

**MUNICIPAL  
STORMWATER MANAGEMENT  
PLAN**

*for the*

**Borough of Caldwell**

Essex County, New Jersey

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## ***INTRODUCTION***

This Municipal Stormwater Management Plan (hereinafter the MSWMP or the Plan) documents the strategy for the Borough of Caldwell (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 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 developments, defined as projects that disturb one or more acres of land or increasing impervious surface by one-quarter acre. These standards are intended to minimize the adverse impact of stormwater runoff on water quality, 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 is not required in this Plan based upon existing zoning and 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 Borough last reviewed the Master Plan in 2005. 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 Plan, specific stormwater management measures are identified to lessen the impact of existing development.

## **GOALS**

The goals of this Municipal Stormwater Management Plan 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 non-point 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 (Image 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.

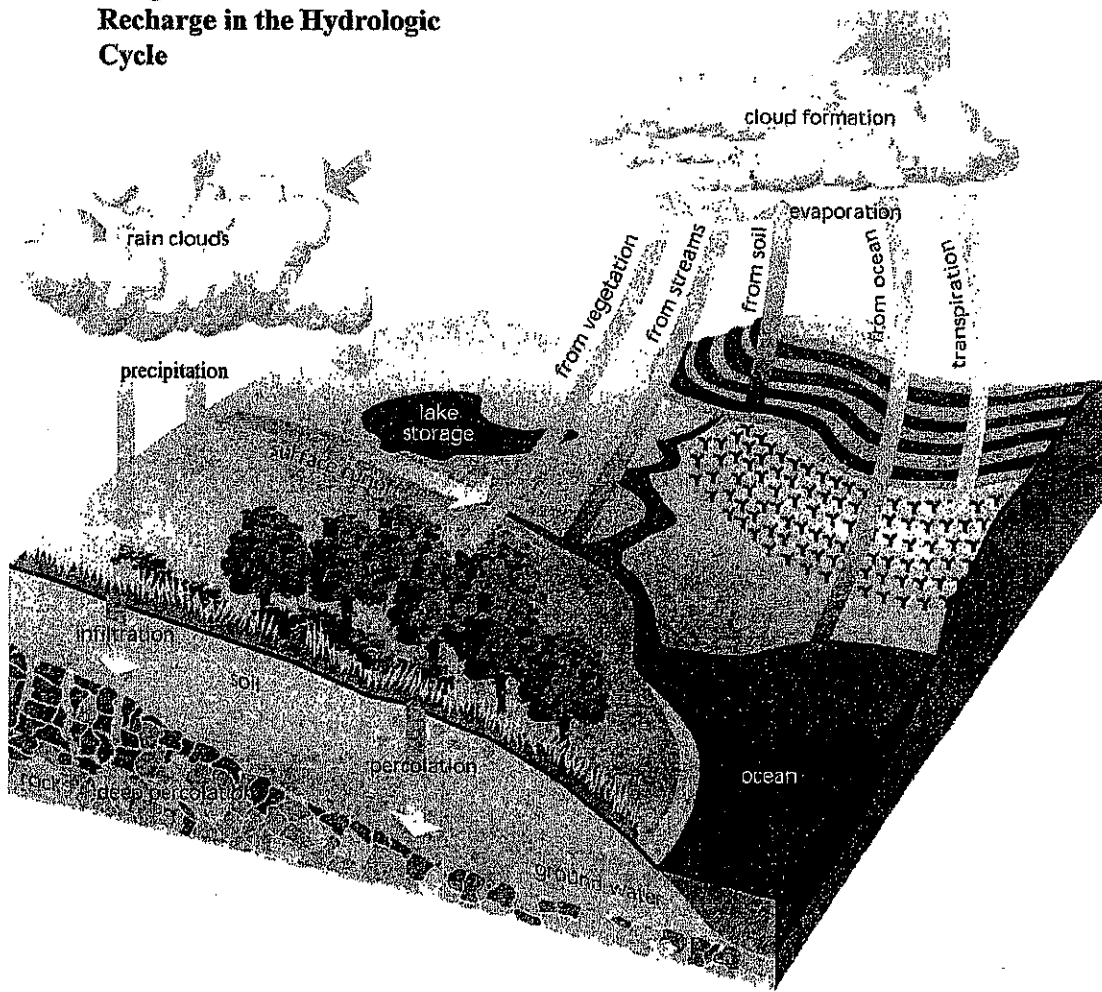
Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration 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.

**Image 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.

## ***BACKGROUND***

The Borough of Caldwell for planning purposes is a fully developed municipality. The middle core area is developed commercially along Bloomfield Avenue. Astride these uses are offices and multifamily housing. The remaining and major portion of Caldwell is developed for single family housing. Caldwell College, in the eastern sector of the municipality is the largest landholder in the community. Caldwell encompasses 1.2 square miles in the western portion of Essex County in north east New Jersey. The Borough is primarily built-out with only 7.6 acres of developable open space equating to approximately 1.0% of the Borough's total area.

The Borough depends entirely on sanitary sewers with a few septic systems located in older sections of the Borough with difficulty of connecting to the sanitary sewer system due to topographic conditions.

Additionally, the Borough of Essex Fells supplies 100% of the Borough's potable water through a long term agreement between the municipalities. Emergency interconnections exist between the Borough and North Caldwell and Verona. It is possible that a small number of individual residences may utilize groundwater wells, however the amount is most likely negligible. **Figure 1** depicts the Borough boundary on the United States Geological Survey (USGS) Quadrangle Map.

The Borough's population decreased from 7,624 in 1980 to 7,549 in 1990 (1.0%). The population then experienced a slight increase to 7,584 in 2000 (projected 7,594 in 2004), ending a decline in population that peaked at 8,677 in 1970. This most recent population increase has most likely resulted in demand for new development. In addition to the population, the Borough has experienced an increase in the development of multi-family housing. Based on the amount of vacant land available in the Borough it is expected that the population increases will remain insignificant.

A Map depicting the Borough's major waterways/waterbodies is included as **Figure 2**. The Borough of Caldwell is located in both Watershed Management Area 4 (WMA-4), Lower Passaic and Saddle River and Watershed Management Area 6 (WMA-6), Upper Passaic, Whippany and Rockaway. Each Watershed Management Area is divided in smaller sub-watersheds, assigned a 14-digit Hydrologic Unit Code (HUC-14). The two (2) HUC-14s for the Borough of Caldwell are shown in **Figure 3**.

The NJDEP is designating an increasing number of streams in the State as Category-1 (C1) waterways, especially those that provide drinking water and important habitat for threatened and endangered species as well as popular recreation fish such as trout. Streams can be designated as C1 based on their ecological significance, recreational or aesthetic significance, water supply significance, fisheries resources, shellfisheries or their location within publicly preserved open space. The C1 designation prevents further degradation in existing water quality. Moreover a 300' buffer is established around the C1 waterways and is referred to as a Special Water Resource Protection Area (SWRP A). None of the waterways in the Borough of Caldwell are considered C1 waterways and are illustrated on **Figure 2**.

The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macro invertebrates by NJDEP on a 5-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 macro invertebrate community dynamics.

The NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the in-stream fecal coliform concentrations of the Passaic River and its tributaries frequently exceed the State's criteria. The Passaic River is considered an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants of each waterway. A TMDL is the amount of a pollutant that can be accepted by a water body without causing an exceedance of water quality standards or interfering with the ability to use a water body 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.

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, the Borough has exhibited water quantity problems including flooding and stream bank erosion. The Borough has two streams which both discharge into the Pine Brook. Stream 1 the northeast tributary originates in North Caldwell and enters the Borough of Caldwell just west of Forest Avenue. This stream channel parallels Forest Avenue, flows under Hatfield Street and Grover Lane and then flows adjacent to Personette Street before entering a lengthy culvert which carries the stream under the Bloomfield Avenue commercial district to the Westville Avenue/Brookside Avenue intersection. From this point the stream flows in an open concrete and rock laid flume under Westbrook Drive and into Grover Cleveland Park. Stream 2 the primary tributary stream originates in Essex Fells and enters the Borough of Caldwell across the eastern Borough boundary and parallels the defunct Morristown & Erie Railroad line and Bloomfield Avenue. This stream is piped in long lengths at numerous locations. Immediately southwest of the intersection of Roseland Avenue and Westville Avenue the stream outlets from a culvert and flows in an open channel and concrete flume paralleling Westville Avenue. Just upstream of Westbrook Drive this tributary joins the northeast tributary stream. Both streams have experienced has erosion problems along the entire length during extreme rainfall events.

Lastly, the Borough contains, or lies within a number of wellhead protection areas. A wellhead protection area is divided into three (3) tiers. The 2-year (Tier 1), 5-year (Tier 2) and 12-year (Tier 3) are intended to represent the time of travel (TOT) a groundwater contaminant in the zones could be expected to reach a municipal potable supply well. The NJDEP then prioritizes the investigation and remediation of contaminated sites within the 2 and 5-year tiers. Wellhead protection areas are shown in **Figure 5**. The Borough may also wish to adopt specific ordinances to further protect wellhead protection areas and minimize the infiltration of pollutants into aquifers.

## ***DESIGN AND PERFORMANCE STANDARDS***

Within the next 12-months the Borough will review its existing ordinances and 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 will include language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and the safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to Essex County for review and approval.

In addition to the adoption of the above performance standards, during future development projects, Borough inspectors will ensure that the stormwater management measures are constructed and function as designed, however, the municipality may adjust these standards. For example, certain municipalities have designated entities required to assume maintenance responsibility. In some cases, the municipality may choose to revise land use and zoning ordinances to prescribe how nonstructural stormwater management measures must be addressed.  
*(to be addressed by the municipality)*

## *PLAN CONSISTENCY*

The Borough is not within a Regional Stormwater Management Planning Area, therefore, this Plan does not need to be consistent with any regional stormwater management plans (RSWMP). If any RSWMPs are developed in the future, this municipal stormwater management plan (MSWMP) will be updated as necessary to be consistent. Essex County is currently creating a County Stormwater Management Plan that should be complete in 2006. This MSWMP will be updated as necessary to be consistent with the County Stormwater Management Plan.

The MSWMP is consistent with the Residential Site Improvement Standards (RSIS) detailed in N.J.A.C. 5:21. The Borough will utilize the most current RSIS during the stormwater management review of residential development. This MSWMP will be updated to be consistent with any future changes to the RSIS.

The Borough's existing ordinances also require all new development and redevelopment plans to comply with New Jersey's 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 local Soil Conservation District.

As mentioned previously, a fecal coliform TMDL has been established for the Passaic River and its tributaries. The Borough will investigate the source of these pollutants that may include areas of high goose populations.

## ***NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES***

The Borough will review its Master Plan and ordinances and provide a list of the sections in the Borough land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. Once the ordinance texts are complete, they will be submitted to the County review agency for review and approval within 24-months of the effective date of the Stormwater Management Rules. A copy will also be sent to the NJDEP at the time of submission.

After review of the Master Plan and zoning ordinances, a sample of revisions may include the following:

**Section (*Municipality to determine*): Buffers** requires buffer areas along all lot and street lines separating residential uses from arterial and collector streets, separating a nonresidential use from either a residential use or residential zoning district line, and along all street lines where loading and storage areas can be seen from the street. The landscape requirements for these buffer areas should recommend the use of native vegetation. The language of this section could be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. Additionally, language could allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. This section may also require the preservation of natural wood tracts and limits land disturbance for new construction.

**Section (*Municipality to determine*): Cluster Development** provides for a cluster development option to preserve land for public and agricultural purposes, to prevent development on

environmentally sensitive areas, and to aid in reducing the cost of providing streets, utilities and services in residential developments. This cluster option is an excellent tool for reducing impervious roads and driveways. The option allows for smaller lots with smaller front and side yard setbacks than traditional development options. It also minimizes the disturbance of large tracts of land, which is a key nonstructural stormwater management strategy. The cluster option could be amended to require that 10% of the total tract be preserved as common open space for residential area. The cluster option does require that 25 percent of the green or common area be landscaped with trees and/or shrubs. This language should be amended to promote the use of native vegetation, which requires less fertilization and watering than non-native ornamental plants. Although the cluster option requires public concrete sidewalks to be installed along all streets, the option requires paths in open space to be mulched or stone to decrease the impervious area.

**Section (*Municipality to determine*): Curbs and Gutters** could require that concrete curb and gutter, concrete curb, or Belgian block curb be installed along every street within and fronting on a development. This section could be amended 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.

**Section (*Municipality to determine*): Drainage, Watercourses and Flood Hazard Areas** requires that all streets be provided with inlets and pipes where the same are necessary for proper drainage. This section could be amended to encourage the used of natural vegetated swales in lieu of inlets and pipes.

**Section (Municipality to determine): Driveways and Accessways** describes the procedure for construction of any new driveway or access way to any street. This section could be amended to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge.

**Section (Municipality to determine): Natural Features** could require that natural features, such as trees, brooks, swamps, hilltops, and views, be preserved whenever possible, and that care be taken to preserve selected trees to enhance soil stability and landscaped treatment of the area.

This section could be amended to expand trees to forested areas, to ensure that leaf litter and other

beneficial aspects of the forest are maintained in addition to the trees.

**Section (Municipality to determine): Nonconforming Uses, Structures or Lots** requires a variance for existing single family homes proposing additions that exceed the maximum percent impervious. The homeowner must mitigate the impact of the additional impervious surfaces unless the stormwater management plan for the development provided for these increases in impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge as described in Chapter *(to be determined)*. A detailed description of how to develop a mitigation plan is present in the Borough Code.

**Section (Municipality to determine): Off-site and Off-tract Improvements** describes essential off-site and off-tract improvements. Language could be added to this section to require that any off-site and off-tract stormwater management and drainage improvements must conform to the "Design and Performance Standards" described in this plan and provided in Sections *(to be determined)* of the Borough Code.

**Section (*Municipality to determine*): Off-street Parking and Loading** details off-street parking and loading requirements. All parking lots with more than 10 spaces and all loading areas could be required to have concrete or Belgian block curbing around the perimeter of the parking and loading areas. This section could also require that concrete or Belgian block curbing be installed around all landscaped areas within the parking lot or loading areas. This section could allow for flush curb with curb stop, or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers could be incorporated. This section also provides guidance on minimum parking space requirements. These requirements are based on the number of dwelling units and/or gross floor area. The section allows a developer to demonstrate that fewer spaces would be required provided area is set aside for additional spaces if necessary. This section could be amended to allow pervious paving to be used in areas to provide overflow parking, vertical parking structures, smaller parking stalls, and shared parking.

**Section (*Municipality to determine*): Performance Standards** provide pollution source control. It prohibits materials or wastes to be deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, evaporation or wind. It also requires that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers.

**Section (*Municipality to determine*): Shade Trees** requires a minimum of three shade trees per lot to be planted in the front yard. In addition to Section (*to be determined*), the Borough has a

Tree Preservation Ordinance, Sections *(to be determined)* that restricts and otherwise controls the removal of mature trees throughout the Borough. This ordinance recognizes that the preservation of mature trees and forested areas is a key strategy in the management of environmental resources, particularly watershed management, air quality, and ambient heating and cooling. These sections set out a "critical footprint area" that extends 20 feet beyond the driveway and building footprint where clearing of trees cannot occur. This complies with minimizing land disturbance, which is a nonstructural stormwater management strategy. These sections could be amended to require the identification of forested areas, and that 25% of forested areas be protected from disturbance.

**Section *(Municipality to determine): Sidewalks*** describe sidewalk requirements for the Borough. Although sidewalks are not currently required along all streets, the Borough can require them in areas where the probable volume of pedestrian traffic, the development's location in relation to other populated areas and high vehicular traffic, pedestrian access to bus stops, schools, parks, and other public places, and the general type of improvement intended indicate the advisability of providing a pedestrian way. Sidewalks are to be a minimum of four feet wide and constructed of concrete. Language could be added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces or use permeable paving materials where appropriate.

**Section (Municipality to determine): Soil Erosion and Sediment Control** addresses soil erosion and sediment control by referencing Chapter *(to be determined)*, the Borough's Soil Erosion and Sediment Control Ordinance. This ordinance requires developers to comply with the New Jersey Soil Erosion and Sediment Control Standards and outlines some general design principles, including: whenever possible, retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; and, install diversions, sediment basins, and similar required structures prior to any on-site grading or disturbance.

**Section (Municipality to determine): Stormwater Runoff** addresses stormwater runoff by referencing Chapter *(to be determined)*, the Borough's Surface Water Management Ordinance, which will be updated to include all requirements outlined in N.J.A.C. 7:8-5. These changes were presented earlier in this document.

**Section (Municipality to determine): Streets** describes the requirements for streets in the Borough. The Borough circulation system consists of County and Borough roadways. This system also describes their function. In that the County roads are collector type road and the Borough roads are local streets. A local street provides access to fronting land uses and typically carries light traffic volumes. A collector road, as the name implies, collects traffic from local streets and connects it with minor and major arterials. Street paving widths are a function of the number of units served, whether a street is curbed, whether on-street parking is permitted, whether the interior streets serve lots of two acres or larger, and whether on-site

topographical constraints allow design flexibility. Depending on these factors, paving width for secondary local streets has a range from 20 to 32 feet. This section could be amended to encourage developers to limit on-street parking to allow for narrower paved widths. This section could also require that cul-de-sacs have a minimum radius of 50 feet. It could be proposed that language be added to this section to reduce the minimum radius of cul-de-sac designs.

## ***LAND USE/BUILD-OUT ANALYSIS***

As previously mentioned, a detailed land use analysis is not required since Caldwell does not contain more than 640-acres of vacant developable land. In support of the aforementioned we have included **Figure 6** illustrating the existing land use in the Borough based on NJDEP's 1995/97 GIS information. Moreover **Figure 3** illustrates the HUC 14s within the Borough; **Figure 4** depicts floodplains located within the Borough; **Figure 7** presents the Borough's zoning; and **Figure 8** illustrates the Borough's constrained lands.

## ***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 mitigation options.

### **Mitigation Project Criteria**

- A. The mitigation project must be implemented in the same drainage area (HUC-14) 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 MSWMP. 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.

The applicant can select one (1) of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information or a list of additional projects can be obtained from the Borough Engineer. Listed below are general projects that can be used to address the mitigation requirement.

1. *Water Quality*

- a) Retrofit an existing stormwater management facility on a Borough-owned property to provide the removal of 80 percent of total suspended solids (TSS) from the parking lot runoff.
- b) Retrofit the existing parking area on a Borough-owned property to provide the removal of 80 percent of TSS.

2. *Water Quantity*

- a) Install stormwater management measures in an open space to reduce the peak flow from an upstream development on the receiving stream by 20 cubic feet per second (cfs), 35 cfs, and 100 cfs for the 2, 10, and 100 year storms respectively.

3. *Groundwater Recharge*

- a) Retrofit an existing Borough-owned property to provide an additional 300,000 cubic feet of average annual groundwater recharge.
- b) Replace an existing deteriorated impervious parking lot on a Borough-owned property.

B. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option A, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met; the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

## *1. Water Quality*

- a) Re-establish a vegetative buffer (minimum 50 foot wide) along 1,500 linear feet of the shoreline at one of the Borough's lakes or ponds as a goose control measure and to filter stormwater runoff from the high goose traffic areas.
- b) Provide goose management measures, including public education at Borough's parks.

The municipality may allow a developer to provide funding or partial funding to the municipality for a project that has been identified by the Borough Engineer or towards the development of a RSMP. 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.

# FIGURES



# Borough of Caldwell Waterways

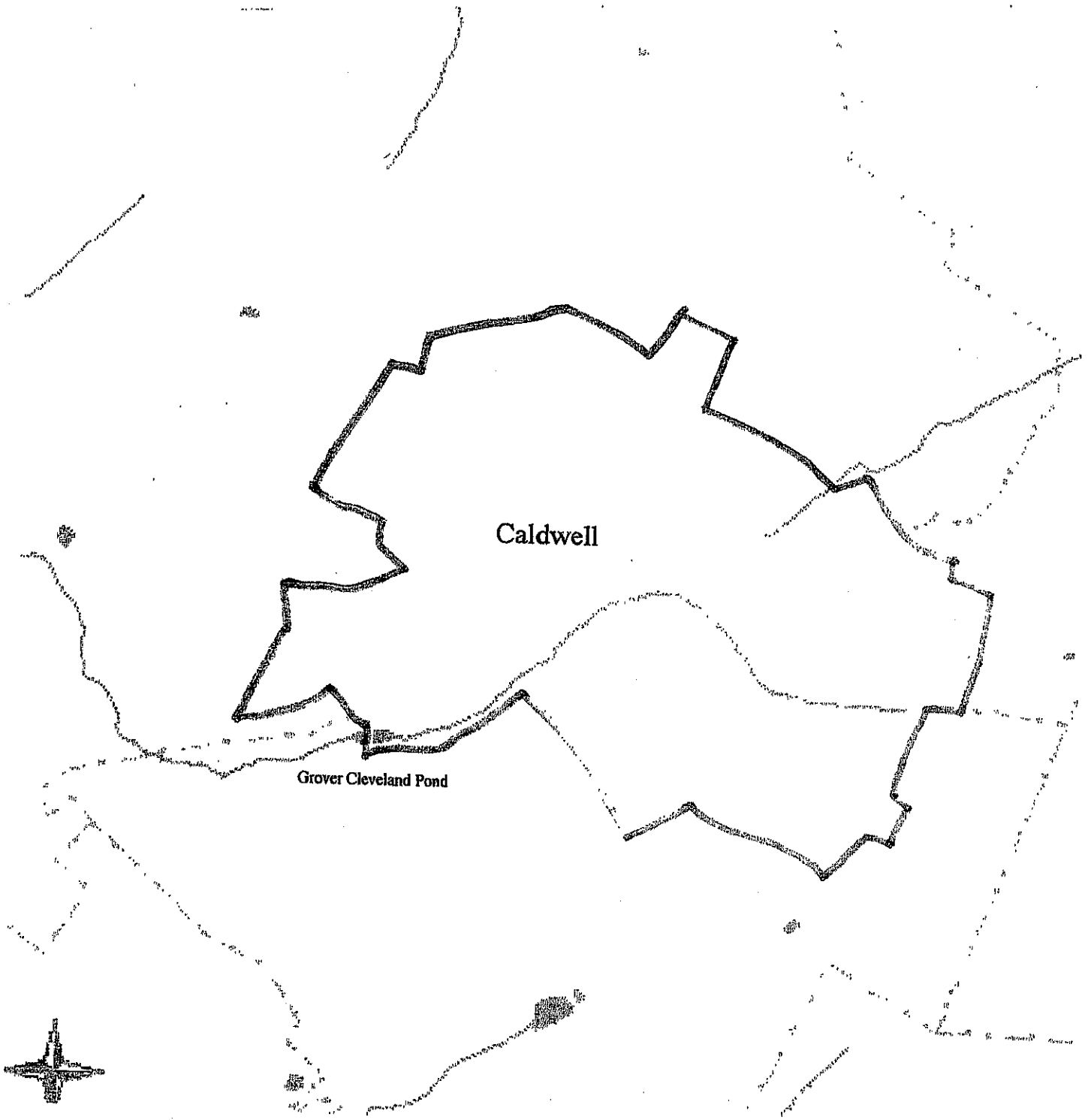


FIGURE 2

# Hydrologic Units (HUC-14) in the Borough of Caldwell

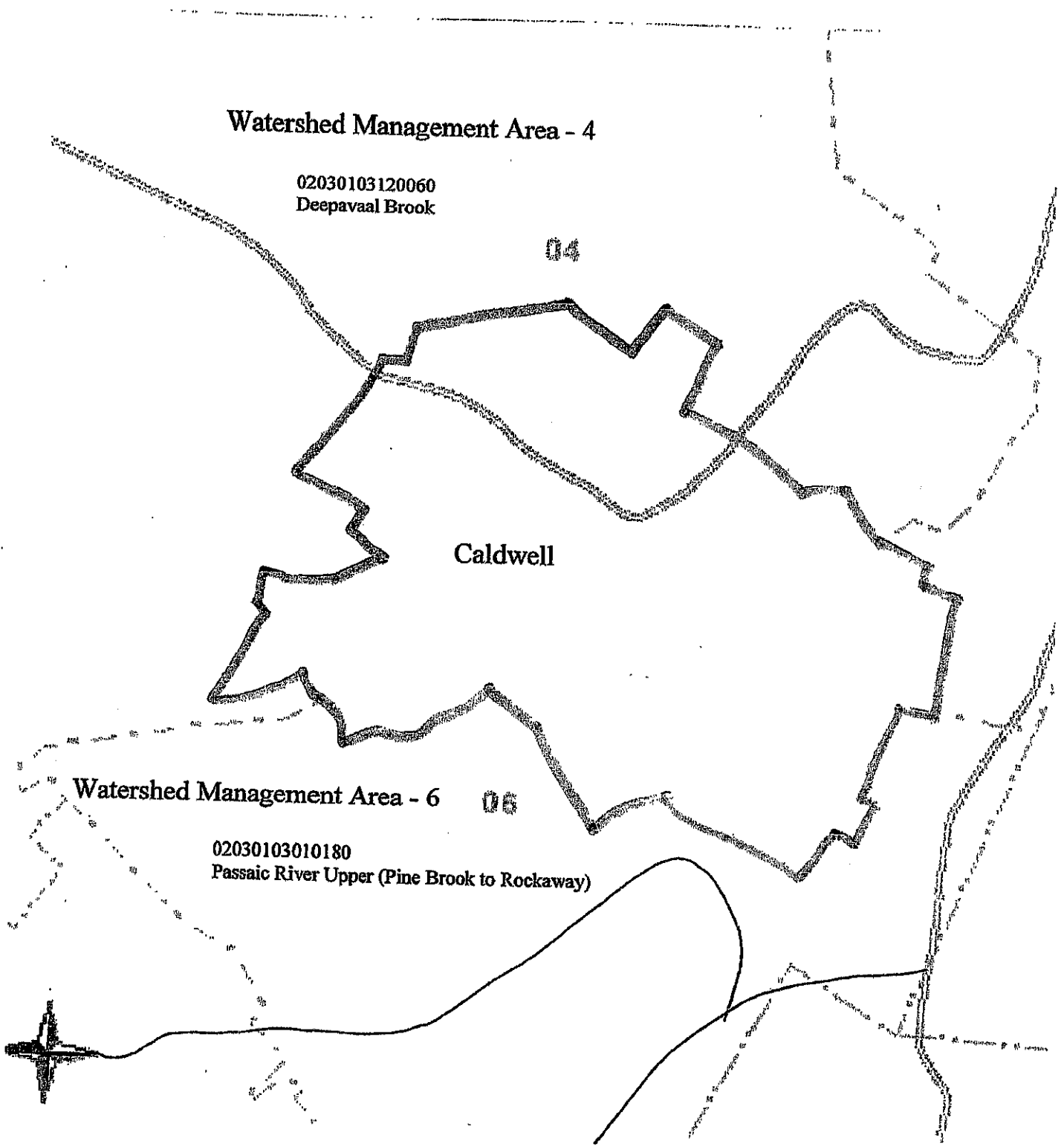
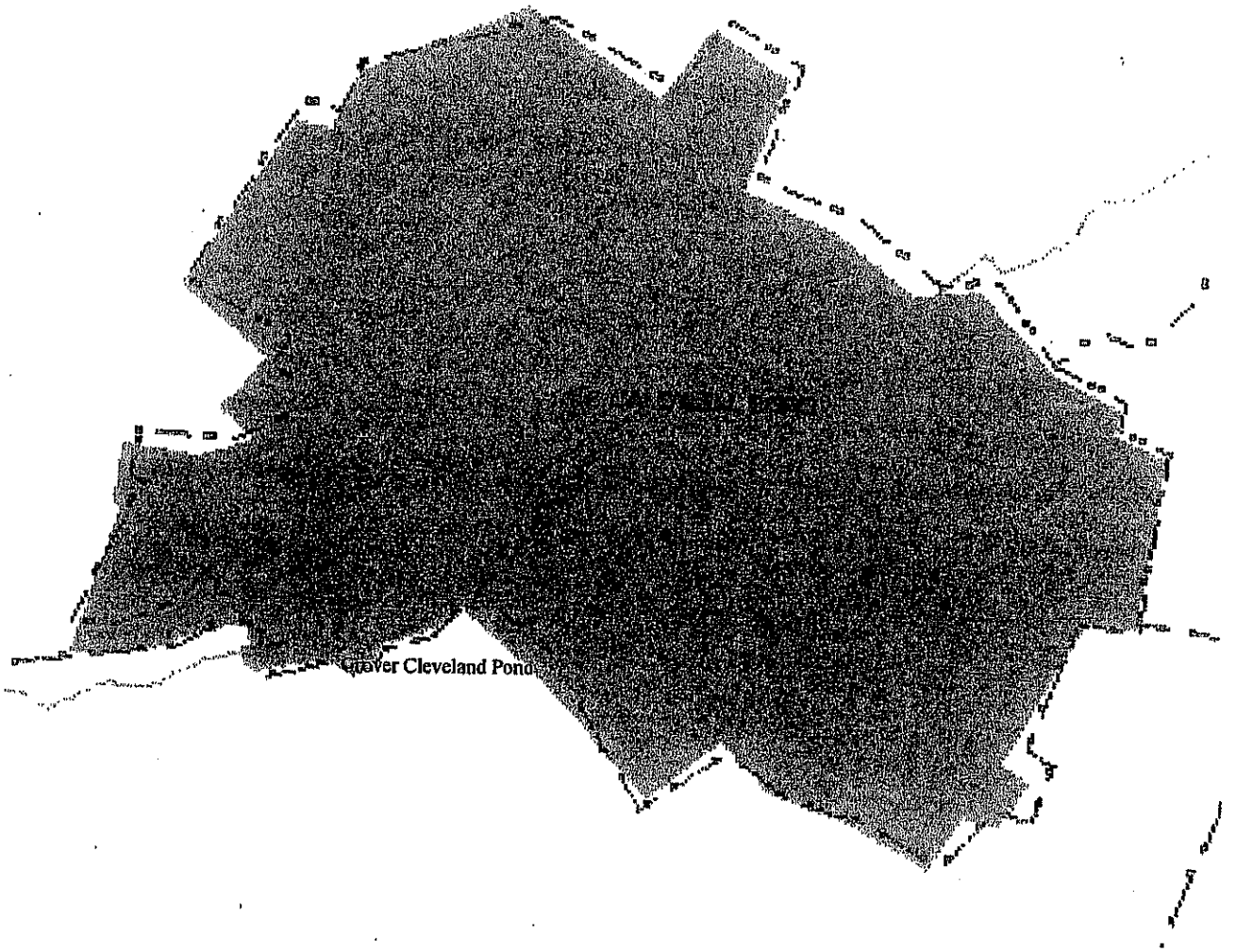


FIGURE 3

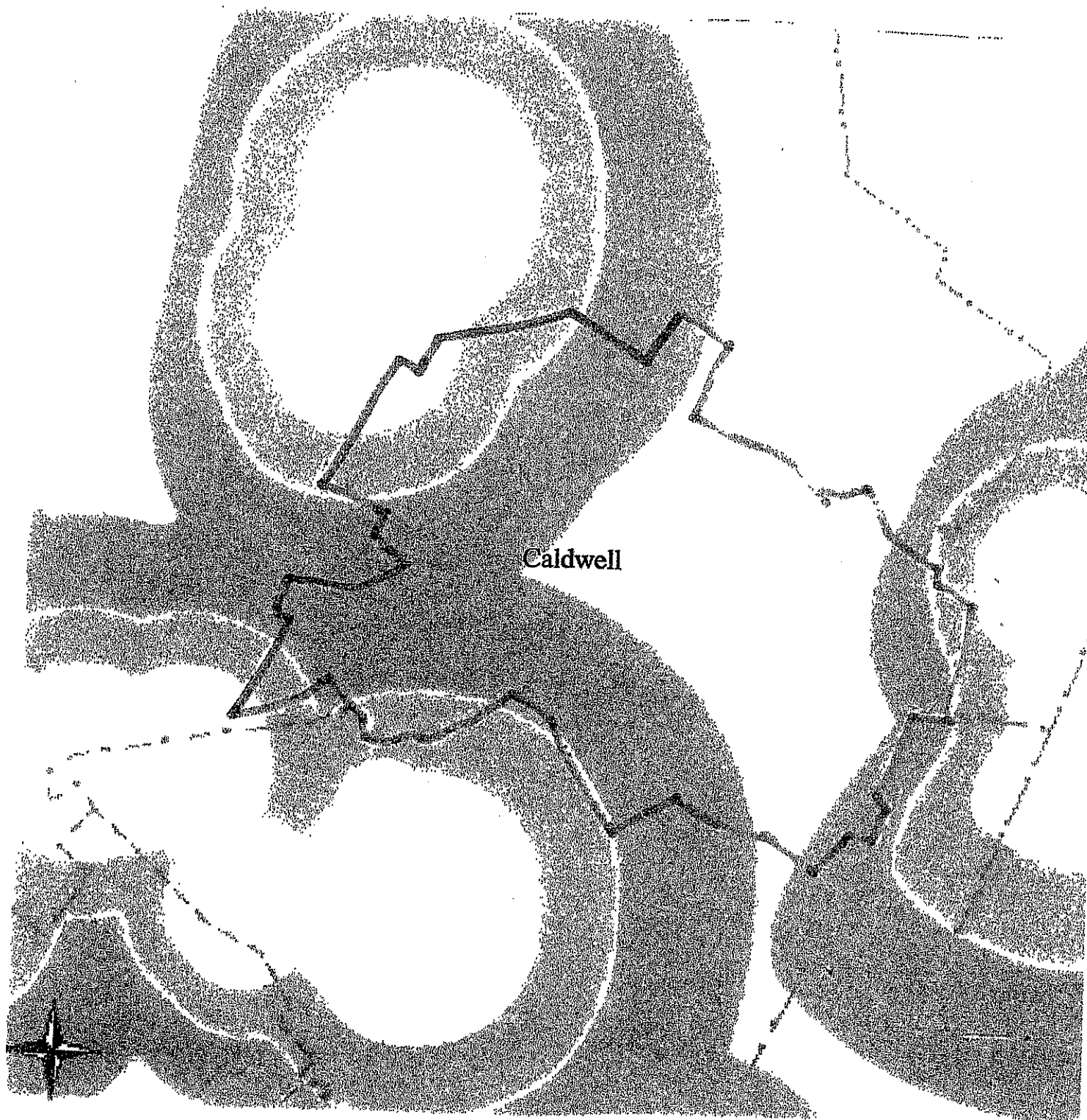
# Borough of Caldwell Floodplains Map



ANI – Area Not Included

FIGURE 4

# Wellhead Protection Areas in the Borough of Caldwell






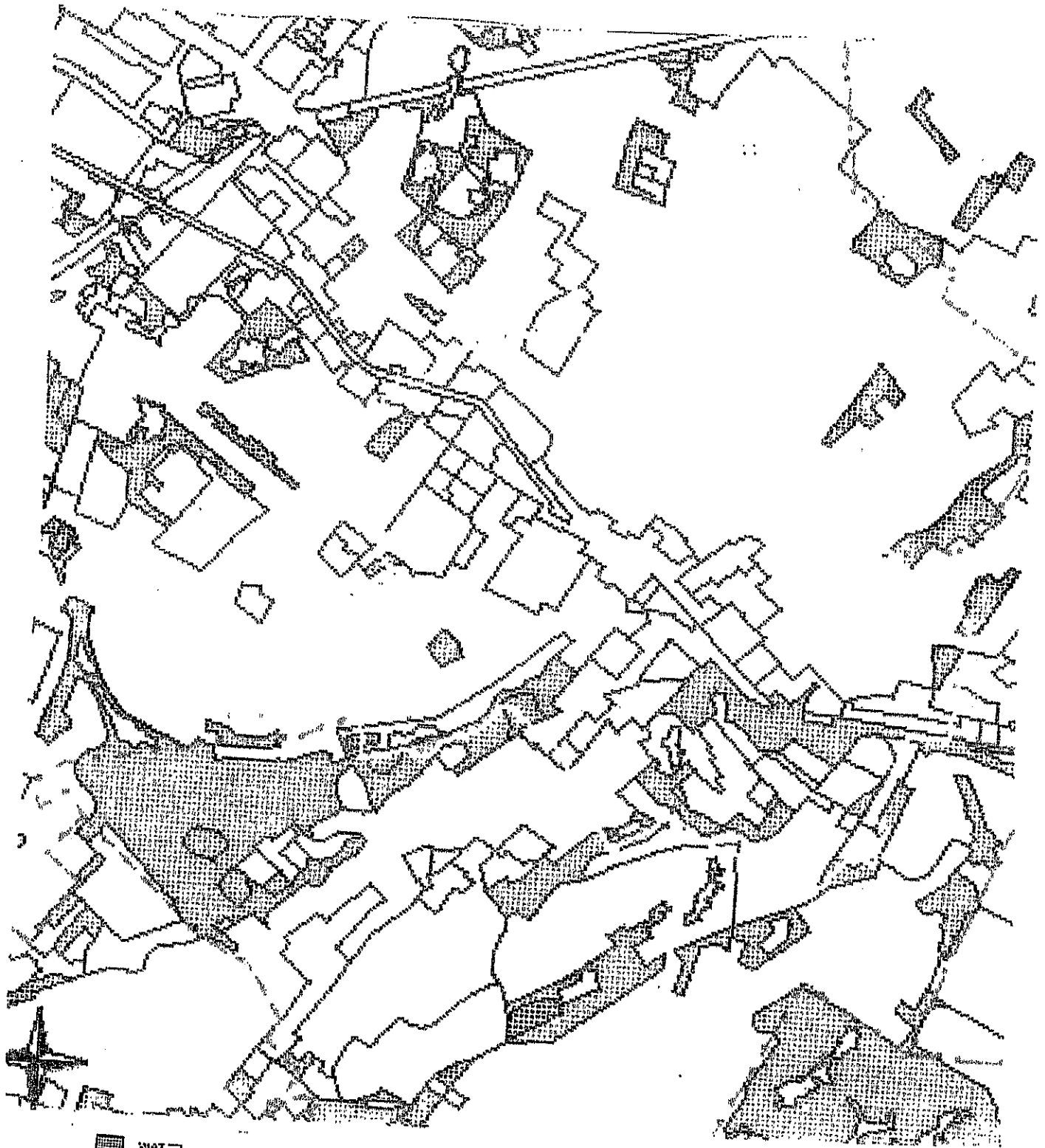
-  Tier 1: 2-Year
-  Tier 2: 5-Year
-  Tier 3: 12-Year

FIGURE 5

# Existing Land Use in the Borough of Caldwell










-  WATER
-  BARREN LAND
-  AGRICULTURE
-  FOREST
-  URBAN
-  WETLANDS
-  Other

FIGURE 6

Freshwater Wetlands and Water Land Uses  
Within the Borough of Caldwell

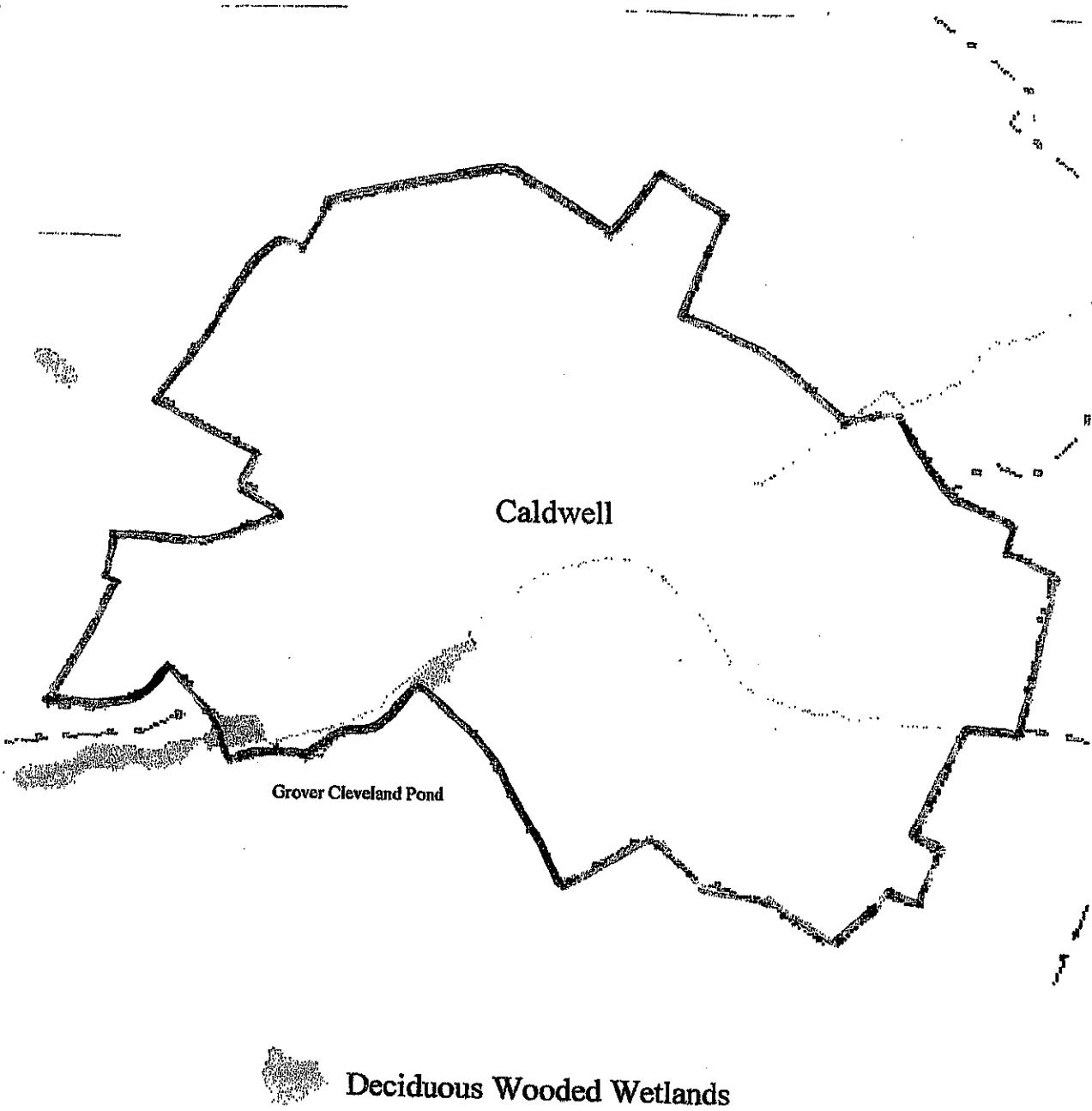


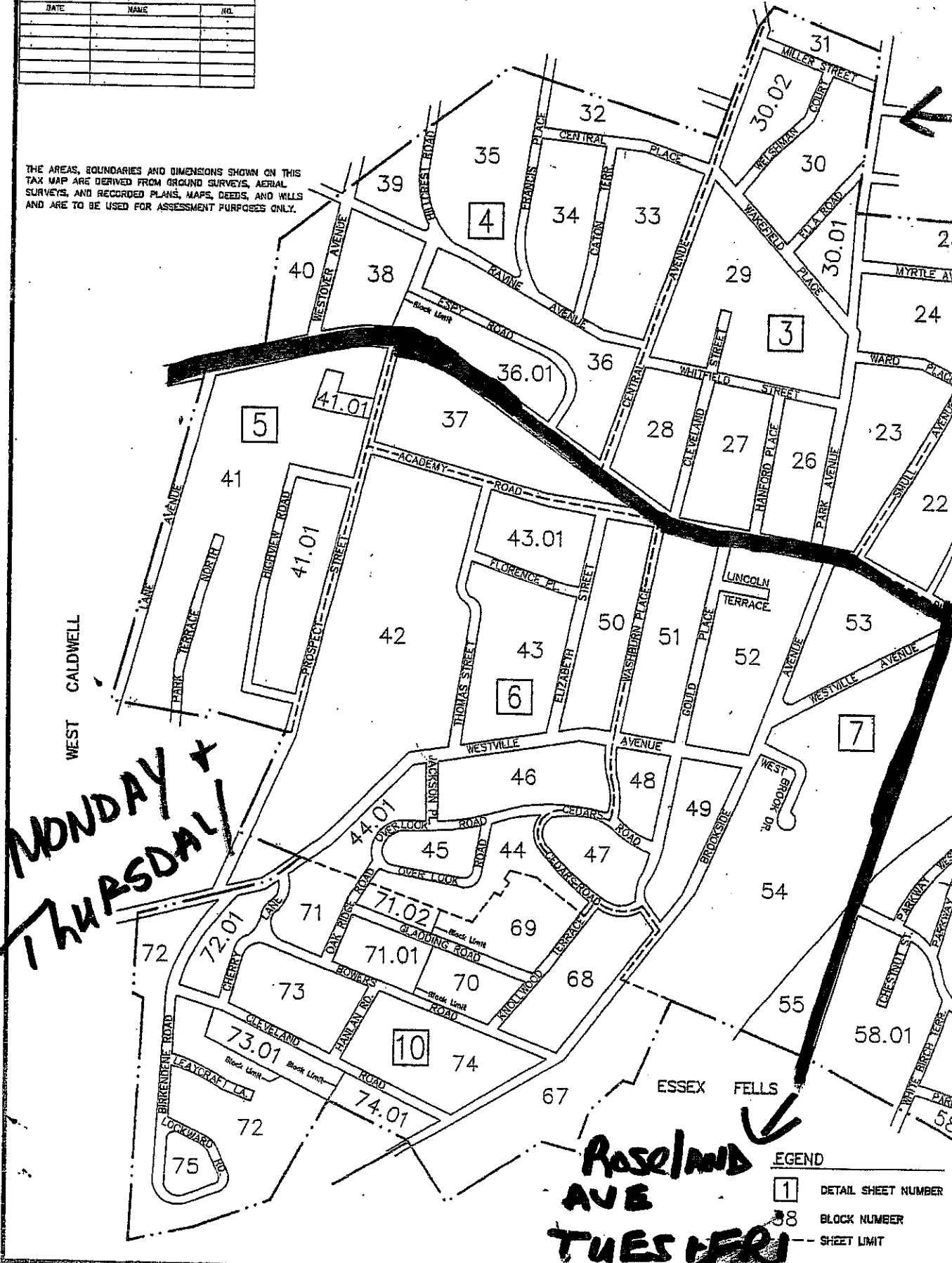
FIGURE 8

REVISIONS		
DATE	NAME	NO.

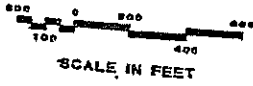
THE AREAS, BOUNDARIES AND DIMENSIONS SHOWN ON THIS TAX MAP ARE DERIVED FROM GROUND SURVEYS, AERIAL SURVEYS, AND RECORDED PLANS, MAPS, DEEDS, AND WILLS AND ARE TO BE USED FOR ASSESSMENT PURPOSES ONLY.

**MONDAY + THURSDAY**

**Roseland Ave  
TUES + FRI**



LEGEND	
	DETAIL SHEET NUMBER
	BLOCK NUMBER
	SHEET LIMIT



P. DAVID ZIMMERMAN, AICP  
PROFESSIONAL PLANNER  
21 WESTERN AVENUE  
MORRISTOWN  
NEW JERSEY

# **ATTACHMENT A**

## **Model Stormwater Control Ordinance for Municipalities**

# New Jersey Stormwater Best Management Practices Manual

April 2004

## A P P E N D I X D

# Model Stormwater Control Ordinance for Municipalities

**Important note:** *This sample ordinance is provided to assist municipalities in the development of municipal stormwater control ordinances and the incorporation of design and performance standards into municipal stormwater management plans. It is provided for information purposes only. It is important that current regulations are carefully reviewed before any portion of this draft ordinance is adopted.*

*This model ordinance does not include a section on fees. The Department expects that the review of development applications under this ordinance would be an integral part of the municipal review of subdivisions and site plans. As a result, the costs to municipalities of reviewing development applications under this ordinance can be defrayed by fees charged for review of subdivisions and site plans under N.J.S.A. 40:55D-8.b.*

*Notes are provided in italics throughout this model stormwater control ordinance, and are not intended to be adopted as part of the ordinance.*

*An editable Word version of this model ordinance is available at <http://www.state.nj.us/dep/watershedmgmt/bmpmanualfeb2004.htm>.*

## Section 1: Scope and Purpose

### A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

*Note: Municipalities are encouraged to participate in the development of regional stormwater management plans, and to adopt and implement ordinances for specific drainage area performance standards that address local stormwater management and environmental characteristics.*

### B. Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for "major development," as defined in Section 2.

### C. Applicability

1. This ordinance shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:
  - a. Non-residential major developments; and
  - b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.
2. This ordinance shall also be applicable to all major developments undertaken by [insert name of municipality].

### D. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

## Section 2: Definitions

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

“CAFRA Planning Map” means the geographic depiction of the boundaries for Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

“CAFRA Centers, Cores or Nodes” means those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

“Compaction” means the increase in soil bulk density.

“Core” means a pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

“County review agency” means an agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

A county water resource association created under N.J.S.A 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

“Department” means the New Jersey Department of Environmental Protection.

“Designated Center” means a State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

“Design engineer” means a person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

“Development” means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law , N.J.S.A. 40:55D-1 et seq. In the case of development of agricultural lands, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act , N.J.S.A 4:1C-1 et seq.

“Drainage area” means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

“Environmentally critical areas” means an area or feature which is of significant environmental value, including but not limited to: stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified

using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

"Empowerment Neighborhood" means a neighborhood designated by the Urban Coordinating Council "in consultation and conjunction with" the New Jersey Redevelopment Authority pursuant to N.J.S.A. 55:19-69.

"Erosion" means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

"Impervious surface" means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

"Infiltration" is the process by which water seeps into the soil from precipitation.

"Major development" means any "development" that provides for ultimately disturbing one or more acres of land. 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.

"Municipality" means any city, borough, town, township, or village.

"Node" means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

"Person" means any individual, corporation, company, partnership, firm, association, [insert name of municipality], or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law , N.J.S.A. 40:55D-1 et seq.

"Pollutant" means any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, ground waters or surface waters of the State, or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

"Recharge" means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

"Sediment" means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

"Site" means the lot or lots upon which a major development is to occur or has occurred.

"Soil" means all unconsolidated mineral and organic material of any origin.

"State Development and Redevelopment Plan Metropolitan Planning Area (PA1)" means an area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state's future redevelopment and revitalization efforts.

"State Plan Policy Map" is defined as the geographic application of the State Development and Redevelopment Plan's goals and statewide policies, and the official map of these goals and policies.

"Stormwater" means water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.

"Stormwater runoff" means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

"Stormwater management basin" means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

"Stormwater management measure" means any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

"Tidal Flood Hazard Area" means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

"Urban Coordinating Council Empowerment Neighborhood" means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

"Urban Enterprise Zones" means a zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et. seq.

"Urban Redevelopment Area" is defined as previously developed portions of areas:

- (1) Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
- (2) Designated as CAFRA Centers, Cores or Nodes;
- (3) Designated as Urban Enterprise Zones; and
- (4) Designated as Urban Coordinating Council Empowerment Neighborhoods.

"Waters of the State" means the ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

"Wetlands" or "wetland" means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

## Section 3: General Standards

### A. Design and Performance Standards for Stormwater Management Measures

1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in Section 4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.
2. The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.

*Note: Alternative standards shall provide at least as much protection from stormwater-related loss of groundwater recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in N.J.A.C. 7:8-5.*

## Section 4: Stormwater Management Requirements for Major Development

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 10.
- B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department' Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlenbergi* (bog turtle).
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G:
  1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;
  2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and
  3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:

1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.F and 4.G to the maximum extent practicable;
3. The applicant demonstrates that, in order to meet the requirements of Sections 4.F and 4.G, existing structures currently in use, such as homes and buildings, would need to be condemned; and
4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.F and 4.G that were not achievable on-site.

#### E. Nonstructural Stormwater Management Strategies

1. To the maximum extent practicable, the standards in Sections 4.F and 4.G shall be met by incorporating nonstructural stormwater management strategies set forth at Section 4.E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.
2. Nonstructural stormwater management strategies incorporated into site design shall:
  - a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
  - b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
  - c. Maximize the protection of natural drainage features and vegetation;
  - d. Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;
  - e. Minimize land disturbance including clearing and grading;
  - f. Minimize soil compaction;
  - g. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
  - h. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
  - i. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:

- (1) Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Section 4.E.3. below;
  - (2) Site design features that help to prevent discharge of trash and debris from drainage systems;
  - (3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
  - (4) When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.
3. Site design features identified under Section 4.E.2.i.(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 4.E.3.c below.
- a. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:
    - (1) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or
    - (2) A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
  - b. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.
  - c. This standard does not apply:
    - (1) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;
    - (2) Where flows from the water quality design storm as specified in Section 4.G.1 are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:
      - (a) A rectangular space four and five-eighths inches long and one and one-half inches wide (this option does not apply for outfall netting facilities); or

- (b) A bar screen having a bar spacing of 0.5 inches.
  - (3) Where flows are conveyed through a trash rack that has parallel bars with one-inch (1") spacing between the bars, to the elevation of the water quality design storm as specified in Section 4.G.1; or
  - (4) Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.
4. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Sections 4.F and 4.G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.
5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at [www.njstormwater.org](http://www.njstormwater.org).

#### F. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

1. This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.
- a. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.
  - b. The minimum design and performance standards for groundwater recharge are as follows:
    - (1) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 5, either:
      - (a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or
      - (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.
    - (2) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (3) below.
    - (3) The following types of stormwater shall not be recharged:
      - (a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40

CFR 302.4; areas where recharge would be inconsistent with Department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and

- (b) Industrial stormwater exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.
  - (4) The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.
- c. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 5, complete one of the following:
- (1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
  - (2) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;
  - (3) Design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100 year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or
  - (4) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

2. Any application for a new agricultural development that meets the definition of major development at Section 2 shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For the purposes of this section, "agricultural development" means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

**G. Stormwater Runoff Quality Standards**

1. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

<b>Table 1: Water Quality Design Storm Distribution</b>			
<b>Time (Minutes)</b>	<b>Cumulative Rainfall (Inches)</b>	<b>Time (Minutes)</b>	<b>Cumulative Rainfall (Inches)</b>
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

2. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at [www.njstormwater.org](http://www.njstormwater.org). The BMP Manual and other sources of technical guidance are listed in Section 7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, New Jersey, 08625-0418.
3. If more than one BMP in series is necessary to achieve the required 80 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (AXB)/100$$

Where

R = total TSS percent load removal from application of both BMPs, and

A = the TSS percent removal rate applicable to the first BMP

B = the TSS percent removal rate applicable to the second BMP

<b>Table 2: TSS Removal Rates for BMPs</b>	
<b>Best Management Practice</b>	<b>TSS Percent Removal Rate</b>
Bioretention Systems	90
Constructed Stormwater Wetland	90
Extended Detention Basin	40-60
Infiltration Structure	80
Manufactured Treatment Device	See Section 6.C
Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

4. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site in which case the removal rate can be demonstrated through a calculation using a weighted average.
5. Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural

measures that optimize nutrient removal while still achieving the performance standards in Sections 4.F and 4.G.

6. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in Section 7.
7. In accordance with the definition of FWI at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FWI.
8. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:
  - a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
    - (1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided. (2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.
  - b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards For Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq.
  - c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard For Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:
    - (1) Stabilization measures shall not be placed within 150 feet of the Category One waterway;
    - (2) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;
    - (3) Temperature shall be addressed to ensure no impact on the receiving waterway;

- (4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;
  - (5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
  - (6) All encroachments proposed under this section shall be subject to review and approval by the Department.
- d. A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Section 4.G(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.
- e. Paragraph G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004 , provided that the construction begins on or before February 2, 2009.

## **Section 5: Calculation of Stormwater Runoff and Groundwater Recharge**

A. Stormwater runoff shall be calculated in accordance with the following:

1. The design engineer shall calculate runoff using one of the following methods:
  - a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds; or
  - b. The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.
2. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term “runoff coefficient” applies to both the NRCS methodology at Section 5.A.1.a and the Rational and Modified Rational Methods at Section 5.A.1.b. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).

3. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.
4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 – Urban Hydrology for Small Watersheds and other methods may be employed.
5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following:

1. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at <http://www.state.nj.us/dep/njgs/>; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427 Trenton, New Jersey 08625-0427; (609) 984-6587.

## **Section 6: Standards for Structural Stormwater Management Measures**

A. Standards for structural stormwater management measures are as follows:

1. Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).
2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch (1") spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than one-third (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 8.D.
3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement.
4. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.
5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.

B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by Section 4 of this ordinance.

C. Manufactured treatment devices may be used to meet the requirements of Section 4 of this ordinance, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

## **Section 7: Sources for Technical Guidance**

A. Technical guidance for stormwater management measures can be found in the documents listed at 1 and 2 below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey, 08625; telephone (609) 777-1038.

1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.
2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

B. Additional technical guidance for stormwater management measures can be obtained from the following:

1. The "Standards for Soil Erosion and Sediment Control in New Jersey" promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540;
2. The Rutgers Cooperative Extension Service, 732-932-9306; and
3. The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

## Section 8: Safety Standards for Stormwater Management Basins

A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.

*Note: The provisions of this section are not intended to preempt more stringent municipal or county safety requirements for new or existing stormwater management basins. Municipal and county stormwater management plans and ordinances may, pursuant to their authority, require existing stormwater management basins to be retrofitted to meet one or more of the safety standards in Sections 8.B.1, 8.B.2, and 8.B.3 for trash racks, overflow grates, and escape provisions at outlet structures.*

### B. Requirements for Trash Racks, Overflow Grates and Escape Provisions

1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:
  - a. The trash rack shall have parallel bars, with no greater than six inch spacing between the bars.
  - b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
  - c. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.
  - d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs/ft sq.
2. An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:
  - a. The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.
  - b. The overflow grate spacing shall be no less than two inches across the smallest dimension.
  - c. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs./ft sq.
3. For purposes of this paragraph 3, escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:
  - a. If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in Section 8.C a free-standing outlet structure may be exempted from this requirement.
  - b. 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. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to

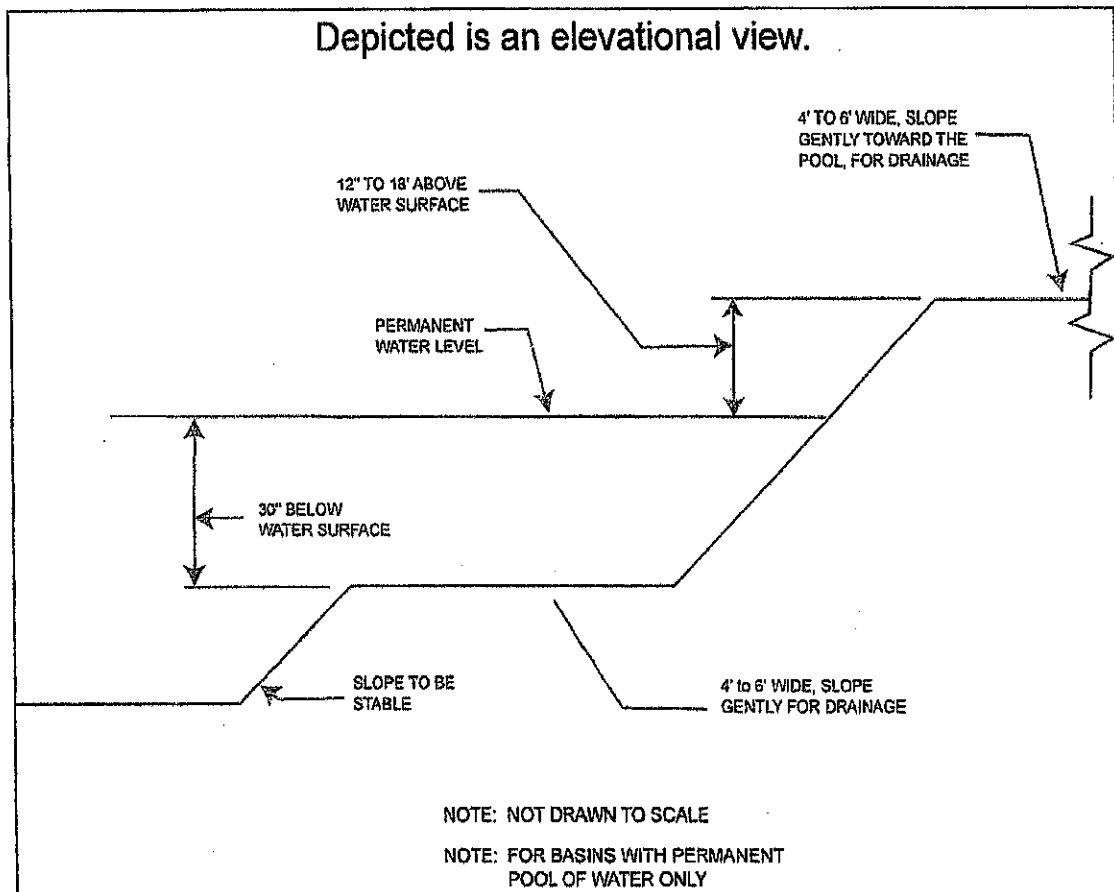
one and one-half feet above the permanent water surface. See Section 8.D for an illustration of safety ledges in a stormwater management basin.

- c. In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

### C. Variance or Exemption from Safety Standards

- 1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

### D. Illustration of Safety Ledges in a New Stormwater Management Basin



## Section 9: Requirements for a Site Development Stormwater Plan

### A. Submission of Site Development Stormwater Plan

1. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 9.C below as part of the submission of the applicant's application for subdivision or site plan approval.
2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.
3. The applicant shall submit [*specify number*] copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this ordinance.

### B. Site Development Stormwater Plan Approval

The applicant's Site Development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.

### C. Checklist Requirements

The following information shall be required:

#### 1. Topographic Base Map

The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and flood plains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown.

#### 2. Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.

#### 3. Project Description and Site Plan(s)

A map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal

high ground water elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.

#### 4. Land Use Planning and Source Control Plan

This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

#### 5. Stormwater Management Facilities Map

The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

- a. Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.
- b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.

#### 6. Calculations

- a. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 4 of this ordinance.
- b. When the proposed stormwater management control measures (e.g., infiltration basins) depends on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on onsite boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.

#### 7. Maintenance and Repair Plan

The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 10.

#### 8. Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation with the municipal engineer, waive submission of any of the requirements in Sections 9.C.1 through 9.C.6 of this ordinance when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

## Section 10: Maintenance and Repair

### A. Applicability

1. Projects subject to review as in Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 10.C.

### B. General Maintenance

1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
2. The maintenance plan 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). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.
3. Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.
4. If the person responsible for maintenance identified under Section 10.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 10.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
5. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, 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 nonvegetated linings.
6. The person responsible for maintenance identified under Section 10.B.2 above 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 maintenance-related work orders.
7. The person responsible for maintenance identified under Section 10.B.2 above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.
8. The person responsible for maintenance identified under Section 10.B.2 above 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 Sections 10.B.6 and 10.B.7 above.

9. The requirements of Sections 10.B.3 and 10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.

*(Note: It may be appropriate to delete requirements in the maintenance and repair plan that are not applicable if the ordinance requires the facility to be dedicated to the municipality. If the municipality does not want to take this responsibility, the ordinance should require the posting of a two year maintenance guarantee in accordance with N.J.S.A. 40:55D-53. Guidelines for developing a maintenance and inspection program are provided in the New Jersey Stormwater Best Management Practices Manual and the NJDEP Ocean County Demonstration Study, Stormwater Management Facilities Maintenance Manual, dated June 1989 available from the NJDEP, Watershed Management Program.)*

10. 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. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. 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.

- B. Nothing in this section shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

## **Section 11: Penalties**

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the following penalties: *[Municipality to specify]*.

## **Section 12: Effective Date**


This ordinance shall take effect immediately upon the approval by the county review agency, or sixty (60) days from the receipt of the ordinance by the county review agency if the county review agency should fail to act.

## **Section 13: Severability**

If the provisions of any section, subsection, paragraph, subdivision, or clause of this ordinance shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision, or clause of this ordinance.

# BOROUGH OF CALDWELL

## MEMORANDUM

To: Maureen Ruane, Borough Administrator  
From: Edward Sandve   
Date: October 10, 2005  
Subject: Stormwater Pollution Prevention Plan (SPPP)

Attached please find a revised copy of the Stormwater Pollution Prevention Plan (SPPP). The plan must be kept on file in the Borough. I suggest that it be filed in both the Department of Public Works and the Borough Clerk offices.

There is no need for the SPPP to be filed with any other agencies; it is simply a guidance document for the Borough. The plan should be reviewed annually to address any revisions that may be necessary. The only item I believe that is missing is a map indicating the two (2) sectors that have been proposed for; Storm Drain Inlet Mapping, MS4 Outfall Pipe Mapping and Yard Waste Collection Program. I have attached a sample map as guidance for the creation of our map. Please have a map prepared and attached to the final document that we put on file.

In addition I have provided you with the disk which contains all the files necessary for you, or someone in the Borough to make the annual revisions. There is also a file which contains the Annual Report & Certification that is required. I suggest that we wait until such time as the Stormwater Management Plan is completed prior to completing the Annual Report. I expect the SMP to be provided to your office within the next month.

Thank you. If you have any questions or require any additional information please do not hesitate to contact my office.

cc: Mario Bifalco, Director of Public Works

Tier A Municipal Stormwater Regulation Program

# Stormwater Pollution Prevention Team Members

Number of team members may vary.

Completed by: Edward Sandve

Title: \_\_\_\_\_

Date: July 26, 2005

Municipality: Borough of Caldwell

County: Essex

NJPDES #: NJG0152901

PI ID #: 171552

Stormwater Program Coordinator: Maureen Ruane

Title: Borough Administrator

Office Phone #: 973-403-4634

Emergency Phone #: \_\_\_\_\_

Public Notice Coordinator: Maureen Ruane

Title: Borough Administrator/Acting Borough Clerk

Office Phone #: 973-403-4634

Emergency Phone #: \_\_\_\_\_

Post-Construction Stormwater Management Coordinator: Planning Board

Title: Chairman

Office Phone #: 973-403-4635

Emergency Phone #: \_\_\_\_\_

Local Public Education Coordinator: Maureen Ruane

Title: Borough Administrator

Office Phone #: 973-403-4634

Emergency Phone #: \_\_\_\_\_

Ordinance Coordinator: Maureen Ruane

Title: Borough Administrator/Acting Borough Clerk

Office Phone #: 973-403-4634

Emergency Phone #: \_\_\_\_\_

Public Works Coordinator: Mario Bifalco

Title: Director of Public Works

Office Phone #: 973-403-4636

Emergency Phone #: \_\_\_\_\_

Employee Training Coordinator: Mario Bifalco

Title: Director of Public Works

Office Phone #: 973-403-4636

Emergency Phone #: \_\_\_\_\_

Other: \_\_\_\_\_

Title: \_\_\_\_\_

Office Phone #: \_\_\_\_\_

Emergency Phone #: \_\_\_\_\_

## SPPP Form 2 - Public Notice

Municipality  
Information

Municipality: Borough of Caldwell

County: Essex

NJPDES # : NJG0152901

PI ID #: 171552

Team Member/Title: Maureen Ruane, Acting Borough Clerk

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05

Date of most recent update: 10/10/05

Briefly outline the principal ways in which you comply with applicable State and local public notice requirements when providing for public participation in the development and implementation of your stormwater program.

*For meetings where public notice is required under the Open Public Meetings Act ("Sunshine Law," N.J.S.A. 10:4-6 et seq.), the Borough of Caldwell provides public notice in a manner that complies with the requirements of that Act. Also, in regard to the passage of ordinances, the Borough of Caldwell provides notice in a manner that complies with the requirements of N.J.S.A. 40:49-1 et seq. In addition, for municipal actions (e.g., adoption of the municipal stormwater management plan) subject to public notice requirements in the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.), the Borough of Caldwell complies with those requirements.*

# SPPP Form 3 – New Development and Redevelopment Program

<b>Municipality Information</b>	Municipality: <u>Borough of Caldwell</u>	County: <u>Essex</u>
	NJPDES # : <u>NJG0152901</u>	PI ID #: <u>171552</u>
	Team Member/Title: <u>Planning Board Chairman</u>	
	Effective Date of Permit Authorization (EDPA): <u>4/1/04</u>	
	Date of Completion: <u>7/26/05</u>	Date of most recent update: <u>7/26/05</u>

Describe in general terms your post-construction stormwater management in new development and redevelopment program (post-construction program), and how it complies with the Tier A Permit minimum standard. This description must address compliance with the Residential Site Improvement Standards for stormwater management; ensuring adequate long-term operation and maintenance of BMPs (including BMPs on property that you own or operate); design of storm drain inlets (including inlets that you install); and preparation, adoption, approval, and implementation of a municipal stormwater management plan and municipal stormwater control ordinance(s). Attach additional pages as necessary. Some additional specific information (mainly about that plan and ordinance(s)) will be provided in your annual reports.

*To control stormwater from new development and redevelopment projects throughout Borough of Caldwell (including projects we operate) we will do the following:*

*We are already ensuring that all new residential development and redevelopment projects that are subject to the Residential Site Improvement Standards for stormwater management (including the NJDEP Stormwater Management rules, N.J.A.C. 7:8, referenced in those standards) are in compliance with those standards. Our planning and zoning boards ensure such compliance before issuing preliminary or final subdivision or site plan approvals under the Municipal Land Use Law.*

*Since the EDPA, Borough of Caldwell has not constructed any new development or redevelopment projects on Borough property. If we decide to construct such a project before our municipal stormwater control ordinance takes effect, we will ensure adequate long-term operation and maintenance of BMPs for that project by requiring a project maintenance plan similar to the maintenance plan described in our draft of that ordinance, and by requiring and funding the implementation of that plan. We will also require any storm drain inlets that we install to comply with the design standard in Attachment C of our permit. Once that ordinance takes effect, we will ensure such operation and maintenance for any new development or redevelopment projects on our property by complying with the maintenance requirements in that ordinance. In addition, any storm drain inlets we install for such projects will comply with that ordinance's standard for such inlets.*

*Our planning board and municipal attorney have reviewed the Sample Municipal Stormwater Management Plan and Model Stormwater Control Ordinance in the NJ Stormwater BMP Manual, and have drafted a municipal stormwater management plan and municipal stormwater control ordinance similar to that sample and model. We have also met with county planning agency staff to discuss the draft plan and ordinance.*

**SPPP Form 3 – New Development and Redevelopment Program**  
(Continued from previous page)

The plan and ordinance will be adopted by our Planning Board and Borough Council, respectively, in accordance with the deadlines specified in the permit, and we will be submitted to the County Planning Agency for approval.

Once approved, the ordinance, which will be administered by our Planning and Zoning Boards and the Code Enforcement Officer, will control stormwater from non-residential development and redevelopment projects. Where necessary to implement the municipal stormwater management plan, the approved ordinance will also control aspects of residential development and redevelopment projects that are not subject to the Residential Site Improvements Standards.

For any BMP that is installed in order to comply with the requirements of our post-construction program, the Borough of Caldwell will ensure adequate long-term operation as well as preventative and corrective maintenance (including replacement) of BMPs. For BMPs on private property that we do not own or operate, the Borough of Caldwell intends to do this by adopting and enforcing a provision in the municipal stormwater control ordinance that requires the private entity to perform the operation and maintenance, with penalties if the private entity does not comply. If, for example, the private entity does not perform the required maintenance, the Borough can perform the maintenance and charge the private entity.

The Borough of Caldwell will also enforce, through the municipal stormwater control ordinance, compliance with the design standard in Attachment C of our permit to control passage of solid and floatable materials through storm drain inlets. The Borough of Caldwell expects that for most projects, such compliance will be achieved either by conveying flows through a trash rack as described in the "Alternative Device Exemptions," or (for flows not conveyed through such a trash rack), by installation of the NJDOT bicycle safe grate and (if needed) a curb opening with a clear space no bigger than two inches across the smallest dimension.

# SPPP Form 4- Local Public Education Program

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Maureen Ruane, Borough Administrator

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

## Local Public Education Program

Describe your Local Public Education Program. Be specific on how you will distribute your educational information, and how you will conduct your annual event. Attach additional pages with the date(s) of your annual mailing and the date and location of your annual event.

*The Borough of Caldwell will distribute annually the DEP brochure to our residents and businesses through the mail. Said distribution will be distributed annually in one of the Borough newsletters. Extra copies of the brochure will be available in the Borough Hall. In addition to the annual distribution of the DEP brochure, each newsletter will also include an insert on stormwater management related issues, such as; Pet Waste, Home Composting, Yard Trimming Management Strategies, Using Leaf Compost, Backyard Leaf Composting and Minimizing Waste Disposal - Grass Clippings.*

*Our annual event will be held each year in coordination with our annual Street Fair in October. We will make the DEP brochure and other educational materials available to residents at this event. In addition, the Borough of Caldwell will continue to assist our schools with providing educational programming related to recycling and the proper handling of waste and the effect on the watershed. The Borough will continue to work with the schools through the Clean Communities clean up programs that have been offered in the past.*

# SPPP Form 5 – Storm Drain Inlet Labeling

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Maureen Ruane, Borough Administrator

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

## Storm Drain Inlet Labeling

Describe your storm drain inlet labeling program, including your labeling schedule, the details of your long-term maintenance plan, and plans on coordinating with watershed groups or other volunteer organizations.

*The Borough of Caldwell plans on coordinating with our local boy scout and girl scout groups and the middle school and high school environmental clubs to implement the storm drain inlet labeling program.*

*Where it is practical, they will do the labeling for us. In areas where it is not safe for the volunteer groups the labeling will be conducted by the Department of Public Works. We will label all storm drain inlets that are along municipal streets with sidewalks, all storm drain inlets within plazas, parking areas, or maintenance yards that are operated by the Borough of Caldwell.*

*We will use stencils that will read, "No dumping - Drains to Waterway" with a picture of a fish next to it. The more opportunities these groups have to perform the storm drain labeling, the greater the benefit. The attached map divides the Borough of Caldwell into two sectors. Sector A is the area north of Bloomfield Avenue and Sector B is the area south of Bloomfield Avenue. Labeling of Sector A will be completed by April 2007, and Sector B will be completed by April 2009.*

*During the annual storm drain inlet cleaning program, the Borough Department of Public Works will be checking these labels to ensure that they are still visible, and if they are not, they will ensure that the labels are replaced immediately.*

# SPPP Form 6 – MS4 Outfall Pipe Mapping

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

Explain how you will prepare your map (include its type and scale, and the schedule for the mapping process). Who will prepare your map (e.g., municipal employees, a consultant, etc.)?

*The Borough Department of Public Works will work with the Borough Engineer to map out the location of the end of all outfall pipes operated by the Borough of Caldwell. They will identify, map and investigate (see Illicit Connection Elimination Program and Outfall Pipe Stream Scouring Remediation Program) each outfall pipe that is located.*

*The attached map divides the Borough of Caldwell into two sectors. Sector A is the area north of Bloomfield Avenue and Sector B is the area south of Bloomfield Avenue. Sector A will be mapped by April 2007, and Sector B will be mapped by April 2008. (See attached map)*

*Once all outfall pipe locations are identified, a map will be developed displaying these outfall pipe locations, with an alphanumeric identifier at a scale of 1 inch = 100 feet. All waterbodies receiving outfall pipe discharges will also be identified on the map.*

# SPPP Form 7 – Illicit Connection Elimination Program

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

Describe your Illicit Connection Elimination Program, and explain how you plan on responding to complaints and/or reports of illicit connections (e.g., hotlines, etc.). Attach additional pages as necessary.

*We will conduct an initial physical inspection of all of our outfall pipes during the mapping process. The Borough will use the DEP Illicit Connection Inspection Report Form to conduct these inspections, and each of these forms will be kept with our Stormwater Pollution Prevention Plan records. Outfall pipes that are found to have dry weather flow or evidence of an intermittent non-stormwater flow will be rechecked again to locate the illicit connection. If we are able to locate the illicit connection (and the connection is within the Borough of Caldwell) we will cite the responsible party for being in violation of our Illicit Connection Ordinance, and we will have the connection eliminated immediately. If after the appropriate amount of investigation, we are unable to locate the source of the illicit connection, we will submit the Closeout Investigation Form with our Annual Inspection and Recertification. If an illicit connection is found to originate from another public entity, the Borough of Caldwell will report the illicit connection to the Department.*

*The Borough of Caldwell has a hotline that is currently used for reporting spills and illegal dumping. This hotline will also be made available for reporting illicit connections.*

# SPPP Form 8 – Illicit Connection Records

Municipality Information

Municipality: Borough of Caldwell County Essex  
 NJPDES # : NJG0152901 PI ID #: 171552  
 Team Member/Title: Mario Bifalco/Director of Public Works  
 Effective Date of Permit Authorization (EDPA): 4/1/04  
 Date of Completion: 7/26/05 Date of most recent update: 7/26/05

Prior to May 2, 2006

*Note: Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*

Total number of inspections performed this year? to begin 10/05

Number of outfalls found to have a dry weather flow? \_\_\_\_\_

Number of outfalls found to have an illicit connection? \_\_\_\_\_

How many illicit connections were eliminated? \_\_\_\_\_

Of the illicit connections found, how many remain? \_\_\_\_\_

May 2, 2006 – May 1, 2007

*Note: Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*

Total number of inspections performed this year? \_\_\_\_\_

Number of outfalls found to have a dry weather flow? \_\_\_\_\_

Number of outfalls found to have an illicit connection? \_\_\_\_\_

How many illicit connections were eliminated? \_\_\_\_\_

Of the illicit connections found, how many remain? \_\_\_\_\_

May 2, 2007 – May 1, 2008

*Note: Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*

Total number of inspections performed this year? \_\_\_\_\_

Number of outfalls found to have a dry weather flow? \_\_\_\_\_

Number of outfalls found to have an illicit connection? \_\_\_\_\_

How many illicit connections were eliminated? \_\_\_\_\_

Of the illicit connections found, how many remain? \_\_\_\_\_

May 2, 2008 – May 1, 2009

*Note: Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*

Total number of inspections performed this year? \_\_\_\_\_

Number of outfalls found to have a dry weather flow? \_\_\_\_\_

Number of outfalls found to have an illicit connection? \_\_\_\_\_

How many illicit connections were eliminated? \_\_\_\_\_

Of the illicit connections found, how many remain? \_\_\_\_\_

# SPPP Form 9 – Yard Waste Ordinance/Collection Program

Municipality Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

Please describe your yard waste collection program. Be sure to include the collection schedule and how you will notify the residents and businesses of this schedule. Attach additional pages as necessary.

*We have considered the two options available, and have decided to continue a yard waste collection and disposal program instead of just adopting and enforcing an ordinance that prohibits placing non-containerized yard waste in the street.*

*We will be conducting monthly collection of leaves and grass during the months of October, November and December and for a limited period in the spring. During the remainder of the year residents must dispose of their yard waste. The Department of Public Works provides for the limited collection of some yard waste, brush and tree limbs. During the months that we are having collections, we will notify residents of our collection schedule and our ordinance requirements in our newsletter, which will be mailed to residents and businesses prior to the annual collection program.*

*To develop the collection program the Borough will be divided into two sectors: Sector A is the area located to the north of Bloomfield Avenue, Sector B is the area located to the south of Bloomfield Avenue. (See attached map).*

*The Borough will also be adopting and enforcing a yard waste ordinance (see SPPP Form 10) that will prohibit all yard waste from being placed at the curb or along the street more than seven days prior to our scheduled collections, unless they are bagged or otherwise containerized. The ordinance will also prohibit the placing of yard waste closer than 10 feet from any storm sewer inlet along the street, unless they are bagged or otherwise containerized.*

# SPPP Form 10 - Ordinances

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Maureen Ruane/Acting Borough Clerk

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 7/26/05

For each ordinance, give the date of adoption. If not adopted, explain the development status:

Pet Waste pending attorney review of the NJDEP model Ordinance

Are information sheets regarding pet waste distributed with pet licenses? Y ( ) N ( )

Litter pending attorney review of the NJDEP model Ordinance

Improper Waste Disposal pending attorney review of the NJDEP model Ordinance

Wildlife Feeding pending attorney review of the NJDEP model Ordinance

Yard Waste pending attorney review of the NJDEP model Ordinance

Illicit Connections pending attorney review of the NJDEP model Ordinance

How will these ordinances be enforced?

*The Borough Code Enforcement Officer and the local Police Department will enforce these ordinances. If someone is found to be in violation of an ordinance, they will be issued a written warning for first time offenses, and penalties will be issued, as necessary, for subsequent offenses.*

# SPPP Form 11 – Storm Drain Inlet Retrofitting

Municipality Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

**What type of storm drain inlet design will generally be used for retrofitting?**

*For most projects the Borough of Caldwell will use the NJDOT bicycle safe grates style and (if needed) a curb opening with a clear space no bigger than two (2) inches across the smallest dimension.*

Repaving, repairing, reconstruction or alteration project name	Projected start date	Start date	Date of completion	# of storm drain inlets	# of storm drains w/ hydraulic exemptions

**Are you claiming any alternative device exemptions or historic place exemptions for any of the above projects? Please explain:**

*The Borough of Caldwell does not have any alternative devices within the municipality. At this time, we do not plan on installing any such devices for repaving, repairing, reconstruction or alteration projects. We also do not plan on claiming any historic place exemptions.*

# SPPP Form 12 – Street Sweeping and Road Erosion Control Maintenance

Municipality Information

Municipality: Borough of Caldwell County: Essex

NJPDES # .NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

## Street Sweeping

Please describe the street sweeping schedule that you will maintain.

(NOTE: Attach a street sweeping log containing the following information: date and area swept, # of miles swept and the total amount of materials collected.)

*The Borough has evaluated all of the streets within its jurisdiction to determine which areas (if any) will need to be swept on a monthly basis. It has been determined that there are no streets under the municipal responsibility that require sweeping on a monthly basis. The Borough intends on maintaining its existing street sweeping program which provides for sweeping all streets on an as-needed basis.*

## Road Erosion Control Maintenance

Describe your Road Erosion Control Maintenance Program, including inspection schedules. A list of all sites of roadside erosion and the repair technique(s) you will be using for each site should be attached to this form.

(NOTE: Attach a road erosion control maintenance log containing the following information: location, repairs, date)

*The Borough of Caldwell will use the Department of Public Works to monitor all their roads and streets for erosion problems during normal patrols. All identified road erosion problems will be reported to Mario Bifalco, Director of Public Works. During quarterly SPPP Team meetings, identified areas of erosion will be discussed and repairs prioritized. All maintenance personnel will then be assigned to the areas of concern, and the areas identified to have road erosion problems repaired in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. All maintenance personnel will maintain an inspection log, and Mario Bifalco will maintain a list of all repairs and the dates completed. The status of the Road Erosion Control Maintenance Program will be included in the Annual Report and Recertification.*

# SPPP Form 13 – Stormwater Facility Maintenance

Municipality  
Information

Municipality: Borough of Caldwell County: Essex

NJPDES #: NIG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 7/26/05

Please describe your annual catch basin cleaning program and schedule. Attach a map/diagram or additional pages as necessary.

*The Borough will implement an annual catch basin cleaning program to maintain catch basin function and efficiency. All catch basins will be inspected once each year. If, at the time of inspection, no sediment, trash or debris is observed in the catch basin, then that catch basin will not be cleaned. All catch basins will be inspected yearly, even if they are found to be "clean" the previous year. At the time of cleaning, the catch basins will also be inspected for proper function. Maintenance will be scheduled for those catch basins that are in disrepair. The annual catch basin cleaning program will begin in September of 2005.*

Please describe your stormwater facility maintenance program for cleaning and maintenance of all stormwater facilities operated by the municipality. Attach additional pages as necessary.

(NOTE: Attach a maintenance log containing information on any repairs/maintenance performed on stormwater facilities to ensure their proper function and operation.)

*The Borough of Caldwell will implement a stormwater facility maintenance program to ensure that all stormwater facilities operated by the Borough function properly. The Borough of Caldwell operates the following:*

- catch basins
- storm drains
- culverts at road crossings

*These stormwater facilities will be inspected annually to insure that they are functioning properly. In high risk areas, preventative maintenance will be performed on all stormwater facilities to ensure that they do not begin to fail.*

# SPPP Form 14 - Outfall Pipe Stream Scouring Remediation

Municipality  
Information

Municipality: Borough of Caldwell County: Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

Describe your stormwater outfall pipe scouring detection, remediation and maintenance program to detect and control active, localized stream and stream bank scouring. Attach additional pages as necessary.

(NOTE: Attach a prioritized list of sites observed to have outfall pipe stream and stream bank scouring, date of anticipated repair, method of repair and date of completion.)

*When we are doing our illicit connection part of this program, we will be checking all of our outfall pipes for signs of scouring. All sites will be placed on a prioritized list and repairs will be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. In addition, repairs that do not need NJDEP permits for those repairs may be done first.*

*We will follow each repair up with an annual inspection of the site to ensure that scouring has not resumed.*

# SPPP Form 15 – De-icing Material Storage

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 10/10/05

## De-icing Material Storage

Describe how you currently store your municipality's de-icing materials, and describe your inspection schedule for the storage area. If your current storage practices do not meet the de-icing material storage SBR describe your construction schedule and your seasonal tarping interim measures. If you plan on sharing a storage structure, please include its location, as well as a complete list of all concerned public entities. If you store sand outdoors, describe how it meets the minimum standard.

*The Borough of Caldwell currently stores its de-icing salt in a salt storage shed at its maintenance yard (1 Provost Square). The salt storage shed is uncovered and exposed to the weather. At the completion of loading and unloading activities, we shall inspect the area for spilled salt.*

*In addition the Borough of Caldwell stores sand for use in our baseball fields, playgrounds etc.. This sand is stored at the public works facilities and is set back a minimum of 125 feet from storm sewers, waterbodies etc. At the completion of loading and unloading activities we shall inspect for spilled sand.*

# SPPP Form 16 – Standard Operating Procedures

Municipality Information

Municipality: Borough of Caldwell County Essex  
 NJPDES # : NJG0152901 PI ID #: 171552  
 Team Member/Title: Mario Bifalco/Director of Public Works  
 Effective Date of Permit Authorization (EDPA): 4/1/04  
 Date of Completion: 7/26/05 Date of most recent update: 7/26/05

BMP	Date SOP went into effect	Describe your inspection schedule
<b>Fueling Operations</b> (including the required practices listed in Attachment D of the permit)	<i>Not Applicable</i>	<i>The Borough fueling operations are conducted at local gasoline service stations, there are no fueling operations done on site.</i>
<b>Vehicle Maintenance</b> (including the required practices listed in Attachment D of the permit)	<i>Dec 1, 2004</i>	<i>Monthly inspections will be held to ensure that the SOP is being met.</i>
<b>Good Housekeeping Practices</b> (including the required practices listed in Attachment D of the permit)  <b>Attach inventory list required by Attachment D of the permit.</b>	<i>Dec 1, 2004</i>	<i>Monthly inspections of all municipal maintenance yards and ancillary operations will be held..</i>

**Borough of Caldwell  
Standard Operating Procedures  
Vehicle Maintenance**

Department of Public Works  
Maintenance Yard  
BMP Objectives

- Waste Management
- Spill Prevention, Containment and Countermeasures
- Pollution Control

**Introduction and Purpose**

This SOP contains the basic practices of vehicle maintenance to be implemented at all maintenance yards including maintenance activities at ancillary operations in the Borough. The purpose of this SOP is to provide a set of guidelines for the Borough of Caldwell vehicle maintenance yards including maintenance activities at ancillary operations.

**Scope**

This SOP applies to all maintenance yards including maintenance activities at ancillary operations within the Borough of Caldwell.

**Standards and Specifications**

- Conduct vehicle maintenance operation only in designated areas.
- When possible, perform all vehicle and equipment maintenance at an indoor location with a paved floor.
- Always use drip pans.
- Absorbent spill clean-up materials shall be available in maintenance areas and shall be disposed of properly after use.
- Maintenance areas shall be protected from stormwater run-on and runoff, and shall be located at least 50 feet downstream drainage facilities and watercourses.
- Use portable tents or construct a roofing device or long term maintenance areas for projects that must be performed outdoors.
- Do not dump or dispose oils, grease, fluids, and lubricants onto the ground.
- Do not dump or dispose batteries, used oils, antifreeze and other toxic fluids into a storm drain or watercourse.

### Spill Response

- Do not bury tires.
- Collect waste fluids in properly labeled containers and dispose properly.
- Provide spill containment dikes or secondary containment around stored oils and other fluid storage drum(s).
- Conduct cleanups of any fuel spills immediately after discovery.
- Spills are to be cleaned using dry cleaning methods only. Spills shall be cleaned up with a dry, absorbent material (e.g., kitty litter, sawdust, etc.) and the rest of the area is to be swept.
- Collected waste is to be disposed of properly.
- Contact the Borough of Caldwell Fire Department.

### Maintenance and Inspection

- Periodically check for leaks and damaged equipment and make repairs as necessary.

**Borough of Caldwell**  
**Standard Operating Procedures**  
**Good Housekeeping**

Department of Public Works  
Good Housekeeping Goals

- Proper Recycling
- Proper Waste Disposal
- Pollution Prevention

Introduction and Purpose

This SOP contains the basic practices of good housekeeping to be implemented at all maintenance yards including maintenance activities at ancillary operations in the Borough. The purpose of this SOP is to provide a set of guidelines for the Borough of Caldwell for good housekeeping at their maintenance yard including maintenance activities at ancillary operations.

Scope

This SOP applies to all maintenance yards including maintenance activities at ancillary operations within the Borough of Caldwell.

Standards and Specifications

- All containers should be properly labeled and marked, and the labels must remain clean and visible.
- All containers must be kept in good condition and tightly closed when not in use.
- When practical, chemicals, fluids and supplies should be kept indoors.
- If containers are stored outside, they must be covered and placed on spill platforms.
- Keep storage areas clean and well organized.
- Spill kits and drip pans must be kept near any liquid transfer areas, protected from rainfall.
- Absorbent spill clean-up materials must be available in maintenance areas and shall be disposed of properly after use.
- Place trash, dirt and other debris in the dumpster.
- Collect waste fluids in properly labeled containers and dispose of them properly.
- Establish and maintain a recycling program by disposing, papers, cans, bottles and trash in designated bins.

### Standards and Specifications (Salt and De-icing Material Handling)

- During loading and unloading of salt and de-icing materials, prevent and/or minimize spills. If salt or de-icing materials are spilled, remove the materials using dry cleaning methods. All collected materials shall be either reused or properly discarded.
- Sweeping should be conducted once a week to get rid of dirt and other debris. Sweeping should also be conducted immediately following loading/unloading activities, when practical.
- Minimize tracking of materials from storage and loading/unloading areas.
- Minimize the distance that the salt and de-icing materials are transported during loading/unloading activities.
- Any materials that are stored outside must be tarped when not actively being used.
- If interim seasonal tarping is being implemented, de-icing materials may be stored outdoors only between October 15<sup>th</sup> through April 30<sup>th</sup>.

### Spill Response and Reporting

- Conduct cleanups of any fuel spills immediately after discovery.
- Spills are to be cleaned using dry cleaning methods only. Spills shall be cleaned up with a dry, absorbent material (e.g., kitty litter, sawdust, etc.) and the rest of the area is to be swept.
- Collected waste is to be disposed of properly.
- Contact the Borough of Caldwell Fire Department.

### Maintenance and Inspection

- Periodically check for leaks and damaged equipment and make repairs as necessary.
- Perform monthly inspections of all (indoor and outdoor if applicable) storage locations.

# Tier A Municipal Stormwater Guidance Document

April 2004



State of New Jersey  
Governor James E. McGreevey

New Jersey Department of Environmental  
Protection  
Commissioner Bradley M. Campbell

Municipal Stormwater Regulation Program  
Bureau of Nonpoint Pollution Control  
Division of Water Quality

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# SPPP Form 17 – Employee Training

Municipality  
Information

Municipality: Borough of Caldwell County Essex

NJPDES # : NJG0152901 PI ID #: 171552

Team Member/Title: Mario Bifalco/Director of Public Works

Effective Date of Permit Authorization (EDPA): 4/1/04

Date of Completion: 7/26/05 Date of most recent update: 7/26/05

Describe your employee training program. For each required topic, list the employees that will receive training on that topic, and the date the training will be held. Attach additional pages as necessary.

The following topics will be covered by a computer generated training program:

<u>Course:</u>	<u>Who will attend</u>
<u>Municipal Ordinances</u>	<u>Code Enforcement and Local Police department, Public Works employees</u>

<u>Yard Waste Collection Program, Street Sweeping, Road Erosion Control, Stormwater Facility Maintenance, Outfall Pipe Stream Scouring Remediation, Construction Activity/Post Construction Stormwater Management in New Development and Redevelopment (for municipally owned projects)</u>	<u>public works employees</u>
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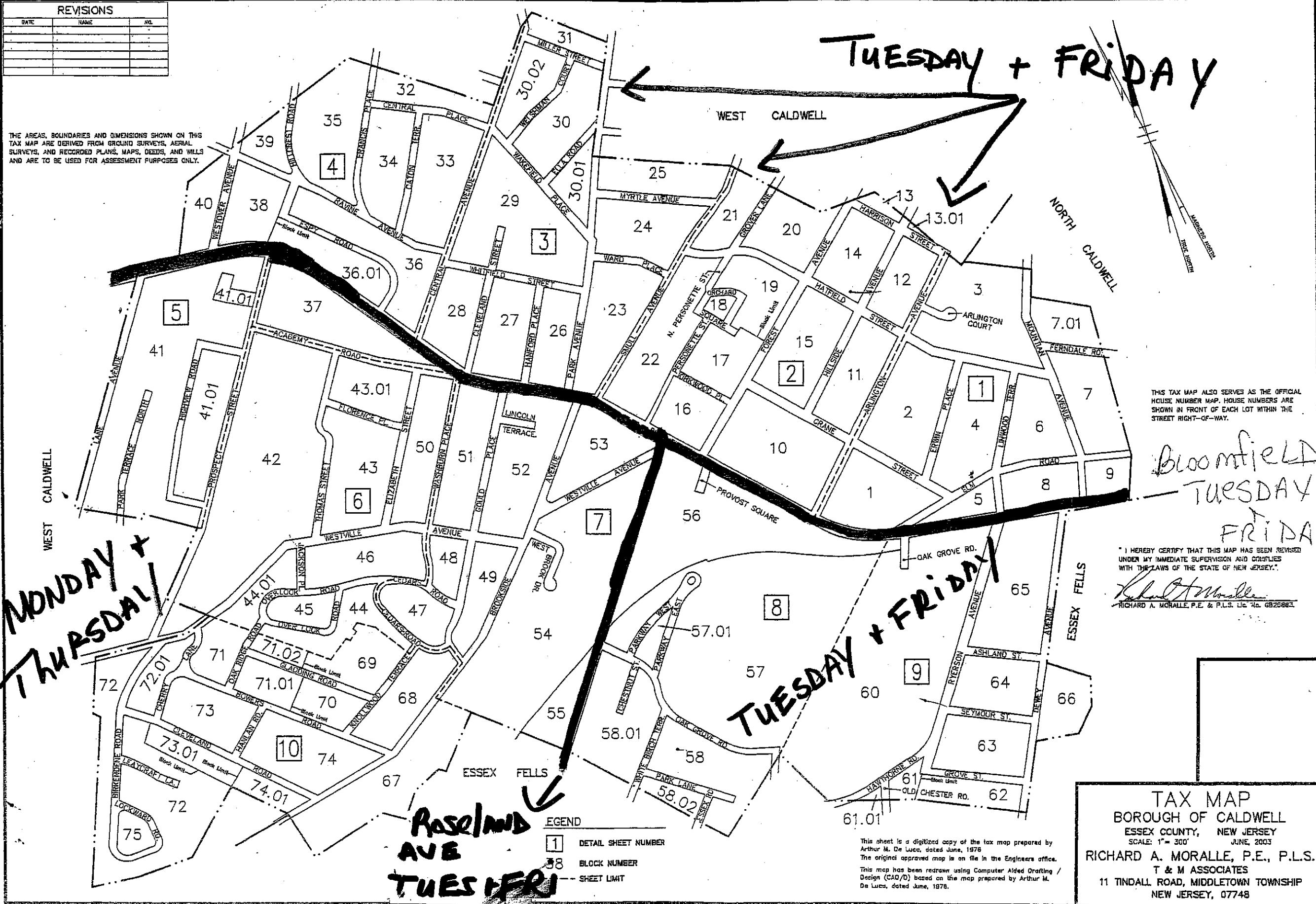
The following topics will be part computer training and part practical field training:

<u>Course:</u>	<u>Who will attend</u>
<u>Illicit Connection Elimination and Outfall Pipe Mapping</u> <u>(field training will include procedures to properly conduct illicit connection detection's, investigations and eliminations)</u>	<u>public works employees</u>
<u>Maintenance Yard Operations (including Ancillary Operations)</u> <u>(field training will include the SOP's for fueling, vehicle and equipment maintenance, general good housekeeping, and good housekeeping for de-icing materials storage)</u>	<u>public works employees</u>

Dates for the above training programs are yet to be determined.

REVISIONS		
DATE	NAME	NO.

THE AREAS, BOUNDARIES AND DIMENSIONS SHOWN ON THIS TAX MAP ARE DERIVED FROM GROUND SURVEYS, AERIAL SURVEYS, AND RECORDED PLANS, MAPS, DEEDS, AND WILLS AND ARE TO BE USED FOR ASSESSMENT PURPOSES ONLY.



**MONDAY + THURSDAY**

**TUESDAY + FRIDAY**

THIS TAX MAP ALSO SERVES AS THE OFFICIAL HOUSE NUMBER MAP. HOUSE NUMBERS ARE SHOWN IN FRONT OF EACH LOT WITHIN THE STREET RIGHT-OF-WAY.

**Bloomfield TUESDAY FRIDAY**

I HEREBY CERTIFY THAT THIS MAP HAS BEEN REVISED UNDER MY IMMEDIATE SUPERVISION AND CONTROL WITH THE LAWS OF THE STATE OF NEW JERSEY.  
*Richard A. Moralle*  
 RICHARD A. MORALLE, P.E. & P.L.S. Lic. No. 6825882

**LEGEND**  
 1 DETAIL SHEET NUMBER  
 38 BLOCK NUMBER  
 --- SHEET LIMIT

**Roseland Ave TUES-FRI**

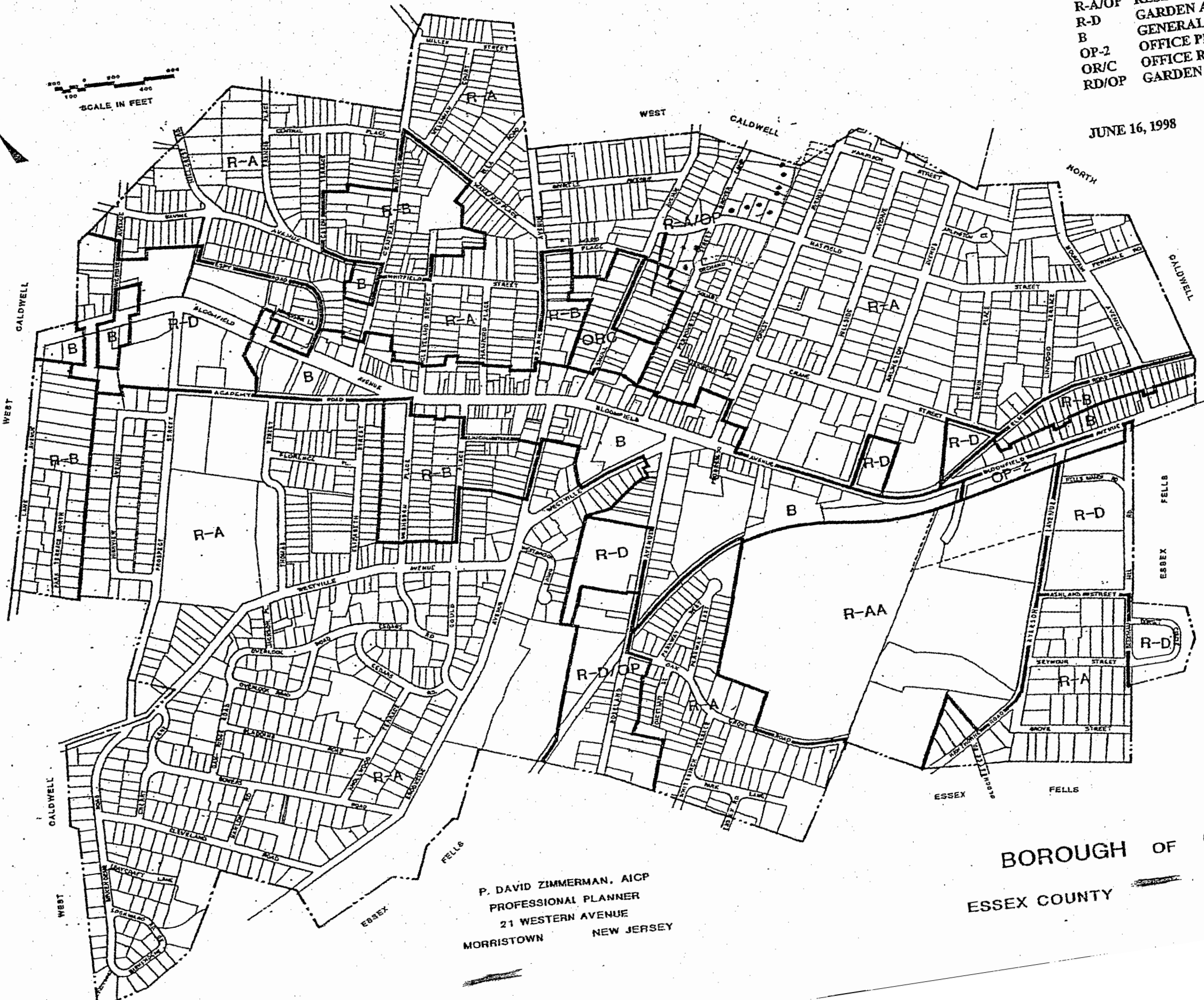
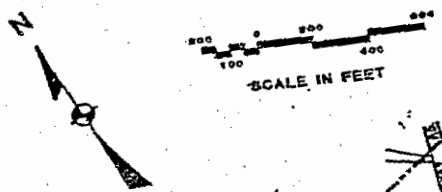
This sheet is a digitized copy of the tax map prepared by Arthur M. De Luca, dated June, 1978. The original approved map is on file in the Engineers office. This map has been redrawn using Computer Aided Drafting / Design (CAD/D) based on the map prepared by Arthur M. De Luca, dated June, 1978.

**TAX MAP**  
 BOROUGH OF CALDWELL  
 ESSEX COUNTY, NEW JERSEY  
 SCALE: 1" = 300' JUNE, 2003  
 RICHARD A. MORALLE, P.E., P.L.S.  
 T & M ASSOCIATES  
 11 TINDALL ROAD, MIDDLETOWN TOWNSHIP  
 NEW JERSEY, 07748

**ZONE DISTRICTS**

- R-AA RESIDENTIAL
- R-A RESIDENTIAL
- R-B RESIDENTIAL
- R-A/OP RESIDENTIAL/HOME PROFESSIONAL OFFICE
- R-D GARDEN APARTMENT
- B GENERAL BUSINESS
- OP-2 OFFICE PROFESSIONAL
- OR/C OFFICE RESIDENTIAL CHARACTER
- RD/OP GARDEN APARTMENT/OFFICE PROFESSIONAL

JUNE 16, 1998



P. DAVID ZIMMERMAN, AICP  
 PROFESSIONAL PLANNER  
 21 WESTERN AVENUE  
 MORRISTOWN NEW JERSEY

BOROUGH OF CALDWELL  
 ESSEX COUNTY NEW JERSEY

FIGURE 7