

Indian Creek River Conservation Plan

Executive Summary

In Accordance With



The Pennsylvania Department of Conservation and Natural Resources

Tom Ridge, Governor

John C. Oliver, Secretary

Prepared for:



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Acknowledgments

Watershed Planning:

A grassroots movement

The Indian Creek River Conservation Planning (RCP) effort was initiated by the Mountain Watershed Association, Inc. (MWA) to help the community better understand the natural, physical, and cultural resources of the Indian Creek Watershed, and how these resources are impacted by various factors. This information will enable stakeholders to make conscious decisions regarding potential improvements, and the protection of important features within the watershed.

In 1999, the MWA was awarded a River Conservation Planning Grant for the Indian Creek Watershed from the Pennsylvania Department of Conservation and Natural Resources (DCNR). In early 2000, the project stakeholders held public meetings concerning the RCP process. This not only assisted in educating local citizens, municipalities, and organizations about the RCP effort, but also aided in identifying potential steering committee members. The steering committee was formed and assisted in reviewing the draft Request for Proposal prior to its distribution to potential consultants. In May 2000, MWA on the advice of the steering committee hired Skelly and Loy, Inc. as the project's consultant. Skelly and Loy was hired to prepare the RCP, perform the needed public participation activities, and to ensure that the RCP is approved by DCNR and listed on the Pennsylvania Rivers Conservation Registry.

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Pennsylvania Department of Conservation and Natural Resources (DCNR) Keystone Recreation, Park, and Conservation Fund

and

- Canaan Valley Institute,
- Catholic Charities: Campaign for Human Development
- Laurel Foundation
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- United States Department of Agriculture, Natural Resources Conservation Service

The Project Steering Committee, which is an informal group of community-oriented individuals, and organizations that are concerned about the future of the Indian Creek Watershed directed the project.

- Donegal Township
- Mountain Watershed Association
- Indian Creek Valley Water Authority
- Saltlick Township
- Western Pennsylvania Coalition for Abandoned Mine Reclamation
- Western Pennsylvania Conservancy

The Mountain Watershed Association was the administering organization for the project.

With Additional Thanks To:

The Honorable Thomas J. Ridge, Governor, Commonwealth of Pennsylvania
Mr. John C. Oliver, Secretary, Department of Conservation and Natural Resources

Jim Mays and Tracy Robinson, Environmental Planners,
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Officials and Municipal Staff:

- Bullskin Township
- Cook Township
- Donegal Borough,
- Donegal Township
- Mount Pleasant Township
- Saltlick Township
- Seven Springs Borough
- Springfield Township
- Stewart Township

and

The numerous volunteers that assisted in developing this plan.
Their participation in the public process facilitated and enabled completion of this
plan, which is a vital step in the restoration of the Indian Creek Watershed.

Indian Creek River Conservation Plan Executive Summary

Introduction

This Executive Summary is provided to serve as a snapshot of watershed conditions, issues, and opportunities in the Indian Creek Watershed. It is designed to accompany the full length River Conservation Plan prepared for the Indian Creek Watershed. The plan focuses on resources and conditions in the watershed and identifies their relation to watershed health. The plan is a reference guide and an integrative tool for decision makers (i.e., municipal officials and staff, conservation organizations, businesses, planners, governmental agencies, etc.) in the Indian Creek Watershed. It incorporates critical watershed conservation information and potential implementation strategies into a single source document. This reference serves as a unifying document to bring multiple stakeholders together for a number of opportunities that are outlined within the document.

Goals

A watershed is the total area that is drained by a network of tributaries that feed the main channel (Allan, 1995). Indian Creek Watershed is located in southwestern Pennsylvania and flows south and west through Westmoreland and Fayette Counties. Indian Creek discharges into the Youghiogheny River at Camp Carmel, five miles upstream from South Connellsville, PA. Indian Creek is not considered navigable by the U.S. Army Corps of Engineers (USACOE, 1995).

The planning process has involved public input, environmental investigation, data gathering, and agency coordination. By outlining goals for watershed improvement we can focus attention on the projects that most effectively contribute to their attainment. This document summarizes the issues and opportunities that affect these goals and makes recommendations for improvement. The following are the five project goals that were established by the projects steering committee.

- Improve water quality;
- Enhance the recreational opportunities of the watershed;
- Provide an environmental education program for adults as well as to enhance existing school curriculum;
- Protect the natural resources, historic landscapes, and scenic beauty within the watershed; and
- Encourage compatible, responsible, and sustainable economic development.

Issues and Opportunities

Water Quality Remediation

Abandoned Mine Drainage (AMD) is the major issue in the Indian Creek Watershed. Extensive mining in the watershed's past has burdened streams with drainage from deep mine portals, surface mines, and coal refuse piles. Impact from mining has occurred in the watershed for approximately 150 years. Abandoned Mine Drainage is made up of numerous water quality parameters and often differs from discharge to discharge. The AMD is typically acidic or alkaline and is loaded with metals including Aluminum, Iron, and/or Manganese. One hundred nineteen (119) mine discharge points flow into and severely degrade Indian Creek and its tributaries. Streams degraded by AMD in the Indian Creek Watershed include:

- Back Creek,
- Champion Creek,
- Indian Creek,
- Little Champion Creek,
- Newmyer Run,
- Poplar Run,
- Wash Run, and
- Numerous unnamed tributaries.

Efforts to address and remediate AMD impacts have been initiated in the Indian Creek Watershed. In 1998, *Mountain Watershed Association* completed its Comprehensive Plan to remediate AMD problems in the watershed. The goal of the plan is to totally rehabilitate the Indian Creek Watershed of its AMD problems (MWA, 1998). In 2000 the Natural Resource Conservation Service's *Watershed Plan and Environmental Assessment*, delineated 10 treatment sites that would improve the water quality in five of eight sub-basins listed above. These treatments could restore over 17 miles of stream and would have an annual economic value of \$886,000. The discharge sites that would be remediated include:

- Buck Run site,
- Fulton discharge,
- Gallentine discharge,
- Kalp discharge,
- Lawrence Coal site,
- Marsolin-Leighty discharge,
- Melcroft #3 Portal Pond and associated discharges,
- Nicholson discharge,
- Permapress discharge, and
- Rondell-Correal discharge.

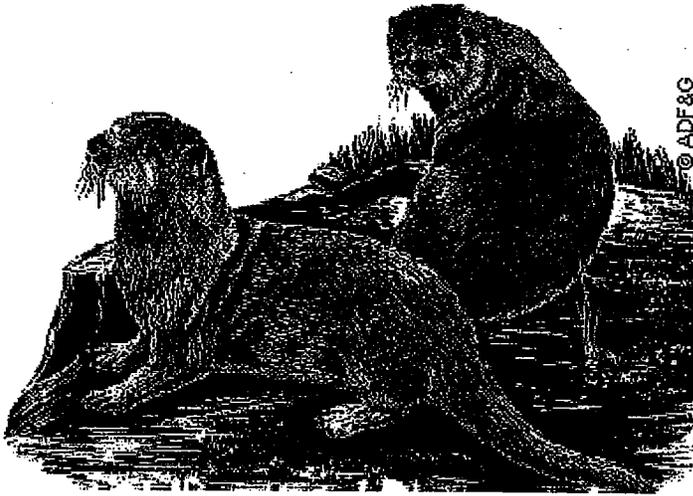


The Sagamore AMD remediation project is located ¼ mile north of Indian Head.

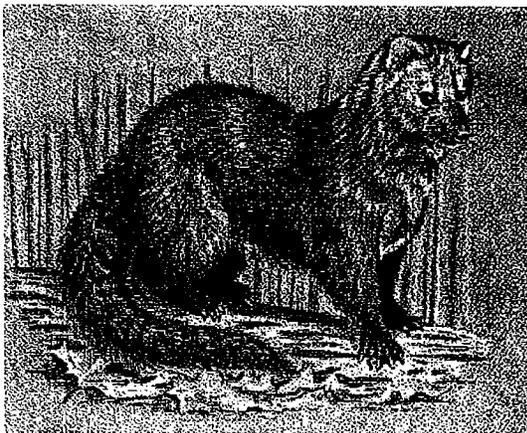
Further actions must be taken to address the problems of AMD in the watershed. Mountain Watershed Association must continue to serve as a holistic conservation organization to promote watershed health. By taking action toward these remediation projects the overall water quality should significantly improve in the watershed. AMD remediation should be considered an *On-going* activity in the watershed to improve water quality and prevent future impacts. Remediation activities must involve public participation to expand the group of interested stakeholders, as well as coordination with private corporations, local, state, and federal governments. To increase involvement among the public and gain increased project support, activities must be focused on goals that are attainable and show a significant improvement.

Sewage is an additional issue that affects the water quality in the Indian Creek Watershed. The introduction of sewage to local streams is due to deficient or absent on-lot septic systems. Currently this problem is not an obvious detriment to the waters of the Indian Creek Watershed. However, the impacts are masked by the affects of AMD. As these AMD problems are corrected, nutrient enrichment in the watershed may become a more pronounced impact. All levels of government, local residents, and businesses must work together in order to correct this water quality issue. Community members and officials should be encouraged to participate in public meetings and forums to be made aware and discuss solutions to the problem. Further, it is recommended that a sewage/nutrient enrichment study be completed in order to understand more fully where specific problems will arise as AMD issues are remediated, what type of systems may need correction, and how implementation action should be initiated.

Biological Opportunities that exist in the watershed are also related to water quality remediation. The **River Otter (*Lutra Canadensis*)** was reintroduced into the Youghiogheny River basin in 1982 and in subsequent years. Though, no scientific surveys have been completed to document the river otter's expansion from the



Youghiogheny River. However, there is credible evidence and numerous local observations that suggest the otter has moved into the Indian Creek Watershed (Serfass, 2000). This reoccupation may be due to improving water quality and overall watershed health in the Indian Creek basin. As further improvements take place, stable populations could become established in the watershed.



Another wildlife issue in the watershed involves the northern expansion of the **Fisher (*Martes pennanti*)** from West Virginia. The fisher was successfully reintroduced into northern West Virginia by the West Virginia Division of Natural Resources over 20 years ago. As with the river otter, no scientific surveys have been completed to document the fisher's expansion into Pennsylvania. However, there is credible evidence and numerous observations made indicating the fisher has

moved into the Indian Creek Watershed and southwestern Pennsylvania (Serfass, 2000). Efforts should be encouraged to study populations and their expansions as well as to facilitate reintroductions and protection to promote biological diversity.

Recreation and Tourism

Recreational opportunities abound in the Indian Creek Watershed. Six (6) park/recreational facilities exist within the watershed. In addition, seven (7) recreational trail projects are in place, under construction, or being studied. The Indian Creek Valley Hike-Bike Trail is the most prevalent of the recreational trails in the watershed. The mainstream of Indian Creek also provides opportunities for canoeing and fishing. These recreational opportunities provide the chance for everyone to experience and gain a stronger appreciation and understanding of the importance of nature within the watershed.



Indian Creek Valley Hike-Bike Trail adjacent to Indian Creek near Melcroft.

Protecting, enhancing, and promoting the existing opportunities will help build support within the watershed's communities. Efforts should be maintained and expanded to add to the existing facilities as well as promote the opportunities that exist. Linking recreational trail segments and developing connections to other features within the watershed would greatly broaden the recreational experience for those using the resources. Municipalities and conservation groups should work together to assemble a recreational "Master Plan" to enhance and promote recreational and tourism opportunities within the watershed. The development of a regional sporting event that draws competitors to the watershed would be a step in enhancing tourism and recreational use of the areas resources. A watershed triathlon that utilizes the trail system, area streams, and introduces athletes to the watershed, would be a good catalyst to increase utilization of watershed facilities.

Adult/Youth Education and Outreach

An abundance of environmental educational opportunities exist in the project area. These opportunities abound for youth, adult, and lifetime education activities. Mountain Watershed Association's outreach program involves a presentation of the issues and concerns of the watershed. This program as well as others should continue and expand on activities with local school districts, volunteer activities, and local/regional conservation initiatives. As membership and local support grows, Mountain Watershed Association should attempt to expand educational staff, promotional literature, equipment, and facilities.

Involvement of youth and adult volunteers in on-going conservation projects as samplers, interpreters, and committee members are crucial to expand community support and promote long-term initiatives.

MWA's Summer 2001 intern collects water samples as part of the organization's water quality monitoring program.

The development of an environmental educational center or nature center would increase community awareness of conservation activities while educating the public about real-life conservation in the area. The center may dispel myths or misgivings regarding conservation group objectives and reinforce the need for public involvement in



protecting and remediating the local environment. Utilizing the media to keep the watershed's citizens informed of projects, concerns, and volunteer opportunities would allow information to reach a larger, more diverse group of residents and businesses.

Protection of Natural, Scenic, and Historic Features



Land Conservation and Protection is an important concern in the Indian Creek Watershed. Many areas of the Indian Creek Watershed occur as rural hills and valleys. To protect the natural and scenic beauty of these rural areas, it may become necessary to formally set aside parcels of land of particular natural significance. Conservation groups such as Mountain Watershed Association must take the lead in

protection of these landscapes. These groups are often the only entity with the financial, administrative, and personnel capabilities organized enough to successfully initiate a dedication, purchase, or preservation. Again, coordination with local, state, and federal agencies is critical to make these actions a success and to ensure that they occur in the best interests of the community and watershed.

Another implementation opportunity is the formal dedication of other Natural Heritage inventoried (NHI) areas as Natural Areas. A natural area is an area of unique scenic, historic, geologic, or ecological value that will be maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention. These areas are set aside to provide locations for scientific observation of natural systems, to protect examples of typical and unique plant and animal communities, and to protect outstanding examples of natural interest and beauty.

An implementation goal of the Indian Creek River Conservation Plan is to work towards gaining "formal dedication" of additional NHI areas for the protection of their ecological systems and biological diversity. A potential location for formal dedication is the lower



Indian Creek Watershed that encompasses the scenic gorge area. This area is

partially included in the Youghiogheny River Biological Diversity Area and the Youghiogheny River Landscape Conservation Area. By setting aside natural areas such as this for protection and observation, we can maintain the rural and scenic surroundings that occur in the Indian Creek Watershed today.

Historic Property Preservation is an important opportunity in the watershed. The renovation of historical buildings could increase tourism from outside of the region. By restoring or preserving sites such as the Mathews Feed and Grist Mill Property and the Martha Jones House, a sense of community is developed and may attract people from nearby areas that have lost these pieces of history. The development of one such property into a museum to house pieces of the regions history and serve as a glimpse of the watersheds past would attract visitors and serve as an economic boost to otherwise unvisited portions of the region.



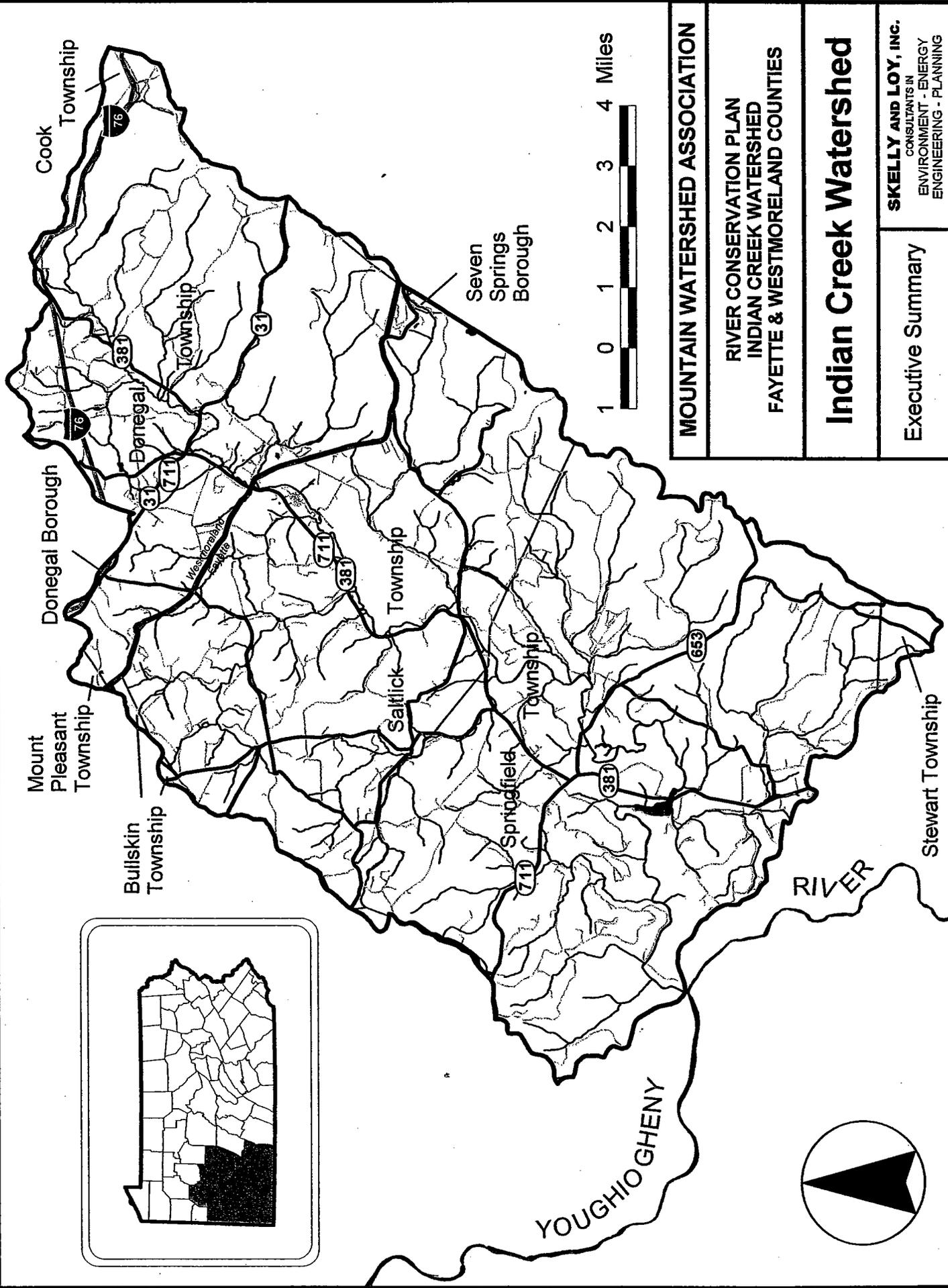
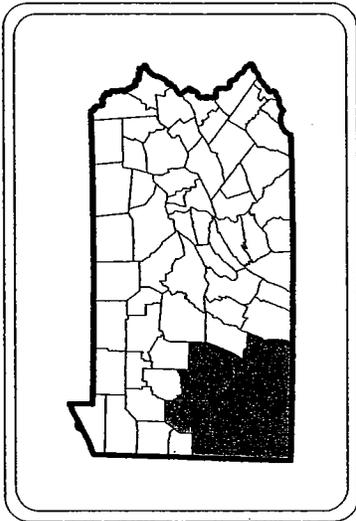
Encouraging Compatible, Responsible, and Sustainable Development

Although successful economic development is critical to the well being to any community, there is often a trade-off between this growth and retaining natural regional landscapes. It is important for municipalities to work together and plan for development in a way that is economically feasible and protects the natural heritage of the region. Officials in the watershed should form an *Inter-Municipal Framework* to plan for responsible development and improve conditions at a regional level.

Developing strong conservation zoning ordinances and encouraging proper administration of existing zoning ordinances are keys to providing environmentally sound development practices. This zoning could occur at a regional level as developed through an *Inter-Municipal Framework*.



Issues associated with deficient septic systems, soil conservation, and farmland protection can be addressed with proper environmentally conscious ordinances. Additionally, planners should promote cluster development, open space communities, and maintain streamside buffers. Other guidelines for development are available in the *Growing Greener* guidance document (Natural Lands Trust, 1997) and the Pennsylvania Land Conservation Handbook (Allegheny Land Trust, 1999).



MOUNTAIN WATERSHED ASSOCIATION	
RIVER CONSERVATION PLAN INDIAN CREEK WATERSHED FAYETTE & WESTMORELAND COUNTIES	
Indian Creek Watershed	
Executive Summary	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
A. Project Area Characteristics				
1. Holistic Watershed Planning and Inter-Municipal Framework	Mountain Watershed Association (MWA) has been the responsible organization for the whole of the watershed for conservation activities. MWA should continue to promote and implement the River Conservation Plan. Additionally, promote an inter-municipal framework necessary for coordinated or unified comprehensive plans, zoning codes, and subdivision and land development ordinances in the watershed to assist in curbing sprawl.	County and 9 municipal planning officials, watershed stakeholders, and MWA.	Pennsylvania Department of Conservation and Natural Resources (PADCNR) circuit rider for funding Executive Director position and Keystone Funds.	2001-2002
2. Model Zoning Ordinances	Develop example zoning and ordinances that are protective of agricultural soils, steep slopes, land, riparian, and floodplain resources. These are especially important in the Donegal area where development can occur at a higher rate along the Pennsylvania Turnpike and S.R. 31.	County and 9 municipal planning officials, watershed stakeholders, and MWA.	Fayette and Westmoreland Counties Planning Departments, Pennsylvania Department of Community and Economic Development (DCED) and PADCNR: Keystone Funds. Appendix 2.	2001-2002
B. Land Resources				
1. Farmland Protection	Complete a comprehensive plan by inventorying watershed farmland (active/inactive), prime soils, farmland of statewide importance, PA Acts 43 (Agricultural Security Areas), 71 (water and sewer assessment exemption), 100 (Agricultural Land Condemnation Approval Board- reviews transportation & solid waste issues related to farmland), and 319 (Clean & Green) properties as it relates to farmland protection.	USDA-Natural Resources Conservation Services, county conservation districts, local municipalities, and MWA.	PADEP, PADCNR: Keystone Funds, and Conservation Districts.	2001-2002
2. Unregulated Solid Waste Sites	2A. Complete an inventory of unregulated waste sites for potential reclamation and development opportunities (e.g., dump sites and junk yards). 2B. Participation in the "Ohio River Sweep Program." 2C. Enact and enforce local zoning and ordinances to control unregulated sites.	PADEP, local municipal officials and MWA.	PADEP, PADCNR: Keystone Funds, and EPA.	2A. 2002, 2B. 2001+ annually, and 2C. 2001.
3. Abandoned Mine Land (AML) Sites	Utilize the figures and data found in this plan, the <i>Technical Study Document for A Petition to Designate Areas Unsuited for Mining</i> , and the <i>Comprehensive Plan for Abandoned Mine Reclamation</i> , and the <i>PL 83-566 Watershed Plan and Environmental Assessment</i> for potential reclamation opportunities (e.g., mine tailing piles, tipple sites, abandoned un-reclaimed sites, etc.).	PADEP, local municipal officials and MWA.	US Department of Agriculture (USDA) Public Law 83-566 Program, PADEP (Abandoned Mine Land [AML] 10% Set Aside, Growing Greener, and WRAP Programs), PADCNR: Keystone Funds, US Environmental Protection Agency (EPA) 104 and 319 Programs, and Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR) Funds.	2005
C. Water Resources				
1A. Water Quality and 1B. Flow Monitoring	1A. Continue the watershed wide volunteer water quality monitoring program. Sample for chemical and biological (e.g., macroinvertebrate [insects] and fish) parameters. 1B. Re-establish the stream gauging (flow monitoring) locations on Indian Creek and its tributaries to assist in gathering hydraulic data that can be utilized for a variety of planning activities.	1A. MWA and school districts and 1B. PADEP, USACOE, and USGS.	1A. PADCNR: Keystone Funds, Growing Greener, USGS, League of Women Voters (LWV) - Citizen Education Fund, PADEP, Canaan Valley Institute (CVI), Isaac Walton League (IWL) - Save Our Streams program, Senior Citizens Volunteer Monitoring program (EASI), local colleges/universities, & local school districts. 1B. PADEP, USACOE, and USGS.	1A. On-going 1B. 2002
2. Water Quality Strategic Plan (WQSP)	As part of the watershed wide volunteer monitoring program, develop a strategic plan that assists in prioritizing restoration, enhancement, and protection activities to make improvement to the watershed.	MWA and PADEP	EPA (104 & 319 programs), USDA PL 83-566 Program, PADCNR: Keystone Funds, PADEP (Growing Greener), Western Pennsylvania Watershed Protection Program (WPWPP) of the Heinz Endowments, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2002+
3. Abandoned Mine Drainage (AMD) Plan	Utilize the figures and data found in this plan, the <i>Technical Study Document for A Petition to Designate Areas Unsuited for Mining</i> , and the <i>Comprehensive Plan for Abandoned Mine Reclamation</i> , and the <i>PL 83-566 Watershed Plan and Environmental Assessment</i> for potential remediation opportunities.	MWA and PADEP	EPA (104 & 319 programs), PADCNR: Keystone Funds, PADEP (Growing Greener, Reclaim PA, Bond Forfeiture Program, etc.), Pennsylvania Department of Transportation (PENNDOT)/Pennsylvania Turnpike Commission (PTC) stream/wetland mitigation funds, WPCAMR, WPWPP, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2001
4. AMD Remediation Activities	Complete remediation of the ten (10) USDA recommended treatment sites.	MWA, municipalities, and PADEP.	EPA (104 & 319 programs), USDA PL 83-566, PADCNR: Keystone Funds, PADEP (Growing Greener Program, Reclaim PA, Bond Forfeiture Program, etc.), PENNDOT/PTC stream/wetland mitigation funds, WPCAMR, WPWPP, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2001

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
C. Water Resources				
5. Nutrient/Sewage Control Plan	Complete a 5A. Nutrient Control Plan and 5B. Sewage Control Plan of the watershed to understand the future water quality problems that will be encountered as the AMD problems are remediated. These studies will assist with understanding issues involving nutrient enrichment and sewage conditions in the watershed's streams, understanding where problem agricultural operations are in the watershed, and where upgrades to septic systems and water treatment facilities are needed. Ordinances that address Concentrated Animal Feeding Operations (CAFO) should be adopted to regulate and limit the problems associated with such agricultural operations.	Local and County government, PADEP, EPA, MWA, ICVWA, and the Conservation Districts.	County, State (PA Act 537 program), PADCNr: Keystone Funds, and Federal.	2005
6. Stormwater Management Plan	Complete a PA Act 167 Stormwater Management Plan in the watershed.	Municipal and county governments.	EPA, PADEP (PA Act 167 program), and PADCNr: Keystone Funds. Appendix 2.	2002
7. Model Zoning Ordinances	Until a PA Act 167 Plan is completed at the county level, encourage local municipalities to create and/or improve local stormwater management ordinances.	Municipal and county governments.	PADCNr: Keystone Funds and Local government. Appendix 2.	2000-2001
8. Water Supply	8A. Continue with expansion of the Indian Creek Valley Water Authority's (ICVWA) facilities in areas not currently served by the public water supply provider. 8B. ICVWA, other groundwater users, Seven Springs Mountain Resort, and municipal officials meet to discuss surface and groundwater supply issues of the watershed. 8C. Complete a watershed-wide hydrologic assessment to determine cumulative impacts, existing conditions, and potential/existing stressors.	ICVWA and municipal government.	DCED, PennVest, and USDA Rural Development Programs.	8A. On-going 8B. 2002 8C. 2003
9. Stream Flow Gauging	Re-establishment and construction of stream gauging stations in the watershed to assist with local and regional planning activities	PADEP, USGS, USACOE.	PADEP, USGS, and USACOE.	2002
10. Fluvial GeoMorphology (FGM) Assessment	Complete FGM assessments in sub-basins which are currently impacted by high stormwater flows and in sub-basins that are experiencing high development activities. Priority areas in the watershed include 1. Indian Creek Headwater Area[s] and 2. Mill Run Sub-basin.	County governments and PADEP.	EPA (319 program), USGS, PADCNr: Keystone Funds, PADEP (Growing Greener and Releaf Programs), PENNDOT/PTC stream/wetland mitigation funds, WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
11. FGM, Riparian, and Streambank Stabilization Projects	Utilize FGM assessments to complete project designs for remediation of stormwater impacts to streams and infrastructure. Priority areas in the watershed include 1. Indian Creek Headwater Area[s] and 2. Mill Run Sub-basin.	PADEP, county governments, and local municipal governments.	EPA (319 program), PADCNr: Keystone Funds, PADEP (Growing Greener, Dirt and Gravel Road, and Releaf Programs), PENNDOT/PTC stream/wetland mitigation funds, WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2001-2002
12. Groundwater Protection Plan	Complete a Groundwater Protection Plan that includes a 12A. Groundwater Inventory and a 12B. Groundwater Use and Needs Survey . This plan would include i. Private Water, ii. Public Water, and iii. Commercial Water Supplies – Immediate and Future Uses.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA, PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
13. Source Water Assessment Protection Plan	Complete a Source Water Assessment Protection Plan that would review all potential sources of contamination to surface waters and provide recommendations for the protection of surface waters from contaminant sources.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA (319 program), PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
14. Wellhead Protection Plan	Complete a Wellhead Protection Plan that would identify wellhead protection areas for groundwater supplies. The plan would review all potential sources of contamination to the wellhead protection areas and provide recommendations for the protection of the wellhead protection areas from contaminant sources.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA, PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
15. Headwater Protection Plan	Complete a Headwater Protection Plan that would identify headwater stream resources and the quality of these resources. Headwaters that are in good condition would have recommendations for their conservation and protection, and impaired sources would have recommendations for resource improvement.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA (319 program), PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
D. Biological Resources				
1. Aquatic and Fishery Management	Complete an Aquatic Survey and Fisheries Evaluation of the watershed.	MWA, Pennsylvania Fish and Boat Commission (PFBC), PADEP, US Geological Survey (USGS), US Army Corps of Engineers (Corps), and regional colleges/universities.	EPA Star Grant, PADCNr: Keystone Funds, and Fish American Foundation.	2005-2010
2. Protection of Important Habitats [Riparian Forest Buffers and Wetlands, Forest, and Natural Heritage Areas]	Establish Natural and Protected Areas in watershed as delineated in the Natural Heritage Inventories. Have additional areas formally designated as Natural Areas.	County and municipal officials with assistance from MWA, land trusts, and the Western Pennsylvania Conservancy (WPC).	Property placed into conservation easements, areas designated by owner, and PADCNr: Keystone Funds.	2002
3. River Otter and Fisher Reintroduction/Population Expansion Survey	Completion of this type of survey or study would assist in documenting the efforts of the reintroduction programs in Pennsylvania and neighboring states. Additionally, this work would help to biologically document the improvement of Indian Creek's water quality.	Dr. Tom Serfass (Frostburg State University (MD) and other regional colleges/universities, PADEP, PFBC, PGC, and US Fish and Wildlife Service (USFWS).	Pennsylvania's Wildlife Conservation Fund, EPA Star Grant, PADCNr: Keystone Funds, and Fish American Foundation.	2002
4. Natural Area Designation	Establish Natural and Protected Areas in watershed as delineated in the Natural Heritage Inventories. Have additional areas formally designated as Natural Areas.	County and municipal officials with assistance from MWA, land trusts, and the Western Pennsylvania Conservancy (WPC).	National Park Service (NPS) - Rivers, Trails, and Conservation Assistance program, EPA Environmental Education Grants Program, PADCNr: Keystone Funds, and county and municipal government.	2002
E. Cultural Resources				
1. Holistic Watershed Recreational Plan	Utilize the various recreational plans that have been completed or are being completed to enhance the varied recreational opportunities (e.g., linking parks via bikeways or trails).	MWA, WPC, and local communities.	PADCNr: Keystone Funds and NPS - Rivers, Trails, and Conservation Assistance program.	2002
2. Bikeway/Trail Feasibility Study/Plan	Further develop the ICVHBT and other trails along Indian Creek.	MWA, WPC, and local communities.	PADCNr: Keystone Funds and NPS - Rivers, Trails, and Conservation Assistance program.	On-going
3. Trail Construction Activities	Construct trails and link resources based on Feasibility Study/Plan.	MWA, WPC, and local communities.	PADCNr: Keystone Funds, PADEP: Growing Greener, PENNDOT TEA-21 funds, and NPS - Rivers, Trails, and Conservation Assistance program.	On-going
4. Land Acquisition for Conservation Activities	Purchasing of properties (e.g., Important Habitats, Natural Heritage Areas, Critical Areas, and Potential Remediation Sites) for conservation, preservation and/or remediation opportunities. Cooperate with Municipal Authority of Westmoreland County to obtain rail/trail lease and promote the trail as public access to recreation in Lower Indian Creek Gorge and the Youghiogheny River.	Allegheny Land Trust, MWA, and WPC.	PADCNr: Keystone Funds and NPS - Rivers, Trails, and Conservation Assistance program.	No Final Implementation Date. This can be an on going activity.
5. EcoTourism	EcoTourism will increase as cultural, recreational, and educational opportunities expand. Opportunities will be tied to Indian Creek, the rail-to-trail network, and environmental educational facilities. Development of a "passive" activity map/brochure would assist in improving ecotourism. The establishment of a Watershed Triathlon would assist generating revenue and expand public awareness of issues.	MWA, community athletic associations, local chamber of commerce, Three Rivers Paddlers Club, local sports clubs, municipal officials, and small business/facility operators.	Penn's Woods West Charitable Trust (PWWCT), Community and Regional Foundations, NPS - Rivers, Trails, and Conservation Assistance program, local chamber of commerce, municipalities, small business, and PADCNr: Keystone Funds.	2001
6. Historical Property Preservation	Preserve historical properties so they are destination points for tourists. Properties for potential preservation include the Mathews Feed and Grist Mill and Jones Family House.	Historic property owner(s), community historical societies, and local chamber of commerce.	PADCNr: Keystone Funds, PENNDOT/PTC cultural resource mitigation funds, and community and regional foundations.	On-going

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
F. Educational Resources				
1. Adult and Youth Education	Integrate watershed wide volunteer water quality monitoring program with other local/regional activities. Develop watershed wide integrated local school district and adult education programs through outdoor environmental classrooms and activities.	MWA, local school districts (Envirothon Program), and local/regional colleges and universities.	PADCNR: Keystone Funds, PADEP's Citizens' Volunteer Monitoring Program, CVI, Alliance for Aquatic Resource Monitoring, LWV - Citizen Education Fund, SWRC, and EPA Environmental Education Grant program.	2001+
2. Educational Facilities	Develop a new facility that would house and integrate watershed wide local school district curriculum with local conservation demonstration projects.	MWA, local school districts (Envirothon Program), and local/regional colleges and universities.	EPA Environmental Education Grant program, PADCNR: Keystone Funds, Pennsylvania Department of Education (PADE), Environmental Education Program, LWV - Citizen Education Fund, and school district funded.	2001
3. Public Relations	Provide year round continuing education to watershed stakeholders through the use of various forms of the media. This can be through the use of local and regional papers, magazines, and regular, cable, and satellite television providers.	Local school districts, communities, and MWA.	GreenWorksChannel.org and Pennsylvania Center for Environmental Education.	2001+
4. Community Empowerment	Provide information to all watershed community members concerning use and protection of resources, and quality of life issues raised by resource use, including addressing direct discharge problems, conservation use, and impacts. Enable the community to make informed choices about resource use.	Local school districts, communities, MWA, and Conservation Districts.	EPA Environmental Education Grant program, PADCNR: Keystone Funds, Pennsylvania Department of Education (PADE), Environmental Education Program, LWV - Citizen Education Fund, Pennsylvania Center for Environmental Education, and school district funded.	2001+

Preface

Purpose

This plan is a reference guide and an integrative tool for decision makers (i.e., municipal officials and staff, conservation organizations, businesses, planners, governmental agencies, etc.) in the Indian Creek Watershed. It incorporates critical watershed conservation information and potential implementation strategies into a single source document. This reference serves as a unifying document to bring multiple stakeholders together for a number of opportunities that are outlined within the document.

The purpose of this Preface is to identify the purpose of this River Conservation Plan (RCP) document and to instruct the reader on how to utilize the document. The RCP is comprised of a variety of information concerning the project area characteristics, natural, physical, and cultural resources of the Indian Creek Watershed. Additionally socio-economic information is provided to show relationships that currently exist between the various resources. Some of this information is general, while other information is more technical in its presentation. The plan also contains numerous figures and appendices to help the reader understand the planning process that led to the production of this document; potential planning and project activities; to present model codes and ordinances to communities that will assist in protecting resources and aid in improving developmental activities; to identify potential project technical and funding sources for individuals, organizations, and municipalities; and to provide a visual guide to resources within the project area.

River Conservation Plan Format - How To Use This Plan

The Indian Creek RCP follows the format recommended by the Pennsylvania Department of Conservation and Natural Resources. The objective of the planning process is to complete a plan that is accepted on the Pennsylvania Rivers Conservation Registry. Once the plan is placed on the Registry, the various implementation activities that are outlined in the plan are eligible for Keystone Funds. This makes the plan a conduit for funding of numerous implementation activities (planning or construction activities). *Once the plan is on the Registry, all the communities that lie within the Indian Creek Watershed are eligible for the granting dollars made available through the Keystone Grant Program. Additionally, by having a completed RCP that is on the Registry, other grant programs are more receptive to funding implementation actions. Therefore, municipal officials and staff, government agencies, politicians, non-profit organizations, and/or a partnership of these entities can work together to make improvements to the items discussed in the plan.*

The Indian Creek RCP is structured according to the following format:

- I. Introduction
- II. Project Area Characteristics
- III. Land Resources
- IV. Water Resources
- V. Biological Resources
- VI. Cultural Resources
- VII. Issues, Concerns, Constraints, and Opportunities
- VIII. Management Options

Management Recommendation Matrix

Potential Assistance Sources for Watershed Projects

Figures
References
Glossary
Appendices

Section I Introduction: The reader is introduced to the project's history, the planning process, and the project's purpose. Additionally, it is here that the reader learns of the project steering committee's overall goals for the plan.

Section II Project Area Characteristics: The reader learns about the general project area characteristics. This section sets the stage for Sections III through VI which include more detail on the differing resources.

Sections III through VI: These sections provide an inventory of the resources reviewed in the River Conservation Planning process. Section III Land Resources, inventories and describes issues such as geology and soils, property ownership, critical areas, landfills, and hazard areas (i.e., waste sites and abandoned mines); Section IV Water Resources, inventories and describes issues such as stream characteristics, major tributaries, wetlands, floodplains, lakes and ponds, water quality (i.e., point and non-point source[s]), and water supply; Section V Biological Resources, inventories and describes issues such as wildlife (terrestrial and aquatic), vegetation, Pennsylvania Natural Diversity Index Species listings, important habitats, and Natural Heritage Areas; and Section VI Cultural Resources, inventories and describes issues such as recreation (i.e., parks, rail-to-trails, and greenways) and archaeological/historical sites.

Section VII Issues, Concerns, Constraints, and Opportunities: In this section, the main issues, concerns, constraints, and opportunities for the resources that were inventoried in Sections III through VI are clearly and concisely identified for **each resource category**. This provides the reader with the foundation for management options that are discussed in Section VIII. Topics discussed in Section VII include items that may be considered as both areas of concern (i.e., sewage and abandoned mine drainage), and areas of community enlightenment (i.e., adult and youth education, land conservation, and rail-to-trails). The purpose is to transition the watershed study from the resource inventory stage to the future implementation phase.

Section VIII Management Options: Here each item is given a recommended implementation strategy in an attempt to solve, correct, and/or improve the item discussed. In addition, a schedule is provided for implementation of each specific item. Section VIII contains the Management Recommendations Matrix which is a simple tool that can be used for planning and implementing the RCP. **Section VIII is where most users of the RCP will go initially to look for action items.**

Management Recommendations Matrix is a simple tool that can be used for planning and implementing the RCP.

Potential Assistance Sources for Watershed Projects: Includes a comprehensive list of technical and funding programs available within Pennsylvania and from the National level. **After the Management Recommendations Matrix, this section may be the next most valuable resource and utilized portion of the plan.**

Throughout these sections, references are provided to help the reader navigate between the text of the main plan, the appendices, and figures.

Figures and Appendices - What Can Be Found Here

The Figures and Appendices follow the body of the text.

Figures

The Figures (see index for listing) illustrate the characteristics and the resources of the region.

Appendices

Appendix 1, Public Participation: Includes public responses and input to the survey, stakeholder visioning activities, and public meetings.

Appendix 2, Code and Ordinance Worksheet (Center for Watershed Protection, 1998) and Model Ordinances, Overlay Districts, and Guidelines/ Standards: This worksheet may be copied and used by community planners at the local level to gauge development priorities in your community. It is useful for comparing your local development rules to model development principles. Thus it is an excellent tool for assessing the current state of local codes and ordinances. Additionally, a number of examples of municipal planning guidelines that can promote better land use, land development, and improve water quality in receiving streams can be found here.

Appendix 3, PADEP: Environmental Good Samaritan Project Proposal: This tool can be used by landowners and conservation groups in assisting efforts to remediate land and streams impacted by abandoned mine conditions.

Appendix 4, "Paying for Growth, Prospering from Development" (Kinsley and Lovins, 1998): This article serves as an educational tool for community planning. It deals with issues concerning sustainable development such as: 1) development and growth, 2) community encouragement of growth, 3) how communities get trapped by growth, and 4) the reasons why more development isn't always better.

Appendix 5, PADEP Fact Sheets: Fact sheets from the PADEP have been included as supplementary material for assisting with sewage permitting, stormwater management and concentrated animal feeding operations (CAFO's)

Closing Remarks

As the grant recipient for this project, Mountain Watershed Association has been provided with the following deliverable products:

The Indian Creek RCP;
The Executive Summary of the RCP;
CD ROM disks containing the digital Geographic Information System (GIS) files that were prepared for the RCP (These files contain the digital copies of the Figures found in the RCP); and
Hard copy large (wall size) maps of the figures found in the plan.

The various types of information and data that were collected and utilized to assemble the plan can be found in the technical file that has been maintained by Skelly and Loy, Inc., 240 Scott Road, Suite 1, Morgantown, WV 26508 / (304) 296-6500. Additional copies of the River Conservation Plan can be purchased by contacting Skelly and Loy.

This Preface is intended to act as a guide for the efficient access and application of this plan by local municipal officials and organizations.

List of Acronyms

ALD	Anoxic Limestone Drains
AMD	Abandoned Mine Drainage
AML	Abandoned Mine Land
BDA	Biological Diversity Area
BMP	Best Management Practice
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CVI	Canaan Valley Institute
DA	Dedicated Area
DOT	Department of Transportation
EASI	Citizens Volunteer Monitoring Program
EP	Extraction Procedure
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FGM	Fluvial GeoMorphology
FHWA	Federal Highway Administration
GIS	Geographic Information System
ICVBT	Indian Creek Valley Bike Trail
IWL	Isaac Walton League
LDW	Limestone Diversion Well
LID	Low Impact Development
LWW	League of Women Voters
ML	Managed Land
MCL	Maximum Concentration Limit
MPC	Pennsylvania Municipalities Planning Code
MWA	Mountain Watershed Association, Inc.
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NHI	Natural Heritage Inventory
NPL	National Priority List
NPS	Non-Point Source
NRCS	Natural Resources Conservation Service
OHA	Other Heritage Area
OLC	Open Limestone Channel
PADCED	Pennsylvania Department of Community and Economic Development
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADE	Pennsylvania Department of Education
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PCB	Polychlorinated biphenyls
PENNDOT	Pennsylvania Department of Transportation
PFBC	Pennsylvania Fish & Boat Commission
PGC	Pennsylvania Game Commission
PHMC	Pennsylvania Historic and Museum Commission
PNDI	Pennsylvania Natural Diversity Inventory
POWR	Pennsylvania Organization of Watersheds and Rivers
PRD	Planned Residential Development
PTC	Pennsylvania Turnpike Commission
PWWCT	Penn's Woods West Charitable Trust
RCP	Rivers Conservation Plan
RCRA	Resource Conservation Recovery Act
SAPS	Successive Alkalinity Producing System
SGL	State Game Land
SPC	Southwestern Pennsylvania Commission

List of Acronyms (continued)

SPL	State Priority List
SWRC	Stroud Water Research Center
TDR	Transferable Development Rights
TEA	Transportation Equity Act
TIP	Transportation Improvement Plan
TMDL	Total Maximum Daily Load
USACOE	United States Army Corps of Engineers
USDOE	United States Department of Energy
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WPCAMR	Western Pennsylvania Coalition for Abandoned Mine Reclamation
WPWPP	Western Pennsylvania Watershed Protection Program

Acknowledgments

Watershed Planning:

A grassroots movement

The Indian Creek River Conservation Planning (RCP) effort was initiated by the Mountain Watershed Association, Inc. (MWA) to help the community better understand the natural, physical, and cultural resources of the Indian Creek Watershed, and how these resources are impacted by various factors. This information will enable stakeholders to make conscious decisions regarding potential improvements, and the protection of important features within the watershed.

In 1999, the MWA was awarded a River Conservation Planning Grant for the Indian Creek Watershed from the Pennsylvania Department of Conservation and Natural Resources (DCNR). In early 2000, the project stakeholders held public meetings concerning the RCP process. This not only assisted in educating local citizens, municipalities, and organizations about the RCP effort, but also aided in identifying potential steering committee members. The steering committee was formed and assisted in reviewing the draft Request for Proposal prior to its distribution to potential consultants. In May 2000, MWA on the advice of the steering committee hired Skelly and Loy, Inc. as the project's consultant. Skelly and Loy was hired to prepare the RCP, perform the needed public participation activities, and to ensure that the RCP is approved by DCNR and listed on the Pennsylvania Rivers Conservation Registry.

Funding for this project was provided by:

Pennsylvania Department of Conservation and Natural Resources (DCNR) Keystone Recreation, Park, and Conservation Fund

and

- Canaan Valley Institute,
- Catholic Charities: Campaign for Human Development
- Laurel Foundation
- Richard King Mellon Foundation
- United States Department of Agriculture, Natural Resources Conservation Service

The project was directed by the Project Steering Committee which is an informal group of community oriented individuals and organizations that are concerned about the future of the Indian Creek Watershed.

- Donegal Township
- Mountain Watershed Association
- Indian Creek Valley Water Authority
- Saltlick Township
- Western Pennsylvania Coalition for Abandoned Mine Reclamation
- Western Pennsylvania Conservancy

The Mountain Watershed Association was the administering organization for the project.

With Additional Thanks To:

The Honorable Thomas J. Ridge, Governor, Commonwealth of Pennsylvania
Mr. John C. Oliver, Secretary, Department of Conservation and Natural Resources

Jim Mays and Tracy Robinson, Environmental Planners,
Bureau of Recreation and Conservation,
Division of Conservation Partnerships, PADCNR

Project Steering Committee:

Kerry Witt, Chairperson, Indian Creek Valley Water Authority
Tom Stull, Vice Chairperson, Donegal Township Supervisor
Beverly Braverman, Mountain Watershed Association
Robert E. Adams, Jr., Mountain Watershed Association
Rick Gales, Saltlick Township Supervisor
Bill Gdosky, Mountain Watershed Association
Mark Killar, Western PA Coalition for Abandoned Mine Reclamation
Dean White, Saltlick Township Supervisor
Trudi Harkum, Donegal Township Secretary
Pam Shea, Mountain Watershed Association
Lisa Smith, Western Pennsylvania Conservancy

Project Manager for MWA:

Beverly Braverman

Officials and Municipal Staff:

- Bullskin Township
- Cook Township
- Donegal Borough,
- Donegal Township
- Mount Pleasant Township
- Saltlick Township
- Seven Springs Borough
- Springfield Township
- Stewart Township

and

The numerous volunteers that assisted in developing this plan.
Their participation in the public process facilitated and enabled completion of this
vital step in the restoration of the Indian Creek Watershed.

1 Introduction

1.1 Planning Process

The Steering Committee and the consultant initiated the planning process in May 2000 in order to prepare this Draft RCP. The approach for this plan involved collecting, analyzing, and evaluating data for natural, physical, cultural, and socio-economic resources in the Indian Creek Watershed, and correlating their impacts to land development activities and trends. This approach has been further analyzed at the sub-basin level to assist in ranking implementation recommendations/goals/ strategies. This gives the plan the flexibility to specifically direct improvements.

Natural, physical, cultural, and socio-economic resource data collected includes information in hard copy and digital formats. This information has been collected from citizens groups, water/sanitary authorities, planning commissions, school districts, colleges, historical societies, and local, county, state, and federal governmental agencies. Data collected includes, but is not limited to: water quality sampling, aquatic surveys, soil surveys, biological studies, flood protection projects, geographical information systems data, surface and deep mining surveys/reports, regulations and laws, natural heritage inventories, park master plans, utility mapping/data, and zoning/ordinance information.

After the data were collected, this information was analyzed and evaluated based on its importance in the planning process. The information was then evaluated to determine which specific resource items, activities, and/or processes correlated into issues, concerns, constraints, and opportunities to be addressed by this plan. This evaluation has produced a list of management options that can bring about improvements to the identified issues, concerns, constraints, and opportunities. These findings have been presented to the public and the input received has been placed into the document to reflect this input (Refer to Appendix 1).

1.2 Project Purpose

The purpose of this project and the River Conservation Planning process is to complete a comprehensive review of the watershed in a holistic manner. Through the planning process, pathways for implementing improvements to its resources (natural, physical, and cultural) were delineated. The intent of this planning process is to provide the needed information to develop an effective River Conservation Plan for the Indian Creek Watershed; provide resource improvement recommendations that can be implemented (short-term and long-term); and to have a plan that is placed onto the Pennsylvania Rivers Conservation Registry. Once on the Registry, communities that lie within the Indian Creek Watershed are eligible for granting dollars made available through the Keystone Grant Program. The overall goals of the project in no specific order are to:

- Improve water quality
- Promote land development that is compatible with a sustainable environment
- Enhance the recreational opportunities of the watershed
- Protect the natural resources, historic landscape and scenic beauty within the watershed
- Provide an environmental education program for adults and enhance existing school-based environmental education
- Encourage compatible and sustainable economic development
- Prepare for future growth

2 Project Area Characteristics

The Indian Creek Watershed is designated as a Category I Priority Watershed basin by the Pennsylvania Department of Environmental Protection. The listing in the Pennsylvania Nonpoint Source Degraded Watershed List is reviewed annually and updated to define priority watersheds for remediation (PADEP, October 1998). This designation makes the Indian Creek Watershed eligible for certain funding identified under Section 319 of the Federal Clean Water Act. This act requires each state to identify major nonpoint source problems, and created grant money to implement management activities that address these problems. (PADEP, April 1998).

2.1 Location

The Indian Creek Watershed is located in southwestern Pennsylvania and flows south and west through Westmoreland and Fayette Counties. Indian Creek discharges into the Youghiogheny River at Camp Carmel, five miles upstream from South Connellsville, PA. Indian Creek is not considered navigable by the U.S. Army Corps of Engineers (USACOE) (USACOE, 1995) (Refer to Figure 1).

2.2 Size

The size of the Indian Creek Watershed is 125 square miles (approx. 80,000 acres) and the length of Indian Creek is 30.0 miles (PADER, 1984). There are an estimated total of 276 stream miles in the Indian Creek Watershed.

2.3 Topography

The project area has a mixture of topographic features. The upper and middle portions of the watershed have mountains, hills, wide flat bottom valleys, and moderate to steep slopes. The lower reach of the watershed has mountains, narrowing valleys, and steep slopes (PADER, 1984). The highest land elevation is located at a point near Lake Tahoe at Seven Springs – Mountain Resort, Fayette County, and has an elevation of 2,994 feet. The lowest elevation in the project area is located at the point where Indian Creek discharges into the Youghiogheny River in Springfield Township, Fayette County, and has an elevation of 940 feet. Other topographic features can be seen at the sub-basin level (USGS, 1973 – 1994). The top of the sub-basins located along the western portion of the watershed forms the topographic feature known as Chestnut Ridge, whereas the area located along the eastern portion of the watershed forms the topographic feature known as Laurel Hill.

2.4 Major Tributaries

Major tributaries of Indian Creek in the watershed are (Refer to Figure 3):

- Tates Run,
- Richter Run,
- Rasler Run,
- Stoney Run,
- Poplar Run,
- Newmyer Run,
- Wash Run,
- Little Champion Creek,
- Champion Creek,
- Pike Run,
- Roaring Run,
- Back Creek,
- Trout Run,
- Neals Run,
- Laurel Run
- Middle Fork,
- Buck Run,
- Clay Run,

- Minnow Run,
- Little Run,
- Camp Run,
- Mill Run, and
- Fulton Run.

2.5 Project Area Characteristics

2.5.1 Land Use / Land Cover

Land Use / Land Cover in the watershed is predominately forested land. The Laurel Hill area is dominated almost exclusively by forested land, but a few areas of agricultural activity can be found. The Indian Creek valley and Chestnut Ridge areas are primarily agricultural and forested with a few villages (residential/non-residential uses) present. There is a number of forested state owned properties in the watershed. These include Forbes State Forest, Laurel Ridge State Park, Roaring Run Natural Area, and State Game Lands No.'s 51 and 111. There are two smaller community athletic facilities and four school facilities in the watershed. These allow for a variety of recreational (from passive to active) opportunities. Open space is not considered a part of this category since open space is a component of a variety of land use types (Refer to Figure 4). Table 2-A and Figure 4 show the major land use types in the watershed (SPC, 2000):

Table 2-A
Major Land Use Types

Land Use Type	Acreage (est.)	Percent
Agricultural	17,500	22%
Forested	61,023	77%
Water	85	0.107%
NON-RESIDENTIAL	49	0.061%
RESIDENTIAL	199	0.25%
STRIP MINES	206	0.26%
Transportation (PA Turnpike)	208	0.26%
WETLANDS-FORESTED	239	0.3%
WETLANDS-NON FOREST	3	0.003%
Total	79,512	100%

Residential (i.e., homes, townhouses, trailers, etc.) and non-residential (i.e., small non-commercial business, shops, etc.) land uses are concentrated in eight areas in the watershed. The residential and non-residential land uses are located at the villages of Clinton, Indian Head, Jones Mill, Melcroft, Mill Run, Normalville, Champion and White, and the Borough of Donegal. The village communities consist of a mixture of single-family housing units and small businesses (i.e., gas stations, general stores, restaurants, etc.). No heavily concentrated industrial or commercial land uses are found in the watershed. Therefore, no areas are designated on Figure 4. However, isolated industrial or commercial businesses may be found and would be classified as non-residential or mixed development.

For transportation land uses please refer to II. Project Area Characteristics, F. Socioeconomic Profile, 2.6.8 Transportation Facilities.

The watershed's major transportation corridor is the Pennsylvania Turnpike (Interstate 70 and 76). This transportation corridor serves to transport people and goods in an east-west direction. However, due to the limited accessibility of the Pennsylvania

Turnpike and the limited industrial and commercial activity in the watershed, the area does not serve as a major end destination for most travelers. Most activity is in the form of tourists passing through the watershed on their way to end destinations outside the watershed (i.e., Fallingwater, Ohio State Park, Seven Springs Mountain Resort, Hidden Valley Four Seasons Resort, and Laurel Mountain Ski Area). This reduced or limited activity has a positive environmental consequence. Less people stopping or traveling through an area translates into reduced construction and maintenance activities along roadway networks and less earth disturbance activities due to business and residential development activities. Compared to other watersheds of the region that have been greatly urbanized and thus have a modified landscape, Indian Creek is only slightly modified due to human activities (i.e., strip mining, deep mining, forestry, agriculture). In areas modified by mining, Indian Creek's surface and groundwater resources have been negatively impacted (i.e., water quality degradation, lost springs, habitat impacts, channelization of stream areas, etc.) (Refer to Figure 5). As the watershed is evolving, a few areas in the watershed are serving as end destinations for tourists. These end destinations include camping, hunting, and fishing destinations (i.e., state parks, local campgrounds, hunting lodges, etc.) (Refer to Figures 8 and 9).

Land use identified as strip mines involve both reclaimed and un-reclaimed properties. These sites are located throughout the watershed, but are more concentrated between Indian Creek and Chestnut Ridge to the west (Refer to Figure 6).

The watershed has visible land use activities, however, land use trends are less apparent when compared to more modified watersheds in the region. Most human activities are concentrated along the Indian Creek valley and Chestnut Ridge areas in the watershed. However, the concentration of these land uses are not the same density as one would find in more urban and/or suburban settings.

Presently, sprawl development in the watershed is not a substantial activity, which is generally associated with transportation corridor pressures or pressures from more urban areas from outside the watershed (Refer to Figures 2 and 4). However, population projections in some municipalities within the watershed predict extensive population growth (Refer to Table 2-D, Column 3). Therefore, it is better to be prepared for potential changes to land use activities in a community than to be reactionary to it. The adoption of proper zoning ordinances may be necessary, especially in the northern, Westmoreland County portion of the watershed. By having proper zoning in a community, developers can be held to standards that will protect a community from poor development (both environmentally and economically). The Pennsylvania House and Senate have recently passed House Bill 14 and Senate Bill 300. These bills (Municipal Planning Code[s]) assist communities in working together in regards to planning activities (Inter-Municipal Framework). This can assist in improving the environment, reducing infrastructure expenditures, and facilitate activities (i.e., reducing the development impact of road widths). Without safeguards in place (sound zoning, planning, inter-community communication) to protect the area's resources, degradation of land and then the subsequent degradation of water quality will result.

2.5.2 Climate

The Indian Creek Watershed has a humid, temperate, and continental climate and is similar in Fayette and Westmoreland Counties. The average winter temperature is between 25° and 34° F. The average summer temperature is between 67° to 75° F (Soil Surveys, 1991 and 1992). Mean annual precipitation is between 46 and 48 inches (PADER, 1984).

2.5.3 Land Use Controls

Land use planning is guided on the local and regional level through adopted and enforced zoning codes and ordinances. The Pennsylvania Municipalities Planning Code (MPC) of 1968, (P.L. 805, No. 247 as enacted and amended) provides the authority for municipalities to manage land use through the enactment of zoning ordinances (Refer to Appendix 2).

Zoning Ordinances

Zoning Ordinances manage development by determining the type of uses (i.e., residential, industrial, commercial, etc.) that will be allowed in any given area within a municipality. This includes the specialized requirements of the development (i.e., number of buildings/density, height of structures, setback distances from property lines, amount of development/intensity of use, and open space provisions). As noted in *A Watershed Primer for Pennsylvania*, "...zoning power represents the real power of municipalities over land use" (Novak and Woodwell, 1999). The MPC denotes other key components that are important to community planning and land use development. These key provisions are discussed below.

Zoning is a framework for the potentially orderly development of a community. A positive pattern of development will be self-evident when values and limitations are applied to natural areas. As noted by Ian McHarg in *Design With Nature* (1969), "nature performs work for man – in many cases this is best done in a natural condition – further that certain areas are intrinsically suitable for certain uses while others are less so."

Applied in the Indian Creek Watershed setting, the hierarchy of all features that have been mapped and identified can be compared for their priority use as having natural process values (i.e., streams, wetlands and floodplains) versus areas with rural developed land use suitability (i.e., flat land or previously developed sites). Some obvious conflicts pointed out by McHarg include the fact that flat land which is often selected for urban type development should be reviewed to assure that the consideration of prime agricultural land (flat land) be identified as intolerant to development (McHarg, 1969). Generally, all other flat land would have a lesser natural value and be more suitable for development (urbanization).

Who has Zoning?

The application of zoning is intended to guide land use development for the best interests of the community. Data compiled by the Southwestern Pennsylvania Commission (SPC) generally identifies the zoning classifications of each of the nine communities of the watershed (SPC, 2000): The municipalities in the watershed have various levels of zoning enforcement and implementation (Refer to Table 2-B).

The level of detail, specifically relating to environmental sensitivity, varies greatly among the established municipal zoning ordinances. Additionally, beyond the actual zoning ordinances, the level of enforcement can vary greatly. **Therefore, developing both strong conservation zoning ordinances and encouraging proper enforcement are the key to providing environmentally sound development practices.** While determining what is being accomplished through zoning by the municipalities is important, it can be a difficult process. It is even more critical to assist in developing a process for future growth and vision. This is the key to sensible development.

**Table 2-B
Zoning Data**

County	Municipality	Date of Most Recent Zoning Action
Fayette	Bullskin Township	April 13, 2000
	Saltlick Township	April 13, 2000
	Seven Springs Borough	No Zoning
	Springfield Township	April 13, 2000
	Stewart Township	May 1995
Westmoreland	Cook Township	No Zoning
	Donegal Borough	No Zoning
	Donegal Township	No Zoning
	Mt. Pleasant Township	No Zoning

Fayette County Office of Community and Economic Development and Westmoreland County Office of Planning and Development (2001).

Comprehensive Plan

While a Comprehensive Plan is not required to enforce or implement zoning ordinances it will complement future land use planning objectives. It is very important to establish a sound and rational basis for zoning regulations because a comprehensive plan must include, by law, the community development objectives statement. This statement sets the stage for sound and reasonable zoning and can address the goals to protect and enhance the community resources.

Official Map

An official map is not required to enforce or implement zoning ordinances, but the official map is a very important tool for notifying landowners of existing and proposed streets, public lands (i.e., parks, trails etc.), streams/waterways, and other public rights-of-way.

Subdivisions and Land Development

Subdivision and land development ordinances apply whenever a tract of land is planned to be divided into smaller tracts or developed for non-residential uses. Subdivision and land development governs activities at property level and sets standards for property plats, street design, water and sewer, and open space dedications. According to *A Watershed Primer for Pennsylvania*, nearly half of the municipalities of the Commonwealth only rely on subdivision ordinances and have not enacted zoning (Novak and Woodwell, 1999). This situation appears to apply to some the communities in the Indian Creek Watershed (Refer to Table 2-B). Communities may rely upon the ordinances too heavily in order to achieve land use objectives, but without the designation of where specific land uses are to be located. The Indian Creek Watershed includes all or portions of nine communities with various levels of zoning ordinances for growth management. Zoning within these communities shapes the quality of life for residents and watershed stakeholders alike.

2.6 Socioeconomic Profile

2.6.1 Political Districts

Political Districts in the watershed include the following:

US Congress

12th Federal Legislative District (John P. Murtha [D])

20th Federal Legislative District (Frank R. Mascara [D])

PA Senate

32nd PA Senatorial District (Richard A. Kasunic [D])

- Minority Leader, Senate Game and Fisheries Committee

39th PA Senatorial District (Allen G. Kukovich [D])

PA House

51st PA Legislative District (Lawrence Roberts [D])

59th PA Legislative District (Jess Stairs [R])

2.6.2 Methodology

Census Tract Data

The US Bureau of the Census has established census tracts for purposes of organizing information on population and housing censuses. Census tracts are defined based on a combination of political, geographic, and population count factors. They typically include many blocks and several block groups. Tract designations change somewhat over time. For the 1997 Census, there were seven census tracts in or intersecting the Indian Creek Watershed. Of these seven tracts, two tracts (#2605 and #808698) consume 99% of the land area. *Therefore, the analysis of the census tract data for this socio-economic profile will be conducted using only these two tracts (Refer to Figure 10).*

Note: For the 2000 Census, these two tracts were re-numbered as #260500 and #808600. (Refer to Figure 10). The boundaries of these two tracts did not change between the decennial censuses. However, the population counts did change slightly, please refer to Table 2-E.

Municipal Census Data

The municipal divisions included in the watershed are shown in Figure 2 and Table 2-C. The Indian Creek Watershed stretches across Westmoreland County to the north and Fayette County to the south. There are nine municipalities that are associated with the watershed. Of these nine municipalities, three municipalities dominate the municipal land area within the watershed. These municipalities are:

Donegal Township (27%),
Saltlick Township (30%) and
Springfield Township (41%).

These three municipalities consist of 98% of the municipal land area in the watershed (est. 77,900 of the approx. 79,500 acres). The following 6 municipalities combined consist of only 2% of the municipal land area within the watershed (est. 1,360 of the approx. 79,500 acres):

- Bullskin Township
 - Cook Township
 - Donegal Borough
 - Mt. Pleasant Township
 - Seven Springs Borough
 - Stewart Township
- (Refer to Table 3).

Noting the geographic dominance of Donegal, Saltlick and Springfield Townships within the watershed, the analysis of the Municipal census data for this socio-economic profile will be conducted using only these three municipalities (Refer to Table 2-C and Figure 10).

Table 2-C
Watershed and Municipality Area Comparisons

Column	1	2
Municipality	% of munic. in Watershed	% of watershed in Munic.
Fayette County	-	72%
Bullskin Township	0.4%	<1%
Saltlick Township	98.5%	30%
Seven Springs Borough		<1%
Springfield Township	84.8%	41%
Stewart Township	5.4%	<1%
Westmoreland County	-	28%
Cook Township	9.0%	<1%
Donegal Borough	12.6%	<1%
Donegal Township	84.0%	27%
Mt. Pleasant Township	4.1%	<1%
Total		100%

2.6.3 Population

Census Tract Data

The total population of the 1990 census tracts #808698 and #2605 were calculated to be 4,664 and 6,221, respectively, for a combined total of 10,885 (1997). The total land area in sq. miles is 97 and 97, respectively, for a total of 194. The population densities of these tracts are 48 and 64 persons per sq. mile, respectively, creating a combined population density of 56 persons per sq. mile.

Population estimates of the census tracts within the watershed are estimated by the percentage of land area of the tract within the watershed and assuming an evenly distributed population. It is believed that the 1990 census tract #808698 had 2,985 persons and tract #2605 had 5,723 persons for a total population of 8,708 (Refer to Figure 10).

The total population of the 2000 census tracts #808600 and #260500 were calculated to be 5,010 and 6,827, respectively, for a combined total of 11,837 (2000). The total land area in sq. miles is 97 and 97, respectively, for a total of 194. The population

densities of these tracts are 52 and 70 persons per sq. mile, respectively, creating a combined population density of 61 persons per sq. mile.

Population estimates of the census tracts within the watershed are estimated by the percentage of land area of the tract within the watershed and assuming an evenly distributed population. It is believed that the 2000 census tract #808600 has 3,206 persons and tract #260500 has 6,280 persons for a total population of 9,486, (Refer to Figure 10).

Analysis of the decennial census data sets reveal an actual 7.4% population increase from 1990 to 2000 for the census tract in the Westmoreland County portion of the watershed (tract #808698 / 808600). The same data sets also reveal an actual 9.7% population increase from 1990 to 2000 for the census tract in the Fayette County portion of the watershed (tract #2605 / 260500).

Municipal Census Data

The estimated 1997 and forecasted 2025 populations of municipalities in the Indian Creek Watershed are shown in Table 2-D. These estimates and forecasts were provided by the Southwestern Pennsylvania Commission as a part of their long-range forecast for the Pittsburgh metropolitan region. While an estimated 30,351 persons lived in municipalities associated with the watershed in 1997, a forecasted 34,780 persons are expected to reside within the associated municipalities by the year 2025. This represents an expected population increase of 14.59% within the municipal population associated with the watershed over the next 27 years (SPC, 2000).

The boundaries of the municipalities shown in Table 2-C are either partially or entirely within the watershed. Column 1 of Table 2-C lists the percentage of land area of each municipality that lies within the watershed. For example, 9.0% of Cook Township lies within the watershed. Column 2 of Table 2-C lists the percentage of the watershed that exists in each municipality. Again, using Cook Township as an example, less than 1% of Cook Township is part of the total watershed land area.

Population densities in each municipality are shown in Column 6, Table 2-D. They are calculated using the estimated 1997 populations in each municipality and total land area in each municipality. Overall, the 1997 population density of municipalities associated with the watershed was estimated at 90 persons per square mile.

The estimated municipal population within the watershed is 7,600. This is based on an assumed evenly distributed population divided by the percent of municipality (in sq. miles) that is within the boundary of the watershed. Population density of the watershed remains at 90 persons per sq. mile (SPC, 1997).

However, as explained above, a more fair assessment of the watershed's municipal population can be derived from examining the three municipalities that are 98% of the watershed's total acreage (Donegal Twp., Saltlick Twp. and Springfield Twp.). These three municipalities combined have an estimated total population of 8,700 persons with a combined population density of 63 persons per sq. mile. Again, assuming an evenly distributed population divided by the percent of municipality (in sq. miles) that is within the boundary of the watershed, the estimated population of the three municipalities within the watershed is 7,450 and the estimated population density of the watershed remains at 63 persons per sq. mile (SPC, 1997).

The median age of these three municipalities is 34 years. The percentage of the population of the total 3-municipality area that is under the age of 18 is 27% (2,373). The percentage of the population of the same area that is over age 65 is 14% (1,191).

The race of the population is overwhelmingly white with only 37 of the estimated 8,700 persons designated otherwise (Census of Population and Housing, 1990).

Table 2-D
Estimated and Forecasted Municipal Population and Population
Densities in the Indian Creek Watershed

Column	1	2	3	4	5	6
Municipality	Estimated 1997 Population	Forecasted 2025 Population	Percentage Change 1997-2025	Estimated 1997 Pop. in Watershed	Estimated 2025 Pop. in Watershed	Persons per square Mile in WS 1997
Fayette County				5,740	6,014	78
Bullskin Township	7,185	7,911	10.10%	27	30	165
Saltlick Township	3,241	3,410	5.21%	3,191	3,358	86
Seven Springs Borough	0	0	0	0	0	0
Springfield Township	2,958	3,076	3.99%	2,508	2,608	49
Stewart Township	756	997	31.88%	13	18	15
Westmoreland County				1,859	2,896	106
Cook Township	1,941	1,841	-5.15%	28	27	42
Donegal Borough	206	212	2.91%	25	26	206
Donegal Township	2,593	4,111	58.54%	1,761	2,792	52
Mt. Pleasant Township	11,471	13,222	15.26%	43	50	205
Total	30,351	34,780	14.6%	7,600	8,911	90

Table 2-E
Actual Census Counts 1990 and 2000 in the Indian Creek Watershed

Column	1	2	3	4	5	6
Census Tract	Total Area (Sq. mi.)	Total Population of tract	Area In WS (Sq. mi.)	Estimated Pop. in WS	Total Pop. Change 1990-2000	Population Densities (per sq. mi.)
Fayette County Tract					9.7%	
2605 (1990)	97	6,221	88	5,723		64
260500 (2000)	97	6,827	88	6,280		70
Westmoreland County Tract					7.4%	
808698 (1990)	97	4,664	34	2,985		48
808600 (2000)	97	5,010	34	3,206		52

Note: Between 1990 and 2000, the geographic area of these tracts remained the same, only the tract numbers changed.

2.6.4 Housing

There are 3,582 housing units in the 3-municipality area. Of these housing units, 70% (2,517) are detached single-unit structures and 27% (978) are mobile homes and/or trailers. Housing is 70% (2,502) owner-occupied with the median value of these homes estimated to be \$47,000. The state median value of owner-occupied housing in the same year was \$69,000 (PASDC, 2001). Therefore, median values of the owner-occupied homes within the watershed are approximately \$22,000 (32%) below the state median. Renter-occupancy is 13% (481) of the units in the watershed, which have a median rental value of \$175.00 per month.

Vacant homes represent 17% (602) of the housing stock within the watershed. However, it is noted that 55% of the listed vacant homes are actually recreational, seasonal or occasional use homes (Census of Population and Housing, 1990).

2.6.5 Educational Attainment

The educational attainment of the residents age 25 and over in the 3-municipality area is as follows:

Less than a High School Diploma	38%
High School graduate	62%
College graduate (US Census, 1990)	10% of H.S. grads

2.6.6 Income

Per capita income by municipality in the watershed averaged \$8,989 per year (Census of Population and Housing, 1990). The state average per capita income for the same year was \$14,068, resulting in a watershed per capita income difference of \$5,079 (36%) from the state average (US Census, 2001). Per capita income by census tract in

the watershed averaged \$10,505. However, census tract #808698, which is located in the northern portion of the watershed and entirely in Westmoreland County, had a 1990 per capital income 36% higher than tract #2605 in the lower, Fayette County portion of the watershed (\$12,844 as opposed to \$8,165) (SPC, 2000).

Household income by municipality in the watershed averaged \$19,262 per year. Household income by census tract in the watershed averaged \$23,279. Again, the census tract located in Westmoreland County to the north, tract #808698, has a household income 24% higher (\$26,504) than the lower tract #2605 (\$20,055) located in Fayette County. This represents a \$6,449 difference in household income between census tract, or a difference of 24% (Census of Population and Housing, 1990) (Refer to Figure 10).

2.6.7 Poverty

According to census tract information for 1990, 16.8% of tract #808698's population lives below the state poverty level. Tract #2605 has 20.8% of its population living below the state poverty level (Refer to Figure 10).

Municipal census data reveals more detailed demographic rates of poverty. The following lists depict rates of poverty for each township.

Donegal Township / Westmoreland County

- 16.1% of individuals
- 14.1% of families
- 70.8% of families' w/children
- 23.5% of children under 18 years
- 20.5% of persons 65 years and over

Saltlick Township / Fayette County

- 14.7% of individuals
- 10.9% of families
- 68.6% of families' w/children
- 22.5% of children under 18 years
- 10.1% of persons 65 years and over

Springfield Township / Fayette County

- 27.7% of individuals
- 24.3% of families
- 68.0% of families' w/children
- 35.8% of children under 18 years
- 25.3% of persons 65 years and over

Averages of poverty rates for Donegal, Saltlick and Springfield Townships are as follows:

<i>Individuals</i>	19.5%
<i>Families</i>	6.4%
<i>Families w/ children</i>	69.1%
<i>Children 18 and younger</i>	7.2%
<i>Seniors 65 and older</i>	18.6%

(Census of Population and Housing, 1990).

2.6.8 Transportation Facilities

Roads

The Indian Creek Watershed has an extensive roadway network. This network includes a full range of roadways from major interstate highways to small, rural, dirt roads. The most prominent of these existing roads is the Pennsylvania Turnpike (Interstate 70 and 76). The Pennsylvania Turnpike runs almost directly along the northern border of the watershed in a east/west direction. Other major roads within the watershed include State Route (SR) 31 that runs parallel to the Pennsylvania Turnpike in the northern portion of watershed, SR 711 and SR 381 that run through the middle of the watershed in a north/south direction, and SR 653 that runs through the east central portion of the watershed. In addition to these roadways, the overall existing travel network (smaller state routes and township roads) provides access to almost any area within the watershed (Refer to Figure 2).

Due to the lack of development and a small population, transportation improvement activities are not aggressively being planned in the watershed. The Pennsylvania Department of Transportation (PENNDOT) Transportation Improvement Plan (TIP) includes projects anticipated for study, design, and construction over the next twelve-year period. These include the replacement of the bridge on S.R. 381 over Indian Creek/Mill Run Reservoir and a possible improvement of the intersections at S.R. 711/31 North (Donegal Borough) and South (Jones Mill) in Donegal Township with light signals. Additionally, S.R. 653 will have maintenance improvements completed in 2001 involving repaving, new culverts, and new decking on White Bridge (Bowser, 2001). While improvements are necessary to provide safe travel for the public, they can also increase access to areas that are prone to developmental pressure. The need to develop a strong conservation plan, as well as working with PENNDOT during development of their transportation plans, becomes essential in the long-term health of the socioeconomic features and ecological aspects of the watershed. *While these projects are presently being planned, because of the extensive political and bureaucratic nature of roadway development, it is extremely difficult to detail exactly when or if these projects or others will actually be constructed.*

The Pennsylvania Turnpike Commission (PTC) has recently (2000) completed the total reconstruction of the Pennsylvania Turnpike (Interstate Routes 70 and 76), Milepost 94 to 99. PTC is currently in the studying and designing phase for the total reconstruction of the Pennsylvania Turnpike from Mile-Post 85 to 94. Construction for this section is currently scheduled for 2002 to 2003, and should be completed in 2005 (PTC, 2001). Additionally, there are plans for construction activities that involve reconfiguring of the existing Donegal Interchange (Harkum, 2001). Beyond these major transportation construction activities, only routine maintenance (i.e., patching road surfaces, snow plowing, etc.) is anticipated (PTC, 2001).

Rail

Baltimore and Ohio rail facilities and rights-of-way formerly existed along the Indian Creek main stem and bisected the watershed (USGS, 1973 – 1994). Currently, no active rail lines exist in the Indian Creek Watershed.

Rail-to-Trail Facilities

The Baltimore and Ohio railroad rights-of-way has been partially transformed into the Indian Creek Valley Bike-Hike Trail facility. (Refer to Section VI. Cultural Resources, Rails-to-Trails, Figure 8).

Public Transportation

Public transportation does not exist in the Indian Creek Watershed. The closest facilities to the watershed involve the Westmoreland County Transit Authority and the Fayette County Coordinated Transit. These facilities operate in the S.R. 40, S.R. 119, S.R. 30, and Interstate 70 and 76 transportation corridors in Fayette and Westmoreland Counties. Currently the Strategic Regional Transit Visioning Study is underway to identify how transit can better serve the region (Szabo, 2001).

3 Land Resources

3.1 Geology and Soils

The Indian Creek Watershed is located in the Allegheny Mountain Section of the Appalachian Plateaus Physiographic Province. The Allegheny Mountain Section is where erosional remnants of upward folds of the earth's crust or "anticlines" remain. The low hills and valley between these two ridges are on the downward parts of the folded crust or "syncline" (Smith, 1998, and Wagner and Coxe, 2000). The three major geologic structures are the Chestnut Ridge anticline, the Laurel Hill anticline, and the intermediate Ohiopyle [Ligonier] syncline. The Chestnut Ridge and Laurel Hill anticlines are oriented in a northeast/southwest trend and are located at higher elevations, thus forming the east and west watershed boundaries. The Ohiopyle syncline is located at the low elevations in the Indian Creek valley. (USDA, 2000)

The bedrock of the ridges varies from the Shenango, Burgoon, Mauch Chunk, Catskill, Pottsville, and the Allegheny Group that is composed of gray sandstone and shales. Sections of sandy crossbedded limestone, referred to as Loyalhanna limestone, outcrop in places along the ridgeline. These bedrock strata formed between the Devonian, Mississippian, and Pennsylvanian periods ranging from 280 to 400 million years ago (Smith, 1998, and Wagner and Coxe, 2000).

The project area has numerous soils and soil associations. Soil associations in the watershed include (Soil Surveys, 1991 and 1992):

Fayette County:	Westmoreland County:
Gilpin-Wharton-Ernest	Gilpin-Wharton-Cavode
Dekalb-Hazelton-Cookport	Gilpin-Dekalb-Cavode
Upshur-Albrights	Calvin
Monongahela-Philo-Atkins	Philo-Monongahela-Atkins

The prime farmland soils in the project area include (Refer to Figure 7):

Fayette County:	
Albrights silt loam (AbB2)	Gilpin channery silt loam (GcA),
Allegheny fine sandy loam (AIB2)	Hazelton channery loams (HaA & HaB2)
Brooke silty clay loam (BrB2)	LINDSIDE SILT LOAM (LN)
Chavies fine sandy loam (Ce)	Monongahela silt loam (MoA)
CLARKSBURG-GUERNSEY SILT LOAM (CGB)	Philo silt loam (Ph)
Clymer channery loam (CIB2)	Upshur silt loam (UhB2)
Cookport loams (CoA & CoB2)	Westmoreland channery silt loam (WcA)

Ernest silt loam (ErA)	Wharton silt loam (WrA & WrB2)
Westmoreland County:	
Brooke soils (BrB2)	Philo soils (Ph)
Clarksburg soils (CuB2)	Sequatchie soils (SeA)
Gilpin soils (GcB2)	Upshur soils (UcB2)
Lindside soils (Ln & Ls)	Upshur-Gilpin soils (UgB2)
Monongahela soils (MoA)	Wharton soils (WrB2)

The above soil associations are well drained to somewhat poorly drained, moderately deep - deep, and nearly level to very steep soils. These soils are found on floodplains, hilltops, ridges, benches, and hillsides. These soils were formed in residuum of weathered acid sandstone, acid shale (red and gray), siltstone, and limestone (Soil Surveys, 1991 and 1992). One of the limitations of the soils in the Indian Creek Watershed is that the soils do not work effectively with septic systems due to the depth of bedrock coupled with seasonal high water tables. Thus, this limitation can affect residential and industrial development activities. Another limitation to the soils is their stoniness. This stoniness can make farming difficult due to droughtiness of some soils that impact crop yields. Finally, another limitation is the width of some soils. The better soils for land development are located on nearly level areas generally. These areas can be rather thin in width thus making development more difficult for certain activities. Generally, the soil associations in the Indian Creek Watershed are found to be excellent for the growing of trees. Much of the watershed's land is managed by private entities and the state for timber production and wildlife propagation. For specific site conditions, and soil uses and limitations (in regards to engineering, planning, recreation, wildlife [conservation applications], and crop estimated yields) please review the relevant county soil survey (Refer to Figure 7) (Soil Surveys, 1991 and 1992).

3.2 Ownership

3.2.1 Public Property

Ten (10) state and municipal properties (forest land, parks, and recreational facilities) are publicly owned in the project area. The public owns 57.7% of the land in the watershed.

3.2.2 Private Property

Private citizens own 42.3% of the land in the watershed (USDA, 2000).

3.3 Critical Areas

Critical areas in the project area include riparian forest buffers, wetlands and forests (Refer to Section V Biological Resources, Section 5.4, Important Habitats for a discussion of the abovementioned critical areas). Another critical area is defined as stream aesthetics.

3.4 Stream Aesthetics

Another opportunity for increasing use of watershed streams is through re-orienting how stakeholders interpret the watershed's stream health. Stream aesthetics can be developed or utilized to appropriately allow citizens to interact with the natural and physical resources of the watershed. Currently many stream reaches are impacted by iron and aluminum precipitates ("yellow-boy") from abandoned mine discharges. By improving water quality of AMD discharges and their pollution, stakeholders can reconnect or reestablish the link to the local environment (via trails and the streams).

3.5 Landfills

The Waste Management Program for the PADEP indicates that no sanitary landfills exist within the project area (PADEP, 2000).

3.6 Hazard Areas

3.6.1 What is a Hazardous Waste?

A hazardous waste is any solid, liquid, or contained gaseous material that is no longer in use and must be either discarded, recycled or stored until proper treatment or disposal can be conducted. A waste is considered hazardous if it appears on any one of the four hazardous waste lists appearing in the Resource Conservation Recovery Act (RCRA) regulations. Even if a waste is not listed, it is considered hazardous if it is ignitable, corrosive, reactive, and/or is found to be toxic through extraction procedure (EP) toxicity testing. Examples include solvents, acids/bases, heavy metals, inorganic waste, pesticides, ignitable waste, reactives, formaldehyde, dry cleaning residues, and cyanide waste (Environmental Institute, 1991). The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA database is a compilation by EPA of reporting facilities that generate, store, transport, treat, or dispose of hazardous waste. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list is a compilation by EPA of the sites which EPA has investigated or is currently investigating for a release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Vista Environmental Information, Inc., 1992).

3.6.2 Waste Sites

The National Priorities List (NPL), commonly known as Superfund, is EPA's database of uncontrolled or abandoned hazardous waste sites identified for priority remediation under the Superfund program (Environmental Institute, 1991). The Pennsylvania Department of Environmental Protection, Hazardous Sites Cleanup Program maintains an inventory of facilities (State Priority List [SPL]) subject to investigations concerning likely or threatened releases of hazardous substances from those facilities (Vista Environmental Information, Inc., 1992). There are no NPL, SPL, PA Hazardous Sites Cleanup Act, or EPA CERCLIS sites within the watershed. This is partly due to the rural nature of the Indian Creek Watershed and the subsequent lack of industrial/commercial sites. There are three sites listed on the EPA's Archive or No Further Remedial Action Planned (NFRAP) database. The NFRAP database is a list of sites that EPA considers to no longer needing further review. The following NFRAP sites are former CERCLIS sites:

- Springfield Township Landfill (S.R. 653, [EPA ID# PAD981044795]),
- Saltlick Township Landfill (S.R. 711, [EPA ID# PAD981044746]), and
- Enertel Corp (Matowski & Fullem Lumber- Normalville, [EPA ID# PAD004374708]).

These facilities had Preliminary Assessments performed by EPA during the 1980's to investigate any potential environmental issues. Of these sites, only the Enertel Corp site had a follow up Site Inspection, however no other additional work was warranted or required by EPA. Some facilities (e.g., gas stations, lumber mills, etc.) in the watershed could contain hazardous or non-hazardous industrial waste issues, such as asbestos, lead based paint, under or above-ground storage tanks, polychlorinated biphenyls (PCBs), and pesticides. However, none of these facilities have been identified by PADEP as being waste sites.

Captive processing facilities perform waste processing at their facilities (e.g., boilers, incinerators, waste water treatment, etc.) thereby not delivering a waste product to be disposed of or controlled at a landfill. The PADEP document, *Waste Management Program Permitted Sites for the Southwestern Region (2000)* indicates that no waste handling facilities are located in the Indian Creek Watershed.

The Solid Waste Management Act of 1980 in Pennsylvania, also known as Act 97, regulates solid waste issues. This enabling legislation gives PADEP control to take corrective actions when needed. However, there is no permitting of unregulated waste sites such as junkyards per se by PADEP. Municipalities, through zoning and ordinances, control unregulated waste sites at the local level. Unregulated waste sites (i.e., dumps, junkyards, abandoned coal tailing piles [gob piles], and barren land) exist within the project area. One area noted by PADEP as being problematic is an adolescent party and/or illegal dumping location in Hawkins Hollow, which is located below the Mill Run Reservoir. No large/promiscuous dumpsites exist in the Fayette or Westmoreland County portions of the watershed. Additionally, PADEP has participated with PA Cleanways, Inc. (PA Cleanways) in portions of the watershed to cleanup roadside dumpsites (PADEP, 2001).

Gob piles are hazardous wastes resulting from coal mining activities. These sites have been separated from other types of waste sites (Refer to Pages 56 and 64, and Figure 4). Gob piles are often located near streams. The project area has some examples of barren land/gob piles associated with riparian zones and streams (e.g., Indian Creek, Champion Creek, Poplar Run, and Rasler Run). Gob piles can be a significant cause of degraded water quality due to their chemistry and relative location to water. (e.g., AMD, sedimentation, suspended solids, etc.).

There are no sewage sludge (bio-solids) land application sites located within the Fayette or Westmoreland County portions of the watershed (PADEP, 2001).

3.6.3 Abandoned Mines

Abandoned deep mines and abandoned surface mined lands exist throughout the watershed (Refer to Pages 57 and 64, and Figure 6). The watershed has been impacted for approximately 150 years. Coal mining of the Middle Kittanning and Lower Freeport seams has taken place since approximately 1850. Other coal seams have also been mined such as the Brookville-Clarion, Mahoning, Upper Freeport, and Upper Kittanning. Initially mining was completed via deep mining methods. Most deep mining operations took place to the west of Indian Creek. However, in the 1960's surface mining became the prominent method of extracting coal. Like the deep mining operations, surface mining also took place mainly to the west of Indian Creek. Presently, no deep mining operations are occurring within the watershed. Surface mining, re-mining (of previously surface mined areas), and reclamation activities continue to this day within the project area (PADEP, January 2001). Presently, 1,066 acres of abandoned mine lands (AML) exist in the watershed (i.e., strip mines, gob piles, etc.). A total of 4,869 acres are considered "Problem Areas" by PADEP because these areas are negatively impacted by the AMLs. Another way of interpreting this is that for every one acre of AML, there are approximately five acres of problem area created/impacted by the AMLs (Refer to Figure 6). The U.S. Department of Interior, Office of Surface Mining has two AML Planning Units in the watershed. They are the Mill Run (PU-410) and Indian Creek (PU-403) Planning Units. Table 3-A is a list of the AML projects that have been completed or are currently in the planning design phase.

MWA recently completed the organization's first AMD and gob pile reclamation project in 2000 at the Sagamore site approximately ½ mile north of the Village of Indian Head. Pennsylvania Department of Environmental Protection (PADEP) has permitted sixty-three (63) mining activities within the watershed (e.g., deep mines, strip mines, stone quarry operations, mining tipple/processors, and reclamation sites). Table 3-B lists the Permitted Surface Mining Operations and Table 3-C the Underground Coal Mine Sites (inactive) in the Indian Creek Watershed:

**Table 3-A
Abandoned Mine Land Reclamation Projects**

Shaded = Completed projects

Bold = Planned / designed

PADEP #	Project #	Title	Township	Issue
0429	AMD 26(0429)102.1	Melcroft	Saltlick	WA/AMD
0429	BF 238-101.1	Stafford Coal	Saltlick	DPE
0429	OSM 26(0429)101.1	Melcroft	Saltlick	DPE/HEF
0708	BF 278-101.1	O & A Coal	Springfield	DH
1016	OSM 26(1016)101.1	Rasler Run	Springfield	DH
1355	BF 167-102.1	Clarksburg (I)	Saltlick	DH
1994	AMD 26(1994)101.1	Rondell- Correal	Saltlick	SA/AMD/O
2767	OSM 26(2767)101.1	Romney N.	Saltlick	CS
3588	BF 103-101.1	B. Louise Coal	Springfield	DH/SA
4704	OSM 26(4704)101.1	Mill Run Res.	Springfield	DH
4708	OSM 26(4708)101.1	Rasler Run	Springfield	DH/SA
4710	OSM 26(4710)101.1	White North	Saltlick	DH
4711	AMD 26(4711)101.1	Marsolino	Saltlick	AMD/O
4715	BF 10-101.1	B. Louise Coal	Springfield	DH/IRW
4715	BF 10-102.1	B. Louise Coal	Springfield	DH/IRW

AMD – Abandoned Mine Drainage
 DH – Dangerous Highwall
 DPE – Dangerous Pile or Embankment
 HEF – Hazardous Equipment/Facilities

IRW – Industrial/Residual Waste
 SA – Spoil Area
 WA – Waste Area

Table 3-B
PADEP Permitted Surface Mining Sites

Type	Operator	Status	Permit #
1. CS	Firestone Coal Corp. (Keller)	Released	3477SM14
2. CS	Milrock Mining, Inc. (Champion #1)	Released	3375SM64
3. CS	Amerikohl Mining, Inc. (Prinkey 1)	Released	26880101
4. CS	Amerikohl Mining, Inc. (Ritenour 2)	Released	26900106
5. CS	Better Mining Co. (Pritts)	Inactive	3375SM30
6. CS	Bridgeport Coke (Sapone)	Released	3376SM13
7. CS	Carksburg Coal Co., Inc. (Barger)	Forfeited	3378BC20
8. CS	Firestone Coal Co., Inc. (Hensel)	Released	26820101
9. CS	Indy-Penn Coal Co., Inc. (Clark)	Forfeited	3377SM17
10. CS	Pine Flats Coal Co., Inc. (Hopewell)	Released	26813036(T)
11. CS	William K. Tedesco (Tedesco)	Forfeited	3370BSM16
12. CS	Amerikohl Mining, Inc. (Ritenour 1)	Released	26880110
13. CS	Bologna Mining Co. (Nicholson)	Inactive	3374SM72
14. CS/A	Adam Eidemiller, Inc. (Miller-Pritts)	Inactive	3376SM11
15. CS	Clarksburg Coal Co., Inc. (Flack)	Forfeited	3377SM25(T)
16. CS	Laurel Ridge Coal, Inc. (Warrick)	Forfeited	3375SM38
17. CS	Ann Mineral Co. (Showman)	Released	3375SM53
18. CS	Fryске & Nole Coal Co. (Pletcher)	Released	2968BSM25
19. CS	Laurel Ridge Coal, Inc. (Geary #1)	Forfeited	3374SM77
20. CS	Laurel Ridge Coal, Inc. (Kineer/Warabak)	Forfeited	3374SM78
21. CS	Laurel Ridge Coal, Inc. (Speyer)	Forfeited	3378BC16
22. CS	Northbrook Mining Inc. (Speyer)	Forfeited	26820112
23. CS	William K. Tedesco (Tedesco)	Forfeited	3370BSM8
24. CS	Brant Coal Co., Inc. (Mastowski)	Released	3375SM33
25. CS	Marsolino Coal & Coke, Inc. (Leighty)	Forfeited	3376SM14
26. CS	Morcoal Co. (Kalp)	Forfeited	34A76SM2
27. CS	Pine Flats Coal Co., Inc. (La Rosa)	Released	26823086(T)
28. CS	Emerald Energy Enterprises (Knopsnider)	Forfeited	3375SM69
29. CS	Emerald Energy Enterprises (Marston)	Forfeited	3377SM13
30. CS/A	Pine Flats Coal Co., Inc. (Becker)	Inactive	26880113
31. CS	Purco Coal Co., Inc. (Layman)	Inactive	26703078
32. CS	C & A Coal Co. (Secrist)	Forfeited	3375SM12
33. CS	Adam Eidemiller, Inc. Mastowski)	Released	2969BSM10
34. CS	Fryске & Nole Coal Co. (Eutsey)	Forfeited	461M115
35. CS	Fryске & Nole Coal Co. (Eutsey)	Released	2966BSM14
36. CS	Fryске & Nole Coal Co. (Knopsnider)	Forfeited	2966BSM36
37. CS	Fryске & Nole Coal Co. (Benton)	Released	2966BSM95
38. CS	Fryске & Nole Coal Co. (Knopsnider)	Forfeited	2968BSM32
39. CS	Genovese Coal Co. (Chearney)	Forfeited	3372SM20

CS- Coal-Strip
CS/A- Coal-Strip/Auger
NS- Not Started
SNCS- Small Non-Coal Strip (Shale)
LNC- Large Non-Coal Limestone

Table 3-B
PADEP Permitted Mining Surface Sites (Continued)

Type	Operator	Status	Permit #
40. CS	Genovese Coal Co. (Becker)	Forfeited	3375SM23
41. CS/A	Holliday Constructors, Inc. (Shaffer)	Inactive	3375SM54
42. CS	Myers Coal Co. (Poplar Run)	Forfeited	3377SM6
43. CS	Purco Coal Co., Inc. (Brown)	Released	2967BSM12
44. CS	Purco Coal Co., Inc. (Coffman)	Released	3371BSM6
45. CS	Purco Coal Co., Inc. (Clark)	Released	3376SM7
46. CS	The Rondell Co. (Knopsnider)	Forfeited	3372BSM4
47. CS	Curtis Snyder Coal Co. (Berdych)	Forfeited	3378SM14
48. CS	Nicholson & Shepler (Nicholson)	Released	3375SM14
49. CS	The Rondell Co. (Correal)	Forfeited	3373SM7
50. CS	C & A Coal Co. (Hawk)	Forfeited	3375SM16
51. CS	Charles Kravetsky (Nicholson)	Forfeited	3377SM27
52. SNCS	V & B Excavating (Brown)	Active	65892305
53. LNCL	New Enterprise Stone & Lime Co., Inc. (Henderson Quarry)	NS	65980401
54. CS	Amerikohl Mining, Inc. (Nicholson)	Inactive	26970102
55. CS	Amerikohl Mining, Inc. (Gallentine)	Inactive	26980105
56. CS	Brant Coal Co., Inc. (Steyer)	Inactive	3375SM25
57. CS	Golden Flame Fuel Co. (Dupre)	Inactive	3378BC25
58. CS	Lawrence Coal Co. (Rogers Mills)	Inactive	3376SM15A
59. CS	Amerikohl Mining, Inc. (Prinkey 2)	Inactive	26990103
60. CS	Amerikohl Mining, Inc. (Nicholson 2)	Active	26990102
61. CS	Amerikohl Mining, Inc. (Compton)	Inactive	26940105
62. CS	Amerikohl Mining, Inc. (Kooser)	Inactive	26940103
63. LNCL	Amerikohl (Jim Mountain Quarry)	Active	26950401

CS- Coal-Strip
CS/A- Coal-Strip/Auger
NS- Not Started
SNCS- Small Non-Coal Strip (Shale)
LNC- Large Non-Coal Limestone

**Table 3-C
Underground Coal Mine Sites**

1. Melcroft No. 1 Mine	11. Nebo Coal Co. – Mohawk
2. Melcroft No. 2 Mine	12. Romney Coal Co. (NROM)
3. Melcroft No. 3 Mine	13. Nebo Coal Co. (NROM)
4. Rand Am No. 4 Permit Application Area	14. Romney Coal Co. – Little Squaw
5. North Star Coal Co., - W. Chrestner Mine	15. Howard Coal Co. – Kimmel
6. Layman Property Mine	16. Sagamore Coal Co. – Big Chief
7. Unnamed Mine	17. Red Top Coal Co. – Puro
8. Indian Creek Coal & Coke	18. Indian Creek Coal & Coke Co. – Sparks
9. Blair Coal Co.	19. Salt Lick Mine.
10. M. K. Piper Coal Co. – No.1	

4 Water Resources

4.1 Stream Characteristics

The streams of the Indian Creek Watershed have a designated use as coldwater fisheries. There are an estimated total of 276 stream miles in the Indian Creek Watershed. The portion of Indian Creek upstream of the Champion Creek confluence is considered a High Quality coldwater fishery. Trout Run, Neals Run and Mill Run are also designated as High Quality coldwater fisheries, while Camp Run is considered an Exceptional Value coldwater fishery. (Pennsylvania Code, 1994) (Refer to Figure 4). The Pennsylvania Fish and Boat Commission (PFBC) 2001 approved trout waters in the Indian Creek Watershed are Back Creek, Indian Creek, and Mill Run in Fayette County, and Indian Creek and Roaring Run in Westmoreland County for the stocking of trout (PFBC, 2001). All tackle selective harvest program is designated on Camp Run and the delayed harvest (artificial lures only) program is designated on Indian Creek (1.6 miles, from the T-916 bridge downstream to SR 0381 bridge) in the Westmoreland County portion of the watershed. Rasler Run is classified by the PFBC as a Wild Rainbow Trout stream. The Environmental Protection Agency in January 2001, recommended to all states that a fish consumption advisory for mercury be made for all waters within each respective state. Pennsylvania recently adopted this policy. The mercury advisory is for one meal per week or 0.5 lbs. of fish per 150 lbs. person per week. This equates to 2 trout per week. The targeted group for the fish consumption advisory is children, women of child bearing years, and pregnant women. If there are any questions concerning this fish consumption advisory, please review the Pennsylvania Fish and Boat Commission's website at www.fish.state.pa.us (PFBC, April 2001). The following streams have been surveyed by the PFBC and have verified trout reproduction (PFBC, 1996 and December 2000):

- Back Creek
- Buck Run
- Indian Creek
- Laurel Run
- Mill Run
- Neals Run
- Roaring Run
- Trout Run
- Camp Run
- Little Run
- Rasler Run

4.2 Major Tributaries

Major tributaries of Indian Creek in the watershed are (Refer to Figure 3) (SPC, 2000):

- Tates Run
- Richter Run
- Rasler Run
- Stoney Run
- Poplar Run
- Newmyer Run
- Wash Run
- Little Champion Creek
- Champion Creek
- Minnow Run
- Little Run
- Camp Run
- Pike Run
- Roaring Run
- Back Creek
- Trout Run
- Neals Run
- Laurel Run
- Middle Fork
- Buck Run
- Clay Run
- Mill Run
- Fulton Run

4.3 Wetlands

The wetlands in the project area vary in size, complexity, and type depending on their location in the watershed. Palustrine and riverine wetlands are the dominant wetland type found within the project area. In order for an area to be considered a wetland, the area must satisfy three parameters. The area must have wetland hydrology (the presence of water), a dominance of hydrophytic (water-loving) vegetation, and hydric (wet/moist) soils. The identified wetlands on the Southwestern Pennsylvania Commission's GIS database are taken from the National Wetland Inventory (NWI) mapping and have been classified as forested and non-forested wetlands (Refer to Figures 4 and 7). Natural wetland systems can be found throughout the project area along stream corridors. Constructed wetlands have also been built in the project area and serve many of the varying functions that the natural wetlands serve (e.g., AMD remediation, sediment trap, nutrient filtering, wildlife habitat, and controls floodflow, etc.). Before proceeding with projects, please consult the NWI mapping to assist in reviewing a specific property or location.

4.4 Floodplains

The streams and waterways of the watershed contain numerous floodplains throughout the project area. These floodplains vary in size (width) and sinuosity (how much the stream and associated floodplain bends, turns, and meanders) as they relate to the specific stream and floodplain. The size and sinuosity of a floodplain is dependent on its relative location and proximity to the streams beginning, or headwaters. As a rule, the farther one travels up a streambed the smaller the size of the floodplain.

The floodplains of the watershed adjacent to main stem Indian Creek have been minimally utilized over the years as the location for development activities. Floodplain development and encroachments have been limited to the village areas adjacent to Indian Creek and its tributaries. Please consult the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps to assist in reviewing a specific property or location.

Floodplains are an important resource because they hold back storm flows, thus reducing destructive flooding downstream (Refer to Figure 7, and Appendix 2). If development were to be restricted or eliminated from occurring within the floodplains, taxing capital investment costs due to expanding infrastructure (i.e., flood channels, levees, etc.) could be reduced or eliminated. This would also reduce the financial burden of maintaining the present structures located on the floodplains. Additionally, floodplains are the areas along a stream where rich alluvial (stream placed) soils are to be found. Nutrients and organic matter are recycled and transformed into food by bacteria, fungi, and plants that then are passed on to animals. This is one reason why farmers utilize these floodplains as cropland. Floodplains also serve as fringe or buffer areas that transition from streams and rivers to upland areas. Floodplains provide important shading to stream habitat yet connect these areas to wetland and upland areas. Much diversity in plant and animal life can be found here due to the amount of nutrient recycling. Floodplains are very fertile areas, thus, are an important resource to enhance and protect.

Flood protection may be a concern in the future as development increases on or near floodplains in the watershed. Problems arise when stormwaters create high flows that threaten property, life, and travel routes. The Pennsylvania Department of Environmental Protection is authorized to provide structural flood protection to communities prone to such flooding. The PA DEP's knowledge of specific flood problems is limited, therefore a formal community request or notification may be needed to increase agency awareness.

4.5 Lakes and Ponds

There are numerous lakes, ponds, and reservoirs within the Indian Creek Watershed including numerous smaller farm ponds and sedimentation structures that are utilized mainly for cattle water supply, soil conservation practices, fire insurance protection, and recreational purposes (snow making for skiing). There are four (4) significant water bodies within the watershed, they are:

- Lake Donegal
- Mill Run Reservoir
- Seven Springs Airport Reservoir
- Lake Tahoe (Seven Springs Mountain Resort)

4.6 Water Quality

Most natural waters contain varying bicarbonate and carbonate compounds, originating from sedimentary rocks. The calcium bicarbonate content of freshwaters determines the pH or acidity / alkalinity balance (Allan, 1999). Thus, limestone geology can determine to what extent buffering to degraded streams occurs. Water quality of the Indian Creek Watershed was good prior to man's intensive land use activities of the 19th and 20th centuries. The underlying geology of the watershed is made up of sandstone, shale, limestone, and siltstone. However, in the Westmoreland County portion of the watershed, there is sandstone, shale, and siltstone. Limestone is found to a lesser extent here and streams are less buffered. Whereas in the Fayette County portion of the watershed, limestone (as well as sandstone, shale, and siltstone) is found which permits more buffering of degraded acidic water conditions (Soil Surveys, 1991 and 1992). The buffering capacity of the streams in the southern portion of the watershed (Fayette Co.) is greater due to the higher limestone composition often exceeding 20 percent. Limestone composition decreases significantly to the north of the study area, with streams at or below 10 percent limestone, thus decreasing the streams ability to buffer degraded acidic water (Sharpe, et al. 1987). Effects of water quality problems associated with poor buffering capacity in northern reaches of the watershed can be felt downstream. This is one reason for some of the various and complex water quality problems that exist in the watershed (Refer to Figures 3 and 5).

Surface water flows from land surfaces into drainage basins (via ephemeral, intermittent, and perennial streams) to the major tributaries until these streams meet Indian Creek. The quality of the water in these streams is directly related to the quality of the land it came from. Therefore, water coming from a commercial area will transport one type of pollution versus water coming from a forested area. The quality of water is important because it directly impacts chemical, physical, and biological processes that take place in streams. Human impacts to these parameters can indicate degraded water whereas conservation measures taken to make improvements can show the opposite.

The watershed is 125 square miles in size. An estimated total of two hundred and seventy-six miles of stream exist in the Indian Creek Watershed and have been assessed for non-point source pollution by PADEP (PADEP, 2000). Of the 276 miles of assessed stream, there are 48 miles (17%) of stream that are not in attainment (or meeting water quality standards for designated use) with the Pennsylvania's Clean Streams Act (Refer to Figure 5) in the watershed. Nineteen (19) sub-basins in the watershed are in attainment (Refer to Figure 3). The sources for non-attainment are shown in Table 4-A. PADEP's 2000 data distinguishes between primary, secondary, and tertiary sources of water pollution. This shows that a stream reach may have multiple sources of non-attainment. Table 7 shows the three primary sources of NPS pollution in the watershed and the amount of stream not in attainment. The top pollution sources are discussed later in this section.

4.6.1 Point Sources

A point source form of water pollution is a source of water pollution that discharges water directly into a stream or other water body. Point source forms of water pollution are regulated by state and federal environmental agencies. The watershed has six (6) direct and indirect dischargers of state permitted treated wastewater into Indian Creek and its tributaries (PADEP, June 1997 and EPA EnviroFacts Website, 2001 [www.epa.gov/enviro/html/ef_overview.html]). Four (4) locations are in Fayette County and two (2) locations are in the Westmoreland County portion of the watershed (Refer to Figure 2). These permitted facilities include a campground, a mobile home park, 2 schools in the Connellsville Area School District, and commercial businesses. Please note that some of these sites were non-listed sites from the PADEP Direct/Indirect Dischargers list (PADEP, June 1997) and were not found on EPA's EnviroFacts website. The following are the permitted point source discharge locations in the watershed and their associated NPDES permit number:

1. Mountain Pines Camping Resort
(PA0034614)
2. Pleasant View Mobile Home Park
(PA0096733)
3. Saltlick Township Elementary School
(PA0098345)
4. Springfield Township Elementary School
(PA0098337)
5. Tri-Fuel Company
(PA0096814)
6. Living Treasures
(PA0096164)

4.6.2 Non- Point Sources (NPS)

A non-point source form of water pollution is a source of water pollution that does not necessarily discharge water directly into a stream or other water body at one location or point. NPS water pollution is more difficult to regulate by state and federal environmental agencies. This is because the source of pollution occurred prior to its regulation, or the problem is so widespread that regulators would have an impossible task trying to regulate it (e.g., abandoned mine discharges, nutrient effluent from farms, and pesticide residue from yards). PADEP's 303(d) list of streams in the Indian Creek Watershed lists five (5) specifically named streams, along with eighteen (18) additional stream segments or reaches that are not in attainment (or meeting water quality standards for designated use) (PADEP, 2000). The PADEP 303(d) listed streams are:

- Champion Creek (lower)
- Indian Creek (middle)
- Laurel Run
- Newmyer Run
- Poplar Run (lower)
- 18 stream segments or unnamed tributaries

The PADEP 303(d) list indicates that none of the impaired streams or stream segments in the watershed are presently targeted to have Total Maximum Daily Loads (TMDLs) developed. The PADEP 305(b) Report states that a TMDL is the sum of individual wasteload allocations for point sources, load allocations for non-point sources, and a margin of safety for the attainment of water quality standards. The TMDL is a tool that helps set water quality objectives (PADEP, April 2000).

Table 4-A
Sources of Non-Attainment of PA Clean Streams Act,
Water Quality Standards in Indian Creek
(PADEP 2000 303[d] List)
Stream Miles Effected by Pollution Source

Pollution Source	Primary Source	Secondary and Tertiary Sources	Total
Abandoned Mine Drainage	6.6	12.16	18.76
Surface Mining	8.26	8.20	16.46
Removal of Vegetation	3.85	3.85	7.70
Land Development	---	5.04	5.04
Total	18.71 mi	29.25 mi	47.96 mi

Abandoned Mine Drainage (AMD)

AMD is made up of numerous water quality parameters and can differ from discharge to discharge (Refer to Figures 5 and 6, and Appendix 2 and 3). AMD typically can be either acidic or alkaline and has metals (Aluminum, Iron, and/or Manganese) associated with it. This is the major water quality problem in the Indian Creek Watershed (Refer to Figure 5). The watershed has been impacted for approximately 150 years. Coal mining of the Middle Kittanning and Lower Freeport seams has taken place since approximately 1850. Other coal seams have also been mined such as the Brookville-Clarion, Mahoning, Upper Freeport, and Upper Kittanning. Initially mining was completed via deep mining methods. Most deep mining operations took place to the west of Indian Creek. However, in the 1960's surface mining became the prominent method of extracting coal. As with the deep mining operations, surface mining also took place mainly to the west of Indian Creek.

As a result of a 1924 lawsuit by the Pennsylvania Railroad and local water companies, a flume was constructed to divert mine drainage below the Mill Run Reservoir. As mining activities increased, so did mine drainage and the flume was unable to handle the increased flow resulting in a complete failure of this early system. Subsequently, the flume deteriorated due to lack of maintenance and has since been dismantled. In addition to the flume's discharge entering Indian Creek, other discharges began to pollute the watershed. One hundred nineteen (119) mine discharge points flow into and severely degrade Indian Creek and its tributaries water quality. The 119 water quality

and quantity samples were obtained from the *Chemical Analysis Results for Surface and Mine Water Discharges within the Indian Creek Watershed, Unpublished Report 1998*, for the *2000 Watershed Plan and Environmental Assessment* by USDA, NRCS. In 1998, Mountain Watershed Association completed its Comprehensive Plan to remediate AMD. Its goal is to totally rehabilitate the Indian Creek Watershed of its AMD problems (MWA, 1998). The lists of PADEP permitted surface mining operations and underground mining sites are found in Tables 5 and 6 respectively.

In the 1994, Pennsylvania Department of Environmental Resources Technical Study Document, *A Petition to Designate Areas Unsuitable for Mining*, a total of 311 spring, well, piezometer, stream, and abandoned mine discharge locations were reviewed for water quality. Approximately 50,000 of the 80,000 acres in the Indian Creek Watershed were reviewed in this study. Most sample locations were sampled for the 1994 study. For other sample locations, recent historical water quality data was utilized. A total of 106 abandoned mine discharge sources were located and sampled (Refer to Figure 5). Of the discharges, 26 are from deep mines and 80 are from surface mines. Streams that are degraded by AMD include:

Back Creek
Champion Creek
Indian Creek
Little Champion Creek
Newmyer Run
Poplar Run
Wash Run
Numerous un-named tributaries.

In the October 2000, USDA, NRCS, *Watershed Plan and Environmental Assessment*, 10 treatment sites were delineated that would improve the water quality in five of the eight sub-basins listed above. The discharge sites that would be remediated include:

- Buck Run site
- Fulton discharge (2002)
- Gallentine discharge (2001)
- Kalp discharge (2004)
- Lawrence Coal site
- Marsolino-Leighty discharge (2002)
- Melcroft #3 Portal pond / associated discharges (2002)
- Nicholson discharge (2002)
- Permapress discharge (2001)
- Rondell Correal discharge (2002)

MWA recently completed the Sagamore AMD and AML remediation project (2000), -½ mile north of the village of Indian Head. The Gallentine discharge AMD remediation project (~1 mile south of the village of Indian Head) is currently under construction (2001). MWA, Skelly and Loy, Inc., PADEP, and USDA, NRCS are working on the Rondell-Correal discharge site (2002), the Nicholson discharge (2002), the Melcroft #3 Portal Pond and associated discharges site (2002), the Marsolino-Leighty discharge (2002), and the Kalp discharge (2004) (Refer to Figure 6). In order to document individual AMD discharge site water quality and flow characteristics, MWA in consultation with the PADEP, Bureau of Abandoned Mine Reclamation has established a monthly water quality program. This program involves the sampling of AMD discharge sites for chemical and flow data. Samples are collected by MWA volunteers, with the analysis of the samples being performed by PADEP staff at the state laboratory in Harrisburg.

Sewage

Sewage is basically composed of wastewater, feces, and particulate matter. In a conventional sewage treatment plant, sewage is transported to treatment facilities via an underground network of sewage pipelines from residences and businesses. At the treatment plant the sewage is then put through primary and secondary (and in some cases tertiary) treatment. This process removes solids, bacteria, viruses, and other waste material until the water is potable or drinkable for consumers. Thus sewage or wastewater is recycled for reuse by patrons of the water treatment authority. The Indian Creek Watershed has no watershed wide sanitary sewer system. Indian Creek's water quality is impacted by malfunctioning and/or non-existent on-lot septic systems. The Indian Creek Valley Water Authority (ICVWA) has observed through its documentation of watershed water quality problems, that raw sewage or effluent is a common cause of water quality degradation. However, the degraded water quality due to sewage pollutions masked by the high volume of AMD within the watershed (ICVWA, 2001). The following are point source (direct discharge) locations that have sewage treatment facilities:

1. Mountain Pines Camping Resort (PA0034614),
2. Pleasant View Mobile Home Park (PA0096733),
3. Saltlick Township Elementary School (PA0098345),
4. Springfield Township Elementary School (PA0098337),
5. Tri-Fuel Company (PA0096814), and
6. Living Treasures (PA0096164).

Nutrient Enrichment

Nutrient Enrichment is a water quality problem associated with the lack of agricultural conservation practices, leaking septic systems, and uncontrolled fertilizer application (e.g., golf courses, parkland, home gardens, etc.). Streams impacted by nutrient enrichment exhibit eutrophic conditions. In these conditions, an increased amount of algae plant growth occurs until the algae die. The decomposition of the large amounts of algae biomass reduces oxygen levels in the stream and fish kills occur as a result. Nutrient enrichment problems increase when agricultural conservation practices are not followed; buffers are not maintained along streams; no streambank fencing exists, or poorly planned/designed facilities are built; fertilizer/pesticides are not applied/used properly; and septic systems have not been built or maintained.

Nutrient enrichment was not found to be a problem in the PADEP 303(d) investigation of the Indian Creek Watershed. However, the ICVWA has observed through its documentation of watershed water quality problems, that raw sewage effluent is a common cause of nutrient enrichment. Indian Creek's water quality is impacted by malfunctioning and/or non-existent on-lot septic systems, and large-scale animal production farming facilities. However, the degraded water quality due to nutrient enrichment is masked by the high volume of AMD (ICVWA, 2001).

Agricultural land use, though found throughout the watershed, is concentrated in the Champion Creek, Upper Indian Creek, and Mill Run sub-basins (Refer to Figures 3 and 4). The Pennsylvania Nutrient Management Program defines a Concentrated Animal Operation (CAO) as a livestock operation with more than two animal units per crop acre. If a farm discharges pollutants into a stream anytime up to a maximum of a storm event of a 24 hour per 25 year storm, then PADEP can legally declare the farm as a CAO and require a Nutrient Management Plan be prepared and implemented. Under the U.S. Environmental Protection Agency regulations, if a farming operation meets its definition of a concentrated animal feeding operation (CAFO), then the farm must obtain

a permit under the National Pollutant Discharge Elimination System in order to discharge pollutants to U.S. waters (WCD, 2001).

Habitat Modification

Habitat modification is a designation given to streams that are impacted due to one or more water quality parameters that alone or together impact the habitat, stream structure, and the environment for benthic organisms and fish. Streams that exhibit habitat modification problems are affected by high stream flows, turbidity, erosion and sedimentation, residual chemical (e.g., road salts, oils, solvents, etc.), and thermal pollution. The factors that lead to these types of water quality impacts are due primarily to areas with high developmental activities, high human population densities, high densities of residential/commercial/industrial structures, and transportation facilities. In general, urban impacted modifications occur due to a high degree of impervious surfaces (e.g., asphalt and concrete roads, structure's roofs, etc.).

In the watershed, habitat modification problems are not currently a significant issue. However, habitat modification is occurring along the headwaters of Indian Creek due to the de-icing practices with salts by the Pennsylvania Turnpike Commission. Habitat modification is also occurring near the village of Mill Run, along Mill Run due to uncontrolled/excessive timbering operations that have increased stream flows in an unprotected area. An additional area of concern for potential habitat modification problems is in the Indian Creek headwater area near the proposed New Enterprise quarry facility. If proper Best Management Practices are not followed, then habitat modification problems could become an issue. If residential and commercial development increases without consideration to stormwater management and other developmental planning issues, then these types of water quality impacts could be observed. These problems increase when vegetated buffers are not maintained along streams, stormwater management facilities do not exist, or inadequately planned/designed facilities are built, stormwater and sanitary sewer discharges are mixed, and when stormwater flow comes from warm/hot surfaces and increases stream thermal temperatures. Stormwater management involves the control of water that runs off the surface of the land from rain, melting ice, or snow (PADEP, 1997). High stream flows coming from developed areas only add to this water quality problem.

Habitat Modification in a rural, agricultural setting may pose a more direct threat to water quality in the watershed than that occurring in developed urban setting. In these situations, farming practices, backyard landscaping, and clearing of riparian vegetation in pastures or hayfields can lead to severe erosion and sediment control problems. In addition to sedimentation from cropland erosion, stream bank erosion also poses a risk to waterways. (PADEP, 1996) Without streamside vegetation to maintain bank integrity, soils are at a high risk to erosion under even minimally high flows. The siltation from these conditions as well as runoff from tractor paths and gravel roads can impact stream health in the form of bottom siltation and water turbidity. High siltation of stream substrate adversely impacts macroinvertebrate abundance and fish reproduction.

Currently no USGS stream flow gauging stations are operated within the Indian Creek Watershed (USGS, 1999). A discontinued station at Poplar Run near Normalville (station #03082200) provided hydraulic data that was utilized by various entities for planning and flood protection purposes. There also had been surface water quality sampling stations located on Indian Creek at White bridge (station #03082237), on Poplar Run near Normalville (station #03082190), and on Champion Creek near Melcroft (station #03082120). PADEP has no permanent stream sampling/gauging stations in the watershed.

Water Supply

The Indian Creek Valley Water Authority is the only supplier of water within the watershed (SPC, 2000). Water supply for watershed residents was started in the early 1900's due to the mining company(s) operating deep mines and subsequently spoiling groundwater wells. The ICVWA incorporation was in 1965 by Saltlick and Springfield Townships. ICVWA currently supplies water to approximately 2,300 service connections (domestic, industrial, and commercial customers). In total ICVWA serves approximately 6,200 users via ninety-five (95) miles of distribution lines and other facilities. Mining activities has had a negative impact on the groundwater resources to the point that users routinely experience premature failure of copper water pipes and hot water tanks due to iron, sulfur, manganese, aluminum, pH, and conductivity associated problems (ICVWA, 2001). Mining activities past and present have placed groundwater/public water supplies at risk for further contamination or loss by the above contaminants.

Historically two springs have supplied water to the Village of Melcroft (Pritts Spring – since 1947) and other areas of the watershed (Grimm Spring – since 1973). ICVWA estimates the water supply yield at 150,000 gallons per day for each spring. The ICVWA also drilled a supply well (ICVWA's 3rd primary water source) in 1993 near the confluence of Neals Run and Trout Run. This well can supply approximately 216,000 gallons per day. ICVWA maintains a surface water treatment plant along Indian Creek near the Mill Run Reservoir and can purchase up to one million gallons per day from the Municipal Authority of Westmoreland County's Mill Run Reservoir for emergency situations (Refer to Figure 2). A well on the Gearhart property in the Little Champion Creek sub-basin provides water for swimming pools and is considered non-potable (PADER, 1994). These springs and wells provide nearly perfect water quality for potable water unlike the groundwater resources found along the valley floor (ICVWA, 2001) (See Table 4-B and Refer to Figure 2 and Appendix 3).

Indian Creek's water quality is also impacted by malfunctioning and/or non-existent on-lot septic systems, and large-scale animal production farming facilities. This raw sewage or effluent is a common nutrient enrichment problem that the ICVWA has observed through its documentation of watershed water quality problems. Again, all existing pollutants are masked by the overwhelmingly high volume of AMD (ICVWA, 2001).

The use of water (surface and groundwater) for snow making purposes at Seven Springs Mountain Resort has an impact on the seasonal availability of water in the Indian Creek Watershed (i.e., the Pritts Spring). The use of water across the Fayette/Somerset County and the Indian Creek/Laurel Hill Creek watershed boundaries has a seasonal impact involving water supply. This seasonal impact is associated with increased fall water storage activities by Seven Springs Mountain Resort in preparation for the winter ski season (snow making) (ICVWA, 2001).

**Table 4-B
Drinking Water Intakes of the Indian Creek Watershed**

Intake	Supplier ID	Operator	Source
Spring	4560024	Seven Springs Municipal Authority	Trout Run Spring #1
Spring	4560024	Seven Springs Municipal Authority	Trout Run Spring #2
Spring	4560024	Seven Springs Municipal Authority	Trout Run Spring #3
Spring	5260011	Indian Creek Valley Water Authority	Pritts Spring
Spring	5260011	Indian Creek Valley Water Authority	Grimm Spring
Spring	5650433	Pike Run C. C.	Spring
Spring	5650436	Donegal Campground	Spring
Spring	5650868	Roaring Run Resort	Roaring Run Spring
Spring	5650871	Caddie Shak	Spring
Spring	5650926	Mountain View Bed & Breakfast	Spring
Well	5260011	Indian Creek Valley Water Authority	Neal Run Well
Well	5260838	Camp Christian Inc.	Well at Caretakers
Well	5650317	Laurel Highlands Campland	Wells #1 & #2
Well	5650317	Laurel Highlands Campland	Wells #1 & #3
Well	5650433	Pike Run C. C.	Wells
Well	5650433	Pike Run C. C.	Wells
Well	5650433	Pike Run C. C.	Wells
Well	5650444	Days Inn Donegal	Wells
Well	5650444	Days Inn Donegal	Wells
Well	5650926	Mountain View Bed & Breakfast	Well #1
Surface		Indian Creek Valley Water Authority	Mill Run Reservoir

5 Biological Resources

5.1 Wildlife

5.1.1 Terrestrial

The Indian Creek Watershed contains a variety of non-game and game wildlife species. In the watershed, the terrestrial habitat setting is rural. In the rural setting, birds, mammals, amphibians, and reptiles generally inhabit and migrate freely between areas of large, wooded tracts, agricultural land, edge/fragmented habitat, riparian, and wetland habitats. Due to the rural setting and overall lack of development in the watershed, most wildlife species thrive. The watershed is noted as being an excellent area for woodcock and waterfowl observation. The communities of the watershed permit legal hunting throughout their respective municipalities. State Game Lands (SGLs) #51 and #111 are located in the Indian Creek Watershed (Refer to Figure 9).

The main wildlife issue in the watershed involves the reintroduction of the river otter (*Lutra canadensis*). The river otter was successfully reintroduced into the Youghiogheny River basin in 1982 [subsequent reintroductions have also occurred] (Fazi, 2000, and Serfass, 2000). Though no scientific surveys have been completed to document the river otter's expansion from the Youghiogheny River, there is credible evidence and there have been numerous local observations made that the river otter has moved into the Indian Creek Watershed (Serfass, 2000).

Another wildlife issue in the watershed involves the northern expansion of the fisher (*Martes pennanti*) from West Virginia. The fisher was successfully reintroduced into northern West Virginia by the West Virginia Division of Natural Resources over 20 years ago. As with the river otter, no scientific surveys have been completed to document the fisher's expansion into Pennsylvania. However, there is credible evidence and numerous observations made indicating the fisher has moved into the Indian Creek Watershed and southwestern Pennsylvania (Serfass, 2000).

5.1.2 Aquatic

A portion of Indian Creek (from Champion Creek confluence upstream on Indian Creek), Trout Run, Neals Run, and Mill Run are considered High Quality coldwater fisheries and Camp Run is considered a Exceptional Value coldwater fishery (Pennsylvania Code, 1994) (Refer to Figure 4). The Pennsylvania Fish and Boat Commission (PFBC) 2001 approved trout waters in the Indian Creek Watershed are Back Creek, Indian Creek, and Mill Run in Fayette County, and Indian Creek and Roaring Run in Westmoreland County for the stocking of trout (PFBC, 2001). All tackle selective harvest program is designated on Camp Run and the delayed harvest (artificial lures only) program is designated on Indian Creek (1.6 miles, from the T-916 bridge downstream to SR 0381 bridge) in the Westmoreland County portion of the watershed. Rasler Run is classified by the PFBC as a Wild Rainbow Trout stream. The following streams have been surveyed by the PFBC and have verified trout reproduction (PFBC, 1996 and December 2000):

- Back Creek
- Buck Run
- Indian Creek
- Laurel Run
- Mill Run
- Neals Run
- Roaring Run
- Trout Run
- Camp Run
- Little Run
- Rasler Run.

The PFBC has performed a number of aquatic surveys and fisheries evaluations in the watershed. These include relative fish abundance and community composition surveys of game and non-game fish species in Camp Run. Additionally, the Index of Biotic Integrity (IBI) has been completed at sampling stations on Little Champion Creek, Newmyer Run, Poplar Run, and Rasler Run (PFBC, December 2000). The PFBC performs stream surveys periodically in order to manage the fishery.

5.2 Vegetation

The Indian Creek Watershed is a part of the Central Appalachians (69) - Forested Hills (69a), and Uplands and Valleys of Mixed Land Use (69b) Level III and VI Ecoregions of Environmental Protection Agency, Region 3. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designated to serve as a spatial framework for research, assessment, management, and monitoring of ecosystems and their components. Ecoregions are directly applicable to the immediate needs of state agencies, including the development of biological criteria and water quality standards and the establishment of management goals for non-point source pollution (Woods et al., 1999).

The Indian Creek Watershed is located in the Allegheny Mountain Section of the Appalachian Plateaus Physiographic Province. The Allegheny Mountain Section is where erosional remnants of upward folds of the earth's crust or "anticlines" remain as the linear northeast to southwest trending Laurel and Chestnut Ridges. The low hills and valley between these two ridges are on the downward parts of the folded crust or "syncline". The bedrock of the ridges varies from the Shenango, Burgoon, Mauch Chunk, Catskill, Pottsville, and the Allegheny Group that is composed of gray sandstone and shales. Sections of sandy crossbedded limestone, referred to as Loyalhanna limestone, outcrop in places along the ridgeline. These bedrock strata formed between the Devonian, Mississippian, and Pennsylvanian periods ranging from 280 to 400 million years ago.

The Indian Creek Watershed has a relatively contiguous forest. These forests are composed largely of second growth forest stands with the exception of the steep sided ravines or valleys where older growth timber may exist. In the 1930's oak (*Quercus spp.*) became the dominant tree species of the watershed after the elimination of the American chestnut (*Castanea dentate*) by chestnut blight. *Quercus species* still are the dominant tree species in the watershed. However, in the late 1980's/early 1990's widespread infestation of oaks by the gypsy moth (*Lymantria dispar*) and the second and third generation of timbering operations has started a change in the forests on the ridges. The oak tree ridge community is changing and includes the following species (Smith, 1998, and Wagner and Coxe, 2000):

- Chestnut oak (*Quercus prinus*)
- Black oak (*Quercus velutina*)
- Red oak (*Quercus rubra*)
- White oak (*Quercus alba*)
- Black birch (*Betula lenta*)
- Black cherry (*Prunus serotina*)
- Sassafras (*Sassafras albidum*)
- Tulip tree (*Liriodendron tulipifera*)
- Sugar maple (*Acer saccharum*)
- Red maple (*Acer rubrum*)
- Mountain laurel (*Kalmia latifolia*)
- Rosebay rhododendron (*Rhododendron maximum*) and
- Blueberry species (*Vaccinimu spp.*).

The diversity of vegetation increases as elevation decreases within the Indian Creek Watershed. Higher moisture levels and deeper soils permit a more abundant and diverse plant community. Along with many of the species found above, the following additional woody plant species are found (Smith, 1998, and Wagner and Coxe, 2000):

- Eastern hemlock (*Tsuga canadensis*)
- American beech (*Fagus grandifolia*)
- Hickory species (*Carya spp.*)
- Witch hazel (*Hamamelis virginiana*) and
- Spicebush (*Lindera benzion*).

Recent investigations performed by the Western Pennsylvania Conservancy (Smith, 1998, and Wagner and Coxe, 2000), involved the Natural Heritage Inventories for Fayette and Westmoreland counties. These inventories describe the vegetative communities in the watershed as taking on the character of the northern conifer hardwood forests found to the north.

5.3 PNDI Species

The species of special concern (threatened and endangered species) listed below are tracked by the state and federal natural resource agencies in the Pennsylvania Natural Diversity Inventory (PNDI) program (PADCNR, 2000; PFBC, 2000; and PGC, 2000). The species listed in Table 9 are reported to occur in or near the Indian Creek Watershed's boundaries in Fayette and Westmoreland Counties, PA (Refer to Pages 59 and 71). It is a matter of policy for the resource agencies not to provide specific site location information in order to provide a level of protection to these organisms and their critical habitats. The state natural resource agencies are to be contacted if any land disturbance activities are planned within the watershed.

Table 5-A
PNDI Species of Special Concern

Common Name	Scientific Name	Last Observed
Birds		
Upland Sandpiper	<i>Bartramia longicauda</i>	1985
Osprey	<i>Pandion haliaetus</i>	1998
Mammals		
Small-Footed Myotis	<i>Myotis leibii</i>	2/16/1999
Eastern Woodrat	<i>Neotoma floridana</i>	2/15/1995
Allegheny Woodrat	<i>Neotoma magister</i>	2/18/1935
West Virginia Water Shrew	<i>Sorex palustris punctulatus</i>	1992
Amphibians		
Long-Legged Green Darner	<i>Anax longipes</i>	1966
Green Salamander	<i>Aneides aeneus</i>	1980's
Reptiles		
Timber Rattlesnake	<i>Crotalus horridus</i>	1999
Fish		
Cheat Minnow	<i>Rhynchthys bowersi</i>	1986
Insects		
Thorey's Grayback Dragonfly	<i>Tachopteryx thoreyi</i>	1987
Plants		
Purple Bluets	<i>Hedyotis purpurea</i>	06/19/1921
Umbrella Magnolia	<i>Magnolia tripetala</i>	05/30/1942
Bushy Naiad	<i>Najas gracillima</i>	08/01/1977
Golden Club	<i>Orontium aquaticum</i>	05/30/1920
Stiff Cowbane	<i>Oxypolis rigidior</i>	09/24/1916
Buffalo-Nut	<i>Pyrolaria pubera</i>	09/31/1997
Lettuce Saxifrage	<i>Saxifraga micranthidifolia</i>	06/20/1987
Hard-stem Bulrush	<i>Scirpus acutus</i>	08/16/1949
Carolina Tassel-Rue	<i>Trautvetteria caroliniensis</i>	07/31/1993

5.4 Important Habitats and Natural Heritage Areas:

5.4.1 Riparian Forest Buffers and Wetlands

Riparian forest buffers and wetland habitats are very important areas in all watersheds for a number of reasons (Refer Figures 4 and 7, and Appendix 2 and 3). First, these habitats are transitional areas (ecotones) between the terrestrial and the aquatic portions (the receiving stream) of a watershed. These areas have direct interaction between terrestrial and aquatic ecosystems. Riparian and wetland areas can vary in size, diversity, and complexity. Riparian zones, wetland complexes, and floodplains are found to exist together in the natural environment. Riparian zones act as transportation corridors, integral and diverse habitats for wildlife and fishes (bio-diversity), high production areas for timber and food, and are important recreational areas. Wetlands serve much the same type of function as riparian zones plus they trap sediments, nutrients, pesticides, and they regulate flood/storm events.

Second, these areas are important from the watershed and fisheries management perspectives because streamside vegetation controls erosion and sedimentation, thus controlling streambank stability/channel morphology. These areas also add large, woody debris to streams, which create habitat and microhabitat for insects, wildlife, and fishes. Riparian zones and wetlands assist in moderating environmental conditions for wildlife, fishes, and humans. These areas assist in controlling the temperature of streams; where sediments, nutrients (phosphorus and nitrogen), and pesticides are deposited; and where energy from floodwaters dissipate (American Fisheries Society, 1997; Orth and White, 1999; and Wesche and Isaak, 1999).

In watersheds with healthy riparian zones and wetlands, the environmental health of that portion of a watershed will be better versus other degraded riparian areas of the same watershed. In the Indian Creek Watershed, less environmental and physical infrastructure impacts occur in comparison to other more urbanized watersheds, due to the healthy riparian forest buffers and associated wetlands. The protection of riparian zones and wetlands in the Indian Creek Watershed is important in order to maintain the environmental health of the watershed. It also will assist in maintaining the aesthetics of the watershed and make the area more appealing to live in.

5.4.2 Forest

Forest systems in the project area are very important habitats as well (Refer to Figure 4, and Appendix 2 and 3). Forest is the dominant landcover type in the watershed. Forested state owned lands include Forbes State Forest, Laurel Ridge State Park, Roaring Run Natural Area, and State Game Lands No.'s 51 and 111. Forest habitat helps to maintain a healthy environment by adding barriers to pollutants that run off the land into adjacent streams. In many locations of the watershed, upland or steep sloped forests continue downslope to riparian/wetland habitats thus adding to the ability of those important habitats in maintaining a healthy environment. Additionally, forest habitat acts as shelter and produces forage for various types of wildlife species, provides needed recreational opportunities, and provides timber and jobs to the local economy. By improving and connecting riparian and upland forest systems, the aesthetics of the watershed improve and so will the environmental health of the watershed's land, stream, and biological resources. By encouraging forestry techniques that involve conservation principals and the restoration of degraded forest communities in the watershed, the quality of life for local citizens will also improve as well as maintaining a vital part of the local economy.

5.4.3 Natural Heritage Areas

The 1998 and 2000 Natural Heritage Inventories (NHI) for Fayette and Westmoreland Counties were performed to identify and map significant natural areas that exist in Fayette and Westmoreland Counties (Refer to Figure 9, and Appendix 3). These investigations identified flora (plant) and fauna (animal) species and communities that are unique and/or uncommon. The NHIs also note areas of general wildlife habitat, educational value, and of scientific importance. The objective of the NHIs is to provide information that can be utilized in planning for the protection of the biological diversity and ecological integrity of the counties (Smith, 1998, and Wagner and Coxe, 2000). The areas in Table 5-B and graphically represented in Figure 9 are noted for their significance in the Indian Creek Watershed. Thirteen are noted as Biological Diversity Areas (BDA), one as a Dedicated Area (DA), two as Landscape Conservation Areas (LCA), and five as Managed Lands (ML). The NHIs are designated with letters in Figure 9 that are referenced in Table 5-B.

Presently, one area (Roaring Run Natural Area) is dedicated to the protection of the ecological systems and biological diversity (Smith, 1998, and Wagner and Coxe, 2000). An implementation goal of this RCP is to work towards gaining "formal dedication" of additional NHI areas (i.e., the Indian Creek Gorge) for the protection of their ecological systems and biological diversity. A location for formal dedication is the lower Indian Creek Watershed area that encompasses the scenic gorge area. This area is shown in Figure 9 (Conservation Lands) as being partially encompassed by the Youghiogheny River BDA and Youghiogheny River Landscape Conservation Area (LCA). Additionally, the gorge area is designated by the >25% slope in Figure 7 (Constraints), near where Indian Creek discharges into the Youghiogheny River.

A process of gaining this formal dedication is through the designation of these areas as Natural Areas. A natural area is an area of unique scenic, historic, geologic, or ecological value that will be maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention. These areas are set aside to provide locations for scientific observation of natural systems, to protect examples of typical and unique plant and animal communities, and to protect outstanding examples of natural interest and beauty. Guidelines governing the administration of Natural Areas are as follows (PADER, 1979):

- No human habitation, except primitive type; backpack camping in designated areas only.
- Access restricted to foot trails.
- Buildings and other improvements restricted to the minimum required for public health, safety, and interpretive aids.
- Timber harvesting prohibited except that required for maintenance of public safety.
- Rights-of-way, leases and mineral development prohibited.

Table 5-B
Natural Heritage Inventoried Resources,
Fayette and Westmoreland Counties

Site Location	Description
A. Wash Run Biological Diversity Area (BDA)	Seepage community that is the location of a plant of special concern.
B. Newmyer Run Biological Diversity Area (BDA)	Seepage community that is the location of a plant of special concern.
C. Stony Run Tributary Biological Diversity Area (BDA)	Seepage community that is the location of a plant of special concern.
D. Laurel Run Biological Diversity Area (BDA)	Forested valley containing numerous seepage areas/spring runs and two plants of special concern.
E. Upper Middle Fork Biological Diversity Area (BDA)	Forested seepage areas and rich woods that are the home to two plants of special concern.
F. Upper Mill Run Biological Diversity Area (BDA)	Seepage community that is the location of a plant of special concern.
G. Upper Indian Creek Biological Diversity Area (BDA)	Complex of swamps and marshes along Indian Creek upstream of Mill Run Reservoir. Home to two natural communities and one plant of special concern.
H. Lower Indian Creek Biological Diversity Area (BDA)	Forested slopes, floodplains and scour zones of Indian Creek downstream of Mill Run that provide habitat for four plant species of special concern.
I. Municipal Authority of Westmoreland County, (Managed Land)	Property located in the surrounding area of the Mill Run Reservoir and downstream along Indian Creek to the Youghiogheny River.
J. Youghiogheny River Biological Diversity Area (BDA)	Scour zones, shores and floodplains of the Youghiogheny River. Includes the most diverse areas in Fayette County.
K. Youghiogheny River Landscape Conservation Area (LCA)	Area of contiguous forest, rugged topography and high natural diversity featuring the Youghiogheny River gorge within the Allegheny Mountains.
L. Spook Hill Biological Diversity Area (BDA)	Adjacent forested watersheds of Neals Run and Trout Run that are the homes to two plants of special concern.
M. Forbes State Forest (Managed Land)	Lands (55,000+ acres) managed by the PADCNR, Bureau of Forestry that are found along Laurel Ridge. Six state parks are associated with the forest.
N. Laurel Ridge Landscape Conservation Area (LCA)	Recognized in the FC & WC NHIs for the large, contiguous forested section of Laurel Ridge containing a density of important BDA's and landscapes.
O. Laurel Ridge State Park (Managed Land)	A state park managed by the PADCNR, Bureau of Forestry and is apart of Forbes State Forest.

P. Roaring Run Biological Diversity Area (BDA)	Large watershed that encompasses the Roaring Run Natural Area and supports high quality seep communities, as well as populations of three plants and one animal of special concern.
Q. Roaring Run Natural Area, Designated Area (DA)	PADCNR, Bureau of Forestry Natural Area containing a natural community and, plant and animals of special concern.
R. Camp Run Biological Diversity Area (BDA)	Exceptional value stream and watershed that contains spring run communities and four plants of special concern.
S. Indian Creek/Little Run Biological Diversity Area (BDA)	Large forested watershed that supports a complex of spring run communities and two plants of special concern.
T. State Game Land #51 (Managed Land)	SGL located in Springfield Township and is managed by the PGC for recreational hunting activities.
U. State Game Land #111 (Managed Land)	SGL located in Stewart Township along Laurel Hill. Managed by the PGC for recreational hunting activities.

6 Cultural Resources

6.1 Recreation

Passive recreational uses and activities available within the Indian Creek Watershed can include, but are not limited to, hiking, biking, skiing, hunting, fishing, kayaking, bird watching, photography, camping, canoeing, horseback riding, gardening, and swimming. Seven Springs Mountain Resort is partially located in the Indian Creek Watershed and is the largest operating ski resort in Pennsylvania. Many of the passive recreational activities are currently being enhanced due to rail-to-trail and water quality improvement projects. Many opportunities abound for further enhancement and/or improvement to the various natural resources in the watershed (Refer to Figure 8, and Appendix 3). These improvements are already occurring in the Indian Creek Watershed and can continue to be made by watershed stakeholders utilizing various programs that are available from private organizations (e.g., foundations and trusts) and public agencies (e.g., state and federal).

The following is a list of completed or on-going recreation projects:

- Indian Creek Valley Hike-Bike Trail (by section) and
- PW&S Mountain-Bike Trail

6.1.1 Parks/Rails-to-Trails/Greenways

Parks

Six (6) community and state owned park/recreational facilities exist within the watershed (SPC, 2000). Five (5) of these parks can be characterized as community parks that are associated with schools and have jungle gyms, basketball courts, soccer, softball, baseball, and football fields. These parks are geared towards school or municipal active recreation programs. Laurel Ridge State Park located at the eastern boundary of the watershed.

The watershed's parks vary in size, as do their uses. Laurel Ridge State Park, along with many areas in the watershed, are reverting back to a more mature forest situation. As a consequence, wildlife is utilizing these areas as refuges, whether during annual migrations or daily life activities. Therefore, these areas have become very popular with naturalists (Refer to and Figures 8 and 9). Table 11 lists the designated state park and recreational facilities of the Indian Creek Watershed.

Table 6-A

Community Parks and Recreational Facilities

Municipality	Recreational Properties
Donegal Township	Laurel Ridge State Park (LRSP)
Saltlick Township	LRSP and Indian Head Athletic Field
Springfield Township	LRSP and Mill Run Athletic Field

Rails-to-Trails and Bikeways

Abandoned railroad beds provide a unique opportunity for communities and environmental groups to develop trails for walking, biking, rollerblading, horseback riding, snow shoeing, and even cross-country skiing (Refer to Figure 8, and Appendix

3). Rail trails provide an alternative to common transportation options as well as providing safer recreational opportunities due to the absence of vehicle traffic. Additionally, many abandoned rail corridors provide beautiful scenery and a relaxing atmosphere as a result of the many lengthy stretches of rural and wooded areas through which they pass (Allegheny Land Trust, 1999). There are two existing trails facilities located in the Indian Creek Watershed (Refer to Figure 8). When completed, these trails will provide an exciting opportunity for a unique recreation choice for residents and tourists.

The Indian Creek Valley Hike-Bike Trail (ICVHBT) is the most developed trail within the watershed. Three entities own sections of the former railroad rights-of-way (Mountain Watershed Association, Saltlick Township, and Municipal Authority of Westmoreland County (leased to Western Pennsylvania Conservancy). When completed, this trail will be a part of a complex of trails that stretch from Coraopolis, PA to Washington, D.C. The trail covers 21.9 miles of abandoned railroad right-of-way from the Baltimore and Ohio Railroad in Westmoreland and Fayette Counties. The ICVHBT could be completed through utilization of additional funding from the Transportation Equity Act for the 21st Century (or more commonly known as TEA 21) for construction of the remaining sections in the watershed.

The PW&S Mountain Bike Trail is a recently completed trail that is located in Lynn Run State Park, Forbes State Forest. The trail covers 38 miles of abandoned railroad rights-of-way and former park access/logging roads in Westmoreland County. This trail could be connected to the ICVHBT located to the south. This connection would also link it to the Youghiogheny River Trail South that is a part of the Pittsburgh to Cumberland Trail network.

Additionally, there are three potential trail facilities that are owned by the Commonwealth of Pennsylvania. The trails are located in Donegal Township, adjacent to Weavertown Road, State Route 381, and Summit Road (S.R. 31). Once constructed these trails will connect to the ICVHBT. The location of the trail networks, are such that all citizens within the Indian Creek Watershed reside within a "reasonable" vicinity of one of these facilities. For this reason, efforts and funds should be placed toward the completion and maintenance of remaining trail sections.

Greenways

A greenway is a corridor of open space. Greenways vary greatly in scale, from narrow ribbons of green that run through urban, suburban, and rural areas to wide corridors that incorporate diverse natural, cultural, and scenic features. Greenways can be land-based or water-based, running along stream corridors, shorelines or wetlands. Some follow old railways, canals, ridge tops, or other features. They can incorporate both public and private property. Some greenways are primarily recreational corridors, while others function almost exclusively for environmental protection and are not designed for human passage. Greenways differ in their location and function, but overall, a greenway network will protect natural, cultural and scenic resources, provide recreational benefits, enhance the natural beauty and the quality of life in neighborhoods and communities, and stimulate economic development opportunities (Ramey, 1995 and The Pennsylvania Greenways Partnership, 1998).

The benefits of greenways have been well known and documented. These benefits can be thought of as functions. The six economic functions of greenways include: real property values, expenditures by residents, tourism, corporate relocation, public cost reduction; and intrinsic value (National Park Service, 1990). The functions help to attract people and businesses to an area because it is an attractive area to live and work. The natural functions of a greenway can also assist in reducing community

infrastructure expenditures, thus reducing maintenance to facilities. Thus greenways also improve the economic conditions in an area that has an established greenway. The six natural functions of greenways include (J.M. Labaree, 1992):

- Habitat
- Filter
- Conduit
- Source
- Barrier
- Sink

These functions help to maintain the environmental health of an area by creating habitat for organisms, travel corridors for wildlife, barriers that prevent migration, filters that purify water quality, sources of purified water/food for organisms, reducing flood water impacts, and sinks to trap sediments, nutrients, and toxins. Greenways help to connect fragmented developed areas/habitats and are associated with stream/river corridors.

Recently, MWA has moved toward improving the natural/aesthetic aspects of local communities by encouraging greenway concepts in their activities and projects. These were started with the hope that governmental entities would acknowledge the economic, environmental, recreation/ transportation, and educational benefits of greenway and greenway concepts. Proposed greenway corridors would utilize existing, public, parkland, openspace, and forested areas in the watershed. The following list of properties are held in trust:

- MWA - Jones Mill Grist Mill (Purchase Pending)
- MWA's section of the ICVHBT (28.6 acres)
- WPC's section of the ICVHBT (in process of being transferred to MWA)
- WPC - Camp Run Conservation Easement
- WPC - Roaring Run property.

6.2 Archaeological/Historical

6.2.1 Archaeological

Archaeological sites exist within the study area boundaries. These sites involve the location of past human activity, marked by the presence of artifacts or cultural features. Archaeological sites can date from as early as 10,000 B.C. to as late as the 20th Century. It is the policy of the Pennsylvania State Historic and Museum Commission (PHMC) not to disclose the location of sites for their own protection.

6.2.2 History

The Indian Creek, known by some in earlier times as the 'Great Salt Lick Creek', is part of the headwaters of the Ohio River drainage area. Presently, the Indian Creek Watershed is located in two counties of Pennsylvania; Fayette and Westmoreland. Fayette County was formed after separating from Westmoreland County. The earliest known religious structures built in the lower portion of the watershed were Lutheran (Reformed), implying an early German presence in the area.

Indian Creek's valley floor provided a good transportation corridor amongst a very hilly, surrounding terrain. One of the oldest roads on record through the watershed was the Turkey Foot Road, which was used by the British Army as early as 1758. Turkey Foot Road extended from Somerset County to the east, starting at the confluence of the Casselman and Youghiogheny rivers (hence the name, 'Turkey Foot') and connected with Clay Pike to form an early transportation network to Pittsburgh. The Indian Creek Valley Railroad was the first railroad in the watershed (1902). It constructed 22 miles of track that provided both passenger and freight trains daily. In 1926, the Baltimore and Ohio Railroad purchased the Indian Creek Valley Railroad. These early roads and railroads provided access to the natural resources of the Indian Creek Watershed. Eventually, this transportation network would lead the communities within the watershed in becoming a vital part of the larger, regional economy.

The local economy, at this time, was based on timbering and agriculture, characteristic of similar places in the region. The voluminous mountain streams of Indian Creek's tributaries were suitable locations to harness waterpower for the milling of the hardwood and grain. Iron and fire clay were the first mining industries to emerge in the watershed. However, coal and limestone soon became the mainstays of the watershed's economy. As steel became the metal of choice, the abundance of coal in the watershed became the most valuable resource. Pittsburgh was emerging as the nation's leading steel producer and it was the outlying areas of the city with the natural resources and adequate transportation, like Indian Creek, that would initially benefit from the city's need for coal to fire its furnaces.

By 1881, eleven (11) mines were in operation in Springfield Township. These mines produced coal solely for external markets. Resource extraction continued to be the basis of the Indian Creek Watershed's economy into the 20th century. Most of these resources went to feed the Pittsburgh Industrial Complex, but some of the resources made their way into other, more remote markets. Much of the timber, for example, was exported to Europe for the shipbuilding industry.

The Indian Creek Watershed once prospered from the exporting of its natural resources. Today, however, the watershed is suffering from the exploitive and environmentally insensitive practices used in the past. Deforestation and most importantly, mine drainage, continue to plague the people and landscape of the Indian Creek Watershed.

6.2.3 Historical

Historic resources include, or can include, standing structures (e.g., houses, barns, grist mills, etc.) and/or remnants of other built environments (e.g., dams, bridges, railroads, etc.). These resources are generally over fifty years old. There are seventeen (17) historic properties listed in the watershed. Of these historic properties, nine (9) are in Fayette County and eight (8) are in Westmoreland County (SPC, 2000 and PHMC, 2001). Two sites are listed (**in bold below**) as eligible for the National Register of Historic Places. Other potential historic properties may exist within the watershed but have yet to be identified and listed by their owners for such a designation. Table 6-B lists the historic properties in the Indian Creek Watershed (Refer to Figure 8).

**Table 6-B
Community Historical Properties**

Municipality	Historical Properties
Donegal Township	1. Moses Horner Property 2. Bruner Property 3. William McClean Property, 4. Donegal School 5. H. Hoyman Property 6. Valley Brethern Church 7. Jones Mill (a.k.a. Mathews Feed & Grist Mill) 8. J. Mayberry & Co. Property
Sattlick Township	9. Melcroft Historic District,
Springfield Township	10. LR 26168 Near Normalville 11. LR 366 Bridge 26 10 0366 00819 10 12. LR578 Bridge 26 10 0578 0 009314 13. Pennsylvania Railroad Co., Mill Run Dam Reservoir 14. Western Maryland Railroad Co., Confluence Station 15. Ora May House 16. Harlan Grist Mill 17. Fayette Furnace.

The historic properties are identified with numbers and are labeled to correspond to mapping found in Figure 8. Currently no historic properties are held in trust by historic preservation organizations.

6.3 Educational

Sixty-five percent (65%) of the Indian Creek Watershed's population, 25 years and older, have graduated from high school. In comparison, the Pennsylvania statewide average is seventy-five percent (75%) (USDA, 2000). The following four Public School Districts and two Private Schools are located in the Indian Creek Watershed:

- Champion Christian School
- Connellsville Area School District
- Ligonier Valley School
- Mount Pleasant Area School District
- Mount Zion Christian Academy
- Uniontown Area School District

Adult and youth environmental educational opportunities exist in the watershed through school districts, volunteer activities, and Mountain Watershed Association (MWA) (Refer to Figure 8, and Appendix 3). These opportunities are linked to schools and MWA. These activities consist of, but are not limited to, water quality monitoring, natural heritage education, nature hikes, and community projects. Many schools have made volunteer activities a component in the educational experience. Student participation has expanded due to these types of volunteer activities.

MWA has sponsored an environmental outreach program since 1994, and has expanded the program each year. The program involves a presentation of the issues and concerns of the watershed. Presentations have been made to schools, community organizations, local fairs, and national conferences. The programs covered 30 days and 2,500+ people in 2000 (MWA, 2000). MWA continuously works to expand the outreach program. A new facility (i.e., Education Center, Nature Center, Cultural Facility, etc.) would enhance MWA's outreach program and give a permanent location for other educational programs. Powder Mill Nature Reserve is an education center currently located near, but not in, the watershed. This facility, however, *does* provide educational opportunities for the region. Continued promotion of the activities in this plan and other activities being accomplished by organizations and communities of the watershed are important. One method of promoting environmental education within the watershed would be by utilizing local and regional media outlets. By further enhancing the existing programs and implementing new programs and facilities, citizens of the watershed will have a deeper understanding of where they live, work and play.

7 Issues, Concerns, Constraints, and Opportunities

The Indian Creek Watershed contains a varied combination of environmental concerns, and ecological and recreational opportunities. During the data collection and analysis portion of the River Conservation Plan, several of the concerns and opportunities stood out as appearing to be the most significant.

The following outlines the significant issues and opportunities.

7.1 Project Area Characteristics

7.1.1 Sprawl

Presently, sprawl is not an active development characteristic within the watershed. However, population projections provided by the Southwestern Pennsylvania Commission (SPC) depict large potential population increases in some of the municipalities associated with the watershed. Donegal Township, in particular, is expected to have significant population gains by 2025 (59% increase). This is significant in large part due to Donegal Township's location near the headwaters of the watershed, meaning any negative impacts due to development in this municipality could effect the downstream portion of Indian Creek and some of its tributaries.

Although water quality degradation caused by sprawl related development is not currently observed, without safeguards in place (sound zoning, planning, inter-community communication) to protect the area's resources, degradation of land and the subsequent degradation of water quality will result in the future. Working with organizations such as the SPC and the county planning commissions would assist in facilitating improved planning activities.

7.1.2 Zoning

Appropriate zoning and comprehensive planning is an important issue and opportunity for sound land management and development activities. The level of detail, specifically relating to environmental sensitivity, varies greatly among the established municipal zoning ordinances. Additionally, beyond the actual zoning ordinances, the level of enforcement and the granting of variances from reasonable zoning requirements can vary greatly. Developing both strong zoning ordinances and encouraging proper enforcement are the keys to providing environmentally sound development practices.

Assessment of Options

Examples of zoning and land use planning measures, which can be used to address growth through quality zoning and land use management methods could include, but not be limited to:

Overlay Districts

Are defined as: special zoning districts which form a second layer over an underlying residential, commercial or industrial zoning in order to protect floodplains, wetlands, steep slopes, and other areas. River or Streamfront overlay zoning districts can also be made a part of the second layer of zoning in order to allow compatible development while protecting from flood hazards and enhancing river or streamfront recreational opportunities. A copy of model ordinances for a *riverfront overlay district* and *floodplain overlay district*, are included in Appendix 2. Additional details can be obtained from

Conservation Zoning

The intent of conservation zoning is to actively and legally encourage subdivisions that set aside at least 50% of the land as permanently protected open space. Several model ordinances that can be applied to conservation zoning include: site capacity analysis, whereby a percent of each kind of land type is reserved as open space. A cluster development option involves compact development through variations in lot sizes in order to preserve open space and sensitive natural resources. Randall Arendt, noted landscape planner, makes reference to the virtues of cluster development in *Rural by Design* (Arendt, 1994). One final example of conservation zoning would be riparian buffer ordinances, and a copy of a model ordinance has been included in Appendix 2 along with the aforementioned model ordinances (ACPD, May 1993).

Conservation zoning allows for future growth with a balance between community goals and private landowner interests. Conservation zoning has several distinct advantages:

- Development can occur with the preservation of "valuable" open space and farmland.
- New development is given incentives to group or cluster homes in order to promote ease of access to local businesses and public services.
- A greenway and streamside buffer system can be encouraged along Indian Creek & its tributaries.
- Other sensitive features and habitats, such as older tracts of forested land, can be identified and protected.
- Additional details can be obtained by reviewing the *Growing Greener* manual.

'Conservation zoning' has sometimes been mistaken as a measure that could result in "a taking of land without compensation." This is not true for two reasons according to site-specific research conducted by the Natural Lands Trust, Inc. for *Growing Greener*, which found:

- *Conservation zoning allows full density development, but just requires the conservation of open space.*
- *No land is taken for public use unless landowners or developers want the land to be open to the public. The municipality must negotiate with the developer to provide municipal recreation facilities on a willing buyer/seller basis. Conservation ordinances can be written with density incentives to encourage parts of their lands be made available for public ownership, access, or use.*

Conservation Easements

The conservation easement concept allows a landowner to give away certain rights to a qualified conservation organization. The landowner would grant conservation easements in order to protect important natural features (farmlands, forested tracts, wetlands, etc.) from inappropriate development and to assure long term conservation of the features that they value. Conservation easements can qualify a donor for income tax, property tax, and estate tax benefits. An example of a conservation (preferential

tax assessment program) easement program for farmland in Pennsylvania can be seen in the Pennsylvania Farmland and Forest Land Assessment Act of 1974 (Clean and Green)(Act 319) programs or the Act of January 13, 1966 (1965)(P.L. 1292, No. 515)(16 P.S. §§ 11941 – 11947)(Act 515) programs (PENNDOT, 1998).

Transferable Development Rights

Transferable Development Rights (TDRs) enable a community to reduce development in rural and sensitive resource areas and encourage development within areas served by public infrastructure. The system of compensation is set-up to allow landowners in rural or sensitive resource areas to sell their development rights to individuals interested in developing predetermined locations in the municipality suitable for more intense development. The seller of the TDRs retains title to the land and the rights to use the land as farmland or other open space; however, the owner cannot develop the site for other uses (i.e., housing plans, strip malls, etc.). The purchaser of the TDRs has purchased the rights to develop another parcel more intensely than would have otherwise been allowed.

Planned Residential Developments

Planned Residential Developments (PRDs) combine elements of zoning, subdivision, and land development ordinances into one package. Builders are given the flexibility to combine greater housing densities in return for the preservation, construction, or dedication of agreed upon public recreation areas/open space.

In conclusion, zoning is a tool to be used to ensure that the land uses of today are not taking away the future rights of generations to enjoy our communities. Even the most up-to-date zoning does not always account for the long-term interests of the public. Short-sighted zoning is often applied as a means to define the land's profit-making potential with *land development* as the goal rather than *quality open space*. Planning through progressive zoning can ensure that private property is maintained with farmland and open space as the norm rather than the exception. Open space does not have to be a temporary use until a land development plan is randomly built.

Transportation Facilities

While the existing roadway network provides access to almost all areas of the watershed, future development and growth within portions of the watershed could necessitate improvements to the transportation system. It is very important for the communities in the watershed to have appropriate zoning ordinances in place, in order for sound land management and development activities to take place.

Roadway construction is one of the major impacts on environmental resources. Mitigation for these impacts consequently becomes one of the most significant contributors to natural resource creation and restoration efforts. Federal and state regulations provide specific guidance on how impacts are calculated, avoided, minimized, and ultimately mitigated. In addition, the sometimes arduously long process of roadway development and design can make it difficult for local conservation groups to track Pennsylvania Department of Transportation (PENNDOT)/Pennsylvania Turnpike Commission (PTC) projects and effectively cooperate with them to most efficiently protect and conserve natural resources. Working with PENNDOT/PTC can assist in reducing project impacts and it can be very beneficial in developing effective mitigation for the impacts incurred.

Most major roadway projects are funded at least in part by the Federal Highway Administration (FHWA). Because this funding is provided by a federal agency, these projects must adhere to the National Environmental Policy Act (NEPA). This Act

generally requires any project funded by the federal government to give full consideration to impacts to the "quality of the human environment." The basic concept of NEPA includes evaluating a range of alternatives to determine the alternative which best satisfies project needs while minimizing environmental impacts. Also, NEPA requires mitigation efforts to be undertaken to compensate for unavoidable impacts. In addition to NEPA, federal legislation authorizing FHWA funding generally includes language regarding environmental mitigation. The present transportation act, commonly known as TEA 21 includes general guidance stating that wetland mitigation should utilize active banking sites for mitigation if possible. In addition the act includes direct funding for "enhancement projects." These funds are predominantly used for trail work but may be available for other projects. State laws, most significantly PADEP Chapter 105 Regulations, also govern roadway construction and mitigation of impacts. Chapter 105 Regulations cover any impact to streams and wetlands and require a permit for these impacts. The permit application process also requires the applicant to evaluate the project's impacts on vegetation and cultural resources. In order to abide by these laws, PENNDOT/PTC must not only study and calculate impacts to natural resources but it must coordinate with the public regarding the project.

Roadway construction projects can result in a number of widely varying impacts to the environment. The most significant natural resource impacts are to wetlands, streams, and vegetation and wildlife. Wetland impacts can involve direct impacts by filling or excavation. Indirect impacts predominantly involve changes to supporting hydrology. Direct and indirect impacts to wetlands are evaluated by both the size of the impact and the loss of functions and values. Stream impacts include culverting, relocation, and loss of stream length. Stream impacts are evaluated largely by a qualitative determination of the loss of stream value. Vegetation and wildlife impacts include the direct loss of vegetative cover types and disruptions to wildlife movement patterns as well as direct and indirect impacts to endangered species. Following the final determination of project related impacts, studies and coordination are undertaken to determine mitigation requirements for the project. Generally, these studies include evaluations of potential sites for mitigation projects and determining an appropriate compensation rate. Compensatory mitigation can include creation, restoration, enhancement, and preservation. The extent to which any of these options is utilized assists in determining the compensation rate required. Coordination is conducted with the regulatory resource agencies to obtain recommendations and ultimately approval. An example of a wetland mitigation area near the Indian Creek Watershed is the Amos K. Hutchinson, PTC Toll Route 66 Mitigation Area in New Stanton, PA.

Wetland mitigation is generally the most "straight forward" mitigation of natural resources. Wetland laws generally require a minimum replacement of wetlands at a one-to-one ratio. This is commonly equated to area lost to area replaced, but is also evaluated by functional replacement. Additional requirements include replacement of wetland impacts as close to the impacts as practicable and generally within the same watershed. Traditionally, transportation agencies have conducted wetland replacement projects on their own. They select a site, design the replacement wetland, purchase the property, and construct the site.

Traditional wetland replacement siting would be conducted by reviewing existing mapping (project related, U. S. Geological Survey [USGS] topographic) and field reconnaissance to identify areas that are favorable to wetland creation. Those sites are then reviewed for potential constraints such as archaeology, ownership, and utilities. A preferred site is selected and built. Recently other information sources such as wetland replacement programs through U.S. Fish and Wildlife Service and the PADEP have added to potential siting opportunities. In addition, some transportation agencies and their contractors have added local conservation groups to the list of potential site sources. Following construction, the site is maintained by the transportation agency or turned over to a local interested party with some type of conservation agreement placed

on the site. Options to individual wetland construction include banking and in-lieu of replacement. Different U.S. Army Corps of Engineers Districts, as well as different states, have wide ranging policies on implementation of these options.

Stream mitigation is less predictable than wetland mitigation. To start with, the evaluation of impacts includes a qualitative assessment of lost value. This equates to a qualitative determination of replacement requirements. Additionally, laws pertaining to stream impacts and mitigation requirements are generally not as specific as those for wetlands. Stream mitigation has traditionally involved enhancement and/or restoration work on streams adjacent to the project. The extent of work is informally negotiated with the regulatory agencies. Because stream mitigation is less defined, it can be easier to work with in a partnering agreement.

Vegetation and wildlife mitigation not associated with endangered species is very similar to stream mitigation. Generally, laws are not specific to the type of mitigation required. Extensive mitigation efforts for habitat impacts are usually only undertaken for large roadway projects such as highways on new alignment or major upgrades to long sections of existing roadways. Defining compensation rates is extremely qualitative. Mitigation often times involves land acquisition for preservation or enhancement of existing preserved land.

Working with PENNDOT or PTC to achieve their required mitigation can be a win-win situation. The benefits to be realized by both sides can be significant. By providing mitigation through a local group, transportation agencies generally see large reductions in costs due to lower administrative efforts and less stringent design standards. Local groups obtain significant funding with generally reduced efforts over standard grant writing requirements. The following items are important factors to keep in mind when trying to coordinate with PENNDOT or PTC.

Timing

Roadway projects involve a tremendous amount of development and evaluation due to numerous laws and policies and are also subject to intense political and public scrutiny. These factors create project schedules that can change often and erratically. Timing a local conservation project with transportation agency mitigation can become at best difficult and at worst impossible. The best option for local groups is to have several projects staged and available to partner with the transportation agency. This allows for some flexibility.

Project Compatibility

According to the laws and policies of state and federal regulatory agencies (environmental and transportation) not all impacts associated with roadway projects can be mitigated through a local conservation group. Mitigation must justifiably replace the lost functions and values of the impacted resource. For example, AMD treatment wetlands cannot replace high quality forested wetlands. Impacts to a high quality trout stream cannot be replaced on a degraded warm water fishery. Knowing the types of impacts incurred on a project and the benefits to be obtained from a mitigation project are crucial to identifying potential mitigation options.

Regulatory Consensus

The final decision on the success of a partnering opportunity lies in the hands of the regulatory agencies. These agencies must concur that the agreements set up between the local group and PENNDOT/PTC will compensate for the project related impacts. This concurrence includes the replacement of impacted resources and the confidence that the project will be successfully completed.

Project Organization

Having a strong plan demonstrating a potential for long-term success to the regulatory agencies improves the likelihood of obtaining the necessary approvals. The planning

and organization of individual projects are important issues. In many circumstances, funding sources other than PENNDOT/PTC are needed in order to complete a project. Funding sources such as grants, endowments, and in-kind services should be identified and applied for. Many of these other sources have their own time frames that, as discussed in the timing section, may not coincide with DOT requirements.

Matching Projects to Impacts

Working together with PENNDOT/PTC to document comparable environmental benefits to roadway impacts is necessary to obtain regulatory concurrence. Projects that provide a variety of environmental improvements provide the best partnership opportunities.

7.2 Land Resources

7.2.1 Farmland and Prime Farmland Soil(s) Protection

Protection of farmland and prime farmland soils at the municipal level is an important issue. As more developmental activities occur in the watershed in the future, if appropriate municipal zoning ordinances and codes are not in place prior to these activities, then appropriate enforcement will not take place. These developmental pressures can then place these resources and the families that rely on them in jeopardy.

7.2.2 Unregulated Waste

Roadside solid waste and small dumping locations are found throughout the watershed and are aesthetically displeasing. Municipalities, through zoning and ordinance controls, can regulate waste sites at the local level. Cleanup activities eliminating promiscuous solid waste sites, such as those performed by PA Cleanways, scouting troops and individuals, should be continued and encouraged.

Commercial and industrial real estate property transactions are required (by banking institutions) to perform a Phase I Environmental Site Assessment (ESA). A Phase 1 ESA evaluates a specific site and its environmental liability issues. A Phase 1 ESA is performed to protect potential property owner(s) and banking institution(s) from environmental liability. If environmental waste issues are identified through an assessment, potential remediation actions can then be completed if warranted.

7.2.3 Abandoned Mine Land Restoration

The removal and restoration of gob piles (coal refuse piles) and other abandoned mine lands is an important issue for improving the environmental health and aesthetics of the watershed. Numerous gob piles and abandoned mine lands exist within the watershed (Refer to Figures 4 and 6). These areas are frequently located near streams; therefore, water pollution issues almost always exist at or near these sites.

7.3 Water Resources

7.3.1 Water Quality

Water quality improvement is the focus of this plan. Water quality data demonstrates that a number of streams and sub-basins in the watershed are meeting water quality standards and are considered in attainment. The following streams and stream

segments or unnamed tributaries are impaired and are not meeting PADEP water quality standards (Refer to Figures 3 and 5):

- Champion Creek (lower),
- Indian Creek (segments),
- Newmyer Run,
- Poplar Run (lower),
- Wash Run, and
- 18 stream segments or unnamed tributaries.

This water quality impairment is due exclusively to AMD discharges and runoff from abandoned mine lands in the middle Indian Creek Watershed. The basic question is "What can be done to implement improvements to the impacted resources?" Impacts or degradation to water resources are caused by human manipulation of the land. It is at this point that implementation and management alternatives will be discussed for restoring, conserving, and preserving water resources. These techniques and strategies involve both better planning and use of land within the watershed for proactive results, as well as reactionary remediation alternatives and strategies to improve historic watershed problems that currently exist.

7.3.2 Floodplains

Floodplains are an important issue for the watershed. The proper use of floodplain areas is critical to the environmental health and reduction in infrastructure maintenance by local municipalities, businesses, and homeowners. If appropriate municipal zoning ordinances and codes (that include conservation and environmental codes/ordinances) are not in place prior to developmental activities and enforcement does not take place, then floodplain resources will be in jeopardy and an increase in infrastructure maintenance will result.

Floodplain development will likely occur in the future along Indian Creek and in subbasins within the watershed. Communities that have or may encounter flooding problems in the future can contact the PADEP for assistance. This agency is authorized to provide flood protection to communities prone to such flooding. Municipalities have the opportunity to obtain Flood Protection Grants from the PA DEP as well.

7.3.3 Abandoned Mine Drainage

Abandoned Mine Drainage (AMD) is the major issue and its problems vary from site to site. AMD issues are found in numerous sub-basins of the watershed (Refer to Figures 3 and 5). The source of AMD discharges can be from deep mines, surface mines, and coal refuse piles. AMD involves various water quality parameters and has seasonal discharge flows. It is critical to have good water quality and discharge flow data in order to fully understand and thus treat a discharge properly. Additionally, AMD remediation projects can involve multiple property owners and, therefore, require much coordination. This makes each problem and solution quite unique. The different AMD remediation alternatives that can be utilized to make improvements to problem situations are listed in Section 8.3. Water Resources.

7.3.4 Sewage

Indian Creek Valley Water Authority (ICVWA) has observed through its documentation of watershed water quality problems that raw sewage is a common cause of water quality degradation. Indian Creek's water quality is impacted by malfunctioning and/or non-existent on-lot septic systems. However, the degraded water quality due to sewage pollution is masked by the high volume of AMD within the watershed (ICVWA, 2001).

7.3.5 Nutrient Enrichment

Nutrient Enrichment is a water quality parameter that involves water polluted by agricultural, golf course, and residential runoff (i.e., animal feedlots, leaking septic systems, home gardens and lawns, athletic fields, golf courses, etc.). Nutrient enrichment was not found to be a problem in the PADEP 303(d) investigation of the Indian Creek Watershed. However, the ICVWA has observed through its documentation of watershed water quality problems that raw sewage or effluent is a common nutrient enrichment problem. Malfunctioning and/or non-existent on-lot septic systems and large-scale animal production farming facilities impact Indian Creek's water quality. However, the degraded water quality due to nutrient enrichment is masked by the high volume of AMD within the watershed (ICVWA, 2001). Nutrient enrichment problems can be addressed as simply as working proactively with the local farmers, golf course owners, and other property owners to make land management changes. Agencies charged in assisting with these issues and currently working with local landowners are the Fayette and Westmoreland County Conservation Districts, Penn State Agricultural Extension Service, and the United States Department of Agriculture - Natural Resources Conservation Service. These agencies promote the use of Best Management Practices (BMPs) for agricultural and land development activities (PADEP, 1998). The list of BMPs promoted by these agencies is found in Section VIII Management Options, Section 8.3, Water Resources.

7.3.6 Habitat Modification

Habitat Modification pollution is an important issue and involves many types of water pollution (i. e., turbidity, thermal, salinity, oil, siltation, etc.) but is primarily driven by high stream flows (stormwater). This type of stream flow is associated with areas of a watershed that have been experiencing high developmental pressures and lack stormwater management facilities. Typically these areas have roads, parking lots, and structures whose impervious surfaces prevent precipitation from entering the groundwater and thus flow quickly to streams and other receiving waters. These receiving waters (usually first through third order streams) are not able to transmit the high flows to larger streams easily and thus erosion and flooding occurs readily. Habitat modifications thus occur to streams impacting aquatic organisms and community infrastructure alike.

Habitat modification is occurring along the headwaters of Indian Creek due to the de-icing practices with salts by the Pennsylvania Turnpike Commission. Habitat modification is also occurring near the village of Mill Run, possibly due to timbering operations that have increased stream flows in an unprotected area. An additional area of concern for potential habitat modification problems is in Indian Creek's headwater area near the proposed New Enterprise quarry facility. If proper Best Management Practices are not followed, then habitat modification problems could become an issue. If residential and commercial development increases without consideration to

stormwater management and other developmental planning issues, then this type of water quality impacts could be observed.

Rural areas of agriculture are also areas of concern regarding Habitat Modification. In these situations, farming practices, backyard landscaping, and clearing of riparian vegetation in pastures or hayfields can lead to severe erosion and sediment control problems. In addition to sedimentation from cropland erosion, stream bank erosion also poses a risk to waterways. (PADEP, 1996) Agricultural conservation plans and best management practices should be utilized to limit sediment inputs to waterways.

In order to implement restoration strategies involving habitat impacts, it is critical to have a good understanding of local land use practices (planning and development) and stream flow data in order to implement potential conservation practices. Critical areas to protect include riparian forest buffers, wetlands, and floodplain areas because one of their functions is to control high flow events and flooding. The Pennsylvania legislature enacted the Storm Water Management Act (No. 167) of 1978 to authorize a comprehensive program managing stormwater at the local level (implementation and enforcement). PADEP under this program provides grant monies to counties to develop stormwater management plans on a watershed basis (PADEP, 1997). A listing of assessment, planning, and implementation (Pennsylvania Handbook of Best Management Practices for Developing Areas) activities that can improve habitat impacted (stormwater) issues are listed in Section VIII, Section 8.3, Water Resources. Additionally, the Potential Assistance Sources for Watershed Projects lists sources of technical and financial assistance for habitat impacted and stormwater impacts (PennVest loans – Pennsylvania Infrastructure Investment Authority, 1997).

7.3.7 Water Supply

Water supply is an issue in the Indian Creek Watershed. Mining activities have had a negative impact on groundwater resources to the point that users routinely experience premature failure of copper water pipes and hot water tanks due to iron, sulfur, manganese, aluminum, pH, and conductivity associated problems (ICVWA, 2001). Mining activities past and present have placed groundwater/public water supplies at risk for further contamination by the above contaminants. Though the supply of water is abundant from the Pritts and Grimm springs, and the Neals Run well, areas of the watershed are still impacted by polluted groundwater and are not serviced by the Indian Creek Valley Water Authority (ICVWA). Future expansion of the ICVWA's facilities in areas not served would improve the standard of living to those residents.

The use of water (surface and groundwater) for snow making purposes at Seven Springs Mountain Resort has an impact on the seasonal availability of water in the Indian Creek Watershed (i.e., the Pritts Spring). The use of water across the Fayette/Somerset County and the Indian Creek/Laurel Hill Creek watershed boundaries has a seasonal impact involving water supply. This seasonal impact is associated with increased fall water storage activities by Seven Springs Mountain Resort in preparation for the winter ski season (snow making) (ICVWA, 2001).

To improve water supply availability for the Indian Creek Valley Water Authority (ICVWA) and other groundwater users, and to meet the seasonal needs of Seven Springs Mountain Resort, it is important for ICVWA, other groundwater users, Seven Springs Mountain Resort, and municipal officials to meet to discuss each groups needs in order to understand how to correct any future problems. Otherwise future water supply and quality problems could be observed on each side of the Laurel Hill boundary.

7.3.8 Stream Flow Gauging

Currently no USGS stream flow gauging stations are operated within the Indian Creek Watershed (USGS, 1999). Discontinued stations were located on Poplar Run near Normalville (station #03082200 and station #03082190), on Indian Creek at White bridge (station #03082237), and on Champion Creek near Melcroft (station #03082120). For real time stream gauging flow data for regional streams, visit the USGS website at http://pa.water.usgs.gov/rt-cgi/gen_stn_pg?. PADEP has no permanent stream sampling/gauging stations in the watershed. Re-establishment or construction of additional stream gauging stations in the Indian Creek Watershed would greatly assist these entities in gaining further knowledge on the impacts caused by high stream flows in the watershed and for developing regional hydraulic curves.

7.4 Biological Resources

7.4.1 River Otter and Fisher Reintroduction/Population Expansion Survey

The expansion of the river otter and fisher into the Indian Creek Watershed is known to have occurred. However, scientific documentation supporting the movement by the river otter and fisher has not yet been attained. Completion of such studies would be a good tool for documenting both the restoration of the river otter (and the fisher) and improvement to water quality (by utilizing the river otter and other aquatic organisms as environmental indicator species) in the Indian Creek Watershed.

7.4.2 Aquatic and Fishery Management

The middle portion of the Indian Creek Watershed is a degraded fishery. The watershed is a significant trout (coldwater) fishery in the region (Refer to Figures 4 and 5). With improvements to the degraded portions of the watershed, recreational and economic benefits would be gained. The PFBC performed a cost benefit analysis in 1999 for the Indian Creek Watershed. If the five stream segments (2 segments of Indian Creek, Champion Creek, Poplar Run, and Newmyer Run) were remediated, the estimated recreational use value could be \$797,516 per year (PFBC, 1999). The PFBC has performed aquatic surveys and fisheries evaluations in the watershed in the past. It is important for future evaluations to be completed to document improvements to the fishery by the PFBC. This would be a useful tool in making strategic decisions in the future activities of improvement projects.

7.4.3 Riparian Forest Buffers, Wetlands, and Forest

The protection of riparian zones, wetlands, and forest in the watershed is important in order to maintain the environmental health of the watershed. It also assists in improving the aesthetics of the watershed and makes the area more appealing to live in. Another important forest related issue is that of trees as an economic commodity or resource. As forest resources mature, these trees become a viable economic commodity that many individuals may choose to harvest. Sustainable forestry management practices, however, are important tools for preventing inadvertent environmental impacts as well as maintaining an economic resource for the future. Areas of the watershed that are currently being protected, or have fewer impacts to water resources due to existing riparian forest buffers, may at some point experience erosion, sedimentation and storm water run-off.

7.4.4 Natural Area Designation

Another implementation opportunity is the formal dedication of other Natural Heritage inventoried areas as Natural Areas. A natural area is an area of unique scenic, historic, geologic, or ecological value that will be maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention. These areas are set aside to provide locations for scientific observation of natural systems, to protect examples of typical and unique plant and animal communities, and to protect outstanding examples of natural interest and beauty.

An implementation goal of this RCP is to work towards gaining "formal dedication" of additional NHI areas for the protection of their ecological systems and biological diversity. A location for formal dedication is the lower Indian Creek Watershed area that encompasses the scenic gorge area. This area is shown in Figure 9 (Conservation Lands) as being partially encompassed by the Youghiogheny River BDA and Youghiogheny River Landscape Conservation Area (LCA). It is also designated by the >25% slope in Figure 7 (Constraints), near where Indian Creek discharges into the Youghiogheny River.

7.5 Cultural Resources

7.5.1 Holistic Watershed Recreational Plan

Recreational opportunities are one of the best assets and greatest potentials within the watershed. Six (6) park/recreational facilities exist within the watershed. In addition, seven (7) recreational trail projects are in place, under construction, or being studied. The mainstream of Indian Creek also provides opportunities for boating and fishing. These recreational opportunities provide the chance for everyone to experience and gain a stronger appreciation and understanding of the importance of nature within the watershed. Protecting, enhancing, and promoting the existing opportunities will help build support within the watershed. Efforts should be maintained and expanded to add to the existing facilities as well as coordinate the opportunities that exist. Things such as linking trail segments and developing trails that connect with other amenities within the watershed can greatly broaden the recreational experience for those using the resources. This will, in turn, add to overall understanding and long-term viability of the watershed.

For a recreational facility to satisfy its patron's needs, it is important to have a "Master Plan or Feasibility Study" completed. The following facilities plan to have or have had planning activities:

- Indian Creek Valley Hike-Bike Trail, and
- PW&S Mountain Bike Trail.

7.5.2 Linking Community Facilities

This can be accomplished through greenway and openspace (rail-to-trail facilities) areas. Boaters (kayakers and canoers) could also use the network of streams throughout the watershed as a "blueway".

7.5.3 Rails-to-Trails and Bikeways

Abandoned railroad beds provide a unique opportunity for communities and environmental groups to develop trails for walking, biking, roller blading, horseback

riding and cross-country skiing. Rail trails provide an alternative to common transportation options as well as providing safer recreational opportunities due to the absence of vehicle traffic.

7.5.4 Eco-tourism

Eco-tourism opportunities will be created and increase in the watershed. Marketing of ecological treasures and recreational facilities will occur as additional segments of the Indian Creek Valley Hike-Bike Trail is completed, water and in-stream habitat quality improves, Mathews Feed & Grist Mill is renovated, and many other activities established, the watershed will observe increased revenue from eco-tourism (i.e., birders, fishermen, boaters, hikers, educators, etc.). The establishment of a triathlon (e.g., biking, running, and canoeing) that assists in promoting eco-tourism and education is an opportunity for stakeholders.

7.5.5 Land Purchase for Conservation

Another vehicle for encouraging conservation in strategically identified areas is the outright purchase of the properties by a land trust, conservation organization, and/or municipality. When land is purchased for conservation purposes, parcels can then be used for green/open spaces, prevention of development on fragile lands and the treatment of degraded water.

7.5.6 Historical Property Preservation

The preservation of historical properties in a community helps to give the community its character. It is an important opportunity that can help improve communities. People like to be located near historic properties because it helps to attract business and improves one's quality of life. The preservation of historic properties is important in helping to restore the economic health of those communities. By completing historical preservation work to properties, these buildings remain an integral part of the community, thus attracting people and business. Therefore, identifying properties and property owners who wish to preserve their historic property is an important tool in improving the economic and population flight from these areas. The following historic properties are potential preservation activities:

- Mathews Feed & Grist Mill Property,
- Martha Jones House, and
- Gearhart House.

7.6 Educational Resources

7.6.1 Adult and Youth Education

An abundance of environmental educational opportunities exist in the project area. These opportunities abound for youth, adult, youth/adult and lifetime education activities. MWA's outreach program involves a presentation of the issues and concerns of the watershed. MWA's and other educational programs can be with school districts, volunteer activities, and local and regional conservation initiatives. MWA and other educator's need to continue to expand upon their community and environmental outreach programs with program substance (i.e., paid staff and brochures), equipment (i.e., power point computer software and hardware, non-point source kit, groundwater kit, carrying case), and facilities (see below).

7.6.2 Educational Facilities

A new facility (i.e., Environmental Education Center, Nature Center, Cultural Facility, etc.) would enhance environmental education programs in the watershed and assist in establishing a permanent location for the varied educational programs.

7.6.3 Community Education/Public Relations Activities

Community empowerment is another important aspect to the educational component in watershed planning. Information needs to be provided to all watershed community members concerning use and protection of resources, and quality of life issues raised by resource use, including addressing direct discharge problems, conservation use, and impacts. By doing this, the community is able to make informed choices about resource use.

As part of continued promotion of the activities in this plan (by organizations and communities), it is important to utilize the media in educating the general public of the watershed. This plan discusses numerous implementation activities that can be moved forward by numerous organizations and communities, and performing public relations activities with these activities will assist in making improvements and educating people.

8 Management Options

In Section VIII, the proposed management options are reviewed for the identified issue, concern, constraint, and opportunity. Additionally, these items are found in a simplified Management Recommendations Matrix at the end of this section.

8.1 Project Area Characteristics

8.1.1 Sprawl

At this time sprawl is not an issue in the watershed, but population projections predict potential areas of sprawl development could arise, especially in the northern portion of the watershed. It can quickly become an issue if proactive planning is not taken to anticipate potential problems. Therefore, sprawl needs to be approached by a combined effort of promoting sound development throughout the watershed while at the same time providing for economic stability. This can be accomplished through a variety of tools that are discussed in Appendix 2 (Model Ordinances, Overlay Districts, and Guidelines/ Standards), the Pennsylvania Land Conservation Handbook (Allegheny Land Trust, 1999), the Pennsylvania Smart Growth philosophy, the Growing Greener guidance document (Natural Lands Trust, 1997), establishment of Environmental Advisory Councils (EACs) at the local level, and through an Inter-Municipal Framework (2001-2002). Tools that could be utilized include:

- Envisioning the Future through completion of Community Audits
- Protecting Open Space Networks via Conservation Planning
- Implementation of Conservation Zoning
- Utilization of Conservation Subdivision Design

An Inter-Municipal Framework (or Partnering) is a process where municipal governments and local organizations work together to improve local conditions such as infrastructure, environment, and education. To solve a common problem throughout the entire length of a sub-basin, communities and organizations must work together to address the situation. For example, Saltlick Township has been working together with a local property owner and MWA in correcting the AMD impacted conditions that exist in Indian Creek near the Village of Sagamore. By working together, the community and organization are improving the quality of Indian Creek's water quality. Additionally, by working together more improvements can be made in comparison to working alone.

8.1.2 Zoning

Developing strong conservation zoning ordinances and encouraging proper administration of existing zoning ordinances (i.e., enforcement, variance activities, etc.) are keys to providing environmentally sound development practices (Refer to Appendix 2). This could be done through an Inter-Municipal Framework (2001-2002).

8.1.3 Transportation Facilities

It is important for the communities in the watershed to have appropriate zoning ordinances in place, in order for sound land management and development activities to take place (Refer to Appendix 2). This could be done through an Inter-Municipal Framework (2001-2002).

8.2 Land Resources

8.2.1 Farmland and Prime Farmland Soil(s) Protection

Protection of farmland and prime farmland soils at the municipal level is very important. If appropriate municipal zoning ordinances and codes are not in place prior to development and appropriate enforcement does not take place, then these resources and the families that rely on them will be in jeopardy. This could be done through an Inter-Municipal Framework or Model Zoning Ordinances into municipal code (2001-2002).

8.2.2 Unregulated Waste

Roadside solid waste and small dumping locations can be found in the watershed. These areas are aesthetically displeasing and sanitarily unhealthy. Municipalities through zoning and ordinances can control these unregulated waste sites at the local level (2001). Continued cleanup activities involving local citizens, conservation groups (PA Cleanways and MWA), scout troops, and school districts can assist in eliminating promiscuous solid waste sites. Participate in the "Ohio River Sweep Program" (2001+ annually).

8.2.3 Abandoned Mine Land Restoration Activities

Utilize the figures and data found in the Indian Creek River Conservation Plan; the PADEP - Technical Study Document for A Petition to Designate Areas Unsuitable for Mining; the MWA - Comprehensive Plan For Abandoned Mine Reclamation; and the USDA, NRCS - PL-566 Watershed Plan and Environmental Assessment as an inventory/guide for the remediation of gob piles and other abandoned mine sites (2005).

8.3 Water Resources

Best Management Practices (BMPs) are a series of practices and management techniques designed to control point and non-point pollution. To rectify water quality pollution sources, BMPs can be utilized in a number of different ways in order to attain the desired effect.

8.3.1 Abandoned Mine Drainage (AMD)

Abandoned Mine Drainage (AMD) is the major issue and its problems vary from site to site. The MWA - *Comprehensive Plan For Abandoned Mine Reclamation* and USDA, NRCS - *Watershed Plan and Environmental Assessment*, identified and delineated 8-10 treatment sites. In the USDA plan, recommended treatment systems, estimated average annual economic benefits, installation and financing, operation and maintenance, and cost estimates are discussed. The 10 sites selected would improve the water quality in five of the eight sub-basins delineated and restore 17.4 miles of stream that would have an annual economic value of \$886,000. Additionally, these 10

treatment sites will treat 94% of the acid load, 90% of the iron load, and 93% of the aluminum load to Indian Creek and its impacted tributaries (USDA, 2000). The USDA's recommended treatment sites are:

- Buck Run site
- Fulton discharge (2002)
- Gallentine discharge (2001)
- Kalp discharge (2004)
- Lawrence Coal site
- Marsolino-Leighty discharge (2002)
- Melcroft #3 Portal pond / associated discharges (2002)
- Nicholson discharge (2002)
- Permapress discharge (2001)
- Rondell Correal discharge (2002)

Some of these discharge sites are currently being worked on to improve the water quality of the Indian Creek Watershed (see referenced proposed construction dates). Remediation of the remaining sites needs to continue until the projects are completed (On-going). From the recently released Draft Coal Remining BMP Guidance Manual, the following are the different BMPs that can be utilized to make improvements to problem situations involving AMD and AML sites (USEPA, 2000).

1.) Hydrologic and Sediment Control BMPs: The following hydrologic and sediment control BMPs can assist in reducing groundwater, erosion and sedimentation pollution or both.

Regrading of mine spoil – Utilized to establish positive drainage, facilitate revegetation, and reduce surface water infiltration of the mine spoil.

Revegetation - Utilized to revegetate areas that were previously mined and left devoid of vegetation thus exposing coal spoil material to the atmosphere. Bio-solids are often utilized to assist in fertilization of re-vegetated areas and to assist in soil formation.

Diversion ditch installation – Utilized to direct clean surface water away from contamination (mine spoil) sources.

Installation of low-permeability caps – Utilized on gob piles and other areas that need to have a synthetic or clay-lined cap placed over the material to reduce or eliminate ground and surface water pollution.

Stream sealing – Utilized to prevent clean surface water from entering an underground mine or surface mine spoil.

Underground mine daylighting (Remining) - Eliminates coal that had been partially mined by historic mining practices and left coal exposed underground. This exposed coal continues to degrade ground and surface waters, but if removed through daylighting activities, water pollution sources can be reduced or eliminated.

Mine entry and auger hole sealing – Refers to dry or wet seals. These seals prevent (dry seals) or control (wet seal) discharge of waters from mine entries.

Highwall and pit floor drains – Horizontal or vertical highwall drains and pit floor drains are used to collect groundwater entering the spoil and work to minimize contact with contaminants.

Grout curtains – Utilized to prevent or divert the flow of groundwater from one location to another. One example would be to utilize a grout curtain between a stream and an underground mine opening.

Ground water diversion wells - Utilized to intercept and collect groundwater prior to its entrance into a backfill area or underground mine where contaminants exist.

2.) Geochemical BMPs: The following geochemical BMPs function to inhibit pyrite oxidation, reduce the contact of water with acid-producing materials, inhibit iron-oxidizing bacteria, or increase the amount of alkalinity generated within backfilled areas.

Alkaline addition – Provides alkalinity to an acidic water source to enhance precipitation of metals.

Alkaline redistribution – Utilized to add alkalinity to one location (an area deficient of alkalinity) from another alkaline addition source.

Induced alkaline recharge – Utilized to add alkalinity to water prior to it entering a spoil area or underground mine.

Special handling of acid-forming materials – Segregate acid forming materials and handle them in a manner to minimize water contact. One example is to place acid forming materials (spoil) above the water table and then placing a cap over the reclaimed area.

Special handling of alkaline materials – Segregation of alkaline materials and encourage contact of these materials with water so dissolution takes place.

Use of bactericides – Use of bactericides is utilized to inhibit or eliminate certain bacteria from becoming established in a reclamation site. Some bacteria species can increase the acidic conditions thus reducing water quality.

3.) Passive Treatment Methods or BMPs:

The following passive treatment methods or BMPs entail a number of engineered treatment systems that require minimal maintenance after construction is completed and the systems become operational. These systems can be used by themselves and/or in combination to passively treat mine discharges. These systems vary in technical/engineering complexity and thus cost. This is because each site brings its own specific water quality (chemistry), discharge flow (gallons per minute, etc.), and engineering requirements (i.e., grading, materials, specific system type, permitting requirements, etc.). Thus it is impossible to give specific cost information to a general site, because each site can vary greatly.

Successive Alkalinity Producing Systems (SAPS) – Utilized for sites with dissolved oxygen, iron (ferric or ferrous) and aluminum as components of the water quality.

Anoxic Limestone Drains (ALDs) – Utilized for sites with low dissolved oxygen, ferric iron and aluminum laden water quality.

Oxic Limestone Drains – Utilized for sites with a variety of AMD types, however, the dissolution of limestone and the generation of alkalinity is somewhat limited.

Limestone Diversion Wells (LDWs) - Utilized for sites that are relatively inaccessible and, therefore, difficult to treat. This type of system needs active (weekly to bi-weekly) maintenance to maintain treatment of the stream or discharge. This system can treat a variety of AMD types.

Open Limestone Channels (OLCs) – Is similar to oxic limestone drains and is utilized for a variety of AMD types too. However, they are found to be most effective on relatively steep slopes.

Limestone Sand – Utilized for treatment of marginally acidic streams. The sand is actually dumped along the stream bank and as flood flows wash the sand into the stream, the sand helps to increase stream alkalinity and can help to reduce dissolved metals. This treatment improves water quality in stream but does not treat the source of the AMD discharge.

Constructed Wetlands (Aerobic Wetlands and Compost Wetlands) – Utilized for treatment of sites with alkaline and acidic, laden with iron. These wetland systems can add alkalinity through sulfate reduction and in some cases dissolution of limestone that is present or added.

Pyrolusite® systems – This type of system is a patented biological process. It utilizes alkaline addition of limestone where the limestone bed is injected or inoculated with bacteria. This bacteria assists in increasing the oxidation process thereby reducing the metal concentration in AMD.

8.3.2 Sewage

Sewage is a pollution source in the Indian Creek Watershed that has received little attention. This is partly due to the masking of its impacts by AMD. However, as

improvements are made to the AMD issue, sewage related water quality pollution sources will become more pronounced (due to eutrophic conditions that will be observed). Residences and businesses with deficient or no on-lot septic systems will need to have corrective action taken. All levels of government, along with local residents and businesses, will need to work together in order to correct this water quality issue. This is due to its financial and technical aspects. Therefore, it is encouraged that citizens, businesses, local officials, and regulators participate in public meetings and forums in order to be educated on the issue(s). It is further recommended that a **Sewage Control Plan** be completed in order to understand more fully where specific problems will arise after the AMD issue is remediated, what type of sewage systems may be warranted, and where implementation is action is needed (2005).

8.3.3 Nutrient Enrichment

Nutrient enrichment is a concern in the watershed. As improvements are made to the AMD issue, nutrient enrichment water quality pollution sources will also become more pronounced. It is recommended that a **Nutrient Control Plan** be completed to study the need for improved agricultural conservation practices in the watershed. This plan should be completed in order to understand more fully where specific problems will arise after the AMD issue is remediated and where implementation action is needed (2005). Specific site conservation projects could utilize BMPs for corrective action. Many BMPs are relatively simple and inexpensive practice(s) and/or management techniques. BMPs involve conservation practices and management techniques that assist in improving water quality. A listing of BMPs and what each BMP entails can be found in the Soil and Water Conservation Technical Guide for Pennsylvania (USDA Technical Document – Consult your local County Conservation District or USDA office). The following is a list of BMPs promoted by the resource agencies:

- BMP-1 Permanent Vegetative Cover
- BMP-2 Animal Waste Management System
- BMP-3 Strip cropping and Contour Farming Systems
- BMP-4 Terrace System
- BMP-5 Diversion System
- BMP-6 Grazing Land Protection System
- BMP-7 Waterway System
- BMP-8 Cropland Protection System
- BMP-9 Cropland Tillage System
- BMP-10 Stream Protection System
- BMP-11 Permanent Vegetative Cover on Critical Areas
- BMP-12 Sediment Retention, Erosion, or Water Control Structures
- BMP-13 Soil and Manure Analysis
- BMP-14 Management of Excess Manure
- BMP-15 Fertilizer Management
- BMP-16 Barnyard Runoff System
- BMP-17 Composting

8.3.4 Habitat Modification

Though habitat modification is not a major problem in the watershed, remediation projects could be identified in specific areas that may exhibit modified stream habitat. Potential habitat modification projects could be located 1.) near the headwaters of Indian Creek due to the de-icing practices with salts by the Pennsylvania Turnpike Commission, 2.) areas near the Village of Mill Run, along Mill Run possibly due to

timbering operations, and 3.) an area of concern for potential habitat modification problems is in Indian Creek's headwater area near the future New Enterprise quarry facility (2001). Additionally, a streambank inventory could be accomplished throughout the watershed to delineate problem areas that are in need of corrective action (2002). If Best Management Practices are not followed, then habitat modification problems could become an issue. If residential and commercial development increases without consideration to stormwater management and other developmental planning issues, then this type of water quality impacts could be observed.

The following permanent and temporary vegetative and structural BMPs can assist in reducing water pollution to developing areas (CH2MHill, 1998). The BMPs are described in further detail in Section 8 of the Pennsylvania Handbook of Best Management Practices for Developing Areas that can be purchased through the PA Association of Conservation Districts.

(www.pacd.org/products/bmp/bmp_orderform.htm) (CH2MHill, 1998).

- Protection, Block and Gravel
- Inlet Protection, Excavated Drain
- Inlet Bioretention
- Constructed Treatment Wetland
- Critical-Area Planting
- Diversion
- Energy Dissipator
- Filter Bag
- Filter Strip (Level Spreader - Alternative BMP)
- Grass Swale
- Infiltration Trench & Dry Well (Dry Well, Below-Grade Detention Basin, Seepage Bed/Recharge Bed - Alternative BMP)
- Inlet Protection, Fabric Insert
- Interim Stabilization
- Lined Channel
- Outlet Stabilization Structure
- Permanent Vegetative Stabilization
- Permeable Paving System
- (Seepage Bed or Recharge Bed - Alternative BMP)
- Pond, Dry
- (Below-Grade Detention Basin, Dry Well or Detention Basin - Alternative BMP)
- Pond, Wet (Detention Basin - Alternative BMP)
- Portable Sediment Tank
- Riparian Corridor Management
- Riparian Forested Buffer
- Rooftop Runoff Management
- Sand Filter, Closed
- Sand Filter, Open
- Sediment Basin
- Sediment Trap
- Silt Curtain
- Silt Fence
- Slope Drain (Chute - Alternative BMP)
- Stabilized Construction Entrance (Tire Cleaning Strip – Alternative BMP)
- Straw Bale Barrier
- Stream Bank Stabilization
- Temporary Stream Crossing

- Tree Preservation and Protection
- Trench Plug
- Water Quality
- Inlet

The following assessment, planning, and implementation activities can also improve habitat-modified streams, and can involve many of the above BMPs as components of these activities.

- Fluvial GeoMorphology Assessment and Design
- Pennsylvania's Stormwater Management (Planning) Program
- (PA Act 167)
- Pennsylvania Handbook of Best Management Practices
- for Developing Areas (see above)
- Local Community Zoning and Planning

A potential source of assistance for communities and conservation groups interested in participating in stream improvement projects is **The Pennsylvania Department of Environmental Protection's Stream Improvement Program**. This program offers assistance to increase flood protection, remediate erosion problems, repair flood damaged stream channels, and for associated habitat improvement (PADEP, 2001)

8.3.5 Water Supply

Water supply is an issue in the Indian Creek Watershed. Mining activities have had a negative impact on groundwater resources. Though the supply of water is abundant from the Pritts and Grimm springs and Neals Run well, areas of the watershed are still impacted by polluted groundwater and are not serviced by the Indian Creek Valley Water Authority (ICVWA). Future expansion of the ICVWA's facilities in areas not served would improve the standard of living to those residents (on-going).

The use of water (surface and groundwater) for snow making purposes at Seven Springs Mountain Resort has an impact on the seasonal availability of water in the Indian Creek Watershed (i.e., the Pritts Spring). The use of water across the Fayette/Somerset County and the Indian Creek/Laurel Hill Creek watershed boundaries has a seasonal impact involving water supply. This seasonal impact is associated with increased fall water storage activities by Seven Springs Mountain Resort in preparation for the winter ski season (snow making) (ICVWA, 2001).

Within the watershed, potential sources of contamination (i.e., under/above-ground storage tanks, industrial facilities, car washes) should be identified and monitored to prevent contamination to groundwater. The development of a watershed-wide Wellhead Protection Plan would provide needed protection to public water supply sources. Additionally, wellhead protection areas should be delineated to prevent contaminants from being located near such potable drinking water sources (i.e., wells, springs, surface water intakes).

To improve water supply availability for the Indian Creek Valley Water Authority (ICVWA) and other groundwater users, and to meet the seasonal needs of Seven Springs Mountain Resort, it is important for ICVWA, other groundwater users, Seven Springs Mountain Resort, and municipal officials to meet to discuss each groups needs in order to understand how to correct any future problems (2002).

Additionally, a watershed-wide study of hydrologic conditions should be completed. Such a study should address existing conditions, potential limitations to water supply, potential and existing stressors to hydrology, and remedial opportunities. (2003)

Stream Flow Gauging

Re-establishment and construction of stream gauging stations in the Indian Creek Watershed should be coordinated with the PADEP, USGS, and USACOE to assist in specific site location determination (2002).

8.4 Biological Resources

8.4.1 River Otter and Fisher Reintroduction/Population Expansion Survey

The completion of a study that scientifically documents the movement of the river otter and fisher into the watershed is needed. Completion of such studies would document both the restoration of the river otter (and fisher) and improvement to water quality (by utilizing the river otter and other aquatic organisms as environmental indicator species) in the Indian Creek Watershed (2002).

8.4.2 Aquatic and Fishery Management

The completion of an aquatic survey and fishery evaluation by the PFBC or others would be a useful tool in making strategic decisions in the future activities of improvement projects (2005-2010).

8.4.3 Riparian Forest Buffers, Wetlands, and Forest

Complete an inventory and management plan for the protection of riparian zones, wetlands, forest, and floodplains in the Indian Creek Watershed (2002). Promote the use of Sustainable Forest Management practices to prevent adverse environmental impacts to the watershed and sustain economic productivity for the future (Refer to Appendix 2) (Ongoing).

8.4.4 Natural Area Designation

Work with the local landowners, PADCNR, MWA, and municipal officials to establish additional areas in the Indian Creek Watershed as dedicated natural areas. Formally dedicate the lower Indian Creek Watershed area that encompasses the scenic gorge area as a Natural Area. This area is shown in Figure 9 (Conservation Lands) as being partially encompassed by the Youghiogheny River BDA and Youghiogheny River Landscape Conservation Area (LCA). It is also designated by the >25% slope in Figure 7 (Constraints), near where Indian Creek discharges into the Youghiogheny River (2002).

8.5 Cultural Resources

8.5.1 Holistic Watershed Recreational Plan

Complete a holistic park/recreational "Master Plan and/or Feasibility Plan" that includes facilities currently being planned. Additionally, use this plan to increase community awareness of recreational resources that may be currently underutilized. Such resources could include Mill Run Reservoir and planned/existing rail-to-trail facilities (2002).

8.5.2 Linking Community Facilities

In the a holistic park/recreational "master plan" form linkages which include both rail-to-trail and bikeway facilities, as well as by the network of streams throughout the watershed via a "blueway" (on-going). Develop rail-to-trail facilities that extend the length of the watershed from the northern study area around Route 31 linking south to

the Youghiogheny River Trail. Efforts to expand existing facilities will encourage inter-community recreation throughout the watershed.

8.5.3 Rails-to-Trails and Bikeways

Complete needed feasibility studies and construction activities on the following facilities (On-going):

- Indian Creek Valley Hike-Bike Trail, and
- PW&S Mountain Bike Trail.

8.5.4 Eco-tourism

Eco-tourism is an opportunity that will increase into the future in the watershed. The establishment of such activities as a Watershed Triathlon could help to bring revenue into the watershed. As facilities are constructed and activities established, the watershed will observe an increased venue from eco-tourism. To assist in the economic development of eco-tourism in the project area, the local chamber of commerce, municipal officials, small business or facility owner/operators need to work together to assist in spawning this type of economic activity (2001).

8.5.5 Land Purchase for Conservation

Strategically identify areas for the outright purchase of the property by a land trust, conservation organization, and/or municipality so it can be utilized for the treatment of a water quality issue, green/open space, or to prevent land development in critical areas (No final implementation date (on-going)).

8.5.6 Historical Property Preservation

Create an inventory of historic properties that identifies each property for the purpose of preserving its historic integrity. This is an important tool in improving the economic and population flight from the watershed. The following properties are potential preservation activities (on-going):

- Mathews Feed Grist Mill Property
- Martha Jones House

8.6 Educational Resources

8.6.1 Adult and Youth Education

An abundance of environmental educational opportunities exist in the watershed. These opportunities abound for youth, adult, youth/adult and lifetime education activities. MWA and other educator's need to continue to expand upon their community and environmental outreach programs with program substance (i.e., paid staff and brochures), equipment (i.e., power point computer software and hardware, non-point source kit, groundwater kit, carrying case), and facilities (see below) (2001+).

8.6.2 Educational Facilities

A new facility (i.e., Environmental Education Center, Nature Center, Cultural Facility, etc.) would enhance environmental education programs in the watershed and assist in establishing a permanent location for the varied educational programs (2001).

8.6.3 Community Education/Public Relations Activities

Community empowerment is an important aspect to the educational component in watershed planning by providing information to all watershed community members. Educational information concerning use and protection of resources, and quality of life issues raised by resource use, include addressing direct discharge problems, conservation use, and impacts. By providing watershed/community educational materials, the community is able to make informed choices about resource use (2001+).

Stimulate community education as part of continued promotion of the activities in this plan (by organizations and communities). It is important to utilize the media in educating the general public of the watershed. This plan discusses numerous implementation activities that can be moved forward by organizations and communities, and performing public relations activities with these activities will assist in making improvements and educating people (2001+).

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
A. Project Area Characteristics				
1. Holistic Watershed Planning and Inter-Municipal Framework	Mountain Watershed Association (MWA) has been the responsible organization for the whole of the watershed for conservation activities. MWA should continue to promote and implement the River Conservation Plan. Additionally, promote an inter-municipal framework necessary for coordinated or unified comprehensive plans, zoning codes, and subdivision and land development ordinances in the watershed to assist in curbing sprawl.	County and 9 municipal planning officials, watershed stakeholders, and MWA.	Pennsylvania Department of Conservation and Natural Resources (PADCNR) circuit rider for funding Executive Director position and Keystone Funds.	2001-2002
2. Model Zoning Ordinances	Develop example zoning and ordinances that are protective of agricultural soils, steep slopes, land, riparian, and floodplain resources. These are especially important in the Donegal area where development can occur at a higher rate along the Pennsylvania Turnpike and S.R. 31.	County and 9 municipal planning officials, watershed stakeholders, and MWA.	Fayette and Westmoreland Counties Planning Departments, Pennsylvania Department of Community and Economic Development (DCED) and PADCNR: Keystone Funds. Appendix 2.	2001-2002
B. Land Resources				
1. Farmland Protection	Complete a comprehensive plan by inventorying watershed farmland (active/inactive), prime soils, farmland of statewide importance, PA Acts 43 (Agricultural Security Areas), 71 (water and sewer assessment exemption), 100 (Agricultural Land Condemnation Approval Board- reviews transportation & solid waste issues related to farmland), and 319 (Clean & Green) properties as it relates to farmland protection.	USDA-Natural Resources Conservation Services, county conservation districts, local municipalities, and MWA.	PADEP, PADCNR: Keystone Funds, and Conservation Districts.	2001-2002
2. Unregulated Solid Waste Sites	2A. Complete an inventory of unregulated waste sites for potential reclamation and development opportunities (e.g., dump sites and junk yards). 2B. Participation in the "Ohio River Sweep Program." 2C. Enact and enforce local zoning and ordinances to control unregulated sites.	PADEP, local municipal officials and MWA.	PADEP, PADCNR: Keystone Funds, and EPA.	2A. 2002, 2B. 2001+ annually, and 2C. 2001.
3. Abandoned Mine Land (AML) Sites	Utilize the figures and data found in this plan, the <i>Technical Study Document for A Petition to Designate Areas Unsuitable for Mining</i> , and the <i>Comprehensive Plan for Abandoned Mine Reclamation</i> , and the <i>PL 83-566 Watershed Plan and Environmental Assessment</i> for potential reclamation opportunities (e.g., mine tailing piles, tipple sites, abandoned un-reclaimed sites, etc.).	PADEP, local municipal officials and MWA.	US Department of Agriculture (USDA) Public Law 83-566 Program, PADEP (Abandoned Mine Land [AML] 10% Set Aside, Growing Greener, and WRAP Programs), PADCNR: Keystone Funds, US Environmental Protection Agency (EPA) 104 and 319 Programs, and Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR) Funds.	2005
C. Water Resources				
1A. Water Quality and 1B. Flow Monitoring	1A. Continue the watershed wide volunteer water quality monitoring program. Sample for chemical and biological (e.g., macroinvertebrate [insects] and fish) parameters. 1B. Re-establish the stream gauging (flow monitoring) locations on Indian Creek and its tributaries to assist in gathering hydraulic data that can be utilized for a variety of planning activities.	1A. MWA and school districts and 1B. PADEP, USACOE, and USGS.	1A. PADCNR: Keystone Funds, Growing Greener, USGS, League of Women Voters (LWV) - Citizen Education Fund, PADEP, Canaan Valley Institute (CVI), Isaac Walton League (IWL) - Save Our Streams program, Senior Citizens Volunteer Monitoring program (EASI), local colleges/universities, & local school districts. 1B. PADEP, USACOE, and USGS.	1A. On-going 1B. 2002
2. Water Quality Strategic Plan (WQSP)	As part of the watershed wide volunteer monitoring program, develop a strategic plan that assists in prioritizing restoration, enhancement, and protection activities to make improvement to the watershed.	MWA and PADEP	EPA (104 & 319 programs), USDA PL 83-566 Program, PADCNR: Keystone Funds, PADEP (Growing Greener), Western Pennsylvania Watershed Protection Program (WPWPP) of the Heinz Endowments, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2002+
3. Abandoned Mine Drainage (AMD) Plan	Utilize the figures and data found in this plan, the <i>Technical Study Document for A Petition to Designate Areas Unsuitable for Mining</i> , and the <i>Comprehensive Plan for Abandoned Mine Reclamation</i> , and the <i>PL 83-566 Watershed Plan and Environmental Assessment</i> for potential remediation opportunities.	MWA and PADEP	EPA (104 & 319 programs), PADCNR: Keystone Funds, PADEP (Growing Greener, Reclaim PA, Bond Forfeiture Program, etc.), Pennsylvania Department of Transportation (PENNDOT)/Pennsylvania Turnpike Commission (PTC) stream/wetland mitigation funds, WPCAMR, WPWPP, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2001
4. AMD Remediation Activities	Complete remediation of the ten (10) USDA recommended treatment sites.	MWA, municipalities, and PADEP.	EPA (104 & 319 programs), USDA PL 83-566, PADCNR: Keystone Funds, PADEP (Growing Greener Program, Reclaim PA, Bond Forfeiture Program, etc.), PENNDOT)/PTC stream/wetland mitigation funds, WPCAMR, WPWPP, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2001

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
C. Water Resources				
5. Nutrient/Sewage Control Plan	Complete a 5A. Nutrient Control Plan and 5B. Sewage Control Plan of the watershed to understand the future water quality problems that will be encountered as the AMD problems are remediated. These studies will assist with understanding issues involving nutrient enrichment and sewage conditions in the watershed's streams, understanding where problem agricultural operations are in the watershed, and where upgrades to septic systems and water treatment facilities are needed. Ordinances that address Concentrated Animal Feeding Operations (CAFO) should be adopted to regulate and limit the problems associated with such agricultural operations.	Local and County government, PADEP, EPA, MWA, ICVWA, and the Conservation Districts.	County, State (PA Act 537 program), PADCNr: Keystone Funds, and Federal.	2005
6. Stormwater Management Plan	Complete a PA Act 167 Stormwater Management Plan in the watershed.	Municipal and county governments.	EPA, PADEP (PA Act 167 program), and PADCNr: Keystone Funds. Appendix 2.	2002
7. Model Zoning Ordinances	Until a PA Act 167 Plan is completed at the county level, encourage local municipalities to create and/or improve local stormwater management ordinances.	Municipal and county governments.	PADCNr: Keystone Funds and Local government. Appendix 2.	2000-2001
8. Water Supply	8A. Continue with expansion of the Indian Creek Valley Water Authority's (ICVWA) facilities in areas not currently served by the public water supply provider. 8B. ICVWA, other groundwater users, Seven Springs Mountain Resort, and municipal officials meet to discuss surface and groundwater supply issues of the watershed. 8C. Complete a watershed-wide hydrologic assessment to determine cumulative impacts, existing conditions, and potential/existing stressors.	ICVWA and municipal government.	DCED, PennVest, and USDA Rural Development Programs.	8A. On-going 8B. 2002 8C. 2003
9. Stream Flow Gauging	Re-establishment and construction of stream gauging stations in the watershed to assist with local and regional planning activities	PADEP, USGS, USACOE.	PADEP, USGS, and USACOE.	2002
10. Fluvial GeoMorphology (FGM) Assessment	Complete FGM assessments in sub-basins which are currently impacted by high stormwater flows and in sub-basins that are experiencing high development activities. Priority areas in the watershed include 1. Indian Creek Headwater Area[s] and 2. Mill Run Sub-basin.	County governments and PADEP.	EPA (319 program), USGS, PADCNr: Keystone Funds, PADEP (Growing Greener and Releaf Programs), PENNDOT/PTC stream/wetland mitigation funds, WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
11. FGM, Riparian, and Streambank Stabilization Projects	Utilize FGM assessments to complete project designs for remediation of stormwater impacts to streams and infrastructure. Priority areas in the watershed include 1. Indian Creek Headwater Area[s] and 2. Mill Run Sub-basin.	PADEP, county governments, and local municipal governments.	EPA (319 program), PADCNr: Keystone Funds, PADEP (Growing Greener, Dirt and Gravel Road, and Releaf Programs), PENNDOT/PTC stream/wetland mitigation funds, WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2001-2002
12. Groundwater Protection Plan	Complete a Groundwater Protection Plan that includes a 12A. Groundwater Inventory and a 12B. Groundwater Use and Needs Survey . This plan would include i. Private Water, ii. Public Water, and iii. Commercial Water Supplies – Immediate and Future Uses.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA, PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
13. Source Water Assessment Protection Plan	Complete a Source Water Assessment Protection Plan that would review all potential sources of contamination to surface waters and provide recommendations for the protection of surface waters from contaminant sources.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA (319 program), PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
14. Wellhead Protection Plan	Complete a Wellhead Protection Plan that would identify wellhead protection areas for groundwater supplies. The plan would review all potential sources of contamination to the wellhead protection areas and provide recommendations for the protection of the wellhead protection areas from contaminant sources.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA, PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005
15. Headwater Protection Plan	Complete a Headwater Protection Plan that would identify headwater stream resources and the quality of these resources. Headwaters that are in good condition would have recommendations for their conservation and protection, and impaired sources would have recommendations for resource improvement.	Local and County government, PADEP, EPA, MWA, and ICVWA.	EPA (319 program), PADCNr: Keystone Funds, PADEP (Growing Greener), WPWPP, McKenna Foundation, Pittsburgh Foundation, Mellon Foundation, CVI, etc.	2005

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
D. Biological Resources				
1. Aquatic and Fishery Management	Complete an Aquatic Survey and Fisheries Evaluation of the watershed.	MWA, Pennsylvania Fish and Boat Commission (PFBC), PADEP, US Geological Survey (USGS), US Army Corps of Engineers (Corps), and regional colleges/universities.	EPA Star Grant, PADCNr: Keystone Funds, and Fish American Foundation.	2005-2010
2. Protection of Important Habitats [Riparian Forest Buffers and Wetlands, Forest, and Natural Heritage Areas]	Establish Natural and Protected Areas in watershed as delineated in the Natural Heritage Inventories. Have additional areas formally designated as Natural Areas.	County and municipal officials with assistance from MWA, land trusts, and the Western Pennsylvania Conservancy (WPC).	Property placed into conservation easements, areas designated by owner, and PADCNr: Keystone Funds.	2002
3. River Otter and Fisher Reintroduction/Population Expansion Survey	Completion of this type of survey or study would assist in documenting the efforts of the reintroduction programs in Pennsylvania and neighboring states. Additionally, this work would help to biologically document the improvement of Indian Creek's water quality.	Dr. Tom Serfass (Frostburg State University (MD) and other regional colleges/universities, PADEP, PFBC, PGC, and US Fish and Wildlife Service (USFWS).	Pennsylvania's Wildlife Conservation Fund, EPA Star Grant, PADCNr: Keystone Funds, and Fish American Foundation.	2002
4. Natural Area Designation	Establish Natural and Protected Areas in watershed as delineated in the Natural Heritage Inventories. Have additional areas formally designated as Natural Areas.	County and municipal officials with assistance from MWA, land trusts, and the Western Pennsylvania Conservancy (WPC).	National Park Service (NPS) - Rivers, Trails, and Conservation Assistance program, EPA Environmental Education Grants Program, PADCNr: Keystone Funds, and county and municipal government.	2002
E. Cultural Resources				
1. Holistic Watershed Recreational Plan	Utilize the various recreational plans that have been completed or are being completed to enhance the varied recreational opportunities (e.g., linking parks via bikeways or trails).	MWA, WPC, and local communities.	PADCNr: Keystone Funds and NPS - Rivers, Trails, and Conservation Assistance program.	2002
2. Bikeway/Trail Feasibility Study/Plan	Further develop the ICVHBT and other trails along Indian Creek.	MWA, WPC, and local communities.	PADCNr: Keystone Funds and NPS - Rivers, Trails, and Conservation Assistance program.	On-going
3. Trail Construction Activities	Construct trails and link resources based on Feasibility Study/Plan.	MWA, WPC, and local communities.	PADCNr: Keystone Funds, PADEP: Growing Greener, PENNDOT TEA-21 funds, and NPS - Rivers, Trails, and Conservation Assistance program.	On-going
4. Land Acquisition for Conservation Activities	Purchasing of properties (e.g., Important Habitats, Natural Heritage Areas, Critical Areas, and Potential Remediation Sites) for conservation, preservation and/or remediation opportunities. Cooperate with Municipal Authority of Westmoreland County to obtain rail/trail lease and promote the trail as public access to recreation in Lower Indian Creek Gorge and the Youghiogheny River.	Allegheny Land Trust, MWA, and WPC.	PADCNr: Keystone Funds and NPS - Rivers, Trails, and Conservation Assistance program.	No Final Implementation Date. This can be an on going activity.
5. EcoTourism	EcoTourism will increase as cultural, recreational, and educational opportunities expand. Opportunities will be tied to Indian Creek, the rail-to-trail network, and environmental educational facilities. Development of a "passive" activity map/brochure would assist in improving ecotourism. The establishment of a Watershed Triathlon would assist generating revenue and expand public awareness of issues.	MWA, community athletic associations, local chamber of commerce, Three Rivers Paddlers Club, local sportsmen clubs, municipal officials, and small business/facility operators.	Penn's Woods West Charitable Trust (PWWCT), Community and Regional Foundations, NPS - Rivers, Trails, and Conservation Assistance program, local chamber of commerce, municipalities, small business, and PADCNr: Keystone Funds.	2001
6. Historical Property Preservation	Preserve historical properties so they are destination points for tourists. Properties for potential preservation include the Mathews Feed and Grist Mill and Jones Family House.	Historic property owner(s), community historical societies, and local chamber of commerce.	PADCNr: Keystone Funds, PENNDOT/PTC cultural resource mitigation funds, and community and regional foundations.	On-going

Management Recommendations Matrix

Management Issue	Management Recommendation	Responsible Entity	Potential Assistance Sources	Implementation Schedule
F. Educational Resources				
1. Adult and Youth Education	Integrate watershed wide volunteer water quality monitoring program with other local/regional activities. Develop watershed wide integrated local school district and adult education programs through outdoor environmental classrooms and activities.	MWA, local school districts (Envirothon Program), and local/regional colleges and universities.	PADCNr: Keystone Funds, PADEP's Citizens' Volunteer Monitoring Program, CVI, Alliance for Aquatic Resource Monitoring, LWV - Citizen Education Fund, SWRC, and EPA Environmental Education Grant program.	2001+
2. Educational Facilities	Develop a new facility that would house and integrate watershed wide local school district curriculum with local conservation demonstration projects.	MWA, local school districts (Envirothon Program), and local/regional colleges and universities.	EPA Environmental Education Grant program, PADCNr: Keystone Funds, Pennsylvania Department of Education (PADE), Environmental Education Program, LWV - Citizen Education Fund, and school district funded.	2001
3. Public Relations	Provide year round continuing education to watershed stakeholders through the use of various forms of the media. This can be through the use of local and regional papers, magazines, and regular, cable, and satellite television providers.	Local school districts, communities, and MWA.	GreenWorksChannel.org and Pennsylvania Center for Environmental Education.	2001+
4. Community Empowerment	Provide information to all watershed community members concerning use and protection of resources, and quality of life issues raised by resource use, including addressing direct discharge problems, conservation use, and impacts. Enable the community to make informed choices about resource use.	Local school districts, communities, MWA, and Conservation Districts.	EPA Environmental Education Grant program, PADCNr: Keystone Funds, Pennsylvania Department of Education (PADE), Environmental Education Program, LWV - Citizen Education Fund, Pennsylvania Center for Environmental Education, and school district funded.	2001+

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS IN PENNSYLVANIA

Source of Assistance	Phone	Contact Information	Assistance Information	Planning	Const.	Other
Environmental Protection Agency: Region III	(T) 215-814-5756 Mr. Bernie Samoski	Water Protection Division 3WP10, 1650 Arch Street Philadelphia, PA 19103-2029 www.epa.gov	Grants awarded to small non-profit groups for various projects in Region III	YES	YES	YES
EPA - Region III Environmental Education Grants	(T) 215-814-5546 Ms. Nan Ides	3G00, 16 th Floor 1651 Arch Street Philadelphia, PA 19103 www.epa.gov	Grants awarded to small non-profit groups for various projects in Region III	YES	YES	YES
Natural Resources Conservation Service (NRCS)	(T) 814-445-8979 Mr. Dan Seibert	North Ridge Building, Suite 105 1590 North Center Avenue Somerset, PA 15501 www.nrcs.usda.gov	Technical and funding assistance to farmers for planning, design, construction, and maintenance activities. These involve many programs (i.e., fencing and stream crossings, farmland protection). Plan development for natural resource concerns within a watershed area: cost-sharing available to carry out plan.	YES	YES	YES
NRCS PL 83-566, Watershed Protection and Flood Prevention Act	(T) 814-445-8979 Mr. Dan Seibert	North Ridge Building, Suite 105 1590 North Center Avenue Somerset, PA 15501	Plan development for natural resource concerns within a watershed area: cost-sharing available to carry out plan.	YES	YES	YES
Office of Surface Mining Reclamation and Enforcement	(T) 717-782-4473 Mr. David Hamilton	415 Market Street Transportation Building Suite 3C Harrisburg, PA 17101	Provides funds to Appalachian Clean Streams Initiative for Abandoned Mine related activities.	YES	YES	YES
PA - Growing Greener	(T) 717- 705-5400 1-877-PAGREEN Ms. Patricia Grim	Rachel Carson St. Office Bldg. 9 th Floor, 400 Market Street PO Box 8776 Harrisburg, PA 17109-8776 www.dep.state.pa.us	Funds for PennVest, PA Department of Agriculture, Department of Environmental Protection and Department of Conservation and Natural Resource activities.	YES	YES	YES
PA DEP - Nonpoint Source Management Program (Section 319 & WRAP)	(T) 717- 787-5259 Ms. Jane Earle	400 Market Street PO Box 8555 Harrisburg, PA 17105-8555 www.dep.state.pa.us	Provide funding for improving Non-point source water pollution.	YES	YES	YES

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS IN PENNSYLVANIA

Source of Assistance	Phone	Contact Information	Assistance Information	Planning	Const.	Other
Farm Service Agency	(T) 724-834-0830 Mr. John Lohr	Donohoe Center RD # 12 - Box 202-B Greensburg, PA 15601 www.fsa.usda.gov www.fs.fed.us	FSA offers financial assistance for streambank fencing and crossings for farmers.	NO	YES	YES
Fayette Co. Conservation District	(724) 438-4497 Mr. Doug Pietro	10 Nickman Plaza Lemont Furnace, PA 15456	Provides technical assistance for conservation activities Small grants to non-profit organizations for clean water projects.	YES	YES	YES
Appalachian Clean Streams Initiative	(T) 412-937-2863 Mr. Milton Allen (T) 717-782-4036 Mr. David Hamilton (T) 717-788-8526 Mr. Jim Mays (T) 412-880-0486 Ms. Tracey Robinson	Office of Surface Mining 1951 Constitution Ave. NW Washington, DC 20240 mallen@osmre.gov 1405 State Office Building 300 Liberty Avenue Pittsburgh, PA 15222 www.dcnr.state.pa.us	Assists with restoration activities involving abandoned mine drainage issues throughout Appalachia.	YES	YES	YES
DCNR: Rivers Conservation Program	(T) 717-772-4048 Mr. Durlia Lathia	400 Market Street Harrisburg, PA 17105 www.dep.state.pa.us	Offer technical and financial assistance for planning, implementation, development, and acquisition grants. Applications: Late August Proposals: Early February	YES	YES	YES
DEP: Stormwater Management Program	(T) 717-787-8821 Mr. Woody Colbert	2301 North Cameron Street Harrisburg, PA 17110-9408	Watershed planning for stormwater control and implementation of programs at local levels.	YES	YES	YES
Dirt and Gravel Road Maintenance	(T) 717-545-8878 Education Specialist	4999 Jonestown Road Suite 203 Harrisburg, PA 17109	Financial assistance through participating conservation districts.	YES	YES	YES
State Conservation Commission						
PA Association of Conservation Districts: Educational Mini-Projects Program			Small grants for PA based grassroots educational projects that address non-point source watershed concepts.	NO	NO	YES

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS IN PENNSYLVANIA

Source of Assistance	Phone	Contact Information	Funding Information	Planning	Const.	Other
The Leo Model Foundation	(T) 215-546-8058 Extension 3021 Ms. Margaret Stridick (T) 412-391-5122	ICO - Model Entities 310 South Juniper Street Philadelphia, PA 19107-5818	Grants for habitat, conservation, watershed conservation, and species preservation.	YES	YES	YES
The Pittsburgh Foundation	Mr. Alfred Wishart, Jr. (T) 412-391-5122	The Pittsburgh Foundation One PPG Place - 30 th Floor Pittsburgh, PA 15222-5401	Funding grants to organizations located in Allegheny County for special projects, seed money for new programs, or grants which would leverage additional funding.	YES	YES	YES
The William Penn Foundation	(T) 215-988-1830 Ms. Hollister Knowlton	Two Logan Square 11 th Floor 100 North 18 Street Philadelphia, PA 19103-2757	Submit proposals Jan. 1, March 15, June 1, and Sept. 15 Grants to preserve natural areas, including environmental education and planning, within the foundation's geographic area.	YES	YES	YES
US Army Corps of Engineers	(T) 412-395-7210 Dr. Ed Smith	1928 Federal Building 1000 Liberty Avenue Pittsburgh, PA 15222 www.usace.army.mil/	Provides funding and technical assistance through a variety of planning and construction programs for environmental improvement, flood protection, and other projects.	YES	YES	YES
US Geological Survey	(T) 717-730-6916 Mr. John Nantz jmnantz@usgs.gov	840 Market Street Lemoyne, PA 17043 http://pa.water.usgs.gov	Provides technical assistance through planning programs for environmental improvement, flood protection, and other projects.	YES	YES	YES
Vira I. Heinz Endowment	(T) 412-281-5777 (F) 412-281-5788 Mr. Andrew McElwaine	30 CNG Tower 625 Liberty Avenue Pittsburgh, PA 15222-3115 www.heinz.org/low/environment/	Funds to implement ecosystem programs in selected western PA watersheds. Small matching grants are provided to the DCNR for the Coldwater Heritage program.	YES	YES	YES
Westmoreland Co. Conservation District	(T) 724-837-5271 Mr. Greg Phillips	Donohoe Center RD # 12 - Box 202-B Greensburg, PA 15601 www.wcdpa.com	Provides technical and financial assistance to farmers, developers, and conservation organizations.	YES	YES	YES

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS IN PENNSYLVANIA

Source of Assistance	Phone	Contact Information	Assistance Information	Planning	Const.	Other
PA Organization for Watersheds and Rivers	(T) 717-234-7910 Mr. Walt Pomeroy wpomeroy@aol.com	PO Box 765 Harrisburg, PA 17108	POWR assists river and watershed organizations in Pennsylvania.	YES	NO	YES
PADEP Southwest Regional Office	(T) 412-442-4149 (F) 412-442-4194 Ms. Rita Coleman (T) 412-442-4049 Ms. Karen Crowley (T) 717-236-8825	400 Waterfront Drive Pittsburgh, PA 15222-4745 www.dep.state.pa.us	Grants for various environmental, conservation, and educational activities.	YES	YES	YES
PA Stream ReLeaf Program	Ms. Susan Richards	Alliance for the Chesapeake Bay 600 North Second Street Harrisburg, PA 17101	Grants for riparian buffers along streams. For the purchase of trees, seed and planting mats. Grants between \$500-\$1000.00 Application: January Begin: Spring Complete: July	YES	YES	YES
Penn's Corner RC&D	(T) 724-834-9063 Mr. Nevin Ulery	Donhoe Center RD 12, Box 202B Greensburg, PA 15601	Provides technical assistance and small financial grants to non-profit organizations in 9 southwestern PA counties.	YES	YES	YES
Pennsylvania Fish and Boat Commission	(T) 814-359-5228 Mr. Tom Shervinski	Adopt-A-Stream Program 450 Robinson Lane Belleville, PA 16823 www.fish.state.pa.us	Offers technical assistance on design and construction of stabilized stream crossings.	YES	YES	YES
Pennsylvania Game Commission	(T) 717-787-6400 Mr. Dennis Neideigh	2001 Elmerton Avenue Harrisburg, PA 17110-9797 www.pgc.state.pa.us	Streambank fencing financial and technical assistance to farmers who participate in one of the commission's cooperative public-access programs.	YES	YES	YES
Pennsylvania Senior Environment Corps: Environmental Alliance for Senior Involvement	(T) 717-787-9580 Mr. Christopher Allen	400 Market Street Harrisburg, PA 17105 www.dep.state.pa.us	EASI provides technical assistance numerous environmental and education issues amongst many more.	YES	NO	YES

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS NATIONAL ORGANIZATIONS

Source of Assistance	Phone	Address	Assistance Information	Planning	Const.	Other
American Canoe Association	(T) 703-451-0141	7432 Alban Station Boulevard Suite B232 Springfield, VA 22150	May provide funding for various watershed related projects including starting groups and lobbying.	YES	NO	YES
National Park Service:	Mr. David Jenkins (T) 215-597-1581	200 Chestnut Street, 3 rd Floor Philadelphia, PA 19106	Provide technical, administrative, public facilitation and other services for a variety of projects.	YES	NO	YES
Rivers, Trails, and Conservation Assistance Program	Mr. Jody Bellows (T) 763-576-1596	2150 Third Avenue North, Suite 310 Anoka, MN 55303-2200	Grants awarded for the conservation of natural resources and water resource management.	YES	NO	YES
American Sportfish Association and Foundation	(T) 703-519-9691 Mr. Thomas Marshall	www.lindberghfoundation.org 1033 North Fairfax Street, #200 Alexandria, VA 22314	Grants awarded for: stream bank stabilization materials, instream habitat improvements, contracted heavy equipment, and stream morphology work.	NO	YES	NO
Scenic America	(T) 202-543-6200 Ms. Debra Myerson	www.fishamerica.org www.asafishing.org 801 Pennsylvania Avenue, SE Suite 300 Washington, DC 20003	Technical assistance for improving community visual quality assessments, sign control, cellular tower location, amongst other visual pollution issues.	YES	YES	YES
Wildlife Forever	(T) 612-936-0605 (F) 612-936-0915 Ms. Andrea Stoffregen	www.scenic.org 12301 Whitewater Drive Suite 210 PO Box 3404 Minnetonka, MN 55343	Provides technical and financial assistance for habitat enhancement projects.	YES	YES	YES
USEPA: Five Star Restoration Program	(T) 202-260-8076 Mr. John Pai	www.wildlife forever.org Office of Wetlands, Oceans, and Watersheds (4502F) Ariel Rios Building 1200 Pennsylvania Avenue Washington, DC 20460 www.epa.gov/owow/wetlands/restore/fsstar/	Clean Water Act Section 104 (b)(3) Program Applications - Jan./Feb.	YES	YES	YES

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS IN PENNSYLVANIA

Source of Assistance	Phone	Contact Information	Assistance Information	Planning	Const.	Other
Waterways Conservation Grant Program (Conserve 2000 Fund) Commonwealth of PA PA Fish and Boat Commission	(T) 717-657-4515 717-657-4540 (F) 717-657-4033 (T) 814-445-3454 Mr. Rick Larson	PA Fish and Boat Commission PO Box 67000 Harrisburg, PA 17160-7000 www.fish.state.pa.us	Grants support activities directed at restoring and protecting watersheds; including acquisition, and enhancing riparian habitat. Application Deadline: June.	YES	YES	YES
Western PA Watershed Protection Program	(T) 814-869-4847 Mr. John Dawes	RD #1, Box 152 Alexandria, PA 16611	Provides funding to grassroot organizations and watershed associations for site specific watershed remediation in western PA.	YES	YES	YES
WPCAMR: Western PA Coalition For Abandoned Mine Reclamation	(T) 724-837-5271 (F) 724-837-4127 Mr. Mark Killar	Donohoe Center RD # 12 - Box 202-B Greensburg, PA 15601 wpcamr@westol.com	Grants through the Regional Watershed Support Initiative Applications - December Received - January Complete - June	YES	YES	YES
Canaan Valley Institute	(T) 814-768-9584 Ms. Janie French (T) 304-866-4739 1-800-922-3601 Ms. Emily Grafton (T) 724-837-1402 Mr. Gary Sheppard	650 Leonard Street Clearfield, PA 16830 www.canaanvi.org Donohoe Center, RD # 12, Box 202-B Greensburg, PA 15601 www.westmoreland.extension.psu.edu 226 Forester Street Harrisburg, PA 17102 http://www.pa/lww.org/wren	Promotes the development and growth of local organizations committed to improving or maintaining the natural resources of their watersheds, in the Mid-Atlantic Highlands portions of PA, MD, VA and all of WV.	YES	YES	YES
Penn State Cooperative Extension	(T) 724-465-2595 (T) 724-465-4687 1-800-692-7281 Ms. Sherene Hess	Donohoe Center, RD # 12, Box 202-B Greensburg, PA 15601 www.westmoreland.extension.psu.edu 226 Forester Street Harrisburg, PA 17102 http://www.pa/lww.org/wren	Provide technical assistance to homeowners, farmers, and others concerning agricultural issues.	YES	NO	YES
League of Women Voters: Citizen Education Fund and Water Resources Education Network	(T) 724-465-2595 (T) 724-465-4687 1-800-692-7281 Ms. Sherene Hess	Donohoe Center, RD # 12, Box 202-B Greensburg, PA 15601 www.westmoreland.extension.psu.edu 226 Forester Street Harrisburg, PA 17102 http://www.pa/lww.org/wren	Grants up to \$3000.00 Application: January Begin: Spring Grants are available for community education or outreach projects pertaining to water resource issues.	YES	YES	NO

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS NATIONAL ORGANIZATIONS

Source of Assistance	Phone	Contact Information	Assistance Information	Planning	Const.	Other
North American Wetlands Conservation Council	(T) 413-253-8269 Attention: Small Grants Coordinator	Atlantic Coast Joint Venture US Fish and Wildlife Service 300 Westgate Center Drive Hadley, MA 01035-9589 www.fws.gov/r8nawwo	Program promotes long-term wetland activities through encouraging participation by new partners who may not be able to compete in the standard grant program. Grants no larger than \$50,000. Application: December Funding distributed on a first come first serve basis. Funding Distribution: February	YES	YES	YES
Walmart/Sam's Club: Environmental Clean Air and Water Grant	See Local Walmart/Sam's Club Small Grants	Grants are administered through the local stores. Talk with Store Manager for applications. Greensburg, Mt. Pleasant, Somerset, and Uniontown, PA Stores. 1120 G Street, NW Suite 770 Washington, DC 20005 www.nationaltreetrust.org/		YES	YES	YES
National Tree Trust	(T) 202-628-8733 Ms. Joanne Miller	4400 Forbes Avenue Pittsburgh, PA 15213 http://fdncenter.org	Grants awarded: Tree plantings, education, administration, and national/regional programs.	YES	YES	YES
The Foundation Center	(T) 212-620-4230 (T) 412-622-1917	614 Dorseyville Road Pittsburgh, PA 15238 www.audubon.org	An independent national service organization established by foundations to provide an authoritative source of information about private philanthropic giving.	NO	NO	YES
National Audubon Society	(T) 412-963-6100	1010 Wayne Avenue, Suite 920 Silver Springs, MD 2-910 http://www.wildlifehc.org	Inspire and educate people of southwestern PA to be respectful of the natural world.	NO	NO	YES
Wildlife Habitat Council	(T) 301-588-8994 (T) 412-433-5900	8925 Leesburg Pike Vienna, VA 22184-0001 http://www.nwf.org/habitats	Provide technical assistance to corporate and community organizations to improve wildlife habitat.	YES	NO	YES
National Wildlife Federation: Community and Backyard Wildlife Habitat Programs	Ms. Marsh Mazlavic (T) 703-790-4434 1-800-822-9919		Provide technical assistance to corporate, communities, and organizations to improve wildlife habitat.	YES	NO	YES

POTENTIAL TECHNICAL & FUNDING ASSISTANCE FOR WATERSHED PROJECTS IN PENNSYLVANIA

Source of Assistance	Phone	Contact Information	Assistance Information	Planning	Const.	Other
<p>PennVest (Pennsylvania Infrastructure Investment Authority): V.A. Johnson. 1997. <i>A Water, Sewer and Stormwater Utility's Guide to Financial and Technical Assistance Programs</i>. Harrisburg, PA.</p> <p>A 56 page guidance document that provides telephone numbers, addresses, internet and email addresses, and contacts for a variety of infrastructure grant programs. These include sewer, septic, and water systems, stormwater, floodplain management, community planning, municipal training, Appalachian Regional activities, and rural development activities. For assistance and to receive a copy of this guidance document, please call Ms. Vickie Johnson at 717-783-8618.</p> <p>Pennsylvania Department of Community and Economic Development (DCED): <u>DCED Funding Source Directory</u>. 2000. A 15 page guidance document that provides sources of information concerning a variety of funding programs to assist in community and economic development. Please contact the DCED for assistance in attaining this guidance document at 1-800-379-7448.</p>						