MUNICIPAL STORMWATER MANAGEMENT PLAN

For the

Borough of Ocean Gate

Ocean County, New Jersey

March, 2005 Updated September 2008 Updated October 2020

Prepared By



9 Allen Street Toms River, NJ 08753 (732) 286-9220

RVE Project No. Job #1506-T-056

Signature

Alan Dittenhofer, PE, PP, CME License # 37672

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INTRODUCTION

The Municipal Stormwater Management Plan (MSWMP) was prepared by Ocean Gate Borough's previous municipal engineers, Schoor DePalma, Inc., dated March, 2005.

As authorized by the Borough, Remington and Vernick did an update to the plan in September 2008 in accordance with Ocean County review comments.

NJDEP has indicated to the Borough to take immediate actions to develop and update its MSWMP and Stormwater control Ordinances in order that these documents are consistent with NJAC 7:8. Therefore Remington and Vernick has been authorized by the Borough to update the Municipal Stormwater Management Plan.

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

A "build-out" analysis has not been included in this plan based upon the fact that there is less than one square mile of existing land available for development. The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan specific stormwater management measures are identified to lessen the impact of existing development.

GOALS

The goals of this MSWMP are to:

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

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

STORMWATER DISCUSSION

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

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.

Evapotranspiration Transpiration Land Surface Unsaturated Zone Water Table Infiltration Recharge Saturated Zone (Ground Water)

Figure C-1: Groundwater Recharge in the Hydrologic Cycle

Source: New Jersey Geological Survey

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.

BACKGROUND

The Borough of Ocean Gate encompasses a. 0.44 square mile area in Ocean County, New Jersey. In recent years, the Borough has been under moderate development pressure. The population of the Borough has increased from 1,385 in 1980, to 2,078 in 1990, to 2076 in 2000 and had a slight decrease to 2,035 in 2020 http://lwww.census.gov). This steady population level in the last ten years has not resulted in considerable demand for new development. Figure C-2 illustrates the waterways in the Borough. Figure C-3 depicts the Borough boundary on the USGS quadrangle maps.

Per discussions with the Borough, many local streets along the Bay are subject to coastal flooding. Some intersections are only a few feet above sea level. Some roadways in the northeast portion of the municipality have undersized storm collection systems. The Borough is currently seeking NJDOT funding to upgrade stormwater systems within the Borough. Coastal flooding problems are present on Bayview Avenue between Monmouth and Narragansett. The Borough is planning on evaluation these roads in the future. Future evaluations of areas subject to flooding should be considered to determine if additional reduction of flooding can be achieved.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 760 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified nonimpaired, 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. Ocean Gate is part of the Regional Watershed Management Area #13. WM #13. According to the Round 4 study of the AMNET sites, the Borough of Ocean Gate does not have any AMNET sites, however, in multiple locations the Toms River is considered Fair meaning that there are "moderate to major changes in structure of biological community and moderate changes in ecosystem function. Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism conditions shows signs of physiological stress; system function shows reduced complexity".

One major water body is present in the Borough, the Toms River, which forms the Borough's northern border. This water body is classified as a nonimpaired waterway. The Toms River is not currently monitored by AMNET but is monitored by the NJDEP Coastal Monitoring and Shellfish Monitoring.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. This data is located on Sublist 5 of New Jersey's Integrated List of Water bodies. It shows that the total coliform levels of the Toms River frequently exceed the state's criteria. This means that this is an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for this pollutant for the waterway. As a result, a TMDL for total coliforms was established for the Toms River Estuary as part of the Amendment to the Monmouth and Ocean Counties Water Quality management Plans, proposed February 21, 2006 and approved September 27, 2006. The Amendment targets a 74% reduction in the Toms River Estuary to address shellfish-impaired waters there, as well as other coastal waters within the Regional Watershed (Watershed Management Area #13).

In 2006, the report established 14 TMDL's for total coliform to address the impaired shellfish water in the WM #13 for Barnegat Bay and Toms River.

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

Ocean Gate Borough will address stormwater point sources through existing best Management Practices (BMPS) of the MS4 program, as practicable, and in accordance with its MS4 permit obligations.

The Borough recently passed wildlife feeding and pet waste (pickup) ordinances which are enforced by the Borough. If needed, geese control measures could also be implemented

It should also be noted that Ocean Gate Borough will also attempt to manage waterward sources of coliforms as practicable, including the following:

- Enforcement of local No Discharge Zones (including Barnegat Bay).
- Endorsement of Clean Marina Programs.

• Marina Best management Practices (e.g., providing and managing Marina pumpout facilities, etc).

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

In addition to water quality problems, flooding in the Borough of Ocean Gate occurs fairly frequently due to slight topography and low elevations relative to the Toms River and the low runoff character of the soil. Since the Borough is close to build out, substantial amounts of permeable soils have been replaced by impermeable surfaces which increases runoff volumes. All future development in the Borough of Ocean Gate shall utilize the best available technology to minimize off-site stormwater runoff, increase on-site infiltration, simulate natural drainage systems and minimize off-site discharge of pollutants to ground or surface water and encourage natural filtration functions. A map of the groundwater recharge areas is shown in Figure C-4. Wellhead protection areas are shown, in Figure C-5.

DESIGN STANDARDS

The Borough has adopted the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.S Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.

The model stormwater ordinance adopted by the Borough contains several key elements of safety-related design features, including:

- Provision of, design for and maintenance of trash racks within stormwater basins.
- Provision of, design for and maintenance of overflow grates within stormwater basins.
- Escape provisions from basins, i.e., the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins.
- Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than two and one-half feet.
- In stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

New basins will be designed, constructed and maintained to address all safety features identified above.

Non-structural measures to be considered first shall include site design and preventive source controls. These nonstructural measures are to be included in the stormwater management report. To confirm the effectiveness of such measures, applicants must verify the control of stormwater quantity impacts as detailed in the Stormwater Management rules.

The general standards for structural measures is specified in the Stormwater Management rules and are incorporated into the Borough of Ocean Gate's Ordinance. These measures meet the soil erosion, infiltration and runoff quantity standards included in the Borough's Stormwater Ordinance. The design standards for the specific structural stormwater management measures are those included in. the New

Jersey Stormwater Best Management Practices Manual. Other designs or practices may be used if they are approved by the Soil Conservation District. The design and construction of such facilities complies with the Soil Erosion and Sediment Control Standards as well as any other applicable state regulation, including the Freshwater Wetland Protection Act rules the Flood Hazard Control rules, the Surface Water Quality Standards, the Coastal Area Facilities Review Act, Waterfront Development and Harbor Facilities Act, and the Darn Safety rules.

The requirement to be consistent with all other applicable rules is included in the Borough's Stormwater Ordinance. Stormwater runoff quality controls for total suspended solids and nutrient load shall meet the design and performance standards as specified in the Stormwater Management rules. The minimum design and performance standards for infiltration and groundwater recharge specified in the Stormwater Management Rules are incorporated into the Borough's Stormwater Ordinance and must be met for all applicable development. Consistent with the Storm water Management Rules, the Ordinance allows for an. exemption from this requirement where the applicant can demonstrate that it is not practicable to meet the standards but has taken all possible steps to meet all stormwater management measures.

During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. Adequate long term operation as well as preventative and corrective maintenance of the selected stormwater management measures will be ensured by requiring the design engineer to prepare a maintenance plan/report for its stormwater management facilities incorporated into the design of the major development. The maintenance plan shall, have specific preventative maintenance tasks, schedules and cost estimates as well as the responsible party for corrective and preventative maintenance.

It should be noted that the NJDEP's Coastal Area Facility Regulation Act (CAFRA) regulations incorporate the NJ Stormwater Rule by reference. An applicant requiring a CAFRA permit for a project that may request a Borough waiver of stormwater performance standards may be required to provide a mitigation plan for the proposed project by the NJDEP (even if not required by the Borough).

Finally, all regulated stormwater BMP facilities will be subject to operation and maintenance requirements stipulated in the NJ Stormwater Rule, including not limited to the following:

- The design engineer shall prepare a maintenance plan/report for the stormwater management measures incorporated into the design of a major development.
- The maintenance plan/report shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement).
- Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure(s), including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of non-vegetated linings.
- The person responsible for maintenance shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenancerelated work orders.
- The person responsible for maintenance shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.
- The person responsible for maintenance shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by the Borough's stormwater ordinances.

• In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.

PLAN CONSISTENCY

The Borough is not within a Regional Stormwater Management Planning Area. However, since the Ocean County Water Quality Management plan was amended for the TMDL for Total Coliform, this plan will have to be amended if any future regulations or requirements result from this or other TMDL's, or if a Regional Stormwater Plan is developed in the future.

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

The Borough's stormwater ordinance requires that all new development and redevelopment plans be consistent with the NJ Soil Erosion and Sediment Control Standards. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Ocean County Soil Conservation District.

NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

Previously the Township had revised the stormwater ordinances 515-07 to incorporate guidelines for nonresidential and residential development for Major Development in the Borough.

After review of the stormwater management ordinances it is our recommendation that the following is revised or added to the stormwater management ordinances and to the nonstructural strategies outlined in the ordinances:

Chapter 515-07 Section 2 Definitions - Major Development definition should be amended to the following: "Major development" means any "development" that provides for ultimately disturbing one or more acres of land or increasing impervious surface by one-quarter acre or more. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation. Projects undertaken by any government agency which otherwise meet the definition of "major development" but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seg., are also considered "major development."

Chapter 515-07 Nonstructural Stormwater Management Strategies: This section should be include the following:

- 1. To allow buffer areas to be utilized for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces,
- 2. To include additional landscaping standards regarding low impact design, native vegetation and green storm water facility concepts such as rain gardens.
- 3. To include language that no bulk storage shall be stored within 50 feet of stormwater management facility.
- 4. To allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas, as deemed appropriate by the municipal engineer.

- 5. To allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge, as deemed appropriate by the municipal engineer.
- 6. To include the required use of native vegetation in easement areas for any replanting, as deemed appropriate by the municipal engineer.

LAND USE/BUILD OUT ANALYSIS

The Borough of Ocean Gate encompasses a total of 0.44 square miles of developable land. Since the Borough in its entirety is less than one square mile, the Borough, of Ocean Gate is not required to complete a build-out analysis.

Figure C-6 illustrates the existing land use in the Borough and Figure C-7 illustrates land use that is not buildable due to the wetlands.

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

Water Quality

- Retrofit the existing stormwater management facilities at the following facilities to provide the removal of 80 percent of total suspended solids.
- Ocean Gate Elementary School at Arverne Avenue.
- Future Municipal Complex at Arverne Avenue.
- Veterans Park
- Retrofit the existing stormwater systems that outfall into the Toms River to provide the removal of 80 percent of total suspended solids and oils.
- Retrofit the heads on catch basins as specified by the Borough Engineer to comply with NJDEP Phase II regulations.

The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a. Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with

the long-term maintenance requirements of the mitigation measure. When developer provides funding for a project listed in Stormwater Management Plan, the municipality must expend any contributions collected within 5 years of their receipt. The Applicant must obtain all required permits for the mitigation project prior to municipal approval and the mitigation should be addressed on-site as much as possible before looking off-site.











