3.4 Terrestrial and Aquatic Ecology

3.4.1 Vegetation

3.4.1.1 Environmental Setting

Several different vegetative community types typical of recently disturbed landscapes are found on the undeveloped Hidden Creek project site. The dominant vegetation and general location of each of these community types are shown in Figure 3.4-1, and described in the following paragraphs. Table 3.4-1 gives the approximate area (acres) that each one occupies at the subject site.

No federal or state listed rare, threatened, or endangered plant species were identified on the site by the New York State Department of Conservation (see Appendix E). Furthermore, no unique, rare, threatened, or endangered plant species were observed during visits to the project site by biologists from Tim Miller Associates.

Table 3.4-1
Vegetative Communities / Wildlife Habitat Types
Hidden Creek

Community Type	Approximate Aerial Coverage (ac.)
Second growth woodland	19.72
Shrub-scrub	3.42
Open field	1.14
Stream	0.78
Wetland	2.15
Mowed lawn *	1.76
Impervious surfaces *	0.33

* These two "communities" are associated with the existing houses, buildings and lawns currently found on the site.

Second Growth Woodland

The term "second growth" refers to currently wooded areas that were cleared of their vegetation in the relatively recent past. Typically second growth woods in the northeast were farm fields that were abandoned due to the consolidation of farming operations to larger tracts of land in the Midwest and west. The first growth of varied scrub brush and tree species have been replaced with hardwood forest species.

The light conditions for second growth trees is ideal for rapid, dense growth. Frequently second growth woods have a higher density of trees than more mature forests because natural selection has not yet thinned the concentration of trees to a number that is sustainable in a mature forest. Also a second growth woods may have some species that are older than what one might anticipate given the relative age of the majority of trees. These erratics may be trees that were in old windrows or otherwise survived the previous farming use. There are some larger trees on the site reflecting these conditions. Where possible they will be saved.

Second growth woodland composed of juvenile and immature mixed deciduous species occupies a wide linear strip along the southern property boundary and areas adjacent to Ramapo Creek in the northeastern corner of the Hidden Creek Property. This community also occurs along a slight depressional valley just west of the site's center, running northeast from the southern property boundary to an area just up-slope of Ramapo Creek. The composition of tree species within this woodland community is highly variable depending upon location. This variability reflects the gradual abandonment of human disturbance on the site.

Second growth woodland located in the eastern half of the site, near the two existing residences and Freeland Street, is composed mainly of tree species that are indicative of recently disturbed conditions. Such species include black locust (*Robinia pseudo-acacia*), black cherry (*Prunus serotina*), and young sugar maple (*Acer saccharum*).

Toward the western half of the site, particularly along the slight depressional valley that bisects the property, black cherry and black locust become far less abundant. Here, a number of other tree species dominate the canopy. These include sugar maple, red maple (*A. rubrum*), American elm (*Ulmus americana*), and slippery elm (*U. rubra*). Less common species include several oaks (red oak (*Quercus rubra*) and white oak (*Q. alba*), silver maple (*Acer saccharinum*), and white ash (*Fraxinus americana*).

The shrub layer within the second growth woodland community is relatively sparse and patchy. The most common species is arrowwood (*Viburnum recognitum*) while Japanese barberry (*Berberis thungergii*) and tartarian honeysuckle (*Lonicera tartarica*) are less common. The herbaceous layer on the woodland floor is likewise sparse and patchy with poison ivy (*Toxicodendron radicans*), virginia creeper (*Parthenocissus quinquefolia*) and garlic mustard (*Alliaria petiolata*) the most frequently encountered species.

Trees

In accordance with the Village of Monroe's Zoning Code 200-43, a tree survey was conducted on the Hidden Creek property by Pietrzak & Pfau Engineering and Surveying and Tim Miller Associates and said plan is provided in the drawings with this document. This tree survey identified the location, diameter, and species of trees greater than eight inches in diameter as measured four feet above grade, ('regulated' trees). Trees north of Ramapo Creek were not included in this survey as no development is proposed in this area. All trees that met the size criteria described in the zoning code were physically marked in the field with consecutively numbered metal tags.

A total of 1017 trees were surveyed at the Hidden Creek site. Of this amount, 24 trees are greater than 24 inches in diameter at breast height. Table 3.4-1A further compares the numbers of trees before and after development. Figure 3.4-2 illustrates the location of the existing trees on the project site. Plans depicting the existing location and physical characteristics of the site's trees, as well as the proposed extent of development, is provided in the rear of the DEIS as full-scale drawings.

Table 3.4-1A Tree Analysis		
Tree Analysis	Pre-development	Post-development
Total Trees	1017	1020
Trees to be removed	--	706
New Trees to be planted	--	709
Trees greater than 24 feet	24	15
Source: Pietrzak & Pfau Engineer, Surveying, PLC Tim Miller Associates, Inc.		

Shrub-scrub

The shrub-scrub community is characterized by an absence of an upper tree canopy and by a thick, almost impenetrable growth of tall shrubs. This plant community is located in two distinct locations within the Hidden Creek site. A rectangular shaped patch of shrub-scrub is found in the far western half of the property, approximately 150 feet from the banks of Ramapo Creek. This area is a near continuous stand of thick shrubs, although several narrow paths do bisect the area. The second patch of shrub-scrub is located near the site's center. This shrub-scrub patch occurs as a band around the periphery of the open field community (described below).

The diversity of shrub species composing this community is quite low, with over 95 percent of the aerial cover attributed to a single species; namely gray-stemmed dogwood (*Cornus foemina* spp. *racemosa*). Other shrub species include red osier dogwood (*C. sericea*) and tartarian honeysuckle (*Lonicera tartarica*). The herbaceous layer is typically abundant and composed of many of the species observed in the open field habitat summarized below.

Open Field

The central portion of the property and small patches on elevated areas adjacent to Ramapo Creek contain areas of open field community. This area has apparently experienced human activity more recently than the shrub-scrub or second growth woodland communities. As a result, this community lacks both a tree and shrub canopy. The herbaceous species growing within this plant association include those that favor the high light environments of early successional communities like open fields.

The diversity of herbaceous plants within this area is relatively high. Frequently encountered species include a variety of grasses (Poaceae), Queen Anne's lace (*Daucus carote),* Aster (*Aster* spp.), bedstraws (*Galium* spp.) and a number of goldenrod species including lance-leaved goldenrod (*Solidago graminifolia*), late goldenrod (*S. gigantea*), and tall goldenrod (*S. altissima*).

Wetlands and Watercourses

The site contains a total of seven wetland systems, the largest which will experience any disturbance is located within a slight depressional valley just west of the site's center. The remaining six wetlands are found adjacent to the site's major watercourse, Ramapo Creek.

Although the majority of wetland area on the Hidden Creek site consists of forested communities, shrub-scrub and open herbaceous wetland communities are also found on the subject property.

These 'open' communities, which are scattered throughout wetland 'B', are likely due to the clearing and land disturbance associated with the installation and continued maintenance of the existing sewer line that traverses this portion of the site. A more detailed discussion of these wetlands, including their vegetative composition and location, is provided in section 3.4.3, Wetlands. A description of Ramapo Creek can be found in section 3.3, Surface Water Resources.

3.4.1.2 Potential Impacts

Existing Vegetation and Wildlife Habitat Impacts

The proposed development plan, as shown on Figure 2-1, depicts the proposed extent of disturbance and the maximum limit of vegetation removal. It is estimated that a total of 17.3 acres of the Hidden Creek site would be disturbed as a result of this project, leaving approximately 12.0 acres or 41 percent of the site undisturbed.

Table 3.4-2 gives the area and relative percent of each of the various habitat types found at the Hidden Creek site for both the existing and proposed conditions. Approximately 13.56 acres of upland forest habitat would also be disturbed leaving 6.36 acres of upland forest to serve as open space and habitat under the proposed plan. Regulated wetland habitat at the Hidden Creek site would be reduced from 4.56 acres to 4.2 acres after construction, a reduction of .31 acres.

Upon completion of the Hidden Creek development, lawn and landscaped areas will have increased from 2.27 acres to a total of 8.77 acres. Impervious surfaces such as buildings, roads, and parking areas would occupy approximately 29 percent of the Hidden Creek site according to the current proposal. While the lawn and landscaped areas may have at least a limited value as wildlife habitat, the areas of impervious surfaces would no longer function as wildlife habitat or be available for wildlife use.

Table 3.4-2
Approximate Site Coverage: Existing and Proposed (in Acres)

Land Cover	Existing	Proposed	Change
Upland/Woodlands	19.92	6.36	-13.56
Wetlands/Woodlands	4.56	4.2	-0.31
Scrub-shrub	1.04	0.24	-0.8
Lawn and Landscaping	2.27	8.77	6.5
Stream	0.78	0.78	0
Detention ponds	0	0.19	0.19
Impervious surfaces*	0.28	8.63	8.35
Dirt Roads & Foot Trails	0.45	0.13	-0.42

Source: Pietrzak & Pfau Engineering Consultants, PLLC 2002.
* includes existing roads, driveways and buildings

Trees

Figure 3.4-3, the Proposed Trees for Removal Map indicates, a total of 706 'regulated' trees will need to be removed to accommodate the Hidden Creek development. Of this amount, 9 are large trees greater than 24 inches dbh.

Grading and site disturbance from installation of roads and utilities, and construction of homes, has been restricted to the greatest extent possible. The existing vegetation will be maintained as near to new buildings and site features as possible as shown on the plans. However the development of the site with a multifamily density will have the impact of requiring the removal of a significant number of trees.

While preserving individual trees from a wooded stand is not always practical, every effort will be made to save healthy trees with relatively straight trunks and full crowns as individuals or in clumps. Any trees or tree clumps that might be saved, in addition to those shown on the plans, will be dependent on identifying appropriate locations where grading and other site disturbances will be minimal or will not occur at all. However it must be recognized that often trees found in a forest stand are poorly shaped, have trunks that lean and/or are seriously diseased. Therefore, additional individual trees or small stands that might be saved will be first evaluated for health and overall shape and will be saved only if the individual conditions permit and warrant saving.

To mitigate against the potential impacts associated with such tree removal, the applicant has prepared a Landscape Plan in accordance with the Village of Monroe's Zoning Code 200-43 (see below).

3.4.1.3 Mitigation Measures

The Proposed Landscape Plan included at the rear of the DEIS include planting of 709 new trees to provide for replacement of the trees removed in accordance with the requirements of Section 200-43A(3).

The number of trees that will be replaced (709) exceeds the number that will be removed (706). This has been accomplished by including street trees along roads and parking areas, screening trees at the rear and sides of units, trees in detention basins, ornamental trees located around the front of units, in the entrance boulevard median and in other clumps, and trees planned for the forest edge. These trees will form a diversified mix of 23 different species.

The proposed Landscape Plan also illustrates large shrub masses of wetland species around the perimeter of the planned detention basins, and other large shrub masses to augment the screening of units from view of the Orange County Trailway.

The landscape plan aims to provide additional landscaping to better ensure that the development blends with the neighboring environment. The landscaping will screen new roads and parking areas and help reduce noise impacts from internal traffic. The Proposed Landscape Plan will provide a buffer to screen the proposed project, retaining the natural character of the Orange County Trailway. The Proposed Landscape Plan is provided as a full size drawing in the rear of the DEIS.

The Proposed Landscape Plan details the number, type, and location of proposed replacement trees and landscaping to be planted at the site after the project's construction. This tree and landscaping plan was designed to comply with the Village's zoning code. In particular, the developer will:

1.) preserve as many individual trees with a diameter of eight inches or greater as possible given the proposed development.

2.) preserve all stands and groupings of trees of any diameter which do not have to be removed to accommodate buildings or other infrastructure.

3.) designate stands and individual trees to be preserved using temporary fencing and/or flagging. Avoid the storage of heavy equipment under trees to be preserved in order to prevent soil compaction.

4.) replace trees with an eight inch or greater diameter that would be with species in quantities and in locations according to the proposed landscape plan,

5.) plant trees along both sides of the proposed roadway, in a staggered fashion and approximately 40 feet apart. No tree is proposed in a location that would limit sight distance along the road.

6.) Plant trees and shrubs to provide screening, and preserve the natural character of the Orange County Trailway

7.) Plant trees and shrubs around the perimeter of all proposed parking areas and any exposed utility structures to provide a visual screen.

8.) Follow the planting specifications as outlined in part 200-43G of the Village of Monroe Zoning Code, including specifications relating to tree size, nursery certification, planting site preparation, and post planting care.

9.) notify the Building Inspector and Village Engineer 30 days prior to the start of planting so that the plants and trees can be inspected and approved for variety, condition and size.

10.) provide a performance bond or nurseryman's guarantee to the Village Board to cover the cost of all treatments and improvements outlined on the approved tree and landscaping plan.

11.) maintain the tree and landscape plantings in a healthy condition and orderly appearance during construction.

As the tree plan indicates, the applicant proposes to plant a total of 709 new trees on the project site upon completion of the development. It is believed that the number, location, and species composition (23 different species) of these trees and landscape plantings will successfully mitigate the various environmental impacts associated with the initial clearing of the site.

3.4.2 Fish and Wildlife

3.4.2.1 Environmental Setting

Recent (July 19, 2002) correspondence from the New York State DEC Natural Heritage Program indicates that there are no known occurrences of protected or rare wildlife species on the project property or adjacent properties (see Appendix E Correspondence). No rare, threatened, or endangered species were observed on the site during recent field visits by biologists from Tim Miller Associates.

Due to the small area (29.3 acres) of the Hidden Creek site and the sub-urban landscape that surrounds it, the overall diversity of wildlife in the area is expected to be low and dominated by generalist species capable of tolerating human contact. Such species include small mammals like chipmunks (*Tamias striatus*), gray squirrels (*Sciurus carolinensis*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), cottontail rabbits (*Sylvilagus floridanus*), deer mouse (*Peromyscus maniculatus*) and woodchucks (*Marmota monax*).

Larger mammals like white-tail deer (*Odocoileus virginianus*) were the most frequently observed animal species during site visits to the Hidden Creek property. Groups of six or more individuals were observed numerous times migrating through the wooded areas and utilizing the on-site open field habitat and nearby residential lawns.

Various bird species, such as the robin (*Turdus migratorius*), crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), chickadee (*Parus* spp.) and common yellowthroat (*Geothlypis trichas*) among others, may find the young deciduous forest, open field, and wetland habitats to be suitable for forage, nesting, and cover activities. Tolerant amphibians like the green frog (*Rana clamitans*) and pickerel frog (*R. palustris*) may also frequent the site and use the wetland areas for general habitat and breeding purposes.

Table 3.4-3 provides a list of mammal, bird, reptile, and amphibian species which are known or could reasonably be expected to utilize the site. Known species include those observed during field visits performed by Tim Miller Associates during the fall of 2002. The list of predicted species is based on a compilation of observations made throughout the lower Hudson Valley in sites with similar habitat conditions.

The expected distribution of these animal species with respect to the different habitats found at the Hidden Creek site is also presented in the following table 3.4-3. This list indicates the habitat types that are most frequently associated with the observed or predicted animal species.

Table 3.4-3
Potential Wildlife at Hidden Creek

Common Name	Scientific Name	Habitat Type				
Mammals		U	FW	SS	Ed	SC
white-tail deer ✓	*Odocoileus virginianus*	X	X	X	X	
coyote	*Canis latrans*	X	X			
Raccoon ✓	*Procyon lotor*	X	X	X	X	X
red fox	*Vulpes vulpes*	X	X	X	X	
gray fox	*Urocyon cinereoargenteus*	X			X	
opossum	*Didelphis virginiana*	X	X			
eastern chipmunk	*Eutamias sp.*	X			X	
gray squirrel ✓	*Sciurus carolinensis*	X	X			
flying squirrel	*Glaucomys volans*	X	X			
cottontail rabbit ✓	*Sylvilagus floridanus*	X		X	X	
striped skunk	*Mephitis mephitis*	X			X	
white-footed mouse	*Peromyscus leucopus*	X			X	
New York weasel	*Mustela frenata*	X	X	X	X	X
deer mouse	*Peromyscus maniculatus*	X			X	
house mouse	*Mus musculus*				X	
meadow vole	*Microtus pennsylvanicum*			X	X	
starnosed mole	*Codylura cristata*	X		X	X	
eastern mole	*Scalopus aquaticus*	X				
Woodchuck ✓	*Marmota monax*	X				
short-tailed shrew	*Blarina brevicanda*	X			X	
common shrew	*Sorex cinereus*	X			X	
little brown bat	*Myotis lucifugus*	X	X		X	
red bat	*Lasiurus borealis*	X	X		X	
Reptiles						
garter snake ✓	*Thamnophis sirtalis*	X	X	X	X	X
milk snake	*Lampropeltis triangulum*	X			X	
brown snake	*Storeria dekayi*	X	X	X	X	
ringneck snake	*Diadophis punctatus*	X	X			
eastern racer	*Coluber constrictor*	X			X	
Northern water snake	*Nerodia sipedon*		X	X		X
wood turtle**	*Clemmys insculpta*	X	X	X		X
box turtle**	*Terrapene carolina*	X	X	X	X	
Amphibians						
red-backed salamander	*Plethodon cinereus*	X	X	X	X	X
slimy salamander	*Plethodon glutinosus*		X	X	X	X
spotted salamander	*Ambystoma malculatum*	X	X	X	X	X
newt	*Notophthalmus virdescens*	X	X	X	X	X
American toad	*Bufo americanus*	X			X	X
gray treefrog	*Hyla versicolor*	X	X			X
wood frog	*Rana sylvatica*	X	X			
green frog	*Rana clamitans*			X	X	X
spring peepers	*Hyla crucifer*		X			X
pickerel frog	*Rana palustris*		X	X		X

CONTINUED ON NEXT PAGE

Table 3.4-3 -Continued

Common Name	Scientific Name	*Habitat Type*				
Birds		U	FW	SS	Ed	SC
turkey	*Meleagris gallopavo*	X	X			
ruffed grouse	*Bonasa umbellus*	X				
hairy woodpecker	*Picoides villosus*	X	X			
downy woodpecker ✓	*Picoides pubescens*	X	X			
northern flicker	*Colaptes auratus*	X	X			
red-tailed hawk	*Buteo jamaicensis*	X	X	X	X	
Robin ✓	*Turdus migratorius*	X	X	X	X	
catbird	*Dumetella carolinensis*	X			X	
mockingbird	*Mimus polyglottos*	X	X	X	X	
flycatchers	*Empidonax sp.*	X	X	X	X	X
eastern phoebe	*Sayornis phoebe*	X	X		X	X
common yellowthroat	*Geothlypis trichas*			X	X	
American redstart	*Setophaga ruticella*	X	X		X	
red-eyed vireo	*Vireo olivaceus*	X	X			
Crow ✓	*Corvus brachyrhynchos*	X	X	X	X	
blue jay ✓	*Cyanocitta cristata*	X	X		X	
American goldfinch	*Carduelis tristis*	X	X	X		
cardinal	*Cardinalis cardinalis*			X	X	
chipping sparrow	*Spizella passerina*				X	
towhee	*Pipilo erythrophthalmus*	X	X	X		
tufted titmouse	*Parus bicolor*	X		X	X	
warbler	*Dendroica spp.*	X	X			
wren	*Troglodytes spp.*	X	X	X	X	
junco	*Junco hyemalis*	X	X	X		
mourning dove	*Zenaida macroura*				X	
chickadee	*Parus spp.*	X	X	X	X	
nuthatch	*Sitta spp.*	X	X		X	
northern oriole	*Icterus galbula*	X			X	
finch	*Carpodacus spp.*	X		X	X	
Evening grosbeak	*Hesperiphona vespertina*	X		X	X	
Brown thrasher	*Toxostoma rufum*			X	X	
turkey vulture	*Cathartes aura*	X	X		X	
E. screech owl	*Otus asio*	X	X		X	
great horned owl	*Bubo virginianus*	X	X		X	
barred owl	*Strix varia*	X	X			

Habitat type: U - Forested upland, FW - Forested wetland, SS - Scrub-shrub Wetlands, Ed - Edge habitat, SC - Stream Corridor,

✓ Indicates species observed at the Hidden Creek site during late summer and fall visit by biologists from Tim Miller Associates
** - New York State species of special concern
Source: Tim Miller Associates, Inc.

Ramapo Creek Fishery Resources

The Ramapo Creek and its associated tributaries are part of the headwater system for the Ramapo River, which is located approximately three miles to the southeast of the Hidden Creek site. The Ramapo Creek consists of two first-order, headwater streams that merge approximately 200 feet upgradient of the site. The first of these streams originates approximately 10,000 feet south of the site, near Pine Tree Road, while the second is a drainage from Monroe Ponds near the center of the Village of Monroe. Immediately after entering the Hidden Creek property, a third stream joins the Ramapo Creek. This stream has its headwaters in a wetland system to the north of the site, along Route 17.

Several physical features act to limit the habitat complexity, and thus potential fishery resource, of this reach of the Ramapo Creek. For one, this portion of the stream has a very sluggish current due to the gentle grade and mostly uniform stream bed. Important fish habitat features such as fast flowing riffles and cascades are lacking from this section of Ramapo Creek. Although there are a few small areas of slow flowing runs, most of the stream consists of eight inch to one-and-a-half foot deep pools. Such slow flowing and stagnant environments tend to have a more limited oxygen supply, and thus support only the more tolerant fish species.

Approximately 70 percent of the substrate beneath the on-site portion of Ramapo Creek is composed of small pebbles, sand, and especially fine silt particles. The remaining 30 percent of the stream bed is composed of small rock and cobble sized material. The predominance of finer, muddier sediment may limit spawning habitat for a number of species that prefer rocky, more oxygenated environments for egg laying. In addition, the abundance and diversity of aquatic macro-invertebrates is frequently limited in streams with silty bottoms and slow currents. These organisms are an important food resource for a considerable number of fish species.

Various disturbances observed along the upland areas immediately adjacent to Ramapo Creek may have altered the fish habitat of this stream in a number of ways. On the Hidden Creek site for example, the southern bank on the Ramapo Creek has been cleared to allow for the installation and continued maintenance of a sewer line. As a result, fewer trees are available to shade the stream bed. The higher water temperatures that tend to result from this increased exposure may act to preclude a number of ‘cold water’ fish species like trout from the Ramapo Creek.

Other physical characteristics suggest a history of disturbance related to human activity in the watershed. In particular, both banks of this stream have major areas of heavy erosion. As a result, the active stream channel has become highly entrenched. The bankfull height, or distance from the typical water surface to the top of the bank, is considerable at between two to four feet. Such entrechment is usually unnatural, and due in large part to an increase in peak stream discharge brought on by urbanization and land clearing in the surrounding watershed. The potential increase in siltation due to this erosion can affect the distribution of fish species, which vary considerably in their tolerance for silty conditions.

According to Title 6, part 860 of the New York State Department of Environmental Conservation Law, Ramapo Creek is classified as a class B stream. This classification indicates that this stream is suitable for both primary and secondary contact recreation and the

propagation and survival of fish. The DEC Region 3 Division of Fish, Wildlife, and Marine Resources was contacted in October, 2002 regarding the availability of fish survey data for the section of Ramapo Creek in the Village of Monroe. According to DEC Region 3, no fish surveys have yet been conducted on the Ramapo Creek or any other headwater tributary of the Ramapo River. No other public or private organization is known to have conducted fish surveys in the vicinity of the Village of Monroe.

Due to the lack of existing data on the fishery resources of the area, Ramapo Creek's physical habitat characteristics, watershed position, and landscape condition were used to predict the fish species that may potentially utilize this stream system. At most, Ramapo Creek may support a warmer water fishery composed of the resident and migratory species presented in Table 3.4-4 below.

Table 3.4-4
Potential Resident and Migratory Fish- Ramapo Creek

Common Name	Scientific Name
Brown bullhead	*Ictalurus nebulosus*
White sucker	*Catostomus commersoni*
Creek chub	*Semotilus atromaculatus*
Comely shiner	*Notropis amoenus*
Spotfin shiner	*Notropis spilopterus*
Bridle shiner	*Notropis bifrenatus*
Blunt nose minnow	*Pimephales notatus*
Fathead minnow	*Pimephales promelas*
Banded killfish	*Fundulus diaphanus*
Red brest sunfish	*Lepomis auritus*
Pumpkinseed	*Lepomis gibbosus*
Bluegill	*Lepomis macrochirus*
Tessellated darter	*Etheostoma olmstedi*

Note: the above list of fish species is based on the habitat descriptions and distribution information provided in:

Smith, C.L., 1985. The Inland Fishes of New York State. The New York State Department of Environmental Conservation, New York.

A copy of this list was provided to the DEC for their review. DEC staff indicated that they would comment on the list if time permitted, but would more likely review it in the context of their review and comment on the accepted DEIS under SEQRA.

3.4.2.2 Potential Impacts

Rare, Threatened and Endangered Species Impacts

No protected wildlife or plant species have been identified or observed on the project site. Therefore, direct impacts to protected species as a result of the Hidden Creek project are not anticipated. Furthermore, indirect impacts to rare, threatened, or endangered species located off-site are also not likely as no listed species have been identified in the landscape immediately surrounding the subject site.

Wildlife Impacts

As table 3.4-2 indicates, the amount of upland forest, open field, and wetland habitat would decrease as a result of the Hidden Creek development. This reduction in available habitat will reduce the overall carrying capacity for some species of existing wildlife on the site. Generalist species such as white tail deer, raccoon, striped skunk, green and pickerel frogs, robin and crow all tolerate nearby human activities and should be least affected by the proposed development.

Species which require a special habitat type or large expanses of continuous habitat may be more adversely impacted by this proposal. However, no 'sensitive' species were observed on the project site during eight site visits by biologists from Tim Miller Associates. Furthermore, given the degree of development surrounding the Hidden Creek site, it is unlikely that such intolerant species inhabit the immediate landscape. As such, impacts to these species are not anticipated from the Hidden Creek development.

Fishery Resources Impacts

The proposed change in land use and the increase in impervious surfaces at the Hidden Creek site has the potential to impact Ramapo Creek's fishery and ecological functioning through increased runoff, siltation, and nutrient loading. An analysis of the potential change in these water quality parameters as a result of the Hidden Creek development was made by the project engineer using the Simple Method, as described in the New York State Department of Environmental Conservation Stormwater Management Design Manual (See Section 3.3).

As described in Section 3.3, the volume of annual runoff from the site's Ramapo Creek drainage basins is expected to increase upon completion of the project. Such a change is due primarily to the proposed increase in impervious surfaces at the site. Paved urban areas frequently result in a marked increase in both the amount and velocity of storm water runoff. Higher and faster discharges can lead to erosion of the channel's bed and banks, which often causes enlargement and entrenchment of downstream channels. As mentioned previously, the portion of Ramapo Creek on the subject site currently shows signs of considerable bank erosion and entrenchment, presumably due to urban land uses in the watershed.

A major consequence of erosion is siltation within the stream, which can have a number of direct and indirect impacts on the fishery resources of an area. Direct impacts include abrasive injuries to external organs (such as gills, mucous coverings, and fins), the clogging of fish and invertebrate gills leading to asphyxiation, and the smothering of algae, macroinvertebrates, and fish eggs by the deposition of silt on the stream bed. Suspended sediment may also interfere with the filtration process of fish that feed on small organisms from the water column.

Indirect impacts of siltation include alterations to the habitat structure and physical condition the stream. For example, the accumulation of fine sediment on a stream bed can reduce the distinction between the different habitat types (i.e. riffle, run, pool). Such homogenization of the fish habitat typically leads to a decrease in fish diversity. Siltation may also lead to the elimination of a preferred food source (i.e. algae or macroinvertebrates) for some fish species.

The applicant however, has proposed a number of water quality control features that would significantly reduce or in some cases eliminate potential impacts from increased runoff,

siltation, and nutrient loading. These features are discussed in Section 3.4.2.3, Proposed Mitigation.

The removal of stream side vegetation can result in a variety of impacts to a stream ecosystem and the organisms that inhabit it. For one, the channel structure may be altered due to the reduction of woody material inputs. This woody material often acts as a debris dam, an important habitat feature for both fish and macroinvertebrates in stream systems. The loss of trees adjacent to a stream also leads to a decrease in leaf litter inputs. Leaf litter is a key food resource for a special group of macroinvertebrates called shredders. Shredders typically form the base of the food chain in headwater streams and thus are crucial to the survival of numerous fish species.

Another significant impact from the removal of stream side vegetation, particularly larger trees, is thermal degradation. Shading by a riparian forest canopy helps regulate a stream's water temperature and minimize temperature extremes. The loss of this canopy can therefore promote higher maximum temperatures in summer and lower minimum temperatures in winter. Some fish species like trout can only tolerate a specific temperature range. Increases in water temperature are likely to result in the loss of these particular fish species from the given stream reach. Higher water temperatures may also have several indirect effects on fish species, including lower dissolved oxygen content of the water and ammonia toxicity.

According to the current site plan, all trees north of Ramapo Creek and those within a 75 to 150 foot wide buffer zone along the southern side of the stream would not be disturbed during the construction of the Hidden Creek development. As such, impacts associated with the loss of stream side vegetation, particularly thermal degradation, are not anticipated as a result of this project.

3.4.2.3 Proposed Mitigation

Landscape Plantings

The project includes lawn and landscape plantings with a mixture of native and ornamental species. While not as valuable as the existing forested habitat, the lawns and landscaped areas created by the proposed development will still be used as forage by deer and other plant eating wildlife, and many species of trees and shrubs commonly chosen for home landscaping will provide both food and nesting sites for squirrels, songbirds and other avian species.

A conceptual version of the proposed plantings are included in the Landscape Plan for the Hidden Creek development which is provided as a full-scale drawing in the rear of the DEIS. Additional details of the landscaping will be worked out as part of the site plan approval process.

Sedimentation and Pollution Control

As discussed above, there may potential impacts to the Ramapo Creek ecosystem and its fishery resources due to this project. These potential impacts include increased runoff, siltation, and nutrient enrichment. The amount of impervious surface associated with a development in this zoning district requires the capture and treatment of large volumes of runoff prior to discharge in to the receiving watercourse in order to meet the criteria established

by the DEC. However, the applicant has incorporated multiple storm water and pollution control features into the site plan. These various features are designed to reduce or eliminate these potential impacts to the greatest extent practicable while achieving the proposed development in this zoning district. A more detailed description of the proposed storm water and pollution control features can be found in the Stormwater Pollution Prevention Plan (Appendix C), in Section 3.2 and 3.3 of this DEIS, and on the large scale site plans in the rear of the DEIS.

A number of Best Management Practices were chosen to help mitigate against possible erosion and pollution impacts. These practices were designed in accordance with the New York State Department of Environmental Conservation Stormwater Management Design Manual, and in the applicant's opinion meet the design standards required by the New York State DEC. The DEC, as an involved agency, will review this DEIS and comment as necessary on these conclusions. The project will not be built unless it complies with the general SPDES permit. The Best Management Practices intended to be used as part of the proposed project are detailed below.

Temporary measures to be used during the construction phase of the project include filter fabric silt fence, diversion swales, sediment traps, existing vegetated filter strips, and a combination of seed, straw mulch, jute netting, and rock rip rap. Such measures would reduce soil erosion from areas exposed during construction and limit sediment and nutrient inputs to Ramapo Creek. The placement of these various features is depicted in the attached Erosion Control Plan.

Following construction, erosion and pollution control will be provided by the established vegetation and the permanent storm water management devices as shown on the attached plans. The principal storm water and pollution control device would be two detention ponds constructed in the north-central portion of the site. These two detention ponds would act in series with one another and receive runoff from a 12.26 acre drainage basin composed of most of the development's impervious surfaces. Runoff would be detained in the pools and treated through settling and biological uptake mechanisms. After treatment, storm water would discharge from the second pond into Ramapo Creek via a single control structure.

Another drainage basin on the proposed Hidden Creek development would also drain into Ramapo Creek upon completion of this project. However, only a small portion of the site's proposed impervious surface area would be located within this 20.08 acre drainage basin. Because of this, the project's engineers have selected the vegetated swale as a suitable method to treat storm water from this basin. Runoff would drain in a westerly direction via overland flow before discharging directly into Ramapo Creek. The considerable grassed and woodland areas of this drainage basin would act to filter sediment and other contaminants and promote infiltration. The applicant believes that the predicted reduction in sediment and pollutant loads will provide the required level of water quality for discharge into Ramapo Creek.

As discussed in Section 3.3, pollutant loading for all parameters decrease in Basin 1, using the modeling methods recommended by the State. At the combined design point draining Basins 2, 3 and 4, total suspended solids decrease significantly, while nitrogen, phosphorus and coliform are shown to increase, although significantly less following the proposed treatment by the water quality basins. Phosphorus is shown to increase by 7.47 pounds annually. This equates to about one third of an ounce per day of P added to the river system. Since this

would only run into the river after a storm event, it would be diluted by onsite runoff and increased flow in the river during the storm event. Concentrations in the water column are difficult to calculate with any degree of accuracy, however, they would not be expected to result in algal blooms, decreased oxygen levels or fish toxicity.

The pollutant loading calculations as provided indicate an incremental increase to the Ramapo Creek watershed. In terms of the loading quantities, these loading are within the range (pounds per year) that can be absorbed by natural systems, and the existence of the large wetland associated with the Ramapo Creek and its flood plain downstream of the site is expected to help mitigate these increases. Wetland systems absorb nutrient loading at a high rate, and it has been shown that these systems can process up to 225 pounds of nitrogen and 45 pounds of phosphorus per surface acre per year without impacting the wetland's nutrient removal function (Nichols, 1983 as reported in Schueler, 1987). The applicant has designed the water quality BMP's in accordance with the DEC design standards, and expects that the DEC will reach the conclusion that the site is in compliance as part of its review for the Section 401 Water Quality Certification.

In addition to providing water quality improvements to runoff from the Hidden Creek site, the proposed storm water control measures have also been designed to provide downstream channel protection during storm events by attenuating the volume and timing of runoff. Furthermore, the project has been designed to provide for a zero net increase in runoff for the 1,2, 10, 25, 50, and 100 year design storms. In fact, the proposed design actually allows for a net decrease in runoff during all design storms studied (see Appendix C, Stormwater Pollution Prevention Plan for the supporting hydrological calculations). Such reductions in runoff should significantly reduce the potential erosion and channel entrenchment impacts to Ramapo Creek.

3.4.3 Wetlands

3.4.3.1 Environmental Setting

A total of seven (7) inland wetland systems were identified on the Hidden Creek site. These wetlands were flagged in the field by LMS Engineers according to the methodology provided in the 1987 Army Corps of Engineers Wetland Delineation Manual. This includes the evaluation for the presence of hydric soils, hydrophytic vegetation and hydrologic conditions that are likely to result in the occurrence of wetlands. The wetland areas vary in size, hydrology, and functional value depending upon their location, geomorphology and proximity to other surface water and upland features.

The wetlands were delineated during a period of normal rainfall and when upland/wetland-indicative vegetation was readily identifiable. Soil borings were taken to a depth of 20 inches in and adjacent to each wetland to assess the soil characteristics and depth to saturated soils. Vegetation in each stratum was identified and any morphological adaptations (surface roots, multiple trunks, buttressed roots) noted. The wetland boundaries were marked with a series of flags. The wetland delineation report, which was submitted to the ACOE as a request for a Jurisdictional Determination, is attached to this DEIS as Appendix H.

The dominant wetland flora, supporting hydrology, and soils of each type of wetland is described below. The location of each wetland within the site is depicted in Figure 3.4-4, while Table 3.4-5 summarizes their size and type.

Table 3.4-5
Wetlands - Hidden Creek

Wetland	Wetland Type	Area (ac.)
Wetland A	Forested Wetland	0.99
Wetland B	Riparian wetland	1.45
Wetland C	Riparian wetland	0.05
Wetland D	Riparian wetland	0.01
Wetland F	Riparian wetland	.51
Wetland H	Riparian wetland	1.53
Wetland J	Riparian wetland	.02
Total		4.56

Source: LMS Engineering & Tim Miller Associates 2003.

Wetland System A

Wetland A is a seasonally saturated area located within a slight depression just west of the site's center. This wetland is oriented in a northeast to southwest direction and spans from the southern property boundary to an area approximately 200 feet south of Ramapo Creek. Most of wetland A slopes gently to the southwest and coalesces to form a small, mostly undefined intermittent stream just south of the Hidden Creek site. This stream ultimately discharges into Ramapo Creek up gradient of the site. The northeastern end of wetland A slopes toward the on site segment of Ramapo Creek and a portion of wetland B.

Due to its closed upper canopy, wetland A can best be classified as a forested wetland. Dominant tree species include red maple (*Acer rubrum*), American elm (*Ulmus americana*), slippery elm (*Ulmus ruba*) and ash (*Fraxinus* sp.). The shrub layer is quite sparse, with arrow-wood (*Viburnum recognitum*), spicebush (*Lindera benzoin*) and blueberry (*Vaccinium corymbo-sum*) typical species. The herbaceous layer is mostly confined to areas along the wetland's periphery and tussocks in the more frequently inundated areas at the southern end. Tussock sedge (*Carex stricta*), poison ivy (*Toxicodendron radicans*), Jack-in-the-pulpit (*Arisaema atroru-bens*), and various grasses (Poaceae) are among the common species of the ground layer.

According to the Soil Survey of Orange County (USDA Soil Conservation Service, 1981), the Erie gravely silt loam, 3 to 8% slopes (ErA) unit exists beneath wetland A. On-site investiga-tions confirm the presence of soils with physical characteristics like those of the Erie mapping unit. This unit consists of deep, somewhat poorly drained, nearly level to gently sloping soil derived from glacial till material. A dense fragipan exists between 10 and 24 inches below the surface in these soils. Although Erie soils are classified as non-hydric according to the Natural Resources Conservation Service, the seasonal high groundwater table is perched above the fragipan in spring and other wet periods. This seasonal fluctuation in the water table likely accounts for the intermittent hydrology seen in this wetland system. During site visits in late summer and early fall, wetland A lacked standing water. However, on November 18, 2002 approximately six to eight inches of water was observed in depressional areas at the southern end of this wetland.

Wetland System B

Wetland B is a riparian wetland system associated with the southern bank of Ramapo Creek. This wetland system is located within the gently sloping to slightly depressional terrace of this stream's immediate flood plain. An existing sewer line parallels Ramapo Creek and bisects much of wetland B. The original construction of this sewer line likely disturbed this wetland's hydrology, soils and vegetation to some degree.

The brush and tree clearing associated with the maintenance of the sewer line right of way has resulted in a mix of wooded, shrub, and open emergent communities within this wetland. Several areas of wetland B, particularly in the southwest corner and along the periphery of the cleared sewer right of way, contain at least a low to moderate cover of young trees. Dominant species include red maple (*Acer rubrum*), American (*Ulmus americana*) and slippery (*U. ruba*) elm, and cottonwood (*Populus deltoides*). Shrub cover is patchy, but for the most part not extensive. Arrowwood (*Viburnum recognitum*) and spicebush (*Lindera benzoin*) are among the frequently encountered shrub species. In areas that have been more recently cleared, there is a dense growth of various herbaceous wetland plants including tussock sedge (Carex *stricta*), soft stem rush (*Juncus effusus*), skunk cabbage (*Symplocarpus foetidus*), and several grass (Poaceae) species.

The Wayland silt loam (Wd) soil unit is reported to occur beneath the area associated with wetland B (USDA Soil Survey of Orange County, 1981). Field investigations performed by Tim Miller Associates verified the presence of this soil type within this wetland. Wayland silt loams are deep, poorly drained and very poorly drained soil formed in recent alluvial deposits. They occur on low flood plains adjacent to streams that periodically overflow. Although such flooding is common in the spring, the water table is between 0 and 0.5 feet from the surface for prolonged periods during the rest of the year. These soils are classified as hydric according to the Natural Resources Conservation Service.

The hydrology of wetland B is appears to be derived from a number of different sources due to its position in the landscape. Although this wetland may frequently go dry during the summer months, it likely maintains shallow surface water for a much longer period than wetland A. The main hydrological source for this wetland is the shallow water table that lies beneath it. Wetland B also receives surface run off from a watershed that encompasses most of the Hidden Creek site. During severe storm events, wetland B may receive flood waters from Ramapo Creek.

Wetland System C, D and J

Wetlands C, D and J are small patches of wetland located in the northeastern corner of the Hidden Creek site. Like wetland B, these wetland systems are positioned along the flood plain of Ramapo Creek. As such, both wetlands have a vegetative community, soil composition, and hydrology similar to that described for wetland B above. The construction of the existing sewer line through this area may have fragmented these wetlands from the larger wetland B.

Wetland System F and H

Wetland F and H are similar in characteristics to Wetland B, and are located on the northern flood plain of the Ramapo Creek. Dominant soil type is Wayland Silt Loam. Dominant vegetation includes red maple, skunk cabbage, spotted jewelweed and jack in the pulpit, with tussock sedge (Carex stricta) occurring in isolated lower areas that are prone to saturated conditions.

Wetland Jurisdictions

Federal Wetlands / The U.S. Army Corps of Engineers

The Army Corps of Engineers regulates activities within wetland areas designated as "above the headwaters" of navigable waters of the United States under Section 404 of the Clean Water Act. There is no defined regulated setback to Federal wetlands. A recent court case determined that the Army Corps may not regulate wetlands that are not shown to be hydrologically connected to "waters of the United States" (Solid Waste Agency of Cook County v. U. S. Army Corps of Engineers, 2001). If the final approved plan for this project includes an impact to greater than one-tenth of an acre of federally regulated wetland, the Corps will be notified via a pre-construction notification (PCN), as required by the current nationwide permits.

The ACOE has been contacted to field inspect the Hidden Creek wetlands and accept the delineated boundaries. A Jurisdictional Determination for each of the wetlands will be issued by the ACOE at some future time. However, the ACOE, because of staffing shortages, has not scheduled field visits needed to confirm the wetland locations at this time. The anticipated jurisdictional status is summarized in table 3.4-6.

New York State Freshwater Wetlands Regulations

Under Article 24 of the New York State Environmental Conservation Law, wetlands greater than 12.4 acres in area are regulated by the Department of Environmental Conservation (DEC). Delineation of State wetlands is based primarily on vegetative dominance by known hydrophytic species. In some cases, the presence of hydric soils and sufficient hydrology to support this vegetation can also be used to determine wetland boundaries if vegetative dominance is not conclusive (NYS DEC Freshwater Wetlands Delineation Manual). The NYS DEC regulates activities within 100 feet of the State wetlands.

Due to their small sizes, the wetlands on the Hidden Creek site are not under New York State DEC jurisdiction.

Table 3.4-6
Wetland Jurisdictional Status - Hidden Creek

Wetland	ACOE Jurisdiction	NYSDEC Jurisdiction
Wetland A	Yes	No
Wetland B	Yes	No
Wetland C	Yes	No
Wetland D	Yes	No
Wetland F	Yes	No
Wetland G	Yes	No
Wetland H	Yes	No

Analysis of Wetland Functions

Functions provided by the site's seven wetland systems include storm water detention, sedimentation, filtration, attenuation of contaminants and nutrients, groundwater recharge, and wildlife habitat. The combined storage capacity of the individual wetland components, in concert with the groundwater discharge capabilities of the system, also serves to regulate stream flow and mitigate the potential for downstream flooding. However, the degree to which each individual wetland on the Hidden Creek site is capable of performing these functions is dependent upon the wetland's physical (size, landscape position, topography) and biological (amount and type of vegetation) characteristics. Table 3.4-7 rates the ability of each wetland to perform these various functions based on their individual characteristics.

Table 3.4-7
Wetland Functional Evaluation - Existing Conditions
Hidden Creek

Wetland Function	Wetland A	Wetland B	Wetland C	Wetland D	Wetland F	Wetland H	Wetland J
water quality improvements	Moderate	Moderate-High	Low-Moderate	Low	Moderate-High	Moderate-High	Low
flood control / storm water runoff	Moderate	Moderate-High	Low-Moderate	Low	Moderate-High	Moderate-High	Low
unique wildlife habitat	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
unique vegetation associations	Low	Low	Low	Low	Low	Low	Low
plant productivity	Low-Moderate	Moderate	Low-Moderate	Low-Moderate	Moderate	Moderate	Low-Moderate
fish habitat	Low	Low	Low	Low	Low	Low	Low
nutrient trapping	Moderate	Moderate-High	Low-Moderate	Low	Moderate-High	Moderate-High	Low
open space and visual relief	Low-Moderate	Low-Moderate	Low	Low	Low-Moderate	Low-Moderate	Low
"living" classrooms	Low	Low	Low	Low	Low	Low	Low
recreational opportunities	Low	Low	Low	Low	Low	Low	Low
erosion control	Low-Moderate	Moderate-High	Low-Moderate	Low	Moderate-High	Moderate-High	Low

Four of these identified functions (water quality improvements, flood control/ storm water runoff, nutrient trapping, and erosion control) are all interrelated and governed by similar physical and biological features of the wetland. As Table 3.4-7 suggests, the different wetland systems on the Hidden Creek site provide varying degrees of settling, filtration, and nutrient uptake.

Wetlands B, F and H can be expected to have a moderate to high capacity to perform these various water quality functions. Such a rating is based on wetland B's size and position near the bottom of the landscape. These characteristics allow this wetland to intercept runoff from a larger watershed area and control its discharge into Ramapo Creek. The slight depressional nature of the central portion of wetland B likely promotes extended detention times which allow for the settling of sediments and storm water infiltration. The uniform cover of herbaceous plant material and leaf litter in certain areas of wetland B are key features that act to disperse

and filter storm water flows. Forested wetlands with limited herbaceous growth tend to be less effective at filtering sediment and nutrients. This is one reason why wetland A is expected to have only a moderate ability for water quality improvements. Wetland A's mid-slope position and smaller watershed area also act to limit its water quality functional value. Although wetlands C and D share many of the same physical and biological features as wetland B, these two wetlands have been deemed to have a low water quality functional value. This is due mainly to the small sizes of these wetlands.

The vegetation associations of Hidden Creek's seven wetlands can be expected to provide local wildlife habitat to a number of common species. Amphibian species like frogs and some salamanders may utilize seasonally inundated portions of the site's wetlands for breeding, while deer, birds, and a variety of other wildlife likely use the woody vegetation for forage and cover. However, the proximity and degree of development within the surrounding landscape potentially limits the ability of these wetlands to perform this function by limiting the diversity of species available to colonize the area.

The site's wetlands and adjacent areas are open space and part of the Ramapo Creek corridor that meanders through the Village of Monroe. Being in private ownership within a residentially zoned area, the wetlands offer limited value as a "living classroom" or for direct recreational opportunities. However, the Orange County Heritage Trail lies just north of the Hidden Creek Site. The site's wetlands contribute to the natural character of the area and likely enhance the experience of individuals using this trail network. As such, the site's larger wetlands have a moderate visual relief value.

3.4.3.2 Potential Impacts

Direct Wetland Loss

According to the proposed site plan for the Hidden Creek project, three of the site's wetlands fall within the bounds of either proposed building lots or the proposed roadway. Construction of these units and road way would require the filling all or parts of these wetlands. This wetland loss totals .31 acres. Figure 3.4-5 depicts the location of wetland systems that would be directly impacted by this proposal and Table 3.4-8 summarizes the type and area (acres) of direct impact for each system.

Table 3.4-8
Direct Impacts to Existing Wetlands, Hidden Creek

Wetland System	Wetland Area Impacted (acres)
Wetland A	.21
Wetland B	.05
Wetland C	.05
Wetland D	0
Wetland F	0
Wetland H	0
Wetland J	0

Figure 3.4-5 shows the areas of disturbance for each wetland. As Figure 3.4-5 indicates, small portions of wetland A would be filled to accommodate this project. Approximately 36 percent of wetland A's loss in area would be attributable to the site's proposed roadway which would bisect the middle region of this wetland. The remainder of wetland A's area loss would be due to the construction of building 19 and building 20. Nearly 76.5 percent of wetland A's total area would remain intact following the development of the Hidden Creek site. Most of this preserved area would be in the wetland's southwestern half, an area of higher wetland quality.

Direct impacts to wetland B would be minimal according to the proposed site plans, with the .05 acres of proposed filling attributable to the construction of the main roadway. The remaining area of this wetland system would remain undisturbed.

In order to construct building number 3 and building number 34, the surrounding area would need to be graded to obtain a level building pad. Part of this grading would include the filling of wetland C. As a result, the total area (0.05 acres) of wetland C would be impacted.

Wetlands D, F, H, and J are totally outside of the proposed development envelope. These wetlands will not be disturbed by the proposed Hidden Creek project.

Impacts to Wetland Functions

Impacts to the various functions performed by the seven wetlands on the Hidden Creek site are anticipated based on the current site plan. Moderate impacts are expected for the various water quality and flood control functions due mainly to the loss of wetland area. However, these impacts would be mitigated by the various storm water and pollution control devices proposed for the Hidden Creek development, particularly the two permanent storm water detention basins (see Appendix C which includes the Erosion Control Plan in the rear of the DEIS).

Table 3.4-9 assess the potential impacts from this project to the anticipated functions of each wetland.

Table 3.4-9
Anticipated Impacts to Wetland Functions, Hidden Creek

Wetland Function	Impact to this function due to this proposal
Water quality improvements	Moderate- loss of wetland area
Flood control / storm water runoff	Moderate- loss of wetland area
Unique wildlife habitat	Slight- loss of wetland area
Unique vegetation associations	No impact
High plant productivity	Slight- loss of wetland area
Fish habitat	No impact
Nutrient trapping	Moderate- loss of wetland area
Open space and visual relief	Slight- loss of wetland area
"Living" classrooms	No impact- increased access
Recreational opportunities	No impact- increased access
Erosion control	Moderate- loss of wetland area

3.4.3.3 Mitigation Measures

Required Permits

According to the current site plan for the Hidden Creek development, approximately .31 acres of Federally regulated wetlands would be filled. Such activity would require a permit from the US Army Corps of Engineers (ACOE) prior to construction.

The applicant has identified two areas that are available for the expansion of existing site wetlands to mitigate the loss of wetland function as a result of this proposal. One area, adjacent to the brook and associated with Wetland B, would provide additional flood plain storage and filtering. A second area, adjacent to Wetland H, would utilize high seasonal groundwater and occasional stream bank overflow to create an expansion of this wetland that is consistent with Wetland B, F and H. These wetland will be created by excavating existing uplands to an elevation that is similar and consistent with the adjacent wetlands, then replanting the area with native species that are currently known to utilize this site. These two areas will provide a one to one wetland mitigation ratio, as is typically required by the ACOE.

The ACOE issues two types of permits to allow the discharge of fill material into federally regulated waters: *individual* permits and *nationwide* permits (NWPs). NWPs are general permits issued on a nationwide basis to authorize minor activities that fill from 1/10 to 1/2 acre of wetland. Because less than 1/2 acre of regulated wetland would be filled, the Hidden Creek project is applying for a nationwide permit #39. An individual permit from the Army Corps of Engineers is not expected to be required.

Soil Erosion and Sedimentation Control

The greatest potential for indirect wetland impact associated with this project would be from erosion and sedimentation during construction. An Erosion Control plan has been developed by the project engineers to help mitigate this potential impact to the greatest extent practicable while achieving the proposed site plan. An Erosion Control Plan is provided in the set of submitted site plans in the rear of the DEIS. The written portion of this plan is provided as part of the Stormwater Pollution Prevention Plan in Appendix C.

All soil erosion and sedimentation control practices have been designed according to the New York State Department of Environmental Conservation Stormwater Management Design Manual. These devices would be installed and maintained in accordance with the approved plans, manufacturers' recommendations, and as directed by Village representatives including the Village engineer, highway superintendent, and building inspector.

The primary aim of this plan is to reduce soil erosion from areas exposed during construction and prevent silt from reaching the on-site wetlands. A number of Best Management Practices (BMP's) would be utilized on the Hidden Creek site to achieve this goal. The location of these various features relative to the site's wetlands is depicted in the previously mentioned Erosion Control Plan.

The first approach of the soil erosion control plan would be to minimize erosion at its source, namely upgradient areas under active construction. The following BMP's have been incorporated into the construction phase of the project to achieve this:

- Land that is stripped of vegetation would be left bare for the shortest time possible and seeded with a temporary mix after 20 days to promote the quick establishment of ground cover. Such ground cover would help stabilize the soil and limit erosion. Temporary seeding mix would include rye grass (or winter rye if seeding from October to November) at an application rate of 30 pounds per acre.

- All slopes would be stabilized with seeding mixtures and mulch to minimize erosion potential. Slopes in excess of four horizontal to one vertical shall be stabilized with jute netting and hydro-seeded. Straw or hay mulch would be added to such steep slope areas at a rate of 2000 pounds per acre and anchored with BioD-Mesh60 netting (RoLANKA International) or approved equivalent.

- Temporary diversion swales would be constructed to either divert clean storm water runoff away from newly graded areas until the establishment of permanent ground cover, or to direct sediment laden runoff into a sediment trapping device (discussed below). These temporary diversion swales would be seeded with a mixture of Kentucky bluegrass, creeping red fescue, and rye grass at an application rate of between 10 and 25 pounds per acre depending upon species.

- Sediment traps would be constructed in key locations down gradient of disturbed areas to collect and filter sediment laden storm water runoff. These sediment traps would consist of a minimum six inch thick layer of stone rip rap over embedded filter fabric. The size of these features would be proportional to the expected volume of runoff.

To provide an additional safeguard from sedimentation impacts, a continuous line of filter fabric silt fence would be erected around all areas of wetland that are to be preserved according to the proposed site plan. Such silt fencing would further diminish the sediment load in runoff entering wetland areas. To maximize the effectiveness of the silt fencing, the following measures would be utilized:

- Filter fabric silt fencing would be Mirafi 140 as manufactured by the Celanese Corporation or approved equal.

- In order to provide the maximum support for the filter fabric, a woven wire fence with a six inch mesh size would first be installed along the fence posts. The filter fabric would then be fastened to the wire fence with ties spaced every 24 inches at top and mid section. The bottom of the filter fabric would be embedded a minimum of eight inches into the ground to prevent undercutting.

- Under some circumstances, additional rows of silt fencing would be utilized to help slow the overland sheet flow and remove more sediment. These rows would be spaced from 50 to 200 feet apart depending on slope steepness.

- Discharge from sediment traps and diversion swales would be dispersed before reaching silt fencing so that the quantity and velocity of runoff is minimized. This would maximize the ability of the filter fabric to treat the storm water runoff.

All of these various erosion control devices would be erected prior to the beginning of construction and remain on site until the project's completion. Regular maintenance of these features is key to effectively controlling erosion at the Hidden Creek site. The details of such a maintenance program are provided in the Stormwater Pollution Prevention Plan (Appendix C).

By employing these various erosion control practices in conjunction with each other, the applicant believes the potential adverse impacts associated with sedimentation of the site's wetlands would be minimized to the greatest extent possible.