Hackensack Meadowlands Floodplain Management Plan

prepared in conformity to

The National Flood Insurance Program
Community Rating System
Activity 510 Guidelines

for

The New Jersey Meadowlands Commission
One DeKorte Park Plaza
Lyndhurst, New Jersey

October 24, 2005

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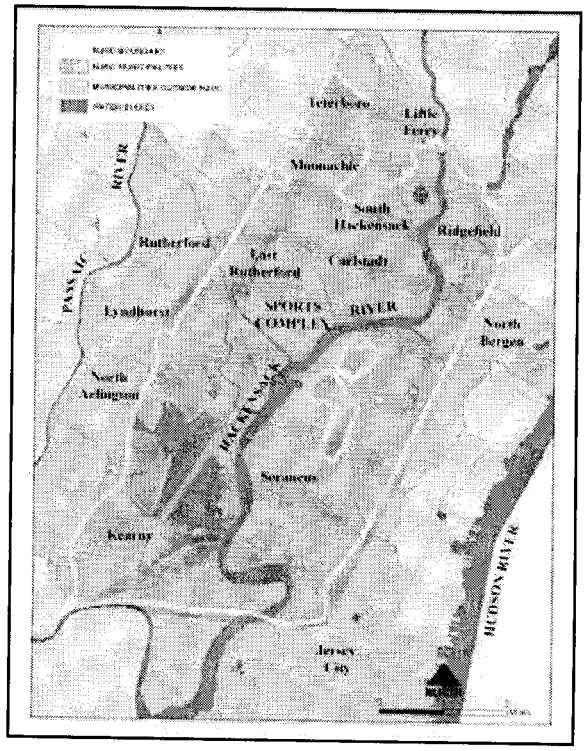
SECTION 1: PREPARATION OF THE PLAN

1.1 Introduction

The New Jersey Meadowlands Commission ("NJMC") participates in the Federal Emergency Management Agency's (FEMA) Community Rating System ("CRS") on behalf of the 14 municipalities within the Hackensack Meadowlands District. This program is voluntary and recognizes and encourages community floodplain management activities that exceed the minimum National Flood Insurance Program ("NFIP") requirements. Property owners and tenants in the Hackensack Meadowlands District currently enjoy a flood insurance discount due to the continued efforts by the NJMC to exceed the program requirements.



Under the CRS guidelines, the NJMC is responsible for the preparation, adoption, implementation, evaluation, and maintenance of this comprehensive Floodplain Management Plan (the "Plan"). It is our goal to achieve the maximum permissible CRS point total for the Plan to not only further reduce the insurance premiums in the District, but also to better address the flooding that has plagued the District in the past several years.

This Plan's development, per the above guidelines, included the following:

Table 1-1: Plan Development Guidelines

Planning Regulations (44 CFR 201.6)	CRS Planning Steps
Planning Process	
201.6(c)(1)	1. Organize
201.6(b)(1)	2. Involve the public
201.6(b)(2) & (3)	3. Coordinate
Risk Assessment	
201.6(c)(2)(i)	4. Assess the hazard
201.6(c)(2)(ii) & (iii)	5. Assess the problem

SECTION 5: GOALS

Based on the hazards identified in Section 4, the goals of the Hackensack Meadowlands Floodplain Management Plan are as follows:

1. Restore, replace, or decommission the 31 regional tide gate, levee, and pump station systems in the District.
   - These systems shall be evaluated by the U.S. Army Corps of Engineers based on the two-dimensional floodplain model developed for the Meadowlands District by their Waterways Experiment Station.
   - Expedite the replacement of the Rutherford Tide Gates, the restoration of the Peach Island Creek Tide Gates, the restoration of the East Riser Ditch Tide Gates and the restoration of the West Riser Ditch Tide Gates.

2. Prepare the permitting necessary for the clean out of the Asia Place, Gotham Parkway, and Barell Avenue stormwater drainage ditch systems.
   - Permitting is assumed to include NJDEP Stream Encroachment Permits, U.S. Army Corps of Engineers Nationwide Permit 31, and a Soil Conservation District Soil Erosion and Sediment Control Plan certification.
   - Coordinate with the municipalities and owners to complete the clean out of each of the systems.
   - Where abandoned rails cross the systems with collapsed or undersized culverts, coordinate with the responsible rail owner for the permanent removal of the stream impediment to restore open channel flow. Culvert systems are prone to becoming clogged over time and during high intensity rainfall events, when debris is often carried in the waterways.

3. Address each of the impacted watersheds that are not improved by above per the priority score associated with each area in Section 6.
   - This effort will include pursuing grants and environmental permits, as well as providing technical assistance to the owner(s).
   - Emphasis will be placed on balancing environmental protection, economic viability, and a realistic maintenance burden. Where possible, mechanical and piped systems will be avoided.

4. Update, in coordination with the U.S. Army Corps of Engineers, Philadelphia District, the New Jersey Hurricane Evacuation Study's Storm Surge Map of the District.

5. Develop and implement a District Flood Hazard Warning System that utilizes both the real-time rainfall and stream elevation data collection systems deployed by the NJMC in District, as well as real-time systems upstream of the District.

- Warnings shall be advanced when practical and shall be designed to alert municipalities of fluvial flooding, tidal flooding, as well as hurricane-related flooding.
- Warning levels shall include the 2-year, 10-year, and 25-year storms and tidal surges, as well as Category 1, 2, and 3 hurricanes.
- The system should deliver a clear description of potential areas of impacts to the District's municipalities accompanied by relevant mapping in a universal digital format and be automated with user override capabilities.

6. Assemble the Plan Committee and Interagency Committee on a quarterly basis.

7. Assume responsibility for approving Stream Encroachment Permits for flood control projects within the District from the NJDEP in non-tidal (tide separated) waters.

8. Continue to provide data to the Committees and the general public via the NJMC website.

SECTION 6: HAZARD MITIGATION RECOMMENDATIONS

6.1 Revisions to Meadowlands Zoning Regulations

As detailed in Section 3.2, the NJMC has proposed changes to the District Zoning Regulations, N.J.A.C. 19:4. These changes were prompted by New Jersey's NFIP Coordinator at the Bureau of Dam Safety and Flood Control, as well as comments from the Plan and Interagency Committees. These proposed changes are awaiting approval via the New Jersey Office of Administrative Law (OAL).

6.1.1. N.J.A.C. 19:4-4.4

A subsection has been proposed that requires the submission of the elevation to which floodproofing is provided in structures that require such measures. Additionally, a subparagraph has been proposed to clarify the requirement for a submittal of a licensed-professional's certification regarding the floodproofing methods used in nonresidential structures. These changes were proposed to be consistent with FEMA's model flood plain management regulations.

6.1.2. N.J.A.C. 19:4-8.6

The proposed changes include a revision to allow the use of vegetated channels to convey stormwater runoff. This proposed additional language provides greater flexibility to design professionals and, by permitting surface stormwater collection and conveyance systems, serves to improve the quality of stormwater runoff and to increase the likelihood of proper maintenance. Grass swales and other vegetated channels have a reported capacity to reduce the level of suspended solids in stormwater runoff.

The proposed revision more specifically defines what hydrologic and hydraulic studies are necessary to verify the capacity of receiving stormwater collection systems. This proposed revision provides for uniformity in the level of detail required of design professionals to demonstrate that proposed stormwater systems will not increase downstream flooding when using an existing collection system. This revision also allows the design professional the option of not completing a capacity study provided that peak flows do not increase.

An important revision mentioned in Section 3.2 is a clarification on the requirement that new development or redevelopment shall maintain existing drainage patterns. Specifically, construction may not block existing drainage systems or overland flow patterns to the detriment of neighboring properties for storms of up to the 25-year event.

Specific design criteria have also been proposed to more specifically define the expectations of the NJMC regarding the methodologies employed in submitted stormwater hydrologic and hydraulic analyses. These criteria include the following:

1. Language is clarified to specify the source of the rainfall data to be used for the development of rainfall intensities and/or rainfall depths for the 25-year design storm and the NJDEP Water Quality Storm. There is no change to the storms that must be addressed; rather, this addition is meant to assist design professionals in locating the required sources of rainfall design data.

2. The proposed description of the appropriate use of the Rational and Modified Rational Method for peak flow and peak runoff volume determination has been revised to conform with the description of in the guidance manual "Standards for Soil Erosion and Sediment Control" promulgated by the New Jersey State Soil Conservation Committee. Specifically, an antecedent precipitation factor has been incorporated into the runoff coefficient and is also included in Figure 8-2. This multiplier accounts for soil saturation during larger storms, such as the 25-year event. This change will have no impact to impervious lots as the multiplier only impacts pervious cover.

3. The proposed description of allowable methodologies for developing the time of concentration for watersheds has been updated to reflect the maximum sheet flow length of 150 feet dictated by the NJDEP and the federal Natural Resources Conservation Service (NRCS). This proposed revision is minor and merely clarifies the maximum sheet flow length that was established by the NRCS in 1993. The clarification differentiates between a maximum sheet flow length of 150 feet for paved surfaces and 100 feet for vegetated surfaces.

4. Language is proposed regarding pressure flow. Specifically, stormwater pipe is not typically designed to carry stormwater under pressure, as pipe joints may open up. The proposed addition states that stormwater pipe systems may not operate under pressure unless justified by the design professional and approved by the NJMC.

5. Language is added to clarify the hydraulic calculations required when a stormwater outfall is in tidal waters. Specifically, a statement has been added that the backwater condition generated by the mean high water (MHW) in tidally-influenced waters needs to be analyzed. This statement clarifies to the design professional the appropriate tailwater elevation to be analyzed in conjunction with tidal areas that require tide gates.

6.2 Open Space Priorities

The NJMC reviewed the location of vacant lands in the District in conjunction with the 25-year floodplain. The data nodes from the 2005 Bergen County Flood Insurance Study, effective September 30, 2005, include only the 10-year, 50-year, 100-year and 100-year tidal surge elevations. As such, a regression was performed on each of the study's nodes by the NJMC following receipt of the report from FEMA to interpolate, as accurately as possible, the 25-year surge elevation. The data was then converted from NGVD29 to NAVD88.

These data points were then modified, with high-resolution digital topographic data and ArcMap GIS software, into a boundary map of the extents of the 25-year flood area. A layer of the vacant lands was projected through the above boundaries to identify Properties of Interest (POI).

POIs that were eliminated included sites smaller in size that 0.15 acres, properties owned by the NJMC, and isolated properties. The findings are presented below in Table 6-x. Note that this table represents the initial step in identifying properties beneficial to the goals listed in Section 5.0 and will need to be further refined and updated with this Plan on a regular basis.

Preference should be placed on wetland areas and properties bordering established wetlands based upon the demonstrated ability of such features to reduce flooding, provide critical habitat, and improve overall water quality. Note that the NJMC adopted a Master Plan in January 2004 that protects 8,400 undeveloped acres of wetlands within the District.