

# Environmental Plan

## *Overview*

Clarksburg is endowed with many special environmental features, including a healthy stream network, extensive tree coverage, valuable habitats for flora and fauna, and a varied topography. Little Seneca Lake, a man-made reservoir, is the focal point of the 1,800-acre Black Hill Regional Park.

The various watersheds that are found in Clarksburg are shown in Figure 44.

Environmental concerns for the outlying areas of Clarksburg, as well as other planning concerns, have resulted in a low-density land use pattern for Little Bennett Creek (except for a small portion south of A-305 and located within Town Center) and Wildcat Branch watersheds. These watersheds are considered to be most susceptible to adverse development effects, and a low density land use pattern is the most effective strategy for protecting environmental resources from urbanization.

The Cabin Branch watershed, a smaller and less fragile watershed, is designated as a future mixed-use neighborhood.

The land use proposals elsewhere in the Study Area reflect a difficult balancing of community development objectives with environmental preservation concerns. The Little Seneca Creek and Ten Mile Creek each have valuable natural resources that can be disrupted by urbanization. The Plan intent to foster

compact, transit- and pedestrian-oriented neighborhoods and to encourage the creation of a Town Center near the historic district means development will occur in a large portion of the Little Seneca Creek watershed east of I-270. In these areas, the Plan relies on many mitigation strategies to help protect key natural features, including:

- Proposing a forested conservation area along all streams (identified in Master Plan environmental studies as a critical component of maintaining water quality).
- Proposing that all the key development areas be subject to more rigorous development review procedures.
- Proposing that the mainstems of all the streams be acquired by the public (M-NCPPC) as part of a greenway network and, where possible, the first and second order tributaries.
- Proposing extraordinary mitigation for land uses which involve extensive impervious surfaces near sensitive headwater areas.

Environmental studies for the Plan indicate that the Ten Mile Creek watershed has the greatest constraints for development. Existing sampling data, aquatic biota surveys, and field observations indicate that Ten Mile Creek has good water quality that supports a diverse environmental community. The combination of relatively healthy streams, existing wetlands, significant woodlands, and diverse land cover help provide valuable habitats. At the same time, steep slopes and poor soils limit opportunities for development. Of the Little Seneca sub-basins, Ten Mile Creek is the most prone to environmental degradation from development.

As discussed in the Land Use Plan chapter, many different public policy objectives have influenced the land use pattern in the Ten Mile Creek area, including environmental concerns, farmland preservation, the creation of a Town Center near the historic district, maintaining future employment sites along I-270, and addressing the County's housing demand for single-family detached units. This Plan seeks to achieve a compromise among these different policy issues. The west side of Ten Mile Creek, designated for farmland preservation, will maintain 64 percent of the drainage area as low density. Elsewhere in the drainage area, this Plan relies on imperviousness caps, extensive stream buffers, and staging to help mitigate the effects of development.

In keeping with the 1992 Maryland Planning Act, most of the planned growth for Clarksburg has been directed to an existing population center which allows the preservation of large contiguous tracts of open space and fosters the use of mass transit. This strategy allows development to be channelled away from Sensitive Areas as defined by the Maryland Planning Act. This Plan recommends clustering development away from these sensitive features and also proposes that some areas of development address stringent environmental objectives.

## *Watershed Analysis*

The Clarksburg Study Area lies largely within two watersheds: Little Seneca Creek and Little Bennett Creek (see Figure 44, page 140).

The Hyattstown Special Study Area is the largest portion of Clarksburg which falls within the Little Bennett Creek watershed. Small portions of the Ten Mile Creek and Town Center Analysis Areas also drain to Little Bennett Creek. Streams in the Little Bennett Creek watershed east of MD 355 are designated by the Maryland Department of the Environment as natural trout waters (Use III-P), demonstrating a capability for the growth and propagation of natural trout populations and their associated food organisms. This designation has more stringent dissolved oxygen, chlorine, and temperature standards than most other waters in the Study Area. Wildcat Branch, at the southeast edge of the Study Area, is also designated as Use III-P.

The majority of the Clarksburg area is in the Little Seneca Creek watershed. A key feature of the watershed is Little Seneca Lake, a major reservoir which provides additional flow to the Potomac River during periods of drought. This function is critical since the metropolitan area's water supply is heavily dependent on the Potomac River. Approximately 8,700 acres in Clarksburg drain to the lake.

The Little Seneca Creek watershed in Clarksburg includes three sub-watersheds or sub-basins. The largest is Little Seneca Creek, followed by the Ten Mile Creek and Cabin Branch.

Many studies relating to the Little Seneca Creek watershed were done as part of this planning process (see Technical Appendix). The key findings regarding the character of the watershed are summarized below:

- **Modelling results indicate that state water quality standards are generally achievable under the proposed end-state Land Use Plan.**

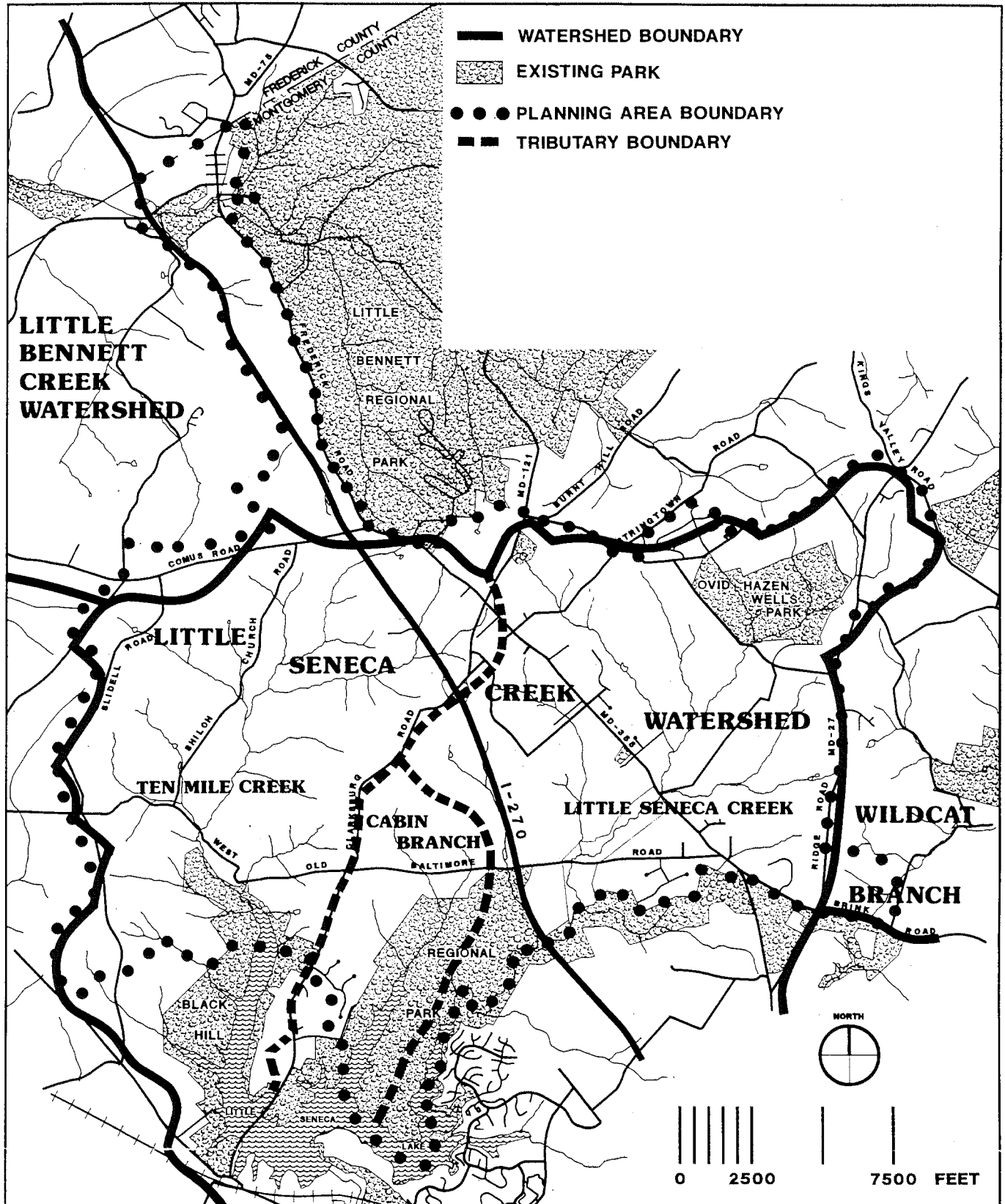
A water resources consultant was retained early in the planning process to evaluate different land use scenarios. One alternative examined development levels which approximated those shown in this Plan.

The study concluded, broadly speaking, with few exceptions, that state water quality standards for dissolved oxygen and temperature probably could be achieved.

A key assumption of this study's water quality projections was that a continuously forested buffer along all the stream valleys would be provided. This is a critical assumption since only a portion (approximately 60-65 percent) of the total stream buffer area is now wooded, with a disproportionate amount of open stream valley in the Little Seneca Creek watershed due to agriculture. Forested stream buffers are part of an effective mitigation strategy, especially in temperature sensitive watersheds since they shade streams as well as filter runoff and provide plant and animal habitat.

# Watersheds

Figure 44



Although the findings about state water quality standards are encouraging, the results of the model must be used in a cautious manner. Some similarly developed areas in other parts of the County have shown stream degradation and temperature increases. Many simplifying assumptions were needed to complete the modeling work because of the limited amount of raw data for model verification and calibration. The study is intended to compare relative impacts of alternative land use scenarios and evaluate potential mitigation measures, not predict absolute values for pollutant loads.

- **The water quality of the streams in the Clarksburg Study Area is good to excellent.**

Little Seneca Creek is designated as suitable for recreational trout populations (put-and-take, or periodic stocking and seasonal catching) by the Maryland Department of the Environment (Use IV-P) with associated standards for temperature and chlorine. Water temperature must remain cool to keep this designation. Ten Mile Creek, Cabin Branch and Little Bennett Creek below MD 355 are designated as Use I-P, which is suitable for general recreation and protection of aquatic life. (See Stream Designation Listing of Montgomery County Streams in the Technical Appendix.) The "P" designation indicates that these streams, like many in the County, ultimately drain to a source of the public raw water supply (in this case, the Potomac River).

A year long field sampling and laboratory assessment of benthic macroinvertebrates was completed in December 1993. The study uses the EPA Rapid Bioassessment Protocol II to establish baseline information on biotic conditions as indicators of water quality. Preliminary results for Ten Mile Creek and Little Seneca Creek show that they continue to support a wide variety of aquatic life. There is no evidence of long-term damage from temperature impacts. The results confirm that the tributaries are functioning as healthy cool water streams. Ten Mile Creek was found to have slightly more diverse and pollution-sensitive macroinvertebrates than Little Seneca Creek.

- **The relatively high water quality of the stream systems and Little Seneca Lake is in part directly related to the existing wetland systems.**

The relatively high water quality of the stream systems in the Study Area and the Little Seneca Lake are related in part to the existing wetland systems. Wetlands greatly enhance the water quality by trapping sediments and filtering excess nutrients. In addition, they also support diverse wildlife species, maintain cool base flows for fragile streams in summer, and provide floodwater storage. The protection and improvement of wetland systems in Clarksburg are critical elements in ensuring that the overall quality of the water resources in this Study Area is maintained.

- All the Master Plan's environmental studies agree that Ten Mile Creek exhibits characteristics that make it most prone to environmental degradation from development.

In addition to the consultant studies, the Montgomery County Department of Parks produced its own assessment of the quality of natural resources in the Little Seneca Lake sub-watershed, based on existing data and some field work. The study found that the three sub-watersheds have markedly different characteristics in terms of tree cover, steep slopes, and habitat for birds and aquatic life. Overall, Ten Mile Creek was ranked as the most important watershed because it had the best or most extensive natural resources and the highest potential for undesirable development effects. Little Seneca Creek was ranked slightly behind Ten Mile Creek, and Cabin Branch was ranked third. This data reinforces the consultant study findings that this area is sensitive to degradation.

- Certain environmental features in this Study Area pose development constraints.

The map shown as Figure 45 ranks environmental constraints such as steep slopes, floodplains, and poor soils in terms of their effect on development potential.

The greatest constraints are in the stream valleys. The least constrained areas are located east of I-270. The Study Area west of I-270 with the exception of the Cabin Branch Neighborhood, displays a pattern of moderate to severe constraints. The Hyattstown Special Study Area is also highly constrained.

The sensitive areas required to be protected under the 1992 Maryland Planning Act (streams and their buffers, floodplains, steep slopes, and known habitats of threatened or endangered species or species in need of conservation) are included in the areas shown in Figure 46.

### *Plan Recommendations Relating to Watershed and Sensitive Areas Protection*

To protect and enhance the Little Seneca Lake watershed and its sensitive environmental areas, this Plan:

- Considers the special qualities of Ten Mile Creek Area.

About 64 percent of the Ten Mile Creek watershed is designated for farmland preservation or rural uses. This recommendation supports the environmental objectives which emphasize that low-density land use patterns and appropriate Best Management Practices (BMPs) are the most effective strategies for maintaining water quality. Elsewhere in the watershed, the



land use plan objectives make environmental mitigation the main focus. The following mitigation strategies are recommended in these areas:

1. In the Town Center District, residential densities beyond transit stop walking distances are lowered, and a limit is imposed on employment uses.
  2. West of I-270, a 15 percent imperviousness cap and a square footage cap are placed on employment uses.
  3. Extensive green space beyond standard stream buffers is recommended for the area bounded by Ten Mile Creek and MD 121 where substantial development is proposed. This expanded green space, as shown in the Land Use Plan, will become part of the undisturbed stream buffer and should be afforested/reforested by the developers during the subdivision process, if not earlier.
  4. Public parkland dedication will be required for the Ten Mile Creek mainstem stream buffers and possibly for buffers for the first and second order tributaries.
  5. Public uses on Site 30 are limited to a size and intensity similar to the County detention center now under consideration. Site 30 will be subject to the same environmental requirements and constraints as comparable development west of I-270 in Ten Mile Creek, including the employment limits and imperviousness cap mentioned above.
- **Designates a forested buffer along all streams.**

All development in the County is required to protect stream buffers along perennial and intermittent streams as part of the Planning Board approval of subdivisions. The Plan endorses public acquisition of key stream valleys along their mainstems. In Clarksburg, it is essential that these buffers be forested for the environmental reasons described earlier. The Master Plan strongly encourages landowners to allow stream buffer areas within 175 feet of the stream to remain undisturbed and to permit trees to regenerate if the area is not presently wooded.

- **Protects environmentally sensitive areas such as mature hardwood forests, wetlands, areas of unique vegetation, and prime wildlife habitat.**

Trees in the natural landscape filter groundwater, reduce surface runoff, help alleviate flooding, and supply necessary habitat for wildlife. Trees improve the quality of life within communities by providing for recreation, aesthetics, climate control, and beautification. They can reduce the cost of home cooling and heating, and also protect a temperature sensitive ecosystem by shading. The Master Plan's environmental analysis underscores the importance of tree cover to water quality in the form of continuous forested buffers along stream valleys. The Master Plan responds to the importance of



preserving large contiguous areas of trees by keeping the most heavily wooded areas, which are west of I-270, in low density rural and agricultural uses.

Recently adopted state and County legislation require that forest and tree conservation be a part of future development projects in the County and Clarksburg. Forest conservation measures include avoiding tree clearing, minimizing the amount of trees lost, and replacing trees that are unavoidably cleared. A major goal of the forest conservation program is to ensure that tree saving and tree planting (reforestation and afforestation) occur in priority areas on the developing properties. When this is not possible, the required planting can be done off-site within the same watershed, and as a last resort, payment of a fee to a tree fund in lieu of planting is acceptable. The tree fund would be used by the County for reforestation projects.

- **Supports a “no net loss of wetlands” policy.**

The Master Plan recognizes the critical role of wetlands by recommending a “no net loss” objective and endorsing the preparation of a Nontidal Wetlands Functional Assessment (NWFA). Montgomery County Planning Department staff and staff of the Nontidal Wetlands Division of the Maryland State Department of Natural Resources are working together to produce an NWFA for Clarksburg. The NWFA will identify the locations of existing wetlands and potential mitigation sites, and assess the functions and values of the wetlands. The NWFA will comprehensively consider potential impact areas and possible alternatives throughout Clarksburg prior to the piecemeal regulatory process with an emphasis on preserving the highest quality wetland resources.

- **Recommends modifications to the M-NCPPC “Environmental Guidelines” for the review of subdivisions to assure that existing high water quality standards can be maintained.**

The Master Plan strives to meet the state’s goals of maintaining or improving existing water quality by first minimizing new development as much as possible in the most sensitive watersheds. Where environmental impacts from significant development and/or major roads are expected, the Plan designates “Special Protection Areas” (SPA). The M-NCPPC “Guidelines for Environmental Management of Development in Montgomery County” should be amended to include additional objectives in Special Protection Areas. This will promote environmentally sensitive design and construction of development and infrastructure in Clarksburg. Water quality monitoring may also be a requirement for certain developments, as specified in the proposed Water Quality Review Process.

The type of amendments needed for the Guidelines for Environmental Management to implement this recommendation are discussed in the Implementation chapter.

- **Maintains the environmental qualities of headwater streams to prevent increases in water pollution, flooding, and stream erosion and sedimentation.**

Headwaters are the principal source of watercourses that can be defined as first and second order streams. They often originate from springs, seeps or other wetlands and they are found throughout the Study Area at the most upstream end of each stream segment. The result is that most sites are fairly close to a headwater area, which makes complete avoidance very difficult. These tiny streams are vulnerable to land use changes within their drainage basins because of their size and small dilution capacity, especially when the natural baseflow is overwhelmed by a much larger quantity of storm runoff. Degradation of a headwater area can adversely affect the water quality and aquatic habitat of the immediate area. It can also harm downstream reaches, especially if the effects occur near the top of the watershed. Headwaters that drain to the middle or bottom of a watershed can be buffered to a certain extent by the greater baseflow of the stream's mainstem. For these reasons, headwaters near the top of the watershed should receive the highest degree of protection possible.

Sensitive headwaters are affected in Ten Mile Creek by the development of the west side of Town Center and between I-270 and the Creek as well as a small portion of the Transit Corridor Area. Headwaters in Wildcat Branch in the Great Seneca Creek watershed are affected by M-83. These areas are included in the Special Protection Area (SPA) designation. (See Implementation Strategies chapter.)

- **Endorses agricultural BMPs in strict accord with the practices prescribed by the Maryland Department of Agriculture and Montgomery Soil Conservation District.**

One of the current sources of stream pollution in the Study Area is agricultural runoff. Although agricultural conservation practices are encouraged, speculative land ownership in the watershed has made the establishment of such practices very difficult. This arrangement maintains the landowner's agricultural assessment by making short term or annual farm leases until the land value proves profitable for development. The result is a resistance from farmers to spend time or money developing BMPs on land that they may not be using in the near future. In recent years, with the development of the Little Seneca Lake area, the number of speculative land holders has increased. Establishing a land use pattern with clearly defined agricultural areas will remove some of the incentive for speculative use of the land.

The Montgomery Soil Conservation District offers free technical assistance with the development and implementation of a soil conservation and water quality plan. This voluntary program relies on the renter/landowner to contact District staff, who visit the property to determine which BMPs might reduce agricultural non-point source pollution.



Popular practices such as conservation tillage, grass waterways, nutrient management systems, animal waste control structures, and planting of stream buffers are often used. If farming increases in the Clarksburg area, it will be even more important to stream quality that as many agricultural BMPs as possible are implemented.

Maryland is currently designing bay-wide tributary protection strategies as part of the initiatives for implementing nutrient reduction goals for the Chesapeake Bay. The Master Plan supports efforts by state and local agencies to offer more assistance in providing agricultural BMPs throughout the County and encourages farmers to participate in the many programs available. These agencies have shown that conservation and water quality plans can be significant cost-savers to farmers as well as very effective environmental management tools.

A summary of the key protection strategies for the watersheds is contained in Table 11.

### *Relation of Environmental Plan to 1992 Maryland Planning Act*

The 1992 Maryland Planning Act mandates that local plans include a “sensitive areas” element. The intent of the sensitive areas designation is to protect streams and their buffers, 100-year floodplains, habitats of threatened and endangered species, steep slopes, and any other areas identified as sensitive by a local plan. A generalized identification of these areas is shown in Figure 46.

Little Bennett Creek will be further protected because of the limited development proposed by this Plan. Due to its moderate land use density, most of the Cabin Branch watershed is expected to maintain existing conditions with use of fully forested stream buffers and appropriate stormwater management.

In those areas where substantial development is recommended, the Plan uses the Special Protection Area designation to buffer the function of sensitive areas from the effects of that development. This approach is discussed in more detail in the Implementation Strategies chapter and involves amending the M-NCPPC “Environmental Guidelines” for the review of subdivisions.

### *Plan Recommendations Relating to Area-Wide Environmental Concerns*

#### **Groundwater**

This Plan:

- Supports protecting the sole source aquifer from groundwater contamina-

## Summary of Key Protection Strategies for Sub-Watersheds in Clarksburg Master Plan Study Area

Table 11

Sub-Watersheds	Key Protection Strategy
<b>Little Seneca Watershed</b>	
Ten Mile Creek	The proposed rural and agricultural land use pattern is the key protection strategy for the area west of Ten Mile Creek, where agricultural BMP usage is anticipated to increase. The east side of Ten Mile Creek where there is substantial development potential will be protected with a mitigation strategy based on imperviousness caps for employment areas, extensive forested buffers for the residential area, and development staging that allows advances in environmental protection technology to be incorporated in Ten Mile Creek properties.
Little Seneca Creek	Little Seneca Creek warrants extraordinary attention to site layout, BMP integration, and construction practices to ensure maintenance of the healthy stream system. Most of the watershed's development should be covered by enhanced environmental guidelines.
Cabin Branch Creek	Cabin Branch is a stream system abbreviated by Little Seneca Lake. The existing agricultural uses have created more open space and stream habitat degradation than is found in the Ten Mile Creek watershed. The water quality analysis projected no water quality problems from temperature effects of development. The DRASTIC analysis did identify two areas outside of the projected stream buffers which had higher potential for groundwater contamination. These areas are recommended for designation as Special Protection Areas. The Land Use Plan proposes moderate densities for the Cabin Branch Neighborhood to tie into the existing road network and nearby Transit Corridor District.
<b>Little Bennett Watershed</b>	
Little Bennett Creek	Little Bennett Creek will receive runoff from the Hyattstown Special Study Area, which the Master Plan recommends for generally low amounts of both residential and commercial uses. The Hyattstown Historic District straddles MD 355, the boundary between the Use III and Use I sections of the watershed. The Plan responds to the high stream quality found in Little Bennett Creek by recommending deletion of the I-270/MD 109 interchange and limited new development. The sewage disposal strategies currently under review for the Historic District should be carefully considered for their environmental impacts and potential for creating more development opportunities. However, the watershed should not be significantly affected by the proposed development under the County's standard environmental guidelines and regulations.

tion. Current water usage in the Clarksburg area is predominantly supplied by individual wells. The aquifer that supplies the water has been designated a Sole Source Aquifer by the U.S. Environmental Protection Agency. As part of the Master Plan analysis, a modeling approach called "DRASTIC" was used to evaluate physical features that affect groundwater conditions. Various parameters such as soil type, slope, depth to the water table, and infiltration capabilities were assigned weighted factors to identify where groundwater pollution would most likely occur. The analysis indicated that most of the highly sensitive locations are within the floodplain/buffer areas. The Plan includes areas outside the stream buffer in the Special Protection Area.

From a planning standpoint, the area where surface water percolates into the ground is the critical area to protect. This area is called the "recharge area." Recharge of aquifers in Clarksburg is typical of the rest of the Piedmont Province, which extends along the East Coast. Typically, recharge occurs through rainfall and runoff infiltrating in permeable upland areas. Stormwater runoff that carries soluble pollutants into recharge areas and areas where surface water and groundwater mix (such as some wetlands) is one source of groundwater contamination, especially from vehicle intensive uses such as parking lots and gasoline stations.

Other possible sources of contamination will be from improperly abandoned wells as community water is phased in, ill-designed or abandoned septic leach fields, leaking underground storage tanks, and injection wells. The County's Health Department supports abandonment of unneeded irrigation or drinking wells by filling in and capping with concrete. This eliminates direct conduits to the water table for toxic spills or urban runoff.

There are no regulations that mandate protection of recharge areas. The land use proposed for Clarksburg largely protects the sensitive recharge areas along the stream valleys via stream buffers. However, the upper reaches of Cabin Branch, Little Seneca Creek, and their tributaries contain some areas pinpointed as easily polluted by the DRASTIC analysis that will be highly developed. These areas will be covered by the Special Protection Area guidelines mentioned earlier.

Extensive groundwater modeling would be needed to accurately determine transport functions. However, it is likely that any contamination would affect only a very small area due to the type of underlying geology. There is no evidence that the groundwater in Clarksburg is connected to deeper aquifers or aquifers that extend far beyond the immediate vicinity, according to the staff of the Maryland Geological Survey.

## Solid and Hazardous Waste

This Plan:

- **Provides opportunities to maximize recycling efforts and reduce illegal dumping of hazardous materials.**

Clarksburg's development will generate a considerable amount of trash that is able to be recycled or composted. The County's Ten Year Solid Waste Plan sets forth the prioritized system of "reduce, recycle/reuse, incinerate, and landfill." The County provides curbside recycling of metals, glass and plastics for most residential developments. Multi-family and commercial properties are required to establish their own recycling programs. Retail and office uses can also participate in the recycling effort for office paper, cardboard, etc.

The potential for groundwater and surface stream contamination by improper disposal of household hazardous wastes is significant in both urbanized and agricultural areas. Since the County's Solid Waste Transfer Station is not near Clarksburg, the Plan recommends that collection opportunities for items such as paints, solvents, and used motor oil be considered in the Up-County area to lessen illegal dumping.

## Air Quality

This Plan:

- **Encourages a land development and transportation network that aids in achieving the standards of the 1990 Clean Air Act Amendments.**

The Clean Air Act Amendments of 1990 contain fundamental changes in the law and significantly alter the approach for attaining air quality standards in areas which currently do not satisfy the standards (non-attainment areas). The Washington Metropolitan Statistical Area (MSA), which includes all of Montgomery County, and consequently Clarksburg, is in non-compliance for ozone and carbon monoxide.

Although there are many provisions in the Amendments, the major focus for the Washington MSA will be on the reduction of mobile source usage, such as automobile commuting. This Plan proposes a land use concept which encourages higher density development near transit corridors, which will help the County reach attainment of air quality standards. Reduction of single-occupancy automobile usage is the most important component for achievement of air quality standards.

For all planning areas, the greatest impact is in transportation planning. Transportation activities must no longer cause or increase violations of any air quality standards. The incorporation of a regional transitway in

this Plan will help address this issue by reducing dependence on the automobile for mobility.

## Noise

This Plan:

- **Avoids locating residential or other noise sensitive land uses where attenuated levels from the roadway are likely to exceed 65dBA Ldn.**

Roadway traffic from I-270 will be the major source of noise in the Study Area (see Figure 47, page 153.) Noise levels adjacent to I-270 are projected to exceed acceptable levels for residential areas in many locations. Where large parcels adjoin I-270, the clustering of residential development away from the highway and other noise mitigation measures will address noise impacts. Where parcels are smaller, alternative land use patterns or noise mitigation measures must be considered.

The Land Use Plan chapter reflects noise concerns in the land use recommendations.



# Roadway Noise Impact Areas

Figure 47

