ENVIRONMENTAL RESOURCE INVENTORY

BOROUGH OF FAIR LAWN
BERGEN COUNTY, NEW JERSEY

Prepared For:

The Borough of Fair Lawn Environmental Commission

"This plan was prepared with the assistance of a Smart Growth Planning Grant from the Association of New Jersey Environmental Commissions."

Prepared By:

Hakim Associates

Landscape Architecture, Professional Planning, & Natural Resource Consultants
68 Dean Street, Harrington Park, New Jersey 07640
201-767-4289 (t); 201-767-0276 (f)

January 19, 2010

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ADOPTED BY THE ENVIRONMENTAL COMMISSION _____

Adopted by the Fair Lawn Planning Board as a part of the Conservation Plan Element of the Municipal Master Plan on this date: _____

The original document was appropriately signed and sealed on _____in accordance with Chapter 41 of Title 13 of the State Board of Professional Planners.

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BOROUGH OF FAIR LAWN
Bergen County, New Jersey

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ENVIRONMENTAL RESOURCE INVENTORY

BOROUGH OF FAIR LAWN
BERGEN COUNTY, NEW JERSEY

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1. INTRODUCTION AND BACKGROUND

The establishment of local municipal Environmental Commissions in New Jersey was made possible in 1968 by the New Jersey State Legislature, when it authorized the formation of "Conservation Commissions". The current name of "Environmental Commissions" was adopted as a replacement name in 1972, when the State legislature amended the enabling legislation to grant expanded roles to these volunteer commissions.

The State Legislature recognized at the time, and it still holds true today, that one of the primary functions of the Environmental Commission is to prepare a municipal Natural Resource Inventory (NRI), more commonly (or contemporarily) referred to today as an Environmental Resource Inventory (ERI). This document is intended to be a factual one, free from opinionated interpretation. The purpose is to identify the presence of natural resources and areas of environmental concern, and to delineate and classify them where appropriate. A certain level of professional interpretation is acceptable, however, as may be necessary to determine the predominance of prescribed characteristics, the cumulative sensitivity of a variety of natural resources as may occur in a particular setting, and/or the particular combination of resources as might characterize or distinguish one locale. The local value of resources may also require a certain level of interpretation in consideration of their frequency of occurrence on a regional basis. Beyond this level, however, interpretations could be construed to be statements which reflect local or personal values or biases. It is important to avoid such statements in an Environmental Resource Inventory in order not to devalue the credibility of the factual data.

Utilizing partial funding from the 2009 Smart Growth Planning Grants for Municipalities as administered by the Association of New Jersey Environmental Commissions (ANJEC) and funded through the Geraldine R. Dodge Foundation of Morristown, N.J., the Fair Lawn Environmental Commission (FLEC) authorized the preparation of this ERI Update. The initial ERI was prepared for Fair Lawn Borough in 1996 by another consultant, and no revisions have since been prepared despite numerous local changes over the past thirteen years. These changes include the loss of both historic and open space sites.

Fair Lawn's changing demographics, local development pressures, and ongoing brownfield issues both locally and nationally have combined to alter both the public's and the government's perception of environmental significance. Unfortunately, the only natural resource and environmental information readily available to be utilized and relied upon by Borough Boards and the Council is primarily that which has been provided by applicants during their land use development presentations. This information generally includes the Applicant's representations (and in some cases interpretations) of environmental significance. This is because the initial Borough ERI is not readily available, has inconsistent graphics and exhibits, and is unwieldy as it is contained in several volumes. As a result, it has been infrequently referenced. The need for a comprehensive, updated and readily accessible ERI, therefore, became apparent.

It is important that this Environmental Resource Inventory not be placed on a shelf in Borough Hall where it would be read and used by only those who seek it out. Rather, this document should be readily available to all those who may derive value from its contents. For this reason, the FLEC has authorized the preparation of large scale exhibits of the graphic portions of this ERI, to be mounted and permanently displayed in the Fair Lawn Council Chambers. Those graphic exhibits are an integral part of this document. In this manner, the information is readily available to all parties to refer to when land use decisions are being discussed and applications deliberated. This document and the large scale exhibits together constitute the Environmental Resource Inventory of the Borough of Fair Lawn. The entire Borough of Fair Lawn constitutes the Study Area for this document.

The text describes the importance of each resource, the methodology employed in the determination of its existence and extent, its level of regulatory protection, its location within Fair Lawn, and its relative level of sensitivity. Where particular resources offer opportunities; or where they may present severe constraints to development, they have been discussed. Furthermore, where a valuable resource is threatened by some type of intrusion; or where one may have already been degraded and remedial actions may be appropriate, these too have been discussed. Finally, resources have been described in terms of their individual characteristics, as well as their value within the context of the overall system of which it may be a part.

The large scale exhibits serve to map such resources as topography, steep slopes, soils, flood plains, wetlands, surface waters, open spaces, watersheds, and contaminated sites. The delineation of these resources is depicted in relationship to the man-made features of the Borough, such as the street system. This mapping is general, and is based on the research of record data, and on-site confirmation to the extent one might expect of a planning study. By no means should this mapping be considered accurate on a site-specific basis. Rather, it should serve as a "red flag", to alert interested parties to the likely presence of valuable natural resources and environmentally sensitive areas in a particular location. This document would then serve as a tool to ensure that the proper questions are asked and hopefully answered in a timely fashion, so that environmental concerns and issues can be considered at the earliest possible opportunity.

2. LOCATION

Bergen County occupies the northeast corner of the State of New Jersey (see Figure #1). The Borough of Fair Lawn is in Central Bergen County, and is centrally located north-south and is along the western boundary of Bergen County (see Figure #2). Fair Lawn is situated

approximately 15 miles northwest of midtown Manhattan, New York City. Fair Lawn encompasses approximately 5.33 square miles and is roughly rectangular in shape. It is bounded by the Boroughs of Elmwood Park to the south, Glen Rock to the north, and Paramus to the east; the Townships of Rochelle Park and Saddle Brook to the southeast; and the Passaic County communities of Paterson and Hawthorne to the west.

Fair Lawn is bisected from northwest to southeast by N.J. Route 208, and from north to south by the Conrail railroad corridor. The large majority of Fair Lawn's western boundary runs along the Passaic River. Its entire eastern boundary runs along the Saddle River. Since the Saddle River is tributary to the Passaic River, the entire Borough can be considered to be located within the Passaic River Basin.

3. TOPOGRAPHY

A. Importance

The topography of an area, or the three dimensional shape (or relief) of the land, is significant in several ways. Varying topography creates visual interest and spatial definition, and supports a variety of vegetation, habitat and water resources. Varying topography also creates a rhythm to the manner in which patterns of development generally occur, often leading to a hierarchy of public and private land uses. The recognition of these topographically induced patterns can help to create a sense of place as espoused by the New Jersey State Development and Redevelopment Plan (SDRP). On more tangible levels, varying topography usually provides opportunities for more efficient sewage disposal, storm drainage control, and water supply distribution.

B. Methodology

The topography of Fair Lawn was analyzed using the Hackensack N.J. and Paterson, N.J. quadrangle U.S.G.S. 7.5 minute quad sheets which provided us with the smallest electronically available contour interval of ten (10) feet (see Figure #3). We also consulted the NJDEP electronic database which only provided a contour interval of twenty (20) feet which was less valuable. The Bergen County GIS system also provides some topographic information. Unfortunately, for some unknown reason the information in the Bergen County database is discontinued at the Fair Lawn municipal boundary, with no information provided within the Borough. Lastly, the Borough Engineer was consulted for information that he may have available. Unfortunately, his information is only available in paper hard copy format, so it could not be utilized in this exercise. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

Fair Lawn has essentially four major watershed ridge lines (see Figure #7), and a series of minor ridge lines which define the Borough's drainage basins. Because of the winding nature of the two rivers that enclose Fair Lawn on its east and west, and the predominantly flat or rolling character of the Borough as a whole, the ridge lines vary considerably in terms of their orientation. With the exception of the Borough's character of predominantly pitching towards one of the rivers to the east or west, there is no other discernable pattern to the ridge lines.

The low point of the Borough of Fair Lawn is:

(a) at approximate elevation 30 (U.S.G.S. Mean Sea Level Datum), and is located at the southwest corner of the Borough where the Passaic River leaves the Borough.

Other Borough low points occur:

(b) elsewhere along the Passaic River which forms the Borough's western boundary, also at approximately elevations 30 to 40; and

(c) along the entire length of the Saddle River which forms the Borough's eastern boundary, at approximately elevation 50.

High points within the Borough occur as the peaks of small gentle knolls, generally with relatively flat side slopes. The high points of Fair Lawn are located:

(d) on the flat top of the drumlin in Berdan heights, between Berdan and Fair Lawn Avenues, and Sunnyside Drive and Saddle River Road. This peak reaches an elevation of approximately 120 (U.S.G.S. Mean Sea Level Datum); and

(e) on the top of a small knoll at the intersection of Eberlin and Emerson Drives, in the northwest quadrant of Rte. 208 and Fair Lawn Avenue at approximately elevation 120.

Other Borough high points also occur as knolls, or small round hills, none of which are parts of longer discernable ridge lines. These can be found:

(f) along the Borough of Glen Rock boundary two blocks east of Radburn Road, at approximately elevation 110;

(g) along the Borough of Elmwood Park boundary just north of Rte. 4, at approximately elevation 90; and

(h) at the intersection of Mansfield Drive and Maynard Place, southeast of Berdan Avenue and Rte. 208, at approximately elevation 100.

There are a few level plateaus within the Borough. These are located:

(i) in the Fair Lawn Cemetery area near Rte. 208 and Maple Avenue;

(j) in the triangular wedge between the railroad and Rte. 208 at the northern end of the Borough;

(k) within the Radburn development;

(l) in the northeast corner of the Borough;

(m) at the western ends of Berdan and Morlot Avenues, just east of the Passaic River;

(n) in the area of the High School;

(o) in the southeast corner of the Borough; and

(p) in the south-central portion of the Borough straddling the railroad corridor.

In general, although the topography of Fair Lawn can be characterized as gently rolling, a very loose and disorganized pattern of a primary north-south oriented ridge does exist, along with the two perimeter river valleys, which is a result of the receding glaciers of the last glacial age. This pattern is reflected in the patterns of the arterial waterways, glacial deposits and soil types.

4. SLOPES

A. Importance

The extent and severity of slopes is one of the most critical factors which influence development patterns. Most often, steep slopes are one of the last areas proposed for development. This is because they pose relatively high levels of constraints to the difficulty of construction and to the expense and re-stabilization aspects of development. Steep slopes can be highly erodible and only marginally permeable by storm water, cause rapid storm water runoff, and are difficult to stabilize by vegetative means. They are generally characterized by shallow soils and surficial (visible along the surface of the ground) rock,

and frequently by groundwater seeps and erratic geological formations. Because development interests tend to shy away from them, steep slopes frequently support large specimen trees, and a variety of wildlife habitat. Steep slopes are not generally found in areas characterized by wetlands or flood plains. Aesthetically, steep slopes are often visually prominent as a result of their elevation above their surroundings, and this represents a valued aesthetic resource.

B. Methodology

Since Fair Lawn Borough is relatively level, only the steep slopes can be considered significant, and they are rare. We have adopted the industry accepted threshold of 15% to delineate steep versus non-steep slopes. The steep slopes of the Study Area of Fair Lawn were manually calculated by using the Hackensack N.J. and Paterson, N.J. quadrangle U.S.G.S. 7.5 minute quad sheets. These have contour intervals of ten (10) feet which is the most detailed topography available in electronic format (see Figure #4).

C. Fair Lawn

The overwhelming majority of slopes within Fair Lawn are less than 10% (pitch of 10 vertical units to 100 horizontal units). With the exception of only three localized conditions, the remaining slopes within the Borough are considered moderate at 10% to 15%. There are only three locations within the Borough that fall within the industry accepted definition of "steep slopes" (15% +, or pitches in excess of 15 vertical units to every 100 horizontal units). These do not have any potential to be significant since they are fully developed and therefore stabilized. While undeveloped slopes of this magnitude do present a constraint to development, they are not often considered to be overwhelming encumbrances. Development on steep slopes of this severity requires some extraordinary engineering techniques, and careful and extensive re-stabilization efforts to avoid environmental degradation, particularly in the vicinity of watercourses and water bodies (see Figure #4).

The steepest (15% +) slopes within Fair Lawn occur:

(a) in a northeast to southwest alignment extending from the intersection of Fair Lawn Avenue and Ferry Heights, to Hillside Terrace at a point approximately 400 feet east of Sampson Road;

(b) in a north to south alignment extending from just north of the intersection of Jerome Place and Stelton Terrace, to Hillside Terrace at a point approximately 170 feet west of Jerome Place; and

(c) in an east to west alignment south of Katherine Avenue extending from just west of the southern end of Albert Avenue, to just southeast of the intersection of Katherine and Pomona Avenues.

The first two of these locations are along the northwest and southeast side slopes of Fair Lawn's one geological drumlin.

5. GEOLOGY

A. Importance

The geology of an area can be an important consideration in land use decisions, for it influences the nature and extent of potential land use in several ways. Underlying geology can be a good source of water supply, if a sufficient frequency of fissures or cracks in the bedrock can be found to allow for adequate access into the water table by well drilling. The converse of this is that certain geologic materials, such as sand and gravel, provide a porous subgrade which allows for a rapid recharge of groundwater supplies. When these materials are located over valuable aquifers, they are considered to be of value for the continuation, sustenance and protection of the aquifer. These same materials, however, are prime construction materials, and are valued as fill materials which exhibit strength and stability.

Subsurface sewage disposal capabilities are influenced by geology, since a dense substratum can inhibit or prohibit infiltration and thereby preclude natural filtration. Conversely, a severely fissured geology allows infiltration at too rapid a rate, precluding adequate filtration, thereby potentially contaminating groundwater supplies. As this issue pertains to stormwater control, however, rapid infiltration rates are beneficial since they both replenish groundwater supplies and reduce the need to retain or detain surface runoff waters for the purposes of flood control.

The nature and depth of bedrock can influence the stability and cost of construction. Certain low bearing strength geologic formations, particularly the surficial (visible along the surface of the ground) deposits, are incapable of supporting heavy loads, in contrast to the sands and gravels mentioned above. These same surficial deposits vary in terms of their ability to accommodate and absorb the freeze-thaw and expansion-contraction of frost action. Further geological constraints are posed by carbonate rock that has a tendency to dissolve, thereby creating subsurface voids and sinkholes, threatening the stability of development that may occur above.

B. Methodology

The geologic information about Fair Lawn was obtained from a publication by the New Jersey Geological Survey entitled “Geology of Bergen County in Brief” by Carol S. Lucey, Senior Geologist. It was prepared for the NJDEP Division of Water Resources, Bureau of Geology and Topography, and is dated December 1971. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

The entire Borough of Fair Lawn is located within the Piedmont Physiographic Province. This geologic province cuts a swath diagonally across the State of New Jersey from its northeast corner through Mercer County. Not far to the west, situated approximately coincident with the Ramapo River, is the beginning of the Highlands Physiographic Province which follows a similar diagonal path.

The specific formation underlying the Borough of Fair Lawn is known as the Brunswick Formation, which is characterized by deep glacial outwash, or surficial deposits, left by the receding glacier. The outwash deposits left by the glacier consist primarily of coarse-grained red sandstone and shales, with some conglomerate. These actions took place during the Triassic Period (180 million to 30 million years ago). During the Wisconsin, or last glacial stage, the receding glacier left deposits of an unsorted mixture of pebbles, boulders, sand and clay, commonly called till. The streams fed by the melting glaciers left deposits of layered and sorted sand, gravel and silt, commonly called stratified drift. Some of this drift formed drumlins (steep sided terraces or flat topped hills). Only one drumlin is present in Fair Lawn in the Berdan Heights section of the Borough.

Within Fair Lawn, the resultant topography is gently rolling. The drainage is good, with subsurface drainage moving reasonably well through the outwash in most cases. In some cases, heavy clay deposits and igneous traprock (basalt and diabase) impede water flow through the subgrade. Surface drainage is carried in a classic system of rivers, tributaries and sub-tributaries with associated flood plains and transitional wetlands.

No subsurface sewage disposal systems such as septic systems are known to still exist within Fair Lawn. If they do exist, however, they are few and far between and (a) could be expected to have a negligible geological impact, and (b) the percolation rate of the substratum could be expected to satisfactorily cleanse the minimal amount of effluent that might be generated. Fair Lawn maintains a public sanitary sewer system that services the entire community. The wastewater is conveyed to the Borough's regional treatment facility at the Passaic Valley Sewer Commission in Newark.

The Borough also maintains a separate storm water drainage system. Storm drainage is collected in this system and it is conveyed directly into open water bodies. The 2004 N.J. Stormwater Regulations require that all N.J. municipalities prepare a Stormwater Control Master Plan. One of its purposes is for N.J. communities to plan contemporary methodologies to be implemented over time to reduce flooding. Several of these methodologies involve subsurface disposal of stormwater, relying on infiltration and percolation through soils and into the underlying geology. This is not expected to be detrimental in Fair Lawn in any way. To the contrary, the implementation of infiltration methods of storm water disposal within Fair Lawn could only serve to replenish the groundwater supply, raising the groundwater levels, and supporting Fair Lawn's subsurface water supply system. Without such disposal methods, Fair Lawn runs the risk of groundwater elevations dropping to dangerous levels in comparison to the Borough's freshwater well depths.

6. SOILS

A. Importance

A knowledge of local soil conditions is important from the perspective of both development and preservation interests. Soil Science is a complex area of study, one which involves the analysis of considerations so numerous that professions have been built around this one subject. This is important to mention in this context, since the considerations discussed in this Municipal Inventory are the primary ones, leaving a myriad of secondary factors to the site specific analyses which should accompany each development proposal.

The Soil Conservation Service within the United States Department of Agriculture has evaluated and rated soils for a variety of uses and characteristics. The uses include woodland management and productivity, recreation, wildlife habitat, engineering, building site development, sanitary facilities, and construction materials. For the purpose of an Environmental Resource Inventory for a mostly developed suburb, it is considered most appropriate to emphasize the building site development uses when evaluating the level of constraints posed by the various soils. These levels can be seen on the Soils exhibit which accompanies this report (see Figure #5). Slight constraints generally mean that the soils are compatible for the intended use. Moderate constraints indicate that there are limitations to the use of the soils for building site construction, and special considerations will be necessary to adequately accommodate this land use. Severe constraints mean that soils properties are so unfavorable for building site construction that extraordinary measures with significantly increased costs are likely to be required to adequately support this land use.

Soils can be mineralogical in composition, generally rendering them structurally sound. Other soils can have a high organic component, which while favorable for a growing medium and for moisture retention, may be too compressible to support development.

Soils can be uniform in particle size (sands, silts or clays), and this characteristic generally promotes erodibility. Conversely, a mixture of particle sizes within a soil composition, commonly known as a loam, promotes a "locking together" of soil particles which minimizes erosion potential. The percentages of particle sizes within a soil are called its Mechanical Analysis. Soils with larger particle sizes (sands), or those intermixed with the even larger particle sized gravels and stones, are generally well-drained and can absorb frost expansion due to the air spaces (or interstices) between particles. Conversely, smaller particle sizes, e.g. silts and especially clays, possess a minimum of interstices and are, therefore, moderately to poorly drained and subject to damaging frost heaving resulting from the expansion of water as it turns to ice.

Some soils absorb water well, maintaining their natural volume to a large extent, which is favorable for development. Others expand significantly when saturated, having what is commonly known as a high shrink-swell potential, which is unfavorable for development.

Certain soils are deep, providing a favorable environment for construction and septic disposal, while others are shallow offering a more readily available supply of groundwater. Shallow soils generally mean that there is a shallow depth to bedrock. It is within the fissures of bedrock where groundwater supplies are usually found. Shallow bedrock also means that blasting or the ripping of rock may be necessary to prepare land for development, which is not economically desirable.

Soils may exhibit extremes of chemical composition, from both of the highly corrosive ends of the acidity and alkalinity spectrum, to the neutral middle ground of pH levels. Excessive corrosiveness may have an adverse impact upon utilities, foundations, and vegetation.

The depth to water table affects the nature of soils. Shallow depths promote hydric soils which are those often or periodically found to be in an anaerobic (absence of air) state since their interstices are frequently filled with water rather than air. Hydric soils commonly support hydrophytic vegetation, which is discussed in the wetlands section of this Inventory. Deeper depths to the water table promote non-hydric soils, which are aerobic (presence of air within interstices). Non-hydric soils commonly support uplands vegetation. The differentiation of these soil categories can be seen on the Soils exhibit which accompanies this report (see Figure #5).

Certain soils are described as having a high potential for frequent flooding. This description is usually given to low-lying soils with a high water absorption capacity, low porosity and slow permeability. In highly developed areas, these soils have often been disturbed and/or filled in the past for the purpose of site development; but this manipulation may not remove their flooding potential. These soils are not considered hydric, and do not receive regulatory protection.

Soil profiles are made up of several layers, or "soil horizons", the characteristics of which help define the soil type. The top horizon, or surface layer, is usually the topsoil, which overlays the subsoil. Topsoil generally has a high organic composition (4 percent or more by volume). Subsoils are predominantly mineralogical, but can have a small organic composition. Soils occurring below the subsoil are known as the substratum.

Steeply sloping areas generally possess soils which are shallow, erodible, well drained, non-hydric, and have a deep depth to the water table in all seasons. In contrast, extremely flat areas often possess soils which are deep, often erodible, poorly drained, frequently hydric, and with a shallow depth to the water table. These characteristics are generalities, and exceptions are frequent in both extremes.

B. Methodology

The soils of Fair Lawn were described in the Soil Survey of Bergen County, New Jersey prepared by the Soil Conservation Service of the United States Department of Agriculture, in cooperation with New Jersey Agricultural Experiment Station, Cook College, Rutgers, the State University; and the New Jersey Department of Agriculture, State Soil Conservation Committee, March 1995 (see Figure #5). The mapping of Fair Lawn's soils was obtained from SSURGO from the NJDEP's electronic database. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

To understand the properties of soil types in generalized locations is to understand how they were formed. A review of the geology of Fair Lawn reveals that most all of the soils of the Borough were formed in water sorted deposits, as opposed to being formed in glacial till as were the soils in many of Bergen County's more steeply sloping communities. Sorted deposits are more erodible and uniform than unsorted deposits, the latter of which are characteristic of glacial till.

The following descriptions of Fair Lawn's soil types include rough approximations of the percentages of the Borough's land that they cover. These percentages are for general comparison purposes and should not be relied upon for any other purpose.

The most common soil type found within the Borough is known as the Dunellen Urban Land Complex which covers approximately 45% of Fair Lawn's land area. Slopes range from nearly level (DuuA Dunellen-Urban land complex, 0 to 3 percent slopes) to undulating and gently rolling (DuuB-Dunellen-Urban land complex, 3 to 8 percent slopes) to moderately hilly (DuuC-Urban land complex, 8 to 15 percent slopes). They can be found within and on the sides of broad outwash plains or stream terraces, and within Fair Lawn are spread out throughout the community without any discernable pattern. Dunellen soils are well drained and loamy, very deep, and highly acidic. They are generally moderately erodible, except in hilly areas where erosion potential is high, and in nearly level areas where it is slight. The lower subsoil and substratum of Fair Lawn's Dunellen soils contain thick layers of silt and very fine sand that are frequently saturated. The surface runoff rates for Dunellen soils range from slow on the flat slopes, to rapid on the steep slopes. Permeability ranges from moderate to rapid. Frost action is considered to be moderate.

Urban Land (UR) is the next most prevalent soil type in the Borough covering approximately 20% of Fair Lawn's land area. Urban land is gently sloping or level. This land has been so disturbed as to be unclassifiable. It has been extensively developed, and usually paved with impervious materials, resulting in a very rapid surface runoff. Within Fair Lawn, the largest concentration of Urban land can be found in the northwest, in the wedge between Rte. 208 and the railroad within the Rte. 208 Industrial Park. It is also concentrated along the Rte. 4 and Rte. 208 and railroad corridors, north of north River and Wagaraw Roads, and then in smaller concentrated areas spread out throughout the Borough.

The third most common soil type found within the Borough is known as the Boonton Urban Land Complex which covers approximately 10% of Fair Lawn's land area. Boonton soils are formed in unsorted glacial till. Some of the slopes are undulating (BouB-Boonton-Urban land complex, 0 to 8 percent slopes) and some are sloping (BouC-Boonton-Urban land complex, 8 to 15 percent slopes). They are slowly to moderately permeable, moderately well drained and moderately deep. They have a medium surface runoff, are strongly acidic, and are slightly to moderately erodible. Their biggest limitation is the existence of a seasonally high water table. Most of Fair Lawn's Boonton soils can be found in the northeast quadrant of the Borough.

Udorthents are also Fair Lawn's third most common soil types as these complexes cover approximately 10% of Fair Lawn's land area. The Udorthents have all been extensively disturbed to a depth of three feet or more, so the compositions of the surficial soils, as well as their rates of surface runoff, are variable. Udorthent soils are presumed to have been deep, poorly to very poorly drained, and prone to flooding and prolonged ponding. It is presumed that they were formerly wetland soils prior to their manipulation. Since they have been extensively disturbed, they no longer enjoy regulatory protection, as do hydric soils. Their substratums are mostly impermeable. The wet substratum Udorthents - Urban Land Complex soils (UdwuB) can be found on low lying marine deposits, upland stream terraces, and flood plains. The loamy Udorthents (UdkttB Udorthents, loamy, 0 to 8 percent slopes, frequently flooded) can be found on glacial till or outwash uplands, and on stream terraces. The wet substratum Udorthents (UdwB Udorthents, wet substratum, 0 to 8 percent slopes, and UdwuB Udorthents, wet substratum-Urban land complex) can be found on upland stream terraces, drainage ways, and flood plains. The greatest concentrations of Udorthents within Fair Lawn are along the Passaic River, as well as along many of the Borough's tributary streams. Interestingly, Udorthent soils are not found to any appreciable degree along the Saddle River.

The hydric soil known as Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded (FmhAt) comprise approximately 7% of Fair Lawn's land area. Hydric soils are those soils whose interstices are filled with water rather than air. This loamy soil is nearly level and somewhat poorly drained to very poorly drained. It is generally found in flood plains, and is subject to frequent flooding. In Fair Lawn, the Fluvaquents can be found exclusively along the Saddle River. Fluvaquents have a moderate permeability, medium to slow surface runoff, and a high erosion hazard which is regularly replenished with new materials from receding flood waters. These soils are moderately acidic to neutral, with a high frost action potential. Generally speaking, Fluvaquents are protected by the NJDEP Freshwater Wetlands regulations.

The Riverhead Soil Complex makes up about 5% of Fair Lawn's land area. The singular concentration of these soils can be found in the Borough's northwest corner, in the wedge between Maple Avenue and Rte. 208. These lands are gently (RkrA Riverhead sandy loam, 0 to 3 percent slopes) to moderately (RkrB Riverhead sandy loam, 3 to 8 percent slopes) sloping. The soil is predominated by sandy loam, and is well drained, but does include small percentages of poorly drained Riverhead soils. Their permeability is rapid,

and the surface runoff is medium. The soil has a moderate erosion hazard, is strongly acidic, and has a moderate frost action potential.

Finally, comprising only about 3% of Fair Lawn's land area, are the hydric Preakness Silt Loam soils, 0 to 3 percent slopes, frequently flooded (PrnAt). This soil is level, very poorly drained, and frequently flooded; and can be found in broad depressional areas on glacial outwash plains, lake beds and flood plains. In Fair Lawn, this soil is predominantly wetlands and can be found in the southeast corner of the borough where Rte. 208 meets the Saddle River. The soil consists of silty and sandy mottled loams. Also included within this classification are small percentages of hydric Adrian and hydric Pascack soils. Preakness silt loams have a moderately rapid permeability and slow surface runoff. They are only slightly erodible, strongly acidic, and highly susceptible to frost action; and they have a surficial seasonally high water table. Generally speaking, Preakness silt loams are protected by the NJDEP by the Freshwater Wetlands regulations.

7. FLOOD PLAINS

1. Importance

The Flood Plain describes the land which serves to temporarily accept excess waters caused by rain storms. Flood plains are generally broad and flat, and are associated with arterial waterways which, under normal rainfall conditions, contain their waters within their banks. Flood plains provide the "elbow room" to temporarily control flood waters and minimize excessive flood water elevations during intensive events. When flood plains are encroached upon, flood water storage capacity is often reduced, flood water elevations are raised, and the likelihood of property damage and human injury can be greatly increased. Furthermore, hydraulics and hydrology are accepted as inexact sciences, and consequently the full impact of an encroachment cannot always be accurately predicted. For example, flood plain encroachments can cause damage in the immediate vicinity of the encroachment, as well as downstream by virtue of elevated water surfaces and reduced detention volumes and times of concentration. Beyond this, flood waters can also rise upstream as a result of an encroachment, due to the constriction of what previously was an adequate outfall.

Because flood plains are often and most desirably undeveloped, they frequently support vegetation which can survive periodic inundation, detain and reduce the velocity of flood waters, and filter silt and particulate matter from the storm water. These functions serve to lengthen the discharge time period. This generally reduces the risk of a large slug of destructive flood waters, and cleanses the water thereby improving water quality and

mitigating against downstream water quality degradation. Flood plains become part of the aquatic ecosystem, providing much in the way of wildlife habitat. Finally, due in part to the limitations on the land uses which they can support, flood plains offer vast recreational opportunities. Active recreational fields can be developed within flood plains, since their presence does not compromise the functions of the flood plain, and because field usage is infrequent during storm events. Benign passive recreation can also take place within flood plains for similar reasons.

A flood plain consists of the floodway, the floodway fringe, and flood plains of varying theoretical storms. These are distinguished from one another by the frequency with which a storm causing flood waters of that magnitude can be expected to occur (e.g. once every 100 years; once every 500 years; etc.). The generally recognized values of flood plains have caused them to be regulated by the NJDEP via the Stream Encroachment Permit Process. Furthermore, since flood plains are oftentimes coincidental with the most sensitive of surface waters (known as C1 waters by NJDEP), they receive additional protection via the stringent 2004 New Jersey Stormwater Regulations buffer requirements for these waters.

2. Methodology

Mapping of flood plains has been completed by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps (FIRM), which are not considered to be comprehensive on a site specific basis. The latest FIRM information is included on the NJDEP electronic database which was used for this ERI (see Figure #6).

3. Fair Lawn

During the last decade the State of New Jersey enacted the publication: Communities of Place: The New Jersey State Development and Redevelopment Plan (State Plan). It makes strong recommendations with regard to flood plains. In the discussion concerning Water Resources, the Plan recommends that development within flood hazard areas be prohibited, and further that some of the existing development situated within flood plains be acquired in order for its land to revert back into the flood plain. The Plan goes on further to endorse some of the recommendations of the New Jersey Statewide Water Supply Master Plan of April 1982 and its more recent Updates, by recommending higher standards for the control of stormwater runoff within watersheds than might otherwise be required. Both of these documents are advisory rather than regulatory. However, the State finally adopted the 2004 N.J. Stormwater Regulations which contain stringent regulations regarding both flood control and the protection of water quality, both of which directly affect flood plains. To our knowledge there have been no cases of Fair Lawn successfully employing management tools such as the NJDEP Green Acres program for the preservation of flood plain lands.

Flood plains within Fair Lawn can be found associated with the following water bodies and waterways (see Figure #6):

1. The Passaic River. In the horseshoe bend of this river that extends from Fair Lawn Avenue south to the Elmwood Park municipal boundary, the 100 year flood plain (for the most part) extends into the developed area of Fair Lawn as far east as 3rd Street. Fortunately for the residents within this area that are situated north of Berdan Avenue, it only reaches easterly to 1st and 2nd Streets. The 100 year flood plain for the rest of the Passaic River corridor in Fair Lawn is confined to a much narrower and contained band. This is primarily because the riverfront properties have historically been dramatically disturbed and developed and its flood plain manipulated and contracted.

2. The Saddle River. The Saddle River's 100 year flood plain is far more meandering than that of the Passaic River. This is to be expected since the Saddle River is protected within a Bergen County Park which protects its land from manipulation. Therefore the flood plain takes on a much more natural configuration than that of the Passaic River. A few minor residential lots, Century Road, and privately owned yard areas appear to be the only encroachments into this flood plain.

3. The Diamond Brook. The 100 year flood plain of the Diamond Brook is well confined in a narrow corridor through a highly developed section of far northwest Fair Lawn. Encroachments are few.

4. The Little Diamond Brook. The 100 year flood plain of the Little Diamond Brook is similarly well confined in a narrow corridor through a highly developed section of northwest Fair Lawn. Except where the brook is culvert-enclosed through the Rte. 208 Industrial Park, encroachments are limited to a few residential properties.

5. The Jordan Brook. For most of the Jordan Brook's length the 100 year flood plain is well confined into a narrow corridor. The exception to this is that it widens in yard areas north of Fair Lawn Avenue and west of Mandon Place. Yard areas appear to be the only encroachments.

6. The Beaverdam Brook. This Brook is located in the Borough's southeast corner and has numerous encroachments. Over half of the length of this flood plain corridor is encroached upon by residential properties. The flood plain is somewhat narrowly confined at its southern end, but it then widens out in a much more meandering fashion on both sides of Morlot Avenue for about three blocks in each direction.

8. FRESHWATER WETLANDS

A. Importance

The U.S. Fish and Wildlife Service defined freshwater wetlands for the purpose of their regulation by the U.S. Army Corps of Engineers (the Corps). They also mapped and classified the nation's wetlands, and this information is available on the National Wetlands Inventory maps (NWI). This project was performed for New Jersey from 1982 to 1984.

Since that time, on July 1, 1988 the NJDEP attained co-permitting jurisdiction over freshwater (or inland) wetlands, along with the Corps. The State of New Jersey adopted the Federal wetlands definition with few modifications. This deliberate redundancy was done for the purpose of ultimately taking responsibility for the Federal program, which if successful would result in sole jurisdiction being awarded to NJDEP. As of January 1994, New Jersey became the second State in the nation (Michigan was the first) to achieve such status. The entitlement granted by this jurisdiction is the right to grant and/or deny permits for work in or adjacent to wetlands. NJDEP has now completed its mapping of New Jersey's wetlands. The Bergen County maps became available to the public in the fall of 1993.

The Federal definition of wetlands is as follows:

> "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes, (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year."

The definition of hydric soils is located in the Soils chapter of this Inventory. Hydrophytes, or hydrophytic vegetation, are defined as "any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content".

Hydrophytes are members of one of four classifications:

1. Obligate (essentially always found in wetlands, greater than 99% of the time);

2. Facultative wet (usually found in wetlands, 66% to 99 % of the time);

3. Facultative (sometimes found in wetlands, 33% to 66% of the time); and

4. Facultative upland (seldom found in the wetlands, less than 33% of the time).

NJDEP modified the definition to state that, in most cases, all three of the above parameters must be met to be deemed a regulated wetland. This means that some wetlands under the federal definition that would have been regulated by the Corps would not be regulated by New Jersey. Offsetting this reduction in regulation, however, the NJDEP enacted more restrictive regulations governing activities in or adjacent to wetlands than utilized by the Corps. For example:

1. In contrast to Corps regulations which do not apply to wetlands smaller than an acre, the New Jersey regulations have no minimum size threshold smaller than which a general permit would automatically be granted. New Jersey does have a limited general permit process similar to the Corps however;

2. Excavation (removal) in addition to deposition (filling) of wetlands is regulated by New Jersey. The Corps only regulates deposition. This is an enormous difference since drainage basins and other elevation reducing activities would not be regulated by the Corps;

3. Transitional Areas (buffers) are required to be preserved around most wetlands, varying in width depending upon the relative level of sensitivity, or their "resource value". In order to make this determination, a classification system has been established, wherein wetlands can be classified as either Exceptional Resource Value (requiring a 150 foot buffer), Intermediate Resource Value (50 foot buffer), or Ordinary Resource Value (no buffer required). The Corps requires no buffers, meaning that disturbance involving fill can take place right up to the edge of Corps wetlands without any requirement for a permit;

4. In New Jersey, there is a presumption that a practicable alternative to the proposed action exists that would have less of an adverse impact on the wetlands; and the onus is on the Applicant to refute this to qualify for a permit. The Corps has no such presumption;

5. In the case of an Exceptional Resource Value wetland, the Applicant must demonstrate that there is a compelling public need for the project which is more important than the desire to preserve the wetland; or that denial of the permit application would present an extraordinary hardship peculiar to the project; and

6. Mitigation (the creation of new wetlands or the improvement of despoiled existing wetlands) is an acceptable practice in some cases, with specific guidelines established for compliance. A mitigation bank has also been established to receive contributions in lieu of on-site mitigation, for sites where mitigation is either impossible or undesirable.

Wetlands serve a variety of functions, including flood control, erosion control, preservation of water quality, provision of habitat and migratory rest area, groundwater recharge, recreational opportunities, and aesthetics. The following is a quotation from the NJDEP Division of Coastal Resources, dated July, 1988:

"Once considered to be wastelands with little or no value, wetlands are now considered to be a vital link in human and natural ecology. Wetlands provide many important benefits including pollution filtration, flood water storage, soil erosion and sediment control, habitat for fish and wildlife, timber production and shoreline stabilization. They also offer unspoiled open space for the aesthetic enjoyment of nature as well as recreational activities such as hiking, fishing, hunting, photography, and environmental education. Wetlands provide valuable habitat for endangered and threatened wildlife and vegetation.

"Wetlands can minimize the damage to downstream property owners by decreasing the velocity of floodwater and acting as a temporary storage basin. When a stream overflows its banks, it spreads horizontally into a surrounding wetlands where the vegetation acts as numerous tiny barriers temporarily detaining the water.

"Along with controlling the flood waters, wetlands also serve to maintain water quality. They have a "self-cleaning" ability which, if not over-taxed, can filter, or take up, most pollutants from runoff before they enter an adjoining watercourse. In many respects, wetlands function much like sophisticated sewage treatment plants by removing nutrients and other pollutants prior to discharge to a waterway. This is done at no cost to the taxpaying public.

"A wetland acts as a sediment trap for soil erosion resulting from natural and man-induced activities. Increased development along a watercourse can hinder the wetlands capability to trap these sediments. Often special measures need to be taken to decrease the sediment runoff in urbanizing areas. Wetlands provide essential wildlife habitat as well. A large number of animals use wetlands from time to time for breeding, feeding, or refuge. All wetlands function in providing an important source of food for wildlife and represent a critical link in life cycles and food webs."

The wetlands delineations shown on the accompanying drawings (see Figure #'s 4 and 7) do not represent accurate delineations. As stated in the Introduction chapter of this ERI, site specific delineations and classifications should be required for any site specific land use proposals. As is conventional for Planning Studies, the scope of this study was limited and did not allow for more accurate delineations.

B. Methodology

Since the NJDEP is the only agency currently having jurisdiction over freshwater wetlands within New Jersey, the illustrated delineations of wetlands were obtained from the NJDEP's electronic database (see Figure #'s 4 and 7). The check on this information then was multi-faceted. First, the NWI maps were consulted for consistency. Second, areas indicated as "wet" on the U.S.G.S. Quad Sheets were compared and contrasted to the NJDEP maps. Third, the three parameters which determine the presence of wetlands were then individually examined as another check of the unsubstantiated delineation used in this ERI. These included hydric soils as inventoried by the Bergen County Soil Conservation District, the

one-year flood plain as extrapolated from the FEMA FIRM maps (which is indicative of annual inundation), and the limits of the predominance of hydrophytic vegetation based upon spot checked general visual observations. Those areas which meet the criteria of most of the tests generally confirmed the NJDEP wetlands mapping delineated for this ERI. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

There are pockets of consolidated freshwater wetlands located in five different primary locations within the Borough. All of the Borough's mapped wetlands are either hydraulically-connected or formerly hydraulically-connected parts of larger systems. It does not appear that any of the mapped wetlands that exist within Fair Lawn are naturally isolated. These five locations exist within the outwash plains of the Saddle River, the Passaic River, and the major tributaries of both rivers. More specifically, they can be found:

1. at the northern extremity of Fair Lawn's Saddle River corridor, north of Fair Lawn Avenue and continuing northbound into the Borough of Glen Rock; and along the south side of Century Road and continuing southbound along the Saddle River corridor as far south as Morlot Avenue (if it were to have been extended);
2. at the southern extremity of Fair Lawn's Saddle River corridor, on both the northern and southern sides of Rte. 208;
3. at the southern extremity of Fair Lawn's Passaic River corridor, in four distinct pockets all south of Fair Lawn Avenue;
4. in the Borough's northwest corner along about 80% of the Diamond Brook corridor; and
5. in one consolidated pocket along the southern side of the Jordan Brook, north of Fair Lawn Avenue and east of Well Drive.

The two other primary mapped freshwater wetland locations within Fair Lawn that are not consolidated into one of the above cited locations include:

1. one at Lyncrest Pond and Brook in the Borough's southwest corner. This wetland is hydraulically connected to the Passaic River through a channelized Lyncrest Brook; and
2. the other in the northeast corner of the properties that support the Thomas Jefferson Middle School, north of Van Riper Place and southwest of Vanore Drive. This wetland appears likely to have formerly been hydraulically connected to the Beaverdam Brook, which is tributary to the Saddle River. It may still be so connected, but it is likely to now be enclosed within culverts through residential neighborhoods.

The Passaic River estuary does not extend north of Dundee Dam south of Fair Lawn, and current information is that the Saddle River estuary also does not reach as far north as Fair Lawn. It is for these reasons that no tidal (or brackish) wetlands exist within the Borough.

None of Fair Lawn's wetlands have been designated as "Critical Environmental Sites" by Communities of Place: The New Jersey State Development and Redevelopment Plan (State Plan). The State Plan defines CES's as being equal in environmental value to lands of the Environmentally Sensitive Planning Area (PA 5), except that they are smaller in size than the minimum size threshold of one square mile established for a Planning Area designation. Nevertheless, the State Planning Commission has provided the same level of protection for CES's as is afforded to PA 5 properties. Such a designation could have value in protecting valuable natural resources. The nomination would be initiated by the Environmental Commission and endorsed by the governing body during a State Plan review cycle.

The wetlands observed within the Borough are characterized by wooded, deciduous hardwood, closed canopy vegetation. These represent the mid-range to drier end of the wetland spectrum; and this observation is not atypical for the highly developed suburbs of Bergen County. The highest ecological value wetlands are those with open canopies and emergent herbaceous vegetation. Unfortunately, no evidence has been uncovered that any of these exist or remain within Fair Lawn. Nevertheless, many believe that due to the predominantly developed nature of Bergen County, all of these wetlands - both open and closed canopy - exhibit an especially high ecological value, as compared to similar wetlands which can be found in more rural areas. Their relative rarity, in addition to their traditional values, renders these wetlands that much more valuable.

Not mapped are the smaller isolated wetlands, drainage ditches, swales or detention facilities that meet the three parameter NJDEP definition of wetlands. These would all probably be classified (see Chapter 8.A of this ERI above regarding NJDEP's classification system) as Ordinary Resource Value wetlands. It is also likely that most all of those wetlands that are mapped on Figure #'s 4 and 7 would be classified as Intermediate Resource Value wetlands. This is notwithstanding the fact that many of the Borough's wetlands have been manipulated and encroached upon, with development up to their edges. Others received Army Corps permits for their manipulation and much of the disturbance that is evident prior to NJDEP taking over jurisdiction. In each of these cases, however, the severity of degradation has not yet destroyed all life within its water body; and the value of reclamation which utilizes recognized mitigation techniques would be high since most of these cases are integral parts of larger systems. This rationale is presented in this Inventory, because there has been precedent for a classification as Ordinary Resource Value as a direct result of environmental degradation and such designations are not desirable from an ecological preservation perspective.

The possible exceptions to the above are wetlands along the Saddle River, some of which could be open canopies emergent wetlands, and some of which could be classified as Exceptional Resource Value wetlands. This latter classification was intended to be reserved for wetlands associated with trout production waters, and those used for breeding and nesting by threatened and endangered species. Fair Lawn has no trout production waters. Additionally, while there may have been sightings of threatened and endangered species within Fair Lawn, they have not been officially documented within NJDEP (see Chapters #11 Wildlife and #12 Upland Vegetation of this ERI). Furthermore, even if they had been documented, there are no documented breeding or nesting sites for these animal species.

This distinction is an important criterion for warranting an Exceptional Resource Value classification. Nevertheless, exceptions to these criteria have been noted within Bergen County, with one noteworthy exception citing a known degraded wetland as Exceptional. The expectation, however, is that the overwhelming majority of Fair Lawn's wetlands will ultimately be classified as being of Intermediate Resource Value.

As discussed above in Chapter 8.A of this ERI, the importance of the Resource Value discussion lies in the Transition (Buffer) Area which will be required to be maintained around these wetlands. As previously discussed, Exceptional Resource Value wetlands require buffers of 150 feet. Buffers of 50 feet are required to be maintained around Intermediate Resource Value wetlands. Ordinary Resource Value wetlands have no transition area requirement. It should be noted that waivers from these regulations and transition area averaging techniques are frequently approved by NJDEP.

9. SURFACE WATERS, HYDROGRAPHY & WATERSHEDS

A. Importance

Surface waters provide many benefits to man and the environment, some of which include storage area and transportation for storm water, recharge of aquifers, potable water supply, habitat for aquatic species, nesting and resting opportunities for aviary species, recreational opportunities, and aesthetic value. The extensiveness of the values which they offer justifies their protection and preservation.

There are many forms of surface waters, including lakes, ponds, reservoirs, rivers, streams, brooks and creeks. The first three are water bodies, while the last four are arterial waterways. In general, water bodies are static, while arterial waterways are dynamic. These classifications tell much about the character of the surface water, in terms of how fragile a system it is, as well as its role within a larger system.

Most often, water bodies have an inlet and an outlet. These features allow water to move through water bodies, although usually at a very slow rate. As a result of this slow movement, water bodies are extremely sensitive to pollution and siltation, and cannot do an adequate job of self-cleansing since the flushing characteristics are minimal. Silt and contaminants which are heavier than water generally settle to the water body's floor and remain there, with no means of escape. This creates adverse environments for bottom dwelling fish, and for the establishment of underwater life-giving vegetation. Contaminants which are lighter than water form a layer on the surface, spreading insidiously to the pond edges, adversely impacting the pond edge vegetation, which is usually considered to be the most environmentally productive vegetation of wetlands regimes.

"Siltation" refers to the deposition of suspended sediments and soil silt particles into surface waters. Silts enter water bodies from upstream or upslope, and settle in the still water to the water body floor. As silt accumulates, the storage capacity of the water body (or volume of water which it contains) becomes reduced. Depending on its depth, as the water body becomes shallower, sunlight may begin to reach the water body floor through the water. These conditions are then favorable for photosynthesis to take place, and this process promotes the establishment of an excess of water body floor vegetation. This excess of vegetation serves to trap an increasing volume of silt, exacerbating the condition described above and creating a vicious cycle. As the water body floor rises, more photosynthesis takes place, and floor vegetation eventually begins to reach the water surface in the form of lily pads and other such vegetation.

This process, known as "eutrophication", can also be caused by other means. For example, eutrophication can be caused by the over-application of nitrogen and phosphorus rich lawn fertilizers which get carried in surface runoff into surface waters, thereby promoting aquatic plant growth. The deposition of organic matter near the water's edge is another prime cause of eutrophication. Grass clippings and leaves leach nutrients into the surface waters as they decompose, further promoting aquatic plant growth. The process can continue until the water body becomes choked off and oxygen deficient. This occurs as a result of a reduction in the available supply of dissolved oxygen due to the overwhelming demand. The water body then degrades, eventually reverting (or converting) into an emergent wetland. While emergent wetlands are valued ecological resources, their inadvertent creation at the expense of open water bodies is not generally encouraged. Other conditions caused by eutrophication include a greater potential for flooding, the destruction of habitat, reduced dissolved oxygen levels, the degradation of the fish environment, and excessively high nutrient content in the water.

Arterial waterways are almost always in motion. Because of the rapid movement of water through waterways, they frequently have a high capacity for self-cleansing. This rapid movement also causes scouring of embankments, especially along horizontal curves of waterways. Unfortunately, scouring also promotes erosion and subsequent siltation. Arterial waterways act as conduits for the transportation of suspended sediments, which are all too often a form of contamination. In some cases, waterways are intermittent, meaning that they flow only during high rain water seasons and remain dry the remainder of the year. Intermittent streams have a very small capacity for stormwater volume and a low tolerance for flooding, and as a result are particularly sensitive to land disturbances which change their hydrology. When this occurs, erosion usually ensues. The conclusion is that within the world of surface waters, water bodies are usually the "degraded", and arterial waterways are usually the systems which deliver the degrading constituents from varying upland sources.

The types of pollution which degrade surface waters (as well as groundwater and soils) are classified as either point source or non-point source. Point source pollution is generated from a specific point, e.g. a pipe outlet, a sewage pump station, or an underground storage tank. The remediation of point sources of pollution is an important activity in reducing the contamination of our resources. But this is only a part of the problem.

Non-point source pollution, on the other hand, is rather insidious in that its source can be anything from leaky vehicles traveling along roadways, to chemicals applied to lawns or sprayed in trees, animal waste, winter road salts, brake pad metals and construction sediments. Because its source cannot be isolated, since in fact it is the collective product of many small sources, non-point source pollution is most difficult to control.

The generally recognized values of surface waters of all types have caused NJDEP to regulate them via (a) the Stream Encroachment Permit Process, (b) the 2004 N.J. Stormwater Regulations which include the stringent regulations regarding C1 waters, and (c) the Watershed Protection Act, among other programs.

B. Methodology

The methodology employed for the Inventory of Fair Lawn's surface waters included their mapping from record data, such as the Hackensack N.J. and Paterson, N.J. U.S.G.S. 7.5 minute quadrangle sheets, as well as the NJDEP electronic database (see Figure #7). Also consulted were 1980 aerial photographs obtained from the Bergen County Department of Planning and Economic Development, and NJDEP freshwater wetland maps. This information was then verified in the field by personal observation. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

As discussed in the Importance section above, surface waters refer to both static water bodies and dynamic waterways, but in both cases the water reaches the earth's surface. This distinguishes surface water from groundwater. Wetlands are the transition area between these two classifications. Hydrography refers to the study of surface waters, including their types and behaviors. Watersheds refer to defined geographic areas that ultimately drain into particular surface waters. A watershed may also contain multiple sub-watersheds that drain into the tributaries of the main surface water.

With the exception of the two significant rivers (the Passaic and the Saddle) that flank Fair Lawn's eastern and western extremities and form the Borough's municipal boundaries, surface waters within the interior of the Borough do not make up important features of Fair Lawn's landscape (see Figure #7). Nevertheless, Fair Lawn is fortunate to distinguish itself from other area communities in that approximately 50% of its municipal boundary is characterized by these two significant natural features, as opposed to some legally defined delineation as are most other area municipal boundaries.

<u>Water Bodies</u>

The most notable water body within Fair Lawn's interior is the Lyncrest Pond in the Borough's southwestern corner. There are no other known standing water bodies within Fair Lawn. Lyncrest Pond is in a wooded area.

Arterial Waterways

As discussed elsewhere within this ERI, all of the arterial waterways within Fair Lawn eventually drain into either the Passaic River or the Saddle River (see Figure #7). The Saddle River itself eventually drains into the Passaic River south of Fair Lawn at the municipal boundary between Garfield and Wallington. The Passaic River then drains into Newark Bay in the City of Newark. The only two significant arterial waterways, and the secondary waterways and their watersheds within Fair Lawn include:

1. The Passaic River. The Passaic River's source is near Mendham Township in Morris County by Mendham High School. The Passaic River traverses lightly undulating and flat lands and is therefore quite winding in configuration following a very circuitous route. It flows for some 80 to 90 miles through seven counties and 45 municipalities on its journey towards the Newark Bay, dropping approximately 600 feet in elevation. Along its route it is joined by several tributaries. In its upper stretch its tributaries include the Great Brook, the Black River, the Rockaway River, and the Pompton River before it reaches Paterson's Great Falls, still upstream from Fair Lawn. The Passaic River was dammed by Dundee Dam at Garfield, thereby creating Dundee Lake, just downstream from Fair Lawn. Below the dam, its lower stretch's main tributary is the Saddle River. The Passaic River then drains into the Hackensack River just upstream from Newark Bay.

The Passaic River is one of the most important waterways in northern New Jersey. While its entire route never leaves this State, its 935 square mile watershed extends to the north into both southern Rockland and southeastern Orange Counties of New York State. Approximately 50% of Fair Lawn's land area is directly within the Passaic River watershed. Within Fair Lawn the Passaic River follows a reverse "S" configuration. Historically its banks were extensively manipulated by industry, and there is very little if any natural riverbank remaining. Industry on both sides of the River (Fair Lawn and Paterson) has polluted the River, although some marginally successful efforts to cleanse it are ongoing.

Approximately 75% of the riverfront is privately owned and inaccessible to the general public. It is a stated objective of Fair Lawn's Open Space Committee to rectify this problem. They have made the acquisition of its riverfront properties a first priority. To further promote this objective, an undated study by the National Park Service entitled "Lower Passaic Canoe & Kayak Trail Action Plan" was prepared. And, in 2007 Keith Simeonoglou of Fair Lawn prepared another study entitled "River Walk Interpretative Trail" as an Eagle Scout project for a pedestrian accessible on-land greenway along Fair Lawn's Passaic River frontage.

2. The Saddle River. The Saddle River's source is its headwaters which are a series of small streams in Airmont Village, Town of Ramapo in southern Rockland County, N.Y. Their confluence forms the Saddle River in Upper Saddle River, N.J., two miles south of the New York State line. Since the Saddle River runs through some foothills-type topography, it runs a fairly straight due north-south route for its 16.3 mile length towards its confluence with the Passaic River. Only its headwater tributaries in Rockland County leave

Bergen County. The Saddle River flows through or adjacent to 15 Bergen County municipalities, dropping approximately 500 feet in elevation along its route. This drop makes the Saddle River's drop four to five times as steep as that of the Passaic River.

The Saddle River is an important river in northern New Jersey. Its watershed measures 51 square miles and is sandwiched between that of the Hackensack River to the east and the Passaic River to the west. It extends north into southern Rockland County, New York. The Ho-Ho-Kus Brook is its main tributary, joining the Saddle River at Fair Lawn's northeastern corner. Approximately 50% of Fair Lawn's land area is directly within the Saddle River watershed. Within Fair Lawn the Saddle River follows a relatively straight north-south course. This does not mean that its banks were manipulated by industry, however. To the contrary, almost all of its natural riverbank still remains. Almost all of Fair Lawn's Saddle River riverfront is owned by Bergen County and is contained within the Saddle River County Park. This is a linear greenway park with a continuous pathway for publicly accessible non-motorized recreational pursuits.

3. The Diamond Brook. This brook begins in southern Ridgewood, flows southbound through Glen Rock, and then cuts across Fair Lawn's northwest corner before it drains into the Passaic River just north of the intersection of Maple Avenue and Wagaraw Road. Of its 2-1/2 mile length, its final approximately 3,000 linear feet are within Fair Lawn. It flows past Columbia Terrace Park, the Columbia Terrace wetlands, and non-residential development. Its watershed includes Fair Lawn's northwest corner, and it drains approximately 10% of Fair Lawn's land area.

4. The Little Diamond Brook. This brook is contained entirely within Fair Lawn's boundaries. Its headwaters are in north central Fair Lawn, just east of the railroad. It flows for less than 1.5 miles to the southwest and drains into the Passaic River just south of the intersection of Maple Avenue and Wagaraw Road. It flows through two residential areas and the Fair Lawn Industrial Park. Its watershed includes Fair Lawn's northwest corner excepting only the Diamond Brook watershed, and it drains approximately 20% of Fair Lawn's land area.

5. Lyncrest Brook. The Lyncrest Brook is contained entirely within Fair Lawn's boundaries. Its beginning is in Lyncrest Pond in southwest Fair Lawn, in Lyncrest Park on the south side of Morlot Avenue. It flows for one half mile to the southwest and drains into the Passaic River at Fair Lawn's boundary with Elmwood Park. It flows from the park through a residential area. Its watershed includes Fair Lawn's extreme southwest corner, and it drains only approximately 5% of Fair Lawn's land area.

6. Jordan Brook. This is an important arterial waterway whose entire length is contained within Fair Lawn's boundaries. Its headwaters are in Berdan Grove in the center of the Borough, on the south side of Berdan Avenue. It flows for less than 1.5 miles to the northeast and drains into the Saddle River in Saddle River County Park in Fair Lawn's northeast corner. It flows from Berdan Grove through residential neighborhoods and a school site. Its watershed includes Fair Lawn's northeast corner, and it drains approximately 20% of Fair Lawn's land area.

7. Beaverdam Brook. This is another brook that is contained entirely within Fair Lawn's boundaries. It begins by Route 208 in southeast Fair Lawn. It flows for about 0.8 miles to the east and drains into the Saddle River in Saddle River County Park in Fair Lawn's southeast corner, just north of Route 208. It flows through a residential areas and Beaverdam Park. Its watershed includes an area of southeast Fair Lawn north of Route 208, and it drains approximately 10% of Fair Lawn's land area.

Watersheds

Fair Lawn has essentially four major watershed ridge lines (see Figure #7), and a series of minor ridge lines that are not shown on the graphic. All of these ridge lines serve to separate drainage basins. Fair Lawn has five large drainage basins that fall within named watersheds, and numerous smaller unnamed watersheds. The most prominent ridge line runs from a knoll in the northwest quadrant of the Rte. 208 and Fairlawn Avenue intersection southeast through Warren Point to the boundary with Saddle Brook Township. This forms the primary divide between the Passaic River and Saddle River watersheds. The second most prominent ridge line runs from the Passaic River northeast through the knoll described above and continues to the northeast through Radburn to the Glen Rock boundary. The northwest side of this ridge line, and the western end of the southeast side of this ridge line, both drain towards the Passaic River. The eastern end of the southeast side of this ridge line drains towards the Saddle River. The third most prominent ridge line runs from the first most prominent ridge line along Route 4 eastward to the Saddle River. Both sides of this ridge line drain into the Saddle River. The fourth and final prominent ridge line runs from Warren Point westward and then southward to the Elmwood Park boundary along Route 4. Both sides of this ridge line drain into the Passaic River. Fair Lawn's named watersheds can be viewed on Figure #7 and are known as:

1. Passaic River Lower (Fair Lawn Ave. to Goffle). This watershed is located in Fair Lawn's northwest corner and comprises approximately 20% of Fair Lawn's land area.

2. Passaic River Lower (Dundee Dam to Fair Lawn Ave.). This watershed is located in Fair Lawn's southwest corner and comprises approximately 24% of Fair Lawn's land area.

3. Passaic River Lower (Saddle River to Dundee Dam). This watershed is located in Fair Lawn's south central area and comprises approximately 8% of Fair Lawn's land area.

4. Saddle River (Rt. 4 to Rt. 17). This watershed is located in Fair Lawn's northeast corner and is the Borough's largest, encompassing approximately 40% of Fair Lawn's land area.

5. Saddle River (Lodi gage to Rt. 4). This watershed is located in Fair Lawn's southeast corner and comprises approximately 8% of Fair Lawn's land area.

Storm Drainage

The Borough of Fair Lawn maintains a storm water drainage system that is independent from its sanitary sewerage system. The separation of those two systems favorably distinguishes Fair Lawn from some of New Jersey's older urban areas. Storm drainage surface runoff is collected in this system and it is conveyed directly into open water bodies, without any pretreatment prior to its discharge. Fair Lawn's direct discharge system compares unfavorably with more contemporary methods of storm water discharge. The 2004 N.J. Storm Water Regulations require all N.J. municipalities to prepare a Storm Water Control Master Plan. One of the purposes of this plan is for N.J. communities to plan contemporary water quality pretreatment methodologies to be implemented over time so that pollutants aren't carried into the state's open waters through a direct conduit without pretreatment, as has historically characterized the State's systems. This program is intended to minimize the adverse impacts caused by non-point source pollution by filtering out pollutants before they reach open waters.

10. GROUNDWATER & SOLE SOURCE AQUIFERS

A. Importance

Groundwater moves through the geology of an area at varying depths and quantities, and this science is known as hydrology. In wetlands, for example, the depth to the water table, or, in other words, to the top surface of the seasonably high groundwater level, can be zero feet. What this means is that groundwater levels have reached the surface elevations, saturating the underlying soils. In other areas, the depth to the water table can be several hundred feet.

In terms of quantity, where soils are relatively impermeable, air spaces are at a minimum and the relative quantity of water to soil is low. In contrast, where soils are rather porous below the water table, and especially where fractured rock geology exists, the ratio of water to soil particles can be extremely high.

The importance of groundwater is varied. Its depth can determine whether or not subterranean basements can be constructed, and if so the type of footing, foundation and subdrainage system which may be necessary. Depth to groundwater will also determine the general wetness of a parcel of land, with the extreme being the presence of regulated wetlands. Groundwater depth also supports water body elevations.

The depth to groundwater is also a determining factor as to how deep one would have to drill a well to reach an adequate supply of potable water. The flow of the groundwater is another factor in this determination. The direction and rate of flow is indicative of groundwater source, and hence the reliability of its quality and safe yield. "Safe yield" describes the maximum quantity which can be safely removed from a groundwater source without jeopardizing its quantity or quality. Groundwater quality can be influenced by the potential for salt water intrusion, geologic decomposition, and most often by the percolation into the water table of contaminants. Contaminants may be in the form of volatile chemicals, metals, petroleum products, landfill leachate, raw sewage and salts, among others. The depth to and usage of groundwater resources also influences the acceptability of septic systems for the disposal of sanitary sewage.

With regard to well water for potable and industry purposes, there are some geographic locations that are completely dependent on groundwater since they have few if any surface water sources from which to impound water, such as in reservoirs as does United Water Resources (formerly the Hackensack Water Company, hereinafter referred to as UWR). Long Island, NY and Cape Cod, MA are two such notable locations. This condition is known as having reliance on sole source aquifers. Fortunately, Fair Lawn is not such an area, although Fair Lawn does obtain some of its water supply from well water.

Because the value of good quality groundwater has been widely recognized, due in part to the deleterious effects of contaminated groundwater on water supply resources and general public exposure, agencies at many levels have promulgated regulations which govern groundwater monitoring and the remediation of its contamination.

Bergen County, which is largely located in the Brunswick Formation of the Piedmont Physiographic Province, has been notorious for its limited groundwater supply. This has spurred the development of extensive public surface water systems for potable water supply. UWR is one of the largest water purveyors, providing water to approximately 1,000,000 people in Bergen, Hudson and Rockland Counties. Their water supply source is primarily from surface reservoirs.

B. Methodology

The information regarding Fair Lawn's groundwater was discerned from the background that supports the geology, soils and watershed information contained elsewhere in this ERI. The NJDEP electronic database was also examined and it indicated that no sole source aquifers exist within Fair Lawn's borders. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

Depending upon the nature of local soil conditions, groundwater and percolated surface water may move laterally through the soils, rather than infiltrating downward. This action usually occurs when groundwater levels are shallow, and when soils are impermeable or poorly drained. When lateral movement of groundwater occurs, or when the phenomenon

of capillary action occurs, groundwater can seep into both surface waters and subsurface water supplies. Therefore, if Fair Lawn's groundwater becomes contaminated, the potential for it to contaminate the water supply of the Borough's numerous public wells and/or the Borough's wetlands exists. Fortunately for Fair Lawn, its form of sewage disposal is predominantly by public sewerage rather than subsurface disposal, so this is not a factor in the protection of the Borough's groundwater supply to its wells.

The Borough of Fair Lawn Water Department (FLWD) currently provides most of Fair Lawn's drinking water, and has provided Fair Lawn with water for about for about 90 years. The quality of this well water has consistently met or exceeded NJDEP and USEPA standards for potable water. These standards were promulgated by The Safe Drinking Water Act (SDWA). The NJDEP permits the Borough to operate sixteen (16) production wells, each of which is sunk approximately 400 feet into the subsurface New Brunswick Aquifer. On average, Fair Lawn's production wells produce fifty-five percent (55%) of the Borough's water. These wells are at various locations throughout the Borough. Once the water has been pumped from the wells, the FLWD treats it to remove numerous contaminants. Four (4) pumping stations service these wells with a capacity of 4.5 million gallons each, yielding a total pumping capacity of 17.6 million gallons per day for the Borough. The treatment system consists of four (4) chlorination facilities and two (2) packed column volatile organic compound (VOC) treatment facilities, having a capacity of 4 million gallons per day. Average daily water consumption is 4.0 million gallons per day, with peak day demands as high as 10 million gallons per day. The federal Environmental Protection Agency (USEPA) is responsible for regulations for contaminants in water provided by public water purveyors, and the federal Food and Drug Administration (FDA) prescribes regulations for contaminants in bottled water.

The Borough augments its well water supply with bulk purchases of treated water from the Passaic Valley Water Commission (PVWC) and United Water New Jersey (UWNJ). About thirty-five percent (35%) of Fair Lawn's water comes from the PVWC. The primary source of water for the PVWC is the Pompton and Passaic Rivers. UWNJ supplies the Borough with about ten percent (10%) of its water. The primary source of water received from UWNJ come from four reservoirs: the Oradell and Woodcliff Lake reservoirs in New Jersey, the Lake Deforest reservoir in New York State, and the Lake Tappan reservoir which overlaps the state line. Additionally, through a regional network of interconnected pipelines, Fair Lawn occasionally receives treated water supplies from the Wanaque, Monksville and Boonton reservoirs in New Jersey.

11. WILDLIFE

A. Importance

The health, population, and diversity of species of wildlife within a community are indicators of the health and diversity of the natural environment within the community. Both an extensive diversity of wildlife species and sustainable population levels indicate the presence of a healthy habitat within which wildlife can thrive. These healthy habitats also represent assets to man in that they provide environments which can promote clean air and water as well as tranquility and recreational opportunities. Furthermore, the presence of wildlife within a community presents educational opportunities. Bird watching and the observing of other wildlife are two of many opportunities to learn about the natural world which exists around us.

Certain species of wildlife are classified globally, federally or by the State of New Jersey as rare, threatened or endangered. These three classifications generally indicate that suitable sustainable habitat is scarce; and the implication is that the presence of these species within a community is indicative of the presence of some of this dwindling habitat, which is a good ecological sign. Threatened and endangered species and their habitat are protected by State and Federal laws from harm or molestation by regulation.

B. Methodology

The methodology for determining the presence of wildlife within Fair Lawn included referencing record data available from a variety of sources. These sources included the Bergen County Audubon Society, the New Jersey Audubon Society, and the NJDEP Office of Natural Lands Management of the Division of Parks and Forestry. The information collected by this latter group is included in the NJDEP electronic database, and locations where threatened or endangered species have been documented are known as Natural Heritage Priority Sites. The Bergen County Audubon Society has an "Audubon Adventures" curriculum scheduled for presentation at the Lyncrest School in Fair Lawn as one of ten Bergen County schools sometime during the 2009/2010 school year. This curriculum assists students in forming positive attitudes towards nature. This County group focuses on the bird species of wildlife. The New Jersey Audubon Society also focuses on bird species but addresses other wildlife as well. While the two Audubon groups provide valuable information to the public, it is not available on a municipal basis. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C. Fair Lawn

Urban Wildlife

Mammals commonly found in and around Fair Lawn include a variety of species of what is commonly referred to as Urban Wildlife. These include chipmunk, deer, fox, mole, mice, muskrat, bat, opossum, rabbit, raccoon, shrew, skunk, squirrel, vole, and woodchuck. Bird

species within Fair Lawn are likely to include varying species of blackbird, cardinal, catbird, chickadee, cowbird, creeper, crow, dove, duck, finch, flicker, gnatcatcher, goose, grackle, grosbeak, gull, hawk, heron, jay, junco, kestrel, kingbird, kingfisher, martin, mockingbird, nuthatch, owl, phoebe, robin, sparrow, starling, tanager, thrush, titmouse, towhee, vireo, vulture, warbler, waxwing, woodpecker, wren and yellowthroat. Common reptiles and amphibians within the Borough likely include a variety of bullfrog, frog, newt, peeper, racer, salamander, skink, snake, toad, and turtles. None of these are considered rare, threatened or endangered species.

Lyncrest Park Inventory

The 1996 Fair Lawn ERI reported on a field study performed of Lyncrest Park[1] in 1991. Their Lyncrest Park inventory included the following observations:

Finfish:	**Marsupials:**	**Reptiles:**	**Amphibians:**
Carp	Opposum	Land Turtle	Frog
			Toad
			Woodhouse's toad

Arthropods:	**Birds:**	**Mammals:**	**Mollusks:**
Carpenter ant	Red Winged Blackbird	Bat	Slug
Sugar ant	Cardinal	Cat	Snail
Japanese Beetle	Northern Cardinal	Deer	
Bee	Grey Catbird	Ground hog	
Monarch butterfly	Black-capped Chickadee	Mouse	
American crayfish	Brown Ceeper	Muskrat	
Cricket	Brown-headed Cowbird	Eastern cottontail Rabbit	
Daddy longlegs	Common Crow	Norway Rat	
Dragonfly	Fish Crow	Raccoon	
Fire fly	Mourning Dove	Striped Skunk	
Fly	Mallard Duck	Eastern gray Squirrel	
Gypsy moth	Yellow-shafted Flicker		
Hornet	Canadian Goose		
Lady bug	Common Grackle		
Locust	Housefinch		
Praying mantis	Blue Jay		
Spider	Slate colored Junco		
Spittlebug	Baltimore Oriole		

[1] Biological Inventory of Lyncrest Park Wildlife Study Area, Fair Lawn, New Jersey, Final Draft, Catherine Del Tufo and Theresa Ten Eyck, Ramapo College, Mahwah, New Jersey, October 30, 1991

Termite	Pigeon		
Wasp	American Robin		
	Sandpiper		
	Sea Gull		
	Sparrow		
	Black Throated Sparrow		
	House Sparrow		
	Starling		
	Scarlet Tanager		
	Thrush		
	Tufted Titmouse		
	Rufous-sided Towhee		
	Downy Woodpecker		

Rare, Threatened or Endangered Species

The NJDEP Division of Parks and Forestry Office of Natural Lands Management maintains a policy of not revealing exact locations of sightings of rare, threatened or endangered animal species. This policy is intended to protect the valuable sensitive habitat upon which they depend. The Office maintains a computerized database of all such documented sightings, and provides a listing of species. They do not provide location maps for the reasons cited above. The only specie identified for Fair Lawn is the Fowler's toad (common name), or Bufo woodhousii fowleri (scientific name). The Fowler's toad has no federal status; its state status is SC[2]; its Grank is G5[3], and its Srank is S3[4].

The New Jersey Natural Heritage Program also publishes a list of Threatened and Endangered vertebrate species known to exist in Bergen County, but only potentially present in any given municipality. Given the favorable percentage of natural area and open space along the Saddle River corridor of Fair Lawn as compared with much of Bergen County, it is reasonable to assume that many of these species do exist within this specific area of the Borough. The species include:

American Bittern	Grasshopper Sparrow	Pied-Billed Grebe	Timber Rattlesnake
Bald Eagle	Great Blue Heron	Red-Headed Woodpecker	Upland Sandpiper

[2] SC Special Concern - applies to animal species that warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a Threatened species. This category would also be applied to species that meet the foregoing criteria and for which there is little understanding of their current population status in the state.
[3] G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.
[4] S3 Rare in state with 21 to 100 occurrences (plant species and ecological communities in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

Barred Owl	Longtail Salamander	Red-Shouldered Hawk,	Vesper Sparrow
Bog Turtle	Northern Goshawk	Savannah Sparrow	Wood Turtle
Brook Trout	Northern Harrier	Sedge Wren	
Cooper's Hawk	Osprey	Short-Eared Owl	

12. UPLAND VEGETATION

A. Importance

Upland vegetation exists in both undeveloped upland areas and in developed and ornamentally landscaped locations. For the purpose of this Environmental Resource Inventory, we shall concern ourselves with only the former, since the latter is often characterized by manipulated and unnatural associations, ornamentals and exotic species.

Undeveloped upland areas themselves provide opportunities for active and passive recreation, as well as habitat for the proliferation of wildlife. They often represent the watershed, or head waters, which supply potable water to our drinking water supplies. Activities within upland areas do not have any generic regulatory protection. The absence of this protection, in conjunction with the value associated with the upland environment, has spurred large scale protective activities such as the one taking place to the north and west of Fair Lawn, within the Highlands Physiographic Province of New Jersey and New York (known respectively as the "Highlands" and "Skylands").

Some specific regulations do exist to regulate land use and other activities within uplands. At the State level, uplands which fall within wetlands transition areas are protected by the wetlands encroachment permitting process. Uplands which fall within stream corridors or flood plains are protected by the stream encroachment permitting process. Additionally, if those water bodies are classified as C1 by NJDEP, the uplands that surround them are further protected by the buffers required by the 2004 N.J. State Stormwater Regulations. Bergen County regulates erosion and sedimentation control of uplands through the Soil Conservation District, which is an arm of the New Jersey Department of Agriculture. At the local level, Fair Lawn enacted a tree preservation ordinance that governs trees and shrubs on both public and private lands, including uplands.

The vegetation itself provides a myriad of benefits to man and the environment. Many of these benefits have been discussed to some degree in other sections of this Inventory. To summarize, the benefits provided by uplands vegetation include the building and holding of soil, controlling moisture, cleansing the air, releasing oxygen while absorbing carbon

dioxide, moderating temperature extremes, providing homes for wildlife, providing food source for wildlife and humans, buffering or screening views, attenuation of noise, providing aesthetic value, articulation of spaces, moderating bright light, dissipating strong winds, and timber production. It is important to note that most plants serve a variety of purposes. Since environmental conditions rarely exist in isolation, the functions of upland vegetation usually address these conditions in combination with each other, and are, therefore, multi-dimensional in their value.

One of the often overlooked but extremely valuable aspects of vegetation is its location within large contiguous tracts, as opposed to smaller isolated parcels. Vegetation within large contiguous tracts provides significantly more ecological value than does the same acreage isolated into smaller disconnected blocks. The diversity of wildlife increases dramatically with size and diversity of habitat. This is because most wildlife depends on safe cover for breeding, nesting, feeding and resting. These benefits to wildlife are not always available on smaller tracts, especially when they have been "intruded" upon by man. By "intruded" it is meant that the presence of man often represents a threat, thereby eliminating safe cover. Man also frequently clears brush from the forest floor, which is detrimental to wildlife which uses fallen trees, brush and rotting vegetative matter for habitat. Since the ecosystem is comprised of the plant life, animal life, soils, air and water, it can only be sustainable if all of its components are accommodated and in balance. This dependence means that if any one of the components is damaged, the entire ecosystem suffers as a result.

B. Methodology

The methodology for determining the presence of vegetative types within Fair Lawn included personal observations, as well as referencing record data available from a few sources. These sources included Vegetation of New Jersey (Robichaud, Buell); and the NJDEP Office of Natural Lands Management of the Division of Parks and Forestry, which maintains a computerized database of all such findings, just as they do for wildlife. As is the case with wildlife, certain species of vegetation are classified globally, federally or by the State of New Jersey as rare, threatened or endangered. These classifications indicate that suitable sustainable environmental conditions are scarce; and the implication is that the presence of these species within a community is indicative of exceptional quality local environmental conditions, which is a good ecological sign. Threatened and endangered species are protected from disturbance by regulations under State and Federal laws. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ, and the 2007 River Walk Interpretive Trail Eagle Project by Keith Simeonoglou of Troop 53 Fair Lawn.

C. Fair Lawn

Associations and Generations

The vegetation of the uplands of Fair Lawn is fairly typical of the northern New Jersey Piedmont Physiographic Province vegetation. General characteristics range from old fields, to successional growth, to dense forests. It varies to some extent as a product of its location,

either in valleys, on side slopes or on ridge tops, as well as its orientation to the sun. Natural vegetation has two primary characteristics - - its succession or change over time, and its diversity or change in spatial composition.

The natural vegetation of Fair Lawn is almost all at least second generation, meaning that it has been once disturbed. With few exceptions, therefore, Fair Lawn's forested areas have been through at least one round of complete successional change, having reverted to forest from farm lands, fields, and red cedar dominated successional brush lands.

Most of the uplands forests of Fair Lawn are classified as Mixed Oak Forest of the Mesic North Jersey Uplands. The predominant tree species include red oak, white oak and black oak. Other trees which characterize these areas to a lesser extent include chestnut oak, scarlet oak, hickories, red maple, sugar maple, ash, beech and tulip tree. Common understory trees include dogwood, sassafras and hop hornbeam. Shrubs are dominated by viburnum and spicebush.

The uplands forests of Fair Lawn which populate moist and cooler sites, in ravines or on steep lower north-facing slopes, are classified as Hemlock-Mixed Hardwoods Forest of the Mesic North Jersey Uplands. These forests are dominated by Canadian Hemlock[5], which is interspersed to a much lesser extent with Sweet Birch, Yellow Birch, Basswood, Beech, Ash, Red Oak, Sugar Maple and Red Maple. There are few understory trees or shrubs.

There are very few scattered undisturbed stands which are remnants of the once predominant Sugar Maple - Mixed Hardwoods Forest of the Mesic North Jersey Uplands. These forests once existed in abundance in the areas which were the most prime for development, and hence have been extensively stripped of their natural vegetation. Those that do exist are dominated by Sugar Maple, but also possess significant stands of Sweet Birch, Yellow Birch, Basswood, Beech, Ash, Red Maple, Red Oak, White Oak and Tulip Tree. Common understory trees include Hop Hornbeam, Dogwood, Ironwood and Sassafras. The shrub layer is dominated by Viburnum and Spicebush.

Rare, Threatened or Endangered Species

The NJDEP Division of Parks and Forestry Office of Natural Lands Management maintains a policy of not revealing exact locations of sightings of rare, threatened or endangered plant species. This policy is intended to protect their valuable sensitive habitat. The Office maintains a computerized database of all such sightings, and provides a listing of species, as well as Index Maps which generally indicate areas where documented locations are known precisely, and where documented locations are known within 1.5 miles. These maps have been provided for the Fair Lawn region on the USGS Hackensack and Paterson Quad Maps, because precise locations within the Borough are not known. The maps are included in the appendix of this ERI. Unfortunately, no such species were identified within Fair Lawn; however the maps show locations for some of Fair Lawn's surrounding communities.

[5] While the Canadian Hemlock (Tsuga canadensis) formerly dominated these forests, they have been devastated in recent years by the Wooly Adelgid, an aphid like bug that has smothered many hemlocks.

Specific Inventories

An updated vegetation inventory was prepared for Lyncrest Park in May of 2009[6]. The symbol "º" indicates a non-native plant that was either introduced or is an invasive specie. Where we noticed errors in nomenclature, we corrected them. Also, not all of these plants are strictly upland plants. Some of them are tolerant of, and at least one even dependent on, wetland conditions for their survival. Their observations included:

Botanical Name	**Common Name**	***Botanical Name***	**Common Name**
WOODY PLANTS			
Acer platanoides	Norway Mapleº	*Nyssa sylvatica*	Tupelo, or Blackgum
Acer rubrum	Red Maple	*Parthenocissus quinquefolia*	Virginia Creeper
Betula lenta	Black Birch	*Prunus serotina*	Black Cherry
Betula nigra	River Birch	*Quercus palustris*	Pin Oak
Clethra alnifolia	Summersweet	*Robinia pseudoacacia*	Black Locust
Fraxinus pennsylvanica	Green Ash	*Rosa multiflora*	Multiflora Roseº
Hedra helix	English Ivyº	*Sambucus canadensis*	Elderberry
Ilex glabra	Inkberry Holly	*Smilax rotundifolia*	Catbrier
Lonicera japonica	Japanese Honeysuckleº	*Toxicodendron radicans*	Poison Ivy
Malus spp.	Apple	*Viburnum dentatum*	Arrowwood Viburnum
Morus alba	White Mulberryº		
HERBACEOUS	**PLANTS**		
Convallaria majalis	Lily-of-the-Valley	*Symphlocarpus foedidus*	Skunk Cabbage
Impatiens capensis	Touch-Me-Not	*Thelypteris noveboracensis*	New York Fern
Maianthemum canadense	Canada Mayflower		

An earlier field study performed in 1991[7] of Lyncrest Park was included in the 1996 Fair Lawn ERI. This inventory included the following observations:

Botanical Name	**Common Name**	***Botanical Name***	**Common Name**
MIXED PLANT	**TYPES**		
Araceae	Arum	*Maianthemum canadense*	Mayflower, Canada
Commelina communis	Asiatic dayflower	*Brassicaceae*	Mustard
Convolvulus senium	Bindweed, hedge	*Vinca minor*	Myrtle (Periwinkle)

[6] Prepared by Lyncrest School, Fair Lawn; Initial list -- May 2009

[7] Biological Inventory of Lyncrest Park Wildlife Study Area, Fair Lawn, New Jersey, Final Draft, Catherine Del Tufo and Theresa Ten Eyck, Ramapo College, Mahwah, New Jersey, October 30, 1991

Vaccinium canadense	Blueberry, Canada	*Solanum dulcamara*	Nightshade, bittersweet (Deadly nightshade)
Typhya latifolia	Cattail, common	*Pachysandra spp.*	Pachysandra
Rumex crispus	Curly dock	*Pachysandra procumbens*	Pachysandra
Rubus hispidus	Dewberry	*Mitchella repens*	Partridgeberry
Smilacina racemosa	False Solomon seal	*Thlaspi perfoliatum*	Penny cress, yellow
Allium canadense	Garlic, wild	*Rhus radicans*	Poison ivy
Vitis spp.	Grape, wild	*Phytolacca americana*	Pokeweed (Pokeberry)
	Grape, frost (riparian)	*Polygonum spp.*	Polygonum, Knotweed
Graminaeae	Grass	*Polygonum persicaria*	Polygonum, Lady's thumb
Dactylis glomerata	Grass, orchard grass	*Polygonum sagittatum*	Polygonum, smartweed
Smilax rotundifolia	Greenbriar	*Polygonum virginianum*	Polygonum, Virginianum
Lonicera japonica	Honeysuckle, Japanese	*Juncaceae*	Rush, Juncus
Humulus japonicus	Hops	*Cyperaceae*	Sedge
Impatiens capensis	Impatiens, Spotted touch-me-not (Jewelweed)	*Eleocharis obtuse*	Sedge, Spike rush
	Ivy, American	*Symplocarpus foetidus*	Skunk cabbage
Hedera helix	Ivy, English	*Tradescentia virginiana spp.*	Spiderwort
Glechoma hederacea	Ivy, ground (Gill-over-the-ground)	*Viola pallens*	Violet, Northern white
Rhus radicans	Ivy, poison	*Parthenocissus quinquefolia*	Virginia creeper
Arisaema triphyllum	Jack-in-the-Pulpit	*Oxalicaceae*	Wood sorrel
Lythrum salicaria	Loosestrife, purple	*Oxalis europaea*	Wood sorrel, Yellow
FERNS, MOSSES,	**& LIVERWORTS**		
Osmunda cinnamomea	Fern, cinnamon	*Atrichum angustatum*	Moss
Dryopteris noveboracensis	Fern, New York	*Plagiomnium ellipticum*	Moss
Dryopteris campyloptera	Fern, spreading wood		
SHRUBS			
Viburnum dentatum	Arrowwood Viburnum	*Rubus sp.*	Raspberry
Berberis thunbergii	Japanese Barberry	*Rosa sp.*	Rose
Sambucus canadensis	Elderberry (common)	*Hibiscus syriacus*	Rose-of-Sharon
Ilex opaca	Holly, American	*Lindera benzoin*	Spice bush
Viburnum acerfolium	Mapleleaf Viburnum	*Clethra alnifolia*	Sweet pepperbush
Philadelphus herstus	Mock, orange	*Taxus sp.*	Yew
Ligustrum sp.	Privet		

TREES			
Pyrus (Sorbus) aucuparia	Ash, European mountain	*Morus alba*	Mulberry, White
Populus tremuloides	Aspen, Quaking	*Quercus velutina*	Oak, Black
Fagus americana	Beech, American	*Quercus prinus*	Oak, Chestnut
Betula populifolia	Birch, Grey	*Quercus palustris*	Oak, Pin
Betula nigra	Birch, River	*Quercus alba*	Oak, White
Carpinus caroliniana	Catalpa, northern	*Pinus strobus*	Pine, Eastern White
Prunus serotina	Cherry, black	*Sassafras albidum*	Sassafras
Castanea mollissima	Chestnut, Chinese	*Albizzia julibrissin*	Silktree
Malus spp.	Crabapple	*Rhus glabra*	Sumac, Smooth
Ulmus americana	Elm, American	*Platanus occidentalis*	Sycamore, American
Carpinus caroliniana	Hophornbeam, American Musclewood	*Ailanthus altissima*	Tree-of-Heaven
Robinia pseudoacacia	Locust, Black	*Juglans cinerea*	Walnut, Butternut
Acer rubrum	Maple, Red	*Salix babylonica*	Willow, Weeping
Acer saccharum	Maple, Sugar		

Another earlier field study performed in 1992 of Columbia Terrace Park[8] was included in the 1996 Fair Lawn ERI. This inventory included the following observations:

Botanical Name	**Common Name**	***Botanical Name***	**Common Name**
MIXED PLANT	**TYPES**		
Rubus allegheniensis	Blackberry, common	*Mimulus ringens*	Monkey flower
Sisyrinchium montanum	Blue eyed grass, common	*Convolvulus sepium*	Morning glory (bind weed)
Eupatorium perfoliatum	Boneset	*Verbascum blattaria*	Moth mullein
Arctium minus	Burrdock, common	*Cerastium vulgatum*	Mouse-ear chickweed
Linaria vulgaris	Butter and eggs	*Artemisia*	Mugwort
Ranunculus acris	Buttercup, common	*Verbascum thapgus*	Mullein, common
Ranunculus septentrionalis	Buttercup, swamp	*Alliaria alliaria*	Mustard, hedge
Hypochaeris radicata	Cat's-ear	*Boehmaria cylindrical*	Nettle, false
Chelidonium majus	Celadine	*Solanum carolinense*	Nettle, horse
Alsine spp.	Chickweed	*Urtica dioica*	Nettle, stinging
Potentilla simplex	Cinquefoil, common	*Circaea quadrisulcata*	Nightshade, enchanter's
Potentilla canadensis	Cinquefoil, dwarf	*Allium cernuum*	Onion, wild
Potentilla recta	Cinquefoil, rough-fruited	*Dactylis glomerata*	Orchard grass
Pilea pumila	Clearweed	*Cassia fasciculate*	Partridge-pea
Trifolium hybridum	Clover, alsike	*Phlox paniculata*	Phlox, garden
Trifolium pretense	Clover, red	*Phragmites australis*	Phragmites
Trifolium repens	Clover, white	*Plantaga lanceolata*	Plantain, english

[8] A Biological Inventory, Columbia Terrace Park Area and Archie W. Aitchson Education Complex Area, Fair Lawn, New Jersey, (undated – field work performed in 1992), authors not identified.

Hesperis	Dames rocket	*Daucus carota*	Queen anne's lace
Taraxacum officinale	Dandelion, common	*Ambrosia trifida*	Ragweed, great
Hemerocalis fulva	Day lily	*Rosa multiflora*	Rose, wild
Dianthus armeria	Deptford pink	*Salvia spp.*	Sage
Lemna sp.	Duck weed	*Rumex acetosella*	Sheep sorrel
Thlaspi arvense	Field pennycrest	*Capsella bursa-pastoris*	Shepards purse
Erigeron annuus	Fleabane, daisy	*Eupatorium urticaefolium*	Snakeroot, white
Solidago spp.	Goldenrod	*Plygonatum biflorum*	Solomon's seal
Graminacea	Graminoids	*Smilacina racemosa*	Solomon's seal, false
Monotropa hypopitys	Indian pipe	*Hupericum perforatum*	St. johnswort, common
Iris sp.	Iris, yellow	*Helianthus strumosus*	Sunflower, woodland
Polygonum cuspidatum	Japanese bamboo	*Lysimachia terrestris*	Swamp candles
Epatorium maculatum	Joe-pye-weed, spotted	*Tanacetum vulgare*	Tansey, common
Hieracium pretense	King devil	*Cirsium arvense*	Thistle, canada
Polygonum persicaria	Lady's thumb	*Impatiens capensis*	Touch-me-not, spotted
Lythrum quadrifolia	Loosestrife, whorled	*Verbena hastata*	Vervain, blue
Lychnis alba	Lychnis, evening	*Vicia cracca*	Vetch, cow
Rhexia virginica	Meadow-beauty, Virginia	*Violet spp.*	Violet, lanced leaved
Medicago lupulina	Medick, black	*Barbarea vulgaris*	Wintercress
Asclepias syriaca	Milkweed, common	*Chimaphila maculata*	Wintergreen, spotted
Polygala sanguinea	Milkwort, field		
FERNS, MOSSES,	**& LIVERWORTS**		
Onoclea sensibilis	Fern, sensitive		

Some professional personal observations were made in 1993[9]:

Botanical Name	**Common Name**	***Botanical Name***	**Common Name**
FERNS, MOSSES,	**& LIVERWORTS**		
Merchantia polymordia	Liverwort		

Some other professional personal observations were made in 1996[10]:

Botanical Name	**Common Name**	***Botanical Name***	**Common Name**
MIXED PLANT	**TYPES**		
	Bamboo	*Spp.*	Scallion, wild
	Bleeding Hearts		

[9] Personal observations by Elaine B Winshell, 1996
[10] Personal observations by Fred N. Rubel

TREES			
Acer palmatum	Maple, Japanese		

13. OPEN SPACE

A. Importance

Open space is a precious resource which, with the exception of its size, is not quantifiable in terms of its value. Extensive research has concluded that open space provides for the mental and physical health and well being of human beings, in addition to providing recreational opportunities. Some of the qualities associated with open space include peace, tranquility, aesthetics, and relief from urban and suburban congestion.

Open space also helps to define the sense of place, or unique identity, of a community. The open spaces of a community can create a recognizable vernacular which can be translated into a representation of the standards of the locality, against which proposed alterations to land uses can be measured. Precedent has been set for the usage of this as a yardstick for evaluating projected adverse impacts from development proposals.

As was discussed in the Vegetation section of this Inventory, open space, like vegetation, similarly becomes more valuable in large contiguous tracts. All of the values of open space discussed above become enhanced as parcels grow larger in size. In some cases, long and linear contiguous stretches of open space are conducive to the development of greenways, or linear park corridors within which users may travel, and because of which other larger blocks of public open space may be linked.

Open space in and of itself is not protected by regulatory authority, except as it may support other environmentally sensitive functions. There are two other notable exceptions to this rule. First, if N.J. State Green Acres funds were used to purchase or improve open space within a municipality, as is the case within Fair Lawn, then pre-existing publicly-owned open space cannot readily be the subject of disposition. Secondly and even more rigidly, if open space is zoned or has been dedicated as park land, and in particular if it was included on a Green Acres Recreation and Open Space Inventory, it would take an act of the State legislature (the State House Commission) to dispose of it. Lands funded through the Green Acres program are open to the use and enjoyment of all residents of the State. Open space may also be protected by regulations concerning buffers for wetlands, flood plains, open waters, and C1 waters.

B. Methodology

The open spaces of Fair Lawn were inventoried in May 1, 2006 in a document entitled "Open Space and Recreation Plan, Borough of Fair Lawn" (OSRP). This consultant worked with various groups within the Borough to inventory all of the open spaces that exist, whether dedicated as park land by the Borough or Bergen County, privately owned, non-dedicated and publicly owned, or Board of Education owned. Desirable open space additions were also identified in this report, and they have since been expanded to include additional privately owned properties. This effort was the background information required for Fair Lawn's successful Planning Incentive Grant application to NJDEP Green Acres. The specific graphic exhibit that was prepared for and appears in this ERI includes all of those properties except for the desirable properties for acquisition (see Figure #8).

C. Fair Lawn

As referenced in Chapter 13 section B above, Fair Lawn's remaining open spaces were detailed in the 2006 OSRP document. Excerpts from that Plan that pertain to this ERI as an inventory rather than an action plan have been included in this section. For this document, they have been provided with their own graphic exhibit which does not include action items (see Figure #8).

There is no zoned open space or park land within Fair Lawn. Moreover, municipal parks and recreation areas are not labeled as such on the Borough Zoning Map, although some of them are labeled on the Borough's tax maps. All of the open space and public parkland within Fair Lawn is zoned to conform to its adjacent building zone, even though those are not the visions or intent the community has for these properties. This may prove to be problematic in the future if a movement to dispose of open space arises.

This is not to say, however, that there are no parks or open spaces within the Borough. To the contrary, Fair Lawn is fortunate to have at least preserved a moderately sized network of open spaces. Yet these are still inadequate to meet the needs of the Borough as verified by the OSRP. Fair Lawn also has a few sizable blocks of privately owned open spaces. While these do not formally contribute to public recreational opportunities, they are used both informally and privately and therefore serve to reduce the demand for the public facilities. They also contribute to the Borough's overall environmental quality. The 2006 Borough of Fair Lawn OSRP reports that there are only approximately 12 acres of uncommitted open space remaining within Fair Lawn, all of which is either subject to future development or has already received development approvals. These privately owned properties are shown on the System Map in the OSRP.

The publicly owned open spaces within the Borough are shown on Figure #8. The majority of these open spaces can be found in the watersheds, along the Borough's western Passaic River boundary and its eastern Saddle River boundary. Most of the lands along the Passaic River are owned by private interests with a lesser extent of public ownership. The opposite is true along the Saddle River where most of the lands are owned by public entities and a lesser quantity is in private ownership. The watershed lands of the Saddle River are part of

a Bergen County owned greenway park system. The Borough of Fair Lawn's Open Space Committee has expressed the desire to create a similar greenway along the Borough's Passaic River waterfront.

The following charts itemize various categories of the Borough's remaining open spaces:

Existing Publicly-Owned Open Space & Recreation Resources

BLOCK/ LOT	SIZE (AC)	TYPE (and Name if appropriate)	LOCATION
1110/4 & 5; 2220/10	7.21	Brookdale Park. Active (1 basketball court & 2 ballfields, 2 playgrounds)	Sycamore Drive
1305/1; 1306/18.01; 2328/7	4.68	Beaverdam Park. Active (1 basketball court, 2 playgrounds)	Saddle River Road
2528/2; 2504/1 – 19	5.21	TJ School Park. Active (1 LL ballfield & 1 tennis court)	Morlot Avenue
3504/1	11.75	Berdan Grove Park. Active (1 softball field; 2 handball, 2 tennis, & 1 basketball court: 3 playgrounds)	Berdan Avenue
2603/8	1.57	Sampson Park (Passive undeveloped site)	Sampson Road
2702/2, 4 & 5; 2703/6; 2704/1 & 2; 2711/21 & 24	17.35	Edison School Park. Active (2 playgrounds, 1 ballfield, 1 basketball court)	Fair Lawn Avenue
3416/7 & 10	4.13	Gregory Park. Active (1 softball field, 1 basketball court, 2 playgrounds)	Southern Drive
3813/19	2.12	Cresthill Park. Active (1 basketball court, 2 playgrounds)	Godwin Avenue
4405/49	8.81	Lyncrest Park. Passive (natural area with wetlands)	Morlot Avenue
4510/1 – 20; 4511/1	13.57	Center Recreation Complex. Active (4 ballfields, 1 soccer field, 2 playgrounds, 1 basketball court)	Berdan Avenue
4700/10; 4800/23	2.07	Everett Park. Active (1 basketball court, 2 playgrounds)	Everett Place
5903/31	15.94	Dobrow/Columbia Terrace. Active (4 ballfields, 1 pool, 2 soccer fields, 1 football field, 2 playgrounds, 3 tennis courts, 2 field houses)	Harriston Road & Maple Avenue
6501/1; 6602/1	29.94	Memorial Park. Active (2 ballfields, 2 playgrounds, 2 tennis courts, 3 hockey courts, 1 swimming pool)	First Street
3207/13 – 22; 3204/13 – 15, & 30 – 32; 3200/1 – 7, & 18 – 38	3.68	Warren Point Annex. Active (2 softball fields, 1 playground, 2 tennis courts)	Broadway/30th Street
4802/1	2.01	Henderson Park is a passive grassy field	Henderson Blvd & 11th St.
2804/1.01	0.83	Passive grassy field	Heywood Ave & Hunter Place
2803/1.01	0.57	Passive grassy field	Heywood Ave & Well Drive

2707/1.01	0.72	Passive grassy field	Well Drive & High Street
1101/1.01, 2.01, 3.01, 4.01, 5.01, 11.01, 12.01, 15; 1201/3 & 5; 1202/1; 1203/7; 1301/1.01 – 7.01, 10 & 22; 1401/1; 1408/1; 1501/1.01; 1505/10; 1515/11; 1601/1; 1603/1.01. 2.01, 3.01, 4.01, 5.01, 6.01, 7.01, 8.01; 1604/2; 1701/1 & 2; 1801/1, 2, 4.01 & 5.01; 1803/4.01	99.09	Saddle River County Park	Between Saddle River Road & the Saddle River

Other Existing Publicly-Owned Open Space & Recreation Resources (schools, etc.)

BLOCK/ LOT	SIZE (AC)	TYPE (and Name if appropriate)	LOCATION
5709/2 & 9; 5710/12; 5714/2	7.25	Westmoreland School playfields. Active (1 softball field, 1 playground, 1basketball court)	Westmoreland Avenue
5602/1	5.01	Forrest School Playfields. Active (1 ballfield, 1 basketball court, 1 playground)	Hopper Avenue
4405/48	2.44	Lyncrest School Play Area. Active (1 basketball court, 1 playground)	Morlot Avenue
3803/1 & 2	2.70	Radburn School Playfields. Active (1 basketball court, 1 softball field, 1 playground)	Radburn Road
2528/1	9.58	Milnes School Play Area. Active (1 basketball court, 1 playground)	Philip Street
2301/1 & 2	4.31	Warren Point School Playfields. Active (1 basketball court, 1 ballfield, 1 playground)	Broadway
2702/3	4.29	Edison School Play Area	Fair Lawn Avenue
2507/1	9.34	T.J. Middle School Playfields. Active (2 soccer fields, 1 softball field, 1 basketball court)	Morlot Avenue
6602/2	15.20	Memorial Middle School Playfields. Active (1 baseball field, 2 soccer fields)	First Street
4515/1	9.12	Fair Lawn H.S. fields. Active (1 tennis court)	Berdan Avenue
4502/8 - 37; 4503/1 – 21; 4504/1	9.19	Fair Lawn H.S. Athletic fields complex. Active (1 football field, 2 lacrosse fields)	Berdan Avenue
5724/5, 6, 15, 16	1.95	BOE/Bus Complex. Passive (open field)	Bergen Avenue

Existing Publicly-Owned Undedicated and Undeveloped Lands

BLOCK/ LOT	SIZE (AC)	TYPE (and Name if appropriate)	LOCATION
1412/12, 13, 18, 19	0.5	Open lot	Monroe Street
2704/2	1.5	Bird Sanctuary and wetlands	Fair Lawn Avenue

Privately-Owned Open Space and Recreation Resources

BLOCK/ LOT	SIZE (AC)	TYPE (and Name if appropriate)	LOCATION
5504/1 & 29; 5501/1	5.13	Church field with 1 softball field (Van Riper Church)	Bellair Ave. & Camp Court
3610/2	5.60	1 basketball court and former publicly used athletic (baseball) field (Daly Field)	Between Plaza Road and Conrail tracks on Berdan Ave.
3609/1	1.79	1 former publicly used soccer field and archery range (Archery Plaza)	Between Plaza Road and Conrail tracks near Fair Lawn Ave.
1702/4 & 10	1.80	Historic Naugle House on lot adjacent to Saddle River County Park	East end of Fair Lawn Avenue
1702/5	2.97	Historic Vander Plaat house on large lot adjacent to Naugle House and Saddle River County Park	East end of Fair Lawn Avenue
3610/1	4.40	Former businesses (Hayward Tract)	Between Plaza Road and Conrail tracks
3609/15	0.48	Currently vacant former site of Topps Cleaners	Fair Lawn Avenue and Conrail tracks
1205/50.01	0.95	Old house in poor condition on sizable lot (Terhune)	Saddle River Road & NJ Rte. 4
6901/21	4.15	Vast wetland area (Columbia Terrace / Diamond Brook)	Smith Avenue south of Harristown Road
4801/1	9.96	Open unused grassy field (Kodak field)	Between Rte 208 & Pollitt Drive
5729/2	13.36	Old business building on riverfront lot (Clariant property)	Fair Lawn Ave and Passaic River
1206/18	0.22	Open lot in business district	Blue Hill Ave. & NJ Rte. 4
5903/7 & 12	0.81	Open lot connecting existing park to major thoroughfare	20-40 & 22-50 Maple Ave near NJ Rte 208
3513/1	1.15	Old building on lot adjacent to recreation fields (JWV Jewish War Veterans parcel)	Plaza Road and Rte 208 ramp
5506/10	0.38	Old building on lot amid small residential lots (Interstate Glass property)	River Road and Harrison Drive
5611/25 & 5709.01/1 (part)	0.23	Old trolley facility on lot amid small residential lots	Between Bergen Ave & Campbell Road
5611/25, 25.01 & 26	0.23	Open field amid small residential lots next to Firehouse	George Street near Berdan Ave
6802/5	0.17	Storage Assets' parcel along the Passaic River bank	River Road and Wagaraw Road
3514/1, 3515/8	1.34	Temple Avoda property	Plaza Road and Romaine Street
3702/18 & 19; 3707/1	4.66	Radburn A Park	Between High Street, Abbott Road North, Howard Avenue, and Alden Terrace
3712/1, 3803/3	8.09	Radburn B Park	Between Howard and Owen Avenues, Plaza Road North, and Radburn Road

14. BROWNFIELDS (CONTAMINATED SITES)

A Importance

Contaminated sites can cause health problems to humans and wildlife, can destroy forests and other vegetation, and can cause the despoliation of other natural resources upon which other species rely for their survival and sustenance. Contaminated groundwater can ruin wells that would otherwise provide potable water, and the lateral migration of contamination (known as plumes) can find its way into surface waters, thereby exacerbating the harm that can be done to the environment. Septic systems can be ruined. And caustic contaminants can damage underground utilities and other infrastructure. At times, contaminants can seemingly defy gravity by using capillary action to rise to the ground surface. When this occurs, the likelihood of primary contact is increased, and serious health hazards can result. Contaminants can also directly affect humans and animals by reaching the surface through utility systems that act as conduits, conveying these contaminants as undesirable side effects. Additionally, contaminated materials may degrade or deteriorate, thereby undermining any surface features that may be above them. Therefore, the existence, extent and seriousness of contamination can cause deleterious effects on how properties can be utilized in the future. The federal government requires high levels of remediation for primary contact activities and residential uses. Lesser levels are often found to be acceptable for commercial and industrial uses.

The contemporary term for those sites that have been contaminated by manmade activities is "brownfields". Some have been registered at the county, state and/or federal level; but contaminated sites are considered brownfields irrespective of whether or not they have been identified or classified. Contaminates that are found on these sites can be found on the USEPA's list of priority pollutants. The worst of these sites are classified by the USEPA as Superfund sites meaning that they have been prioritized for cleanup by the federal government. The cost for these cleanups can be borne by a variety of sources. Generally, the USEPA seeks out a trail of ownership and attempts to hold culpable parties responsible for the cleanup costs. Most often, however, tax payers foot much of the bill for these cleanups. New Jersey has what is known as the Industrial Site Recovery Act which documents ownership trails and requires inspections prior to ownership transfers. Sites are frequently added to the list of brownfields as newly contaminated sites are discovered. More positively, however, sites periodically are removed from the list as they are remediated to acceptable levels.

Depending on the anticipated future land use, cleanup may take different forms. Removal and legal disposal in a federally licensed hazardous waste landfill was the traditional form of cleanup, and this remains today as the ultimate level of site remediation. Unfortunately, the costs of such cleanups and the limited availability of qualifying landfill space caused the cost for such cleanups to be so excessive that sites were simply abandoned instead. In efforts to quell this trend and encourage site

remediation and productive reuse, as opposed to having brownfield sites lay fallow and unproductive, and in some cases as attractive nuisances, programs were initiated at both the federal and state levels to make cleanups more cost effective. The federal government has ruled that encapsulation (rather than excavation, removal and disposal) can be an acceptable form of remediation. Other scientific methods of contaminant removal have also been approved by the USEPA such as vacuum collection systems. New Jersey has also encouraged the reuse of contaminated sites by initiating programs that encourage brownfield remediation and redevelopment utilizing adaptive reuse techniques. These programs have had enough recent success that they will continue into the foreseeable future.

There is also a source of natural contamination which comes in the form of radon gas. Radon gas can be found in indoor air or drinking water and it can be harmful to health. Radon gas has been found to be generated within certain specific geological formations such as the Reading Prong. Fortunately, Fair Lawn is not within such a formation, and as such can be expected to not have a radon gas problem within the Borough's boundaries. Actual concentrations of this gas, however, can only be measured by on-site testing.

B Methodology

The list of Known Contaminated Sites below and the graphic representation of their locations on the Brownfields (Contaminated Sites) graphic were obtained from the NJDEP electronic database (see Figure #9). The federal government also keeps a list of Superfund sites, but these are all included within the NJDEP list. We also consulted the December 1996 ERI for the Borough of Fair Lawn NJ.

C Fair Lawn

The latest Known Contaminated Sites List below for New Jersey was developed in 2005. These are those sites and properties within the State where contamination of soil or ground water has been identified or where there has been, or there is suspected to have been a discharge of contamination. This list of Known Contaminated Sites may include sites where remediation is either currently under way, required but not yet initiated, or has been completed. Forty-three (43) such sites have been identified within Fair Lawn. There is no discernable pattern to their locations as they are scattered about the Borough. Slightly discernable concentrations of these sites, however, might be identified as (a) an area just north of Fair Lawn Avenue and west of River Road; (b) the intersection area of Fair Lawn Avenue and the Conrail Railroad; and (c) an area just south of Nevins Road between McBride Avenue and the Railroad.

Known Contaminated Sites Supplementary Legend to Figure #9

Map ID #	Place Name	Address	Status	Status Date	Remediation Level
1	106 MIDLAND AVENUE	106 MIDLAND AVE	Active	7/26/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination

2	10 WILLIAMSON PLANE	10 WILLIAMSO N PL	Active	7/26/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
3	12 56 12TH STREET	12 56 12TH ST	Active	7/1/2003	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
4	12 TO 59 12TH STREET	12 TO 59 12TH ST	Active	1/23/1996	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
5	13-25 SUNNYSIDE DRIVE	13-25 SUNNYSIDE DR	Active	3/26/2003	C2: Formal Design - Known Source or Release with GW Contamination
6	13-38 SUNNYSIDE DRIVE	13-38 SUNNYSIDE DR	Active	9/29/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
7	1-38 CYRIL AVENUE	1-38 CYRIL AVE	Active	10/25/2000	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
8	1 42 35TH STREET	1 42 35TH ST	Active	5/21/2003	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
9	14-23 THIRD ST	14-23 THIRD ST	Active	12/1/1999	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
10	16-19 HUNTER PLACE	16-19 HUNTER PL	Active	6/22/1999	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
11	18 04 SPLIT ROCK ROAD	18 04 SPLIT ROCK RD	Active	1/26/2004	C2: Formal Design - Known Source or Release with GW Contamination
12	30 TO 13 HIGH STREET	30 TO 13 HIGH ST	Active	5/12/2000	C1: No Formal Design - Source Kown or Identified- Potential GW Contamination
13	35-07 GARDEN VIEW TERRACE	35 07 GARDEN VIEW TER	Active	12/9/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
14	36 06 FERRY HEIGHTS	36 06 FERRY HTS	Active	7/28/2003	C2: Formal Design - Known Source or Release with GW Contamination
15	38 WINSLOW TERRACE	38 WINSLOW TER	Active	2/3/2005	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
16	5 ELM STREET	5 ELM ST	Active	1/20/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
17	64 SANFORD RD	64 SANFORD RD	Active	12/27/2002	C2: Formal Design - Known Source or Release with GW Contamination
18	7 02 MORLOT AVENUE	7 02 MORLOT AVE	Active	1/31/2003	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
19	7 PRESCOTT PLACE	7 PRESCOTT PL	Active	6/25/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination

20	8-43 OAK STREET	8-43 OAK ST	Active	9/11/2003	C2: Formal Design - Known Source or Release with GW Contamination
21	AUTO SUMSER INC	7-06 SADDLE RIVER RD	Active	5/13/1998	C2: Formal Design - Known Source or Release with GW Contamination
22	BERGEN SCHOOL	5-01 BERGEN AVE	Active	12/22/1999	C2: Formal Design - Known Source or Release with GW Contamination
23	BORDEN CHEMICAL INC	8 10 22ND ST	Active	1/1/1991	C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW
24	CAMEO CLEANERS	31-01 BROADWAY	Active	1/10/2002	C2: Formal Design - Known Source or Release with GW Contamination
25	CITGO SERVICE CENTER	22-32 MAPLE AVE	Active	4/19/2004	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
26	COLE ENGINEERING INC	1300 PLAZA RD	Active	11/22/1993	D: Multi-Phased RA - Multiple Source/Release to Multi-Media Including GW
27	CUMBERLAN D GULF 060102	20-11 FAIRLAWN AVE	Active	5/10/2001	C2: Formal Design - Known Source or Release with GW Contamination
28	EASTMAN KODAK PROCESSING LABORATORY	16-31 RTE 208	Active	7/1/1992	C2: Formal Design - Known Source or Release with GW Contamination
29	EXXON MOBIL CORP 35598	20-22 PLZ RD	Active	7/29/1998	C2: Formal Design - Known Source or Release with GW Contamination
30	ENGINE REBUILDERS CORP OF AMERIC	18-02 RIVER RD	Active	4/12/1991	D: Multi-Phased RA - Multiple Source/Release to Multi-Media Including GW
31	FAIR LAWN SELF STORAGE	16 TO 01 MCBRIDE AVE	Active	3/18/1999	C1: No Formal Design - Source Known or Identified- Potential GW Contamination
32	FAIR LAWN WELLFIELD CONTAMINAT ION	HENDERSON BLVD & WESTMOREL AND AVE	Active	8/13/1982	D: Multi-Phased RA - Multiple Source/Release to Multi-Media Including GW
33	FISHER SCIENTIFIC CO	1 REAGENT LN	Active	2/26/1987	D: Multi-Phased RA - Multiple Source/Release to Multi-Media Including GW
34	JOHN'S CORNER EXXON	PLAZA RD & MORLOT AVE	NFA-A (Limited Restricte d Use)	1/25/1999	C2: Formal Design - Known Source or Release with GW Contamination
35	KEM MANUFACTU RING CO INC	18-35 RIVER RD & MAPLE AVE	Active	6/19/2000	C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW

36	NJ TRANSIT RADBURN TRAIN STATION	POLLITT DR & FAIR LAWN AVE	Active	3/16/1998	C2: Formal Design - Known Source or Release with GW Contamination
37	PARKWAY FRIENDLY SERVICE INC	30-09 BROADWAY	Active	8/26/1992	C2: Formal Design - Known Source or Release with GW Contamination
38	SANDOZ CHEMICALS CORP	FAIR LAWN AVE & 3RD ST	Active	3/11/1994	C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW
39	SANDVIK COROMANT CO	17-02 NEVINS RD	Active	1/1/1996	C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW
40	STATE TIRE AUTOMOTIVE DISCOUNT CENTER	15-10 RIVER RD	Active	7/1/2003	C2: Formal Design - Known Source or Release with GW Contamination
41	STEAM LEASING CORP @ FAIR LAWN IND	20 21 WAGARAW RD	Active	4/7/1995	C2: Formal Design - Known Source or Release with GW Contamination
42	TOPPS CLEANERS & LAUNDERERS	2202 FAIRLAWN AVE	Active	1/22/2004	C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW
43	ZERO TWENTY FOUR GAS STATION INC	40 TO 10 RTE 4 E	Active	10/21/1998	C2: Formal Design - Known Source or Release with GW Contamination

15. ENVIRONMENTALLY SENSITIVE AREAS

A. Importance

Each category of natural resource has a threshold beyond which it is considered to (a) be particularly sensitive to disturbance (sometimes referred to as "environmentally sensitive"); and (b) exhibits particularly valuable ecological benefits. It is generally agreed that the lands which meet the criteria of being environmentally sensitive include wetlands, the 100 year flood plain, hydric soils, slopes which exceed 15 percent, reservoirs and their tributaries, surface waters, and the habitats for threatened and endangered species (see Figure #10). Most of the lands surrounding drinking water reservoirs and their tributaries are considered to be environmentally sensitive. The sensitivity diminishes the more distant the land is from the reservoir or tributary. Because of this sensitivity, the State of New Jersey has promulgated regulations that govern land use around reservoirs and their tributaries. While there are no such areas in Fair Lawn, this issue is of concern to Fair Lawn residents since a significant percentage of their potable water comes from upstream reservoirs in other Bi-County municipalities.

Many of the most severe of these categories have been recognized by means of their protection via State or Federal regulation, e.g. wetlands and flood plains. Others are monitored closely by the County, e.g. soils. Some municipalities have elected to protect other resources by municipal ordinances. One example includes the adoption of an environmental checklist to accompany development applications, for the purpose of obtaining full disclosure of expected environmental impacts. Environmental Impact Statement ordinances have also been adopted by some municipalities (including Fair Lawn) to fully and impartially explore a development proposal's projected impacts, as well as to study reasonable alternatives. Other ordinances which have been enacted by municipalities include those for the protection of steep slopes and vegetation (trees in particular), and for the control of pesticide and herbicide use.

B. Metholology

The graphic that illustrates Environmentally Sensitive Areas (see Figure #10) was prepared by combining the most serious of these features overlaid onto one map. Those features are the ones described in the above paragraphs. The value of this graphic is that it should serve as the first point of reference in the review of development proposals. If the site of the proposal is included on this graphic, it should be considered "red flagged" and the reviewers should then look more closely at the individual ERI graphics to determine in which category or categories the concern may lay. This should then spur the Applicant to provide site specific information with specific reference to those concerns.

C. Fair Lawn

The criteria for inclusion on this map exhibit are those cited above. As might be expected, those locations within Fair Lawn that meet these criteria are concentrated along the Saddle and Passaic River corridors. The others follow the surface water corridors.

Beyond this mapping, in 1992 New Jersey adopted a Statewide Master Plan to guide land use entitled Communities of Place: The New Jersey State Development and Redevelopment Plan (otherwise known as the "State Plan" or "SDRP"). It was later revised in 1997. On a state-wide basis, and with the assistance of participating municipalities on a voluntary basis, this document identifies environmentally sensitive areas that are critically important for all New Jersey citizens. With few exceptions, all of Fair Lawn Borough falls within SDRP's Planning Area 1 (PA 1), otherwise known as the "Metropolitan Planning Area". One of the important policy objectives of this Planning Area is:

> *"Natural Resource Conservation: Reclaim environmentally damaged sites and mitigate future negative impacts, particularly to waterfronts, scenic vistas, any remaining wildlife habitats and to Critical Environmental Sites (sites that would be included within Planning Area 5 if they met the minimum size threshold) generally. Give special emphasis to addressing air quality concerns; provide open space and recreational amenities."*

The few exceptions to PA 1 in Fair Lawn include the park and natural areas along the Saddle River which are considered PA's 6, 7 and 8, otherwise known as "Parks and Natural Areas". No policy objectives were proffered for these Planning Areas.

Also, no places within Fair Lawn have been designated as "Critical Environmental Sites" (CES) by the State Plan. SDRP defines CES's as being equal in environmental value to lands of Planning Area 5, otherwise known as the "Environmentally Sensitive Area" of which there are none within Fair Lawn. The only difference is that CES's are smaller in size than the minimum size threshold (one square mile) established for a Planning Area designation. Nevertheless, the State Planning Commission has provided the same level of protection for CES's as is afforded to Planning Area 5. Among the policy objectives for PA 5 (and by extension CES's) is:

> *"Natural Resource Conservation: Protect and preserve large, contiguous tracts and corridors of recreation, forest or other open-space land that protect sensitive natural and cultural resources, including endangered species and, particularly, ground and surface water resources that are aquifers and serve as the head waters of many of the State's rivers and streams."*

Since there are no areas within the Borough that meet the criteria for a PA 5 designation, the Borough may wish to consider petitioning for CES designation for sites that are particularly sensitive and replete with natural resources.

16. RECOMMENDATIONS

A. GEOLOGY AND GROUNDWATER. We recommend that Fair Lawn begin formulating performance standards, guidelines, best management practices and regulations that would govern discharges, sewage disposal, pet management, property maintenance, and pesticide, herbicide and fertilizer applications. These actions would help to protect the groundwater as well as surface waters. FLEC could begin the process by disseminating information to the public about the importance of this resource and the need to protect it. It should be emphasized that one accidental spill or noxious effluent producer is not usually the primary culprit. Rather, quite often the worst source of groundwater contamination comes from non-point source pollution which is the cumulative impact of lawn chemicals and road salts and other noxious materials over large areas.

   Fair Lawn should also begin to implement its Stormwater Management Plan which should have been prepared in response to the 2004 New Jersey Storm Water regulations. One of the primary benefits would be to replenish the groundwater supply upon which the Borough is dependent for its water supply.

B. SOILS. The Borough should be hesitant to permit any of the remaining non-urban land areas to be converted to urban land. While it is understood that other higher level authority agencies have policies which may force such conversions, the recommendation here is that any lands over which Fair Lawn maintains ultimate land use control be prohibited from such conversion.

C. FLOOD PLAINS. Wherever stream encroachment, storm water (including C1 waters buffers) regulations and/or other statewide permits do not mandate land preservation themselves, we recommend that flood plains be preserved through funding from programs such as New Jersey's Green Acres and Blue Acres programs. Additionally, Bergen County has an open space trust fund that may assist in the preservation of flood plain lands. The Federal Emergency Management Agency (FEMA) also has a Blue Acres program for the acquisition of flood prone lands. It is further recommended that the public be educated as to the importance of flood plains, in order to encourage them to avoid deposition of materials within flood plains which: (a) are likely to be carried downstream during a future flood event, potentially degrading downstream water quality, or (b) may constrict the free flow of storm water potentially causing upstream flooding. Residents should also be made aware that the despoilment of flood plains reduces flood storage capacity, potentially causing damage to structures and costing taxpayers money for elaborately engineered storm water control facilities.

D. WETLANDS. Some of the wetlands within Fair Lawn are protected from development within park lands. The New Jersey Freshwater Wetlands Act of 1988 is expected to protect those other wetlands that remain from development. The exceptions would only be those degraded or isolated wetlands that may qualify for Statewide general permits. In addition to providing protection for wetlands within the State, the Act cited above prohibits municipalities from enacting their own local ordinances. In view of these restrictions, the Borough should be diligent about requiring development applicants to obtain a "Letter of Interpretation" from NJDEP. This is a State-generated opinion on the presence and extent of wetlands on a particular site.

Wetlands require protection from more than just developers. Wetlands are fragile ecosystems, and they should be protected from intrusion by vehicles, from active recreation, and from the deposition of foreign materials. Often times, this latter item comes in the form of lawn clippings by residents who dismiss this activity as the disposal of organic materials within woodlands, rendering it acceptable in their minds. This is clearly not the case. Most of the ornamental grasses of manicured lawns are not indigenous plants. In contrast to other decaying organic matter which falls naturally within a wetland setting, the clippings of ornamental grasses offer neither wildlife habitat nor food source. Grass clippings have often been treated with pesticides, herbicides, and high nitrogen-content fertilizers. When the clippings degrade, they create an

unnatural organic mat that leaches high concentrations of organic matter, as well as the chemical constituents which were applied when it was a lawn. This contributes to oxygen deficiency in, and potentially the eutrophication of surface waters. Grass clippings can also create an impermeable layer which inhibits groundwater recharge, and which smothers native plants. Therefore, Fair Lawn should educate its residents about stewardship at the local level with a "Think Globally, Act Locally" campaign.

The Borough's Environmental Commission should nominate some of Fair Lawn's inland wetlands for designation as "Critical Environmental Sites" by the State Plan. Such designations could have value in protecting valuable natural resources that aren't otherwise protected. These nominations would be initiated by the Environmental Commission and endorsed by the governing body during an SDRP review cycle.

E. SURFACE WATERS. Point source pollution is a problem that can often be controlled by directing remedial actions at the sources of pollution. The Borough should consider initiating a program whereby it ensures that the owners of all pipe discharges are in possession of a proper New Jersey State Pollution Discharge Elimination Permit (NJSPDES).

In contrast, non-point source pollution is extremely difficult to control, since its source cannot be isolated. The best method of non-point source pollution control is to educate those who could prevent its generation in the first place. Significant beneficial reductions in non-point source pollution could be achieved if road crews would reduce the amount of salt used for winter roadway de-icing, and if they would use a less objectionable product than calcium chloride. Facilities such as golf courses could be required to practice Best Management Practices (BMP) by using only organic fertilizers, and in limited quantities, and to limit the use of herbicides and pesticides. Residents could be convinced through education to follow the same BMP's for their properties as well. This would be particularly beneficial for those properties that are situated adjacent to open spaces and surface waters. Beyond this, developers could be required to follow BMP's for soil erosion and sedimentation control, including the installation of oil traps and catchments within terminal catch basins, by the use of biofilter drainage basins, and by strictly utilizing the methods included in the 2004 N.J. Stormwater Regulations (i.e. rain gardens).

In addition to these measures, the natural pretreatment of storm water discharge through the construction of silt fences, sedimentation basins, infiltration basins, vegetated buffers and meandering grassy swales are also beneficial. The Borough should be mindful of insisting on adherence to NJDEP's regulations regarding C1 waters and their buffers. In addition, integrated Pest Management procedures could also be followed which limit the use of pesticides, thereby minimizing non-point source pollution.

Since storm runoff is collected and conveyed directly into open water bodies without pretreatment, Fair Lawn could require applicants to comply with its Storm Water Control Master Plan so that pollutants aren't carried directly into the state's open waters without pretreatment. The Borough could also initiate a program to retrofit its own public drainage outlet structures to comply with the State's 2004 regulations.

F. VEGETATION AND WILDLIFE. These two items go hand in hand because they depend upon each other for their survival and sustenance. For example, wildlife would be hard pressed to find food, shelter, safe cover, and suitable breeding and nesting grounds without healthy stands of vegetation. Likewise, much of our vegetation depends on wildlife to spread their seeds for propagation purposes. Theirs are symbiotic relationships which result in large benefits to the overall environment.

In addition to the indisputable value of vegetation and wildlife of undeveloped open spaces, one of the most valuable and beautiful aspects of Fair Lawn is the presence of vegetation and habitat which is interspersed within the Borough's developed areas, albeit it limited in its extent. While much of this vegetation is ornamental, large quantities are indigenous, native or naturalized species which inhabit the property lines between yards and properties. This mature vegetation is one of the most important factors that differentiate Fair Lawn from other highly developed suburban towns. Native trees in particular have the potential to represent a recognizable Fair Lawn vernacular. For this reason among others, the vegetation of the Borough should be protected. This can be done by means of strengthened tree removal and land clearing ordinances.

G. OPEN SPACE. Through the use of Planning Incentive grant funds from NJDEP Green Acres, the Borough is seeking to acquire privately owned open space and potential open space lands for conservation and recreation purposes. A part of the emphasis is towards lands that are contiguous to larger blocks of open space and not otherwise protected, e.g. the Naugle House property which is adjacent to the Saddle River County Park. The New Jersey Green Acres program has become a boon to this municipal program. The Borough is also seeking funding assistance from the Bergen County Open Space Trust Fund. In mostly developed suburbs, opportunities to preserve and expand open spaces are rare and may never again present themselves.

In response to this desire and need, the Fair Lawn Open Space Committee, through the governing body, authorized Hakim Associates to prepare an Open Space and Recreation Plan (OSRP) in 2006 to address the issues of open space preservation and acquisition (and creation in the cases where former land uses are demolished in favor of open space and recreation) in Fair Lawn. Despite the backwards sequence of their preparation, that document should be viewed as both a companion to and a partial implementation of this ERI. It explores a variety of planning techniques for these objectives, some conventional and some

innovative, which are available for consideration. The OSRP formed the basis for Fair Lawn being awarded the Planning Incentive grant cited above.

Examples of less expensive non-fee simple acquisitions are numerous. The Borough of Fair Lawn could consider the purchase of Conservation and/or Recreation Easements over certain properties. A Conservation Easement would allow the current property owners to continue to own their properties and use them for a variety of purposes, but would preclude their development. A recreation easement would permit public access onto the properties for passive recreational activities, and would conserve the natural resources of the properties. Other techniques could include land donations, land trades, leases, current use assessments, municipal regulatory techniques, cluster zoning, and transfer of development rights. And on its simplest level, oftentimes more responsible and/or sensitive property management techniques can create the appearance of more open space (see Environmentally Sensitive Areas below).

From a land use planning perspective, the Borough could consider zoning open space and park lands within Fair Lawn as such, as opposed to their current zoning classifications which simply conform to their adjacent building zones. Such an action would have a more permanent memorializing effect on the actions being taken by the current administration, environmental commission and open space committee.

H. Brownfields (Contaminated Sites). The Borough should monitor the existing brownfields within its borders and take steps to promote their remediation. This can include taking such steps as (a) encouraging property owners to seek higher authority assistance in their cleanup; (b) relieving development regulations for the redevelopment of and related fees for brownfield sites; and (c) becoming flexible in the land uses permitted for these sites so that they do not remain fallow. The Borough should monitor its current industries that are not brownfields to ensure that they do not become one. Also, the Borough can be cautious about permitting new industry into the community that has a history of generating brownfield conditions.

I. Environmentally Sensitive Areas. The nomination of CES's for the SDRP is supposed to occur on a three-year interval although that has not been the State's history. They have been regularly behind in that schedule. Nominations can only be made by the governing body of the municipality within which the resource is situated. We recommend that Fair Lawn consider nominating environmentally sensitive sites for CES designation, particularly if they might be threatened by planned development. This process can be initiated by contacting the Bergen County Department of Planning and Economic Development who serves as the intermediary between the State and its towns.

Municipal regulatory techniques can also be effective. For example, Fair Lawn's Environmental Impact Statement (EIS) ordinance could require the full

public disclosure of existing conditions and impacts which could reasonably be expected to result from a development proposal. It could also require the exploration of reasonable alternatives and the provision of acceptable mitigation of impacts, and would be subject to the scrutiny of an intense public review process. As a compromise ordinance, lands which appear on the Environmentally Sensitive Areas exhibit, and which are presented to the Borough as subjects of development or subdivision proposals, could receive further protection by the adoption of a local ordinance with the following requirements. The applicants for such a proposal could be required to prepare site-specific studies, more closely evaluating the location and extent of sensitivity for each natural resource which may be present on or adjacent to the subject site. Each applicant could then be required to project the impacts upon those resources which might reasonably be expected to result from their proposal, study and present alternatives to their proposals, and submit a plan for minimizing or mitigating against anticipated adverse impacts.

Environmentally sensitive areas can also be protected by a more widespread acceptance of cluster development. The theory behind cluster development is that sensitive lands can be preserved by permitting higher densities on adjacent non-sensitive lands. Unless Fair Lawn is presented with a wholesale redevelopment proposal, such as might occur along Route 208, this technique has little applicability in fully developed towns.

* * *

APPENDIX

1. 12-15-09 letter from NJDEP Division of Parks and Forestry, Office of Natural Lands Management, Natural Heritage Program, to Michael G. Hakim of Hakim Associates regarding rare species in Fair Lawn Borough, Bergen County, N.J.

2. Natural Heritage Grid Maps: Description of how grid maps identify species and natural communities with documented occurrences in localized areas.

3. Natural Heritage Grid Map for Hackensack, N.J., February 2004.

4. Natural Heritage Grid Map for Paterson, N.J., February 2004.

5. Fish Weir Information, *Fair Lawn, Historic Tales from Settlement to Suburb,* Jane Lyle Diepeveen[11]

6. Historic Sites in Fair Lawn[12]

[11] To be added later in 2010
[12] To be added later in 2010

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NJ County Boundaries
Bergen County

H A K I M A S S O C I A T E S
Professional Planning / Landscape Architecture
68 Dean Street, Harrington Park, NJ 07640
Tel: (201) 767-4289 Fax: (201) 767-0276

Source:
Boundaries - New Jersey Department of Environmental Protection

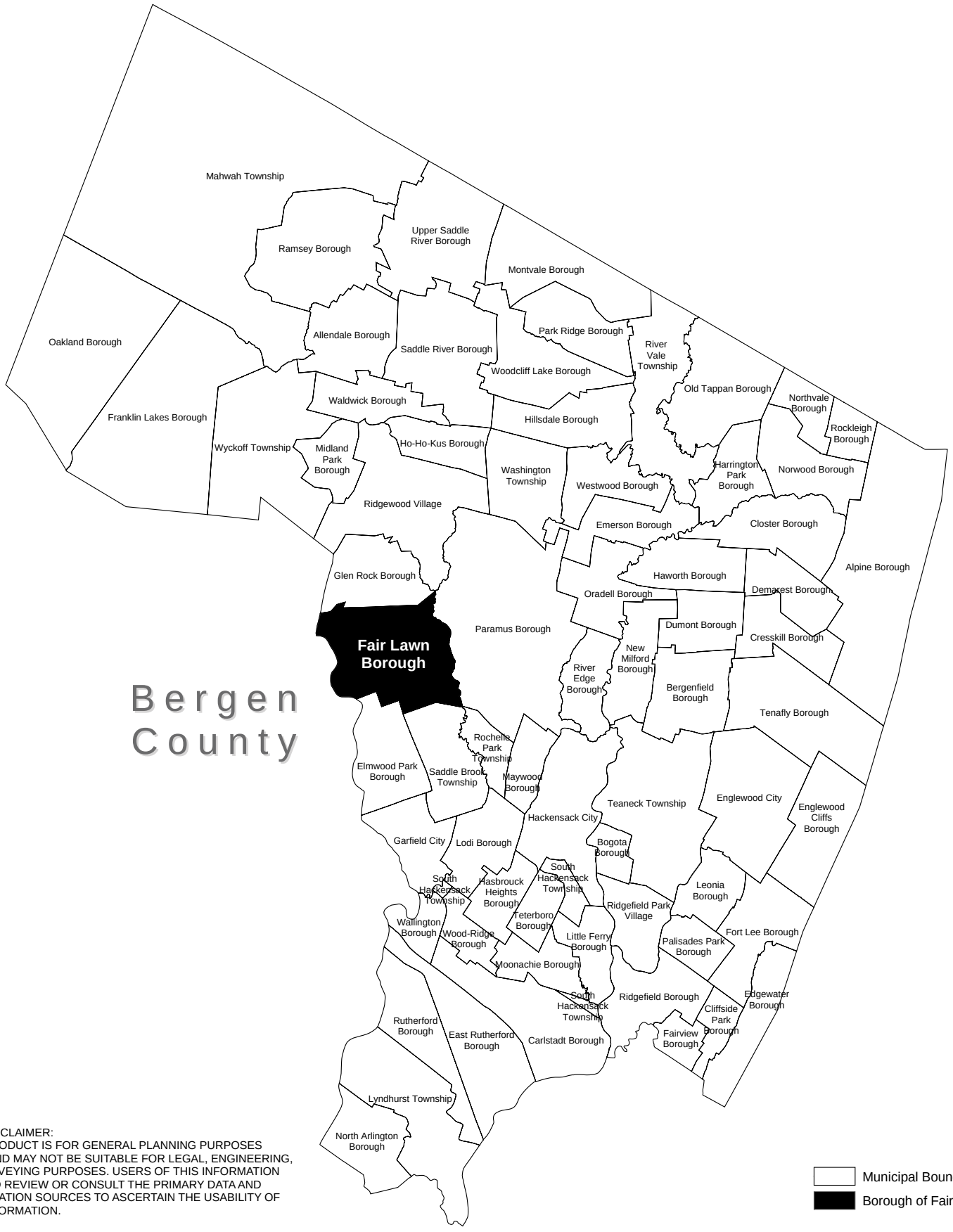
Map Prepared October 2009 by TMG

15 0 15 Miles
1 inch = 15 miles

Figure 1 - Location Map

Environmental Resource Inventory

Borough of Fair Lawn, NJ



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Source:
Boundaries - New Jersey Department of Environmental Protection

Map Prepared October 2009 by TMG

2 0 2 Miles

1 inch = 2 miles

Figure 2 - Vicinity Map

Environmental Resource Inventory

Borough of Fair Lawn, NJ

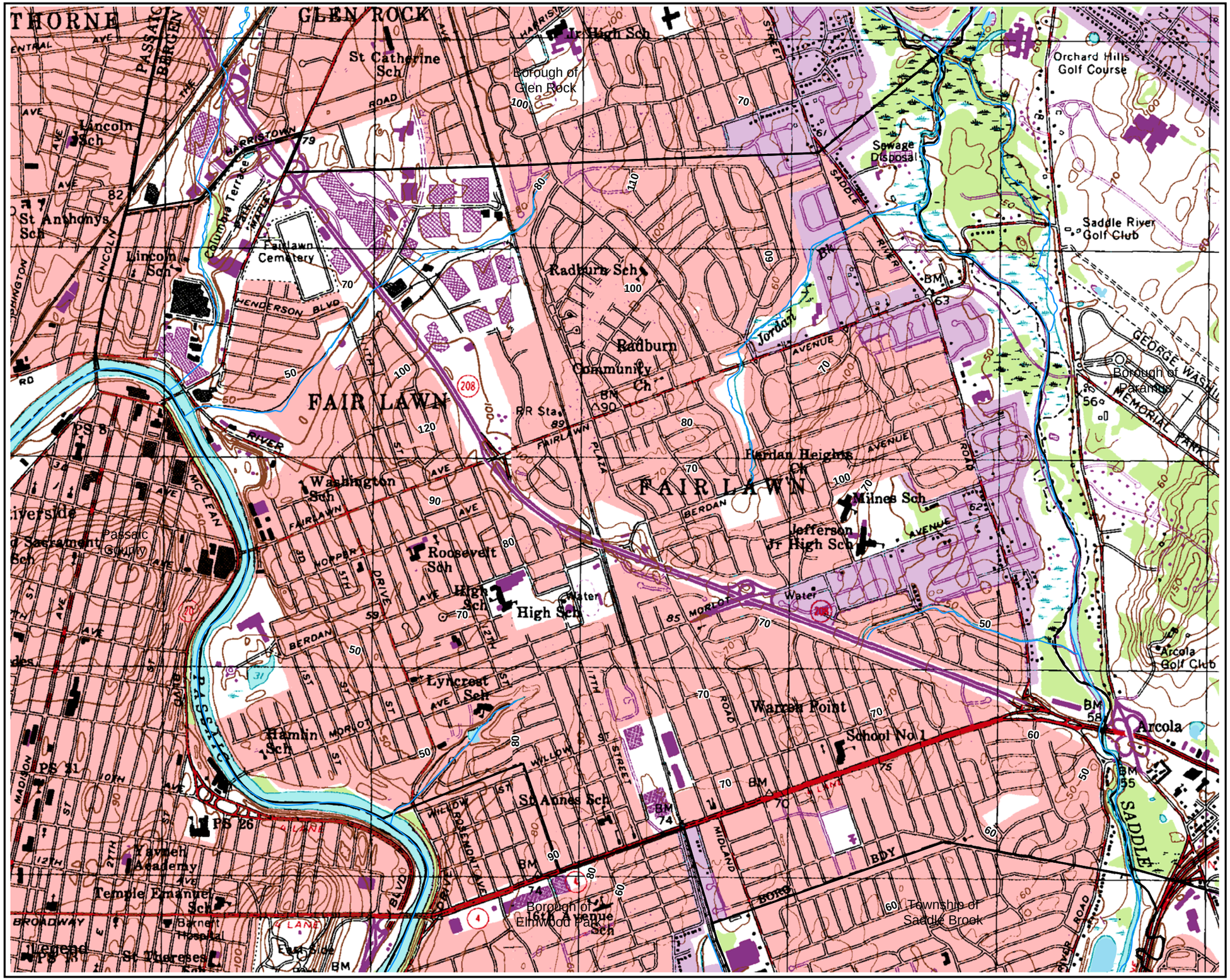

FIGURE 3

TOPOGRAPHY

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey

- Municipal Boundaries
- Waterbodies
- Rivers & Streams

Borough of Fair Lawn
Bergen County, New Jersey

Locus Map
B. of Fair Lawn

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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Rivers/Streams - New Jersey Dept. of Environmental Protection (DEP)
1:24,000K Topoquads (Hackensack & Paterson) - USGS

Map Prepared October 2009 by:
TURNER MILLER GROUP, LLC
SUFFERN, NY

1,500 0 1,500 Feet
1 inch = 1,500 feet

HAKIM ASSOCIATES
Professional Planning / Landscape Architecture
68 Dean Street, Harrington Park, NJ 07640
Tel: (201) 767-4289 Fax: (201) 767-0276

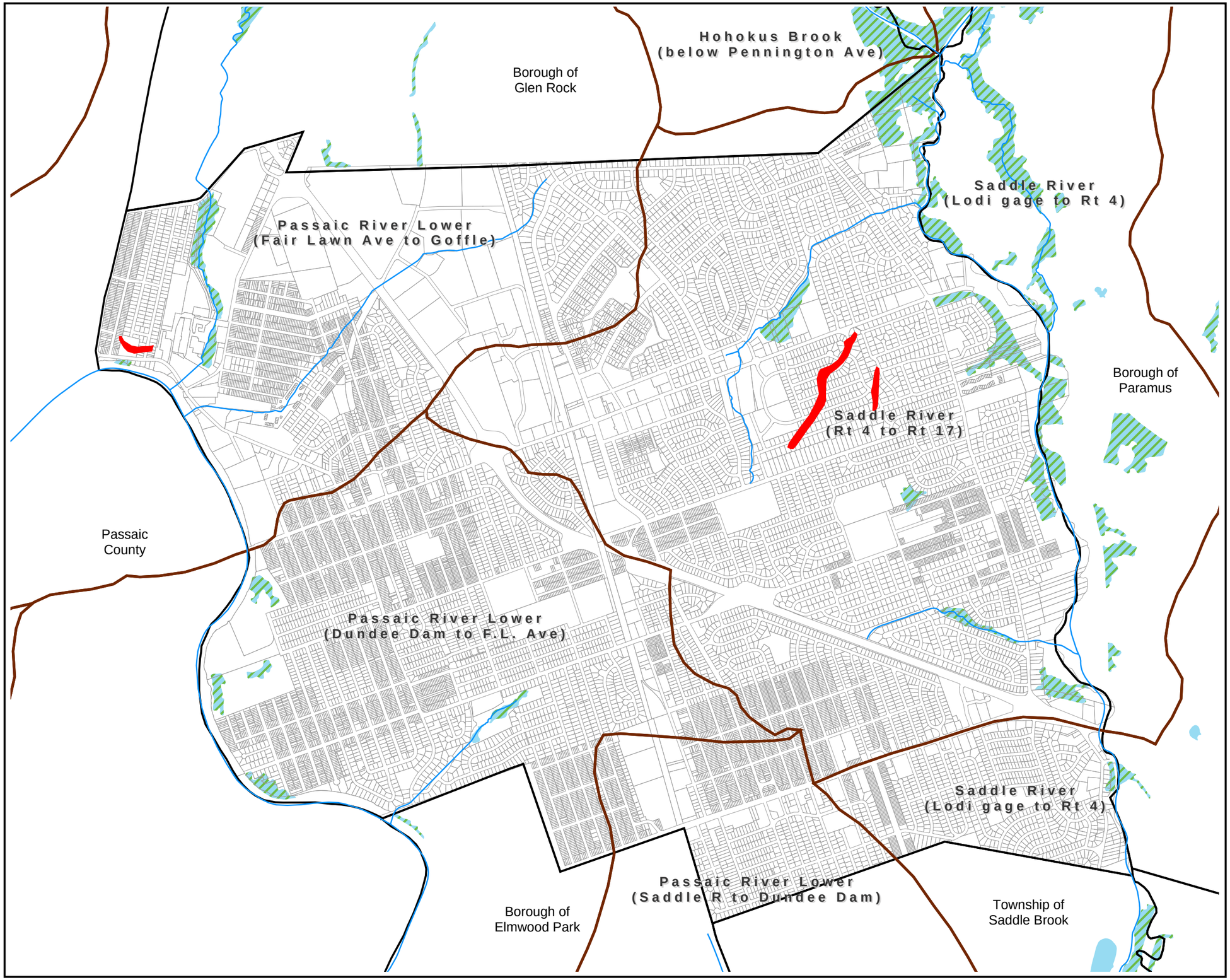


FIGURE 4

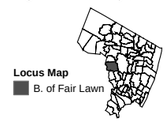
WATERSHEDS & STEEP SLOPES

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey

- Municipal Boundaries
- Watersheds
- Parcels
- Waterbodies
- Wetlands
- Slopes 15%+
- Rivers & Streams

Borough of Fair Lawn
Bergen County, New Jersey



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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Wetlands, Rivers/Streams, Watersheds - New Jersey Dept. of Environmental Protection (DEP)
Steep Slopes - Hakim Associates

Map Prepared October 2009 by:
TURNER MILLER GROUP, LLC
SUFFERN, NY

1,500 0 1,500 Feet

1 inch = 1,500 feet

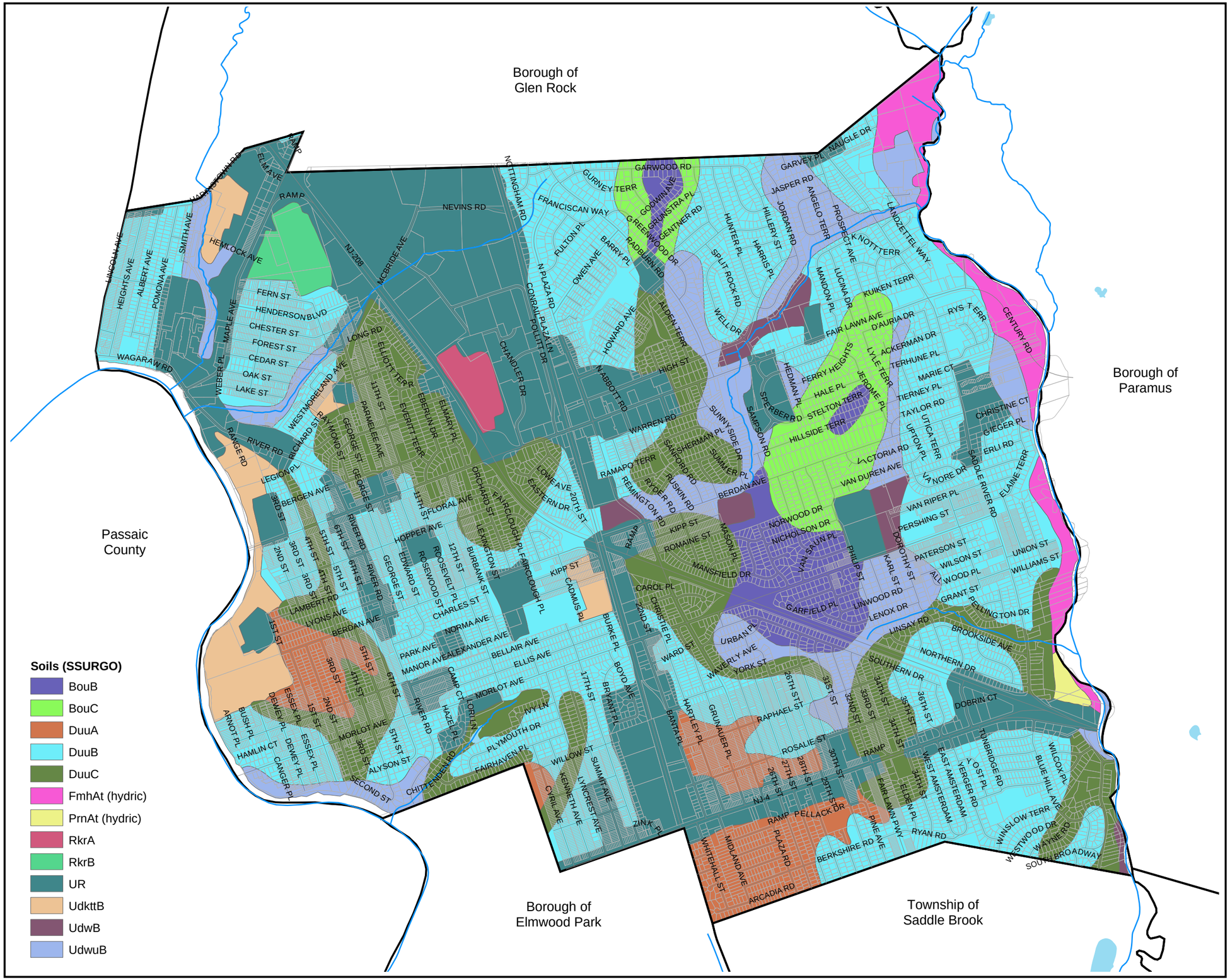
HAKIM ASSOCIATES
Professional Planning / Landscape Architecture
68 Dean Street, Harrington Park, NJ 07640
Tel: (201) 767-4289 Fax: (201) 767-0276

FIGURE 5

SOILS (SSURGO)

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey



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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Soils, Rivers/Streams - New Jersey Dept. of Environmental Protection (DEP)

Map Prepared October 2009 by:
TURNER MILLER GROUP, LLC
SUFFERN, NY

HAKIM ASSOCIATES

Professional Planning / Landscape Architecture

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FIGURE 6

FEMA 100 & 500 YEAR FLOODPLAINS

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey

- Municipal Boundaries
- Parcels
- Waterbodies
- 100 Year Flood
- 500 Year Flood
- Rivers & Streams
- Roads

Borough of Fair Lawn
Bergen County, New Jersey

Locus Map
B. of Fair Lawn

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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Rivers/Streams - New Jersey Dept. of Environmental Protection (DEP)
Floodplains - Federal Emergency Management Agency (FEMA)

Map Prepared October 2009 by:
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SUFFERN, NY

1,500 0 1,500 Feet
1 inch = 1,500 feet

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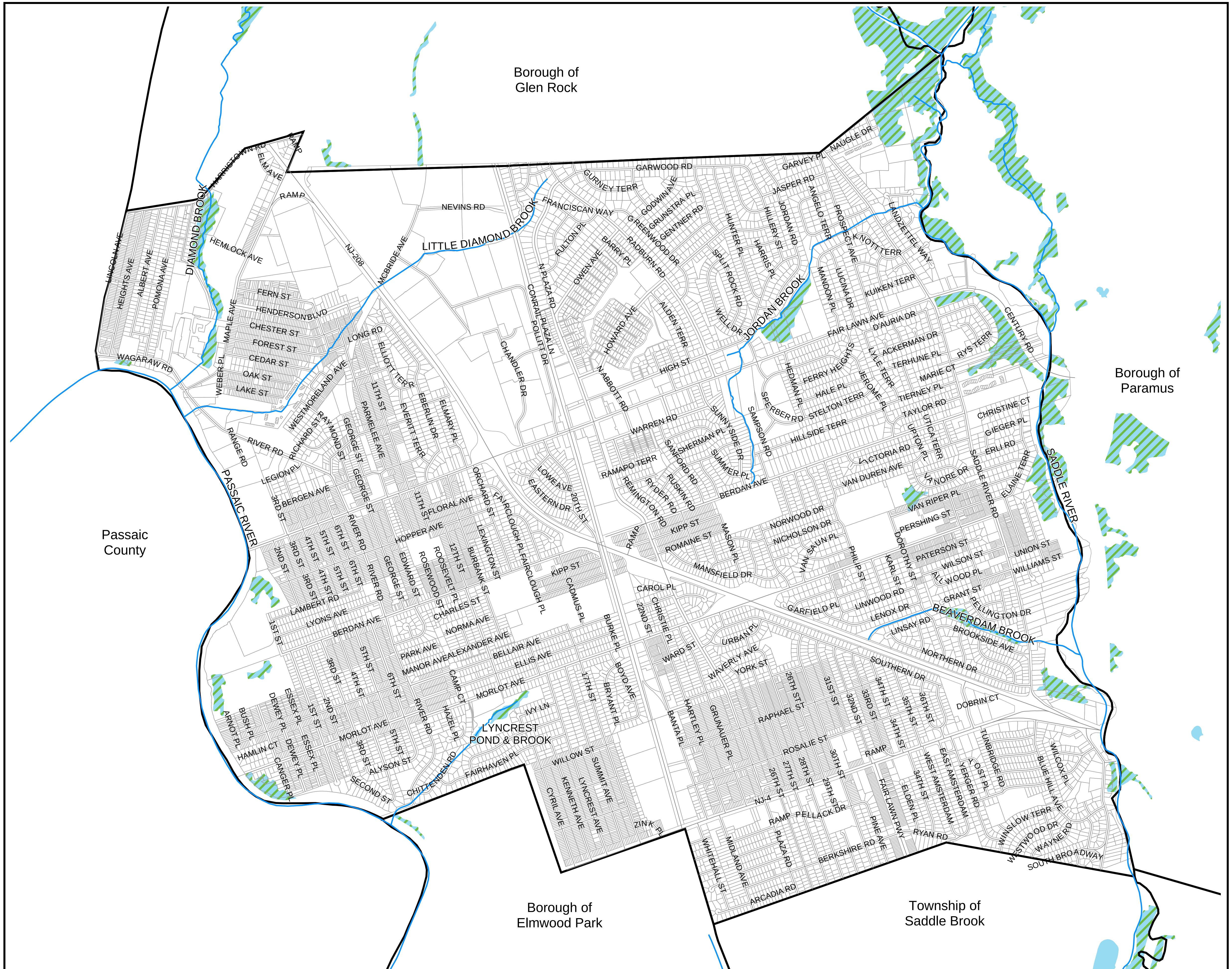
Tel: (201) 767-4289 Fax: (201) 767-0276

FIGURE 7

SURFACE WATER RESOURCES

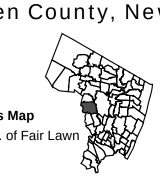
Environmental Resource Inventory

Borough of Fair Lawn, New Jersey



- Municipal Boundaries
- Parcels
- Waterbodies
- Wetlands
- Rivers & Streams
- Roads

Borough of Fair Lawn
Bergen County, New Jersey



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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Wetlands Rivers/Streams - New Jersey Dept. of Environmental Protection (DEP)

Map Prepared October 2009 by:
TURNER MILLER GROUP, LLC
SUFFERN, NY

1,500 0 1,500 Feet
1 inch = 1,500 feet

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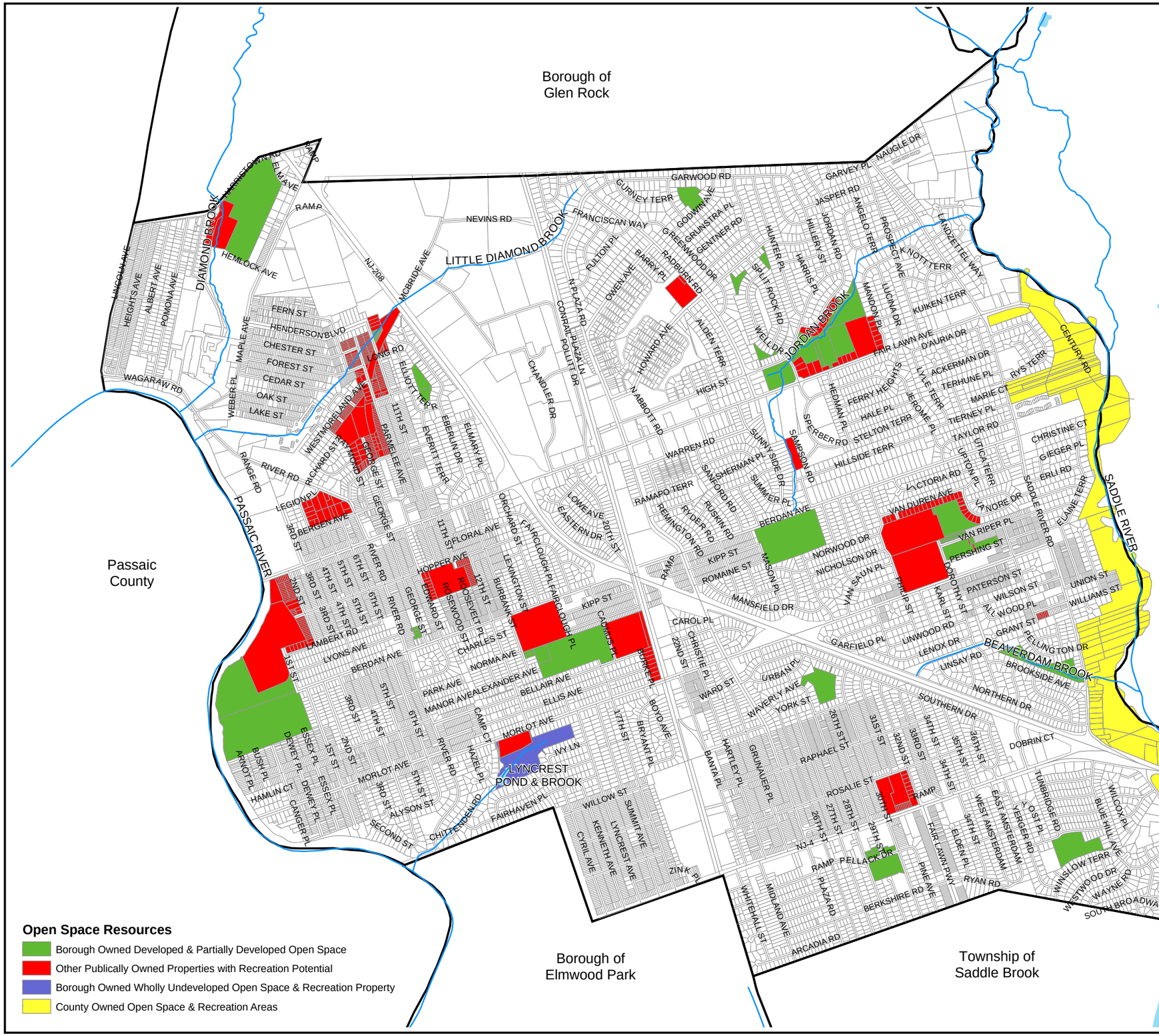
Tel: (201) 767-4289 Fax: (201) 767-0276

FIGURE 8

OPEN SPACE RESOURCES

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey



Open Space Resources

- Borough Owned Developed & Partially Developed Open Space
- Other Publically Owned Properties with Recreation Potential
- Borough Owned Wholly Undeveloped Open Space & Recreation Property
- County Owned Open Space & Recreation Areas

- Municipal Boundaries
- Parcels
- Waterbodies
- Rivers & Streams
- Roads

Borough of Fair Lawn
Bergen County, New Jersey

Locus Map
B. of Fair Lawn

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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Rivers/Streams - New Jersey Dept. of Environmental Protection (DEP)
Open Space - Hakim Associates

Map Prepared October 2009 by:
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SUFFERN, NY

1,500 0 1,500 Feet
1 inch = 1,500 feet

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Tel: (201) 767-4289 Fax: (201) 767-0276

FIGURE 9

CONTAMINATED SITES

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey

Municipal Boundaries
Parcels
Waterbodies
Known Contaminated Sites
Rivers & Streams
Roads

Borough of Fair Lawn
Bergen County, New Jersey

Locus Map
B. of Fair Lawn

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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Waterbodies, Rivers/Streams, Known Contaminated Sites - New Jersey Dept. of Environmental Protection (DEP)

Refer to supplementary legend detailing known contaminated sites

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1,500 0 1,500 Feet
1 inch = 1,500 feet

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Tel: (201) 767-4289 Fax: (201) 767-0276

FIGURE 10

ENVIRONMENTALLY SENSITIVE AREAS

Environmental Resource Inventory

Borough of Fair Lawn, New Jersey

- Municipal Boundaries
- Parcels
- Environmentally Sensitive Areas*
- Rivers & Streams
- Roads

Borough of Fair Lawn
Bergen County, New Jersey

Locus Map
B. of Fair Lawn

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Data Source(s):
Parcels, Roads, Boundaries - Bergen County Geographic Information Systems
Rivers/Streams, Environmentally Sensitive Areas* - New Jersey Dept. of Environmental Protection (DEP)

* Composite of Wetlands, Surface Waters, FEMA 100-Year Floodplains, Hydric Soils & Steep Slopes (15%+)

Map Prepared October 2009 by:
TURNER MILLER GROUP, LLC
SUFFERN, NY

1,500 0 1,500 Feet
1 inch = 1,500 feet

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Tel: (201) 767-4289 Fax: (201) 767-0276