3.1 Geology, Soils, and Topography

3.1.1. Existing Conditions

Soils

On-site soils were mapped, and are described, by the United States Department of Agriculture, Natural Resources Conservation Service in the Soil Survey of Putnam and Westchester Counties, New York (Soil Survey). The limits of the mapped soil units, which consist of Knickerbocker (KnB) and Riverhead (RhE) soils are shown in Figure 3.1-1 - Soils Map. Characteristics of these soils, including their susceptibility to erosion, are described below and summarized in Table 3.1-1.

Knickerbocker fine sandy loam (KnB), 2-8 percent slope. These soils are gently sloping, very deep and somewhat excessively drained. Knickerbocker soils are found in benchlike areas along streams and on rounded hilltops. Individual soil inclusions are somewhat oblong or rounded and range from 2 to 30 acres in size. No major limitations are identified in the survey for development of dwelling and roads in this soil unit and it represents only a slight erosion hazard. Most of the project area slated for development are characterized by Knickerbocker soils and the potential for erosion and sedimentation associated with these soils are relatively low.

Riverhead loam (RhE), 25-50 percent slopes. This soil is steep, very deep, and well drained. It is found on the sides of terraces and on small hills adjacent to uplands. Individual soil inclusions are long and narrow and range from 2 to 25 acres in size. The soil survey indicates that some areas of Riverhead soil are used for community development and describes slope as the main limitation for development of dwellings and roads. The survey describes the erosion hazard associated with this soil as being very severe.

Table 3.1-1
Soil Characteristics and Limitations

Soil Series	Depth to Water Table	Depth to Bedrock	Erosion Factor	Potential Limitations for:	
			K[1]	**Local Roads, and Streets**	**Buildings w/ basements**
Knickerbocker (KnB)	6 feet +	> 60 inches	.20	Slight	Slight
Riverhead (RhE)	6 feet	> 60 inches	.28	Severe: Slope	Severe: Slope

[1] Erosion Factor K indicates susceptibility to sheet and rill erosion (expressed in tons/acre/year). K values range from 0.05 to 0.69.
Source: Soil Survey of Putnam and Westchester Counties, New York, USDA SCS

The proposed project involves the temporary disturbance of both Knickerbocker and Riverhead soils. Largely because the Riverhead soils are classified in the Soil Survey as being highly erodable, the Erosion Control Plan in the Waters Edge Stormwater Pollution Prevention Plan (SWPPP, See Appendix B) proposes specific measures, including construction sequencing, to prevent erosion of these soils during construction, and the subsequent sedimentation of the Hudson River and off site properties.

Topography

Existing topography on the project site has been mapped at two foot contour intervals based upon field survey and the existing topographic conditions are depicted on the plans that accompany this DEIS. Future grades are shown on the engineers grading plan which also accompanies this document. Slopes range from 0% to 10% in the interior of the site, and between twenty-five and fifty percent at the western limits of the site adjacent to the Metro North rail line.

The USGS topographic map shows steep slopes along the Hudson River roughly 90 feet above sea level. Nearly flat topography (between 0 and 10%) characterizes the area between the central portion of the site and its eastern limits. Elevations rise steeply to over 90 feet above sea level from the Metro North property along the western portion of the site (See Figure 3.1-2 - Local Topography).

Steep Slopes

The categories of on-site slopes, and the area and percentages of the site they occupy, are shown in Table 3.1-2.

Table 3.1-2
Existing Slope Analysis

Slope Category	Area of Total Site	% of Total Site
0% to 10%	103, 876 square feet	59.18%
10% to 15%	8,024 square feet	5.14%
15% to 25%	7017 square feet	4.00%
>25%	46,863 square feet	25.58%
Total Site Area	145,958 square feet	100%

Source: Paul Petretti, P.E.

Both existing and proposed topography, as determined by field survey, are depicted on the Erosion and Sediment Control Plan submitted as Appendix B.

Existing steep slopes, as defined by the Village of Dobbs Ferry Combined Land Use Ordinance are slopes greater than 15 percent to slopes over 25 percent. As noted in the above table, 4 percent of the total site contain slopes of 15 to 25 percent and over 25 percent of the total site includes slopes that are greater than 25 percent. The applicant notes that areas of steep slopes have been calculated by the project engineer and deducted from the proposed parcels areas in accordance with Chapter 300-35 of the ordinance.

A slope on the western portion of the property falls sharply to the west, toward the adjacent Metro-North Railroad and the Hudson River beyond. The site grades range between elevation 18.0 feet at the bottom of the existing slope near the railroad, elevation 80.0 feet at the top of the existing steep slope, and elevation 90.0 feet near the existing Fairlawn Avenue in the eastern portion of the subject site.

The topographic field survey of the site, which was conducted by the project engineer, indicates that the majority of the existing slopes vary from approximately 1.2 horizontal to 1.0 vertical (1.2H:1.0V) to 2.0 horizontal to 1.0 vertical (2.0H:1.0V). There are also isolated areas of the site

where the slope is less steep. (i.e. 2.5H:1.0V). For slopes constructed in soil, a slope of 3 horizontal to 1 vertical (3.0H:1.0V) is recommended for vegetated stabilization.

History of Slope Conditions in Area

Past modifications to the slopes on the subject site have not been historically documented. There is no visible evidence of recent modifications and the slopes are generally vegetated with second growth materials. Some cutting into the slope at its lower elevations may have occurred in connection with the construction of the railroad line in the earlier part of the 20th century.

Appendix C of this DEIS is a Report of Investigation of the January 28, 1994 Fairlawn Avenue Slope Failure (Slope Failure Report) prepared by Lewis L. Zickel, P.E. The report characterizes this slope failure, which occurred south the subject site, as massive and indicated that the inadequate stormwater drainage system that existed at the time contributed significantly to the failure of the approximately 37 degree slope.

That report cites the cause of the 1994 slope failure, as the result of the stratified drift soils on the slopes, with lens of silt in the profile that are subject to slippage, particularly when they become saturated. These characteristics were subjected to saturation due largely to improperly controlled stormwater from the malfunctioning infrastructure that existed and currently exists in that area.

To minimize potential slope problems on the Waters Edge's site, the applicant proposes the stabilization of the steep slope as discussed in detail below as well as the improvement of the current stormwater drainage system. The stabilization will be designed to provide long term stabilization by permanently reinforcing the slope. Pursuant to the general recommendations in the Zickel Report, and slope analysis appended to this DEIS. The steep slopes subject to development under the Proposed Action will be kept dry and thoroughly drained with the installation of new infrastructure that will prevent stormwater from saturating the steep slopes on the site and increasing risk. Construction sequencing will also follow accepted practices.

Geotechnical Review

The applicant commissioned a Subsurface Soil and Foundation Investigation (SSFI Report) to determine the nature and engineering properties of soil and groundwater conditions that may influence both the stability of the existing steep slope on the western limit of the property, and the design of the proposed development. The investigation was conducted by Carlin - Simpson and Associates and included a slope stability analysis that involved, among other things, a review of the proposed construction, soil borings, visual identification of soil layers, and collection and laboratory analysis of soil samples from the existing steep slope, and any analysis of field and laboratory test data. The outcome of the investigation, which is included in Appendix H of this DEIS, is summarized below.

Four test borings were performed at the locations shown on the Boring Location Plan included in the Subsurface Soil and Foundation Investigation (SSFI Report, Appendix H) to determine existing soil and groundwater conditions at the site that influence the current stability of the slope. Detailed boring logs were recorded and are also included in the Appendix H. In addition, soil samples were collected from the existing slope and were tested. Groundwater was not encountered in any of the four test borings during the field investigation. The explorations extended to depths ranging from 37'0" to 42'0" beneath the existing ground surface.

According to the SSFI Report, the boring data revealed that the existing slope consists of approximately 1'6" to 2'0" of loose to medium dense existing fill that is comprised of brown coarse to fine sand, little silt, trace coarse to fine gravel, with root fibers, cinders, and coal. Below this fill is medium dense to dense light brown coarse to fine sand, little (to some) silt, trace (to and) coarse to fine gravel with occasional lenses and layers of light brown or gray brown silt, trace medium to fine sand.

The boring data also indicates that the subsurface soils of the slope consist of a shallow layer of loose to medium dense existing fill that is approximately 1'6" to 2'0" in thickness followed by layers of medium dense to depths coarse to fine sand with varying amounts of silt and gravel[1]. According the SSFI Report, the boring data collected from the existing site conditions was imported into a slope stability computer program (Slope/W 2004 by Geo-Slope International LTD) in order to perform slope stability analyses under various site conditions. Please refer to Appendix H for further details.

Four cross-sections through the steep slope were generated in the above mentioned computer program to further assist in the assessment of current slope stability. A slope stability analysis was then performed by Carlin - Simpson and Associates on the cross-sections using the information obtained from the test borings and the from the most recent topographic survey prepared the project engineer.

A factor of safety (FS) is assigned to the slope in order to evaluate slope stability. As noted in the SSFI Report, a factor of safety (FS) is defined as the ratio of the available shear strength of the soil to that required to keep the slope stable, or as the ratio of the available resisting forces (cohesion and friction) of the soil to the driving forces (weight of the soil).

A factor of safety of less that 1.0 is undesirable. Generally accepted factors of safety range from 1.3 to 1.5 and depend on the critical nature of the slope (i.e. loss of life or property damage that would occur if the slope fails)[2].

Based on the proposed construction and the location of the Metro-North Railroad, Carlin - Simpson and Associates recommends a factor of safety of 1.5 be used for the proposed project, which is the high end of acceptable and the applicant has accepted into the final design of the project slope stability measures. Please refer to Table 1 of the SSFI Report for the factors of safety assigned to the existing slope located on the project site. (Appendix H).

"The risks associated with slope conditions were analyzed for the project site. These include a surface or slope slide; a crest slope slide; and a deep seated or global slide. A surface slide is also commonly known as a mud slide. In that case there is a rapid movement of earth from the surface of the slope resulting in a shallow slump. A crest slope slide is a failure that begins near the top (or crest) of the slope where there is a rotational movement of a larger mass (or wedge) of earth along a concave failure plane. A deep seated slide is similar to a crest slide except that the failure plan is deeper into the slope and a larger wedge of soil in involved[3]." (See Appendix H)

---

[1] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

[2] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

[3] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

The analysis conducted by Carlin - Simpson and Associates concluded that the site's existing condition was at risk for potential surface slides. Historic reports bears this out. The slope stability evaluation indicated potential for a progressive series of slope slides beginning near the surface of the slope and propagating back into the slope over time with each slide. The potential also exists for a more deep seated slope slide. Such a failure could result from a sudden rise in the groundwater elevation due to heavy rainfall, broken water lines, or an adverse change in the surface drainage that saturated the slope.

The existing slope, if left untreated, could potentially slide in the event of heavy rainfall or a adverse change in the surface drainage. This could result in damage to any house in close proximity to the top of the slope as well as the adjacent railroad[4]". (See Appendix H)

It is for the aforementioned reasons and conditions that the applicant, upon receipt of the data and recommendations of the geotechnical report, modified the base design plans to address geotechnical conditions and has designed the homes and will stabilize the slope with all the proper measures recommended by Carlin - Simpson, the geotechnical consultant, by soil nailing the undisturbed slopes along with more extensive soil stabilizing in the ravine).

3.2.2 Potential Impacts

Soils and Topography

The Proposed Action involves the temporary disturbance of some 3.9 acres of the 4.4 acre Waters Edge site, and the collection and discharge of stormwater into the Hudson River following construction.

Without appropriate mitigation incorporated into the Proposed Action, disturbance of the steeper slopes on the property may have the potential to result in erosion and sedimentation from the clearing and grading of the slopes. If not controlled, these activities may lead to accelerated erosion and sedimentation both during and after construction. Sedimentation of the Hudson River could result in decreased light penetration and nutrient enrichment, increased turbidity, increased transport of pollutants that are adsorbed to the sediment particles, and clogging of gills and filters in aquatic organisms.

In order to reduce stormwater-induced impacts from the project, the applicant has designed erosion and sediment control practices in accordance with current and accepted protocols. Accordingly, an Erosion and Sediment Control Plan, that includes construction sequencing, has been included in the Stormwater Pollution Prevention Plan (SWPPP, Appendix B) prepared for the Waters Edge project. All soil erosion and sediment practices will be installed in accordance with NYSDEC, and New York State Standards and Specifications for Erosion and Sediment Control and any applicable conditions of approval.

The purpose of the Erosion and Sediment Control Plan is to minimize the erosion of disturbed soil and to prevent the migration of sediment into surface waters and off site properties during construction and until the site has received final stabilization. The Erosion and Sediment Control Plan included with the SWPPP (Appendix B) contains Construction Notes, Soil Erosion and Sediment Control Notes, specifications of Stabilization Materials, a Sequence of Construction, and associated construction details and notes designed to provide a maximum level of mitigation for potential erosion and sedimentation.

[4] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

As specified in the SWPPP, all soil erosion and sedimentation measures such as silt fencing will be installed following a pre construction conference with appropriate agency staff, and prior to any construction activities. In addition, the applicant will engage a Certified Professional in Stormwater Quality/Erosion and Sediment Control to oversee implementation of the SWPPP for the project, including its site specific Erosion and Sediment Control Plan component. Refer to SWPPP in Appendix B of this DEIS for erosion and sediment control practices to be implemented.

The applicant notes that disturbance of the site will be performed sequentially as residences are constructed on individual parcels. The entire site will not be disturbed at one time. The applicant further notes that a Certified Professional Erosion and Sediment Control Specialist (CPESC) will be engaged to oversee implementation of the Erosion and Sediment Control Plan.

Cut and Fill

With respect to cuts and fills, it is expected that there will be a net export of material from the site of 5,000 to 6,000 cubic yards (cy). Total required cuts are estimated to be approximately 12,000 cubic yards of which around half will be used to fill the ravine.

The onsite ravine will filled at the start of the job as the drainage system needs to be installed during the first phase of construction (see construction sequence in Project Description). The project engineer and geotechnical engineer have reviewed the soil conditions onsite and believe that the material onsite can be used for fill.

The majority of material for the ravine will come from cutting from the western loop road and lowering the grades of proposed lots 1 and 2. This aforementioned amount of cut is anticipated to satisfy most of the fill requirements for the ravine and will not require fill from foundation excavations or the importation of significant volumes of fill from offsite. Fill for the ravine is estimated to be 6,000 to 6,500 cubic yards.

The removal of topsoil from the site will involve an estimated 2,000 cubic yards of earth movement. This will likely be stockpiled onsite and used to re - landscape yards.

The balance of excess material will be excavated from residential foundations and will occur over time as residential lots are built out. Assuming approximately 500 to 600 cubic yards of materials would come from each residential foundation, some 40 to 50 truck trips would be required to remove material that cannot be used on site (assuming that small dump trucks are used). Locations where fill might be purchased or disposed of are not known at this time and minimal offsite trucking of soil or fill materials will be required.

Geotechnical Considerations

After the geotechnical report was commissioned and reviewed, it was clear that an adjustment in the subdivision layout was necessary in order to adhere to the recommendations of the geotechnical engineer. This adjustment resulted in the number of lots being reduced from 12 to 11 and a modest reconfiguration of the road layout.

Of primary concern were the four lots originally platted between the proposed Waters Edge road and the Metro North rail line, where almost all the steeper topography of the subject site is situated. The plat has been altered to show only three residences at the aforementioned location, and said residences are proposed to be situated at a greater distance from the top of the existing slope, in order to adhere to the recommendations of the geotechnical engineer.

The applicant's plans call for filling the ravine in the northwest quadrant of the site and placing existing surface drainage (that has in fact, created the ravine and continues to contribute to erosion and unstable condition), in a below grade pipe, so as to eliminate erosion and bring about a much more stable condition. This will, in particular, benefit the downstream facilities, such as the culvert under the Metro North line, that will not longer be impacted by sediment laden stormwater.

The existing slope will be stabilized through a series of actions. The existing, improperly functioning, stormwater management system will be replaced and as noted previously surface water will be fully contained in a new piped system, therefore not affecting local soils. The new residences will be constructed a minimum of 20 feet away from the top of the slope.

A Geotechnical engineer will be retained to review future decks at the rear of proposed residences for the three homes on the western side of the property. The existing grade at the top of the slope will be lowered approximately 8 to 10 feet. By reducing the height of the slope, the factor of slope stability safety is increased. The new residences will have walkout basements and retaining walls will be required between the structures.

Stormwater control will be beneficial to protecting the existing slope and is thus, proposed in conjunction with other remedial activities. The proposed stormwater infrastructure will remedy the existing condition that impinges upon the integrity of the slope by collecting and safely conveying runoff away from the slope. This will prevent saturation of the soils and reduce unstable conditions. The proposed residences in this area will not have foundation drains that could add water to the slope, and all roof drains will be connected to the stormwater collection system.

A slope stabilization system will be constructed on the slope to provide further protection. This system will include soil nailing, a well established technique used to reinforce and strengthen an existing slope. The soil is reinforced by installing closely spaced grouted steel bars (or "nails") into the slope. The grouted nails will increase the shear strength of the overall soil mass.

The procedure for installation of the soil nails and wire mesh is simple. First, the soil nail locations are staked out in a pattern according to the requirements for the subject slope. The nail holes are then drilled (or self drilling nails are used) and the nails are installed. The nail holes are then grouted with frost-resistant mortar from the bottom of the hole. A steel wire mesh is then fastened to the nails to cover the entire surface of the slope. The existing vegetation will

remain intact and will only be removed where necessary during construction to install the soil nails and wire mesh.

Within one year, the mesh will be covered by the indigenous vegetation. The number of soil nails required, as well as the spacing of the nails, are determined by the site-specific soil and slope properties. Based upon the site characteristics, it is expected that a nail spacing of approximately 6 to 10 feet will be required for the site. It is also expected that each of the nails will be approximately 15 to 25 feet long. The actual extent and design of the soil nails and the wire mesh will be determined during the final design phase of the project.

The soil nails and mesh will be designed so that the factors of safety associated with the slope conditions will be greater than 1.5. Detailed plans and specifications for the slope stabilization will be prepared at that time. A Contractor shall then be retained to implement the design. Manufacturers' information on soil nails and wire mesh are included in Appendix H of this DEIS. Combined, these measures will improve the overall stability of the existing slope and allow the new residences to be safely constructed where proposed[5].

Proposed Residences

At present, the footprints and locations of proposed residences, finished floor elevations, and site grading have not been finalized. Upon completion of final designs, the information will forwarded to the applicant's geotechnical consultants to confirm they appropriateness of the designs and so that any additional recommendations can be developed for each of the individual residences.

The new structures will be designed to resist stress produced by lateral forces computed in accordance with Section 1615 of the New York State Building Code. If applicable, construction techniques may include H-pile foundations. In the event that H-piles are necessary for these structures, the H-piles would consist of 10HP42 piles driven to depths of 20 to 35 feet.

In general, topsoil and existing fill were encountered at the surface in the test borings extending to depths ranging from 1'6" to 2'0" below the existing ground surface. The topsoil and existing fill are not desirable bearing materials for the new residences and must be completely removed from the planned building areas down to the virgin soil.

Since basements are planned for the new residences, the existing fill will be removed from these areas during the basement excavations. The removal of the surface layers and existing fill shall extend at least 10 feet beyond the limits of the new building lines. Once the planned footing elevation has been achieved, the new foundations may be installed, bearing on new compacted fill or virgin sand. The new foundations may be designed as spread footings, utilizing a net design bearing pressure of 1.5 TSF.

All exterior foundations shall bear at least 42 inches below finished grade for protection from frost. The wall footings shall have a minimum width of 18 inches and column footings, if required, shall have a minimum dimension of 30 inches. After the footings and foundation walls are completed, fill will be required to backfill these excavations and to raise grades in the building area to the slab subgrade elevation.

[5] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

New fill shall consist of sand and gravel containing less than 20 percent by weight passing a No. 200 sieve. The fill shall be placed in layers up to one foot thick and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Fill layers shall be placed, compacted, tested, and approved before placing subsequent layers. The new floor slabs may be designed as a slab on grade supported on the virgin soil and the new compacted fill. A minimum of six (6) inches of crushed stone gravel is proposed beneath the slabs for drainage. Building settlement will be less than ½-inch, which is within tolerable limits for these structures[6]. Please refer to the SSFI Report in Appendix H.

Foundation drains are not proposed for the new structures. However, the outside face of the basement walls must be waterproofed. The basement walls shall be backfilled in layers approximately one foot thick and the new fill shall be compacted with small hand guided vibratory compactors to at least 92% of its Maximum Modified Dry Density. Outside the residence area, the backfill placed adjacent to the foundation walls shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Please refer to Appendix H, SSFI Report.

Retaining Walls

Upon completion of the final project design, a determination will be made concerning the requirement for retaining walls between the residences near the top of the soil slope. The type of wall and elevations that may be required are unknown at this time. The proposed three homes along the slope will actually reduce the surcharge (= weight of material) on those slopes. Retaining walls would run house to house and would provide additional reduction in surcharge.

Filling the Ravine

As discussed in Section 2.0, Project Description and Section 3.2, Surface Water Resources, the applicant proposes to fill in the existing eroding ravine on the property to construct a formal, properly functioning stormwater infrastructure system. The ravine would be filled in lifts of free draining earth that would be compacted to prevent future movement of soil. Filling the ravine and constructing the stormwater infrastructure would eliminate the existing erosion of the ravine bottom, thereby eliminating the existing source of sediment now entering the Hudson River.

Potential impacts associated with filling the ravine are limited to erosion and sedimentation during the filling and until the soil has been stabilized. Like the potential erosion that could result from disturbance of steep slopes, sedimentation of the off site Metro North property and the Hudson River could result from erosion during filling of the ravine. Accordingly, specific measures have been proposed in the project specific Erosion and Sediment Control Plan to mitigate those potential impacts. The applicant notes the Erosion and Sediment Control Plan complies with New York State and Westchester County Erosion and Sediment Control guidelines.

The ravine will be filled and a reinforced slope will be constructed across the fill section. As noted in SSFI Report, in order to prepare the ravine area for construction, the existing surface materials (topsoil and vegetation) will be completely removed from the slope. In addition, the existing fill shall be completely removed from the planned slope area. The excavation of the topsoil and existing fill will extend at least 10 feet beyond the limits of new reinforced slope.

[6] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

After the topsoil and existing fill have been removed and prior to the deposition of new fill, the exposed subgrade shall be proofrolled by several overlapping 8 passes of a large vibratory drum roller. The proofrolling is required to compact the underlying soils. In the event excessive movement is noted during the proofrolling, the soft soil shall be removed and replaced with new compacted fill.

The new fill used to construct the reinforced slope shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. The fill shall be placed in layers about one foot thick and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D-1557). Fill layers shall be compacted, tested, and approved before placing subsequent layers. The fill layers must be benched into the existing slope to increase slope stability. Drains will also be installed in the soil slope to collect subsurface water and convey it away from the new slope area. The above is referenced from the Subsurface Soil and Foundation Investigation located in Appendix H.

Environmental Studies conducted on the Ravine

A Phase I Environmental Site Assessment (Appendix G) included an evaluation of the ravine. Refer to Section 3.9, Public Health and for the results of the Phase I Environmental Site Assessment.

State, County and Local Statutes and Guidelines

New York State and Westchester County

Stormwater discharges during, and in some cases following, construction are regulated by the New York State Department of Environmental Conservation pursuant to the State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activities (GP-02-01). GP-02-01 requires that a SWPPP, that includes an Erosion and Sediment Control Plan, be developed and implemented for projects such as Waters Edge at Dobbs Ferry. The SWPPP prepared for the Waters Edge project has been developed in compliance with GP-02-01.

The Waters Edge SWPPP, the implementation of which is to be overseen by a qualified professional, complies with NYSDEC requirements and the standards of the Westchester County Soil and Water Conservation District.

Village Ordinance Governing Steep Slopes

Steep slopes are included in the definition of Environmentally Sensitive Areas set forth in Section 300-2B of the Village Code and are protected under Section 300-35, which imposes a requirement to deduct a certain percentage of the area of lots with steep slopes, those ranging from 15% to over 25%, from the buildable area calculation. Disturbance of steep slopes are also generally regulated under the Declaration of Policy provisions of Section 300-68 of the ordinance and by the requirement for an Erosion and Sediment Control Plan to mitigate

potential impacts associated with steep slope disturbances, as set forth in Section 300-72E(!) of the Code.

As noted, the proposal reflects a reduction in lot area calculated pursuant to the ordinance and includes the required Erosion and Sediment Control Plan as part of the propped project. The Erosion and Sediment Control Plan, included in the Waters Edge SWPPP, is included in this DEIS as Appendix B. The Erosion and Sediment Control plan complies with New York State Department of Environmental Conservation guidelines for the preparation of that plan, and with New York State Standards and Specifications for Erosion and Sediment Control

The purpose of the Erosion and Sediment Control Plan is to minimize the erosion of disturbed soil and to prevent the migration of sediment into surface waters and off site properties during construction and until the site has received final stabilization. The Erosion and Sediment Control Plan included with the SWPPP (Appendix B) contains Construction Notes, Soil Erosion and Sediment Control Notes, specifications of Stabilization Materials, a Sequence of Construction, and associated construction details and notes designed to provide a maximum level of mitigation for potential impacts associated with erosion and sedimentation.

As specified in the Waters Edge SWPPP, all soil erosion and sedimentation measures such as silt fencing will be installed following a pre construction conference with appropriate agency staff, and prior to any construction activities. Refer to SWPPP in Appendix B of this DEIS for erosion and sediment control practices to be implemented.

An overview of the construction sequence, which is intended to reduce the potential for erosion by minimizing site disturbance and controlling runoff velocities, follows:

This section of the report will require the installation of the main drain line M from the point of discharge at MTA Metro-North flume and portions of drain lines FLW, F, AN, FA and C, and the installation of the reinforced slope (soil nailing) and stabilization of the fill sections, as well as any and all construction activity in addition to the installation of the above referenced drainage works. The anticipated time frames in months are located to the left of the task. No issues have been identified that could materially lengthen the below time frames.

Months

+ 0 Prior to mobilization for construction, the Owner/Operator will implement the erosion & sediment control plan by performing the site assessment and inspection report and certify the site is ready for construction activity.

+ 0 Prior to mobilization for construction, the owner/operator will require all contractor certifications.

+ 0 Prior to mobilization for construction, the temporary stabilized construction entrance at the north end of Constance Avenue will be installed. This will be the only access to the site for the installation of the main drain line M.

Manage and maintain all E&SCP practices. Monitor the performance of all E&SCP practices, perform necessary inspections and maintain construction site logbook and monitoring requirements of the General Permit. Remain flexible, check all practices and modify if necessary. Manage and maintain all E&SCP practices.

+1 Demolish and remove the existing residence. Dispose of all materials off-site in full compliance with all applicable codes and regulations.

+1 Install hay bales and silt fence as per the direction of the certified professional for the erosion & sediment control plan.

+1.5 Install soil nails (if needed) on the western slope in accordance with the recommendations of the Carlin Simpson & Associates report on subsurface soil and foundation investigation (CSA ROSSS&F).

+1.5 Clear the ravine and slope to the extent of the center line of lots 4 to 8 for the installation of drain line M.

+1.5 Begin filling and stabilization of reinforced earth slope in accordance with the recommendations of the Carlin Simpson & Associates report on subsurface soil and foundation investigation (CSA ROSSS&F).

+1.5 Stockpile and protect all cleared and grubbed material.

+3.0 Install drain line M beginning at drainage structure DS-1M and continuing to CB-6M, working from bottom to top.

Install and maintain inlet protection at all drainage structures.

+6.0 Stabilize the slope with native vegetation to full ground prior to the end of the growing season.

+8.0 Install the stabilized construction entrances and clear and grub the remainder of the site to complete the installation of drain lines and FLW, F, AN, FA and C.

Install and maintain inlet protection at all drainage structures including the drain lines to Atilda Avenue.

+8 Install temporary pavement for all excavations in the existing street prior to the onset of winter.

+10 Bring roads to grade and install the sanitary sewer and water mains. Test mains as required for acceptance by the Westchester County Department of Health.

Prior to the winter shutdown on or before December 15th, the Owner/Operator will call for an inspection of all erosion and sediment control practices by the site erosion and sediment control plan inspector and the Village Engineer for certifications that all practices are installed and ready for a winter shutdown and prepared for spring rains.

Install and maintain inlet protection at all drainage structures.

+12 Proceed with work on off-site road improvements and utility relocation.

+12 Proceed with work on private utility lines, cable TV, Telephone, Electric and Gas.

+14 Proceed with work on the installation of curbing and road work items to the installation of pavement base.

+18 Construction on the individual houses can begin as soon as the road accessing the particular building lot has been improved with curbing and pavement base.

Maintain all erosion & sediment control practices in accordance with the E&SCP and the requirements of the General Permit.

+30 Finish house construction and landscape to stabilization in accordance with the requirements for the filing of a Notice of Termination (NOT). Prior to filing a NOT, perform final inspection and certify final stabilization of all disturbed soil. Remove all temporary erosion and sediment control practices.

+36 Certify that all permanent SWPPP practices have been installed and that an operation and maintenance (O&M) manual has been prepared and made available to the MS4, the Village of Dobbs Ferry.

+40 With the completion of the above, the Notice of Termination can then be filed with the NYSDEC.

The maintenance of the proposed stormwater infrastructure during construction prior to acceptance by the Village of Dobbs Ferry would be the responsibility of the project developer. Funding and enforcement of monitoring and maintenance activities, during construction, will also be the responsibility of the developer as a part of the cost of construction. Actual costs to be incurred by the Village of Dobbs Ferry in maintaining the proposed roads, water mains and stormwater features after acceptance are not known, however, any such costs will be offset by property tax revenues generated by the future homeowners at the subject site.

The project roads, water supply and stormwater infrastructure located within the right-of-way and associated easements will be offered for dedication to the Village. Ownership and responsibility for year-round maintenance of the proposed roads and infrastructure (including snow and ice control, sewer and water lines, and stormwater infrastructure) will remain the project developer's until these facilities are accepted by the Village. Thereafter, operation and maintenance of the project road system, water supply and stormwater infrastructure located within the road right-of-way and associated easements will be the responsibility of the Village of Dobbs Ferry. The project plans associated with this DEIS illustrate the right-of-way lines and easement lines within which these facilities are located to allow Village access and control.

3.3.3 Mitigation Measures

The existing slope conditions on the subject site are unstable and unmanaged stormwater continues to contribute to this condition, as well as causing continued erosion and downstream siltation. As noted above, the analysis conducted by Carlin - Simpson and Associates concluded that the site's existing condition was at risk for potential surface slides. Historic reports bears this out. The slope stability evaluation indicated potential for a progressive series of slope slides beginning near the surface of the slope and propagating back into the slope over time with each slide. The potential also exists for a more deep seated slope slide. Such a failure could result from a sudden rise in the groundwater elevation due to heavy rainfall, broken water lines, or an adverse change in the surface drainage that saturated the slope.

The existing slope, if left untreated, could potentially slide in the event of heavy rainfall or a adverse change in the surface drainage. This could result in damage to any house in close proximity to the top of the slope as well as the adjacent railroad[7]". The Proposed Action will bring about a stabilization of existing slopes and improve existing conditions.

The mitigation measures set forth above are included in the project plans. With appropriate mitigation measures in place, impacts will be minimized to the greatest extent practicable.

In order to preserve continuity in this project, the applicant will retain professional services to provide geotechnical-related inspections during construction. This services will include the inspection of the installation of soil nails and wire mesh on the existing slope; the removal of unsuitable soil from the new slope area; the proofrolling of the subgrade soil prior to placement of compacted fill; the placement and compaction of controlled fill; the installation of reinforcement in the new slope area; the excavations for the new building and retaining wall foundations; the installation of any H-piles for the new structures, and if necessary; preparation of the subgrade for the new floor slabs. The above is referenced from the Subsurface Soil and Foundation Investigation located in Appendix H.

The proposed mitigation measures, addressing the proposed residences, stormwater management, retaining walls, and slope stabilization will be refined upon final design of the project. At present, the proposed building locations, finished floor elevations, and site grading have not been finalized. Upon completion of final design, the design will be reviewed by a geotechnical consultant on the project and additional recommendations, if needed, will be provided.

Erosion and Sediment Control Plan

Sedimentation resulting from erosion of disturbed soil during construction is a potential indirect impact to wetlands, watercourses, and receiving waters. Accordingly, the Erosion and Sediment Control Plan component of the SWPPP has been developed in accordance with New York State Guideline for Urban Erosion and Sediment Control and New York State Standards and Specifications for Erosion Control. The plan design also incorporates applicable elements of the New York State Standards and Specifications for Erosion and Sediment Control. An Erosion and Sediment Control plan has been developed and provided with the SWPPP. All erosion and sediment controls will be installed in accordance with the SWPPP.

The purpose of the plan is to minimize the potential for soil erosion from areas exposed during construction and prevent sediment from entering downgradient wetlands and watercourses, and water bodies. Prior to the commencement of any construction or disturbance of any soils, erosion and sediment control measures will be placed in accordance with the specifications in the SWPPP. These measures will be maintained until the site has been permanently stabilized in accordance with NYSDEC and NYCDEP standards and specifications.

The construction contractor will be responsible for complying with all specifications and conditions of the project specific SWPPP. In addition, the applicant will engage a Certified Professional in Erosion and Sediment Control/Certified Professional in Stormwater Quality to oversee implementation of the SWPPP.

The proposed Erosion and Sediment Control Plan component of the SWPPP will minimize the area of soil exposed at any one time to the greatest extent practicable in accordance with the

[7] Source: Subsurface Soil and Foundation Investigation, Carlin - Simpson and Associates, November 17, 2006.

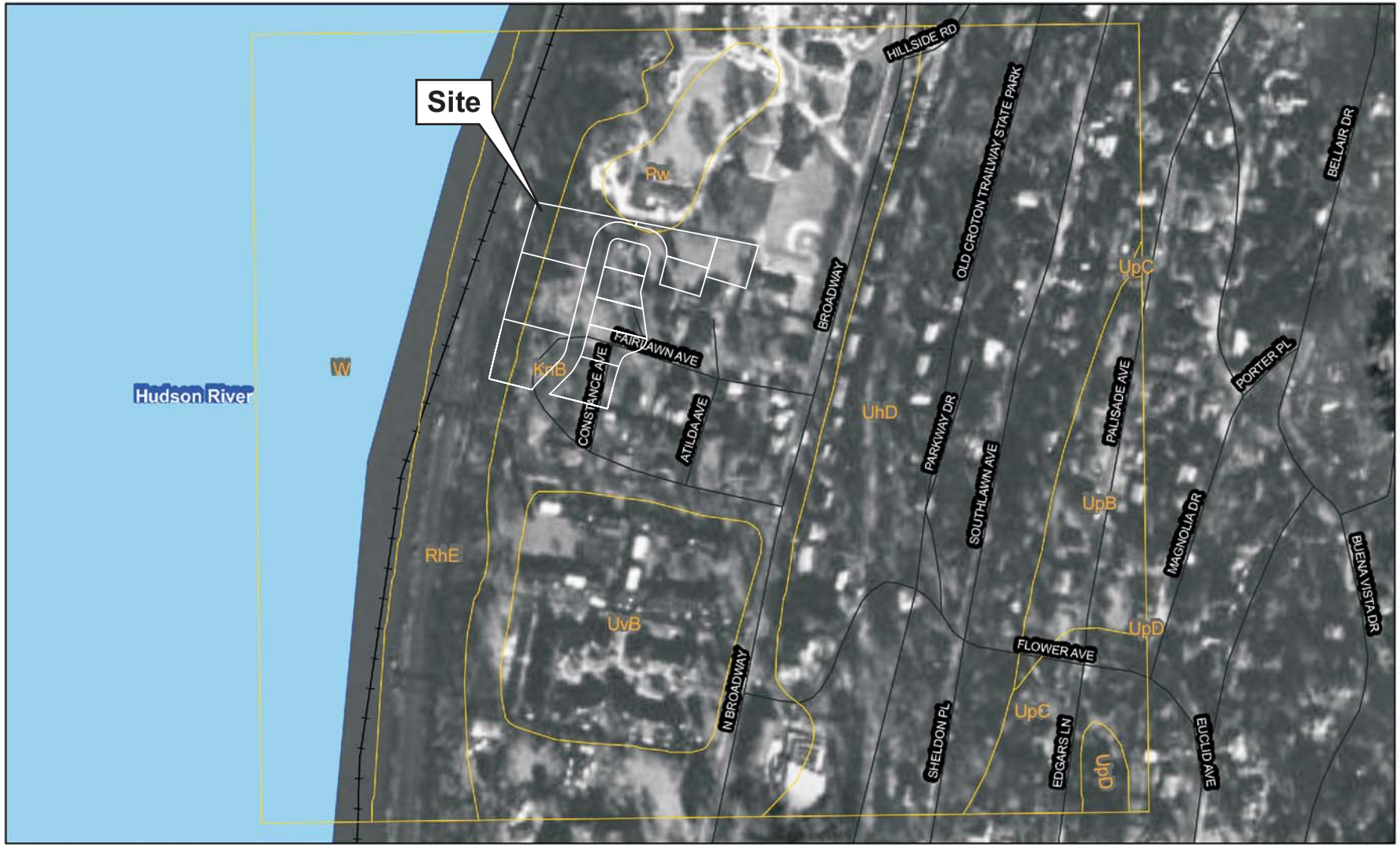
conditions of the NYSDEC SPDES General Permit (GP-02-01) for Stormwater Discharges from Construction Activities and further mitigate potential impacts on water resources. Erosion and sediment control measures specified on the Erosion and Sediment Control Plan are developed specifically for this project to provide both temporary controls during the construction period and permanent controls to be in place and functioning upon final stabilization of the site.

A final Erosion and Sediment Control Plan that will be included in the project specific SWPPP will include the following elements:

- A Detailed Construction Sequence;
- Limiting Disturbed Soils During Construction to the greatest extent practical;
- Installation of protective fencing around trees and other features to be preserved;
- Installation of a stabilized construction entrance and temporary perimeter silt fencing around the construction area;
- Diversion of clean runoff around disturbed soils during construction;
- Clear and grub vegetation, remove existing structural debris;
- Strip and stockpile topsoil as indicated on the erosion control plan;
- Provide temporary sediment protection at all stormwater inlets;
- Maintain silt fence barriers, sediment traps, and other erosion control measures in working order throughout the construction period;
- Plant, seed or pave all disturbed areas in a timely manner to prevent or minimize erosion;
- Monitor site to ensure establishment of all landscape plantings and other permanent erosion control measures at the site;
- Promptly stabilize and restore damage to plantings and seeded areas.

Retaining Walls

There is a retaining wall proposed at the north side of the property. The retaining wall is a low wall at approximately 2 to 4 feet in height. The topography of the area proposed is relatively flat. Little or no stabilization would be required for the proposed retaining wall.



N
W E
S

File 9405 Fig 3.2-11 11/01/02

Figure 3.1-1: Soils Map
Waters Edge
Village of Dobbs Ferry, Westchester County, New York
Source: Soil Survey of Westchester County, NY
U.S. Dept. of Agriculture, National Resources Conservation Service
Scale: Graphic

Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418

N
W E
S

Figure 3.1-2: Local Topography
Waters Edge
Village of Dobbs Ferry, Westchester County, New York
Base: USGS 7.5-minute Topographic Map, Nyack Quad
Scale: 1 inch = 1,000 feet

File 05113 12/01/06
JS:\05113

Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418