

**WHITE CLAY CREEK & ITS  
TRIBUTARIES**



*WILD AND SCENIC RIVER STUDY*

DRAFT REPORT

SEPTEMBER 1999

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Prepared By:

*Wild and Scenic Rivers Program*

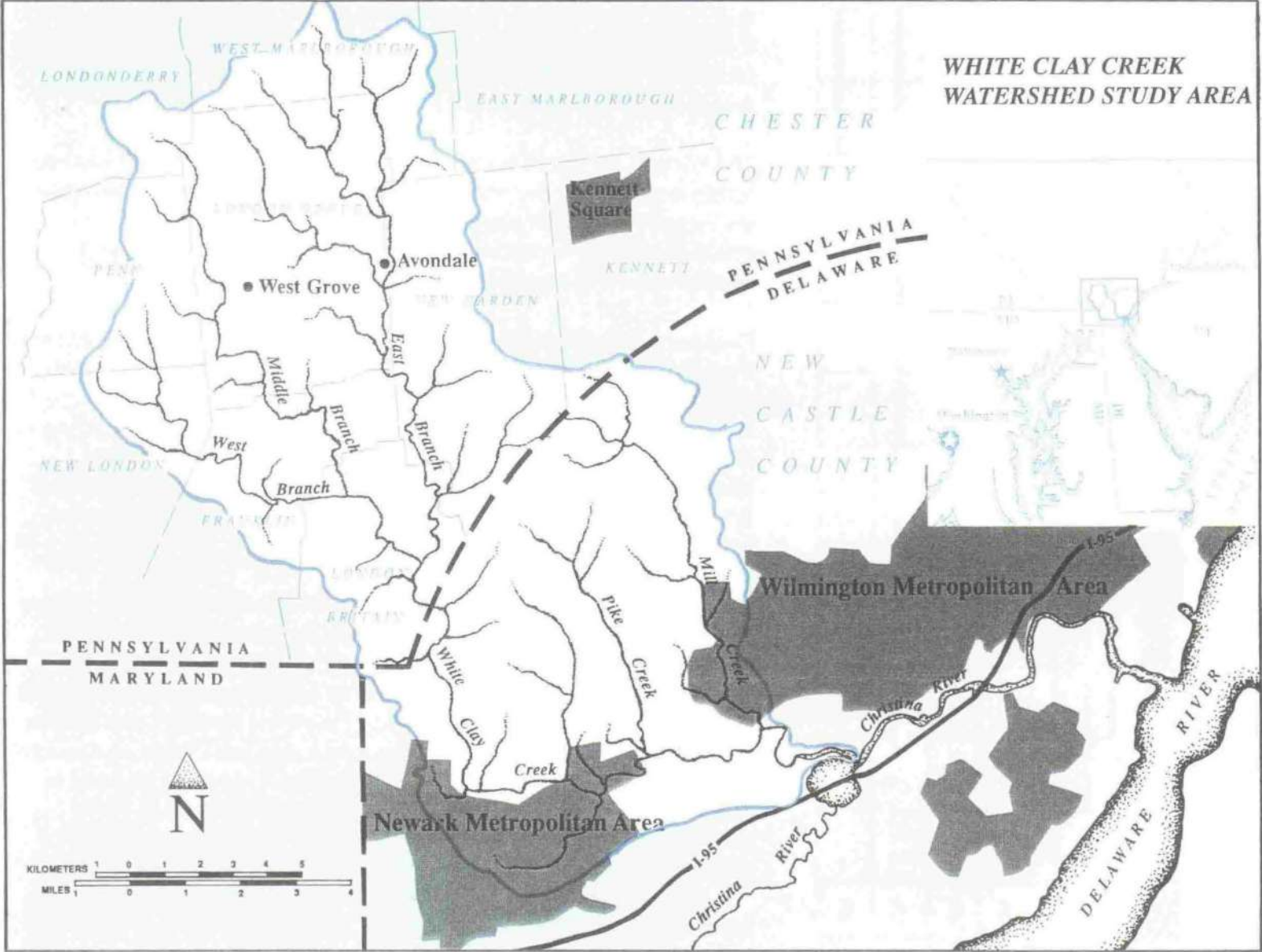
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*National Park Service*

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## **EXECUTIVE SUMMARY**

The White Clay Creek drains more than 69,000 acres in southeastern Pennsylvania and northwestern Delaware. For most of its course the creek runs through the rolling Piedmont region, dropping over the fall line to the Atlantic Coastal Plain near Newark before veering eastward to empty into the Christina River. Normal rainfall supplies enough water to support a mature deciduous forest and an extensive freshwater tidal wetlands system downstream. Its underlying stratum of Cockeysville marble marks the White Clay Creek watershed as an important source of drinking water.

The White Clay Creek watershed is one of only a few relatively unspoiled river systems remaining in the highly congested and developed corridor between Philadelphia and Newark, Delaware. The stream itself features forest-flanked steep banks and cobble-bottomed beds in some places, and dramatic gorges cleaving low-lying floodplain in others. In general, as the stream moves south and eastward, its landscape evolves from successional meadows to agricultural fields and forested ridges, to large blocks of mature forest broken up by stretches of suburban and urban development.

A sweeping range of uses - from urban through suburban to rural - characterizes the watershed as a whole. Close to a million people reside within the counties in which the watershed is located. Located right on the busy Northeast transportation corridor, the watershed can be reached in two hours or less by at least eight million people.

Concerned about the future of the White Clay Creek watershed, interested citizens and organizations requested that the creek and its tributaries be considered for inclusion in the National Wild and Scenic Rivers System. Responding to those concerns, Congress amended the National Wild and Scenic Rivers Act (P.L. 90-542) to authorize a study of the White Clay Creek and its tributaries. The amendment directed the National Park Service to determine the eligibility and suitability of the White Clay Creek and its tributaries for inclusion in the National Wild and Scenic Rivers System. The amendment also directed the National Park Service to develop a management plan for the area in consultation and cooperation with state, county and local governments and affected landowners, prior to designation of the river.

This document presents the results of the White Clay Creek study. It summarizes the extensive resources associated with the White Clay Creek watershed, the White Clay Creek Watershed Management Plan, and the eligibility and suitability of the study segments for National Wild and Scenic River designation.

### **The National Wild and Scenic Rivers Program**

The National Wild and Scenic Rivers Program is designed to provide river protection through the combined efforts of private landowners and other citizens, river-related organizations, and all levels of government. (In the case of White Clay Creek, the area to be studied for protection was designated as the creek and its tributaries, collectively referred to in this document as the 'White Clay Creek watershed.')

Emphasis is given to cooperative actions to protect resource values. Designation does not open private lands to public access, nor does it usually affect existing uses of private property. Once designated, the river receives permanent protection from federally-licensed



or assisted dams, diversions, channelizations, and other water resource projects that would have direct and adverse effects on its free-flowing condition or outstandingly remarkable resources.

### **Eligibility and Suitability**

For a river to be designated into the National Wild and Scenic Rivers System, it must be found both "eligible" and "suitable." To be eligible, the river must be (1) free flowing and (2) possess at least one "outstandingly remarkable" resource value as determined by the professional judgment of the study team, such as high quality scenery, recreational opportunities, geologic features, fisheries and wildlife, historic sites or cultural resources. Rivers that are found "eligible" are then given a proposed classification as either "wild," "scenic," or "recreational," depending on the amount of development and human presence along the river.

Determining suitability requires an evaluation of: first, whether an eligible river would be an appropriate addition to the national system; second, whether national wild and scenic designation is an appropriate element of long-term management for the river; and finally can the river and its outstandingly remarkable resources be protected. In other words, does national wild and scenic designation make sense for the river in question?

### **Watershed Management Framework**

The White Clay Creek Watershed Management Plan recognizes that the watershed is embedded in the fabric of its surroundings and is subject to influences from many precincts of its setting. Therefore, it cannot be wisely managed through the use of traditional wild and scenic river strategies that concentrate on a narrow corridor. This sensitive aquatic environment needs a broader approach, one that considers its complex network of streambeds and diverse settings as a coherent system. The management plan was designed using that approach.

Using a two-tier approach to the management of the White Clay Creek watershed that acknowledges both the importance and preference for local leadership, and the additional protection afforded by wild and scenic river designation, the plan is driven by the following carefully-considered goals:

- Improve and conserve water quality and water quantity
- Conserve open space, woodlands, wetlands and geologic features
- Protect native plant and animal species.
- Preserve cultural, historical and archaeological sites
- Enhance outdoor recreation opportunities
- Encourage environmental education and outreach

A key principle of the administrative framework created for the plan is that existing institutions and authorities will play primary roles in the long-term protection of the White Clay Creek



watershed. To bind together the diverse interests of municipalities, counties, states and federal agencies, together with private organizations and landowners, the plan proposes the creation of a White Clay Creek Watershed Management Committee. The committee would be supported by a National Park Service employee (or employees) serving as coordinator and as liaison among the committee, and the state and local agencies and organizations that participate in its activities. Should the White Clay Creek and its tributaries be designated into the national system, the Watershed Management Plan proposes they be administered by the Secretary of the Interior in cooperation with the states, counties and municipal authorities that comprise the White Clay Creek Watershed Management Committee. Through this partnership approach, the federal government would retain responsibility for ensuring federal water resource projects do not impair the rivers' free-flowing character or outstanding resources, while the state, county and municipal governments retain their existing land use authorities.

### **Public Involvement in the Study**

A Study Task Force representing watershed interests including state, county and local governments along with landowners and various citizen organizations was formed in 1992 to work cooperatively with the National Park Service on the study and the development of the watershed management plan. In the spring of 1994, the White Clay Creek Task Force sent a survey to nearly 3,000 landowners within the watershed. The purpose of the survey was to learn about landowner attitudes concerning recreational, historical, and natural resources of the White Clay Creek watershed area and to elicit their feelings in regards to the future of the Creek and its tributaries.

Results from the survey indicated strong support for protecting the watershed's natural, historic, and recreational resources. In fact, 89.4% of those who returned the survey said they would support land use regulations and programs to conserve and protect the watershed. While 87.7% want to discourage aggressive development of the area, 55% feel that there must be room for planned residential, commercial, and industrial growth.

### **Study Recommendation**

*A total of 191 miles, 24 miles classified as scenic and 167 miles classified as recreational, of the White Clay Creek and its tributaries were deemed eligible and suitable for designation into the National Wild and Scenic River System.* The following descriptions more accurately describe those segments recommended for designation and their classifications:

*All second-order streams as depicted on the Recommended Designated Area Map (see Appendix) including: 40.2 miles of the main stem of the White Clay Creek along with its tributaries, from the confluence of the East and Middle Branches in London Britain Township, Pennsylvania downstream to its confluence with the Christina River in New Castle County, Delaware, 27.5 miles classified as recreational and 12.7 miles that flow through the boundaries of the White Clay Creek Preserve and the White Clay Creek State Park classified as scenic; 49.9 miles of the East Branch along with its tributaries, 45.9 miles classified as recreational and 4 miles that flow through the boundaries of the White Clay Creek Preserve classified as scenic; 17.2 miles of the West Branch along with its tributaries, classified as a recreational river; 23 miles of the Middle Branch along with its tributaries, 20.9 miles classified recreational and 2.1 miles that flow through the White Clay Creek Preserve as scenic; 6.5 miles of Middle Run along with its*

*tributaries, 1.3 miles classified as recreational and 5.2 miles that flow through the Middle Run Natural Area as scenic; 15.6 miles of Pike Creek along with its tributaries, classified as recreational; and 38.7 miles of Mill Creek along with its tributaries, classified as recreational.*

**The following segments of the White Clay Creek and its tributaries were deemed eligible but not suitable for inclusion in the National Wild and Scenic River System:**

Lamborn Run ( along with the properties on which the intake structures and pipelines for the Thompson Station Reservoir will be located; Lamborn Run will remain unsuitable until such time as it is removed from the Delaware River Basin's Comprehensive Plan as a potential reservoir location); the East Branch from the point at which it enters New Garden Township at the Franklin Township line, approximately 10,500 feet, to the point at which it exits New Garden Township at the London Britain Township line; Egypt Run and its unnamed tributary; the East Branch within the Borough of Avondale, 500 feet north of the Avondale wastewater treatment facility and south of the Avondale wastewater treatment facility to the London Grove Township line; and the properties on which are located the surface water intakes, water treatment and wastewater treatment facilities of the City of Newark and United Water Delaware and the Borough of West Grove and Avondale; Churchman's Marsh is deemed not suitable until such time as it is removed from the Delaware River Basin Commission's Comprehensive Plan as a potential reservoir location.

All fifteen of the affected municipalities and counties have passed resolutions supporting the White Clay Creek Watershed Management Plan and the proposed designation of the White Clay Creek and its tributaries, as recommended within the Watershed Management Plan, into the National Wild and Scenic Rivers System, with exceptions as noted in the resolutions. (See Appendix for resolutions.)

## **SECTION I: INTRODUCTION AND STUDY BACKGROUND**

The White Clay Creek watershed is renowned for its scenery, opportunities for birding and trout fishing and for its historic features. The watershed is also an important source of drinking water for residents in both Pennsylvania and Delaware.

The proximity of the Philadelphia and Wilmington-Newark metropolitan areas, however, is having an impact on the watershed. There are more findings of pollution, fewer migrating birds, and receding forests. Because the White Clay Creek flows through two different states, two counties, and more than a dozen boroughs and townships, concerned citizens turned to the federal government. In 1991, citizens of the White Clay Creek area requested that the creek and its tributaries be considered for inclusion in the National Wild and Scenic Rivers System.

Responding to the concerns of local interests, Congress amended the National Wild and Scenic Rivers Act (P.L. 90-542) to authorize a study of the White Clay Creek and its tributaries. The amendment directed the National Park Service to determine the eligibility and suitability of the White Clay Creek and its tributaries for inclusion in the National Wild and Scenic Rivers System. The amendment also directed the National Park Service to develop a management plan for the area prior to designation of the river.

This report summarizes the work performed pursuant to the authorization by Congress to study White Clay Creek and its tributaries and the conclusions that were reached. It also makes recommendations for further action based on the information that was collected and analyzed.

### **WILD AND SCENIC RIVERS ACT**

Enacted in 1968, the National Wild and Scenic Rivers Act (P.L. 90-542) was created to balance long-standing federal policies promoting construction of dams, levees, and other river development projects with one that would permanently preserve selected rivers, or river segments, in their free-flowing condition. Section 1(b) of the Act states, in part:

*It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.*

The original Act designated eight rivers into the National Wild and Scenic Rivers System, and specified two processes by which other rivers could be added to the system. The more frequently used process involves a formal study authorized by Congress followed by a legislative designation through an Act of Congress. The second process calls for designation as "wild, scenic or recreational" by the legislature of the State or States through which the river flows followed by an application of the Governor(s) of the State(s) to the Secretary of Interior for approval. The study and designation process used for the White Clay Creek and its tributaries is an example of the former process - that is, the legislative or "congressional" route.

As of November 1996, one hundred fifty four rivers or river segments, totaling 10,815 river miles, had been included in the national system. Of the designated segments, only three are located in Pennsylvania: the Upper and Middle Delaware, the Allegheny and the Clarion. There are no designated segments in Delaware.

Under Section 7 of the Act, each river designated into the national system receives permanent protection from federally-licensed or assisted dams, diversions, channelizations and other water projects that would have a direct and adverse effect on its free-flowing condition and special resources. The term "federally-assisted" includes projects requiring any type of license, permit, grant, loan, or other assistance from the federal government. The Wild and Scenic Rivers Act explicitly prohibits any new dam or other project licensed by the Federal Energy Regulatory Commission (FERC) on or directly affecting a designated river segment, and requires that all other proposed federally-assisted water projects in the area be evaluated for their potential impacts on the river's special features. Any project that would result in adverse effects to the designated segment is precluded under the Act.

The same protection is provided on a temporary basis for rivers that are under formal, legislatively authorized study for potential addition to the national system. The interim protection remains in place from the date of study authorization until Congress makes a decision on whether or not to designate the river into the national system, or until three years after a final study report is transmitted to Congress by the President, whichever comes first.

### **Requirements for Designation**

For a river to be designated into the National Wild and Scenic Rivers System, it must be found both "eligible" and "suitable." To be eligible, the river must be free flowing and possess at least one "outstandingly remarkable" resource value, such as high quality scenery, recreational opportunities, geologic features, fisheries and wildlife, historic sites or cultural resources. Rivers that are found "eligible" are then given a proposed classification as either "wild," "scenic," or "recreational," depending on the amount of development and human presence along the river.

Determining whether a river is "suitable" for designation is more complicated than the relatively straight forward resource assessment required to evaluate eligibility. Essentially, suitability is an evaluation of: first, whether the importance of protecting natural, cultural and recreational resource values outweighs other potential uses of the river; and second, whether national wild and scenic designation is an appropriate element of long-term management for the river. In other words, does national wild and scenic designation make sense for the river in question?

For rivers flowing through predominantly private lands and for which federal land acquisition and land management are not envisioned as part of the long-term scenario, there are several distinct issues that must be addressed in the suitability analysis. These include:

*Protection:* Are there adequate mechanisms in place to provide lasting protection for the river's outstanding values without the need for federal land acquisition and management (if those existing mechanisms are complemented by the instream protection provided by national wild and scenic designation)? These protective mechanisms may include: municipal, county, state, and federal laws and regulations; land owned by individuals, governmental bodies or private organizations that are legally dedicated for conservation purposes; and either natural limitations (e.g., adjacent

wetlands or steep slopes) or man-made features (e.g., roads and railroad corridors) that create physical barriers to shoreland development.

*Support:* Is there demonstrated support for river protection and for national wild and scenic designation, as well as a commitment to participate in long-term management, among the major river interests (e.g., adjacent communities, county government, state government, elected officials, conservation organizations, residents and landowners, regional authorities, river users and business interests)?

*Management:* Is there an existing or proposed management framework that will bring those key river interests together to work toward the ongoing protection of the river?

*Efficiency:* For the river in question, national wild and scenic river designation must be an appropriate and efficient river conservation tool.

## **BACKGROUND TO WHITE CLAY CREEK STUDY AND MANAGEMENT PLAN**

On December 11, 1991, President Bush signed into law the White Clay Creek Study Act (P.L. 102-215). Congress directed the National Park Service to prepare the study, including the recommended management plan, in cooperation with appropriate state and local governments and affected landowners and other interests. The evaluation was to include the creek and its tributaries. The National Park Service infers, therefore, that the entire watershed should be included in the study area.

### **General Description: White Clay Creek Watershed and Population**

The White Clay drains more than 69,000 acres in southeastern Pennsylvania and northwestern Delaware. A great deal of sediment from the rolling hills of Chester County, Pennsylvania, is eroded by water and other forces and is carried into the White Clay, probably accounting for the creek's name. For most of its course the creek runs through the rolling Piedmont region, dropping over the fall line to the Atlantic Coastal Plain near Newark before veering eastward to empty into the Christina River.

Normal rainfall (averaging 44 inches per year) supplies enough water to support a mature deciduous forest and an extensive freshwater tidal wetlands system downstream. Its underlying stratum of Cockeysville marble marks the White Clay Creek watershed as an important source of drinking water. The marble layer supports a high yielding aquifer, which also supplies continuous and relatively high base flows in the stream.

The stream itself features forest-flanked steep banks and cobble-bottomed beds in some places, and dramatic gorges cleaving low-lying floodplain in others. In general, as the stream moves south and eastward from the upland regions in the north to the Christina River, its landscape evolves from successional meadows to agricultural fields and forested ridges, to large blocks of mature forest broken up by stretches of suburban and urban development.

A sweeping range of uses - from urban through suburban to rural - characterizes the watershed as a whole; patterns of use include residential, commercial, office, industrial, institutional, agricultural,

utilities and others. Development in the Pennsylvania portion of the watershed is largely rural with a few small towns and villages and some suburban clusters. In the Delaware portion, the City of Newark and suburbanization characterize much of the watershed, but by contrast, several large tracts of public open space flank the river in this state as well.

Some 95,000 people actually live in the White Clay Creek watershed. The watershed encompasses a portion of the City of Newark (population 27,500), and it neighbors Wilmington (estimated population 70,000). Close to a million people reside within the counties in which the watershed is located. The July 1990 census enumerated 376,396 people in Chester County, Pennsylvania (projected 2020: 489,300); and 441,947 (projected 2020: 539,503) in New Castle County, Delaware. Located right on the busy Northeast transportation corridor, the watershed can be reached in two hours or less by at least eight million people.

### **Study Goals**

Based on the study background and legislative directive, the National Park Service had two major goals:

- (1) To determine whether the White Clay Creek and its tributaries are eligible and suitable for addition to the National Wild and Scenic Rivers System, and, if so, whether national wild and scenic river designation is an appropriate protection tool for the White Clay Creek watershed; and
- (2) To assist local communities in preparing and implementing a watershed conservation plan that protects the watershed's special qualities, regardless of whether wild and scenic designation proved to be the recommended outcome of the study.

In accordance with legislative directives, wishes of study area communities, and established NPS policies for wild and scenic studies of "private land" rivers, the study included the following elements:

- (1) A strong emphasis on grassroots involvement and consensus-building in determining whether the creek and its tributaries were suitable for designation and how they should be managed;
- (2) The development of the "comprehensive watershed management plan" specified in the Act during the study rather than after designation. This watershed management plan relies on private, municipal, county, and state conservation measures rather than federal land acquisition and direct management to protect the watershed's outstanding resources, and was the product of close collaboration among NPS, the Study Task Force, and local and state governments; and
- (3) A commitment to the study area communities that federal designation would only be recommended if strong support was expressed through passage of support resolutions by the affected municipalities. Municipal resolutions were requested after completion of the Watershed Management Plan in order to ensure the clarity of what was being proposed.

## **Watershed Approach**

Until the White Clay Creek study, the approach to river conservation through national wild and scenic designation relied on studying and designating a narrow corridor of land surrounding a river, not exceeding more than 320 acres per river mile. This kind of approach does not account for the variety of influences beyond the corridor limits that have profound impacts on river resources, such as non-point sources of pollution. The White Clay Creek study took a different approach by recommending the national designation of all of the second order or higher streams within the watershed, in conjunction with the development of a watershed management plan which would address issues beyond the designated area.

A watershed or drainage basin is the entire area of land that drains water, sediment and other dissolved materials to a common point or outlet. Most often this common point is the confluence of one stream with another. The defining point for the White Clay Creek watershed is the confluence of White Clay Creek and the Christina River. Further, it is possible to define multiple subwatersheds within one large drainage basin. This was done for the purpose of this study.

From a river planning perspective, the watershed is the best physical characteristic for defining a study area because it encompasses an area large enough to include all of the possible land uses that might affect a stream system. Watersheds are also extensive enough to be able to analyze all of the natural elements and resources which critically affect the health and functioning of aquatic ecosystems, such as geologic formations and wetlands. To study an entire watershed is, in effect, to identify all of the natural and man-made forces that affect the water that flows through the system. In defining the watershed as the study area for the White Clay Creek, the National Park Service recognized that a management plan derived by studying a watershed would lead to more comprehensive and holistic protection of the river system.

Many specific features of the White Clay Creek watershed were also instrumental in authorizing a watershed approach for this study. The White Clay Creek watershed is one of only a few watersheds remaining in the highly congested Philadelphia metropolitan area which still maintains a host of river resource values. Situated on the fringe of the urbanizing corridor between Newark, Delaware and Philadelphia, the White Clay Creek watershed plays a critical role in: supplying safe and reliable drinking water for the region; providing a haven for pursuing many recreational activities, including fishing, canoeing, bicycling, bird-watching, hiking, mountain biking, and hunting; maintaining stable populations of neotropical migrating birds by providing extensive interior forest habitat and nesting sites; and sustaining a vast interconnected network of aquatic, riparian, successional and forest ecosystems. Understanding these watershed roles, and the natural and human systems that support them, is key to planning for resource management, conservation, and protection.

## **Study Timeline**

In January 1992, the initial Study Task Force was established and began work on the study. As a first step the National Park Service held public meetings to describe the study process and to seek additional volunteers for the Study Task Force. Ultimately, over 100 individuals became members of the Study Task Force, including watershed residents; landowners; representatives of private organizations; and representatives of local, county, state and federal governments. The group was



charged with overseeing the preparation of a management plan, and with creating a forum for broad public involvement in which participants could voice opinions and suggestions, exchange ideas and proffer recommendations. To facilitate its work, the Study Task Force established an advisory committee through which it communicated with the National Park Service.

As a way to bind the governmental units together in common purpose, the NPS, along with the Commonwealth of Pennsylvania, the State of Delaware, Chester County, Pennsylvania, and New Castle County, Delaware, and the thirteen affected municipalities, entered into a Memorandum of Understanding. All parties agreed to cooperatively work to complete the study and to conduct the study with broad public involvement, and to stimulate the best possible exchange of ideas in the decision-making process.

To allow in-depth analysis of important resources, and to focus potential management issues, the Study Task Force organized itself into subcommittees. The subcommittees were Natural Resources; Water Resources; Cultural Resources; Education; Land Use; Recreation; and Management, Governance and Funding. Public workshops were held in both Pennsylvania and Delaware. News articles and fact sheets stimulated participation in the workshops.

These sessions highlighted for the subcommittees the issues that mattered most to residents and policymakers in the watershed, and they yielded valuable information and insights members would not otherwise have had. The subcommittees' research and findings support the statements and recommendations made in the Watershed Management Plan.

After the subcommittees had completed their studies, meetings and reports, the Study Task Force organized a Management Planning Committee to develop a Watershed Management Plan. Work commenced in 1995.

Over the course of the study the National Park Service, in conjunction with the Study Task Force, issued the following reports:

*Resources and Issues Report (September 1994),*

*Landowner Survey (November 1994),*

*Draft Eligibility and Classification Report (November 1994),*

*Draft Management Goals and Actions (November 1994),*

*Draft Watershed Management Plan (October 1997),*

*Final Watershed Management Plan (May 1998).*

## **Public Involvement: Summary of 1994 Landowner Survey and 1997 Public Review of Draft Watershed Management Plan**

### ***Landowner Survey***

In the spring of 1994, the White Clay Creek Study Task Force sent a survey to nearly 3,000 landowners within the watershed (see Appendix). The purpose of the survey was to learn about landowner attitudes concerning recreational, historical, and natural resources of the White Clay Creek watershed area and to elicit their feelings in regards to the future of the Creek and its tributaries. Landowners who received a survey were chosen at random by computer based on property tax records. Landowners who did not own property along the White Clay Creek or one of its tributaries were not eliminated from the survey. The Study Task Force decided that the opinions of all watershed landowners were important to the development of a watershed management plan. The Study Task Force believed that since the use of all of the land within the watershed has an influence on the quality of the White Clay Creek the survey should not be limited to those who own creek-front property. In addition, many local residents beyond those who own property along the White Clay Creek utilize its resources.

The questionnaire was comprised of 15 multiple-choice questions and two open-ended questions. Of the latter, the first asked for a list of any cultural or historic resources or sites within the watershed that should be conserved, while the second allowed for general comments.

Of the 2,936 questionnaires mailed, 54 were undeliverable. Of the remaining 2,882 legitimate surveys, 351 were completed and returned. This is a response rate of just over 12%, which is considered a good initial response. Just over half of the respondents were from Pennsylvania. Some 75% said that they use their property as their primary residence. And 25% indicated that they own property on the White Clay Creek or one of its tributaries.

Results from the survey indicated strong support for protecting the watershed's natural, historic, and recreational resources. In fact, 89.4% of those who returned the survey said they would support land use regulations and programs to conserve and protect the watershed. While 87.7% want to discourage aggressive development of the area, 55% feel that there must be room for planned residential, commercial, and industrial growth. And over half (54%) of the individuals said they would support an overall conservation plan for the watershed.

Respondents feel strongly that the White Clay Creek and its tributaries have many qualities worthy of protection, including water quality (62%); wildlife habitat (49%); undeveloped land (56%); and scenic character (40%). Respondents listed water quality, aquatic life, and wetlands as being the three most important resources of the area.

Over half of those who responded to the survey think the watershed possesses natural beauty and that it is a good place to live. Other important qualities cited are that the area is home to many important plant and animal species (43%) and it is relatively undeveloped (47%). Only four individuals said the watershed is an important resource for commercial and industrial use. 46.9% of the total respondents said that farms are the most important cultural resource within the watershed, while 38.5% chose historic register sites, and 29.4% said churches. Under other resources, the most often picked important resource was open space with 73% of the total

respondents choosing it.

Cumulative results show that 71.7% think drinking water is the most important resource of the White Clay Creek watershed. This received the highest percentage of agreement among all four resource categories. Drinking water was followed by mature woodlands, with 64% choosing this category, and 44% selecting wetlands. The least support, was given to "Riparian Zones." Only 32 respondents (9.1%) selected it.

When results were tabulated with individuals' ranking of resources, there was the following outcome: (1) drinking water; (2) aquatic life; (3) wetlands; (4) mature woodlands; (5) farms; (6) historic register sites; (7) hiking trails; (8) existing trails, greenways, parks, (9) open space; and (10) stream access.

63.8% of the respondents said the protection of water quality should be encouraged. This was ranked overall as being the first most important activity. Ranked second was the preservation of undeveloped land (57.4%). Conservation of wildlife habitat with 50.4%, was ranked third, while ranked fourth was encouraging the preservation of the watershed's scenic character (39.9%).

The largest percentage of respondents (83.8%) say that in order to protect natural resources, landowners should practice conservation on their property. 67.8% think they and their neighbors should learn more about conservation, while 63.2% would urge the government to practice more comprehensive planning.

## **SECTION II: DESCRIPTION OF STUDY AREA RESOURCES**

### **CULTURAL HISTORY**

The White Clay Creek watershed has been occupied by various peoples for over 10,000 years. The indigenous Lenni-Lenapes or Delaware Indians lived along the banks of the White Clay Creek where abundant game and fertile lands provided the resources for intermittent village settlements.

European settlements of Dutch and Swedes began around 1625-1650 in Delaware and Pennsylvania. Between 1680-1705, land grants from the King of England were made to Lord Baltimore and William Penn who chartered the states of Delaware and Pennsylvania respectively. Some of the first settlers to the White Clay area were the English, Irish and Scots who were drawn to America with the promises of peace, religious freedom and abundant land resources.

From the beginning, agriculture was an important industry in the rural and sparsely populated area. Early settlers cleared the land and planted wheat or corn or developed meadows for cows. Today dairy farms, horse farms, and mushroom farms dominate the local agricultural landscape. By 1750, some of the first gristmills and sawmills located near the banks of the White Clay Creek from which they drew power. By 1800, mills began producing a diverse range of products including paper, cotton and woolen goods. These mills were primarily small rural operations situated on farms. Exceptions were the Curtis Paper Mill, Dean Woolen Mill and Roseville Cotton Factory which grew into substantial businesses. By the 1880's most of the water-powered mills in the watershed had ceased operation. Mill locations had little effect on the overall development of the watershed.

In the mid-nineteenth century, populations increased and the first signs of urban sprawl from Philadelphia began to impact the rural areas of Chester County and northern Delaware. Villages such as Avondale, Landenberg and the town of Newark began to serve as important commercial areas. The emergence of the railroad influenced the development of these areas because mills were then better able to transport their goods. Inns, taverns and retail businesses flourished. With the invention and availability of the automobile in the twentieth century, the settlement patterns of the White Clay Creek watershed began to change. Commercial centers and residential developments sprung up close to major highways and the City of Newark while much of the watershed remained rural.

Historic and architecturally important sites are abundant in the watershed. In Pennsylvania, there are eight sites, including Primitive Hall and Lunn's Tavern, which are listed on the National Register of Historic Places, the federal listing of significant historic properties. There are many more properties that are considered eligible in Pennsylvania for the National Register, but have not been submitted for designation. In Delaware, there are currently 30 properties listed on the National Register, representing the fields of commerce, architecture, religion and agriculture.

### **GEOLOGY**

A series of folds and uplifts, beginning billions of years ago with the Appalachia land mass off the present coast, and continuing through erosion and weathering, has created the landscape we see today in the White Clay Creek watershed. The topography of most of the watershed is

characterized by rolling terrain, moderately steep-sided ridges and fertile soils of the Piedmont region. The small southwest section of the watershed is characterized by the flat terrain and the sandy and fertile soils of the Coastal Plain. There are three dominant geologic formations found throughout the watershed: the Wissahickon formations; Cockeysville marble; and the Wilmington complex. Resistance to erosion and structural characteristics of these underlying rocks affects the degree of weathering, which is the primary determinant for the terrain we see throughout the White Clay Creek Watershed - broad valleys punctuated by steep ridges.

The Piedmont region was formed between 200 and 400 million years ago when pressure and heat physically and chemically changed the composition of the sediment to form hard crystalline rock formations. There are folds of metamorphosed sedimentary rock underground in the Piedmont portion of the watershed. The Wissahickon formation, including schist and gneiss, is the predominant bedrock of the site and has weathered to create the terrain. There are some areas of Cockeysville marble found near West Grove and Avondale, Pennsylvania, and Hockessin and Pleasant Hill, Delaware. Most of these rock formations are close to the surface, and in areas are exposed, making them susceptible to weathering. The White Clay Creek has cut into these erodible formations.

Cockeysville marble is composed of metamorphosed carbonate rocks such as limestone and dolomite; it is harder than the original substance. It has been identified as being a unique mineral and sediment, and has been widely used for buildings and monuments. Most of the old quarries have been flooded, but where low plains are located this marble is cultivated today.

Cockeysville marble is particularly susceptible to contamination and erosion and it contains sinkholes. However, outcroppings are still valuable as regional aquifer recharge zones, if they are protected from contamination. They maintain high storage levels of good quality drinking water, produce exceptionally high saturated yields, up to 1400 gallons per minute, and contribute to the high base flow of the White Clay Creek, especially during dry periods of the year. Because of its hydro-geological characteristics the White Clay Creek watershed is an important regional source of drinking water.

The third geologic formation in the watershed is the Wilmington complex, which runs generally along the Robert Kirkwood Parkway through the watershed. It contains granite, gneiss, quartz and amphibolite. These rocks are younger and are more resistant to weathering, thus, creating a more level terrain. They are excellent for foundation support and for heavy construction.

## **PHYSIOGRAPHY**

The fall line that separates the Piedmont from the Atlantic Coastal Plain physiographic regions lies within the Wilmington complex. Part of the southwestern corner of the watershed is characteristic of the Inner Coastal Plain - relatively flat and having sandy, fertile soils. The Coastal Plain soils are made up of decomposition from the sedimentary rock of the Piedmont, from marine deposition and glacial melting occurring between 1 and 130 million years ago. The Coastal Plain was deposited as layers of loose and unconsolidated sediments. The sediments are primarily gravel and vary in thickness from 1 to 100 feet. The bedrock is very deep and slopes from the Piedmont southeasterly to the Atlantic Ocean.

The White Clay Creek stream valley ranges from steep banks and wooded gorge areas with cobble-bottom stream beds to broad low-lying floodplains with deep cut soil streambanks. This is typical of the hard rock rolling lowlands of the Appalachian Piedmont Province. This physiographic region goes along the Atlantic coast from the Hudson River to Georgia between the Atlantic Coastal Plain and the Blue Ridge Mountains.<sup>1</sup> The White Clay Creek watershed includes part of the interior lowlands of the Coastal Plain, which has level terrain and wide, meandering stream valleys. The fall line between the two provinces cuts across the White Clay Creek watershed in the southeast from the City of Newark, generally along the railroad line to Wilmington. The fall line is marked by terrain and stream flow changes. The location of the historic hydro-powered mills along this line plays a significant role in the development of the economy of the region.

The slope of the land is generally toward the southeast, towards the Coastal Plain. The White Clay, like other major streams in the region, flows southeast, at a right angle to the northwest strike of the underlying rock, creating stream valleys. The entire White Clay Creek watershed is found within the Southern Chester Piedmont lowland; it includes the section of the Piedmont that is just next to the dip under the sandy Coastal Plain. In the southeast section of West Marlborough Township there is an upland that is characterized by more resistant rocks. The White Clay Creek is one of the deeply carved streams of the Southern Chester County Piedmont.

The interior lowlands of the Coastal Plain includes most of New Castle County's prime agricultural lands. The development of agricultural markets and transportation routes to distribute produce in this area is directly related to the rich soils and favorable characteristics of the gently sloping Piedmont and the level, more sandy interior lowlands of the Coastal Plain. Throughout the watershed, the terrain ranges in elevation from 200 to 600 feet.

Within the White Clay Creek watershed, the slopes range from nearly level to steeply sloping. Along the floodplain the slopes are nearly level, ranging from 0-3%. Throughout the majority of the watershed there is a gentle slope ranging from 3-8%; this slope is suitable for crop land, residential and commercial development. Most of the land adjacent to the Creek is moderately sloping land, from 8-15%, which is suitable for crop land, but is not suitable for commercial or high intensity residential development. Some areas along the creek in Avondale, Franklin and London Britain Townships, and along the main stem, Pike Creek and Mill Creek in New Castle County have steep slopes that are greater than 15%.

## **HYDROLOGY**

The White Clay Creek is considered a consequent stream because it flows southeasterly at a right angle to the underlying rock and because it follows the initial slope of the land. The White Clay Creek is a major tributary of the Christina River, which eventually empties into the Delaware River Estuary. The Christina is the major basin, the White Clay is the sub-major basin while the East Branch, Middle Branch, West Branch, Pike Creek, Mill Creek, Middle Run and main stem are the sub-minor basins for the White Clay Creek. The stream pattern is dendritic, with successive smaller branches, due to the relatively uniform permeability of the underlying rock.

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<sup>1</sup> Natural Environment and Planning; Chester County Planning Commission, 1963.

Most of the groundwater in the watershed comes from rain or snow fall. Throughout most of the watershed, low porosity and permeability of the underlying rocks does not allow for storage and transmittal of large amounts of water; there is limited availability of groundwater resources in the watershed. However, in the limestone areas yield is quite high.

The watershed is primarily schist with some hybrid gneiss and marble. The schist and gneiss have low porosity and permeability, which retards storage and flow of groundwater and limits yields to 0 to 10 gallons per minute. However, the Wissahickon schist, found in the northern part of the watershed, has slightly higher groundwater yields - between 10 and 20 gallons per minute. Occasionally, yields of 100 gallons per minute can be tapped from a system of horizontal master joints. These yields are sufficient for low density residential use but not for fire fighting. Groundwater from these crystalline rocks has very high quality; it is generally acidic, moderately hard and low in dissolved solids. Because of the low permeability, groundwater pollution is localized.

In the areas of Cockeysville marble, the groundwater is found in solution channels, surface fractures and fissures. The Cockeysville marble is an aquifer recharge area due to its permeability and porous characteristics. Very high yields can be found where a large solution is tapped. In some areas of Chester County, 900 to 1400 gallons per minute have been reported in these limestone solution channels. The groundwater drained in these areas is quite hard, due to dissolved minerals such as calcium and magnesium carbonates, and is alkaline.

Contamination and increase in impervious cover are concerns in areas of aquifer recharge. There is great potential for groundwater contamination because pollutants can easily enter underlying water channels, be carried over long distances in unpredictable ways and have little capacity for self-purification because of lack of air, sunshine and filtering material. Serious contamination is not a problem at present, but increasing urbanization, with associated increase in amounts of industrial and domestic waste, could create a serious contamination problem. In addition to direct pollutant contamination, uncontrolled increase in impervious cover will block the surface of the recharge area, restricting infiltration and eventually reducing the water table. Limestone found throughout the watershed contains sinkholes and other solution channels, creating a concern in regard to building foundations; detailed studies on core borings must be made before major construction is begun.

In the Piedmont, floodplains tend to be narrow and constricted within steep valleys, while in the Coastal Plain, floodplains tend to be wider and more extensive. Most of the wetlands within the watershed are small and usually found adjacent to watercourses. The exception to this are the extensive tidally-influenced marshes located in the Coastal Plain.

## **VEGETATION**

There is great diversity in the number and types of plants and plant communities found in the study area as a result of the agriculture and development patterns, the stream valley configuration, and the unique water-related properties. Over 60 species of native trees and shrubs, 250 species of herbaceous plants and wildflowers, and 30 species of ferns and fern allies are found in the watershed.



The watershed has a variety of forests, including floodplain forests along the main stem of the White Clay Creek and Broad Run; mesic forests on the middle to lower slopes of the creek valleys; and xeric forests on the ridge tops and uplands. These forests include beech, tulip poplar, some oak, hickory, maple, green ash and boxelder. Successional forests are also present and include abandoned croplands and pastures, dry upland glades, floodplain, mesic thickets, and upland thickets. Wetlands of the White Clay Creek watershed include seeps, marshes, floodplain swamps, sloughs, and creeks.<sup>2</sup>

Generally, the floodplains consist of hickory, walnut, willow, sycamore and hawthorn. On the slopes and uplands, the woods consist of walnut, tulip poplar, hawthorn, hickory, sassafras, oak, maple, dogwood and red cedar. Small conifer plantations and open agricultural fields are also found in the watershed.

Five sites, including the stream corridor, have been identified by the Delaware Department of Natural Resources and Environmental Control (DNREC) as Natural Areas. These five sites are noted for their wildlife habitat, scenic vistas, native hardwoods, old growth forests and rock outcrops. They are the Whitely Farm, Owl and Broad Wing Trail Woods, Fall-Spring Woods (White Clay Creek State Park), and Jackson Hollow.

There are three endangered, one threatened and two rare plant species listed by the Commonwealth of Pennsylvania and found within the White Clay Creek watershed. Pennsylvania endangered status is defined as "plant species which are in danger of extinction throughout most of their natural range within this Commonwealth, if critical habitat is not maintained or if the species is greatly exploited by man."<sup>3</sup> Pennsylvania threatened status is defined as "plant species which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent their future decline, or if the species is greatly exploited by man."<sup>4</sup> Pennsylvania rare status is defined as "plant species which are uncommon within this Commonwealth."<sup>5</sup>

The Delaware Natural Heritage Inventory identifies 100 plant species on their list of Species of Special Concern within the White Clay Creek watershed. There is no formal listing for endangered, threatened or rare species.

The Nationwide Rivers Inventory identifies the White Clay Creek, from the northern boundary of the City of Newark to the confluence with Egypt Run, as having botanic value because it contains the purple fringeless orchid (*Platanthera peramoena*). Since the NRI study, the purple fringeless orchid has "proven to be more abundant or widespread than was previously believed [or is] not

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<sup>2</sup> Rare Plant and General Flora of the White Clay Creek Natural Preserve; Chester County, PA and New Castle County, DE, May 31, 1988.

<sup>3</sup> Species Classification Definitions; Pennsylvania Natural Diversity Inventory; July 18, 1991.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

subject to any identifiable threat."<sup>6</sup> It is listed on the Delaware Natural Heritage Inventory Species of Special Concern within the White Clay Creek watershed. However, it is not a federal candidate for threatened or endangered.

## **FISH AND WILDLIFE**

The diverse habitats in the White Clay Creek watershed support a wide variety of animal life, including 26 species of fish, 200 species of birds, 34 species of mammals, and 27 species of amphibians and reptiles.

The White Clay Creek watershed is within the range of many northern species and is at the northern limit of many southern species. This area is particularly rich in bird habitat because it is relatively undisturbed and is located along the Atlantic flyway. The White Clay Creek valley is considered to be the prime location for song bird diversity in Delaware on a year-round basis. Of the 200 bird species within the watershed, 90 are breeding birds. Of the 90 breeding birds, some 40 species of neotropical migrants nest during the summer in the large blocks of mature forest that exist in the watershed. The cerulean warbler is an "extremely rare neotropical migrant [and the broad-winged hawk is considered a] "very rare breeder that is a common summer resident."<sup>7</sup>

The U.S. Fish and Wildlife Service's Breeding Bird Survey indicates that the number of neotropical forest migrants has declined at a rate of two to three percent a year between 1979 and 1989 in eastern North America. Viable populations of a number of migrant species, such as the cerulean warbler, a candidate for federal endangered species listing, and the worm-eating warbler are not supported in many areas of the eastern United States; the continued presence of both of these species in the White Clay Creek attests to the valuable habitat existing there.

While sightings are rare, the White Clay Creek does provide habitat for bald eagles, until recently a federally listed endangered species. The watershed is also home to the bog turtle (*Clemmys muhlenbergii*), which was recently added to the list of federally threatened species. In addition, the U.S. Fish and Wildlife Service has identified six species in the watershed as C2 status. These are species that could be proposed as endangered or threatened, but, further research on vulnerability needs to be conducted. The six species are the northern goshawk (*Accipiter gentilis*), henslow's sparrow (*Ammodramus henslowii*), the cerulean warbler (*Dendrocia cerulea*), Darlington's spurge (*Euphorbia purpurea*), the Harlequin duck (*Histrionicus histrionicus*), and the loggerhead strike (*Lanius ludovicianus*). Of these, only the cerulean warbler is not considered extirpated and, therefore, may be seriously considered for endangered or threatened status.

The bog turtle (*Clemmys muhlenbergii*) is the one animal species in the White Clay Creek watershed that is listed by the Commonwealth of Pennsylvania as endangered. The Delaware Natural Heritage Inventory identifies over 38 "rare" animal species that exist within the watershed which are of "special concern."

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<sup>6</sup> Federal Register; January 6, 1989; U.S. Fish and Wildlife Service; Federal Status Categories of Endangered and Threatened Plants and Animals.

<sup>7</sup> State Heritage Ranking, Delaware Natural Heritage Inventory, January 1993.

There are 20 native fish species found in the White Clay Creek.<sup>8</sup> There are 27 reptile and amphibian species identified as occurring along the floodplain and ledges of the White Clay Creek. Of these, the bog turtle is considered the most rare, and is found in some swampy areas of the watershed. There are 8 other reptile and amphibian species that are probably present, but no reliable records are available to quantify occurrences.<sup>9</sup> There are 34 mammal species found in the White Clay Creek watershed; these include deer, rabbits, fox, woodchuck and raccoon.

Both Delaware and Pennsylvania have designated portions of the watershed as "Cold Water Fisheries" due to their potential, or their existing, ability to support native fish species reproduction and survival. The State of Delaware designated Mill Creek, from Route 288 to Route 7; and Pike Creek, from Route 72 to Road 316, as Cold Water Fisheries. Pennsylvania designated the east fork of the East Branch as a Cold Water Fishery.

## **WATER RESOURCES**

Flows in the White Clay Creek vary widely among drought, normal and flood flow conditions. Flows measured at Newark can vary between 15 cubic feet per second (cfs) (10 million gallons per day (mgd)) during droughts to 14,000 cfs (9,000 mgd-15 feet deep) during 100-year flood events. Normal flows range between 30-100 cfs, which is ideal for fishing.

### **Existing Water Supply: New Castle County**

The White Clay Creek watershed is a major source of drinking water for the residents of New Castle County. The major water purveyors are the City of Newark, Artesian Water Company and United Water Delaware. The utilities obtain water from surface, ground and interconnected supplies. Surface water from the White Clay Creek accounts for 33 mgd of the overall production of water supply from the watershed. At the surface water intakes for the City of Newark and United Water Delaware, minimum flow requirements (DRBC, 7Q10) are in place for aquatic habitat protection purposes along the White Clay Creek. Groundwater supplies from five wells in the watershed provide up to 1.8 mgd of water to the City of Newark. The Artesian Water Company operates six wells which provide up to 1.9 mgd in the Cockeyville marble formation near Hockessin. Additionally, a maximum of 6 mgd can be provided to the Artesian Water Company from a Pennsylvania interconnection with the Chester Water Authority at Limestone Road.

### **Existing Water Supply: Chester County**

The White Clay Creek watershed also provides drinking water for the residents of Chester County. Groundwater is the primary water supply source, for which the Commonwealth of Pennsylvania does not issue water supply allocations. The maximum supply capacity of the systems are not known. Currently, the major supply wells in the Chester County portion of the watershed are

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<sup>8</sup> White Clay Creek Study; NPS, 1984.

<sup>9</sup> Ibid.

pumping less than 1 million gallons per day.

## **Water Quality**

The Pennsylvania Department of Environmental Protection (PADEP), the Delaware Department of Natural Resources and Environmental Control (DNREC), and the Delaware River Basin Commission (DRBC) have established formal water quality goals for their respective portions of White Clay Creek. PADEP goals are based on the traditional use approach, and they apply to water supply, aquatic life and recreation. Water uses to be protected are established for each stream, as well as specific water quality criteria necessary to protect these uses. These criteria are used to establish waste-discharge permit limits.

In Pennsylvania, water quality designations are based on the current conditions of the stream. The "Exceptional Value Waters" designation refers to streams that are relatively pristine, with little or no development or access. The Commonwealth of Pennsylvania has identified the east fork of the East Branch, from Trout Run to the headwaters, as an "Exceptional Value Waters."

The east fork of the East Branch of the White Clay Creek is also important for water quality monitoring and stream research. The Stroud Water Research Center, a field laboratory of the Academy of Natural Sciences of Philadelphia, has conducted ecological research and collected water quality data on the East Branch since 1968. Of prominent significance to research is the 1,800 acre "Stroud Experimental Watershed," located on the east fork and maintained by the Stroud Water Research Center. Hypotheses and methods developed on the White Clay Creek have been tested and applied in rivers and streams throughout North America. The National Science Foundation designated the experimental watershed an "Experimental Ecological Reserve," in recognition of the site as an outstanding example of a Piedmont stream ecosystem.

The creek's levels of dissolved oxygen and its temperature are able to support fish, aquatic life and wildlife. The reproducing trout population in the upper reaches of the East Branch strongly indicates high water quality. However, data collected by the White Clay Creek Watershed Association suggests that there is a decline in water quality as one proceeds from the headwaters down into Delaware.

A technical evaluation of the watershed as a whole has been initiated in order to determine appropriate levels of control for both point sources and non-point sources of pollution. Both states, DRBC, EPA, University of Delaware Water Resources Agency, Chester County Planning Commission, Chester County Conservation District, Natural Resource Conservation Service (NRCS), U.S. Fish & Wildlife Service, and U.S. Geological Survey are participating in this activity.

The State of Delaware has identified certain beneficial water uses in accordance with the Clean Water Act, Section 303, which mandates that all waters should be fishable and swimmable. In Delaware, the designated uses for the White Clay Creek are for public water supply, for primary contact recreation, for cold water fish and for agricultural water supply. The cold water fishing, (put-and-take) apply to the creek from the state line south to the dam at Curtis Paper and, from March 15 to June 30, on Mill Creek from Brackenville Road to Route 7 and on Pike Creek from Route 72 to Henderson Road.

The State of Delaware also identifies the section from the state line to the dam at Curtis Paper as waters of "Exceptional Recreational or Ecological Significance" (ERES). Areas with this designation are recognized as special natural assets of the state to be protected and enhanced; they have a higher level of monitoring and protection than other waters. ERES waters have specific guidelines for restoration to the natural conditions, limits on discharge, pollution prevention, pollution control and best management practices.<sup>10</sup>

## **RECREATION**

The White Clay Creek watershed offers regional residents outstanding recreational opportunities. Fishing, hiking and jogging are three of the most popular sports within the watershed. In addition, the White Clay Creek is commonly used for swimming, and the valley for bird-watching, picnicking, horseback riding, cross-country skiing, skating, sledding, photography, nature observation, and limited deer hunting. Because of the small size of streams, canoeing is limited and not very popular. The only truly suitable canoeing area is the main stem of the White Clay Creek in Delaware, and that area is limited by flow conditions.

The White Clay Creek is the most heavily stocked and most heavily used put-and-take trout stream in the State of Delaware. More than 18,000 brown and rainbow trout are stocked along the White Clay Creek in Delaware from March through April. They represent 68% of all of the stocked trout in the state. The White Clay Creek is also the most popular fly-fishing stream in the State of Delaware.

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<sup>10</sup> State of Delaware Surface Water Quality Standards, February 26, 1993; pages 47-66.

## **SECTION III: ELIGIBILITY AND CLASSIFICATION**

### **PURPOSE**

The purpose of this section is to document National Park Service findings relative to the eligibility of the study river segments for designation under the Wild and Scenic Rivers Act, and the proposed classifications under which they qualify.

### **STUDY AREA**

As directed by Congress in the White Clay Creek Study Act (P.L. 102-215), the study area for the White Clay Creek Wild and Scenic River Study includes: "The headwaters of the river in Pennsylvania to its confluence with the Christina River in Delaware, including the East, West, and Middle Branches, Middle Run, Pike Creek, Mill Creek, and other main branches and tributaries as determined by the Secretary of the Interior...."

### **SUB-BASIN/STUDY SEGMENT DESCRIPTIONS**

Following are general descriptions of the nine (9) segments used for this study. Except in the case of the White Clay Creek main stem, the study segments coincide with the hydrologic sub-basins of the watershed. More detailed descriptions can be found in the "Draft Eligibility and Classification Report," November, 1994. Sub-basins/study segments include all forks and tributaries to the named creeks and runs, as shown on the official "Recommended Designated Area" map. (see Appendix).

The descriptions include a generalization of the stream corridor and existing land use, along with identification of the outstandingly remarkable values found within the study segment. Analysis of this data was then used to determine both eligibility and classification under the Federal Wild and Scenic River Act.

For the purposes of this study, land use is classified as either residential, agriculture, commercial or industrial. Residential land use is broken into three categories: "low density" refers to lots that are greater than one acre; "moderate density" refers to lots that are from one-quarter acre to one acre; and "high density" refers to lots less than one-quarter acre, and includes townhouses and other multi-family dwellings, apartments or mobile home areas. Row crops, grazing lands and large cleared lots are all referred to as "agricultural land use." "Commercial land use" is where merchandise is sold and "industrial land use" refers to lots where materials are produced. Where a description indicates a "forested corridor," this refers to vegetated streambanks and small woodlots associated with farmsteads. There is no commercial forest land within the White Clay Creek watershed.

**STUDY SEGMENT W1 – WEST BRANCH SUB-BASIN**, from its source just east of the Village of Kelton in Penn Township, downstream to its confluence with the Middle Branch.

The headwaters are in Penn Township, and the sub-basin includes parts of New London, Franklin and London Britain Townships. It drains a total of 6,515 acres, or 10.2 square miles. Land use changes from predominantly agricultural in the northern end of the sub-basin to predominantly forested in the south. There is limited low to medium density residential development along most

of the major roads. The headwaters in this sub-basin are found primarily on agricultural lands with some flowing through low density residential areas and forested lands.

The northern section of the sub-basin is dominated by agricultural land uses. There is low to medium density residential development along most of the major roads along with quite a few large blocks of forest. There are numerous crossings of the stream system by either roads and/or major power transmission lines. A railroad passes through the upper portion of the sub-basin.

STUDY SEGMENT W2 - MIDDLE BRANCH SUB-BASIN, from its source just south of Route 41 in Londonderry Township, downstream to its confluence with the East Branch.

The Middle Branch of the White Clay Creek begins in Londonderry Township and flows through Penn, London Grove, Franklin and London Britain Townships. The sub-basin covers 10,157 acres (15.9 square miles), and includes the Borough of West Grove. Within the northern section of the sub-basin, from the headwaters to Route 1, land use in this section is primarily agricultural with some forested areas and low density residential development. The stream course itself runs primarily through forested lands. There are large electrical power lines which cross the headwaters.

The central section, between Route 1 and Avondale-New London Road, includes medium to high density residential development, agriculture, some commercial development and forest. The stream course runs primarily through forested lands, but near Route 1 and Baltimore Pike the stream course runs through low density residential development. The Borough of West Grove and several bridge crossings are in this segment of the sub-basin. There are numerous informal pulloffs for stream access along Creek Road.

The southern section, from South Guernsey Road to the confluence with the West Branch, is primarily forested with agricultural fields, limited low density residential development and several mushroom farms. The Middle Branch flows through a series of steep-sided ravines in this area. The extreme southern area is completely dominated by forest, within the White Clay Creek Bi-State Preserve. An underground gas transmission line crosses the Middle Branch in this area, but there are few road crossings.

STUDY SEGMENT W3 - EAST BRANCH SUB-BASIN, from its sources in West Marlborough Township and London Grove Township, downstream to its confluence with the Middle Branch, including the west and east forks, and Trout Run, Egypt Run, Broad Run and Walnut Run.

The East Branch begins in various portions of West Marlborough and London Grove Townships, with numerous small streams coming together to form the east and west forks. The two forks join within the Borough of Avondale. Trout, Egypt, Walnut and Broad Runs are tributaries that flow into the East Branch from the east, between Avondale and the point where it meets the Middle Branch in the White Clay Creek Bi-State Preserve, near Yeatman Station Road. The confluence of the East and Middle Branches at this point marks the beginning of the White Clay Creek main stem. The East Branch sub-basin is the White Clay Creek's largest, draining a total of 21,165 acres, or 33.1 square miles.



The northern portion of the sub-basin, from the headwaters to Route 1, is generally undeveloped. The area is primarily agricultural with rolling hills and farmsteads. Chatham is included in this section, and is located one half mile west of the closest headwater stream. The New Bolton Center of the University of Pennsylvania and the Upland Country Day School are also in this section of the sub-basin. Mushroom farms are located along Woodview Road. The stream course runs mostly through forested and agricultural lands, with limited low density residential development. This section of the East Branch is composed primarily of first order or headwater streams. There is limited stream access by informal trails, and a few power lines cross the streams.

The central portion of the East Branch, from Route 1 to Egypt Run, is primarily agricultural with some forested lands. Between Route 1 and New Garden Station Road there is low to medium density residential development, and in the Borough of Avondale and the western limits of the Borough of West Grove there is medium to high density residential development. Along Route 1 and Baltimore Pike there is some commercial and industrial land use. Mushroom farms are found between Elliot Road and Starr Road. This area includes numerous schools, an airfield, the Hewlett-Packard industrial complex, and the Lock Nairn Golf Links. There is a sewage treatment facility in the Borough of Avondale and a bridge on Clay Creek Road, just north of New Garden Station Road.

The southern portion of the East Branch, from Egypt Run to the confluence with the Middle Branch, is primarily forested with limited low to medium density residential development. It includes the White Clay Creek Bi-State Preserve. The stream courses in this section run primarily through forested lands and steep-sided ravines. Broad Run and Walnut Run join the East Branch in this section. The sub-basins of these streams contain mostly low to high density residential development, some limited commercial development along Route 41, some agricultural land, and limited forest cover.

STUDY SEGMENT W4 – MIDDLE RUN SUB-BASIN, from its source near the intersection of Corner Ketch Road and Union Road, in New Castle County, to its confluence with White Clay Creek.

The Middle Run sub-basin begins in Delaware just south of the state line and north of Corner Ketch, and drains some 2,490 acres (3.9 square miles). The sub-basin contains a mix of low to high density residential development, limited commercial development, and extensive forest. The northern section is primarily forest, some agricultural fields, low to medium density residential development along Possum Park Road and Curtis Paper Mill Road, and limited commercial development in Corner Ketch. The stream course runs through forested lands and some agricultural fields. More than 810 acres of this section are permanently protected within the Middle Run Natural Area, a New Castle County park. Trails and informal access are available through state land holdings. The southern portion of the Middle Run has medium to high density residential development along Possum Park Road and Route 2. The corner of Possum Park Road and Route 2 also has commercial development.

STUDY SEGMENT W5 - PIKE CREEK SUB-BASIN, from its source at the outfall of the pond located just south of Penn Manor Drive in New Castle County, to its confluence with the White Clay Creek main stem.

The Pike Creek sub-basin begins just south of the state line in Delaware and runs between Polly Drummond Road, Limestone Road, the state line and Route 2. The sub-basin is primarily low to high density residential development with some open space, forest cover, and limited commercial development. North of Curtis Mill Road, there is mostly low density residential development. The southwest corner of the sub-basin between Old Coach Road, Route 2, Pike Creek Road, and Polly Drummond Road is forested. The Pike Creek Valley Golf Course, Wilson Elementary School, Drummond Plaza and numerous bridges are found in this sub-basin. Most sections of the sub-basin do have riparian buffers along the stream or the stream runs through large blocks of forest. The stream course runs primarily through forested land in the southern portion of the sub-basin. It drains 4,250 acres, or 6.7 square miles.

STUDY SEGMENT W6 - MILL CREEK SUB-BASIN, from its source north of Hockessin in New Castle County, Delaware, downstream to its confluence with the White Clay Creek main stem.

The headwaters of the Mill Creek sub-basin begin north of Hockessin and the sub-basin is located between Route 41, Limestone Road, the state line, and Route 2. The Mill Creek sub-basin is characterized by medium to high density residential development and limited to extensive commercial development. It drains a total of 8,269 acres (13.0 square miles).

The northern section, from the headwaters to Graves Road, contains medium to high density residential development, with significant commercial and some industrial land use. This section includes Hockessin and the Sanford Preparatory School. There are many lots under construction or slated for residential construction. While the stream course runs through the medium to high density residential development, it retains in many locations a vegetated buffer.

The central section runs from Graves Road to the intersection of Limestone Road and Concord Drive, and is primarily low to high density residential development in the form of planned unit developments. This segment includes the Delcastle Recreation Area, Carousel Park, Goldey Beacom College and the Pike Creek Center commercial shopping area on Limestone Road. The stream course flows through residential, open space and forest.

The southern section of Mill Creek runs from the intersection of Limestone Road and Concord Drive to the confluence with the main stem. It is characterized by medium to high density residential development and extensive commercial development along Route 2. The Delaware Park Race Track, numerous schools, and the Milltown Medical Center are found in this segment. The stream course passes through some large blocks of forested land.

STUDY SEGMENT W7 - MAIN STEM SUB-BASIN, from its beginning at the confluence of the Middle and East Branches near Yeatman Station Road in London Britain Township, Pennsylvania, downstream to the northern city limits of Newark, Delaware.

The main stem of the White Clay Creek begins at the confluence of the Middle and East Branches of the White Clay Creek, in the Bi-State Preserve, near Yeatman Station Road. The main stem then crosses the state line into Delaware and flows south to the City of Newark. This portion is

primarily forested with limited low to medium density residential development. This section includes the White Clay Creek Bi-State Preserve, White Clay Creek State Park, several large undeveloped tracts, the MBNA Country Club and a large office complex. The stream course runs primarily through forested land. The road going north from North College Avenue to Wedgewood Road is paved. From Wedgewood Road to South Bank Road in Pennsylvania the road is unpaved. This road is used primarily by property owners, and, in season, by people fishing and hunting. There is a trailhead with a parking lot on Chambers Rock Road, maintained by the Bi-State Preserve, that is used to access the stream for hiking, bird-watching, jogging, and fishing. This trail runs north to the state line along the western bank of the stream. There is an informal trail that runs along the western bank of the stream, from Chambers Rock Road to the northern boundary of the City of Newark. People who fish park along Tweeds Mill Road and access the stream by this informal trail. At various sites along this stretch of the main stem, the State of Delaware stocks 70% of its fish. There is a transformer station on the east bank of the stream, just north of the University of Delaware property.

STUDY SEGMENT W8 - MAIN STEM SUB-BASIN, from the northern city limits of Newark, Delaware, downstream to the entry of Red Clay Creek.

Once in the City of Newark, the main stem turns 90 degrees and heads east to Churchman's Marsh and the Christina River. This section is heavily developed with a full range of residential, commercial and industrial land uses. The area includes several strip malls, industrial parks, major railroads and highways, the Delaware Park Racetrack, the University of Delaware, numerous schools, and the Newark Country Club. Part of this segment is in the "Metroform" area of Newark, where industry and commercial uses are concentrated. The stream course runs through developed areas and along Route 2, including crossing under Route 2 and several railroad lines.

Although there is extensive residential, commercial and industrial development within this section of the sub-basin, the stream system is still well buffered from the development. The riparian area is well vegetated throughout this section of the main stem, and much of the floodplain has not been encroached by development. This greenway is functioning as a conduit for the movement of wildlife throughout the watershed, and much of the development is visually screened from the river course.

STUDY SEGMENT W9 - MAIN STEM SUB-BASIN, from the entry of Red Clay Creek, downstream to its confluence with the Christina River.

I-95 is in close proximity to this segment. Within this segment, the EPA has identified a superfund site. Sections of the main stem are well buffered from development. There are several wetlands in this segment including Churchman's Marsh, approximately 350 acres in size. Churchman's Marsh appears as a recommended water supply reservoir for New Castle County in the Delaware River Basin Commission Comprehensive Plan.

## **EVALUATION PROCESS**

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) requires that for rivers to be eligible

for inclusion into the National Wild and Scenic Rivers System, they must be both free flowing and adjacent to or within related land areas that possess one or more outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. The following four-step process was applied to each sub-basin within the watershed to determine eligible river areas and/or river segments:

- (1) Examine each study segment/sub-basin to determine all free-flowing river segments of the White Clay Creek and its tributaries.

The Wild and Scenic Rivers Act is intended to protect only “free-flowing” rivers, and such flows must be adequate to support all flow-dependent outstanding resource values. Section 16(b) of the Act defines “free-flowing” as:

“... existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures... shall not automatically bar...consideration for such inclusion: Provided, that this shall not be construed to authorize, intend, or encourage future construction of such structures within components of the national wild and scenic rivers system.”

Federal guidelines provide the following additional clarification:

“The fact that a river segment may flow between large impoundments will not necessarily preclude its designation. Such segments may qualify if conditions within the segment ... Existing dams, diversion works, rip-rap and other minor structures, will not bar recreational classification provided that the waterway remains generally natural and riverine in its appearance.”

The criteria for free flowing does permit some low dams or impoundments, with the requirement that the function and structure of the stream not be impaired. The functions of greatest concern in the White Clay Creek watershed are the base flow and the habitat for aquatic species.

To determine which segments and tributaries are free flowing, several documents were consulted. The United States Geologic Survey (USGS) topographic maps, available Federal Emergency Management (FEMA) floodplain maps, and aerial photographs for the entire watershed were analyzed. Knowledgeable local and state water resource specialists were also consulted. Field work was conducted to verify certain sites.

- (2) Examine each free-flowing river segment or sub-basin for the presence of outstandingly remarkable resource values.

The term “outstandingly remarkable” is not defined in the Wild and Scenic Rivers Act. The determination of what constitutes an outstandingly remarkable resource value is left to the professional judgment of the study team. An “outstandingly remarkable resource value” is defined for this study as one that has been identified and documented as (1) having either national, regional or state importance and (2) is river related.

The criteria for outstandingly remarkable values was adapted from two primary sources: *The*

*Natural and Recreational Resources Evaluation*, produced for the Delaware and Lehigh Canal National Heritage Corridor Commission, and *A Systematic Approach to Determining the Eligibility of Wild and Scenic River Candidates*, produced for the Columbia Gorge National Scenic Area. These documents incorporated established criteria for National Park Service and Forest Service efforts. Further information was derived from professional planning publications.

Information about important resources within the watershed was gathered from a variety of sources. The study team consulted with, and was supplied resource information from, a host of federal, regional, state, county, and local government agencies; national conservation and preservation programs; and members of the White Clay Creek Study Task Force. To determine what is "outstandingly remarkable," criteria were developed that assigned points for national, regional, and state recognition of a resource and for the critical function of the resource in the watershed. Each significant resource was analyzed and awarded a number of points.

1. Officially Recognized

- a. Federal (3 points): resource's significance has been established through designation or recognition in federal programs such as: endangered, threatened or rare species of fish, wildlife and vegetation; historical and cultural sites and parks; and exceptional waters.
- b. State (2 points): resource's significance has been designated or recognized by the State of Delaware or the Commonwealth of Pennsylvania in their programs such as: scenic rivers or byways; historical and recreational parks; endangered, threatened or rare fish, wildlife; and stream/water quality classifications.
- c. Regional (local or county or regional) (2 points): resource's significance has been recognized or documented in programs such as critical natural areas studies and university/foundation research.

2. Relationship to the Watershed

- a. Existence (3 points): resource's existence is/was owed to its location within the watershed. Example: a rare bird depends on a specific habitat in the watershed for survival or an historic mill was placed on a stream segment because of the water flow.
- b. Role (3 points): resource's contribution or influence to the functioning of the watershed. Example: Cockeysville marble aquifer influences stream flows in spring and summer.

In order to qualify as "outstandingly remarkable," a resource had to receive at least five points. **(See Appendix for a summary of the results.)**

- (3) Classify as wild, scenic, or recreational those sub-basins or river segments that were found eligible by meeting all of the above criteria.

To be classified as a "wild river," the river or section of river must be free of impoundments, have essentially primitive shorelines, be generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Wild rivers represent vestiges of primitive America.

To be recommended for "scenic" classification, the river or river section must be free of impoundments, possess largely primitive shorelines or watersheds and only be accessible in places by roads. Roads may occasionally reach and bridge the river. The presence of small communities or dispersed dwellings or farm structures is acceptable.

A river or river section qualifies for "recreational" classification if it is readily accessible by road or railroad, has some development or substantial evidence of human activity along the shoreline, and may have had some impoundment or diversion in the past. The presence of extensive residential development and a few commercial structures is acceptable.

- (4) Determine for those sub-basins and/or river areas which are free flowing and possess outstandingly remarkable resources the level of development.

Land use over the entire watershed was identified from aerial photographs, county maps, USGS maps and field investigation. A general description of land use for each sub-basin was prepared. These general descriptions will serve as a guideline for future local management planning.

## **MAJOR FINDINGS**

### **Free Flowing**

**The entire system of rivers, tributaries and sub-basins of the White Clay Creek watershed was found to be free flowing.** The one sizeable check dam (approximately 6-feet high with a half-acre impoundment), the waterfall at the Curtis Paper Mill site, is a permissible impoundment because it does not impede the base flow nor does it have a negative impact on habitat for aquatic species. A few other small check dams and weirs, all less than one-foot high, were found throughout the watershed and also pose no adverse impacts. The conclusions are that there are no impoundments or dams of significant size that would impede base flow or have a negative effect on aquatic species.

### **Outstandingly Remarkable Values**

**A number of outstandingly remarkable values were found in the White Clay Creek watershed (see Appendix for Resource Evaluation Sheets).** The outstandingly remarkable values and the resources that exemplify those values as determined through this study include the following:

#### ***Hydro-Geology***

The presence of Cockeysville marble makes the White Clay Creek watershed an important source of drinking water. Cockeysville marble formations are valuable as aquifer recharge zones; they have high storage levels, high saturated yields (1400 gallons per minute) and contribute to the base

flow of the White Clay Creek, especially during dry periods. The base flow of the White Clay Creek is high relative to other streams in the Piedmont; this can be attributed partially to the characteristics of the Cockeysville marble. This high base flow helps to sustain many critical plant and animal species. Cockeysville marble is recognized as a significant resource in county and university studies because it contributes to the hydrologic function of the watershed.

Because Cockeysville marble serves as a regionally important groundwater recharge area and contributes to maintaining base flow, especially during dry periods, which helps to maintain critical plant and wildlife habitat, it is identified as an outstandingly remarkable resource.

### ***Water Quality and Quantity***

The hydro-geology of the White Clay Creek watershed makes it an exceptional source of water to residents of both Delaware and Pennsylvania. The quality and quantity of water that flows on the surface and underground make the White Clay Creek watershed an important regional source of drinking water. The quality and quantity of the water of the White Clay Creek and its tributaries also support a rich and diverse array of plant communities and wildlife habitats.

Both Delaware and Pennsylvania have recognized the potential or existing water quality attributes. The State of Delaware has designated a portion of the main stem of the White Clay Creek, from the state line to Route 72 in Newark, as waters of "Exceptional Recreational or Ecological Significance." The Commonwealth of Pennsylvania has identified a portion of the East Branch, from the northern border of Avondale Borough to the headwaters as an "Exceptional Value Stream."

The White Clay Creek has also been recognized for its contributions to stream research and water quality monitoring. Of significance to research is the 1800 acre "experimental watershed " located on the east fork and maintained by the Stroud Water Research Center. Hypotheses and methods developed on the White Clay Creek have been tested and applied in rivers and streams throughout North America. The National Science Foundation designated the experimental watershed an "Experimental Ecological Reserve," in recognition of the site as an outstanding example of a Piedmont stream ecosystem.

Because of the state designations, the important water quality research and monitoring, the role in supporting critical plant and wildlife habitat, and the contribution to the functioning of the watershed, the portion of the East Branch from the northern border of Avondale Borough to the headwaters is considered an outstandingly remarkable resource.

### ***Botany***

The intrinsic botanical value of the White Clay Creek watershed is largely due to the rich and diverse array of plants and plant communities that still exist within this river system - plants and plant communities which have virtually disappeared in many of the other surrounding river systems in this rapidly developing region. The White Clay Creek in many ways is a botanical island or oasis in a sea of urban and suburban sprawl which characterize many sections of southeast Pennsylvania and northern Delaware.

The watershed supports populations of three endangered, one threatened and two rare plant species

listed by the Commonwealth of Pennsylvania. The endangered species are: the leather flower (*Clematis viorna*), the tawny ironweed (*Vernonia glauca*), and elephant's foot (*Elephantopus carolinianus*). The threatened species is the fall witch grass (*Digitaria cognatum*). The rare species are the puttyroot orchid (*Aplectrum hyemale*) and the crane fly orchid (*Tipularia discolor*). The Delaware Natural Heritage Inventory identifies over 100 "rare" plant species that exist within the watershed which are of "special concern."

The six plant species listed above are considered outstandingly remarkable throughout the watershed. These species are designated at the state level and their presence within the watershed is directly related to the watershed's intrinsic ability to support endangered or threatened plant species.

### ***Fish and Wildlife***

Aquatic and terrestrial habitats are in abundance within the entire White Clay Creek watershed. These natural habitats remain large enough in area to support very diverse populations of wildlife and are configured spatially in such a way as to provide for the easy movement of wildlife species from one habitat to another, which is important for the survival of many species.

A significant and important segment of the wildlife population present in the White Clay Creek drainage basin are the many species of neotropical migrant birds that breed there over the summer months. Some 40 species of neotropical migrant birds nest in the large blocks of mature forest present in the White Clay Creek drainage area. The continued presence of neotropical migrants adds to the rich wildlife resources of the region. The survival of neotropical migrants in the region is due, to a large degree, to the nesting grounds present within the White Clay Creek.

While sightings are rare, the White Clay Creek does provide habitat for bald eagles, a former federally-listed endangered species. In addition, the U.S. Fish and Wildlife Service has identified seven species in the watershed as C2 status; these are species that could be proposed as endangered or threatened, but further research on vulnerability needs to be conducted. Of these, only the cerulean warbler and the bog turtle are not considered extirpated and therefore may be seriously considered for endangered or threatened status. The bog turtle was elevated to the federal threatened list recently.

The cerulean warbler and the bog turtle are considered outstandingly remarkable. These species are designated at the state or national level and their presence within the watershed is directly related to the watershed's role in providing habitats for these species.

### ***Historical and Cultural***

There are numerous important archaeological, historical and architectural sites in the watershed. In Pennsylvania, there are eight sites including Primitive Hall and Lunn's Tavern which are listed in the National Register of Historic Places. There are many more properties in the Pennsylvania portion of the watershed that are believed eligible for the National Register, but have not been submitted for designation. In Delaware, there are currently 30 properties listed in the National Register representing the fields of commerce, architecture, religion and agriculture.

The following sites are considered outstandingly remarkable resources because of their direct and



substantial relationship with the history of man's use and development of the White Clay Creek and other significant natural resources in the area:

#### England House and Mill

Wealthy Quakers John and Joseph England built the existing brick house and gristmill in 1747 and 1789, respectively. In 1840, the mill passed from the England family but continued as a gristmill until 1960. Today, "it stands as one of the oldest and best preserved mills on the White Clay Creek and in New Castle County."

#### Eastburn-Jeanes Lime Kilns Historic District

Burnt lime produced at this site was used by local farmers to improve the soil. The site consists of Cockeysville marble outcroppings, two abandoned quarries, several lime kilns and accessory industrial structures. Taken as a whole, the complex reveals much regarding the operation of a major local industry of Delaware during the period c. 1820-1900. The limestone deposits formed the nucleus of an extensive lime industry during the early to mid-nineteenth century. The Jeanes and Eastburn families established quarries, lime kilns and accessory industrial structures in 1816-1850.

#### Dean Woolen Mill

The Joseph Dean and Son Woolen Mill, one of the earliest and largest cloth mills in Delaware, contains seven nineteenth century mill buildings, including the original four-story stone mill. In 1841, Joseph Dean purchased the mill, built earlier in the century, and converted it for the manufacturing of woolen yarn and Kentucky jeans. During the Civil War, the mill was expanded to accommodate the growing demand for blankets and cloth. In 1881, the mills were once again expanded and modernized until they were gutted by fire in 1886. Eventually, the remaining buildings were purchased and rehabilitated by Continental Diamond Fiber Company. A recent fire destroyed the interior of one of the remaining nineteenth-century structures.

### **NATIONAL WILD AND SCENIC RIVER ELIGIBILITY**

**All streams within the White Clay Creek watershed are eligible for inclusion into the National Wild and Scenic River System. This includes all streams within the Mill Creek, Pike Creek, Middle Run, and the East Branch, West Branch, and Middle Branch sub-basins.\***

1. *The White Clay Creek main stem, along with all of its tributaries, are free flowing.*
2. *The White Clay Creek watershed possesses the following outstandingly remarkable values,: hydro-geology, water quality and quantity, botany, historical and cultural, and fish and wildlife.*
3. *The Mill Creek, Pike Creek, Middle Run, the East Branch, West Branch, and Middle Branch sub-basins each individually have been found to possess outstandingly remarkable values*

*and are each free flowing and, therefore, are eligible individually for inclusion in the National Wild and Scenic Rivers System.*

\* Concerns were raised during the study about the level of development around the streams within Study Segment W5, Pike Creek; Study Segment W6, Mill Creek; and Study Segment W8 & W9 the Main Stem which flows through Newark, Delaware and New Castle County. Questions arose about whether these segments should be found ineligible as a result of the high level of residential and commercial development within these areas.

The Study Team felt that these segments were eligible from two standpoints, one each of the segments possessed at least one outstandingly remarkable resource and was determined to be free flowing and two, the streams within these study segments were in most cases adequately buffered with natural vegetation. It is true that in certain instances development does encroach on the streams, however, even in these instances the encroachment is not several miles in length but is usually at most several hundred yards. The encroachments are balanced by miles of intact riparian vegetation and forest cover, even within the City of Newark, refer to the Outstandingly Remarkable Resources Map in the Appendix.

The buffering exists in part because of existing land use regulations, existing parklands, conservation easements and individual landowner actions. Approximately 10% of the streams in the Pike Creek and Mill Creek segments flow within protected areas. The main stem as it flows through the City of Newark was well screened and buffered from development through a combination of acquisition by the City of Newark of floodplain areas for use as open space and strict adherence to ordinances that restrict development in the floodplain. In total, approximately 10 miles out of 19 miles of the main stem, 9 miles out of 16 miles of Pike Creek and 16 miles out of 39 miles of Mill Creek are buffered with riparian vegetation.

It must also be remembered that the outstandingly remarkable resource values of the White Clay Creek such as its diverse array of botanical communities, its groundwater resources and the presence of many neo-tropical birds is largely due to the existing system of interconnected riparian and forest habitats. These corridors and blocks of forest provide vital links for wildlife and protect both surface and groundwater quality. The Study Team felt that designation of the main stem in the City of Newark, Pike Creek and Mill Creek would provide a platform in which to seek further protection for them at the local level and ultimately provide better protection for the interconnected resource values of the White Clay Creek as a whole.

## **CLASSIFICATION**

A total of 190.9 miles of the White Clay Creek system are recommended to be included in the Wild and Scenic Rivers System. The recommended classifications are: 24 miles scenic and 166.9 miles recreational. (See Classification Map in Appendix for locations of each type of classification.)

Due to the presence of developments, land alteration and other human encroachment, the only segments that qualify for "Scenic" designation are the following: *Those portions of the White Clay Creek Main Stem, the East Branch and the Middle Branch which flow through the boundaries of the Bi-State Preserve and/or the White Clay Creek State Park; and*

*Those portions of the Middle Run which flow through the boundaries of the Middle Run Natural Area.*

All designated portions of the White Clay Creek watershed which are not classified as "Scenic" are proposed for the "Recreational" classification.

### ELIGIBILITY AND CLASSIFICATION SUMMARY CHART

SUB-BASIN	SCENIC	RECREATIONAL	FREE FLOWING	VALUES	RESOURCES
EAST BRANCH Above Avondale		30.7 miles	Yes	Hydro-geology Water quality Botany Fish & Wildlife	Cockeysville Marble Exceptional Value Stream Rare Plant Species Cold Water Fishery / Rare Animal Species
Below Avondale	4 miles	15.1 miles			
MIDDLE BRANCH	2.1 miles	20.9 miles	Yes	Hydro-geology Botany Fish & Wildlife	Cockeysville Marble Rare Plant Species Cold Water Fishery / Rare Animal Species
WEST BRANCH		17.1 miles	Yes	Botany Fish & Wildlife	Adj. Rare Plant Species Adj. Rare Animal Species
MAIN STEM Above Newark	12.7 mi.	6.3 miles	Yes	Botanical Fish & Wildlife Historical	Rare Plant Species Rare Animal Species England House & Mill Dean Wollen Mill
Near Delaware Park Churchman's Marsh		16.8 miles 4.4 miles			
MIDDLE RUN	5.2 miles	1.3 miles	Yes	Hydro-Geology Botany Fish & Wildlife	Cockeysville Marble Adj. Rare Plant Species Adj. Animal Species
PIKE CREEK		15.6 miles	Yes	Hydro-Geology Historical Fish & Wildlife	Cockeysville Marble Eastburn Lime Kilns Rare Animal Species
MILL CREEK		38.7 miles	Yes	Hydro-geology Fish & Wildlife	Cockeysville Marble Adj. Rare Animal Species

## **SECTION IV: WHITE CLAY CREEK WATERSHED MANAGEMENT PLAN**

A headwater watershed, like the White Clay Creek, typically consists of a dense network of very small perennial and nonperennial streams. More than 54% of the White Clay Creek watershed is made up of these "first order," or smallest-category streams. Most first-order streams are only a few feet wide and they carry small volumes of water.

Because of low volumes they lack the capacity to dilute pollutants, small headwater streams are very susceptible to non-point source contamination. They can also be unbalanced dramatically by changes in surrounding land uses. Even apparently insignificant shifts in use can cause severe fluctuations in temperature, nutrient composition, and, ultimately, in the biodiversity of headwater streams.

Recognizing the factors that distinguish this watershed, Congress directed the National Park Service to consider the entire White Clay Creek watershed when devising a management plan. This comprehensive approach allowed inventory, analysis, and recommendations that address all of the conditions and potential threats that face this complex, sensitive and influential river system.

This section summarizes the work performed by the Study Task Force Management Planning Committee and the recommendations for the implementation of the management plan. A full description of the committee's work and its recommendations are available in the "White Clay Creek Watershed Management Plan."

### **MANAGEMENT PLANNING COMMITTEE**

The White Clay Creek Watershed Management Plan was developed by a subcommittee of the Study Task Force, the Management Planning Committee. The resource information, issues, and management recommendations were developed by the Management Planning Committee through a public planning process. Professional planning assistance was provided to the Management Planning Committee from the National Park Service. The National Park Service planning assistance included providing direction and advice to the Committee and the actual writing and preparation of the Watershed Management Plan document. The Park Service also supervised the graphic production, printing and distribution of the document.

Work began on the management plan in 1995. Landowners; citizens; private organizations; local, county, state, and federal governments; businesses; and others provided input and comments on the work of the Management Planning Committee. In the fall of 1997, the Management Planning Committee issued a Draft Watershed Management Plan.

A key issue that was addressed in the plan was the area to be federally-designated as wild and scenic. The Management Planning Committee felt that they needed to put forth a recommendation for the designation boundary in the management plan so that local governments could make a better informed decision whether to support the plan and designation. The geographic area proposed for federal designation within the Draft Watershed Management Plan represented the consensus of the Management Planning Committee. Based on public comments on the draft plan,

a final version of the management plan was released in May 1998.

## **EXISTING LAND DEVELOPMENT AND CRITICAL AREAS**

Among the first steps the Management Planning Committee took toward developing an approach to managing the White Clay Creek watershed was an analysis of existing land uses and development patterns, and an inventory of critical resource areas. (See Appendix for Critical Resource Map.)

From the outset it was clear that the White Clay Creek watershed is a complex mosaic of land uses. The watershed represents a fairly typical cross-section of the mid-Atlantic seaboard region, showcasing dense highway commercial strips, industrial corridors and tiny agricultural crossroads villages. In and around the intense land uses flourishes a more hidden natural world where plants and animals thrive and tiny streamlets flow toward the creek.

To date, the municipal, county and state authorities within the watershed have balanced fairly well the region's growth with the protection of sensitive resources. But demographic trends show that population in the watershed and surrounding area continues to burgeon, and development pressure will inevitably increase. Many municipalities currently work with older ordinances, and few local and regional governments utilize all the conservation tools now available for watershed protection purposes. New Castle County and London Grove Township are two exceptions. New Castle County has recently adopted a new "Unified Development Code," including a riparian buffer ordinance to improve water quality, and reduce erosion in the watershed. London Grove has implemented a comprehensive stormwater management ordinance which addresses many watershed protection issues.

## **DRINKING WATER PROTECTION**

Drinking water is perhaps the White Clay Creek's most important resource. Residents of New Castle County, Delaware, depend on the White Clay Creek for much of their water supply; even so, the surface water flowing through the creek does not consistently meet the demand. During times of drought, especially, the drinking-water supply can shrink to critically low levels. The water supply drawn from the creek is currently supplemented by wells replenished by the watershed's groundwater supply.

As development continues in Chester County and New Castle County, demand for drinking water - much of it drawn from new wells fed by the watershed - will certainly grow. The Management Planning Committee recognized that the management approach selected must give a very high priority to protecting the quality and quantity of drinking water within the watershed.

## **MANAGEMENT PRINCIPLES**

The Management Planning Committee established the following set of principles to guide the development of management strategies for the watershed:

*No Federal Land Acquisition:* The National Park Service (NPS) will not acquire land within the White Clay Creek watershed for the purpose of protecting outstandingly remarkable resources.

*Local Management:* Management of White Clay Creek resources will be based primarily on the actions of local government in cooperation with landowners, the business community, individual citizens, and county and state agencies. The role of the federal government will be minimal.

*Use of Existing Statutes, Ordinances, and Programs:* Every effort will be made to utilize only existing authorities, statutes, ordinances, and programs to protect the important resources of the White Clay Creek and its watershed. A set of recommended guidelines for local resource management and protection are part of this plan.

*Protection of Landowner Rights:* Any strategy to conserve the resources of the White Clay Creek and its watershed should simultaneously ensure that the property rights of landowners are protected.

*Consistency with Local Plans:* The existing range and pattern of agricultural, residential, commercial and industrial land uses should be consistent with adopted comprehensive development plans at the local and county levels.

*Existing/Future Public Water Facilities:* The plan should recognize the existing and future water supply uses and wastewater treatment facilities in the White Clay Creek watershed. Existing uses include the surface water supply intakes for the City of Newark and United Water Delaware and wastewater treatment plants in the Boroughs of Avondale and West Grove. Wild and scenic designation within the 500-year floodplain of the White Clay Creek and its second-order tributaries should not restrict the existing operations or future modification to the water intakes, water treatment or wastewater treatment plants of the City of Newark, United Water Delaware or the Boroughs of Avondale and West Grove. The properties on which these facilities are located are not recommended to be included in the federal wild and scenic river designation. The Churchman's Marsh reservoir alternative has been deleted from further consideration as a water supply alternative.

Future water uses may include the Thompson Station reservoir alternative, which is to be located on Lamborn Run. Lamborn Run, along with the property on which the intake structures for the Thompson Station Reservoir will be located, should not be designated for wild and scenic status pending the completion of the federal Environmental Impact Statement (EIS). If the federal EIS is not completed, or if it determines the Thompson Station reservoir site is practicable and the site remains on the DRBC Comprehensive Plan, then the Thompson Station reservoir site would remain unsuitable for federal wild and scenic status.

*Adoption of Recommended Land Use Management Protection Guidelines:* The Land Use Management Guidelines should offer a range of alternatives for meeting resource protection goals. Local governments should adopt into their local ordinances and plans those areas of the guidelines not currently addressed in their local ordinances. Landowners should be encouraged to adhere to the management guidelines in the stewardship of their own properties.

*Comprehensive Strategy for Resource Protection and Conservation:* The plan recognizes that no one group, organization, or level of government can protect all of the resources of the White Clay Creek watershed. The actions of local governments will be a cornerstone of the plan. However, the successful protection of resources will require a coordinated approach and application of conservation easements, land trusts, education programs, best management practices, reforestation

projects, etc.

*Advisory Board or Commission:* An advisory board or commission representative of all watershed interests should be created to coordinate the long-term implementation of the Watershed Management Plan. The advisory board or commission should assist and guide local governments and landowners in their efforts to implement the overall watershed management plan as well.

## **GOALS**

- *Improve and conserve water quality and water quantity*
- *Conserve open space, woodlands, wetlands and geologic features*
- *Protect native plant and animal species*
- *Preserve cultural, historical and archaeological sites*
- *Enhance outdoor recreation opportunities*
- *Encourage environmental education and outreach*

## **A TWO-TIER APPROACH**

A two-tier approach to the management of the White Clay Creek watershed acknowledges both the importance and preference for local leadership, and the additional protection afforded by wild and scenic river designation.

The first management tier will focus on the watershed's municipal and county governments, with the cooperation of state agencies in both Pennsylvania and Delaware, and with the DRBC. Participants in this tier will begin to adopt and implement watershed management strategies contained in the Local Land Use Management and Resource Management sections of the plan. Cooperation across state and county lines will foster consistency throughout the entire watershed.

The second management tier will involve the federal government through the National Wild and Scenic Rivers System. Federal action will center on the designation of major White Clay Creek tributaries into the system. Federal authority will center on reviewing the impacts on outstanding watershed resources from water resource projects involving federal loans, licenses or permits, within the designated area.

This approach to management recognizes that existing federal and state agencies and the Delaware River Basin Commission will continue to exercise their authorities over state and federal permits and other regulations affecting the river environment of the White Clay Creek.

### **Federal Designation Boundary**

Generally, designation boundaries envelope outstandingly remarkable resources and provide enough land area to buffer the waterway from incompatible land uses. The designated area may not exceed more than 320 acres per river mile, on average. Some members of the Study Task Force favored federal designation of the entire area drained by the White Clay Creek and its tributaries, others favored designation only for areas that would protect resources while relying on the municipalities in Pennsylvania, the City of Newark and New Castle County to continue to regulate the remainder of the watershed's lands.

The Management Planning Committee debated the appropriateness of extending the protection conferred by designation over the entire White Clay Creek watershed. The Committee had particular concern about the appropriateness of conferring the same type and level of protection for the watershed's urban areas as for its undeveloped portions. A considerable portion of the White Clay Creek watershed within the City of Newark municipal boundaries is intensively developed, including a large portion of the city's central business district. These areas will be developed or redeveloped and the committee recommended it not be considered for inclusion in the federally-designated area. The Committee also debated whether it was appropriate to designate existing water treatment facilities and existing waste water treatment plants.

The consensus of Committee was to designate all second order streams into the national system and leave all first order streams and the majority of the lands within the watershed under the jurisdiction of the states, counties and municipalities. It was felt that the most threatening federal actions might occur on second order and higher streams. The existing waste water treatment facilities and water treatment plants were not recommended for designation since they are sufficiently regulated by U.S. EPA, Delaware River Basin Commission and the states, which regulate surface water discharges and instream flows for the White Clay Creek.

## **ADMINISTRATIVE FRAMEWORK**

### **Geographic Area Proposed for Designation**

The following segments of the White Clay Creek system were recommended by the Management Planning Committee for consideration for federal wild and scenic river designation: White Clay Creek, from the confluence of the East and Middle Branches in London Britain Township, Pennsylvania downstream to its confluence with the Christina River in New Castle County, Delaware; the East, West, and Middle Branches within Pennsylvania; Middle Run, and Pike and Mill Creeks in Delaware; and all other second-order streams.

The following areas were not recommended for consideration for inclusion in the federal wild and scenic river designation: all first order streams; Lamborn Run (along with the properties on which the intake structures and pipelines for the Thompson Station Reservoir will be located); and the properties on which are located the surface water intakes, water treatment and wastewater treatment facilities of the City of Newark and United Water Delaware and the Boroughs of Avondale and West Grove.

The Management Planning Committee concluded that the inclusion of riparian corridors in the designated area is wise, as most of the issues raised in the White Clay Creek watershed involve the protection and restoration of those corridors for the benefit of wildlife and the enhancement of water quality. In general, lateral boundaries will bracket the riparian zone, including the 500-year floodplain as defined by the Federal Emergency Management Agency, or 250 feet from the ordinary high water mark, whichever is greater, along the White Clay Creek, Middle Run, Pike Creek, Mill Creek and the second-order tributaries to their waterways. Within the City of Newark, the designated corridor shall consist of the delineated 500-year floodplain, which is protected by municipal ordinance and existing public open-space lands. Beyond the 500-year floodplain, the city is highly urban and developed.



## **White Clay Creek Watershed Management Committee**

- A key principle of the administrative framework described here is that existing institutions and authorities will play the primary roles in the long-term protection of the White Clay Creek watershed. Municipalities, counties, states and federal agencies, together with private organizations and landowners, will participate in maintaining the high quality of the White Clay Creek watershed. To bind these diverse interests together in common purpose, a permanent committee representing all of them should be convened. This proposed White Clay Creek Watershed Management Committee will utilize and carry forward the work of the White Clay Creek Wild and Scenic River Study Task Force.

### ***Purpose***

The White Clay Creek Watershed Management Committee will promote the long-term protection of the White Clay Creek watershed. To do this, it will:

- Bring together the major watershed interests on an annual basis;
- Stimulate cooperation among the major watershed interests;
- Provide a forum for discussing and resolving issues; and
- Promote and facilitate the implementation of the watershed management plan

### ***Function***

The White Clay Creek Watershed Management Committee will be advisory in nature; it will have no regulatory or land-acquisition authority. The committee may provide advice to agencies and institutions with management or regulatory authority, but it will not have the power to force the actions or decisions of any of those entities.

### ***Cooperative Management Agreement***

The committee will develop a memorandum of understanding for the cooperative management of the White Clay Creek watershed. The State of Delaware, the Commonwealth of Pennsylvania, New Castle County, Chester County, Avondale Borough, City of Newark, Franklin Township, London Grove Township, London Britain Township, Londonderry Township, New Garden Township, New London Township, Penn Township, West Marlborough Township, West Grove Borough, and the National Park Service will be the signatories to the agreement. The townships of Kennett and East Marlborough, the U.S. Fish & Wildlife Service, the Natural Resources Conservation Service, and other entities may at their discretion become party to the agreement.

### ***National Park Service Role***

The National Park Service (NPS) will serve as the key federal representative in the implementation of the White Clay Creek Watershed Management Plan and designation. The agency's principal role will be to represent the Secretary of the Interior in reviewing federal projects as required by

Section 7(a) of the Wild and Scenic Rivers Act and to serve as coordinator and liaison among participants in the White Clay Creek Watershed Management Committee. The NPS will review any proposed water resources project which requires federal assistance through permits, licenses, funding, or other action encroaching on or directly affecting any designated segment of the White Clay Creek and its tributaries. During its review, NPS will evaluate each proposed project in terms of its potential impact upon the management plan's objectives and standards and on the designated area's outstandingly remarkable values. NPS may also continue to provide technical assistance to the committee, on a request basis, through the NPS River, Trails, and Conservation Assistance program.

## **LOCAL LAND USE MANAGEMENT PROGRAM**

A major goal of the overall watershed program is to guard against the indiscriminate urban sprawl-type development patterns within the watershed which serve to destroy or otherwise impact the very values which make the White Clay Creek watershed an attractive place to live and work. The key to success in this effort is coordination among local communities and other watershed citizens, which can best be realized through active participation in and support of the White Clay Creek Watershed Management Committee.

The local land use element is the heart of the White Clay Creek Watershed Management Plan. This Local Land Use Program articulates and explains a series of resource protection guidelines and objectives designed to improve water quality and fish and wildlife habitat. For each objective, the plan suggests a series of actions municipalities can take to enhance resource protection within their community. Municipalities are encouraged to review and revise their land use ordinances so that the objectives may be achieved. Local governments are encouraged to adopt into their ordinances and plans those areas of the guidelines that they do not currently address in their ordinances. The guidelines present alternatives for meeting each objective (refer to the White Clay Creek Watershed Management Plan for a listing of all alternatives). It is up to each municipality to decide which alternative (or alternatives) best fits its particular situation.

**OBJECTIVE A:**        *Protect and improve base flows and stream habitat through recharge.  
Protect Cockeysville marble recharge areas from contamination.*

**OBJECTIVE B:**        *Protect and improve water quality and stream habitat through floodplain  
and wetland protection.*

**OBJECTIVE C:**        *Protect and improve water quality and stream habitat through riparian  
forest buffers.*

**OBJECTIVE D:**        *Protect and improve water quality and stream habitat through sediment  
and stormwater management.*

**OBJECTIVE E:**        *Protect and improve water quality and stream habitat through slope  
protection.*

- OBJECTIVE F: *Sustain biodiversity through habitat linkage and management.*
- OBJECTIVE G: *Encourage dedication, purchase and stewardship of open space.*
- OBJECTIVE H: *Protect the historic, cultural and archaeological resources in the White White Clay Creek watershed.*

## **RESOURCE MANAGEMENT**

The Resource Management section of the watershed management plan describes the challenges of the watershed's major resource groups, delineates the responsibilities of each government agency and other entities involved in their management, sets goals, and recommends actions that would enhance the conservation and quality of each resource (refer to the White Clay Creek Watershed Management Plan for a listing of all recommended actions).

### **Resource Management Challenges**

#### ***Water Resources***

The White Clay Creek watershed usually receives abundant rainfall. Nevertheless, due to accelerated real estate development in recent decades, demand has outpaced supply creating a shortage of water especially during periods of drought. A sustainable, consistently high quality water supply is critically important.

#### ***Fish and Wildlife***

Because of its physiographic and geologic features, the White Clay Creek watershed contains an abundance of diverse and high quality habitat types that support a wide variety of species. Other watersheds in the region once resembled the White Clay Creek watershed, but these have been irreversibly altered. Fish and wildlife are being threatened by development activity in the watershed.

#### ***Watershed Restoration***

The need for repair of eroding streambanks, enhancement of water quality and restoration of fish and wildlife habitat throughout the watershed has been well documented. The Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture has prepared a Watershed Protection Plan and Environmental Assessment for Red and White Clay Creeks. While not as severe as those of Red Clay Creek, the White Clay watershed is also experiencing non-point pollution and habitat loss. The NRCS Plan cites erosion, runoff, sedimentation, inadequate riparian vegetation and the loss of wetlands as the major factors contributing to the phenomenon.

Examples of activities that may be necessary and appropriate (when applied judiciously), include, but are not limited to, the following: streambank stabilization; in-stream and streambank fish habitat improvement structures; installation and recruitment of large woody debris; fish stocking; implementation and maintenance of erosion and sedimentation control measures; removal of "tree

dams" and other obstructions; placement of spawning gravel; and re-vegetation/re-forestation.

### ***Cultural Resources***

While many watershed areas remain relatively unchanged in modern decades, other portions are experiencing development and infrastructure improvements on a vast scale. There is an urgent need, therefore, to identify, document and protect those sites and structures that survive.

### ***Recreation Resources***

In general, open space acreage and opportunities for passive recreation within the watershed are adequate, according to the guidelines of the National Recreation and Park Association (NRPA). However, public opinion does not support the finding of adequacy; and there is a regional imbalance in the location of active and passive recreational lands in favor of the dense population centers. In addition, park and trail maintenance is inconsistent; and numerous conflicts have been identified between parkland uses and the preservation of natural qualities and resources.

### ***Water Resource Projects***

Facilities providing transportation, energy resources, communications, water supply, waste disposal, education and recreation are critical public services provided to citizens living and working in, or visiting, the White Clay Creek watershed. However, if improperly located, designed, constructed or maintained, such facilities have the potential for destroying or severely damaging natural and cultural resource values, and adversely affecting the quality of life within the watershed. The cumulative impact of multiple corridors and stream crossings can magnify these problems.

### ***Education and Outreach***

Education and outreach are mutually reinforcing tools for inspiring public appreciation and stewardship for the watershed and its resources, and for engaging public participation in conservation activities. As such, they must be included in a comprehensive management strategy.

## **FALL, 1997 PUBLIC REVIEW OF DRAFT WATERSHED MANAGEMENT PLAN**

During October and November 1997, the Draft White Clay Creek Watershed Management Plan was presented for public review. Two open houses and two formal public meetings were held within the watershed. More than 100 persons attended, with numerous citizens asking questions and making general comments. There were 11 citizens who presented specific testimony. Those attending were encouraged to complete a survey/response form and submit it and/or additional comments to the National Park Service. The public comment period remained open for an additional 45 days. A total of 17 survey/response forms, 11 letters and two official resolutions were submitted.

Many of the public comments concerned suggestions for wording changes which would clarify the Draft Watershed Management Plan. Those suggestions were considered and changes were made where appropriate. Discussions centered on four major issues: (1) the Draft Watershed

Management Plan itself; (2) proposed federal wild and scenic river designation; (3) the proposed exemption of Lamborn Run from designation and protection; and (4) the proposed exemption of water treatment plants. These are the positions which were specifically articulated by citizens, either during the public meetings, or submitted afterwards:

- Twenty-six people supported the Draft Watershed Management Plan, with ten of those specifically supporting federal wild and scenic river designation, as well. Two persons were opposed to both the Draft Plan and wild and scenic river designation, based largely on the involvement of the federal government.
- Regarding exemptions, five citizens felt that no exemptions of any kind should be recommended at this point. Nine persons were opposed to exemption of Lamborn Run, four supported that exemption, and two questioned why Lamborn Run was proposed for exemption. Three listed a concern with new dams, without any specific mention of Lamborn Run. Six persons voiced their opposition to exemption of water treatment plants, while one person supported the proposed exemption of water treatment plants.

## **SECTION V: EVALUATION OF RESOURCE PROTECTION**

To demonstrate that the White Clay Creek and its tributaries are suitable for designation, it must be shown that the creek's outstandingly remarkable values and resources can be protected through feasible strategies. This section of the report highlights resource protection strategies currently practiced within the watershed and in its two-state region.

The majority of the White Clay Creek is in private ownership, therefore, local land use regulations are critical to resource protection. For this reason the evaluation focused primarily on the municipal level in Pennsylvania, and on the county level in Delaware, which governments are vested with the authority to regulate local land use. A review of several Chester County, Pennsylvania plans and programs were included since they provide for resource protection even though Chester County does not regulate land use within the White Clay Creek watershed. The summary also describes some of the state and federal agencies and programs with provisions that provide additional resource protection for White Clay Creek. The protection mechanisms described in this section are by no means the only ones available. The ones highlighted here are most likely to provide direct protection of the White Clay Creek watershed and its outstandingly remarkable values. The implementation of the White Clay Creek Watershed Management Plan is a key component to the overall protection strategy.

### ***Local Resource Protection - Pennsylvania***

Twelve municipalities in Pennsylvania have jurisdiction over land in the White Clay Creek watershed, all within Chester County. The twelve affected municipalities have primary jurisdiction over land use and development activities as granted by the Pennsylvania Municipalities Planning Code (MPC; Act 247). Municipalities include townships, boroughs and cities; each of these governments is empowered to engage in comprehensive planning, and to enact zoning, subdivision, and planned residential development ordinances. Pennsylvania counties are considered "municipalities" under the MPC, with the ability to plan, and, when municipalities do not do so, to zone. All counties must (MPC, Section 301.4) prepare comprehensive plans, which are strictly advisory in nature.

All twelve of the affected municipalities have exercised their land use authority under the MPC and have comprehensive plans, zoning ordinances, and subdivision and land development ordinances in effect. Chester County has a comprehensive plan in effect. The plans and ordinances in effect provide varying degrees of protection for the outstandingly remarkable values of the White Clay Creek.

Of special note are the Ground Water Protection District in the East Marlborough Township Zoning Ordinance, and the London Grove ordinance protecting Cockeyville Marble. These zoning overlay districts protect the aquifer contained in the Cockeyville Marble geologic formation underlying parts of the townships. Their provisions aim to safeguard the aquifer against depletion due to increased demand from new land development, against wastewater pollution that threatens its quality, against exorbitant surface cover that would diminish its recharge capability, and against increased danger of land subsidence and sinkholes. The majority of the known Cockeyville Marble within the Pennsylvania portion of the watershed is located in London Grove Township. While the Cockeyville formation extends into other municipalities, most of the land where it exists is developed. The cited ordinances are the only ones known to have been specifically

written to protect this aquifer.

London Grove Township also has a comprehensive stormwater ordinance which encourages infiltration to maintain streamflow. The applicant is required to delineate all Stormwater Management Areas on the property. There are two types of Stormwater Management Areas: (a) a riparian forest buffer for all bodies of water; and (b) Hydrologic Management Areas. Hydrologic Management Areas are (1) water related land areas consisting of (a) wetlands including a (25') twenty five foot buffer area along their boundary, (b) floodplain areas, (c) sites occupied by Best Management Practices, as well as; (2) access easements along stormsewers, floodplains, and watercourses. These areas are to be designated as open space with no disturbance and are to be secured by deed restriction. Since London Grove is entirely within the White Clay Creek watershed this ordinance will have a substantial effect on protecting the outstandingly remarkable hydro-geologic values of the watershed.

Protecting steep slopes and floodplains is another form of municipal protection. Steep slope and floodplain development ordinances indirectly improve water quality in the watershed. By limiting new development on steep slopes municipalities help to reduce soil erosion. Restricting floodplain development reduces the loss of riparian vegetation as well as the loss of habitat for threatened and endangered plants and animals. A majority of the affected municipalities have adopted steep slope ordinances. All of the affected municipalities have adopted floodplain protection ordinances, except West Grove which does not contain any floodplains.

Another aspect that was considered for the local protection of outstandingly remarkable values of the White Clay Creek involved planning assistance that is available from Chester County. While planning alone cannot insure permanent protection for resources, it is an important tool which can guide future development in the watershed and therefore provides indirect benefit to river-related resources. Through its "Vision Partnership Program" Chester County provides financial and other incentives to municipalities for comprehensive planning which will assist with protecting important watershed resources.

This effort is guided by "Landscapes," a county-wide comprehensive policy plan, which compares the current trend in Chester County - toward an undifferentiated suburban sprawl - with a commonly - held vision of development concentrated in centers supported by resource preservation, open space, and reduced motor vehicle congestion. The plan articulates goals, objectives and policies in the following areas: Land Use, Resources, Economic Development, Transportation, Community Facilities, Utilities, Housing, Human Services, Public Health, and Planning and Coordination. Those goals, objectives and policies most likely to affect the White Clay Creek watershed are found in the areas of Land Use, Resources, Community Facilities and Utilities.

Other Chester County resource protection measures that provide more permanent protection include open space acquisition programs and erosion and sedimentation regulations. The Chester County Parks and Recreation Department has several programs which provide incentive and funding to municipalities for the acquisition and protection of open space for use as parks and greenways. Under state sedimentation and erosion regulations, the Chester County Conservation District has both regulatory and outreach responsibilities related to the White Clay Creek watershed. Through education and grants the Chester County Conservation District promotes conservation practices, which include best management practices affecting stormwater

management and mushroom agriculture.

### ***Local Resource Protection - Delaware***

In 1998 New Castle County adopted a new Unified Development Code (UDC). The UDC is a compilation of all of the zoning, subdivision, design and resource protection regulations for New Castle County. The Unified Development Code covers land use development for the entire White Clay Creek watershed outside the limits of the City of Newark.

The UDC establishes basic performance standards to protect natural resources. Developments are required to conduct a carrying capacity analysis (Article 05) which regulates the maximum intensity based on actual site conditions. The code also requires a site carrying capacity analysis which ensures that public health, safety, general welfare and quality of life is protected and preserved for future generations. Protection standards for activities in areas of natural resources or the mitigation of resource areas that are disturbed are established.

The UDC protects natural resources by requiring the preservation of a minimum amount of the resource as open space. The amount of natural resources to be protected is determined by carrying capacity calculations. Such open space is part of the open space ratio in residential developments and part of the landscape surface ratio in non-residential developments. Unless otherwise permitted by the code the open space shall remain undisturbed. Resource protection levels are specified and must be met within any development.

The development intensity may be modified by the site capacity calculations. Some of the natural resources considered in the carrying capacity analysis include floodplains, forests, wetlands, riparian buffer areas (RPA), steep slopes and water resource protection areas (WRPA). WRPAs include the Cockeysville Marble formation, surface water, wellheads, and aquifer recharge areas.

Riparian buffer areas are defined as a corridor one hundred (100) feet on either side of perennial and intermittent streams, lakes and tidal wetlands as well as land adjacent to identifiable stream channels that drain greater than ten (10) acres; all of the floodplain, plus an additional fifty (50) feet of adjacent land; all of a non-tidal wetland greater than twenty thousand (20,000) square feet in area, plus an additional fifty (50) feet of adjacent land; all of any size non-tidal wetland classified as a Piedmont Stream Valley Wetland, as defined in the 1997 New Castle County Comprehensive Plan Update and designated by the Delaware Natural Heritage Program, a Division of DNREC, plus an additional fifty (50) feet of adjacent land. Permitted uses in the buffer area include nature preserves, parkland not requiring structures, wildlife sanctuaries, etc.

Floodplains, wetlands, RPAs and WRPAs are highly weighted in the carrying capacity calculations. Therefore, the presence of these natural features on a particular property will tend to increase the amount of land to be protected as open space. Open space preserved through this ordinance will be centered on those natural features that are of the most benefit to the White Clay Creek watershed as a whole.

The New Castle County Department of Land Use also administers a drainage code designed to control the quantity and quality of stormwater from new developments. The code contains provisions for stormwater detention, buffer areas, soil erosion and sediment control. Under the UDC subdivision and land development applicants shall investigate the utilization of conservation



design methods. Before other alternatives are considered, the applicant shall demonstrate that conservation design methods are not feasible on the site.

A number of sections in the UDC deal with historic resources. Properties with historic resources are eligible for bonuses to ensure the preservation of the historic resources. Open space subdivisions and open space planned developments require that open space be preserved around historic structures to preserve their original setting. Bonuses are given to developers who choose this type of development.

A historic resource may also require significant expensive renovations and costly maintenance that could be deemed fiscally impossible. The Department of Land Use, upon a recommendation from the Historic Review Board, can review and consider a bonus for the renovation and long-term maintenance of such historic resources. A bonus of dwelling units in an open space planned development, additional floor area for non-residential properties, or transferable development rights may be offered to provide the incentives needed to renovate and preserve the historic resource. This ordinance will provide a tool for protecting the outstandingly remarkable historic resources identified by this study, but will also help to ensure protection for other historic resources in the watershed as well.

Historic Zoning Districts are also established by the UDC. Exterior alterations, demolition, relocation, construction or reconstruction of any building, structure, site, or object within a historic zone is prohibited unless a permit is first obtained from the Department of Land Use. The Department of Land Use will not issue a permit until the Historic Review Board first reviews and approves the application. Subdivision or land development plans affecting a historic zoning district or any property which is eligible to be zoned H (Historic) may be approved by the Department of Land Use without the prior review and recommendation of the Historic Review Board. The Eastburn-Jeanes Lime Kilns in New Castle County were determined to be an outstandingly remarkable resource by the National Park Service and are protected by New Castle County as an Historic District.

A number of key regulations and initiatives have also been implemented by the City of Newark, Delaware providing protection for the outstandingly remarkable resources in that community. The floodplain ordinance provides that no fill, new construction, substantial improvements or any other development is permitted within the "regulatory floodway," that would result in any increase in flood levels within the community during the occurrence of the 100 year flood. Development above the "regulatory floodway," but within the 100 year floodplain, is generally limited to agricultural uses, private and public recreational uses, open space, and lawns or side or rear yards for residential uses. Almost all of the floodplain lands adjoining the White Clay Creek within the City of Newark are publicly owned. Both the City and the State have purchased floodplain land for open space and parkland use. The City of Newark also has regulations that restrict development on steep slopes.

The City of Newark also has comprehensive Water Resource Area protection regulations. These regulations significantly limit or forbid development in wellhead recharge protection and aquifer recharge protection areas. Portions of these areas overlap the floodplain and are within the watershed of the White Clay Creek. In particular, the wellhead resource protection areas stipulate that for residentially zoned areas no more than 10 percent of the site can be covered with impervious surfaces, and permitted uses are restricted to single family detached dwellings not to

exceed one per two areas.

The City of Newark is a "delegated city," under Delaware Department of Natural Resources and Environmental Control's Stormwater Management Program. The city is responsible for regulating stormwater runoff within city boundaries. To qualify as a delegated local government, the city regulations must meet specific State requirements. All land-disturbing activities impacting sites larger than 5,000 square feet require the submission of detailed stormwater management plans for quality and quantity control. In particular, the city's regulations specify that the post-development peak discharge rate for the 2,10, and 100-year frequency storm events shall not exceed the pre-development peak discharge rates for the 2,10, and 100-year frequency storm events.

The City of Newark has promulgated wetland regulations in addition to the existing state and federal ones. All applicants for new development or additions to existing developments must submit wetlands reports which describe the conditions of the site, including hydrological soil and vegetative characteristics, and copies of all applicable federal and state wetlands permits. Wetlands reports are reviewed to determine: (1) the feasibility of a subdivision plan that does not require the disturbance of wetlands on the site; and (2) that the subdivision plan will result in minimal feasible alteration or impairment to the wetlands characteristics and its existing contours, vegetation and hydrological conditions, and will not cause significant degradation of ground and surface water quality.

In addition, the City of Newark has adopted a comprehensive historic preservation ordinance. The ordinance lists historic properties and stipulates review requirements for the demolition or significant alteration of the listed properties or sites. All demolition permits and building permits calling for the destruction of the entirety or a significant part of an exterior architectural facade for historic buildings shall require a certificate of economic hardship reviewed by the Planning Commission and approved by City Council under procedures for review of such certificates established in this section. However, the Dean Woolen Mill, which was determined by this study to be outstandingly remarkable, is not listed as a historic building or site and is therefore not covered by this ordinance.

### ***State Resource Protection - Pennsylvania***

The Pennsylvania Rivers Conservation Program conserves and protects river resources through the development and implementation of locally initiated plans. It provides technical and financial assistance to municipalities and river-support groups so that they can carry out planning and implementation activities. A registry is established to recognize local river-conservation efforts. The program consists of five components: planning grants, technical assistance, river registry, implementation grants, and acquisition and development grants. Local planning and support are prerequisites for any grant or recognition from this program, which is funded in part by the Keystone Recreation, Park and Conservation Fund Act of 1993.

Rivers in Pennsylvania are also protected through designation into the Pennsylvania Scenic River System. The Department of Conservation and Natural Resources (DCNR) administers the Pennsylvania Scenic Rivers Act (P.L.1277, Act 283, 1972, as amended). The act authorizes a Scenic River System comprising river segments with outstanding aesthetic and recreational values, and provides for the protection and administration of the designated segments.

While the White Clay Creek is not currently designated as a component of the Pennsylvania Scenic Rivers System that may be an action that is considered in the future. The White Clay Creek watershed has however benefited from the River Conservation Program. In 1998 the White Clay Watershed Association (WCWA) developed a "Watershed Management Plan," which focused primarily on water quality and was based on water quality monitoring that the White Clay Watershed Association conducted over a number of years. The plan was funded in part through a grant from the Pennsylvania Rivers Conservation Program. The WCWA plan provides specific prescriptions for water quality improvement that go beyond the more general recommendations made through the wild and scenic study.

### ***State Resource Protection - Delaware***

Authorized by the 1990 passage of the Delaware Land Protection Act, the Open Space Program of DNREC Division of Parks and Recreation coordinates and administers the acquisition of parks, fish and wildlife areas, forest, nature preserves and cultural sites. The Open Space Council designated the White Clay Creek as one of 20 State Resource Areas, a list of lands containing natural and cultural resources significant to the state. The identification of resource areas provides the state with a blueprint for future land acquisitions that will provide permanent resource protection. Through this program a number of major acquisitions of parkland have been made along the White Clay Creek and its tributaries.

The Delaware Department of Natural Resources and Environmental Control (DNREC) developed a program in the mid 90's after recognizing that "traditional permitting and enforcement practices, though effective to a point, may not be enough to help improve the environment." DNREC developed a new approach to its management responsibilities called Whole Basin Management. The basin-wide approach will evaluate the goals, needs, constraints and practices of the Department's Office of the Secretary and its five divisions. The objectives of this type of management are to improve relations, maximize usage, enhance coordination, promote public outreach and interaction, and integrate efforts with other State and local governmental units. This planning effort has generated a substantial amount of information about the Delaware portion of the White Clay Creek watershed which will assist in its management and protection as a national wild and scenic river.

### ***Bi-State Resource Protection***

In 1984 the Dupont Company donated land in the White Clay Creek valley north of Newark, Delaware, for a natural preserve to be managed jointly by Delaware and Pennsylvania. The preserve holds important natural and cultural resources, including freshwater wetlands, mature forests, rare plant and animal habitats, geological formations and archaeological sites. The preserve is managed for natural resource preservation and passive recreation.

The 1,800 acres in White Clay Creek Preserve are managed by the Pennsylvania Bureau of State Parks and the Delaware Division of Parks & Recreation. With the neighboring 1,752 acre White Clay Creek State Park and the 800 acre Middle Run Natural Area, the 500 acre addition to White Clay State Park adjacent to Middle Run, the protected riparian corridor along the White Clay Creek and its tributaries now totals more than fifteen miles out of nearly 200 miles proposed for designation. These areas provide permanent protection for many of the threatened and endangered species of the watershed which were identified as outstandingly remarkable by this study.

### ***Federal Resource Protection***

In 1961 the federal government along with the states of New York, New Jersey, Pennsylvania and Delaware, entered into a compact which created the Delaware River Basin Commission (DRBC). The compact recognized the river basin's regional and national significance. The commission adopts and promotes basin-wide policies for water conservation, control, use and management. The commission's authority to plan and regulate water conservation and use gives it a central river management role, particularly for water supply and quality issues. DRBC maintains a comprehensive plan that guides development of the basin's water resources and serves as a management and regulatory mechanism. The plan codifies administrative decisions governing water-resource use, development and conservation. In 1991 DRBC included in its comprehensive plan two proposed water-supply projects within the White Clay Creek watershed, reservoirs at Churchman's Marsh and-Thompson Station.

In 1996 the Natural Resources Conservation Service (NRCS) and the Forest Service (FS), in cooperation with the Chester and New Castle county conservation districts and the Brandywine Conservancy, issued a draft watershed protection plan for the Red Clay Creek and White Clay Creek watersheds. Its primary focus is on watershed protection and water-quality improvement. This plan falls under the authority of the Watershed Protection and Flood Prevention Act (P. L. 83-566, amended 16-USC-1001-1008).

Recommendations include accelerated land treatment and the acquisition of conservation easements. NRCS would support these recommendations by providing technical assistance and matching grants through a voluntary watershed protection program. NRCS will provide up to 65% of the costs for property owners proposing enduring land treatments and up to 50%, possibly higher, of the costs for purchasing conservation easements. Grants will be available, on a competitive basis, to landowners in both the Red and White Clay creek areas. Congress has authorized and appropriate funds to carry out this program. Implementation of this program will greatly assist in meeting the goals of the White Clay Creek wild and scenic study.

### ***Conclusions***

After a thorough review the National Park Service concludes that the outstandingly remarkable resources and values that were identified through this study of the White Clay Creek watershed can be protected. The protection of these resources and values will be accomplished through a combination of mechanisms. These mechanisms include federal programs, conservation easements, public land ownership, and local, county and state land use regulations and the protections offered through the Wild & Scenic Rivers Act.

At the top of the protection strategy will be the successful implementation of the White Clay Creek Watershed Management Plan. The focus of the White Clay Creek Watershed Management Plan centers on the protection and restoration of riparian corridors for the benefit of wildlife and the enhancement of water quality. Protection of the riparian areas within the watershed, along with the implementation of the recommendations for land use regulations, will only enhance the protection of the many outstandingly remarkable resources and values of the White Clay Creek watershed.

The recommended federal wild and scenic designated boundary includes the 500 year floodplain or 250 feet, whichever is greater, around all of second order streams (with those exclusions as noted in the plan). It was no accident that this was recommended as the boundary. The floodplain also envelopes many of the outstandingly remarkable resources and therefore its protection is key. We found that regulations are in place at the local, county, state and federal levels to sufficiently protect the floodplain from development and therefore protect many of the outstandingly remarkable resources and values.

Public open space and parklands are another key to the protection of the values and resources of the White Clay Creek watershed. More than 10 percent of the watershed is protected through a combination of conservation easements and publicly-owned parkland and open space. Much of the property which has conservation easements or is parkland surrounds the White Clay Creek and its tributaries. Approximately 40 miles of the recommended designated stream segments are permanently protected this way. Within the boundaries of the existing parks and preserves is much of the habitat for endangered or threatened plant and animal species which were identified as outstandingly remarkable.

The Cockeysville Marble formations will be protected almost exclusively through local land use regulations. Regulations exist in both Pennsylvania and Delaware to accomplish a sufficient level of protection for this hydro-geologic resource. Better stormwater management within the watershed will indirectly benefit many of the resources of the White Clay Creek watershed. Stormwater management can reduce peak flood flows in streams by infiltrating stormwater back into the ground, thereby reducing the soil erosion from flood events. By recharging the ground water with stormwater from developments droughts are not as severe because there is sufficient ground water to replenish the streams during dry periods. Much of the watershed is covered by excellent stormwater regulations that were enacted by London Grove Township and New Castle County.

## SECTION VI: SUITABILITY

This section describes the findings relative to Section 4(a) of the Act, which requires the study report to detail the river's suitability for designation into the National Wild and Scenic River System.

### SUITABILITY CRITERIA

A river's suitability for wild and scenic designation is a matter of whether designation makes sense, and whether the proposed management plan provides lasting protection. For rivers such as the White Clay Creek that flow through predominately private lands, federal land acquisition may not be an appropriate protective measure. Thus, protection must rely on a combination of federal, state, local, and private resource protection actions. If designation is to be effective, the non-federal entities must support and be committed to the implementation of any necessary resource protection measures.

For the White Clay Creek, the criteria used to assess suitability were:

1. ***Is there local support for national designation of the eligible segments of the White Clay Creek and its tributaries and implementation of the White Clay Creek Watershed Management Plan?***

This support was evidenced primarily by municipal agreement to implement the *White Clay Creek Watershed Management Plan*, dated May 1998 and support for national designation of the White Clay Creek and its tributaries as proposed in the White Clay Creek Watershed Management Plan. To date of the all 15 county, municipal and city governments in the area under consideration for designation have passed resolutions of support for designation and implementation of the plan (see Appendix for Municipal Resolutions).

Public workshops and the Landowner Survey Report document strong support for preserving the creek and its tributaries natural, historic, and recreational resources. Survey respondents listed water quality, wildlife habitat, and undeveloped land of the region as the three most important qualities of the area. In fact, 89.4 percent of those who returned surveys said they would support land use regulations and programs to conserve and protect the river. Over 54 percent of the respondents said they support an overall conservation plan for the river.

2. ***How adequate are existing protection measures (including state and local resource protection laws, zoning, and land ownership) in conserving the river's outstanding resources and free-flowing character?***

The White Clay Creek Watershed Management Plan documents the significant resource protection provided by the existing municipal land use control, the State of Delaware and the Commonwealth of Pennsylvania, and the Delaware River Basin Commission. The plan documents all of the affected municipal and county land-use plans and zoning ordinances. The watershed management plan also describes the regulatory and non-regulatory programs by the states, the Delaware River Basin Commission, federal agencies, and non-profit organizations. Further, the plan documents

the publicly-held land that protects important river-related resources, such as the White Clay Creek Bi-State Preserve and the White Clay Creek State Park.

- 3. Can a resource protection and management framework be developed that closes any resource protection gaps without relying on federal land acquisition and that facilitates communication and cooperation among governmental entities and private citizens who bear responsibility for implementing all river protection measures?***

The Watershed Management Plan provides the framework for enhanced resource protection and greater cooperation between resource management entities. This is accomplished, in part, through voluntary support of the goals of the White Clay Creek Watershed Management Plan and through creation of a Watershed Management Committee. By establishing the Watershed Management Committee, which will include representatives of all entities responsible for on-going resource protection, the Plan ensures that future management decisions will be based on resource protection objectives that satisfy the Wild and Scenic Rivers Act mandate to protect and enhance the outstanding values. Federal designation will encourage enhanced coordination among two states, two counties, and thirteen municipalities.

## **SUITABILITY FINDING**

The following segments or areas of the White Clay Creek and its tributaries were deemed suitable based on demonstrated local support for designation of these segments and areas and because the communities surrounding them endorsed implementation of the White Clay Creek Watershed Management Plan. These segments or areas also possess sufficient existing resource protection measures at the state, county and local government levels. Therefore, these segments or areas are deemed suitable for inclusion in the National Wild and Scenic River System:

***White Clay Creek, from the confluence of the East and Middle Branches in London Britain Township, Pennsylvania downstream to its confluence with the Christina River in New Castle County, Delaware; the East, West, and Middle Branches within Pennsylvania; Middle Run, and Pike and Mill Creeks in Delaware; and all other second-order streams as more accurately depicted on the Recommended Designated Area Map ( see Appendix).***

The following segments or areas were deemed **not suitable** because local support for their designation was not demonstrated (see Appendix, Municipal Resolutions of Support):

***All first order streams within the watershed.***

***Churchman's Marsh; Lamborn Run (along with the properties on which the intake structures and pipelines for the Thompson Station Reservoir will be located; until such time as it is removed from the Delaware River Basin Commission Comprehensive Plan as a potential reservoir site); and the properties on which are located the surface water intakes, water treatment and wastewater treatment facilities of the City of Newark and United Water Delaware and the Boroughs of Avondale and West Grove; the East Branch 500 feet north of the Borough of Avondale wastewater treatment facility and south of said wastewater treatment facility to the Avondale Borough - London Grove Township Municipal Boundary Line.***

***The East Branch within New Garden Township, from the point entering New Garden Township***

*(at the Franklin Township Municipal Boundary Line) to a distance of 10,500 feet downstream; and Egypt Run and its tributary.*

*Churchman's Marsh is deemed not suitable until such time as it is removed from the Delaware River Basin Commission Comprehensive Plan as a potential reservoir location. The first order streams within London Britain Township. While local officials of London Britain requested that the first order streams be designated (see letter in Appendix); there was not support from the Study Task Force for their designation. The consensus of the Study Task Force as expressed in the White Clay Creek Watershed Management Plan endorsed only the federal designation of second order and higher streams.*



## SECTION VII: ENVIRONMENTAL ASSESSMENT

### PURPOSE AND NEED FOR ACTION

#### *A. Purpose*

The purpose of the study report is to provide a basis for the National Park Service and its partners to:

1. Determine if portions of the White Clay Creek watershed within Pennsylvania and Delaware should be added to the National Wild and Scenic Rivers System; and
2. Determine the best long-term conservation strategy for the White Clay Creek watershed.

Public Law 102-215 amended the Wild and Scenic Rivers Act of 1968 to require study of the White Clay Creek, including its headwaters, main branches and tributaries, for possible designation as a Wild and Scenic River. Further, the legislation required the development of a recommended management plan, hereafter referred to as the White Clay Creek Watershed Management Plan.

The Wild and Scenic Rivers Act (Public Law 90-542, as amended), passed in 1968, establishes a framework whereby certain of the nation's outstanding rivers and streams may be permanently protected for the benefit and enjoyment of present and future generations. Congress declared that "the established national policy of dam and other construction ... needs to be complemented by a policy that would preserve other selected rivers, or sections thereof, in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes." These selected rivers collectively form the National Wild and Scenic Rivers System.

Before a river can be added to the National Wild and Scenic River System, it must be found both eligible and suitable. To be eligible, the river must be (i) free flowing; and (ii) possess at least one "outstandingly remarkable" resource value, such as exceptional scenery, recreational opportunities, fisheries and wildlife, historic sites, or cultural resources. The resource values must be directly related to, or dependent upon, the river. The determination of a resource's significance, i.e., the degree to which it fulfills the "outstandingly remarkable" requirement, is based on the professional judgment of the study team.

The White Clay Creek watershed contains important "outstandingly remarkable" resource values related to physiography and geology, water quality, species of concern, recreation, scenery, and culture and history. (See the White Clay Creek Wild and Scenic River Study Report for a detailed description of the resource values.)

The suitability determination for a wild and scenic river designation is based upon several findings. First, there must be evidence of lasting protection for the river's free-flowing character and outstanding resources, either through existing mechanisms, or through a combination of existing and new conservation measures resulting from the wild and scenic study. Second, there must be strong support for designation from the entities - local municipalities, state agencies, riverfront landowners, and conservation organizations that will be partners in the long-term

protection of the river. Third, a practical management framework must be devised that will allow these interests to work together as effective stewards of the river and its resources. Finally, wild and scenic designation must make sense for the river in question: it must be an appropriate and efficient river conservation tool.

## **B. Need**

The primary need for the study, as determined by the legislative mandate, the direction set by the White Clay Creek Wild and Scenic River Study Task Force, and established policy for wild and scenic studies of "private land" rivers, is to assist local communities in preparing and implementing a river conservation plan that protects the special qualities of the White Clay Creek watershed. The following goals were set through the study process to direct the decision for designation and the creation of implementation strategies for river conservation:

- Goal 1: *Water Quality* - Maintain existing water quality in the White Clay Creek and its tributaries so that it does not measurably degrade and improve it where practical.
- Goal 2: *Natural Resources* - Preserve and protect the river's outstanding natural resources, including rare and endangered plant and animal species, river islands, steep slopes and buffer areas in the river corridor and along the tributaries.

## **AFFECTED ENVIRONMENT**

The White Clay Creek watershed is one of only a few relatively unspoiled river systems remaining in the highly congested and developed corridor between Philadelphia and Newark, Delaware. The White Clay drains more than 69,000 acres in southeastern Pennsylvania and northwestern Delaware. A great deal of sediment from the rolling hills of Chester County, Pennsylvania, is eroded by water and other forces and is carried into the White Clay, probably accounting for the creek's name. For most of its course, the creek runs through the rolling Piedmont region, dropping over the Fall Line to the Atlantic Coastal Plain near Newark before veering eastward to empty into the Christina River.

The stream itself features forest-flanked steep banks and cobble-bottomed beds in some places, and dramatic gorges, cleaving low-lying floodplains in others. In general, as the stream moves south and eastward from the upland regions in the north to the Christina River, its landscape evolves from successional meadows, to agricultural fields and forested ridges, to large blocks of mature forest broken by stretches of suburban and urban development.

A sweeping range of uses, from urban through suburban to rural, characterizes the watershed as a whole. Patterns include residential, commercial, office, industrial, institutional, agricultural, utilities and others. Development in the Pennsylvania portion of the watershed is largely rural with a few small towns and villages and suburban clusters. In the Delaware portion, the City of Newark, along with rampant suburbanization, characterize much of the watershed. By contrast,

several large tracts of public open space also flank the river in this state.

Some 95,000 people actually live in the White Clay Creek watershed. The watershed encompasses a portion of the City of Newark (population 27,500), and it neighbors Wilmington, Delaware (population 70,000). Close to a million people reside within the two counties in which the watershed is located. Located right on the busy northeast transportation corridor, the watershed can be reached in two hours or less by at least eight (8) million people.

## **CONSULTATION, COORDINATION, PUBLIC INVOLVEMENT**

An extensive public involvement program was developed to make sure that the study and action alternatives considered the concerns of landowners, local residents, state, and federal agencies. Municipalities and counties, business and conservation interests. To ensure that diverse viewpoints were considered during each step of the study, the broad-based ad hoc White Clay Creek National Wild and Scenic River Study Task Force was created. The Task Force consisted of the following subcommittees: Natural Resources; Water Resources; Cultural Resources; Education; Land Use; Recreation; and Management, Governance and Funding.

The Study Task Force and its subcommittees were the focal points for public involvement. The Public Education Committee coordinated public involvement including:

- development of mailing lists with close to 500 entries, including key local officials, riparian landowners, and other interested individuals. Those on the lists received meeting notices, minutes, progress reports and draft documents for comment.
- frequent meetings of study subcommittees at various locations within the bi-state study area. The meetings were advertised through mailings and the local press.
- public forums held during the beginning of the study to identify issues of importance to area residents and river users, and also to identify sources of river-related expertise.
- public forums held to educate interested parties and to receive feedback regarding the draft Watershed Management Plan.
- special events to promote public awareness of the study and the unique qualities of the river.
- presentations to municipalities.
- the landowner survey, where random landowners within the watershed were asked to describe their watershed management issues and interest in river protection. Nearly 3000 landowners were surveyed.

## **ALTERNATIVES**

In accordance with legislative directives, wishes of study area communities and established NPS

policy for wild and scenic studies of "private land" rivers, NPS utilized the following guidelines in conducting the White Clay Creek Wild and Scenic River Study:

1. A strong emphasis on grassroots involvement and consensus building in determining whether the watershed was suitable for designation and how it should be managed.
2. The development of the "comprehensive watershed management plan" specified in the Act during the study rather than after designation. The watershed management plan prepared was the product of close collaboration among NPS, the Study Task Force, and local and state governments. It relies on private, local and state conservation measures rather than federal land acquisition and direct management to protect the river's outstanding resources.
3. A commitment to the study area communities that federal designation would only be recommended if strong support was expressed through passage of support resolutions by the affected municipalities.
4. The laws and regulations affecting the White Clay Creek watershed are a complex web of overlapping jurisdictions involving two states, municipalities, two counties, the Delaware River Basin Commission, and several federal agencies. Coordination among jurisdictions is limited and the recommended management strategy must enhance cooperation and communication.

These guidelines set parameters for review of the following alternatives considered by the study partners:

#### **Alternative A. *No Action***

The National Environmental Policy Act requires consideration of no action along with action alternatives. No action is analyzed and used as a baseline for comparison with the effects of the action alternatives. The "no action" alternative means that the river and its tributaries are not designated into the national system. Under this alternative it is assumed that municipal, county, state, and federal government authorities would continue to function according to their existing regulations. Implementation of the White Clay Creek Watershed Management Plan, along with the formation and staffing of the Watershed Management Committee as envisioned by the plan, would rest solely with municipal, county, and state governments and other local watershed interests.

Local municipalities would remain responsible for land use regulation. Landowners would continue current activities under existing state and federal regulations and programs. Resource protection would depend on existing programs including voluntary local zoning, voluntary landowner covenants, state and municipal programs, and not-for-profit conservation strategies.

#### **Alternative B. *Implementation of the Watershed Management Plan with establishment of White Clay Creek Watershed Management Committee, without wild and scenic river designation***

Under Alternative B, the White Clay Creek and its tributaries would not be added to the National

Wild and Scenic River System. The goal of conserving river and river-related resources would be accomplished through implementation of the White Clay Creek Watershed Management Plan. The chief assumption of this alternative is that increased vision, education and coordination are sufficient to achieve this goal. A river management committee or council, similar to that described in Section III of the White Clay Creek Watershed Management Plan, would be established to coordinate river and watershed conservation activities. Membership on the council/committee would be voluntary and could include government agencies that currently manage resources in the corridor and individuals representing major river-related interests. The purpose of the council/committee would be to remind river management organizations of the management plan goals, provide oversight and guidance to participating agencies, and, through those agencies, to other organizations. Functions of the council/committee would include:

- coordinate management of the river/watershed with responsible agencies
- assist municipalities in implementing zoning and other protection methods
- review and coordinate actions among municipalities for consistency
- provide education and technical assistance to promote Best Management Practices
- coordinate law enforcement and river access
- provide assistance in seeking funds for operating activities
- implement and update the Watershed Management Plan
- provide a forum for open discussion of water quality and other watershed management issues

The National Park Service could provide technical assistance to the Watershed Management Committee if requested and if it has personnel available.

***Alternative C. Congressional wild and scenic river designation of all segments found eligible and suitable, including all second order and larger streams deemed eligible and suitable within the watershed, with the watershed plan implemented through joint private, local, state and federal actions, and guided by a Watershed Management Committee.***

Under Alternative C, the White Clay Creek and all of its second order and larger tributary streams would be added to the National Wild and Scenic River System. The Watershed Management Committee (as described in Chapter III of the White Clay Creek Watershed Management Plan), would assume lead responsibility for coordination and implementation of the watershed management plan. Affected communities, agencies, organizations and citizens would be active partners in the protection and enhancement of the many public values of the watershed.

The National Park Service would serve as a member of the Committee, provide support staff as appropriate, coordinate with other federal agencies and otherwise be a partner in protection of the White Clay Creek watershed. Much of NPS involvement would be through the use of cooperative agreements.

The purpose of the council/committee would be to remind river management organizations of the management plan goals, provide oversight and guidance to participating agencies, and through those agencies to other organizations. Functions of the council/committee would include:

- coordinate management of the river/watershed with responsible agencies
- develop policies that promote long term preservation of the river corridor/watershed
- assist municipalities in implementing zoning and other protection methods
- review and coordinate actions among municipalities for consistency
- provide education and technical assistance to promote Best Management Practices
- coordinate law enforcement and river access
- provide assistance in seeking funds for operating activities
- implement and update the Watershed Management Plan
- provide a forum for open discussion of water quality and other watershed management issues

*Functions of the National Park Service would include:*

- perform Section 7 determinations on federally-assisted water resource projects
- seek financial assistance to support the functions of the Watershed Management Committee
- seek financial assistance for management plan implementation by municipalities
- serve in an advisory capacity
- develop appropriate corridor-wide plans to protect resources and develop solutions for visitor/interpretation needs
- fund additional research initiatives for resource protection/public use
- provide technical and financial assistance, as appropriate, through use of cooperative agreements
- assist in public education
- develop interpretive brochures

***Alternative D. Congressional wild and scenic river designation of all segments found eligible and suitable, excluding first order and second order streams, with the watershed plan implemented through joint private, local, state and federal actions, and guided by a Watershed Management Committee***

This approach is the same as Alternative C, except that only those portions of the White Clay Creek system named above would be protected under the Wild and Scenic River Act. Second order streams and other minor tributaries would not be designated. Further, federal actions on water resource projects located on non-designated streams will not be required to meet requirements protecting Wild and Scenic River values. It is hoped, however, that the Watershed

Management Committee will view the non-designated streams as the critical building blocks of the watershed that they are, and encourage their management as outlined in the White Clay Creek Watershed Management Plan.

**Alternative E. *Congressional wild and scenic river designation of all eligible and suitable segments, with National Park Service as the direct managing agency (This alternative was considered but was dropped because it conflicts with guidelines for how NPS treats "private land rivers").***

Under Alternative E, the National Park Service would provide extensive management services and direction. The White Clay Creek and its tributaries would be added to the National Wild and Scenic Rivers System as a unit of the National Park System and management services would be provided directly by National Park Service staff. A local NPS office would be funded and staffed for administration and operations. A river council/committee with similar responsibilities to that described in Alternative B would be created. This option requires a more active NPS role, using the council/committee and river management plan for guidance. NPS would link organizations together and be a much more visible presence in the communities. NPS would assume responsibility for direct coordination of the management council/committee functions:

- perform Section 7 determinations on federally-assisted water resource projects
- seek financial assistance to support the functions of the Watershed Management Committee
- coordinate with federal agencies
- develop and implement appropriate resource protection and visitor/interpretation plans
- provide technical assistance to municipalities on river recreation, resource protection and visitor service facility development
- provide direct public education programs and activities
- develop and produce informational brochures and interpretative signage
- respond to public inquiries
- fund necessary research initiatives for resource protection/public use
- would have land acquisition authority
- would have regulatory authority
- would provide needed recreational facilities

**Alternative F. *Federal wild and scenic river designation by Secretary of the Interior, under Section 2(a)(ii) of the Federal Wild and Scenic Rivers Act***

In this scenario, the State of Delaware and the Commonwealth of Pennsylvania would serve as the managing agencies, at no expense to the federal government. The streams would need to be designated and managed as components of a state scenic river system or protected through an act of the state legislature. And the Governors of each state would have to formally request that the Secretary of the Interior add the affected streams to the National System. The National Park Service and White Clay Creek Watershed Management Committees would serve in advisory roles. The National Park Service would retain the authority to perform Section 7 determinations on

federally-assisted water resource projects within the designated area.

## **IMPACTS – COMPARISON OF ALTERNATIVES**

This section provides the analytic basis for comparing the alternatives. It is not anticipated that any aspect of the natural environment will be negatively affected or impacted by designation of the White Clay Creek and its tributaries into the National Wild and Scenic River System or adoption of the Watershed Management Plan. The alternatives under consideration, except for no action, are intended to enhance protection of the river in order to prevent negative impacts on the river corridor. No physical construction projects or improvements that may impact the environment are being considered as part of this planning process.

### **Alternative A. *No Action***

Selection of this alternative would be contrary to the expressed interest of the White Clay Creek Study Task Force and the counties and municipalities within the White Clay Creek watershed. Based on the responses from the White Clay Creek National Wild and Scenic River Study Task Force committees; the landowner survey; public workshops; comments received on draft proposals; and the passage of resolutions by municipalities agreeing to adopt the White Clay Creek Watershed Management Plan and urging designation of the river, there is local consensus that the "no action" alternative is not sufficient to adequately protect the river's outstanding resources.

Under the "no action" alternative, environmental protection will continue to rely on the many separate local, state, and federal agencies. There would be no review of federal actions for consistency with state and local policies as articulated in the White Clay Creek Watershed Management Plan. There would be little if any further assistance from the federal government for implementation of the White Clay Creek Watershed Management Plan including providing on-going professional staff assistance to the Watershed Management Committee. The National Park Service could provide limited technical assistance to the Management Committee if requested and if it has personnel available.

Given existing staffing constraints at the municipal, county and state governments it is unlikely that the White Clay Creek Watershed Management Plan would be fully implemented without federal assistance. The result would be limited coordination among entities. Based on current land use trends, lands adjacent to the river will continue to be developed in many areas. Potential effects include: destruction of buffers; decreased bank stabilization; increased storm water runoff volume; potential water quality degradation; and reduction in the scenic value of the corridor. Alternative A does not provide designation of the river or enhance river protection, thus existing socio-economic trends are expected to continue.

### **Alternative B. *Adoption of the Watershed Management Plan with establishment of White Clay Creek Watershed Management Committee, without wild and scenic river designation***



This multiple partnership model to coordinate river management activities will help minimize regulation and service duplication, and minimize cost, while protecting resources. The breadth of issues, political jurisdictions and resources suggests that no single agency can adequately implement a river/watershed management plan. This partnership model brings the major players in river and watershed management together on a regular basis, stimulates cooperation and coordination among the players, provides a forum for all interests to discuss and resolve issues, and coordinates implementation of the watershed management plan.

The primary positive impacts of this alternative would be to attract greater attention to the White Clay Creek watershed and provide a vision for resource protection through the management plan. A strictly voluntary approach responds to concerns about restrictions placed on landowners and municipal governments. The effectiveness of an all-volunteer council/committee would be based upon its ability to encourage individuals and organizations to respond to river management issues. The limitations of this approach are the difficulty in getting all the appropriate players involved, particularly municipalities, and obtaining funding for ongoing coordination activities.

Environmental impacts on the river would be decreased under this alternative through coordination of watershed management. Socio-economic impacts would be minimal. Adoption of management plan recommendations by municipalities may result in expenditures to change zoning ordinances. However, local land use regulation remains a local responsibility, thus any additional costs are assumed voluntarily by the affected municipality. Appropriate zoning will help minimize municipal service costs over the long term.

As in Alternative A, the no-action alternative, there would be no review of federal actions for consistency with state and local policies as articulated in the White Clay Creek Watershed Management Plan. There would also be little if any further assistance from the federal government for implementation of the White Clay Creek Watershed Management Plan. The National Park Service could provide limited technical assistance to the Management Committee if requested and if it has personnel available.

***Alternative C. Congressional wild and scenic river designation of all segments found eligible and suitable, including all second order and larger streams deemed eligible and suitable within the watershed, with the watershed plan implemented through joint private, local, state and federal actions, and guided by a Watershed Management Committee***

Similar to Alternative B, this model will help minimize regulation and service duplication, and minimize cost, while protecting resources. This model brings the major players in watershed management together on a regular basis, stimulates cooperation and coordination among the players, provides a forum for all interests to discuss and resolve issues, and coordinates implementation of the watershed management plan. National designation, along with its federal financial and technical assistance, are strong incentives for participation in the Committee and for implementation of the watershed management plan.

The primary positive impacts of this alternative would be to attract greater attention to the White Clay Creek watershed, provide a vision for resource protection through the management plan, and

require federal consistency with the plan. Management coordination and municipal outreach by the Management Committee is viewed as less threatening than directly from the National Park Service. NPS involvement, through technical and financial assistance and participation on the Committee, is critical to long-term river preservation.

Environmental impacts on the watershed would be decreased under this alternative through coordination of watershed management activities and implementation of the management plan recommendations. Socio-economic impacts would be minimal. Adoption of management plan recommendations by municipalities may result in expenditures to change zoning ordinances. However, local land use regulation remains a local responsibility, thus any additional costs are assumed voluntarily by the affected municipality. Appropriate zoning will help minimize municipal service costs over the long term.

Federal financial assistance and technical assistance for river conservation may help landowners and municipalities by encouraging compatible land use.

There is potential for greater positive impacts with this alternative because management decisions are made at the local level, with support from the National Park Service. A strong understanding of local issues and concerns provided by the Committee allows more appropriate and responsive decisions to be made.

***Alternative D. Congressional wild and scenic river designation of all segments found eligible and suitable, excluding first order and second order streams, with the watershed plan implemented through joint private, local, state and federal actions, and guided by a Watershed Management Committee***

The impacts of this alternative are essentially the same as for Alternative C, except that, in reality, this approach does not take a watershed approach to protection. The smaller feeder streams serve as the building blocks for the watershed, and to neglect them only jeopardizes the larger streams themselves. The non-designated streams will not be protected as well against the introduction of polluted runoff, sedimentation and other non-point sources of pollution. Further, many of these smaller streams are fairly pristine, cool and of high quality. As such, they serve both as high quality contributors to the whole river system, as well as providing spawning and nursery areas for cool and cold water fish species.

***Alternative E. Congressional wild and scenic river designation of all eligible and suitable segments, with National Park Service as the direct managing agency***

Alternative E was dropped from further consideration because it did not meet the guidelines NPS has set out for conducting "private land" wild and scenic river studies. These guidelines focus on developing locally managed rivers with the federal government a partner with state, county and local governments. Under direct management by NPS the federal government's presence would be increased, federal land use regulations may be imposed, and NPS would have the authority to acquire land along the river to protect resources. Home rule and local control over land use was clearly stated as a priority by the Study Task Force and municipal representatives. While resource conservation is a high priority there is consensus that the White Clay Creek watershed remain

locally managed.

**Alternative F. *Federal wild and scenic river designation by Secretary of the Interior, under Section 2(a)(ii) of the Federal Wild and Scenic Rivers Act.***

While this approach was examined, it cannot be considered a viable option. Section 2(a)(ii) of the Federal Wild and Scenic Rivers Act requires, first, that a nominated river must be a component of a state special rivers management program. The State of Delaware has no such program. And while Pennsylvania has its Wild and Scenic River Program, it has showed no interest in designating any portion of the White Clay Creek system under that program, or pursuing state-managed federal wild and scenic river designation for the White Clay Creek or its tributaries.

**PREFERRED ALTERNATIVE AND CONCLUSIONS**

The preferred alternative is C – national wild and scenic river designation of all segments found eligible and suitable, including all second order and larger streams eligible and suitable within the watershed, with the watershed plan implemented through joint private, local, state, and federal actions and guided by a Watershed Management Committee.

Designation of all second order or higher streams found eligible and suitable will enhance the protections already in place for these segments and will fill gaps in those protections. It will preclude federal water resource projects that would alter the free-flowing condition of the White Clay Creek and its major tributaries or degrade the outstanding resource values that are present. Affected communities, agencies, organizations and citizens would be active partners in the protection and enhancement of the many public values of the watershed through the implementation of the White Clay Creek Watershed Management Plan. Under Alternative C limitations in getting all the appropriate entities involved in implementing the White Clay Creek Watershed Management Plan, particularly municipalities, and obtaining funding for ongoing coordination activities would be eliminated through a greater NPS partnership role. In addition, increased attention to all of the tributaries in the watershed by local, state, and federal governments could lead to enhancement of the entire White Clay Creek ecosystem as a whole.

Alternative C meets the Congressional policy under the Wild and Scenic Rivers Act to protect the outstandingly remarkable values, and free-flowing condition of the White Clay Creek and its tributaries. Alternative C also meets NPS guidelines for “private land” wild and scenic rivers by creating long term partnership between NPS and state, county and local governments to manage the White Clay Creek and its tributaries. Alternative C was also the preferred alternative of the White Clay Creek Study Task Force.

# **APPENDICES**

# **ACKNOWLEDGMENTS**

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Cindy Greene, *DE Resident*  
Michael Hahn, *Delaware DOT, Environmental Studies*  
Richard Harris, Jr., *PA resident*  
Willis Hocking, *PA farmer*  
Russell Holland, *Elkton MD*  
Janet Kalb, *London Britain Planning Commission*  
Louis Kaplan, *London Grove Township Supervisor*  
Phil Kraus, *PA resident*  
Catherine Larmore, *London Grove Planning Commission*  
Eugene G. McDowell, *New London Township Representative*  
Tricia Nilsson, *Chester County Planning Department*  
Ed O'Donnell, *New Castle County Department of Land Use*  
Aileen Parrish, *London Britain Township Supervisors*  
Jennifer H. Powell, *New Castle County Chamber of Commerce*  
Mr. & Mrs. Earl Stiner, *DE residents*  
Leon Wilkinson, *PA farmer*

### **Natural Resources Subcommittee**

John Tarburton, *chairperson; New Castle County Conservation District*  
Ann Brown, *Newark Center for Creative Learning*  
Cheryl Caster,, *PA resident*  
Steve & Marna Goddard, *PA resident*  
Esther & Elton Homan, *Franklin Township Supervisor*  
Marguerite Jahn, *Delaware Audubon Society*  
John Janowski, *DE resident*  
Louis Kirkaldie, *chairman, Avondale Borough Planning Commission*  
Phil Kraus, *PA resident*  
Joan Mehl, *De resident*  
Dorothy Miller, *Coalition for Natural Stream Valleys, Inc.*  
Neal Perkins, *DE resident*  
Judith Shuler, *London Grove Township Representative*  
Allison Willets, *Chester County Planning Commission*  
Dennis White, *PA resident*

### **Recreation Subcommittee**

Susan M. Moerchel, *chairperson; DNREC, Division of Parks & Recreation*  
John Baker, *DNREC, Division of Parks & Recreation, Division of Fish & Wildlife*  
Chris Beatty, *Trout Unlimited*  
Yvonne Blades, *Wilmington Trail Club*  
Vivian & Warren Davies, *White Clay Creek Watershed Association*  
Ed Deaton, *PADER State Parks*  
Jim Hall; *director, City of Newark Parks & Recreation*  
Steve & Debbie Hegedus, *DE Sierra Club*  
Esther & Elton Homan, *Franklin Township Supervisor*  
Roger Hone, *Trout Unlimited*  
Lewis McCullough, *Avondale Planning Commission*  
Nick McFadden; *superintendent, White Clay Creek Bi-State Preserve*  
Laurel J. Pearson, *PA resident*  
Ken Robinson, *DE resident*  
Mike Stangl, *DNRC Division of Fish & Wildlife*  
Vanyla Tierney, *PADER Program Planning & Development*  
Ken Wood & Jason Wood, *PA residents*  
Jon Husband, *New Castle County Department of Parks & Recreation*

### **Cultural Resource Subcommittee**

Tom Zawislak, *chairperson; PA resident*  
Ann Brown, *Newark Center for Creative Learning*  
Cyril E. Caster, *PA resident*  
Thomas L. Webb, *PA resident*  
William P. Webb, *PA resident*  
Betsy Wilkinson, *New Garden Township Zoning Board*  
Andrea Withers, *White Clay Creek Watershed Association*

### **Water Resources Subcommittee**

Tom Russell, *chairperson; New Castle County Water Resources Agency*  
Mark Bubel; P. E., *Moore Environmental Management, Inc.*  
Cyril Caster, *PA resident*  
John Davis, *DNREC Division of Water Resources*  
Joe Dombrowski, *City of Newark Water Department*  
Margaret Emslie, *DNREC, Division of Water Resources, Wetlands/Non-tidal Program*  
Lorraine Fleming, *Delaware Nature Society*  
Robert Francis, *Chester County Conservation District*  
Paul Giammatteo, *DE resident*  
Rick Greene, *DNREC Division of Water Resources*  
Cissy Johnson, *PA resident*  
Phil Kraus, *PA resident*  
Bill Lucas, *Integrated Land Management*  
David A. Pollison, *Delaware River Basin Commission*  
Judy Porta, *London Britain Township Supervisor*  
Charles Rehm, *PADER Bureau of Water Management*  
Bernie Sweeney; *director, Stroud Water Research Center*  
Norm Wagner, *University of Delaware*

## **Public Education & Information Subcommittee**

John A. Murray, *chairperson; White Clay Creek Watershed Association*  
Rick Darke, *PA resident*  
Joan Fenza, *PA resident*  
Kyle Gulbranson, *Delaware Nature Society*  
Scott Hunter, *PA resident*  
Janet Kalb, *London Britain Township Planning Commission*  
Robert J. Mackin, *PA resident*

## **Management, Governance and Funding**

Aileen Parrish, *chairperson; London Britain Township Supervisors*  
John A. Murray, *White Clay Creek Watershed Association*  
Dorothy Miller, *Coalition for Natural Stream Valleys, Inc.*  
Judith Shuler, *London Grove Township Representative*  
Judy Porta, *London Britain Supervisor*  
Charles Rehm, *PADER Bureau of Water Management*



## BIBLIOGRAPHY

Farmington Wild and Scenic River Study Final Report; prepared by Division of Rivers and Special Studies, North Atlantic Regional Office, National Park Service, U.S. Department of the Interior; May 1995.

Lamprey Wild and Scenic River Study. Draft Report; prepared by Division of Rivers and Special Studies, New England System Support Office, National Park Service, U.S. Department of the Interior.

Lower Delaware Wild and Scenic River Study. Draft Report; prepared by Northeast Region, National Park Service, U.S. Department of the Interior; August 1998.

Lumber River, 2(a)(ii) Wild and Scenic River. Eligibility and Environmental Assessment; prepared by Southeast Regional Office, National Park Service, U.S. Department of the Interior; July 1998.

St. Marys River, Wild and Scenic River Study, Florida and Georgia. Draft Report; prepared by Southeast Regional Office, National Park Service, U.S. Department of the Interior; October 1993.

Sudbury, Assabet and Concord, Wild and Scenic River Study. Draft Report; prepared by Rivers Program, New England System Support Office, National Park Service, U.S. Department of the Interior; September 1996.

White Clay Creek and Its Tributaries, National Wild and Scenic River Study. Draft Eligibility and Classification Report; prepared by the Division of Park and Resource Planning, Mid-Atlantic Regional Office, National Park Service, U.S. Department of the Interior; November 1994.

White Clay Creek and Its Tributaries, National Wild and Scenic River Study. Final Landowner Survey Report; prepared by Division of Park and Resource Planning, Mid-Atlantic Regional Office of the National Park Service, U.S. Department of the Interior in cooperation with the White Clay Creek Wild and Scenic Study Task Force; November 1994.

White Clay Creek and Its Tributaries. Watershed Management Plan with Reference Sections; prepared by the White Clay Creek Wild and Scenic Study Task Force and the National Park Service, U.S. Department of the Interior; May 1998.

*One Hundred Second Congress of the United States of America*

*AT THE FIRST SESSION*

Begun and held at the City of Washington on Thursday, the third day of January,

one thousand nine hundred and ninety-one

An Act

To amend the Wild and Scenic Rivers Act by designating the White Clay Creek in Delaware and Pennsylvania for study for potential addition to the National Wild and Scenic Rivers System, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.*

**SECTION 1. SHORT TITLE.**

This Act may be cited as the 'White Clay Creek Study Act'.

**SEC. 2. FINDINGS.**

Congress finds that--

- (1) the White Clay Creek watershed is one of only a few relatively undisturbed areas remaining within one of the most densely populated areas in the country;
- (2) the Creek and several of its tributaries were placed on the Nationwide Rivers Inventory List by the National Park Service for initially meeting the criteria of the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.);
- (3) the concerns and interests of those people who live, work, and recreate within the watershed will be reflected in the development of a study and management plan by the Secretary of the Interior pursuant to this Act; and
- (4) the conservation of the watershed, and its outstanding natural, cultural, and recreational values, is important to the residents within the watershed and to the residents within the surrounding suburban and urban areas of Delaware and Pennsylvania.

**SEC. 3. STUDY RIVER DESIGNATION.**

Section 5(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1276(a)) is amended by adding at the end the following new paragraph:

'(112) WHITE CLAY CREEK, DELAWARE AND PENNSYLVANIA- The headwaters of the river in Pennsylvania to its confluence with the Christina River in Delaware, including the East, West, and Middle Branches, Middle Run, Pike Creek, Mill Creek, and other main branches and tributaries as determined by the Secretary of the Interior (herein after referred to as the White Clay Creek).'

## SEC. 4. STUDY AND REPORT.

Section 5(b) of the Wild and Scenic Rivers Act (16 U.S.C. 1276(b)) is amended by adding at the end the following new paragraph:

(11)(A) The study of the White Clay Creek in Delaware and Pennsylvania shall be completed and the report submitted not later than 3 years after the date of enactment of this paragraph.

(B) In carrying out the study, the Secretary of the Interior shall prepare a map of the White Clay Creek watershed in Delaware and Pennsylvania, and shall develop a recommended management plan for the White Clay Creek. The plan shall provide recommendations as to the protection and management of the White Clay Creek, including the role the State and local governments, and affected landowners, should play in the management of the White Clay Creek if it is designated as a component of the National Wild and Scenic Rivers System.

(C) The Secretary shall prepare the study, including the recommended management plan, in cooperation and consultation with appropriate State and local governments, and affected landowners.

Speaker of the House of Representatives.

Vice President of the United States and

President of the Senate.

*END*

ORIGINAL

RESOLUTION NO. 99-05-01  
(Non-Legislative)

AVONDALE BOROUGH  
CHESTER COUNTY, PENNSYLVANIA

A RESOLUTION OF AVONDALE BOROUGH, CHESTER COUNTY,  
PENNSYLVANIA, SUPPORTING THE WHITE CLAY CREEK  
WATERSHED MANAGEMENT PLAN UNDER AND SUBJECT TO  
CERTAIN CONDITIONS AND RESERVATIONS.

WHEREAS, in 1991, the Pennsylvania and Delaware Delegations to the United States Congress introduced certain Bills to study the White Clay Creek Watershed under the "Wild and Scenic River Act"; and

WHEREAS, the White Clay Creek Study Act (P.L. #102-215) was enacted and became effective on December 11, 1991; and

WHEREAS, the White Clay Creek Study Act amended the National Wild and Scenic River Act by authorizing the National Park Service to conduct a study of the White Clay Creek for a determination of its potential addition to the National Wild and Scenic River System; and

WHEREAS, the National Wild and River Scenic System is intended to permanently protect for the benefit and enjoyment of present and future generations outstanding rivers and streams located in the United States of America; and

WHEREAS, the "White Clay Creek National Wild and Scenic River Study" and a proposed draft of the "White Clay Creek Watershed Management Plan" (dated September 1997) was developed by the Middle Atlantic Regional Office of the National Park Service after coordination with interested residents, local property owners, and certain counties and municipalities located in the Commonwealth of Pennsylvania and the State of Delaware; and

WHEREAS, the White Clay Creek Study Task Force requested local government comment concerning the draft of the White Clay Creek Watershed Management Plan; and

WHEREAS, the draft of the "White Clay Creek Watershed Management Plan" has been finalized into an official "White Clay Creek Watershed Management Plan"; and

WHEREAS, the Avondale Borough recognizes that potential cooperative action by all communities within the White Clay Creek Watershed as listed in the "White Clay Creek Watershed Management Plan" is necessary to protect and enhance watershed national resources; and

WHEREAS, the White Clay Creek Watershed Management Plan appears to be a reasonable approach to cooperative watershed management which recognizes the importance of the various roles of landowners, state and local governments, businesses and industries, and other citizens whose cooperation is necessary for the protection of important watershed values.

NOW, THEREFORE, it is hereby **RESOLVED** that:

A. Avondale Borough, Chester County supports the White Clay Creek Watershed Management Plan, under and subject to the following specific conditions:

1. The review and approval of all Land Use Applications (including, but not limited to, Subdivision Applications, Land Development Applications, Applications to the Zoning Hearing Board, etc.) for those areas located within the municipal limits of the Avondale

Borough, Chester County, Pennsylvania, are - and shall continue to be - the sole responsibility of Avondale Borough; and

2. The geographic area in the Avondale Borough included in the White Clay Creek Watershed Management Plan shall consist of and shall be solely limited to the area delineated as the "100 Year Floodplain" depicted on the "Floodway/Floodplain Areas" Map contained in the White Clay Creek Watershed Management Plan; and
3. The following sites, locations, and described areas shall not be included in the White Clay Creek Watershed Management Plan:
  - (a) The Avondale Borough Wastewater Treatment Plant, its point-source discharge location, or those portions of the East branch of the White Clay Creek extending for a distance of five hundred (500) feet North of the point-source discharge, and between the point-source discharge South to the Avondale Borough - London Grove Township Municipal Boundary Line; and

(b) Any existing or future potable water supply facility owned by Avondale Borough, or any source for the water thereof, including, but not limited to, reservoirs, wells, well-heads, etc.

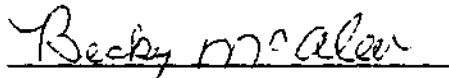
B. Any recommendation made by the White Clay Creek Watershed Management Plan Committee may, at the option of the Avondale Borough Council, be considered by the Avondale Borough Council, but under no circumstances shall any such recommendation be considered more than advisory in nature; and

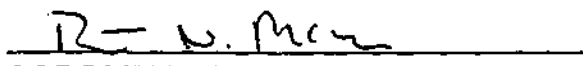
C. If at any time Avondale Borough's support of, or participation in the White Clay Creek Watershed Management Plan proves detrimental to the interests of the citizens of the Borough of Avondale, or the Borough of Avondale itself, Avondale Borough expressly reserves the right to rescind this Resolution, either in whole or in part.

**ADOPTED THIS 18th DAY OF MAY, 1999.**

**ATTEST:**

**AVONDALE BOROUGH COUNCIL**

  
**BECKY McALEER, Secretary**  
**Avondale Borough**

**BY:**   
**ROBERT N. McCUE, President**

\*\*\*\*\*



RESOLUTION IN SUPPORT OF

WHITE CLAY CREEK & ITS TRIBUTARIES  
WATERSHED MANAGEMENT PLAN

*Prepared As Part Of The  
White Clay Creek National Wild & Scenic River Study*

WHEREAS, the Commissioners of Chester County have observed the loss of certain natural resources and cultural values, and recognize the necessity to improve water quality within the White Clay Creek Watershed, thereby affecting the quality of life for its citizens; and

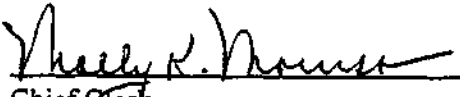
WHEREAS, the Commissioners have recognized the importance of protecting such resources and values, through adoption of the Chester County Comprehensive Plan Policy Element, *Landscapes*; and

WHEREAS, joint cooperative action by all communities within the White Clay Creek Watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

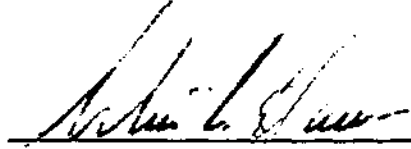
WHEREAS, the White Clay Watershed Management Plan presents an appropriate approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values;

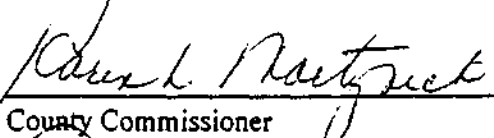
NOW THEREFORE BE IT RESOLVED THAT the Commissioners of Chester County support the *White Clay Creek & Its Tributaries Watershed Management Plan* which was prepared as part of White Clay Creek National Wild & Scenic River Study and urge its adoption by all affected communities.

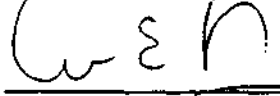
Attest:

  
\_\_\_\_\_  
Chief Clerk

6-16-98  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Chairman, County Commissioners

  
\_\_\_\_\_  
County Commissioner

  
\_\_\_\_\_  
County Commissioner

**EAST MARLBOROUGH TOWNSHIP  
CHESTER COUNTY, PA**



**RESOLUTION 98-14**

**White Clay Creek & Its Tributaries  
Watershed Management Plan**  
*Prepared As Part of the  
White Clay Creek National Wild & Scenic River Study*

WHEREAS, East Marlborough Township has observed the loss of certain natural resource and cultural values and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, East Marlborough Township individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, East Marlborough Township recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

**BE IT RESOLVED THAT** East Marlborough Township supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities.

**APPROVED** by the Board of Supervisors of East Marlborough Township on this 8<sup>th</sup> day of June, 1998.

I, Jane Russell Laslo, Manager of East Marlborough Township, certify that the foregoing is a true and correct copy of Resolution 98-14, approved by the Board of Supervisors of East Marlborough Township on June 8, 1998.

NOV 1997 RECEIVED

RESOLUTION OF SUPPORT FOR DRAFT WHITE CLAY CREEK WATERSHED PLAN

WHEREAS, the Township Of Franklin has observed for quite some time the deterioration of water quality and the loss of certain natural resource and cultural values within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the Township Of Franklin individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, the Township Of Franklin recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

BE IT RESOLVED THAT the Township Of Franklin supports the draft White Clay Creek Watershed Plan with the following exceptions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Attest:

*Richard [Signature]*  
Township Manager

Date: November 13, 1997

Chairman - Board of Supervisors

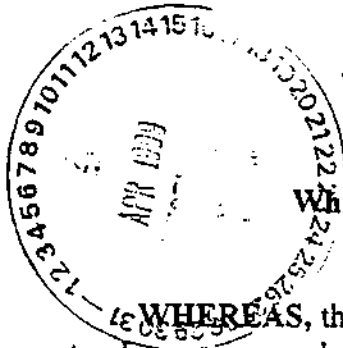
*Richard W Whipple*  
Member

*Nolan H. Morris*  
Member

*Harold T. Walls*  
Member

\_\_\_\_\_  
Member

RESOLUTION 99-11



**WHITE CLAY CREEK & ITS TRIBUTARIES  
WATERSHED MANAGEMENT PLAN**  
Prepared as part of the  
**White Clay Creek National Wild & Scenic River Study**

**WHEREAS**, the Township of Kennett, Chester County, has observed the loss of certain natural resources and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

**WHEREAS**, the Township of Kennett individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

**WHEREAS**, the Township of Kennett recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

**WHEREAS**, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values;

**NOW, THEREFORE, BE IT RESOLVED**, that Kennett Township supports the White Clay Creek and Its Tributaries Watershed Management Plan, which was prepared as part of White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities.

**ADOPTED** this 1<sup>st</sup> day of April, 1999.

**BOARD OF SUPERVISORS  
KENNETT TOWNSHIP**

**ATTEST:**

Cheryl A. Kusy  
Secretary-Treasurer

Michael E. Elling  
Michael E. Elling

James C. Henderson  
James C. Henderson

(absent)  
Charles G. Shoemaker

# London Britain Township

*Chester County, Pennsylvania*  
*established 1725*

PO Box 215, Kemblesville PA 19347-0215

Phone: 610-255-0388 • Fax: 610 255-3542

June 25, 1998

Charles Barscz, Jr.  
Wild & Scenic Rivers Coordinator  
United States Department of the Interior  
National Park Service  
Chesapeake/Allegheny System Support Office  
U. S. Custom House  
200 Chestnut Street  
Philadelphia PA 19106

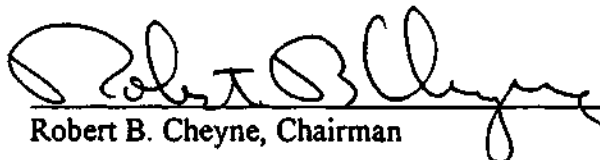
Dear Chuck:

At their regularly scheduled meeting on June 22, 1998, the Board of Supervisors of London Britain Township, Chester County, Pennsylvania, resolved to support the *White Clay Creek & Its Tributaries Watershed Management Plan* and agreed that they would like to see the White Clay Creek and Its Tributaries designated as a part of the Wild and Scenic Rivers Act.


The Board recognizes that the Management Plan recommends for designation all second order and above tributaries of the White Clay Creek. However, for the Township of London Britain, the Board of Supervisors would like to request that all first order streams be included in the designation as well.

London Britain Township is unique in that twenty per cent of the township consists of the White Clay Creek Preserve, a state owed Preserve managed by the Department of Conservation and Natural Resources. The Board feels that the addition of all first order streams within the Township to the designation will give additional protection to water quality of the Township and the Preserve.

Sincerely,

  
Robert B. Cheyne, Chairman

  
Glenn C. Frederick, Vice-Chairman

  
Aileen H. Parrish, Member

RESOLUTION 98-8

WHEREAS, the Board of Supervisors of London Britain Township, Chester County, Pennsylvania, has observed the loss of certain natural resources and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and


WHEREAS, the Township of London Britain, Chester County, Pennsylvania, individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and


WHEREAS, the Township of London Britain, Chester County, Pennsylvania, recognizes that joint cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

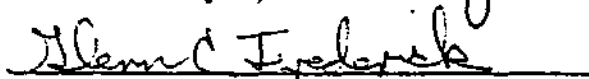
WHEREAS, the White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

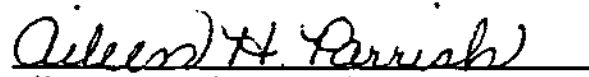
BE IT RESOLVED, on this 22<sup>nd</sup> day of June, 1998 that the Board of Supervisors of London Britain Township, Chester County, Pennsylvania, supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of the White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities.

Attest:

  
\_\_\_\_\_  
Sally Cheyne, Township Secretary

  
\_\_\_\_\_  
Robert B. Cheyne, Chairman

  
\_\_\_\_\_  
Glenn C. Frederick, Vice-Chairman

  
\_\_\_\_\_  
Aileen H. Parrish, Member

WHITE CLAY CREEK & ITS TRIBUTARIES  
WATERSHED MANAGEMENT PLAN  
*Prepared As Part Of The*  
*White Clay Creek National Wild & Scenic River Study*

WHEREAS, the Londonderry Township has observed the loss of certain natural resource and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the Londonderry Township individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, the Londonderry Township recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

BE IT RESOLVED THAT the Londonderry Township supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities.

Date July 29, 1998

Londonderry Township  
Board of Supervisors

Attest:

Charlotte Wiley

Howard W. Bann

V. Dean Amis

Clair C. Burkhardt

**RESOLUTION NUMBER 236**

WHEREAS, London Grove Township has observed for quite some time the deterioration of water quality and the loss of certain natural resource and cultural values within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, London Grove Township individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, London Grove Township recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

BE IT RESOLVED that London Grove Township supports the draft White Clay Creek Watershed Plan with the following exceptions: NONE

Adopted this 3rd day of December, 1997.

BOARD OF SUPERVISORS OF LONDON GROVE TOWNSHIP

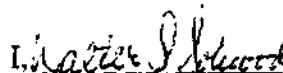
  
CHAIRMAN

  
VICE CHAIRMAN

  
MEMBER

  
MEMBER

  
MEMBER

I,  (Walter S. Soliwoda), Secretary, attest the Township Board of Supervisors have passed the above resolution and the foregoing is a true copy of the Township Resolution #236, adopted December 3, 1997.

Municipal Address: 550 E. Baltimore Pike, Suite 200  
West Grove, PA 19390  
610/268-8524



CITY OF NEWARK  
DELAWARE

RESOLUTION NO. 97-V

WHITE CLAY CREEK WATERSHED PLAN

WHEREAS, in 1991 the Pennsylvania and Delaware delegations to the United States Congress introduced bills to study the White Clay Creek Watershed under the Wild and Scenic River Act; and

WHEREAS, the White Clay Creek Study Act (Public Law #102-215) became law on December 11, 1991; and

WHEREAS, Public Law #102-215 amended the National Wild and Scenic River Act by authorizing the National Park Service to conduct a study of the White Clay Creek for potential addition to the National Wild and Scenic River system; and

WHEREAS, the National Wild and Scenic River system is intended to permanently protect America's outstanding rivers and streams for the benefit and enjoyment of present and future generations; and

WHEREAS, the Middle Atlantic Regional Office of the National Parks Service coordinated with local jurisdictions, New Castle County, the States of Delaware and Pennsylvania, interested residents, and local property owners, the development of the White Clay Creek National Wild and Scenic River Study and a proposed Draft White Clay Creek Watershed Management Plan (September, 1997); and

WHEREAS, the White Clay Creek Study Task Force has requested local government comment concerning the Draft White Clay Creek Watershed Management Plan; and

WHEREAS, the City of Newark recognizes that cooperative action by all communities within the White Clay Creek Watershed as proposed in the Watershed Management Plan is necessary to protect and enhance the watershed national resources; and

WHEREAS, the draft White Clay Creek Watershed Management Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in the protection of the watershed important values.

NOW, THEREFORE, BE IT RESOLVED that the City of Newark supports the Draft White Clay Creek Watershed Management Plan with the following conditions:

1. Local land use review and approval for those areas within the City limits or under consideration for annexation will continue to be the sole responsibility of the City of Newark Council as specified in the Newark City Charter;
2. The geographic area proposed for designation within the City of Newark shall consist of the delineated Federal Emergency Management Agency's floodplain as shown on the Water Resources Agency map, dated August, 1997, and entitled "White Clay Creek Wild & Scenic River Study Report, Recommended Designated Area," which is protected by the City's floodplain regulations; and
3. The geographic area proposed for designation shall not include Lamborn Run (the proposed site of the Thompson Station Reservoir) and the City of Newark intake, ancillary facilities, and water treatment plant.

RESOLVED at a Regular Meeting of Council on December 8, 1997.

VOTE: 6 to 0.

  
Mayor

Attest:

  
City Secretary

Introduced by: Ms. Venezky *VJ*  
On: July 28, 1998

RESOLUTION NO. 98- *134*

**Affirming Support For The White Clay Creek  
And Its Tributaries Watershed Management Plan**

**WHEREAS**, in 1991 delegations from Delaware and Pennsylvania appeared before the United States Congress to introduce bills to study the White Clay Creek Watershed;

**WHEREAS**, the White Clay Creek Study Act was signed into law by President Bush on December 11, 1991;

**WHEREAS**, the White Clay Creek Watershed contains many valuable natural resources which are worthy of national protection and are vulnerable to unwise land use and environmental practices;

**WHEREAS**, the New Castle County Comprehensive Development Plan stresses that natural resources are a fundamental part of the character of the community and a vital part of what makes New Castle County an attractive place to live and work;

**WHEREAS**, natural resources must be protected in order to ensure the long-term economic viability of New Castle County and the health, safety and welfare of its residents;

**WHEREAS**, New Castle County cooperatively manages the White Clay Creek Watershed with State of Delaware, City of Newark, the Commonwealth of Pennsylvania, and the surrounding Pennsylvania municipalities;

**WHEREAS**, the federal Wild and Scenic Rivers Act provides for the designation of Wild and Scenic Rivers to permanently protect America's outstanding rivers and streams for the benefit and enjoyment of future generations;

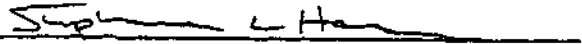
**AND WHEREAS**, the designation of the White Clay Creek as a Wild and Scenic River is expected by the United States Congress in the coming years;

**NOW, THEREFORE, BE IT RESOLVED**: that the County Council of New Castle County hereby affirms support for the White Clay Creek and Its Tributaries Watershed Management Plan with the following condition:

Corrections to factual errors about New Castle County shall be made prior to the final printing of the document and before the White Clay Creek and Its Tributaries

Watershed Management Plan is forwarded to the United States Congress.

Adopted by County Council of  
New Castle County on: July 28, 1998

  
\_\_\_\_\_  
President of County Council  
of New Castle County

Synopsis: Same as Title

Fiscal Impact: this resolution will have no immediately discernible fiscal impact on the County.



NEW GARDEN TOWNSHIP  
CHESTER COUNTY, PENNSYLVANIA

RESOLUTION NO. 464

WHITE CLAY CREEK AND ITS TRIBUTARIES  
WATERSHED MANAGEMENT PLAN

WHEREAS, New Garden Township has observed the loss of certain natural resources and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the Board of Supervisors individually has taken steps to protect such values through the adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, New Garden Township recognizes the joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values.

NOW THEREFORE BE IT RESOLVED that the Board of Supervisors of New Garden Township, subject to the conditions and limitations as hereinafter set forth, supports the White Clay Creek and its Tributaries Watershed Management Plan, which was prepared as part of the White Clay Creek National Wild and Scenic River Study and urges its adoption by all affected communities.

New Garden Township's affirmance of support is subject to the following conditions:

(1) Local land use, review and approval for those areas within New Garden Township will continue to be the sole responsibility of, and subject to the sole control by, New Garden Township.

(2) The Township's support of the plan does not relinquish its right to the surface waters of the White Clay Creek and its Tributaries for domestic, municipal and agricultural water uses. In order to secure future surface water uses, the following stream stretches in New Garden Township are being excluded from the plan:

(a) The East Branch, White Clay Creek from the point entering New Garden Township (at the Franklin Township line) to a distance of 10,500 feet downstream of the point of entry.

(b) Egypt Run and its Tributary.

RESOLVED AND ENACTED at a regular meeting of New Garden Township held March 23, 1999.

NEW GARDEN TOWNSHIP  
BOARD OF SUPERVISORS

Robert N. Taylor, P.A. J.E.K.  
Supervisor

Dean Kober  
Supervisor

Frank J. Zygalski  
Supervisor

Norman S. Hill  
Supervisor

Attest:

Joan F. Kelleher  
Secretary

\_\_\_\_\_  
Supervisor

***New London Township  
Board of Supervisors***

RESOLUTION NO. 98-07-1

WHEREAS, the New London Township Board of Supervisors has observed the loss of certain natural resource and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the New London Township Board of Supervisors individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, the New London Township Board of Supervisors recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

BE IT RESOLVED THAT the New London Township Board of Supervisors supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of the White Clay Creek National Wild & Scenic River Study.

ADOPTED this 20th Day of July 1998.

Attest:

  
Trish Fagan, Secretary

  
JOHN A. ARRELL, Chairman

CLIFFORD B. OWENS, Vice Chairman

  
GARY M. BOGERT, Supervisor

**RESOLUTION NO. 1999-7**  
**WHITE CLAY CREEK & ITS TRIBUTARIES**  
**WATERSHED MANAGEMENT PLAN**  
**Prepared As Part Of The**  
**White Clay Creek National Wild &**  
**Scenic River Study**

WHEREAS, the Board of Supervisors has observed the loss of certain natural resource and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the Board of Supervisors individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, the Board of Supervisors recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

BE IT RESOLVED THAT the Board of Supervisors supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities.

RESOLVED THIS 7<sup>th</sup> day of April 1999.

PENN TOWNSHIP  
BOARD OF SUPERVISORS

By: Curtis A. Mason, Sr., Chairman

By: Thomas H. Sinsheimer, Vice Chairman

By: W. A. Finnen, Secretary

By: Thomas O'Rourke, Treasurer

By: Daniel C. Price, III, Roadmaster

ATTEST: W. A. Finnen  
W. A. Finnen, Secretary



**BOROUGH OF WEST GROVE  
CHESTER COUNTY, PENNSYLVANIA  
RESOLUTION NO. 98-2**

**WHITE CLAY CREEK & ITS  
TRIBUTARIES  
WATERSHED MANAGEMENT PLAN**

Prepared as Part of the  
White Clay Creek National Wild & Scenic River Study

WHEREAS, the Borough of West Grove has observed the loss of certain natural resource and cultural values and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the Borough of West Grove individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, the Borough of West Grove recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

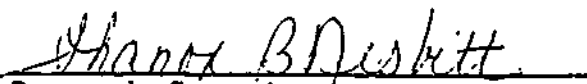
BE IT RESOLVED THAT the Borough of West Grove supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities.

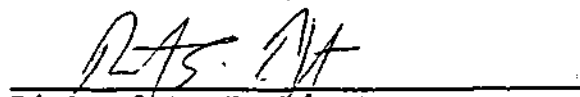
Enacted into a Resolution this 1st day of July, 1998.

ATTEST:

BOROUGH OF WEST GROVE

CHESTER COUNTY, PENNSYLVANIA

  
Borough Secretary

  
Richard S. Turkington  
Borough Council President

**CERTIFICATION**

I HEREBY CERTIFY that the forgoing Resolution was duly adopted by the Borough council of the Borough of West Grove, Chester County, Pennsylvania at its regular meeting held on July 1, 1998.

Sharon B. Duskett  
Borough Secretary

WEST MARLBOROUGH TOWNSHIP

RESOLUTION # 4-98

WHEREAS, West Marlborough Township has observed the loss of certain natural resource and cultural values, and recognizes the necessity to improve water quality within the White Clay Creek watershed, thereby affecting the quality of life for its citizens; and

WHEREAS, the Board individually has taken steps to protect such values, through adoption and administration of zoning and other development guidelines within its jurisdiction; and

WHEREAS, the Township recognizes that joint, cooperative action by all communities within the White Clay Creek watershed will be necessary in order to protect and enhance the watershed's natural resource and cultural values for all of its citizens; and

WHEREAS, the draft White Clay Creek Watershed Plan is a reasonable approach to cooperative watershed management that recognizes the importance of the various roles of landowners, government, business and industry, and other citizens in protection of the watershed's many values; therefore

BE IT RESOLVED THAT the Board of Supervisors of West Marlborough Township supports the White Clay Creek & Its Tributaries Watershed Management Plan, which was prepared as part of White Clay Creek National Wild & Scenic River Study and urges its adoption by all affected communities on this Seventh day of July, 1998.

Attest:

Shirley K. Statton  
Secretary

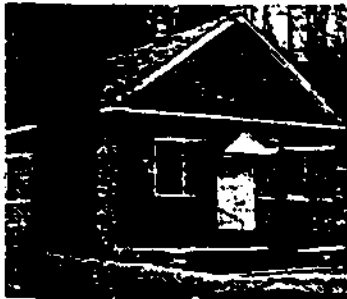
Donald K. Pusey  
Donald K. Pusey, Supervisor

Hugh Lofting  
Hugh Lofting, Supervisor

Michael M. Ledyard  
Michael M. Ledyard, Supervisor

WEST MARLBOROUGH TOWNSHIP  
1300 Doe Run Road  
Coatesville, PA 19320

## White Clay Creek & its Tributaries



Dear Neighbor:

As you may know, the National Park Service is working in conjunction with the White Clay Creek Study Task Force on a study of the White Clay Creek watershed, which includes portions of twelve municipalities in Chester County, Pennsylvania and portions of northern New Castle County, Delaware. The purpose of this study is to determine whether or not the White Clay Creek and its tributaries are eligible and suitable for inclusion in the National Wild and Scenic Rivers System. A local river conservation and management plan for the watershed is an important additional component; it will be prepared by the White Clay Creek Study Task Force, based upon citizen input.

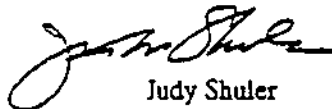

We need your help. In order for the task force to envision what is best for this area, we need to hear from you. Your opinion is important and will make a big difference in shaping the outcome of the study.

Attached to this letter is a questionnaire that will provide valuable assistance in directing the study. Your answers to these questions will be completely anonymous. Please take a few minutes to provide your answers and return the survey to us; postage is pre-paid.

For more information about the study or to join the task force, please call Chuck Barscz, National Park Service, at 215-597-6482.

Thank you for your cooperation.

Sincerely yours,

Judy Shuler

Dorothy Miller

Co-chairs,

White Clay Study Task Force

## *The White Clay Creek National Wild & Scenic River Study - A Summary*

### **Legislative Background**

On December 11, 1991, Congress passed Public Law 102-215, directing the National Park Service to study the White Clay Creek watershed to determine its suitability for inclusion into the National Wild and Scenic Rivers System.

The northwestern part of the study area includes all of London Grove Township and portions of eleven other municipalities in Chester County, Pennsylvania — East Marlborough, West Marlborough, Londonderry, Penn. New Garden, New London, Franklin, London Britain, West Grove Borough and Avondale Borough. From here the headwaters of the White Clay — the West, Middle, and East branches — converge at the border with Delaware to form the mainstem. The southeastern part of the study area includes part of New Castle County, Delaware and three tributaries: Middle Run, and Pike and Mill creeks. These join the mainstem after it flows south to Newark, Delaware, where it takes a sharp turn east upon leaving the piedmont and becomes a coastal plain river. Finally, the White Clay empties into the Christina River south of Wilmington.

### **The Wild and Scenic Rivers Act**

In 1968, Congress passed the National Wild and Scenic Rivers Act (Public Law 90-542, as amended). The intent of the act is to establish a national system to protect selected free flowing rivers with outstanding natural, cultural, and recreational features for the benefit and enjoyment of present and future generations. It provides communities with a way to protect their rivers that is sensitive to the specific needs and concerns of the people that live, work, and play along the rivers.

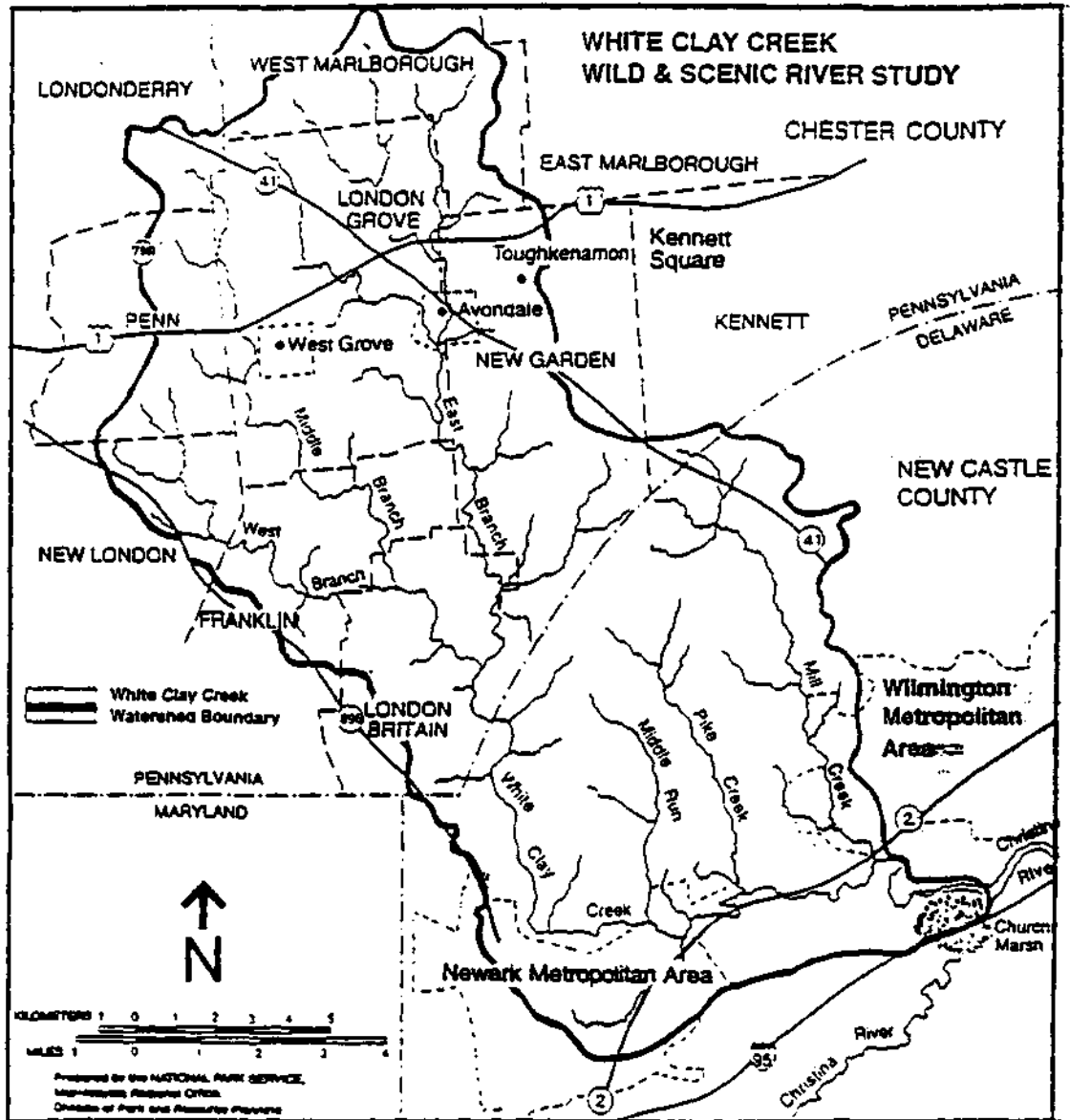
### The Study Process

The National Park Service will assist by directing the study. Members of the White Clay Creek Watershed Association, the White Clay Creek Study Task Force, interested municipalities, local groups, and citizens will assist with the resource assessment and public involvement. The study will:

- \* describe the outstanding resources of the study area
- \* determine the eligibility of the area for the national rivers system
- \* develop a river conservation plan
- \* develop consensus on the plan through public forums
- \* produce a report summarizing the study and recommending whether to add part or all of the study area to the National Wild and Scenic Rivers System.

The study process will result in a proposed river conservation and management plan. The plan will recommend locally supported actions to maintain and improve the White Clay Creek and its tributaries. Concurrently municipal officials, with the assistance of the task force and local residents, will decide whether to seek designation of eligible parts of the river area for inclusion in the National Wild and Scenic Rivers System.

The intent of National Wild and Scenic River designation is to allow for economic growth in a manner that does not adversely affect the region's exceptional river-related resources. The National Park Service emphasizes the protection of landowners' rights; it does not intend to acquire any land within the sections of the White Clay Creek under study. Designation does not open private lands to public access, nor would it affect existing uses of private property.



*White Clay Creek Watershed Public Opinion Survey*

1. In which area do you reside?

If in Pennsylvania:

- \_\_\_ (1) Avondale Borough, zip code \_\_\_\_\_
- \_\_\_ (2) East Marlborough Township, zip code \_\_\_\_\_
- \_\_\_ (3) Franklin Township, zip code \_\_\_\_\_
- \_\_\_ (4) Kennett Township, zip code \_\_\_\_\_
- \_\_\_ (5) London Britain Township, zip code \_\_\_\_\_
- \_\_\_ (6) Londonderry Township, zip code \_\_\_\_\_
- \_\_\_ (7) London Grove Township, zip code \_\_\_\_\_
- \_\_\_ (8) New Garden Township, zip code \_\_\_\_\_
- \_\_\_ (9) New London Township, zip code \_\_\_\_\_
- \_\_\_ (10) Penn Township, zip code \_\_\_\_\_
- \_\_\_ (11) West Grove Borough, zip code \_\_\_\_\_
- \_\_\_ (12) West Marlborough Township, zip code \_\_\_\_\_
- \_\_\_ (13) Other, Chester County, PA, zip code \_\_\_\_\_

If in Delaware:

- \_\_\_ (14) Elsmere, zip code \_\_\_\_\_
- \_\_\_ (15) Hockessin, zip code \_\_\_\_\_
- \_\_\_ (16) Newark, zip code \_\_\_\_\_
- \_\_\_ (17) Newport, zip code \_\_\_\_\_
- \_\_\_ (18) Stanton, zip code \_\_\_\_\_
- \_\_\_ (19) Other, New Castle County, DE, zip code \_\_\_\_\_

Name of your development or nearest subdivision:

\_\_\_\_\_



2. How long have you lived in or near the White Clay Creek watershed?

- (1) less than 1 year
- (2) 1-5 years
- (3) 5-10 years
- (4) 10-20 years
- (5) more than 20 years

3. How many acres of land do you own within the White Clay Creek watershed?  
(See map.) (If you do not own land in the watershed, go to question 7.)

- (1) none
- (2) less than 1 acre
- (3) 1-5 acres
- (3) 5-20 acres
- (4) 20-50 acres
- (5) more than 50 acres

4. Does the White Clay Creek or any of its tributaries front on or flow through property that you own?

- (1) yes
- (2) no

5. Please describe the way that your property is used and the approximate acreage for each use. Check all that apply.

<u>Use</u>	<u>Approximate Acreage</u>
<input type="checkbox"/> primary residence	___
<input type="checkbox"/> seasonal residence	___
<input type="checkbox"/> agricultural use	___
<input type="checkbox"/> commercial use	___
<input type="checkbox"/> government/municipal property	___
<input type="checkbox"/> open space (forest, uncultivated field)	___
<input type="checkbox"/> wetlands, marsh	___
<input type="checkbox"/> other (please specify)	___

6. Please indicate which of the following options might happen to your land within the next ten years. Check all that may apply.

- remain under current ownership and use
- transferred to heirs
- transferred to a conservation program
- developed or subdivided
- sold
- other (please specify)

7. How have you or your family made recreational use of the White Clay Creek watershed? Check all that may apply.

- birding
  - canoeing/kayaking
  - fishing
  - horseback riding
  - hunting
  - nature observation
  - off-road bicycling
  - swimming
  - other (please specify)
- 
- no recreational use

8. Please check the three qualities or characteristics of the White Clay Creek watershed that are most important to you.

- it is a good place to live
  - it is home to many important plant and animal species
  - it is important for recreation
  - it possesses many cultural and historic resources
  - it is relatively undeveloped
  - it is an important resource for commercial and industrial use
  - it possesses natural beauty
  - it is a source of drinking water
  - it is a good resource for environmental education
  - it is an important agricultural area
  - other (please specify)
-

9. Check the three most important activities to encourage in the White Clay Creek watershed.

- protection of water quality
  - residential development
  - maintaining water supply
  - conservation of wildlife habitat
  - maintaining bio-diversity
  - preservation of undeveloped land
  - protection of landowners' rights
  - continued agriculture
  - industrial use
  - preservation of historic resources
  - preservation of scenic character
  - recreation opportunities
  - commercial use
  - fishing opportunities
  - hunting opportunities
  - tourism
  - other (please specify)
-

10. Check what you believe are the ten most important resources in the White Clay Creek watershed.

Natural Resources:

- drinking water
- aquatic life
- deer
- rare and endangered plants and animals
- bio-diversity
- floodplains
- wetlands
- riparian zones
- nutrient rich soils
- air quality
- mature woodlands
- WCC Preserve

Other Resources:

- open space
- stocking sites
- agricultural preservation areas
- stream access
- other (please specify)

Cultural Resources:

- churches
- mills
- farms
- railroads
- archaeological sites
- historic register sites
- local folklore
- grave sites

Recreational Resources:

- hiking trails
  - biking
  - mountain biking trails
  - horseback riding trails
  - existing trail/greenway/  
park
- 

11. Indicate the extent to which you agree or disagree with the following statements;

A. I would support land use regulations and programs that may be necessary to conserve/protect the watershed environment.

- 1\_\_strongly agree 2\_\_agree 3\_\_disagree 4\_\_strongly disagree  
5\_\_no opinion

B. I would support an overall conservation plan for the watershed, but feel that there must be some room for planned residential, commercial and industrial growth.

1\_\_strongly agree 2\_\_agree 3\_\_disagree 4\_\_strongly disagree  
5\_\_no opinion

C. I favor aggressive development of this area and oppose any conservation effort that would restrict new residential, commercial or industrial growth.

1\_\_strongly agree 2\_\_agree 3\_\_disagree 4\_\_strongly disagree  
5\_\_no opinion

12. Who should have major responsibility for conserving natural, historic and recreational resources in the White Clay Creek watershed? Check only one.

- (1) conservation organizations
  - (2) landowners and private citizens
  - (3) regional planning agencies
  - (4) local government
  - (5) state government
  - (6) federal government
  - (7) coalitions of public and private organizations
  - (8) other (please specify)
- 

13. What do you think landowners should do to help conserve natural, cultural, historic and recreational resources? Check all that apply.

- practice conservation on their property
  - learn more about conservation techniques
  - become more active in conservation organizations
  - organize/participate in conservation efforts in the community
  - urge government to practice comprehensive planning
  - nothing; conservation of resources is not a landowner responsibility
  - other (please specify)
-

14. Are government agencies currently meeting the need for conservation and management of resources within the White Clay Creek watershed?

- \_\_\_(1) yes
- \_\_\_(2) no

If "no," what improvements are needed?

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15. Please list any cultural or historic resources or sites in the White Clay Creek watershed area that should be conserved, along with any source(s) of information about them.

**RESOURCES**

**INFORMATION**

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16. Had you heard about the White Clay Creek Wild and Scenic River Study prior to receiving this questionnaire?

- \_\_\_(1) yes
- \_\_\_(2) no (Skip to question #17)

Through which of the following sources did you receive your information?  
Check all that apply.

- \_\_\_ newspaper
  - \_\_\_ radio
  - \_\_\_ television
  - \_\_\_ White Clay Creek Wild and Scenic Study brochure
  - \_\_\_ public meeting
  - \_\_\_ White Clay Creek Wild and Scenic Study slide presentation
  - \_\_\_ friend
  - \_\_\_ other (please specify)
- 

17. Please use this space for any further comment regarding the White Clay Creek Wild and Scenic River Study or the future of the White Clay Creek watershed.

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112

University of Delaware  
Urban Affairs - CADSR  
P.O. Box 6003  
Newark, Delaware 19714-9984



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STAPLE OR TAPE HERE



*Thank you.*

By taking some time to complete this survey, you have ensured that your opinions about the future of the White Clay Creek will be heard.

After answering the questions on the survey, please follow the instructions below:

1. Tear off this page and the cover page from the remainder of the survey and discard.
2. Staple or tape the survey where indicated on the previous page.
3. Send to the University of the Delaware using the pre-paid mailback given on the previous page.

REMOVE THIS PAGE AND COVER FROM REST OF SURVEY SO YOU CAN  
USE THE MAILBACK ON THE PREVIOUS PAGE!

Outstandingly Remarkable Resource Evaluation

114

	RESOURCE CATEGORY	FEDERAL 3 Points	STATE 2 Points	REGIONAL 2 Points	EXISTENCE 3 Points	ROLE 3 Points	TOTAL
	<b>WATER RESOURCE DESIGNATIONS</b>						
PA	East Branch - Exceptional Value and Cold Water Fishes		2			3	5
PA	Middle Branch & West Branch - Trout Stocking & Migratory Fishes		2				2
PA	Main Stem PA/DE state line to northern border of Avondale - Cold Water Fishes		2				2
PA	Main Stem PA/DE state line to Rt.72 bridge in Newark - Exceptional Recreational and/or Ecological Significant Water		2				2
DE	Mill Creek from Rt. 288 to Rt.7 - Cold Water Fishes		2				2
DE	Pike Creek from Rt.72 to Road 316 - Cold Water Fishes		2				2
	<b>RARE &amp; ENDANGERED SPECIES</b>						
PA	Leather Flower ( <i>Clematis viorna</i> ) - State Endangered		2		3		5
PA	Tawny Ironweed ( <i>Veronia glauca</i> ) - State Endangered		2		3		5
PA	Elephant's Foot ( <i>Elephantopus carolinianus</i> ) - State Endangered		2		3		5
PA	Fall Witch Grass ( <i>Digitaria cognatum</i> ) - State Threatened		2		3		5
PA	Puttyroot Orchid ( <i>Aplectrum hyemale</i> ) - State Rare		2		3		5
PA	Crane-fly Orchid ( <i>Tipularia discolor</i> ) - State Rare		2		3		5
PA DE	Bog Turtle ( <i>Clemmys mühlenbergii</i> ) - PA State Endangered Federally Listed Endangered U.S. Fish & Wildlife Service	3	2		3		8

Outstandingly Remarkable Resource Evaluation

	RESOURCE CATEGORY	FEDERAL 3 Points	STATE 2 Points	REGIONAL 2 Points	EXISTENCE 3 Points	ROLE 3 Points	TOTAL
	<b>RARE AND ENDANGERED SPECIES</b>						
PA DE	Cerulean Warbler ( <i>Dendrocia cerulea</i> ) - Candidate for Federal Endangered Listing U.S. Fish & Wildlife Service	3			3		6
PA DE	Northern Goshawk ( <i>Accipiter gentilis</i> ) - Candidate for Federal Endangered Listing U.S. Fish & Wildlife Service (assumed extirpated from this location, not observed in over 30 yeas)	3					3
PA DE	Henslow's Sparrow ( <i>Ammodramus henslowii</i> ) - Candidate for Federal Endangered Listing U.S. Fish & Wildlife Service	3					3
PA DE	Darlington's Spurge ( <i>Euphorbia purpurea</i> ) - Candidate for Federal Endangered Listing U.S. Fish & Wildlife Service	3					3
PA DE	Harlequin Duck ( <i>Histrionicus histrionicus</i> ) - Candidate for Federal Endangered Listing U.S. Fish & Wildlife Service	3					3
PA DE	Loggerhead Strike ( <i>Lanius ludovicianus</i> ) - Candidate for Federal Endangered Listing U.S. Fish & Wildlife Service	3					3
	<b>CULTURAL/HISTORICAL RESOURCES</b>						3
	<b>National Register of Historic Places</b>						
DE	J. Eastern Barn	3					3
DE	Curtis Paper Mill Worker Houses	3					3
DE	James Steel House	3					3
DE	Thomas Phillips Mill Complex	3			3		6
DE	Westket M.E. Church	3					3
DE	Samuel Lindsey House	3					3
DE	J. McDaniel Farm	3					3

Outstandingly Remarkable Resource Evaluation

	RESOURCE CATEGORY	FEDERAL 3 Points	STATE 2 Points	REGIONAL 2 Points	EXISTENCE 3 Points	ROLE 3 Points	TOTAL
	<b>CULTURAL/HISTORICAL RESOURCES CONT.</b>						
	<b>National Register of Historic Places</b>						
DE	R. Walkers Barn	3					3
DE	Armstrong Farm	3					3
DE	Delaware State Boundary Markers	3					3
DE	Chambers House	3					3
DE	Eastburn - Jeanes Lime Kilns Historical District	3			3		6
DE	J. Stinson Farm	3					3
DE	James Morrow House	3					3
DE	Merimaid Tavern	3					3
DE	White Clay Creek Presbyterian Church	3					3
DE	Hale - Byrnes House	3					3
DE	Rotheram Mill House	3					3
DE	England House (and Mill amendment)	3			3		6
DE	Bartley - Tweed Farm	3					3
DE	Welsh Tract Baptist Church (Loran Tract)	3					3
DE	J. Lindsey Barn	3					3
DE	William Morgan Farm	3					3
DE	Hoccessin Friends Meeting House	3					3
DE	St. James Church	3					3
DE	McIntyre Farm	3					3
DE	T. Runson Farm	3					3

Outstandingly Remarkable Resource Evaluation

	RESOURCE CATEGORY	FEDERAL 3 Points	STATE 2 Points	REGIONAL 2 Points	EXISTENCE 3 Points	ROLE 3 Points	TOTAL
	<b>CULTURAL/HISTORICAL RESOURCES CONT.</b>						
	<b>National Register of Historic Places</b>						
DE	Springer Farm	3					3
DE	Public School No. 29	3					3
PA	Lumms Tavern	3					3
PA	Thompson Farm	3					3
PA	John Ferron House	3					3
PA	Moses Ross House	3					3
PA	St. Malachai Roman Catholic Church	3					3
PA	White Clay Creek Bridge New Garden Township	3					3
PA	Cyrus Hoopes House and Barn	3					3
PA	Primitive Hall	3					3
	<b>NATURAL RESOURCES</b>						
	<b>Chester County Open Space Plan</b>						
PA	Unique Natural Area Ravine along White Clay Creek north of Landenburg			2			2
PA	Wooded slopes along White Clay Creek east of Chesterville			2			2
PA	Wooded slopes along White Clay Creek at Delaware State Line			2			2
	<b>New Castle County Comprehensive Plan</b>						
PA DE	Cockeysville Marble Formation (found throughout watershed, identified in PA plans as important resource)			2		3	5



**RECOMMENDED NATIONAL WILD AND SCENIC DESIGNATIONS  
WHITE CLAY CREEK WATERSHED PENNSYLVANIA / DELAWARE  
Stream Length (miles)**

Government	W1	W2	W3	W3	W4	W5	W6	W7	W8	W9	Subtotal / % of Total
	West Branch	Middle Branch	EB above Avondale	EB below Avondale	Middle Run	Pike Creek	Mill Creek	Newark	MS near Delaware Pk	MS Churchman's Marsh	
West Marlborough			8.2								8.2 / 4.3%
Londonderry		1.8									1.8 / 0.9%
London Grove		8.9	16.5	4.7							30.1 / 15.7%
Penn	2.4	3.3									5.7 / 3.0%
West Grove			0.4								0.4 / 0.2%
Avondale			1.6								1.6 / 0.8%
New Garden			4.0	7.1							11.2 / 5.9%
New London	6.3	0.3									6.6 / 3.5%
Franklin	7.1	3.5		1.8							12.4 / 6.5%
London Britian	1.4	5.1		5.1				5.7			17.2 / 9.0%
Kennett							0.3				0.3 / 0.2%
<b>Subtotal PA</b>	<b>17.2</b>	<b>23.0</b>	<b>30.7</b>	<b>18.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.3</b>	<b>5.7</b>	<b>0.0</b>	<b>0.0</b>	<b>95.5 / 50.0%</b>
Newark								2.0	2.0		4.0 / 2.1%
New Castle County				0.5	6.5	15.6	38.4	13.3	12.8	4.4	91.5 / 47.9%
<b>Subtotal DE</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.5</b>	<b>6.5</b>	<b>15.6</b>	<b>38.4</b>	<b>15.3</b>	<b>14.8</b>	<b>4.4</b>	<b>95.5 / 50.0%</b>
<b>Total</b>	<b>17.2</b>	<b>23.0</b>	<b>30.7</b>	<b>19.1</b>	<b>6.5</b>	<b>15.6</b>	<b>38.7</b>	<b>21.0</b>	<b>14.8</b>	<b>4.4</b>	<b>191.0 / 100%</b>

	Recreational Subtotal	Scenic E. Branch	Scenic M. Branch	Scenic Main Stem	Scenic Mid. Run	Scenic Subtotal	Total
Pennsylvania	87.1	4	2.1	2.3	0	8.4	95.5
Delaware	79.9	0	0	10.4	5.2	15.6	95.5
<b>TOTAL</b>	<b>167</b>	<b>4</b>	<b>2.1</b>	<b>12.7</b>	<b>5.2</b>	<b>24</b>	<b>191</b>

Compiled by Univ. of Delaware, Water Resources Agency  
Revised: 6-09-99



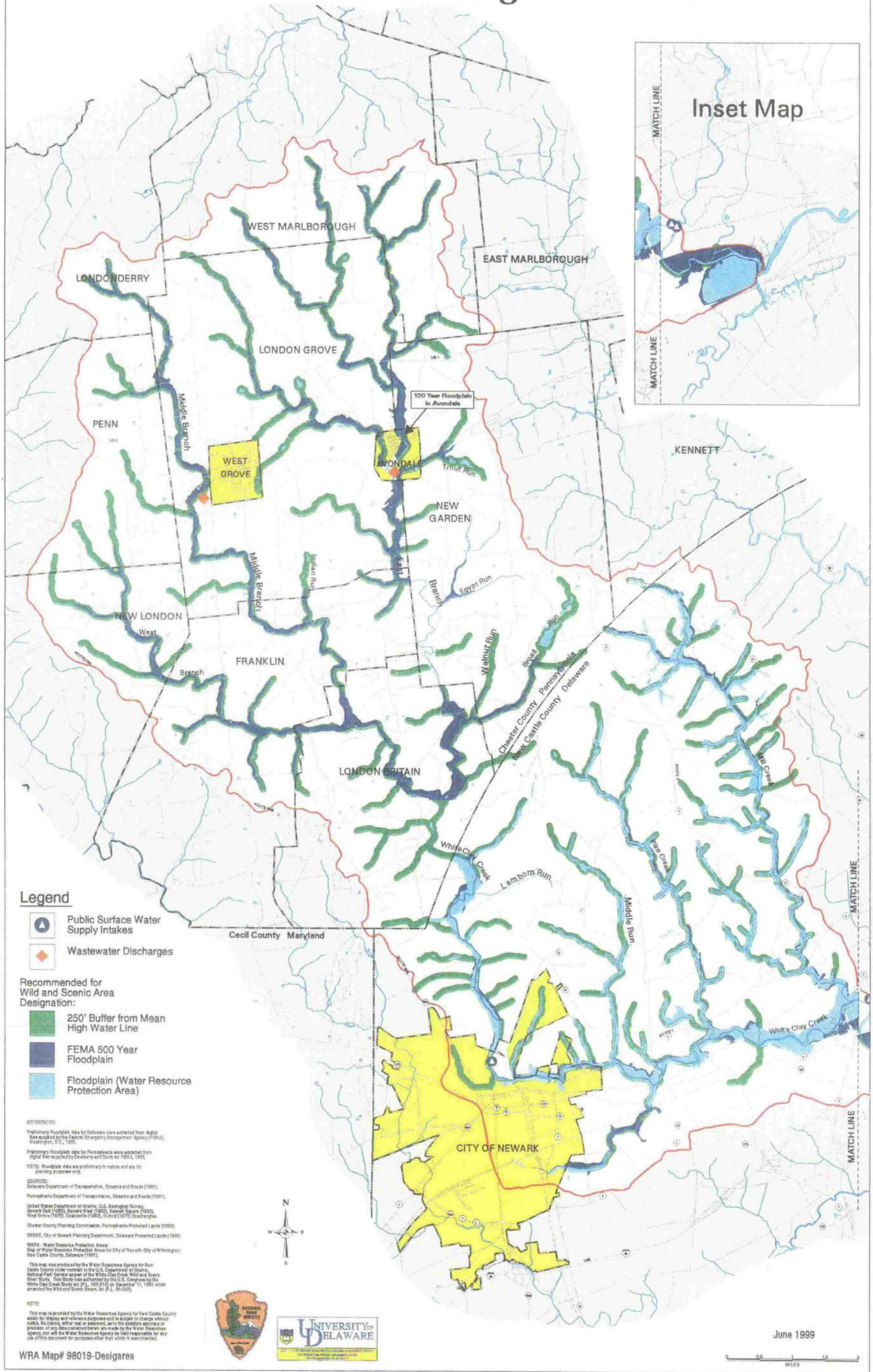
## PUBLIC MEETINGS / PUBLIC INVOLVEMENT SUMMARY

<u>DATE</u>	<u>LOCATION</u>	<u>PURPOSE</u>
June, 1992	Newark, DE * Avondale, PA *	Announce Study Question and Answer
February 22, 1993	Newark, DE *	Formation of Study Task Force; First Study Task Force Meeting
March 18, 1993	Avondale, PA *	Formation of Subcommittees; Study Task Force Second Meeting
March 1993 -November 1994	Various Watershed Locations	Study Task Force Subcommittees meet on a regular basis - Open to the Public
July 27, 1993	Newark, DE *	Memorandum of Understanding Signing Ceremony
October 21, 1993 October 27, 1993	West Grove, PA * Newark, DE *	Resources and Issues Public Workshops
April, 1994	Entire Watershed	Public Opinion Survey Distributed
November 14, 1994 November 16, 1994	West Grove, PA * Newark, DE *	Goals and Actions Workshop Results of Public Opinion Survey Release of Draft Eligibility Report Release of Draft Issues Report
November 1994 - August 1997	Various Watershed Locations	Management Planning Committee Meetings to prepare Management Plan - All Meetings Open to Public
October 15, 1997 October 17, 1997	West Grove, PA * Newark, DE *	Present and Discuss Draft Watershed Management Plan
February 28, 1998	Entire Watershed	Deadline for Comments on Draft Watershed Management Plan
May 15, 1998	Entire Watershed *	Final Watershed Management Plan Distributed
July 30, 1998	All affected local governments	Deadline for resolutions of support for management plan and wild and scenic designation

\* Noticed in area newspapers



# White Clay Creek Wild and Scenic River Study Area Recommended Designated Area



### Legend

- Public Surface Water Supply Intakes
- Wastewater Discharges

### Recommended for Wild and Scenic Area Designation:

- 250' Buffer from Mean High Water Line
- FEMA 500 Year Floodplain
- Floodplain (Water Resource Protection Area)

### REFERENCES:

Preliminary Floodplain data for Delaware were extracted from digital files supplied by the Federal Emergency Management Agency (FEMA), Washington, D.C., 1995.  
 Preliminary Floodplain data for Pennsylvania were extracted from digital files supplied by Deberry and Davis for FEMA, 1995.  
 NOTE: Floodplain data are preliminary in nature and are for planning purposes only.  
 SOURCES:  
 Delaware Department of Transportation, Streets and Roads (1991).  
 Pennsylvania Department of Transportation, Streets and Roads (1991).  
 United States Department of Interior, U.S. Geological Survey, Newark East (1993), Newark West (1992), Kennett Square (1983), West Grove (1976), Coatesville (1982), Colton (1977), Strasburgville.  
 Chester County Planning Commission, Pennsylvania Protected Lands (1996).  
 DRRC, City of Newark Planning Department, Delaware Protected Lands (1990).  
 WSPA - Water Resource Protection Areas.  
 Map of Water Resource Protection Areas for City of Newark; City of Wilmington; New Castle County, Delaware (1991).  
 This map was produced by the Water Resources Agency for New Castle County under contract to the U.S. Department of Interior, National Park Service as part of the White Clay Creek Wild and Scenic River Study. This Study was authorized by the U.S. Congress by the White Clay Creek Study Act (P.L. 102-215) on December 15, 1991, which amended the Wild and Scenic Rivers Act (P.L. 95-623).

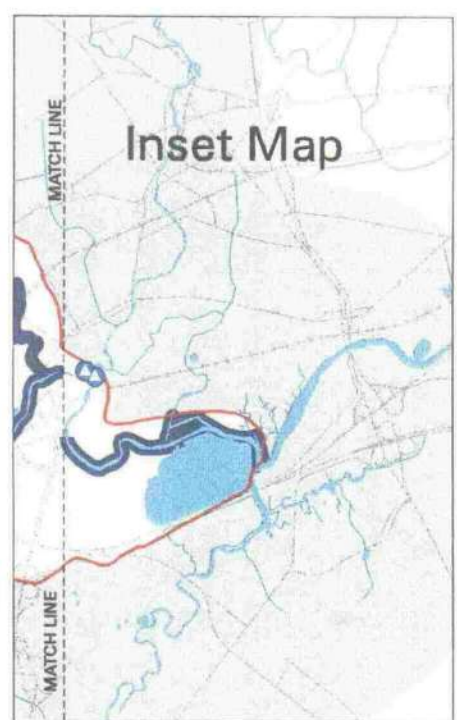
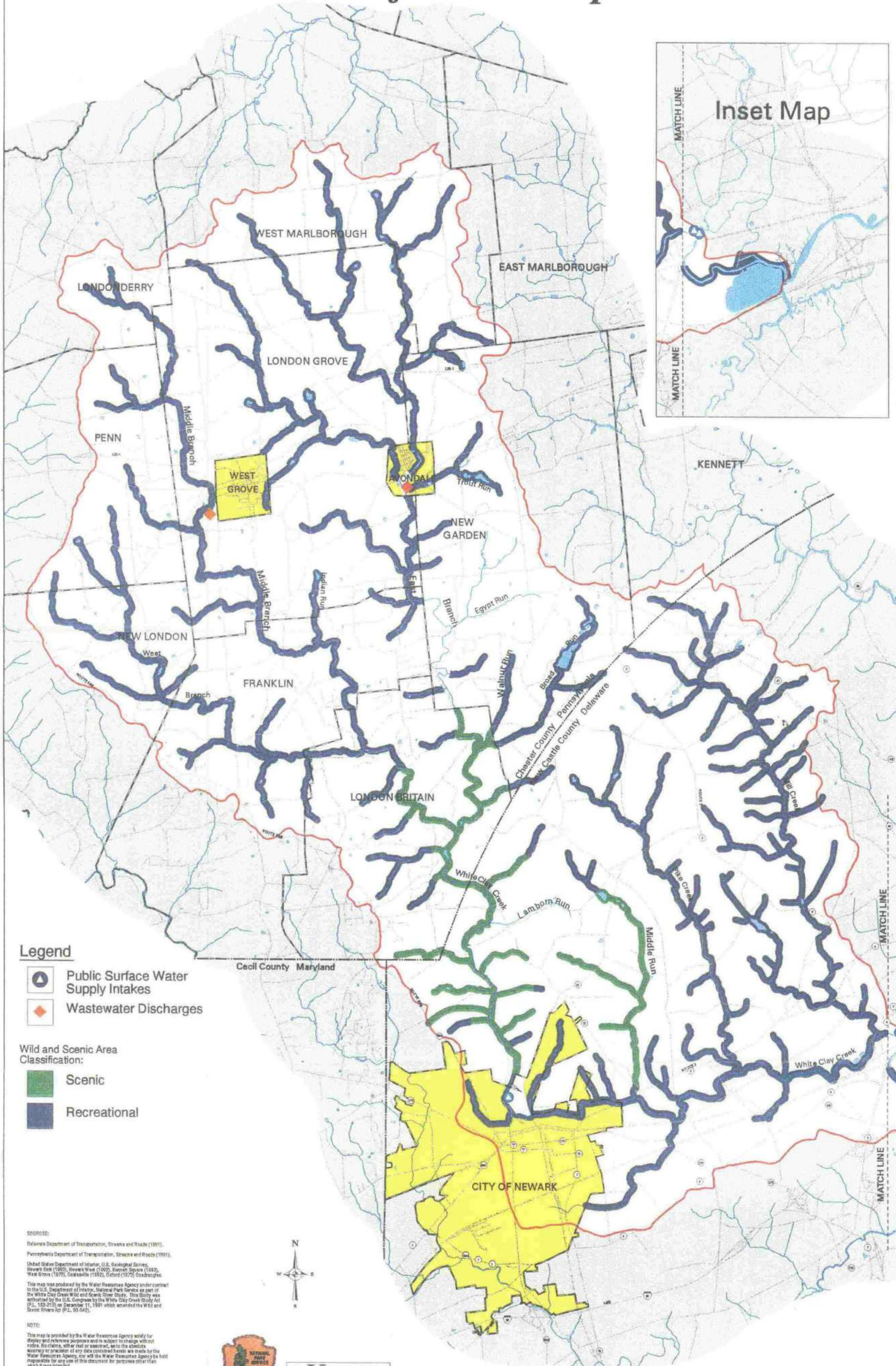
### NOTE:

This map is provided by the Water Resources Agency for New Castle County solely for display and reference purposes and is subject to change without notice. No claims, with or without, as to the absolute accuracy or precision of any data contained herein are made by the Water Resources Agency, nor will the Water Resources Agency be held responsible for any use of this document for purposes other than which it was intended.





# White Clay Creek Wild and Scenic River Study Area Classification Map



- Legend**
- Public Surface Water Supply Intakes
  - Wastewater Discharges
- Wild and Scenic Area Classification:**
- Scenic
  - Recreational

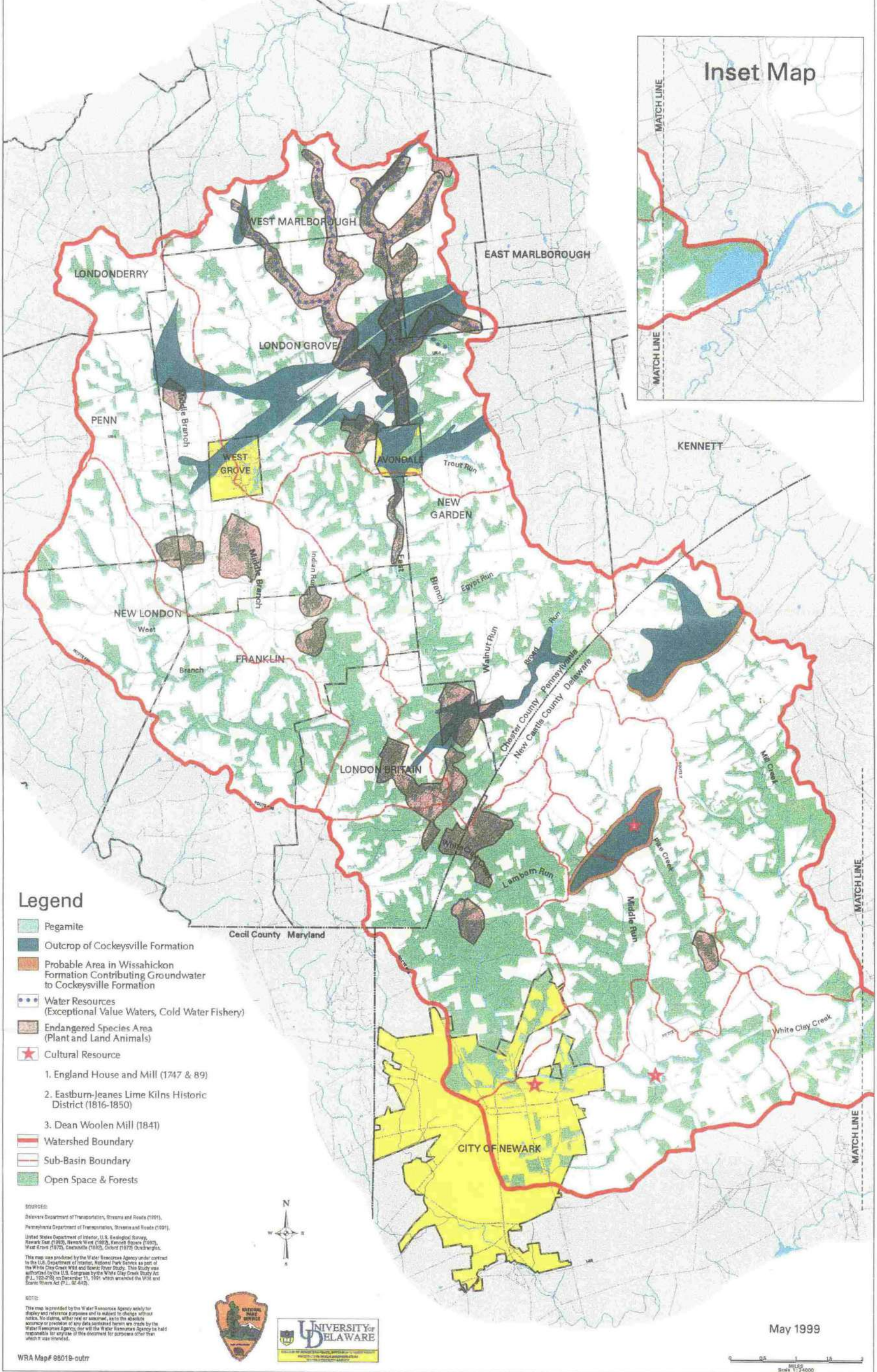
**SOURCES:**  
 Delaware Department of Transportation, Streets and Roads (1991).  
 Pennsylvania Department of Transportation, Streets and Roads (1991).  
 United States Department of Interior, U.S. Geological Survey, Newark, DE (1995), Newark West (1995), Kennett Square (1993), West Grove (1975), Gettysville (1992), Oxford (1975) Dendrologics.  
 This map was produced by the Water Resources Agency under contract to the U.S. Department of Interior, National Park Service as part of the White Clay Creek Wild and Scenic River Study. This Study was authorized by the U.S. Congress by the White Clay Creek Study Act (P.L. 103-215) on December 11, 1991 which amended the Wild and Scenic Rivers Act (P.L. 90-542).

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# White Clay Creek Wild and Scenic River Study Area Outstandingly Remarkable Resources



## Legend

- Pegamite
- Outcrop of Cockeysville Formation
- Probable Area in Wissahickon Formation Contributing Groundwater to Cockeysville Formation
- Water Resources (Exceptional Value Waters, Cold Water Fishery)
- Endangered Species Area (Plant and Land Animals)
- Cultural Resource
- 1. England House and Mill (1747 & 89)
- 2. Eastburn-Jeanes Lime Kilns Historic District (1816-1850)
- 3. Dean Woolen Mill (1841)
- Watershed Boundary
- Sub-Basin Boundary
- Open Space & Forests

**SOURCES:**  
 Delaware Department of Transportation, Streams and Roads (1991).  
 Pennsylvania Department of Transportation, Streams and Roads (1991).  
 United States Department of Interior, U.S. Geological Survey, Newark Gap (1972), Newark West (1982), Newark Spring (1982), West Grove (1972), Cockeysville (1982), Oxford (1972) Dickinson.

This map was produced by the Water Resources Agency under contract to the U.S. Department of Interior, National Park Service as part of the White Clay Creek Wild and Scenic River Study. The study was authorized by the U.S. Congress by the White Clay Creek Study Act (P.L. 102-240) on December 11, 1991 when amended the Wild and Scenic Rivers Act (P.L. 92-442).

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WRA Map# 98019-outrr



May 1999

