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1. INTRODUCTION

The Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Emerson (Borough) to address stormwater related impacts. The creation of this plan is required by the ***Municipal Stormwater Regulations*** (N.J.A.C. 7:14A-25) and contains all of the required elements described in the ***Stormwater Management Rules (Rules, N.J.A.C. 7:8)***. The plan addresses groundwater recharge, stormwater quantity and stormwater quality impacts by incorporating stormwater design and performance standards, as contained within the Rules, for new major development. Major development as defined with the Approved Stormwater control Ordinance in Appendix 1, is defined as: an individual “development,” as well as multiple developments that individually or collectively result in: the disturbance of one or more acres of land since February 2, 2004; the creation of one-quarter acre or more of “regulated impervious surface” since February 2, 2004; the creation of one-quarter acre or more of “regulated motor vehicle surface” since March 2, 2021 or a combination of 2 and 3 above that totals an area of 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 baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The last full ***Master Plan*** was adopted in 2006. ***Master Plan Reexamination Reports*** were adopted in 2017 and 2020 and a ***Master Plan Amendment*** was adopted in 2015.

The Borough of Emerson has significantly less than one square mile of vacant or agricultural land. Therefore, according to ***N.J.A.C. 7:8-4.2 (c)10***, a “build-out” analysis is not required. However, the plan addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to provide guidance for future development to include low impact development techniques. The final component of this plan includes a mitigation plan to allow for variances or exemptions from the requirements.

2. GOALS

2.1 STATEMENT OF GOALS

The goals of this MSWMP are to:

1. Reduce artificially induced flood damage to public health, life, and property
2. Minimize increased stormwater runoff rates and volumes
3. Minimize the deterioration of existing structures that would result from increased rates of stormwater runoff
4. Induce water recharge into the ground wherever suitable infiltration, soil permeability and favorable geological conditions exist
5. Prevent an increase in nonpoint-source pollution
6. Maintain the integrity and stability of stream channels and buffers for their ecological functions, as well as for drainage, the conveyance of floodwater, and other purposes
7. Control and minimize soil erosion and the transport of sediment
8. Minimize public safety hazards at any stormwater detention facility constructed pursuant to subdivision or site plan approval
9. Maintain adequate base flow and natural flow regimes in all streams and other surface water bodies to protect the aquatic ecosystem
10. Protect all surface water resources from degradation
11. Protect groundwater resources from degradation and diminution

2.2 ACHIEVEMENT OF GOALS

The Borough plans to achieve these eleven (11) goals in the following ways:

1. Flood damage will be reduced by using detention basins and by requiring new developments to follow the requirements of the ***Residential Site Improvement Standards (RSIS)*** and the Approved Stormwater Control Ordinance. Additionally, 19 acres of open space was preserved in the Borough; protecting that area from development will help to prevent increased flood damage by controlling development.
2. Stormwater runoff will be reduced by following the requirements of ***RSIS*** and the Approved Stormwater Control Ordinance.

3. Soil erosion from development and construction projects will be reduced through the Borough's Soil Movement Ordinance and coordination with the Bergen Soil Conservation District.
4. There is only one culvert in the Borough, which is located near the high school. The condition of this existing culvert is evaluated via periodic inspections by the Borough's Department of Public Works. The condition of any proposed culverts, bridges and other in-stream structures will be monitored similarly.
5. Groundwater recharge is maintained through the use of detention basins.
6. The Borough established the following practices to prevent, to the greatest extent feasible, an increase in nonpoint pollution:
 - a. Storm drain labeling
 - b. Adoption of Litter, Improper Waste Disposal, Yard Waste and Illicit Connections ordinances
 - c. Implementation of as Street Sweeping and Road Erosion Control Maintenance program
 - d. Annual catch basin cleaning program to maintain catch basin function and efficiency.
7. These practices are described in the Borough's Stormwater Pollution Prevention Plan (SPPP).
8. The Borough intends to maintain the integrity of stream channels for their biological functions, as well as for drainage, by performing stream desnagging when necessary and preventing erosion by following the Soil Erosion and Sediment Control guidelines.
9. Minimization of pollutants in stormwater runoff will be accomplished through the various practices and programs established through the SPPP, some of which are listed in item 6 of this section
10. The Borough's SPPP established a Stormwater Facility Maintenance program to ensure that all of the Borough's stormwater facilities are inspected on an annual basis. Additionally, the SPPP established an annual catch basin cleaning program. These programs will help to protect public safety through the proper operation of catch basins and other stormwater facilities.

3. STORMWATER DISCUSSION

Land development can dramatically alter the hydrological 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 this 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.

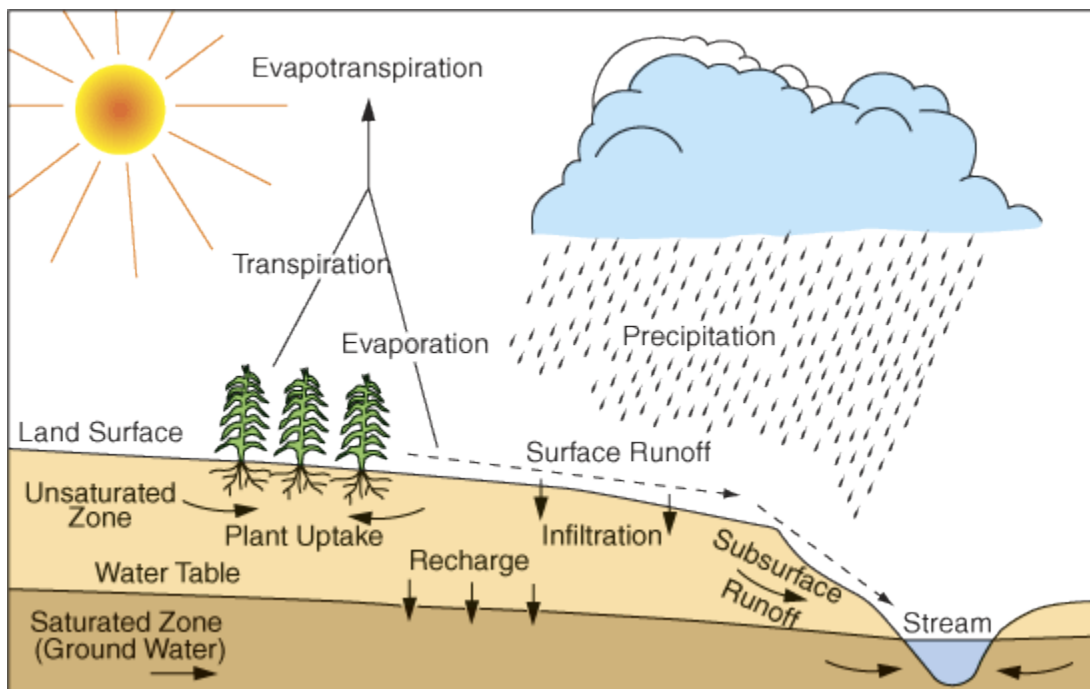


Figure 1. Groundwater Recharge in the Hydrologic Cycle

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

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

4.0 BACKGROUND

4.1 BOROUGH CHARACTERISTICS

The Borough of Emerson comprises a 2.4 square mile area in Bergen County, New Jersey. Figure C-3, USGS Topographic Map, depicts the Borough boundary on USGS quadrangle maps.

4.1.1 Population and Housing Trends

According to the **2010 Bergen County Census Data** published by the Bergen County Department of Planning and Economic Development, the population has fluctuated over the years.

Year	Population (persons)
1970	8428
1980	7793
1990	6930
2000	7197
2010	7401

However, while the population has fluctuated, the number of housing units has steadily increased over the years.

Year	Housing Units
1970	2135
1980	2231
1990	2257
2000	2398
2010	2480

4.1.2 Land Use

The most recent document containing land use statistics is the 2007 Master Plan Reexamination Report shown below. This plan does not break the Residential usage down by low, medium and high density.

Existing Land Use Distribution		
Category	Acres	Percent
Residential	527	34.1
Open Space and Recreation	413	26.7
Railroad & R-O-W	204	13.2
Commercial	195	12.6
Cemetery	83	5.4
Public Schools	53	3.4
Public	35	2.3
Quasi-Public	17	1.1

Vacant	11	0.7
Farm	7	0.4
Industrial	1	0.1
Total	1546	100.0

In 2004, the Mayor and Council designated an area on Kinderkamack Road in downtown Emerson as needing development. In 2018 site plan approval was granted by the Land Use Board for said property, which includes 147 new residential units and approximately 14,700 square feet of retail space. As part of the project a 42” RCP pipe shall be installed parallel to the railroad tracks to upgrade the existing 15” storm line that is undersized.

4.1.3 Water and Sewer Service

Water service throughout the entire Borough is provided by Suez Water New Jersey.

Sewer service throughout the entire Borough is provided by Bergen County Utilities Authority. According to the Borough, one septic system remains on a farm in the Borough. There is no plan to eliminate the septic system.

4.1.4 State Development and Redevelopment Plan

The purpose of the ***State Development and Redevelopment Plan (State Plan)*** is to coordinate planning activities and establish State-wide planning objectives in the areas of land use, housing, economic development, transportation, natural resource conservation, agriculture and farmland retention, recreation, urban and suburban redevelopment, historic preservation, public facilities and services and intergovernmental coordination. The State Plan designates planning areas that share common conditions with regard to development and environmental features:

- Areas for Growth: Metropolitan Planning Areas (PA-1), Suburban Planning Areas (PA-2) and Designated Centers in any planning area.
- Areas for Limited Growth: Fringe Planning Areas (PA-3), Rural Planning Areas (PA-4), and Environmentally Sensitive Planning Areas (PA-5). In these planning areas, planning should promote a balance of conservation and limited growth---environmental constraints affect development and preservation is encouraged in large contiguous tracts.
- Areas for Conservation: Fringe Planning Areas (PA-3), Rural Planning Areas (PA-4), and Environmentally Sensitive Planning Areas (PA-5).

Approximately 65% of the Borough is located in the Metropolitan Planning Area (PA-1). Approximately 32% of the Borough is located in the Environmentally Sensitive Planning Areas (PA-5). The remainder of the Borough is comprised of the Oradell Reservoir.

4.1.5 Brownfield Sites and Known Contaminated Sites

A brownfield is defined under NJ state law (***N.J.S.A. 58:10B-23. d***) as “any former or current commercial or industrial site that is currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of contaminant”. According to both the United States Environmental Protection Area (USEPA) and New Jersey Department of Environmental Protection (NJDEP) brownfields

websites, there are no brownfields in the Borough. Additionally, the Borough has not identified any brownfields.

The ***Known Contaminated Sites in New Jersey report*** (2005 Edition) is a municipal listing of sites where contamination of soil and/or ground water is confirmed at levels greater than the applicable cleanup criteria or standards. Remedial activities are underway or required at the sites with an on-site source(s) of contaminations and at locations where the source(s) of contamination is unknown. Sites with completed remedial work that require engineering and/or institutional controls have reporting measures in place to ensure the effectiveness of past actions, and some include maintenance and/or monitoring. Per NJDEP GeoWeb application along with NJGIN Open Data application there are currently Six (6) Known Contaminated Sites in Emerson.

4.1.6 Groundwater

According to the Borough Administrator, there is no existing groundwater assessment for the Borough. For Groundwater Recharge Areas within the Borough's limits, refer to figure C-4.

4.2 WATERWAYS

The following watercourses are located in or immediately adjacent to the Borough

- Emerson Brook
- Hackensack River
- Herring Brook
- Musquapsink Brook
- Oradell Reservoir
- Pascack Brook

The following ponds are also located in the Borough:

- Emerson Golf Club Pond
- Emerson Woods Pond
- Hackensack Golf Club Pond
- Shop Rite Pond

Figure C-2. Borough and its Waterways, illustrates the waterways in the Borough.

4.2.1 Watershed Management Areas, HUC-14's and Category One Waters

The Borough of Emerson is located within the Hackensack, Hudson and Pascack Watershed Management Area (WMA #5). A Watershed Management Area is subdivided into smaller drainage area units which are defined as HUC-14's. The term "HUC-14" is from the hydrologic unit code system developed by the United States Geological Service for delineating and identifying drainage areas. The system starts with the largest possible drainage areas and progressively smaller subdivisions of the drainage area are delineated and numbered in a nested fashion. A drainage area with a hydrologic unit code (HUC) designation with 14 numbers, or HUC-14, is one of several sub-watersheds of a larger watershed. There are three (3) HUC-14's within the Borough.

- 02030103170020 – Pascack Brook (below Westwood gage)

- 02030103170060 – Hackensack River (Oradell to Old Tappan gage)
- 02030103180010 – Coles Brook/Van Saun Mill Brook

Figure C-7, Hydrologic Units (HUC-14’s), illustrates the HUC-14s within the Borough

Special water resource protection areas are those areas within 300 feet of Category One (C-1) waters and their immediate tributaries. C-1 waters are waters that receive special protections under the **Surface Water Quality Standards** because of the clarity, color, scenic setting or other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s). In addition, the special water resource protection area is required adjacent to those waters that drain in the C-1 water within the limits of the associated sub-watershed (HUC-14). The special water resource protection area is intended as a buffer between development and these special waters in order to protect both water quality and the attributes for which the waters have been designated. The NJDEP has determined that a buffer of 300 feet is necessary to achieve the intended goals. Three (3) watercourses within the Borough of Emerson are categorized as Category One (C-1) by the NJDEP.

- Emerson Brook
- Hackensack River, including Oradell Reservoir and Emerson Woods Pond
- Pascack Brook

The following table summarizes the watercourse information:

TABLE 1: WATERCOURSE INFORMATION		
Name of Watercourse	HUC-14	Classification
Emerson Brook	02030103170060 – Hackensack River (Oradell to Old Tappan gage)	FW2-NT (C-1)
Hackensack River	02030103170060 – Hackensack River (Oradell to Old Tappan gage)	FW2-NT (C-1)
Herring Brook	02030103180010 – Coles Brook/Van Saun Mill Brook	FW2-NT/SE1 (C-2)
Musquapsink Brook	02030103170020 – Pascack Brook (above Westwood gage)	FW2-NT (C-2)
Oradell Reservoir	02030103170060 – Hackensack River (Oradell to Old Tappan gage)	FW2-NT (C-1)
Pascack Brook	02030103170020 – Pascack Brook (above Westwood gage)	FW2-NT (C-1)
Emerson Golf Club Pond	02030103180010 – Coles Brook/Van Saun Mill Brook	NCA
Emerson Woods Pond	02030103170060 – Hackensack River (Oradell to Old Tappan gage)	FW2-NT (C-1)
Hackensack Golf Club Pond	02030103170060 – Hackensack River (Oradell to Old Tappan gage)	FW2-NT/SE1 (C-2)

Shop Rite Pond	02030103170060 – Hackensack River (Oradell to Old Tappan gage)	NCA
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Legend:

FW2 -- General surface water classification applied to those fresh waters that are not designated as FW1 or Pinelands waters.

NT (non-trout) – means freshwaters that have not been designated in **N.J.A.C. 7:9B-1.15(b) through (h)** as trout production or trout maintenance waters.

SE1 – General surface water classification applied to saline waters of estuaries where the designated uses are shellfish harvesting in accordance with **N.J.A.C. 7:12**; maintenance, migration and propagation of the natural and established biota; primary and secondary contact recreation; and any other reasonable uses.

C-1 (Category One); means those waters designated for purposes of implementing the antidegradation policies set forth at **N.J.A.C. 7-9B-1.5(d)** for protection from measurable changes in water quality characteristics 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(s).

C-2 (Category Two) waters means those waters not designated as Category One.

NCA – Emerson Golf Club Pond and Shop Rite pond are not associated with any watercourses and therefore; no classification is available.

4.2.2 AMNET Data

The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state’s waterways. There are over 800 AMNET sites through 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 do not appear to be any AMNET testing sites in Emerson. Classifications for the Hackensack River, Pascack Brook, and Musquapsink Brook were available from nearby AMNET sites. The following are the watercourses with their AMNET testing location and classification.

- Hackensack River at River vale Road in Old Tappan/River Vale (Site ID AN0205) – Moderately Impaired
- Pascack Brook at Westwood Avenue in Westwood/River Vale (Site ID AN0207) – Non-impaired
- Musquapsink Brook at Harrington Avenue in Westwood (Site ID (Site ID AN0206) – Moderately impaired

No data were available for the remaining waterways.

4.2.3 Integrated List Data and TMDL’s

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. The **New Jersey Integrated Water Quality Monitoring and Assessment Report 305(b) and 303(d) (Integrated List)** is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards and identifies waters that are impaired.

The Integrated List is composed of the following four (4) Sublists:

- Sublist 1: Attaining the water quality standard and no use is threatened.
- Sublist 3: Insufficient or no data and information to determine if any designated use is threatened.
- Sublist 4: Impaired or threatened for one or more designated uses but does not require the development of a Total Maximum Daily Load (TMDL).
- Sublist 5: The water quality standard is not attained. The waterway is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL.

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 a New Jersey Pollutant Discharge Elimination System (NJDPES) permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMP's.

The following are the watercourses with their location, sublists, and sublist constituents:

- Hackensack River at New Milford (Site ID 01378500)
This section is on Sublist 5 for Phosphorous and Fecal Coliform
- Hackensack River at Old Tappan Road in Old Tappan (Site IDs AN0205 and 01376970)
This section is on Sublist 1 for Phosphorous, pH, Dissolved Oxygen, Nitrate, Dissolved solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel, Selenium and Zinc. It is on Sublist 3 for Fecal Coliform and Temperature. It is on Sublist 5 for Arsenic and benthic macroinvertebrates.
- Hackensack River in River vale (Site ID 01377000)
This section is on Sublist 1 for Phosphorous, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia. It is on Sublist 3 for Cadmium, Selenium and Zinc. It is on sublist 4 for Nickel and Fecal Coliform. It is on Sublist 5 for Arsenic, Chromium, Copper, Lead, and Mercury.
- Musquapsink Brook at Harrington Avenue in Westwood also referred to as Musquapsink Brook at River Vale (Site IDs AN0206 and 01377499)
This section is on Sublist 1 for Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids and Unionized Ammonia. It is on Sublist 3 for Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Zinc. It is on Sublist 4 for Fecal Coliform. It is on Sublist 5 for Phosphorous, Arsenic and Benthic macroinvertebrates.
- Oradell Reservoir
This section is on Sublist 5 for Mercury (fish).

- Pascack Brook at Westwood Avenue and Harrington Avenue in Westwood (Site IDs AN0207 and 01377500)
- This section is on Sublist 1 for Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids and Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Zinc and benthic macroinvertebrates. It is on Sublist 3 for Dissolved Solids. It is on Sublist 5 for Phosphorous, Arsenic and Mercury.

The following table details TMDL information for the river segments listed on Sublist 5

TABLE 2: TMDL INFORMATION				
Watercourse, Location and Site ID	Sublist constituents	#5	TMDL information	TMDL ref #
Hackensack River at New Milford 01378500	Phosphorous		A phosphorous TMDL has not yet been developed for this segment because the segment is located at the outlet of a lake, and the NJDEP's current methodology for developing TMDL's at such a location is inappropriate. The NJDEP expects to develop an appropriate methodology in 2007	1
	Fecal Coliforms		According to TMDL document, water quality monitoring is needed to identify if an impairment exists. TMDLs will not be developed for this location until and unless recent data indicates violations of the Surface Water Quality Standards	3
Hackensack River at Old Tappan Road in Old Tappan AN0205, 01376970	Arsenic		The NJDEP has not yet developed a methodology for developing Arsenic TMDL's	1
	Benthic Macroinvertebrates		The NJDEP has not yet developed a methodology for developing TMDL's for biological impairments	1
Hackensack River in River vale ID 01377000	Arsenic		The NJDEP has not yet developed a methodology for developing Arsenic TMDL's	1
	Chromium		The NJDEP has not yet developed a methodology for developing Chromium TMDL's	1
	Copper		TMDL document established by the EPA on 1/24/1996	4*
	Lead		TMDL document established by the EPA on 1/24/1996	4*
	Mercury		TMDL document established by the EPA on 1/24/1996	4*
Musquapsink Brook at Harrington Avenue in	Phosphorous		TMDL document approved by the EPA on 9/30/2005	2

Westwood/ Musquapsink Brook at River Vale AN0206, 01377499	Arsenic	The NJDEP has not yet developed a methodology for developing Arsenic TMDL's	1
	Benthic Macroinvertebrates	The NJDEP has not yet developed a methodology for developing TMDL's for biological impairments	1
Oradell Reservoirs	Mercury	The NJDEP has not yet developed a methodology for developing Mercury TMDL's	1
Pascack Brook at Westwood AN0207 01377500	Phosphorous	TMDL document approved by the EPA on 9/30/2005	2
	Arsenic	The NJDEP has not yet developed a methodology for developing Arsenic TMDL's	1
	Mercury	The NJDEP has not yet developed a methodology for developing Mercury TMDL's	1

TMDL References:

1. Information obtained during a telephone conversation on April 27, 2006 with Ms. Kimberly Cenno, Supervising Environmental Analyst, NJDEP Division of Watershed Management.
2. Amendment to the Northeast Water Quality Management Plan, Total Maximum Daily Loads for Phosphorous to Address Three (3) Stream Segments in the Northeast Water Region, Watershed Management Area 5 (Hackensack and Pascack Watersheds). Proposed July 5, 2005, Established August 31, 2005, Prepared by the New Jersey Department of Environmental Protection Division of Watershed Management.
3. Amendment to the Northeast Water Quality Management Plan, Total Maximum Daily Loads for Fecal Coliforms to Address 32 streams in the Northeast Water Region, Watershed Management Area 3 (Pompton, Pequannock, Wanaque and Ramapo Rivers), Watershed Management Area 4 (Lower Passaic and Saddle Rivers), Watershed Management Area 5 (Hackensack River, Hudson River, and Pascack Brook), Watershed Management Area 6 (Upper and Middle Passaic, Whippany and Rockaway Rivers). Proposed January 21, 2003, Established March 28, 2003, Prepared by the New Jersey Department of Environmental Protection Division of Watershed Management.
4. Total Maximum Daily Loads for Copper, Mercury, Nickel and Lead in NY-NJ Harbor, Prepared by the U.S. Environmental Protection Agency, Region 2, in cooperation with Department of Environmental Protection, under the New York-New Jersey Harbor Estuary Program, July 26, 1994.
 - Please note that TMDL document #4 is a document prepared by USEPA. No TMDL's have been developed by NJDEP for these metals.

In addition to the TMDL documents referenced above, a fecal coliform TMDL was approved by the USEPA in July 2003 for the Hackensack River at River Vale, Musquapsink Brook at River Vale and Pascack Brook at Westwood. This document is entitled "Amendment to the Northeast Water Quality Management Plan, Total Maximum Daily Loads for Fecal Coliforms to Address 32 streams in the Northeast Water Region, Watershed Management Area 3 (Pompton, Pequannock, Wanaque and Ramapo Rivers), Watershed

Management Area 4 (Lower Passaic and Saddle Rivers), Watershed Management Area 5 (Hackensack River, Hudson River, and Pascack Brook), Watershed Management Area 6 (Upper and Middle Passaic, Whippany and Rockaway Rivers). Proposed January 21, 2003, Established March 28, 2003, Prepared by the New Jersey Department of Environmental Protection Division of Watershed Management.”

Additionally, on April 27, 2000, the NJDEP Division of Watershed Management adopted an amendment to the Northeast Water Quality Management Plan, to establish a Total Maximum Daily Load for Nickel in the Hackensack River.

Copies of these TMDL’s are available on the NJDEP and USEPA websites:

NJDEP: <https://www.nj.gov/dep/dwq/msrp-tmdl-rh.htm>

USEPA: <https://www.epa.gov/tmdl/impaired-waters-and-tmdls-program-your-epa-region-state-or-tribal-land>

4.3 EXISTING AND FUTURE STORMWATER FACILITIES

The Borough operates the following stormwater facilities:

- Catch basins
- Storm drains
- Surface detention basins:
 - Fairways
 - Lake Hollow Estates
- Underground detention basins
 - Linden Avenue Estates

Additionally, one development application includes the construction basins:

- Goesbeck Ct. emptying into Sanford Avenue was constructed and made operational in 2006

In order to maintain existing stormwater facilities, the following practices were established and are described in the Borough’s SPPP:

- Storm drain labeling
- Adoption of Litter, Improper Waste Disposal, Yard Waste and Illicit Connections Ordinances
- Implementation of a Street Sweeping and Road Erosion Control Maintenance program.
- Annual catch basin cleaning program to maintain catch basin function and efficiency

The Borough will ensure adequate long-term operation and maintenance of stormwater management measures by requiring a Maintenance Plan, as described in section 10 of the Approved Stormwater Control Ordinance.

4.4 FLOODING ISSUES

The following areas of the Borough are known to experience flooding:

- Palisade Avenue
- Vivian Avenue
- Randolph Avenue
- Lincoln Boulevard

Please refer to Figure C-4, Groundwater Recharge Areas

4.5 WELLHEAD PROTECTION AREAS

Public community water systems either pipe water for human consumption to at least 15 service connections used by year-round residents, or regularly serve at least 25 year-round residents (e.g. municipality or subdivision). One (1) mapped public community water supply well and its associated wellhead protection production area from a well situated outside the municipal border is located in the Borough.

Figure C-5. Wellhead Protection Area, depicts the well and wellhead protection areas in the Borough.

It should be noted that the County of Bergen adopted a Wellhead Protection Ordinance in 1998 which addresses public non-community water systems. A non-community water system is a public water system that pipes water for human consumption to at least 15 service connections used by individuals other than year-round residents for at least 60 days a year, or serves 25 or more people at least 60 days a year (e.g. schools or factories). According to the ***Bergen County Wellhead Protection Ordinance***, maps delineating the wellhead protection areas, prepared by the Bergen county Department of Health Services (BCDHS) and dated September 26, 1997, are on a file and maintained by the BCDHS, Bergen County Clerk, and Borough Clerk's Office.

5.0 DESIGN AND PERFORMANCE STANDARDS

The Borough will adopt the design and performance standards for stormwater management measures as presented in ***N.J.A.C. 7:8-5*** to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the ***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***.

In order to address impacts from existing development, the Borough has established and implemented various stormwater management controls and/or programs. These controls and programs were established and described in the SPPP. The controls and programs include

- Local Public Education
- Illicit Connection elimination
- Pet waste, Litter, Improper Waste Disposal, Wildlife Feeding, Yard Waste and Illicit Connections ordinances
- Storm Drain Inlet Retrofitting
- Annual catch basin cleaning
- Outfall pipe stream scouring remediation
- Implementation of Standard Operating Procedures for fueling operations, vehicle maintenance and housekeeping
- Employee Training

During construction of future developments and projects, Borough inspectors will perform periodic inspections of the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

As stated previously in Section 4.3, the Borough intends to ensure adequate long-term operation and maintenance of stormwater management measure by requiring a Maintenance Plan as described in Section 10 of the Approved Stormwater Control Ordinance. The penalties established by the Borough are detailed in Section 11 of the Approved Stormwater Control Ordinance.

6.0 PLAN CONSISTENCY

6.1 BERGEN COUNTY

This MSWMP will be updated as necessary to be consistent with the county Stormwater Management Plan. If any additional Regional Storm Water Management Plans are developed in the future, this MSWMP will be updated to be consistent.

6.2 RESIDENTIAL SITE IMPROVEMENT STANDARDS (RSIS)

The Borough of Emerson currently utilizes the *Residential Site Improvement Standards (RSIS, N.J.A.C. 5:21)*. The MSWMP is consistent with the *RSIS*. The municipality will utilize the most current updates of the *RSIS* in the stormwater management review of residential areas. This MSWMP will be updated to be consistent with any future updates to the *RSIS*.

6.3 BERGEN SOIL CONSERVATION DISTRICT

The Borough Engineer and/or Construction Official are responsible for coordination with the Bergen Soil Conservation. According to the Borough Construction Official, the threshold review is any project larger than a two-lot subdivision.

6.4 TOTAL MAXIMUM DAILY LOAD (TMDL) DOCUMENTS

As stated previously in Section 4.2, TMDL's have been developed for river segments in the vicinity of the Borough.

1. Hackensack River in River Vale for copper, lead and mercury
Document entitled: "Total Maximum Daily Loads for Copper, Mercury, Nickel and Lead in NY-NJ Harbor, Prepared by the U.S. Environmental Protection Agency, Region 2, in cooperation with the New York State Department of Environmental Conservation and the New Jersey Department of Environmental Protections, under the New York-New Jersey Harbor Estuary Program, July 26, 1994."
2. Phosphorous TMDL for the Musquapsink Brook at Harrington Avenue in Westwood/ Musquapsink Brook at River Vale and Pascack Brook at Westwood
Document entitled: "Amendment to the Northeast Water Quality Management Plan, Total Maximum Daily Loads for Phosphorous to Address Three (3) Stream Segments in the Northeast Water Region, Watershed Management Area 5 (Hackensack and Pascack Watersheds). Proposed July 5, 2005, Established August 31, 2005, Prepared by the New Jersey Department of Environmental Protection Division of Watershed Management.
3. Fecal Coliform TMDL for the Hackensack River at River Vale, Musquapsink Brook at River Vale and Pascack Brook at Westwood.
Document entitled: "Amendment to the Northeast Water Quality Management Plan, Total Maximum Daily Loads for Fecal Coliforms to Address 32 streams in the Northeast Water Region, Watershed Management Area 3 (Pompton, Pequannock, Wanaque and Ramapo Rivers), Watershed Management Area 4 (Lower Passaic and Saddle Rivers), Watershed Management Area 5 (Hackensack River, Hudson River, and Pascack Brook), Watershed Management Area 6 (Upper and Middle Passaic, Whippany and Rockaway Rivers). Proposed January 21, 2003, Established March 28, 2003, Prepared by the New Jersey Department of Environmental Protection Division of Watershed Management."

4. Nickel TMDL for the Hackensack River

Document entitled “Adoption of the Amendment to the Northeast Water Quality Management Plan to establish a Total Maximum Daily Load for Nickel in the Hackensack River, Dated April 27, 2000.”

6.4.1 Implementation Strategies

This MSWMP must be consistent with the established TMDL’s.

6.4.1.1 TMDL for Copper, Mercury, Nickel and Lead in the Hackensack River

The TMDL for copper, mercury, nickel and lead in the Hackensack River was specifically focused on municipal and industrial dischargers. According to the most recent available NJDEP GIS data, there are no surface water dischargers within the Borough. Therefore, the specific implementation strategies discussed in the TMDL document do not apply to the Borough.

6.4.1.2 TMDL FOR Phosphorous in the Musquapsink and Pascack Brooks

The TMDL for phosphorous in the Musquapsink Brook and Pascack Brook identified the following implementation strategies:

- Nonpoint source public education
- Cleaning catch basins
- Performing good housekeeping of maintenance yards
- Septic Tank management to address failing systems (there is only one existing septic tank in the Borough)
- Waterfowl and pet waste disposal ordinances
- Goose management programs

The Borough has already established several of these strategies through their SPPP.

Additionally, the phosphorous TMDL requires that watersheds with a high percentage of urban land use adopt a low phosphorous fertilizer ordinance as part of the stormwater permitting program. Guidance, as well as a sample ordinance is included in Appendix 3.

6.4.1.3 TMDL for Fecal Coliform in the Hackensack River, Musquapsink Brook and Pascack Brook

The TMDL for fecal coliform listed the following sources of fecal coliform

- Non-Human: Canada geese; pet waste; stormwater basins; direct stormwater discharges to waterbodies; and farms, zoos and livestock.
- Human: Malfunctioning or older improperly sized septic systems; failing sewage conveyance systems; and improper garbage storage and disposal

The TMDL identified various short and long-term management strategies including stream bank restoration projects; goose management programs; establishment of riparian buffers; adoption of no feed ordinances for waterfowl and wildlife and pet waste ordinances; retrofit of detention/retention basins to achieve water quality control; conducting of regularly scheduled stormwater basin cleanouts and maintenance, storm sewer inlet cleanouts and street sweeping programs: adoption of SPPP and MSWMP;

and elimination of malfunctioning and older improperly sized septic systems and illicit connections of domestic sewage.

The following potential sources of fecal impairment were specifically noted in the TMDL document:

- Hackensack River at River Vale: geese observed at Golf Course, Open Spaces, and County Park
- Musquapsink Brook at River Vale: Canada geese observed at elementary school ballfields and nearby cemeteries
- Pascack Brook at Westwood: No sources were listed that are in the Borough of Emerson

It is unknown whether the specific areas listed in the TMDL are located in the Borough of Emerson; however, the Borough has already established several of the recommended strategies in their SPPP.

6.4.1.4 TMDL for Nickel in the Hackensack River

This TMDL recommends that load reduction measures be implemented through the use of Best Management Practices (BMPs) including local ordinances for stormwater management and nonpoint source pollution control. As is mentioned throughout this MSWMP, various ordinances and programs to control and reduce nonpoint source pollution control were established through the Borough's SPPP. Additionally, a Stormwater Control Ordinance was adopted in May 2006 and an amendment adopted at the Mayor and Council Meeting February 2, 2021. The meeting agenda memorializing the adoption of the amendment to the ordinance is shown in Appendix 1.

6.4.2 Future TMDLs

The NJDEP has not yet developed a methodology for developing TMDLs for metals. The NJDEP expects to develop TMDLs for metals, especially arsenic and mercury, in the next few years. Currently there is no schedule in place as to when the NJDEP will develop TMDL's for other metals, including copper, lead and chromium. If and/or when the NJDEP develops TMDLs for these metals or other constituents this MSWP will be updated to be consistent.

7.0 NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The borough has reviewed the Master Plan and the Borough Code and has provided a list of the sections in the Borough ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval. A copy will be sent to the NJDEP at the time of submission. The Borough Stormwater Control Ordinance adopted in February 2021 covers the Nonstructural Stormwater Management strategies.

8. LAND USE/BUILD OUT ANALYSIS

There is significantly less than one square mile of developable land in the Borough; there for a “build-out” analysis is not required.

Figure C-6, Existing Land Use, illustrates the existing land use in the Borough based on 1995/97 GIS information from NJDEP. Figure C-8, Zoning Map of the Borough of Emerson, depicts the current zoning districts. Figure C-9, Constrained Land, illustrates the constrained lands within the Borough.

9.0 MITIGATION PLAN

This mitigation plan is provided for a proposed development or redevelopment projects that seek a variance or exemption from the Borough Stormwater Management Plan or the **Rules**. Approval of the option to utilize a mitigation plan and choice of mitigation plan shall be under the sole discretion of the Borough Agency providing review, i.e. Land Use Board, Mayor and Council and Borough Engineer.

Any relief from this MSMP or the **Rules** via a mitigation plan shall utilize an option to provide equal or greater, quantifiable benefit than the specific relief being sought. The plan must identify the measures necessary to offset the deficit created with respect to the design and performance standard(s) that would result from the grant of a variance or exemption at a project site. The plan must also ensure that the mitigation is completed in the drainage area and for the performance standard(s) for which the variance or exemption was granted for a project. It should be noted that the standards for the Special Water Resource Protection Area (SWRPA) established under the Stormwater Management rules at N.J.A.C. 7:8-5.5(h) cannot be waived through the municipal mitigation plan.

The Borough has the option to identify a specific mitigation project that could be used by an applicant to offset the effect of a requested waiver/exemption or to address an existing stormwater problem, or choose to provide a process through which an applicant has the flexibility and responsibility to identify an appropriate mitigation project and a location to implement the mitigation project.

Selection of an appropriate mitigation project for a requested waiver/exemption must adhere to the following requirements:

The project must be within the same area that would contribute to the receptor impacted by the project. If there are no specific sensitive receptors that would be impacted as the result of the grant of the waiver/exemption, then the location of the mitigation project can be located anywhere within the municipality, and should be selected to provide the most benefit relative to an existing stormwater problem in the same category (quality, quantity or recharge).

Legal authorization must be obtained to construct the project at the location selected. This includes the maintenance and any access needs for the project in the future.

The project should be close to the location of the original project, and if possible, be located upstream at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but on a similar hydraulic distance to the sensitive receptor. For example, if the project for which a waiver is obtained discharges into a tributary, but the closest location discharges to the main branch, it may be more beneficial to identify a location discharging to the same tributary.

For ease of administration, if sensitive receptors are addressed, it is preferable to have one location that addresses any and all of the performance standards waived, rather than one location for each performance standard.

It must be demonstrated that implementation of the mitigation project will result in no adverse impacts to the other properties.

Mitigation projects that address stormwater runoff quantity can provide storage for proposed increases in runoff volume, as opposed to a direct peak flow reduction.

Note that work in regulated areas, such as floodplains and wetlands must be performed in accordance with applicable regulations such as the Flood Hazard Area Control Act Rules and the Freshwater Wetland Act Rules.

Also, many areas of open space in New Jersey have received funding by the Department's Green Acres Program and many of those encumbered lands have restrictions placed on them as a result of that funding.

The Borough will allow developers to fund analyses to identify potential mitigation projects that could be used to address deficits in complying with each of the performance standards. However, the funding option shall only be allowed where the project requesting a waiver will have no measurable impact with respect to flooding, erosion, water quality degradation, etc. The funding option may also be appropriate in situations where the size of an individual project requesting a waiver/exemption is small. In such cases, the receipt of the financial contribution shall satisfy the mitigation obligation for the project.

APPENDIX 1

APPROVED STORMWATER CONTROL ORDINANCE AND MEETING AGENDA MEMORIALIZING ORDINANCE ADOPTION

See attached PDF

Mayor and Council Meeting Agenda 2-2-21.pdf