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## 1.0 Executive Summary

The Crosswicks-Doctors Creek Watershed is a 146 square mile area comprising four counties and fifteen municipalities. The watershed is rich in natural, cultural, historical, recreational, social and economic features. Greenway preservation activity has taken place in the Crosswicks Creek-Doctors Creek Watershed area including the formation of the Doctors Creek/Crosswicks Creek Regional Greenway Planning Group (CCDC Greenway Group) in 2001 and the completion of The Crosswicks Creek-Doctors Creek Greenway Plan in 2004 (FX Browne, Inc. & CCDC ).

The Greenway Plan contains a number of regulatory and non-regulatory recommendations to conserve watershed features including completion of a trail *feasibility* study for the Doctors Creek and Assunpink Creeks. In 2005, the CCDC Greenway Group obtained a grant from the New Jersey Department of Environmental Protection, Environmental Services Program (ESP) to complete the Doctors Creek-Assunpink Creek Trail Feasibility Study. State grant funding was matched by the four municipalities (Hamilton Township, Allentown Borough, Upper Freehold Township, and Millstone Township) within the study area (See Map 1, Base Map).

A greenway trail is a linear open space area established along both natural and man-made corridors usually intended for recreational use. The benefits of multi-use greenway trails are numerous. The vision for the Doctors-Assunpink Trail is a low impact recreational trail that will benefit landowners and local citizens. The CCDC sought to determine, through the feasibility study, whether creating a trail, and linking with other existing and proposed trails is possible.

The Doctors Creek-Assunpink Creek study area is approximately 21.5 square miles and includes the two creeks, several creek tributaries and the parcels adjacent to them. The primary tasks included in the Doctors Creek-Assunpink Creek Feasibility Study were: public outreach, overall research and evaluation of the project area, a preliminary trail inventory and trail analysis, creation and selection of trail alternatives, creation of objectives and implementation strategies for the selected trail alternative.

Three (3) trail alternatives were developed and ten (10) primary criteria were applied to each trail alternative to determine feasibility. The most feasible alternative is a land trail located primarily on the southern side of the Main Stem Doctors Creek and the southern side of the Assunpink Creek. This alternative would take advantage of presently preserved parcels and link with other existing/proposed trails within the study area.

Although implementation of this alternative is expected to present a number of challenges, a number of recommendations are provided, and the CCDC Planning Group has an attitude of realistic optimism, as the benefits associated with trail development are positive and numerous.

**Insert Map 1 (Base map)**

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## 2.0 Introduction

The terms *greenway* and *greenway trail* are not new. In fact, Benton Mackaye proposed the Appalachian Trail, now one of the greatest greenways in the world, over eighty-five years ago. Though it is not a new concept, there is now a variety of definitions for the term *greenway* contained in a number of government, non-government and academic publications. A more recent definition is as follows (Schwartz, Flink & Searns, 1993):

*The word “greenway” connotes two separate images: “green” suggests natural amenities –forests, riverbanks, wildlife: “way” implies a route or path. Put them together and they describe a vision of natural corridors crisscrossing a landscape that has been otherwise transformed by development.*

Considered a classic work, Charles Little defines *greenway* in his book entitled *Greenways for America*:

*A greenway is a linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, scenic road, or other route. It is any natural or landscaped course for pedestrian or bicycle passage. An open-space connector linking parks, nature reserves, cultural features, or historic sites with each other and with populated areas. Locally, certain strip or linear parks designated as parkway or greenbelt.*

Little elaborates and further defines six (6) general types of greenways and Trails:

- **Urban Riverside-** Urban riverside greenways usually created as part of a redevelopment program along neglected often run-down city waterfronts.
- **Recreational-** Recreational greenways, featuring paths and trails of various kinds, often of relatively long distance, based on natural corridors as well as canals, abandoned rail beds and public rights-of-way.
- **Ecological-** Ecologically significant natural corridors, usually along rivers and streams and less often ridgelines, to provide for wildlife migration and species interchange, nature study, and hiking.

- **Scenic/Historic-** Scenic and historic routes, usually along a road, highway or waterway, the most representative of them making an effort to provide pedestrian access along the route or at least places to alight from the car.
- **Networks-** Comprehensive greenway systems or networks usually based on natural landforms such as valleys and ridges but sometimes simply an opportunistic assemblage of greenways and open spaces of various kinds to create an alternative municipal or regional greenway infrastructure.

Water trails have also become a very popular type of recreational trail. Water trails are stretches of river or other water bodies that have been mapped out with the intent to create an educational, scenic, and challenging experience for recreational canoeists and kayakers. In fact, a water trail can be almost everything a hiking trail can be as it may also contain varying degrees of challenge and provide a recreational, historic and environmental experience.

The CCDC Greenway Group vision for the Doctors-Assunpink Trail is really an overlapping blend of the categories previously listed. The selected project area is along the two creek corridors, and upon the parcels directly adjoining the Doctors and Assunpink Creeks. As other greenway trails are already developed or in varying stages of development in the project area, a comprehensive greenway system is envisioned as well. In addition, a water trail has recently been developed on the Delaware River. Therefore, the CCDC Greenway Group was also interested in studying navigable portions of the two waterways in an effort to link with the Crosswicks Creek and eventually the Delaware River.

## 2.1 Benefits of Greenway Trails

The benefits of greenways and multi-use greenway trails are numerous and are addressed in a number of publications. Many of these references speak to the variety of positive connections resulting from the development of greenways and multi-use greenway trails. These overlapping connections include: connections between people and the land, between public parks, natural areas, historic sites, and other open spaces, between conservation and economic development, and between environmental protection and the quality of life (The Conservation Fund, 1993).

In a time where natural communities are disappearing, remaining open areas are being negatively impacted by increased development and public access to waterways and other natural areas are often restricted, people are having a harder time experiencing the outdoors and obtaining the numerous benefits associated with passive and active outdoor recreation.

In fact, the vast majority of publications note that greenways and multi-use greenway trails provide a variety of benefits ecological, social and economic benefits including:

- Greenway corridors and trails protect water resources by providing a natural buffer for non-point pollution sources.
- Greenways protect significant flora, fauna and ecological systems.
- Greenway corridors and trails help preserve scenic beauty and provide recreational areas thereby fostering physical, psychological and spiritual wellness.
- Greenways provide a positive economic impact.
- Greenway corridors and trails enhance the sense of local community.

Many of these positive greenway trail attributes were noted in the Crosswicks-Doctors Creek Watershed Greenway Plan, and were a driving force for the initiation of the Doctors Creek-Assunpink Creek Trail Feasibility Study.

## **2.2 The Trail Feasibility Study & Study Area**

The definition of *feasibility* is *a determination of the degree to which something can be carried out*. Therefore, the Doctors Creek-Assunpink Creek Trail Feasibility Study is intended to determine whether creating a trail may be carried out in the selected project area.

Consequently, the tasks selected for the Doctors Creek-Assunpink Creek Trail Feasibility project were intended to determine whether linking existing recreational areas, easements, and other trails within and proximate to the study area with a new trail through adjacent parcels along the Doctors and Assunpink Creeks is viable, possible, probable or practical. The tasks selected for the Doctors Creek-Assunpink Creek Trail Feasibility Study were in keeping with the project budget and were intended to set the stage for a larger, more comprehensive Master Trail Plan at a later date. The intent was to obtain the information necessary to recommend and finally select a trail alternative for more intensive and future study.

The CCDC Greenway Groups' area of interest is the Crosswicks-Doctors Creek Watershed. This watershed is a 146 square mile project area comprising four counties (e.g., Mercer, Monmouth, Ocean and Burlington Counties), and fifteen municipalities (e.g., Allentown and Wrightstown Borough, and Hamilton, Millstone, Plumsted, Washington, Upper Freehold, Bordentown, New Hanover, North Hanover, Chesterfield, Springfield and Jackson Townships, and the Cities of Bordentown and Trenton).

The watershed is rich in natural, cultural, historical, recreational, social and economic features. According to the Crosswicks-Doctors Creek Watershed Greenway Plan (FX Browne & CCDC Planning Group, 2004), the watershed contains a variety of significant resources.

The Main Stem Doctors Creek flows through Millstone and Upper Freehold Townships, Allentown Borough and Hamilton Township. The Main Stem Doctors Creek joins the Crosswicks Creek in Hamilton Township, which flows into the Delaware River near the Hamilton-Trenton-Bordentown Marsh. The plan notes that the watershed is:

*... A valuable natural resource that provides habitat for a variety of wildlife. The water quality of the Crosswicks Creek and its tributaries is important to the Hamilton-Trenton-Bordentown marsh and the plants and animals it supports. The watershed has a rich history. Many of the skirmishes leading to the battle of Monmouth during the Revolutionary War occurred in the Crosswicks-Doctors Creek Watershed. Many of these areas still remain as they were during the Revolutionary War. In addition to the Revolutionary War sites, the watershed is home to a number of other historically significant sites. Native American artifacts have been found along the Crosswicks Creek. Fossils have also been found in the watershed. At least one house in the watershed was part of the Underground Railroad.*

The 21.31 square mile Doctors Creek-Assunpink Creek Trail Feasibility Study area is a smaller part of the Doctors Creek-Crosswicks Creek watershed area. It is comprised of land parcels adjoining the Crosswicks Creek, within two Counties (e.g., Mercer and Monmouth Counties), and four municipalities (e.g., Millstone Township, Upper Freehold Township, Allentown Borough and Hamilton Township). The town centers and agricultural areas provide scenic vistas which are threatened by development (UF Scenic Byway Report, 2006).



**Photo 2-1: Doctors Creek  
Tributary, Proximate to Yellow  
Meeting House Road**  
*Photo: Dillon Torno*

**Insert Map #2, Parcel Map**

### **2.3 The History of Regional Greenway Preservation Efforts**

Establishing strong support for regional and local greenway preservation is an important facet of determining trail feasibility. A significant amount of greenway preservation activity has taken place in the Crosswicks Creek-Doctors Creek Watershed area, and much of it has to do with the partnership of the Crosswicks Creek-Doctors Creek Greenway Committee (CCDC). The following greenway conservation and project efforts serve as a useful means for describing the vitality of greenway preservation efforts in the region, the growing partnerships in the region, and the viability and success rate of the CCDC:

- ✓ Formation of the Panhandle Regional Environmental Council, Mid 1990's
- ✓ Formation of Doctors Creek- Crosswicks Creek Greenway Group, 2001
- ✓ NJDEP Office of Environmental Services Grant (OES) for Greenway Plan, 2001
- ✓ Completion of Crosswicks Creek-Doctors Creek Greenway Plan, 2004
- ✓ New Jersey Environmental Council (ANJEC) Environmental Achievement Award, 2004
- ✓ Conceptualization of Washington to Walnford Trail Study, 2006 & 2007.
- ✓ Commencement and Completion of Doctors Creek-Assunpink Creek Trail Feasibility Study, 2005 & 2007.

In the mid-1990's planning for the protection of watersheds began in full force and at the New Jersey State level. At that time, the state was divided into several watershed planning areas. The Panhandle Regional Planning Council was one of several watershed planning councils in Monmouth County, and included Millstone Township, Upper Freehold Township and Allentown Borough. Soon after, neighboring municipalities in neighboring counties were invited to join the Panhandle Council, which eventually evolved into the Crosswicks/Doctors Creek Regional Greenway Planning Group. The six municipalities included in the Greenway Group were: Allentown Borough and Hamilton, Millstone, Plumsted, Washington and Upper Freehold Townships.

The Crosswicks/Doctors Creek Regional Greenway Planning Group continues to evolve and is now comprised of twelve (12) municipalities that are actively supporting watershed conservation efforts. The group now includes the following municipalities: Allentown and Wrightstown Boroughs, the Cities of Trenton and Bordentown, and Bordentown, Chesterfield, Hamilton, Millstone, New Hanover, Plumsted, Upper Freehold and Washington Townships.

The CCDC Greenway Group vision statement is as follows:

*Implementation of the regional greenway plan which envisions a continuous preserved historic, cultural, scenic, recreational trail and navigation system stretching from the Delaware River inland and connecting with other regional greenways.*

The mission statement references the implementation of a regional greenway plan. In 2001, the group applied for an Office of Environmental Services (OES) grant from the NJDEP to complete a comprehensive, watershed-based conservation management plan. After completing the plan, the Group received an Environmental Achievement award from the Association of New Jersey Environmental Commissions (ANJEC) for forming the CCDC Greenway Group and completing the greenway plan. The Crosswicks Creek/Doctors Creek Regional Greenway Plan was finalized in 2004 (FX Browne, Inc. & CCDC Greenway Group). The CCDC Greenway Group has been seeking formal municipal adoption for the plan for the last two years. The Group continues to meet monthly and is actively working on studies, conservation projects and landowner education.

The Crosswicks Creek-Doctors Creek Greenway Plan includes both planning information (e.g., GIS mapping, data analysis) and a greenway conservation management plan. A number of regulatory and non-regulatory recommendations are included in the Greenway Plan including:

- Continue public outreach efforts,
- Conserve stream corridors and headwater areas in their natural state,
- Restore negatively-impacted stream corridors, headwater areas and surface water resources,
- Acquire conservation easements, and
- Adopt more stringent local ordinances to address land development and the resource impacts associated with land development.

The Greenway Plan recommended the completion of more comprehensive greenway trail studies. Therefore, in 2006 two trail feasibility study efforts were initiated including one for the Washington to Walnford Trail and another for the Doctors Creek-Assunpink Creek Trail.

An informal map and description of the Washington to Walnford Trail concept has been developed. The CCDC Greenway Group is looking for possible funding sources to prepare more formal development of this trail concept. The proposed trail would have its northerly origin in Washington Township (Robbinsville), Mercer County, at the Washington Community Park, would inter-tie with the existing loop trail in Heritage Park, and the southern terminus would be at a vacated vehicular entrance to Historic Walnford Park in Upper Freehold Township, which is located right on the Crosswicks Creek.

The Washington-Wanlford Trail and other proposed and existing trails are illustrated on Study Maps 4-7 and further described in subsequent sections of this feasibility Plan.

## 2.4 Greenway Plan Consistency & Project Focus Areas

Establishing consistency between the overriding greenway plan and the vision behind the implementation of the Doctors-Assunpink Creek Trail is also an important facet of trail feasibility planning, as it illustrates adoption of a guiding plan, selecting implementation efforts consistent with the guiding, and consistent planning may also open doors to funding opportunities. The reasons for the trail feasibility study are in keeping with the major recommendations included in the Greenway Plan, and include:

- **Recommendation 1: Protect Ecological Significance of Region-** The Crosswicks/Doctors Creek Watershed Greenway Plan recommends protecting a 35-foot or greater creek buffer area, headwater areas, steep slopes, and water quality. Members of the Planning Group are well-aware that creating a greenway trail addresses ecological needs as buffer areas protect a coherent riparian ecosystem, provide for wildlife migration, and allow for species interchange. Enhancing and protecting a greenway along the Doctors and Assunpink Creeks is also a way to protect, maintain and enhance native vegetative associations, as well as floral and faunal biodiversity, and surface and groundwater quantity and quality;
- **Recommendation 2: Preserve Historic Sites Scenic Vistas & Recreational Attributes-** There are many historic attributes, scenic amenities and recreational features associated with the watershed region. Therefore, creating and maintaining greenway areas within the project area will also preserve the varied and significant attributes associated with the Doctors and Assunpink Creeks; and
- **Recommendation 3: Develop Trail System-** Trails and greenway areas positively impact local economies, enhance a sense of community, and add to the health and well-being of recreational users.

The trail feasibility focus areas are as follows:

- **Project Focus Area 1: Effective Educational Outreach to Partners:** This project focus area involved marketing and outreach to elected and appointed government officials, agency personnel, and interested citizens. Educational outreach is imperative and will continue well-beyond the trail feasibility stage.
- **Project Focus Area 2: Foster Landowner Conservation Efforts:** This area involved a well-organized effort to identify and communicate with creek corridor landowners. The Crosswicks Creek-Doctors Creek Regional Greenway Planning Group was especially interested in understanding landowners' concerns with the development of a trail system and to factor areas of concern into a determination of feasibility. They remain interested in developing a trail that will be mutually beneficial to landowners, the environment and local citizens.
- **Project Focus Area 3: Develop Greenway Trail Conservation and Preservation Tools:** Certain information tools were needed to assess whether a trail would be feasible. This focus area involved obtaining information (e.g., geographic features, landowners) and creating a GIS information base (e.g., GIS mapping, GIS database). More tools are needed in the future to further development and implementation of the trail.

As noted earlier in the introduction, the tasks or information gathering process selected for the trail feasibility study included: public outreach, an overall evaluation of the project area, a trail inventory and trail analysis, proposed trail alternatives, objectives and strategies for the selected trail alternative, and implementation strategies. The following sections of the study provide an overview of those tasks and project findings.



**Photo 2-2: Doctors Creek  
Tributary, Proximate to  
Imlaystown Lake**  
*Photo: Forbes Environmental*

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## 3.0 Public Outreach

Effective public education and public outreach were important and necessary aspects of this feasibility study. The landowners were and continue to be very important to the CCDC Greenway Group as the feasibility analysis required direct input and selected trail alternatives pass through many privately-owned parcels.

The following subsections describe the importance of public outreach to the CCDC Greenway Group, to the development of the Doctors Creek-Assunpink Creek Greenway Trail Feasibility study, and finally the development of trail alternatives and subsequent selection of a trail location.

### 3.1 The Importance of Effective Public Outreach

A number of books and guidance documents for trail development note the importance of pro-active education and public outreach. Education and outreach are important elements to increase understanding and to cultivate the necessary relationships required to create greenway trail systems. The following passage succinctly states the importance of involving local *stakeholders* in the trail planning process (Rails-to-Trails Conservancy, 1993):

*Public involvement is a major step in the process of creating a multi-use trail. If you institute and carry out a comprehensive public involvement campaign, you will create trust and support between your organization and the public.*

*Most trail projects have numerous publics or stakeholders including trail users, friendly and hostile adjacent landowners, elected officials and those unaware of the project. Know who the various stakeholders are, whom you need to inform, and from whom you need input. The goal should be to get all publics involved in the planning and design phase so that all develop a sense of ownership and investment in the trail.*

The previous statement is therefore recommending that public involvement is imperative throughout the planning, design, implementation and maintenance stages of trail projects. The Crosswicks Creek- Doctors Creek Regional Greenway Planning Group agrees, therefore the education and outreach efforts implemented during this feasibility study initiated a public education process expected to continue throughout future stages of the trail project. The group agreed from the beginning, that the key constituent for the trail effort is the landowner, and that fostering confidence in the organization and defining the message would be very important facets in present and future education and outreach efforts.

Although the CCDC Planning Group had a public outreach and education plan in place at the onset of the Doctors Creek-Assunpink Creek Trail Feasibility project, the effort benefited a great deal from the advice of community member and CCDC Planning Group partner Dr. Patrick Hossay. Dr. Hossay, an Associate Professor of Political Science at Richard Stockton College, has direct experience in public outreach methods geared specifically toward trail development. Dr. Hossay attended the first community update meeting held on September 5, 2006, and was therefore able to provide a number of recommendations to improve outreach and education efforts. Subsequent meetings and media outreach efforts benefited greatly due to his advice as well as the advice and direct experience of CCDC Planning Group members and partners (See Appendix A, Image Management Presentation, October 2006).

### 3.2 Feasibility Study Phase: Outreach Tasks

A successful public involvement program should be well funded and include a variety of techniques to include the entire community. With that in mind, the CCDC Planning Group selected the following public outreach techniques. The following outreach goals were selected in an effort to inform stakeholders, collect trail feasibility information and to gauge landowner support for land preservation, greenway trails, the trail alternatives, and the selected trail route:

- Provide a clear sense of study goals to landowners and officials,
- Cultivate the necessary landowner relationships required to obtain trail feasibility information,
- Provide an overview of the benefits associated with regional land conservation programs and trail development, and
- Develop the study components/determine the feasibility of selected trail options.

The education and outreach tasks selected to attain those goals were as follows:

- **Monthly Meetings** -The CCDC Planning Group met monthly at the Allentown Borough Public Library. The Trail Feasibility Project was on the monthly agenda and written and verbal updates were provided to CCDC members, partners, and attendees. Project input was provided to the consultants each month based on the formal updates.

Throughout the duration of the feasibility study, landowners and project partners were invited to monthly meetings. Professional speakers attended the monthly meetings to provide information to the forum. Representatives from the Delaware and Raritan Greenway, Inc., Richard Stockton College, and other interested organizations provided information and invaluable advice.

- Meeting speakers and attendees provided information on study progress, available land conservation program opportunities, existing open space, the benefits associated with obtaining conservation easements, existing and proposed trail development efforts, and improving outreach techniques. Monthly CCDC Planning Group agendas, project updates, and minutes were provided via the internet to all project partners and interested landowners unable to attend.
- **Project Outreach Meetings-** Project update meetings were well advertised. The meetings took place during key phases of the feasibility study. Selected meeting minutes, handouts and press information are included in the appendices of this feasibility study (See Appendix A, Public Outreach Information).
  - **Municipal Newsletter Updates/Media Efforts-** Landowners and other interested members of the community are not always able to attend evening meetings. A database of media outlets was developed for this project. A press package was sent to each media source before project update meetings. Press releases, newsletter articles and handouts were developed and distributed to the press and to the four municipalities. Educational materials were posted on the CCDC website [www.ccdcgreenway.org](http://www.ccdcgreenway.org). Outreach examples are provided in the appendices (See Appendix A, Public Outreach Information).
  - **Landowner Outreach-** The importance of effective landowner outreach efforts was presented earlier in this feasibility. Early on in the planning process, the following landowner outreach efforts were initiated to obtain landowner participation and feedback:
    - ✓ Landowners were identified using tax parcel data from project area municipalities.
    - ✓ Project maps were developed using a Geographic Information System (GIS) and to illustrate parcel data (See Map 2).
    - ✓ Surveys were sent to all landowners in the study area (those with property adjoining the Doctors and Assunpink Creeks) and analyzed (See Appendix A).
    - ✓ A landowner database was developed and updated throughout the planning process.
    - ✓ Landowners were invited to monthly CCDC meetings.

- ✓ Landowners were invited to study update meetings and time was allotted for dialogue and comment.
- ✓ Landowner comments received throughout the planning process were closely considered when developing the trail alternatives.

### 3.3 Outreach Findings

Although the budget for a full-fledged, comprehensive public outreach effort was not available for the Doctors-Assunpink Creek Trail Feasibility Study, the selected outreach efforts did provide CCDC Planning Group with useful information about the project area.

With regard to the citizen survey, a random sample survey is an effective way to gather valid input and opinions from all segments of the community if conducted in a statistically valid manner. Therefore, early in the feasibility planning process, it was decided that landowners abutting the two creeks would provide the most information for the trail feasibility study.

A three-paneled brochure/questionnaire was developed and distributed to three-hundred (300) landowners in the study area. Although the CCDC Planning Group only received twenty (20) postage-paid surveys back, citizen feedback was viewed as valuable and used for general guidance. The survey findings were as follows:

- **Location-** The respondents were from the four study area municipalities (e.g., Allentown Borough, Hamilton Township, Upper Freehold Township, and Washington Township).
- **Age-** Most respondents were in the 51-60 year old age range.
- **Residency Type/Longevity-** The majority of respondents lived in single-family detached homes and for more than 20 years.
- **Location-** Most respondents lived on parcels adjacent to the Doctors Creek.
- **Definitions-** The majority of respondents knew the definitions for both *watershed* and *stormwater*.
- **Water Issues-** Most respondents noted that both water quality and water conservation were important personal issues.

- **Significant Natural Features-** The most valued features noted in the project area were: habitat (most significant), scenery and beauty, open space, recreational opportunities, drinking water, and privacy.
- **Recreational Activities-** The most common recreational activities on the Creeks included: walking/hiking (most common), nature exploration, fishing, water sports, picnicking, mountain biking, hunting, and riding ATVs.
- **Water Quality Impacts-** Most of the respondents noted that water quality had worsened through the years due to low flows and stormwater runoff, which resulted in moderate water quality. Other actions impacting water quality were: over use of fertilizers and pesticides, riding ATVs, dumping trash, over use of farm chemicals and over development. The majority did not feel that those inflicting impact understood that their actions were negative.
- **Recommends-** Respondents most commonly recommended: water quality improvements, less litter, and less flooding.
- **Community Participation-** Some of the respondents were currently participating in land conservation programs (e.g., conservation easements, Farmland Preservation Program). Most were not involved in watershed projects, but appeared interested in attending meetings, participating in watershed/creek walks, planting trees, anti-litter campaigns, and water quality monitoring.
- **Contact Information-** Most of the respondents provided contact information, so they could be contacted about future meetings and projects.
- **Additional Comments-** Several respondents took the time to submit additional written comments to express concerns associated with trail development (e.g., loss of privacy, land ownership rights, insurance issues, and endangerment to private property and animals).

The CCDC Planning Group Secretary took and circulated meeting minutes, and many of them are included in the Appendices (See Appendix A). Commonly expressed citizen concerns associated with trail development were as follows:

- **Quality of Public Outreach-** Some community members expressed an interest in finding out more about economic compensation as well as positive impacts upon property values.

- **Support For Trails-** Those supporting the development of a Doctors Creek-Assunpink Creek trail expressed support for a low impact, multi-use trail for bikers, hikers, canoeists and kayakers. Many stated a preference for keeping the trail in a more natural/passive state and providing a trail protecting scenic vistas. Trail supporters noted that trail maintenance and policing of trails is successful in other areas and would be successful in this project area as well.
- **Concerns Associated With Trails-** Those not supporting the trail were concerned about potential impacts to their property. They noted that maintenance might be a problem and wondered whether littering, vandalism and lawsuits might result.

Through research, the CCDC Planning Group found that the concerns expressed by the public were ones commonly verbalized during trail development projects. Research links backing up the benefits associated with developing greenway trails were included similar information on the CCDC Greenway Group's website (see [www.ccdcgreenway.org](http://www.ccdcgreenway.org)). The Group also began including the following information in subsequent public outreach efforts (see Appendix A, Presentation by Dr. Hossay).

- **Preservation of Open Space-** The overriding goal of the project is to preserve open space.
- **Compensation for Land Access-** Preserving land for trails and trail access is often beneficial to land owners. For instance simple acquisition for land, conservation easements (e.g., 70-80% of property value, tax benefits, federal deductions), and other programs (e.g., title donations, bargain sales to land trusts) is often economically beneficial.
- **Property Values-** Property values increase (e.g., 20-30%) when an adjacent greenway trail is present. Property values increase even when the landowner is within a ½ mile of a greenway trail (e.g., 15%).
- **Security-** Research shows that perceived security risks related to trail use are often overestimated. In fact, there is no increase in loitering, vandalism or other criminal activity when a trail is well designed and well managed. The final design will not include any new parking areas near residential properties and trail access will be limited to established sites (e.g., existing parks and previously preserved parkland). Trail barriers preventing motorized access will also be used.
- **Likely Trail Users-** Research indicates that greenway trail users of this are likely to be 38-56 years old, middle to upper-middle income, and slightly more likely to be female. Scouting troops and school groups will also provide positive social benefits.
- **Privacy-** The trail design will allow for the continuation of privacy (e.g., placed away from homes, buffered with trees).

- **Perceived Issues-** Several studies indicate that a clear majority end up supporting the trail (e.g., 90-95% approval rates once the trail is in place).
- **Economic Values-** Studies indicate that spending by trail users benefits local businesses (e.g., \$10-25 per user in benefits to local businesses) and has other indirect positive benefits (e.g., exceeding \$300,000/year).
- **Trail Development & Design-** Subsequent trail studies will include the following assurances:
  - ✓ Trail development will involve the least invasive machinery and techniques.
  - ✓ When possible, previously cleared areas such as right of ways will be used.
  - ✓ Trail surface will be the least invasive and would be altered in sensitive areas.
  - ✓ Where needed, native species will be planted.
  - ✓ Existing trees and other desirable features will be protected.
  - ✓ Erosion control will be installed and monitored.
  - ✓ Trails will function with existing drainage patterns.
- **Trail Maintenance-** Subsequent trail studies will include trail maintenance and a maintenance support strategies.

The landowner survey findings, public meeting comments and the previous list of trail attributes and assurances served as an important basis for subsequent tasks included in the Doctors Creek-Assunpink Creek Trail Feasibility Study.



**Photo 3-1: Doctors Creek,  
Proximate to Galloping Brook  
Development**  
*Photo: Walter Helfrecht*

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## 4.0 Project Area Evaluation

As noted previously the region of interest for the CCDC Greenway Group is the 146 square mile Crosswicks/Doctors Creek Watershed. The region of study for the Doctors Creek to Assunpink Trail Feasibility study includes parcels adjacent to the Doctors and Assunpink Creek. Both the larger watershed and the study area contain numerous and significant natural and manmade features. The overriding goal of the CCDC Greenway Group is to protect significant features within the watershed and to create a trail that protects those features as they will greatly enhance the value of the trail experience.

Although some significant features may enhance the trail experience (e.g., scenic vistas, presence of natural and historic elements) others may present environmentally or economically prohibitive situations (e.g., very steep slopes, dam obstructions, presence of threatened and endangered species). Land use, land ownership, and the level of landowner support are other common issues directly impacting a selected trail route and overall trail feasibility. Although some private landowners might welcome a trail and provide a trail easement, other landowners may be opposed to a trail running through their property.

The following subsections of the Doctors Creek-Assunpink Creek Trail Feasibility Study are intended to provide an overview of some of the more evident physical features, significant resources, and land ownership issues present in the study area. They are provided in an effort to determine the feasibility of trail alternatives explored later in this study (See Section 6).

### 4.1 Physical & Natural Features

The study area is located primarily in the Coastal Plain Province. The Main Stem Doctors Creek is 14.8 miles from its confluence with the Crosswicks Creek in Hamilton Township to where it crosses Route 526 in Millstone Township. At Route 526 the Main Stem Doctors Creek separates into two major headwater tributaries. An additional 5.5 miles are added by the two major Doctors Creek tributaries within Millstone Township.

The Assunpink Creek tributaries (approximately 5.8 miles) are located in the Stage Coach Road vicinity of Millstone Township. The Main Stem portion of the Assunpink Creek and within the study area is approximately 5 miles from just east of Assunpink Lake to the end of the study area at Route 130.

There are numerous lakes and ponds within the study area including Conine's Mill Pond (Allentown Lake) in Allentown Borough, Imlaystown Lake in Upper Freehold, Red Valley Lake in Millstone Township and Lake Assunpink in the Assunpink Wildlife Management Area (WMA) in Millstone, Upper Freehold and Washington Townships.

The Crosswicks Creek/Doctors Creek Greenway Plan noted some water quality problems within the watershed and study area. These included high fecal coliform levels, point source pollution points (e.g., Hamilton Township Sewage Treatment Plan, Allentown Sewage Treatment Plan), and high lake and pond nutrient levels associated with land use and stormwater pollution. For instance, Imlaystown Lake is considered *eutrophic* as it experiences seasonally high levels of phosphorus and nitrogen (2002, NJDEP Integrated List of Waterbodies). Allentown Lake experiences similar water quality issues as well as high sedimentation and excessive plant growth.

On a positive note, the plan also notes that large amounts of the stream corridor still remain in their natural state. This was confirmed during the course of this study; however large parcels in proximity to the main stem of Doctors Creek have been developed and continue to be developed.

With regard to topography, the highest and most steeply sloping areas are in the Doctors and Assunpink Creek headwater areas. The topographic map (See Map 3) illustrates that the most steeply sloping areas are in secondary or tertiary tributaries of the Doctors Creek in Millstone Township (e.g., Millstone Township north of Interstate 195) and in Upper Freehold Township (e.g., east and southeast of Imlaystown Lake), on the southern banks of the Main Stem Doctors Creek in Allentown Borough (e.g., east and southeast and just west of Allentown Lake). The regulations within all four municipalities protect water bodies, address water quality issues, and prohibit certain types of development on steep slopes (See Section 4.2).



**Photo 3-2: Tributary to Doctors Creek,  
Proximate to Red Valley Lake**  
*Photo: Dillon Torno*

**Insert Map 3, Topography**

One of the primary reasons the project area is under study for a potential greenway trail is to both assist with the conservation of and take advantage of the myriad of significant natural, recreational and historic resources present. When a greenway trail meanders through areas affording significant features and takes advantage of proximity to them, the trail becomes more interesting to the user (e.g., bird watching, plant identification, scenic vistas, historic research) and also provides numerous educational opportunities (e.g., interpretive signage, outdoor classroom, educational curriculum).

According to the Crosswicks Creek/Doctors Creek Regional Greenway Plan, the watershed is *a haven for birds and other wildlife*. A full listing of flora and fauna may be found in the plan. The following categories of flora and fauna are present in the watershed:

- **Watershed-Wide Flora & Fauna:** 65 bird, 14 mammal, 8 reptile and 14 amphibian species.
- **Marsh System:** 22 bird, 3 turtle and 9 fish species.
- **Riparian System:** 25 forested wetland and 15 upland plant species.
- **Threatened & Endangered Species:** Bald eagle, bog turtle animal and swamp pink vegetation species.

Greenway trails also provide an opportunity to link with and augment the value of existing recreational areas. New trails also serve to protect historic remnants from earlier times (e.g., historic districts, historic buildings, and significant archeological features) as they are a much lower impact land use than a residential or commercial development.

There are a number of large parks and corridor easements within and proximate to the Doctors Creek-Assunpink Creek Feasibility Trail study area (See East, Central, West and North Study Area Maps 4-7). The largest parks within and just outside of the Doctors-Assunpink Greenway Trail Feasibility Study include: The Hamilton-Trenton Marsh, The Delaware and Raritan Canal State Park, Allentown Lake, Imlaystown Lake, Clayton Park, and the Assunpink Wildlife Management Area. A list of parks, listed by municipality and within the project area, is included on the following page (see Table 1, Historic and Recreational Resources by Municipality). The Doctors Creek-Assunpink Creek Trail would link these existing recreational areas and allow for a broader recreational experience.

The project area and surrounding watershed also has a number of significant historic resources. According to the Crosswicks Creek/Doctors Creek Watershed Plan, the region served as a backdrop for Revolutionary War battles. The Battle of Monmouth occurred in 1781 in Manalapan (Freehold, NJ), and many of the events that led up to this battle took place within the watershed.

The table below illustrates some of the recreational and historic sites identified in the Crosswicks Creek/Doctors Creek Regional Greenway Plan as well as additional information collected during the course of this greenway trail feasibility study. It is included for illustrative purposes and is not a comprehensive list of all municipal and historic resources in the project area.

**Table 1, Historic and Recreational Resources by Municipality**

Municipality	Site Name
Hamilton Township	The Delaware River Hamilton-Trenton Marsh Delaware & Raritan State Park CC Abbott Farmland Gropps Lake Hamilton-Trenton-Bordentown Marsh Hamilton Veterans Park Middletown House Roebling Park (Watson House)
Allentown Borough	Allentown Historic District Heritage Park Grist Mill Conines Mill Pond (Allentown Lake) Pete Sensi Park
Upper Freehold Township	Clayton Park Byron Johnson Recreational Park Mark Harbourt Soccer Complex Imlaystown Historic District Salters Mill Imlaystown Lake Red Valley Lake Assunpink WMA
Millstone Township	Bowman's Tannery Clarksburg Cemetery Clarksburg Historic District Clarksburg Inn Clarksburg Schoolhouse Methodist Episcopal Church Assunpink WMA

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## 4.2 Land Use & Land Ownership

Land use, local planning and local regulations are important factors in determining trail feasibility. Existing and future land use and associated zoning and land use regulations have a direct impact upon land availability and trail implementation.

According to the Crosswicks Creek/Doctors Creek Regional Greenway Plan, there are a variety of primary land uses in the watershed including: residential, agricultural, commercial, and industrial. With regard to the four study area municipalities, the greenway plan notes the following:

- **Hamilton Township-** Hamilton Township is primarily medium- to high-density residential and commercial. Hamilton Township is a major population center within the project area.
- **Allentown Borough-** Allentown Borough is primarily medium-to high density residential with some commercial properties along Main Street (Route 524) and Church Street (Route 526). Allentown Borough is a designated “historic village”. Like Hamilton, Allentown Borough is a major population center within the project area.
- **Upper Freehold Township-** Upper Freehold Township is primarily agricultural with residential land throughout the municipality. Upper Freehold is experiencing increased development on agricultural land.
- **Millstone Township-** Millstone Township is primarily forested and agricultural. Millstone Townships has also experienced increased residential development on agricultural land.

Roadways allow for potential greenway trail access, parking for water trails, and may serve as a portion of the trail where there are barriers to trail development. Interstate I-195 runs east and west through the watershed and is within the eastern portion of the study area. It also provides access to the entire study area via the New Jersey Turnpike and Routes 130, 526 and 524. The majority of the trail feasibility project area skirts County Routes 524, 526, and 539.

There are also several very scenic roadways providing a pleasant car ride and potential access to the Doctors Creek-Assunpink Trail. According to the Crosswicks Creek/Doctors Creek Watershed Plan, many of the roads in the watershed are designated *scenic* and representative of the character of the region. Portions of County Routes 524, 526, and 539 are identified in the Monmouth County Scenic Roadway Plan.

Determining parcel ownership and identifying the parcels under government ownership and within land conservation programs was an important facet of the Doctors-Assunpink Creek Trail Feasibility Study.

The majority of study area parcels are located in Upper Freehold Township. Land ownership throughout the watershed is largely private. Approximately 39% of the project area is privately owned and 61% under public (e.g., government owned parks and easements) or quasi public ownership (e.g., private farmers participating in the Farmland Preservation Program). Publicly owned parcels include those parcels and easements conserved through state, county, and municipal open space programs. Conserved properties include uses such as: state land, state & county preserved farmland, county parks, municipal parkland, and municipal easements. Several maps included in this study illustrate those parcels that are both privately and publicly owned (see Study Area Maps 4-7).

### **4.3 Local Planning & Local Regulatory Features**

*Land use planning* is the process by which public agencies, local governments, and landowners decide the intensity (how much) and the geographical arrangement (where) of various land uses. More simply stated, land use planning is a process applied to determine what gets built, how much gets built, and where things are built. *Environmental planning* applies physical, biological, and social information to a given land area to determine land use development measures that protect human and ecological health.

The environmental planning and regulatory tools applied to further analyze the trail feasibility project area, included municipal master plans (e.g., land use, historic preservation, conservation, open space and recreational planning elements), functional plans (e.g. natural resources inventories, open space and recreation plans), and land use development regulations (e.g., zoning and land development). The environmental policies of interest were those supporting land conservation, stream corridor protection, and the development of recreational areas. The regulations of interest included zoning and land development regulations, and specific environmental performance standards.

The following subsections of the Doctors Creek-Assunpink Creek Trail Feasibility Plan provide general municipal environmental policy and regulatory information required to assist with determining trail feasibility within the project area. Information is provided for each of the four municipalities in the study area. Additional planning and zoning research will be required for future phases of the project.

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## **Hamilton Township**

### ***Planning & Open Space Efforts***

The trail feasibility project area within Hamilton Township begins in the vicinity of state owned (Delaware and Raritan Canal) land just west of Route 130. The study area within Hamilton Township (approximately 5.8 miles of Doctors Creek) includes those parcels immediately adjacent to the Main Stem Doctors Creek. The study area within the township ends at the municipal boundary of Upper Freehold Township where Breza Road crosses the Doctors Creek. (See Map 4, Study Area West).

The Hamilton Township Master Plan (reexamination report 2002) identifies a number of goals and objectives supporting environmental preservation and advocating the development of recreational areas. The Township Master Plan (reexamination report, 2002) specifically states the following:

*There is a Township-wide interest in open space and recreational planning. The Planning Board and administration have sought to preserve open space by preserving the Lengyen Farm and promoting a green belt along the Doctor's Creek, Crosswicks Creek and other streams within the Township.*

The Lengyen Farm and several others in Hamilton Township were purchased through funding from the Green Acres Program. Many parcels within the study area were preserved through the Mercer County Farmland Preservation Program.

According to New Jersey Green Acres, the goal of the program is *to achieve, in partnership with others, a system of interconnected open spaces, whose protection will preserve and enhance New Jersey's natural environment and its historic, scenic, and recreational resources for public use and enjoyment.* The Green Acres Program was created in 1961 and funded through a bond issue program until 1999 when the Garden State Preservation Trust Act was signed. The Act established a more stable source of funding for preservation efforts. Program funding for state and local land acquisitions are available through the program.

The Township of Hamilton Open Space and Recreation Plan (2003) also supports the acquisition of undeveloped land and the preservation of farmland. Examples of successfully preserved Green Acres and Farmland Preservation Program farmland along the Doctors Creek within Hamilton Township include: the Doerler, Kim, Lengyen, Samu, Danch, and Hunt farms, which were preserved through or purchased by the state through the Green Acres Program and Mercer County Farmland Preservation Program. These parcels are illustrated on the study area map (See Map 4, Study Area West).

It is important to note that, although The Farmland Preservation Program does support trail opportunities on preserved farms where appropriate, trail easements need to be identified *prior* to preservation so that the land intended for trails can be excluded from the deed of easement. Once a farm is preserved, another easement cannot be conveyed granting access for trail purposes because it would violate the farmland preservation deed of easement.

Trail easements are in place for at least two farmland preserved parcels in Hamilton Township (e.g., Lengyen and Hunt farms) as Hamilton Township and the Mercer County Agriculture Development Board recommended it. However, this has not taken place for all farmland preserved parcels in Hamilton Township or in all parcels within the entire project area.

The Hamilton Township Open Space Plan also recommends protecting stream corridors, developing parkland for recreational uses, and providing for greenways along streams. Additional preserved parcels identified in the municipal open space plan include utility easements, linear park easements and other stream corridor easements. (See West Study Area, Map 4 & Appendix B, Table 6).

### ***Zoning & Environmental Performance Standards***

The Land Development Code of Hamilton Township (Chapter 160) addresses Zoning in the Township and contains a number of pertinent chapters including zoning districts, zoning maps, zoning regulations and design standards. The Township is divided into 23 Zoning Districts. Those Zoning Districts within the project area are noted in the table below.

**Table 2, Hamilton Township Zoning District Information**

<b>Zoning District</b>	<b>Notes</b>
Industrial District (I) <i>CSX Rail Line to route 156</i>	Zoning ( 1-2* acres) allows for the following principle permitted uses: office buildings, fabrication/manufacturing of a variety of metals and other products, professional scientific, wholesale trade distribution centers, food industry, freight forwarding, machine shops, and industrial parks (requires 2 acres)*.
Single Family Residential (R-10) <i>Route 156 to Groveville-Allentown Road</i>	Zoning (10,000 square feet) allows for the following principle permitted uses: detached single-family unites, public playgrounds and conservation areas, public recreational and community centers, public libraries, parks and playgrounds, horticultural uses, harvesting of wild crops, repair and maintenance farm buildings and machinery, and right to farm uses.

<b>Zoning District</b>	<b>Notes</b>
Single Family Residential (R-15) <i>Parcel abutting Groveville-Allentown Road &amp; South Broad Street</i>	See R-10 Zoning District (15,000 square feet)-Same district provisions to R-10, just larger minimum square area requirements.
Rural Resource Conservation (RRC) <i>Remaining Project Area to Upper Freehold Township/Monmouth County Border</i>	Zoning (40,000 square feet) allows for following principle permitted uses: farms, single family detached dwellings, public recreation/community center buildings and grounds, public libraries, parks and playgrounds, harvesting of wild crops, and conservation areas. Allows for lot averaging, open lands subdivisions and conservation cluster subdivisions.
Stream Buffer Conservation Overlay Zone (SBCZ) <i>Entire Segment</i>	Zoning (75 feet) - This overlay zone is further described below and allows for wildlife sanctuaries, nature preserves, forest preserves, fishing areas, game farms, fish hatcheries and fishing reserves, and passive areas of public and private parklands including unpaved hiking, bicycle and bridle trails.

The Land Use Regulations for Hamilton Township contain a number of pertinent articles and regulations including: land development, environmental impact, flood damage prevention, stormwater control, floodplains and stream buffers.

The flood plain regulations (Section 157-61) contain a variety of prohibited uses in the delineated floodplain zone including the placing, depositing or dumping any vehicles, solid waste, garbage, refuse, trash, rubbish or debris, the dumping or discharging untreated domestic sewage or industrial waste, either solid or liquid, the storage or disposal of pesticide, buoyant, flammable or explosives or hazardous materials in time of flooding or critical facilities such as schools, firehouses, nursing homes, hospitals and other typical life-support systems, including powerhouses and pumping stations.

Sections 157-62 of the floodplain ordinances prohibit structures and certain improvements in stream channels. Exceptions for stream excavation or improvements (e.g., stabilization) are included, but require Mercer County Planning Board and Township Planning Board approvals.

Some permitted uses within the floodway and flood fringe areas are allowed (Section 157-63 & 64) including structures, excavation or other improvement in connection with stream improvements and stabilization, as well as some residential improvements (e.g., lawns, play areas, playing fields). Again, these permitted uses may only take place with NJDEP, Mercer County Planning Board and Township Planning Board approvals.

Exceptions to this provision include: practices of soil husbandry and farming and recreational uses associated with nature of parks, wildlife preserves, play yards, picnic areas, golf courses and boat landings.

The stream buffer conservation zone (SBZA) provisions (Chapter 155) within the Hamilton Township Land Use Regulations are of particular interest as they may also impact the feasibility of a trail along the Doctors Creek. For instance, the SBCZ overlay zone provides for two classes of stream conservation zones (e.g., C-1 and C-2), and therefore affords protection above and beyond the designated zoning district and floodplain provisions.

The Doctors Creek is designated a Class 2 (C-2) stream conservation zone. C-2 stream conservation zones extend to 75 feet from the top of each bank at bank-full flow or from the maximum pool elevation or from the centerline of intermittent streams, or from the 100-year flood plain, whichever is greater. The width of the SBCZ zone is further extended where there are steep slopes (in excess of 15 percent).

Within the designated SBCZ, the area must remain in a natural condition, and no clearing or cutting of trees and brush is allowed. All subdivision and site plans must show the stream buffer, intended development in proximity, and it must be restricted by deed or conservation easement held by the township. A stream buffer management plan must be submitted and reviewed by the Planning Board.

### **Allentown Borough Open Space Planning, Open Space Land, and Land Use Regulations**

#### ***Planning & Open Space Efforts***

The trail feasibility project area (approximately 0.9 miles of Doctors Creek) in Allentown Borough begins at the municipal boundary with Upper Freehold Township where Breza Road crosses Doctors Creek. The study area continues through Allentown Borough, including parcels immediately or approximately adjacent to Doctors Creek, and to the municipal boundary of Upper Freehold Township just east of Allentown Lake (See Maps 4-5, Study Area West and Central).

The Allentown Borough Master Plan (1978, 1997 Reexamination Reports) identifies a number of goals and objectives intended to *preserve the small town character of the historic borough, to avoid undue fiscal burdens, preserve land for future open space, to generate commercial viability, and to have a reasonable land use mix, and to improve access to open space.* This plan, the Borough's Natural Resources Inventory (2003), and Open Space Plan (2003), all consistently recommend that the Doctors Creek Corridor be protected. Recently, the Doctors Creek-Crosswicks Creek Regional Greenway Plan was formally adopted as part of the Borough's Master Plan.

The Allentown Borough Open Space Plan (June 2003) supports the acquisition of undeveloped land and the preservation of farmland in order to *protect the Allentown historic greenbelt, address the diverse interests for environmental/historic/recreational protection, and make the best use of the considerable natural resources of the Borough.* The open space plan further notes the efforts of the CCDC Greenway Group, and particularly the desire of the Borough to preserve stream corridors for: surface water quality protection, future public recreational trail access (biking, hiking and multi-municipal trail system), and protection of historic vistas. Several parcels within the Doctors Creek to Assunpink Creek project area are preserved as open space including Heritage Park, Sensi Park and Allentown Lake (See Maps 4-5, Study Area West and Central, Appendix B, Table 6).

Additional land is identified in the open space plan for future easement or outright purchase, including land between Breza Road and Heritage Park *in preparation for the proposed Walnford to Washington Trail, to preserve steep slopes, and to protect ecologically significant stream corridor areas.* Additional parcels noted and in the project area include easements and outright purchases on properties along the Route 526 and Route 539 corridor entrances to Allentown Borough and property adjacent to Allentown Lake.

***Zoning & Environmental Performance Standards***

The Zoning Regulations of the Borough of Allentown (Chapter 115-1, Ordinance Number 015-78) contains a number of pertinent regulatory provisions including zoning districts, zoning maps, zoning regulations and design standards. The Borough is divided into five zoning districts including Residence District (R-140), Residence District (R-60), Residence District (R-85), Multi-Family District (R-135), and Business District (BD). An overview of some of the zoning provisions (Allentown Borough Zoning Map, July 1997) are noted in the table below.

**Table 3, Allentown Borough Zoning District Information**

<b>Zoning District &amp; Project Area Vicinity</b>	<b>Notes</b>
Residence District (R-40) <i>Upper Freehold Township Line to North Side of Main Street</i>	Zoning (4,000 square feet) allows for the following principle permitted uses: detached single family dwelling, agricultural/horticulture, greenhouses, sale of farm products, millinery and dress making, essential public services, municipal buildings, parks & playgrounds, and community residences for developmentally disabled.
Business District (BD) <i>North Side of Main Street and Conine's Mill Pond</i>	Zoning (4,000 square feet) allows for the following principle permitted uses: a variety of stores and services, printing shops, movie theaters, motor vehicle repair service stations,
Residence District (R-85) <i>South Side of Conine's Mill Pond</i>	Zoning (8,500 square feet): See R-40 District

The Allentown Borough Zoning and Land Development Code (November 2000) contains a number of provisions protecting natural resources and of particular interest as they might play a role or factor into the feasibility of a potential greenway trail along the Doctors Creek-Assunpink Creek.

The Zoning Code (section 32-4.8) also addresses preservation of natural features and prohibits structures within fifty feet (50') of the designated floodplain of any watercourses, requires an approved erosion and sediment control plan, and requires that existing natural features (e.g., trees, brooks, drainage channels and views) be retained.

### **Upper Freehold Township Open Space Planning, Open Space Land, and Land Use Regulations**

#### ***Planning & Open Space Efforts***

The trail feasibility project area (approximately 8.3 miles of Doctors Creek) in Upper Freehold Township begins at the municipal boundary with Hamilton Township to the western boundary of Allentown Borough, and continues east of Allentown Lake. The study area continues through Upper Freehold Township, and to the municipal boundary of Millstone Township (See Maps 4-5, Study Area West and Central).

The Township of Upper Freehold Master Plan (Land Use Element and Amendments 1994-95, 2002, 2003) clearly states that the overall mission is to *preserve land and maintain the rural agricultural character of the Township*. The mission statement notes the need to accomplish the following: maintain the rural and country atmosphere, preserve farmland to the maximum extent possible and in a manner that is equitable to the farmer, and to provide a sufficient amount of open space and appropriate facilities for a variety of passive and active recreational needs. The Township's natural resources protection policy documents consistently recommend the conservation of existing natural resources and environmentally critical and sensitive areas (e.g., wetlands, 100-year floodplains, steep slopes).

The Upper Freehold Township Open Space and Recreation Plan was adopted in 2000. Recommendations in that plan include working with organizations and agencies to acquire land and easements along stream corridors, supporting the development of rail-to-trail projects, and protecting water quality through the acquisition of environmentally sensitive land. As noted in the Crosswicks Creek/Doctors Creek Watershed Greenway Plan (2004), the Upper Freehold Farmland Preservation Plan contains an overall goal to acquire development easements on farms and to coordinate farmland preservation efforts with adjoining municipalities.

Strategies include increasing the farmland preservation/open space tax rate, using bonds to increase open space and preservation funds, using municipal appropriations to purchase development rights, encouraging municipal and non-profit organizations to participate in the development of easement programs, and coordinating with state agencies to obtain open space funding for farmland preservation.

Upper Freehold has been quite successful with implementing their open space and farmland preservation goals, and several parcels within the Doctors Creek to Assunpink Creek project area are preserved or are identified as areas to be preserved (See Maps 4-5, Study Area West and Central and Appendix B, Table 6).

**Zoning & Environmental Performance Standards**

The Township of Upper Freehold Land Use Regulations (Chapter 35, September 2005) contain a number of pertinent chapters including zoning districts, zoning maps, zoning regulations and design standards. There are eight zoning districts in the Township including Agricultural Residential (AR), Rural Agricultural (RA-5), Village Neighborhood (VN), Community Commercial (CC), Highway Development (HD), Research, Office & Manufacturing (ROM), General Industrial (GI), and Parks Education & Conservation (PEC). Optional development alternatives are provided via Single Family Cluster and Commerce Park Planned Development Regions within the Township.

The Township of Upper Freehold Zoning Map (September 2003) notes the following districts within the project area include (west to east):

**Table 4, Upper Freehold Township Zoning District Information**

<b>Zoning District &amp; Project Area Vicinity</b>	<b>Principal Permitted Uses/Notes</b>
Agricultural Residential (AR) <i>Allentown Lake to Imlaystown</i>	Zoning (3 acres) allows for the following principle permitted uses: detached, single family dwelling units, minimum 5 acre farms, conservation areas, parks, community residences, golf courses, churches, first aid company uses, single family clusters, commerce planned developments, quasi public uses, public utilities, agricultural preservation subdivisions, & farmland/open space conservation subdivisions.
Village Neighborhood (VN) <i>Imlaystown Historic District</i>	Zoning ( 5 acre farms, .25 acres single family home, .50 acres offices/shops/childcare centers/churches ) allows for the following principle permitted uses: detached single family dwelling units, farms conservation areas and parks, community residences, professional offices, retail shops, personal service shops, churches, quasi public uses, child care centers, residential flats, and commerce park planned developments.

<b>Zoning District &amp; Project Area Vicinity</b>	<b>Principal Permitted Uses/Notes</b>
Parks, Education & Conservation (PEC) <i>Clayton Park &amp; Vicinity</i>	Zoning (3 acre homes, 5 acre farms) allows for the following principle permitted uses: detached single family homes, farms, conservation areas and parks, schools, and cellular antennas.
Agricultural Residential (AR) <i>Main Stem and Tributary Parcels North of Route 526 and south of I- 195</i>	See AR Description Noted Previously
Rural Agricultural (RA-5) <i>Tributary Parcels North of I- 195 Bordering Assunpink Tributaries and Assunpink WMA</i>	Zoning (5 acre) is similar to AR district, but does not allow golf courses, churches, first aid company uses, quasi-public uses, public utilities, or farmland/open space conservation subdivisions.

The design standards for Upper Freehold Township contain regulations guiding building appearance, stormwater management drainage facilities, driveways, fences and walls, fire protection, landscaping and buffer screening, lighting, lot configuration and suitability for intended use, off street parking, performance standards for all uses, public utilities, sanitary sewerage systems, septic systems, signs, streets, curbs and sidewalks, swimming pools, water supply facilities, natural features preservation, and easements on private property.

The Natural features preservation and easement provisions within the Upper Freehold Township Land Use Regulations are of particular interest as they may impact the feasibility of a potential greenway trail along the Doctors Creek-Assunpink Creek. For instance, natural features preservation regulations (Section 35-510) specifically address the protection of trees, hilltops, scenic vistas, natural terrain, open waters, and natural drainage ridge lines.

Avoiding development impacts to critical areas must be demonstrated by all land development applicants. This section (Section 35-510) is cross-referenced with the conservation easement provisions contained within the land use regulations.

The Land Use Regulations (Easements on Private Property) address conservation and other easements (e.g., drainage ways, sight triangles) that may be required by the Township in order to protect public health safety and welfare. In particular, conservation easements may be required by the Planning Board or the Zoning Board of Adjustment in order to preserve critical areas (e.g., aquatic buffers and/or the natural, scenic, aesthetic or historic value of the land). These include conservation easements upon areas of freshwater wetlands, 100-year floodplains and/or lands with a topographic slope fifteen percent (15%) and greater.

The Doctors Creek Stream Corridor, and other stream corridors identified by Monmouth County, are specifically noted (Section 35-504 D) as well as required easement dimensions (e.g., width coinciding with the extent of the 100-year floodplain or 100 feet from the top of bank). The easement regulations further specify provisions associated with plan review, maintenance and monitoring access, and other items. The Land Use Regulations contain a critical areas map that illustrates freshwater wetlands, steep slopes and the 100 year floodplain on parcels throughout the Upper Freehold Township project area.

### **Millstone Township Open Space Planning, Open Space Land, and Land Use Regulations**

#### ***Planning & Open Space Efforts***

The Main Stem Doctors Creek becomes two secondary tributaries of the Doctors Creek in Millstone Township. Therefore, the trail feasibility project area (approximately 5.5 miles) includes those parcels along the two secondary tributaries north of Route 526 from the municipal border with Upper Freehold Township. The project area continues north east and follows the two secondary tributaries as well as the Millstone Creek Greenway Trail (“Assunpink Trail”) up to the point where the proposed trail meets the Assunpink Creek Wildlife Management Area (See Map #3, East Tax Parcels).

The Greenway Trail (Millstone Township Proposed Greenway) is really a proposed loop trail that could potentially connect the Doctors Creek with the Assunpink Creek Wildlife Management Area. This particular trail loop is part of a larger greenway trail system proposed for the entire municipality. It is further discussed in Section 6 of this study.

The Master Plan, Township of Millstone (September 2002) includes a number of background studies as well as Natural Resources and Open Space Elements. Clearly stated principles, objectives, policies and standards within the Master Plan include the following:

- The rural character of Millstone Township should be maintained,
- A Township network of permanently preserved open spaces and farmland is needed for public recreation, biodiversity, water quality protection, flood control and conservation of significant resources, and
- Protecting the exceptionally high water quality resources as the township includes a convergence zone for nine watershed basins.

The Township’s natural resources protection policy documents consistently recommend the conservation of parks for outdoor recreation, farmland, open space, environmentally critical lands and natural resources.

The Millstone Township Open Space, Recreation and Preservation Plan was adopted in 2001 and incorporated into the Master Plan in 2002. Recommendations in that plan include acquiring land for public access (community parks and recreational areas), preserving natural areas (e.g. upland woodland areas), and establishing a system of greenways that link public parks and conserve the natural/historic environment.

The plan identifies a greenway trail and bridle path network, portions of which are located in the trail feasibility study area. The plan recommends that the township amend their land development ordinance to require private properties to dedicate 15' wide easements along their property lines for only equestrian use. Portions of the proposed greenway trail are indicated on the map (Map 3, Eastern Tax Parcels). The plan further recommends the development of a Doctors Creek Linear Park for an 11.4 linear mile region running from the border of Upper Freehold to Red Valley in Millstone. The County and the Township are working together as lead agencies on this effort.

The Millstone Township Natural and Environmental Resources Inventory (April 2006) contains a comprehensive overview of land use, wetlands, vegetation, wildlife, threatened and endangered species, critically sensitive areas, existing contaminated sites, surface water, groundwater, soils, sewage disposal systems, wells, climate, air quality, and open space/conservation easements/horse trail network areas.

Millstone Township has had success toward implementing their open space and farmland preservation goals, and several parcels within the Doctors Creek to Assunpink Creek project area are preserved or slated for preservation (See Map Maps 6-7, Study Area East and North & Appendix B, table 6).

### ***Zoning & Environmental Performance Standards***

The Township of Millstone Land Use and Development Regulations (Chapter 35) contain a number of pertinent chapters including zoning districts, zoning maps, zoning regulations and design standards. There are 13 zoning districts in the Township including Rural Preservation (RU-P), Rural Conservation (RU-C), Rural Environmental (R-170), Rural Residential (R-130), Rural Residential (R-80), Residential (R-20), Neighborhood Commercial (NC), Highway Commercial (HC), Highway Commercial (HC-1), Planned Commercial Development (PCD), Business Park (BP), Recreation Camp (RC), and a Flood Hazard and Stream Corridor Overlay (FHSC).

The Main Stem Doctors Creek becomes two secondary tributaries of the Doctors Creek in Millstone Township. The zoning districts described below span the two tributaries as well as the Millstone Township Greenway Trail ("Assunpink Trail Loop"), and tributaries to the Assunpink Creek within the feasibility study area.

The Township of Millstone Zoning Map (May 2003) notes the following districts within the Doctors Creek-Assunpink Creek Trail Feasibility study area include (west to east):

**Table 5, Millstone Township Zoning District Information**

<b>Zoning District &amp; Project Area Vicinity</b>	<b>Principal Permitted Uses/Notes</b>
Flood Hazard & Stream Corridor Overlay (FHSC) <i>Doctors Creek &amp; Assunpink Creeks and Tributaries</i>	This overlay zone allows for the following principle permitted uses: wildlife sanctuaries, woodland preserves, arboretums, game farms, fish hatcheries, fishing reserves, hiking/bicycle/bridal trails, trails or pathways, fishing areas, cultivation of the soil for agriculture, horticulture etc.
Rural Preservation (RU-P) <i>Portions of Greenway Trail Loop South and North of I-195 &amp; Assunpink WMA</i>	Zoning (10 acres) allows for the following principle permitted uses: farms and farm buildings, non-farm stables, detached dwellings, family day care homes, public playgrounds/conservation areas/parks/open space, firehouse and rescue squad buildings.
Rural Residential (R-130) <i>Portions of Greenway Trail Loop South of I-195</i>	Zoning (130,000 square feet) allows for the following principal permitted uses: detached dwellings, farms and farm buildings, non-farm stables, family day care homes, public and quasi-public outdoor parks and facilities controlled by a government.
Business Park (BP) <i>Portion of Eastern Greenway Trail Loop North of I-195</i>	Zoning (130,000 square feet) allows for the following principal permitted uses: storage warehouse and distribution centers, scientific and research laboratories, manufacture of beverages, fabrication/manufacturing/processing/assembly for goods and materials, finishing/assembly of articles, quasi-public buildings for assemblies, farms and agriculture, corporate offices and business centers, banks and financial institutions, and child care centers.
Rural Environmental (R-170) <i>Portion of Western Greenway Trail Loop North of Yellow Meeting House Road</i>	Zoning (170,000 square feet) allows for the following principal permitted uses: farms and farm buildings, non-farm stables, detached dwellings, and family day care homes
Neighborhood Commercial (NC) <i>Portion of Greenway Trail Just South of Assunpink WMA</i>	Zoning (40,000 square feet) allows for the following principal permitted uses: retail trade and service trade establishments serving surrounding residential area.

The FHSC Flood Hazard and Stream Corridor Overlay Zone (Article 5-16) provisions within the Millstone Township Land Use and Development Regulations are of particular interest as they might impact the feasibility of a potential greenway trail along the Doctors Creek-Assunpink Creek Trail.

The article provides for a significant amount of protection for all streams and corridors and also allows for trails and paths. For instance, the Planning Board may allow an average stream corridor buffer width of one hundred feet (100') from the one hundred (100) year flood line.

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This width may be reduced to a minimum of seventy-five feet (75') from the flood line provided there is an equivalent increase in width elsewhere on the site. Some activities are permitted where there is no "reasonable or prudent" alternative. The Planning Board may also require conservation easements or deed restrictions ensuring that there will be no further intrusion on the stream corridor. The applicant must illustrate the one hundred (100) year flood line, wetland boundaries, stream corridor buffer boundary, steep slopes and the location of all improvements and land disturbances.

The Design and Performance Standards and Construction Specifications (Article 11) also contain regulations that might assist with the implementation of the Doctors-Assunpink Trail. For instance, the easements and wildlife corridor provisions (Article 11-13) were adopted in 1996 allowing the Planning Board to require conservation easements in areas deemed "valuable" (e.g., scenic vistas, open space, historic areas, significant soils, steep slopes, tree preservation watercourses, wildlife or to eliminate noise).

In addition, the dedication of strips of land (a minimum of 15' wide around the interior perimeter of all or portions of a subdivision tract as wildlife corridor), and to develop a series of horse trails within the Township (a minimum of 15' wide, around the perimeter of all or portions of a subdivision or a site plan tract are also required. All easements and corridors must be indicated on development plans and dedicated to the Township.