

A. The petitioner requests the Environmental Quality Board to
 Amend a regulation (Citation 25 Pa. Code § 93.9c.)

B. Why is the petitioner requesting this action from the Board?

The petitioners are requesting an amendment to the regulation that designates the upper Swiftwater Creek and all of its tributaries, including the Indian Run, as a High Quality Cold Water Fishery (HQ-CWF). This current designation does not accurately reflect the exceptional quality of the waters within this pristine watershed. Although the current designation affords special protection to the Swiftwater Creek, it may allow for discharges to degrade the quality of the water if a social or economic justification can be provided by a permit applicant. The redesignation of this watershed to Exceptional Value (EV) will allow only non-degrading discharges into its waters, thus protecting the existing water quality with no exceptions.

Increases in development are anticipated to occur within the upper Swiftwater Creek watershed. The redesignation of the upper Swiftwater Creek to EV will not prevent or hinder development from occurring in the watershed. Rather, it will encourage better planning of future developments, thus protecting the ecology of the stream and maintaining water quality.

The upper Swiftwater Creek and Indian Run are headwater tributaries in the Paradise watershed, a sub-watershed of the Brodhead watershed that drains into the Delaware River (Drainage List C.) The Delaware Water Gap formed at the exact point where the Brodhead watershed drains into the Delaware River.

Like the nearby Buck Hill Creek, which was redesignated from HQ to EV, Indian Run and Swiftwater Creek emanate from acidic swamps and bogs in the Glaciated Pocono Plateau region. The Pocono Plateau is 1300 feet in elevation higher than the elevation of the Delaware Water Gap, and the Plateau has a history of flooding the lowlands near the Delaware Water Gap dating back to the melting of the Wisconsin Glacier 12,000 years ago. Geologically, the Pocono Plateau is considered an upland that is a part of the Catskill formation of mountains extending into New York State, while the nearby Kittatiny Ridge at the Delaware Water Gap is considered part of the Appalachian Ridge and Valley system of mountains.

There is a substantial body of data and studies indicating that the upper Swiftwater Creek and Indian Run qualify for EV protection. Physical, chemical, and biological data sampled annually by the Monroe County Planning Commission demonstrate that these two streams maintain optimal to nearly optimal water quality. Indian Run, having optimal water quality, is the coldest stream in Monroe County based on this county-wide study. According to the a letter to DEP written by the former owner of Pocono Manor, James Ireland, Kettle Spring on Indian Run, has been a source of drinking water for the Pocono Manor community since its establishment in 1902. (See **Appendix Y for 1930 era map with location of Kettle Spring and Ireland letter.**)

In the 2005 and 2006 County Water Quality studies, Indian Run (INDIRU01) scored 33 and 29 respectively. The two Swiftwater Creek stations in the stream segment of interest (SWIFCR03 and SWIFCR07) scored 27 and 29 in 2005 and both scored 27 in 2006. A score of 31 to 35 is considered optimal. It is important to note that the County does not test the Swiftwater Creek from its headwaters to the Pocono Manor Sewage Treatment plant; the County only tests downstream from the plant. **(See Figure E-9 Appendix D for site locations.)**

Another study of the same region, the Brodhead Watershed River Conservation Plan, completed in 2002 with funding from the Department of Conservation and Natural Resources identified as a primary goal, “maintain and improve water quality and quantity throughout the watershed and insure that an adequate quantity of surface water and groundwater is maintained.” And an action item under this goal is to “protect headwaters areas.”

As a next step beyond the River Conservation Plan, the Brodhead Watershed Association obtained a Growing Greener grant from the Department of Environmental Protection to conduct a study of the Paradise Watershed – the recently completed Paradise Watershed Restoration and Protection Project. This study compiled all existing water quality and quantity data in the Paradise watershed and, for over a year, conducted additional water quality monitoring. The data compiled and collected for the Paradise WRPP are included with, and form the basis for our presenting this petition. **(See Appendix H.)**

The Paradise Watershed Management Plan included in its Action Plan, “sustain existing water quality where it is better than state standards,” (i.e. where the water quality is actually better than the stream’s designated use as defined in 25 Pa. Code §93.9c.)

The Brodhead Watershed Association has conducted volunteer monitoring of Swiftwater Creek and Indian Run since 1991 as part of its watershed-wide volunteer Streamwatch program. **A summary of the BWA data for the upper Swiftwater Creek and Indian Run is included in Appendix V.**

The Monroe County Planning Commission and Conservation District have jointly conducted annual water quality monitoring for more than ten years. **The data collected in the 2005 and 2006 studies are included in Appendices E and F.**

The studies enumerated above show that water quality in the upper Swiftwater Creek and Indian Run meet or exceed the standards required for EV designation. In order to assure that existing water quality is maintained, the petitioners are requesting that the streams be redesignated as EV.

Furthermore, the entire Brodhead Watershed has a long history as a fly fishing mecca. Ultimately, the Swiftwater Creek flows into the Paradise Creek just upstream of the village of Henryville. In 1880, according to “Remembrance of Rivers Past,” by Ernest Schweibert (1972), Grover Cleveland and Benjamin Harrison were simultaneously registered at the Henryville House, a fly fishing hotel on the Paradise Creek, during the week before their election campaign. Theodore Roosevelt and his friend and advisor Gifford Pinchot were also

registered to fish at the Henryville House. Schweibert writes in his book that Paradise Creek deserves to share credit with the Catskills as the “birthplace of American fly-fishing.” Petitioners believe this historic watershed should be preserved for current and future generations of fly fishers.

C. Describe the types of persons, businesses and organizations likely to be impacted by this proposal.

The largest landowner in the stream segment of interest is the Pocono Manor Golf Resort and Spa, purchased in 2005 by Pocono Manor Investors, LLC. Pocono Manor is an historic resort that was originally founded by Quakers from Philadelphia in 1902. The resort is located on 3,500 acres, offering fishing, sporting clays and golf. The entire Pocono Manor property was named a National Historic District in 1997 by the U.S. Department of the Interior.

Historical information and marketing materials from the Pocono Manor property are included in Appendix X.

Pocono Manor’s marketing material boasts of its 2 ½ miles of classic mountain trout stream with “deep runs, free-running riffles, mossy banks and small pools with a consistent cool seasonal flow. A heavy canopy of hemlock provides an abundance of cover for the bountiful hatches and a healthy population of rowdy native brown trout.” Pocono Manor will be positively impacted by this proposal because of the overwhelming public support for the protection of clean streams in the Poconos, and because of the importance of clean streams to Pocono Manor’s business.

Pocono Manor Investors, LLC is proposing to build a casino on the Pocono Manor property. Pocono Manor Investors, LLC was not awarded a license in 2007 and has appealed the decision of the Gaming Commission. If it is awarded a license in the future and if the casino is developed, an increased discharge to the upper Swiftwater Creek may be proposed, although the current plan is to use a non-discharge alternative. If an increased discharge is proposed, Pocono Manor Investors LLC will be impacted by the proposed EV classification because any increased discharge would have to meet or exceed existing water quality.

The Sanofi Pasteur manufacturing facility, the largest manufacturer of vaccines in the United States, is located on the Swiftwater Creek immediately downstream of the stream segment of interest. Sanofi Pasteur will be positively impacted by this proposal in that it will continue to have a beautiful, unpolluted stream flowing through its several hundred acre campus if the stream is redesignated EV. Indeed, Sanofi stocks the stream with trout and allows employees to participate in fishing contests on the campus. Sanofi also is constantly improving and monitoring the quality of the fish habitat of the stream segment it abuts.

Monroe County’s largest school district, Pocono Mountain, currently discharges effluent from its sewage treatment facility into the Swiftwater Creek below the stream segment of interest. Petitioners believe it is in the best interest of the school district, from a public relations standpoint, to be concerned about the water quality of a stream into which it discharges.

The Indian Run Fishing Club, a private fishing club with exclusive rights to fish Indian Run, will be greatly impacted in a positive way, in that it will be able to continue to rely on the excellent quality of that stream for its recreational use, as will residents of Pocono Manor who have been fly fishing in the upper Swiftwater Creek since Pocono Manor's inception in 1902.

The Swiftwater Preserve fishing club is located immediately downstream of Sanofi Pasteur. The Lake Swiftwater Club, farther downstream, uses the Swiftwater Creek as a source of water for a small man-made lake. Petitioners believe that members of these two clubs who swim in that lake or fish in the stream will be positively impacted by any and all efforts by their upstream neighbors to maintain the exceptional water quality in the Swiftwater Creek. The Henryville Flyfishers are another fishing club on the Paradise Creek below the Swiftwater confluence that will also benefit from stronger headwater protection.

D. Does the action requested in the petition concern a matter currently in litigation?

The requested action does not concern a matter currently in litigation to the petitioners' knowledge. The appeal of the decision of the Gaming Commission by Pocono Manor Investors, LLC, is unrelated to the issue of stream designation.

E. Supporting material

1) Description of upper Swiftwater Creek Watershed including Indian Run

The upper Swiftwater Creek watershed is located on USGS 7.5 minute Quadrangles for Pocono Pines and Mount Pocono and the watershed spans parts of the municipalities of Tobyhanna Township, Pocono Township, Paradise Township, and Mount Pocono Borough. (See **Figure E-1 Appendix A.**)

The Swiftwater Creek is a 13.5 km (8.4 mile) tributary to Forest Hills Run, which is a tributary to Paradise Creek near Henryville, Pennsylvania, which is a tributary to Brodhead Creek and ultimately the Delaware River Watershed, Drainage List C. It is a part of the Paradise Creek sub-watershed which drains an area of 44.5 square miles as part of the larger Brodhead Watershed. (See **Appendix W Paradise Creek Subwatershed.**)

Swiftwater Creek originates on the Pocono Plateau near the Interstate 380 and Route 940 interchange west of Mount Pocono. The Swiftwater Creek begins at an elevation of 1820 feet above sea level. It is a high gradient stream that descends 680 feet in elevation in approximately 4.5 miles from its source to its intersection with Route 611, an elevation of 1140 feet above sea level.

Indian Run, a tributary of approximately two miles, originates on the Pocono Plateau at elevation 1760 feet near the railroad line in Pocono Summit. Indian Run joins the upper Swiftwater Creek just upstream of Swiftwater, Pennsylvania, west of the Route 314 and Route 611 intersection.

The upper Swiftwater Creek watershed, for which the petitioners are requesting redesignation, is the 4.5 mile stream segment from its source in Pocono Summit to where it crosses under Route 611, just upstream from the Sanofi Pasteur manufacturing plant in Swiftwater, and the approximately two mile long Indian Run from its source in Pocono Summit to where it joins the Swiftwater Creek north of Route 314. The segment of the Swiftwater Creek that flows through the Sanofi Pasteur property is not included in this request for redesignation.

Regarding habitat, the Swiftwater Creek originates amongst forested wetlands perched on the topographically flat Pocono Plateau in Tobyhanna Township. These wetlands contain tree species including red oak, eastern hemlock, red maple, white pine, and ash. Highbush blueberry shrubs are also found in this swamp. From the point at which a defined channel for the Swiftwater Creek can be identified to downstream stretches of this watercourse, the steep banks and surrounding steep slopes prevent the collection of surface waters. Therefore, water drains quickly to the Swiftwater Creek via overland and underground flow.

The cold temperature of the waters within this watershed is maintained by the year-round shade of evergreens such as the eastern hemlock and rhododendron. A constant inflow of cold clean groundwater from the high water table of the Pocono Plateau adds to the stream flow. The cold temperature, ground water inputs and mixing of oxygen into the water as it tumbles down the escarpment of the Pocono Plateau, allows the sensitive stream macroinvertebrates to thrive in these waters.

2) **Current Designated Uses**

The upper Swiftwater Creek and Indian Run are listed on Drainage List C in 25 Pa. Code §93.9c. Both are designated as High Quality Cold Water Fisheries. The current HQ-CWF designation would allow degradation of the existing exceptional quality.

3) **Requested Designated Uses**

The requested designation for the upper Swiftwater Creek and Indian Run watershed is Exceptional Value. This designation would protect the existing water quality which is important to both the economy and the ecology of the area. **See Figure E-3 Appendix A.**

4) **Available Technical Data: Water Chemistry, Benthic Macroinvertebrates and/or Fishes**

The Swiftwater Creek/Indian Run watershed is part of the larger Paradise Watershed. This area has been studied extensively by the County and Paradise Township. The required technical data is found in the volumes below submitted with this petition. **See Map E-9 Appendix D for a map of the sampling stations.**

Monroe County Annual Water Quality Study (2005) conducted by the Monroe County Planning Commission and the Monroe County Conservation District.

Year 2005: Volume I, Executive Summary: See page 10 for SWIFCR03, page 11 for SWIFCR07 and page 13 for INDIRU01, for site locations and habitat descriptions. (See **Appendix E**)

Volume II, Technical Appendices: see page 26 for all biological metric scores. See page 39 for INDIRU01, page 49 for SWIFCR07 and page 51 for SWIFCR03 for lists of macroinvertebrates. See pages 96, 98 and 99 for water chemistry. (See **Appendix E**)

Monroe County Annual Water Quality Study (2006) conducted by the Monroe County Planning Commission and the Monroe County Conservation District.

Year 2006: Volume I, Executive Summary: See page 10 for SWIFCR03, page 11 for SWIFCR07 and page 14 for INDIRU01, for site locations and habitat descriptions. (See **Appendix F**)

Volume II, Technical Appendices: see page 29 for all biological metric scores. See page 39 for INDIRU01, page 49 for SWIFCR07 and page 51 for SWIFCR03 for lists of macroinvertebrates. See pages 99, 100 and 101 for water chemistry (See **Appendix F**)

Spreadsheet, Benthic Macroinvertebrate Metric Scores 1996 – 2005 Collected from the Monroe County Water Quality Studies. (See **Appendix G**)

Paradise Creek Watershed Management Plan (2005) sponsored by the Brodhead Watershed Association and funded through a Growing Greener grant from the Pennsylvania Department of Environmental Protection. (See **Appendix H**)

See page 29: Upper Swiftwater Creek Management Area Chemistry, and page 39 for Macroinvertebrate Trending Results.

Spreadsheet, Paradise Creek Watershed Study Field Water Chemistry for various sites along Indian Run and Swiftwater Creek. Sampling dates 2003 – 2004. (See **Appendix I**)

Paradise Watershed Historical Biological Data (1999 – 2003) Benthic macroinvertebrates and fish populations. (See **Appendix J**)

Stream Morphology and Water Quality Based Restoration Plan for the Paradise Creek Watershed (2005) prepared by Robert Limbeck, Watershed Scientist, Delaware River Basin Commission. (See **Appendix K**)

See page 17 for Upper Swiftwater sub-watershed potential restoration sites.

Biological & Fish Data Gap Analysis. Paradise Watershed Historical Biological Data, Benthic Macroinvertebrates (undated) prepared by Don Baylor, Aquatic Resource Consulting for the Brodhead Watershed Association. (See **Appendix L**)

See page 2 for fish populations and page 4 for historical macroinvertebrate data.

Fish Inventory of Paradise Creek and Tributaries (2003) prepared by Jim Hartzler, Aquatic Biologist for Paradise Township. (See Appendix M)

See page 5 for fish species and page 11 for stream characterization for Indian Run.

Land Use and Impervious Cover in the Paradise Creek Watershed: An Initial Assessment (2003) prepared by James Sheehan (See Appendix N)

See page 6 for Upper Swiftwater Management Area

Benthic Macroinvertebrates of Swiftwater Creek above and below the Pocono Manor Sewage Treatment Plant Discharge (2001) prepared by Don Baylor for Paradise Township Supervisors. (See Appendix O)

See page 7 for summary.

Electrofishing Survey of Swiftwater Creek (2000) prepared by Jim Hartzler, Aquatic Resource Consulting, for Paradise Township Supervisors. (See Appendix P)

This study was conducted below the stream segment of interest and is included for purposes of evaluating sensitivity of downstream habitat to changes in the upstream habitat.

Benthic Macroinvertebrates of Swiftwater Creek (2000) prepared by Donald Baylor, Aquatic Resource Consulting, for Paradise Township. (See Appendix Q)

Station 1 is located in the stream segment of interest. Station 2 is located downstream of Sanofi Pasteur.

See page 6 for macroinvertebrate scores, page 7 for habitat and page 8 for taxa.

Benthic Macroinvertebrates of Swiftwater Creek (1997) prepared by Don Baylor, Aquatic Resource Consulting for Lake Swiftwater Association. (See Appendix R)

Benthic Invertebrates of Swiftwater (1986) prepared by Don Baylor, Aquatic Resource Consulting. (See Appendix S)

Memo, Department of Environmental Protection, October 25, 2000 authored by Sherrill R. Wills, Water Pollution Biologist. Subject: Phosphorous Criteria, Swiftwater Creek. (See Appendix T)

Included as historical data. As of 2000, according to the author, “water chemistry and macrobenthic results do not indicate any impairment of Swiftwater Creek.”

Memo, Department of Environmental Resources, August 3, 1992 authored by Edward P. Kupsy, Water Pollution Biologist. Subject: Aquatic Chemical and Biological Investigation, Swiftwater Creek. (See Appendix U)

Included as historical data.

Brodhead Watershed Association, (1991 - 2005) containing data collected by volunteers at several sites along Indian Run and Swiftwater Creek. **(See Appendix V)**

BWA site 223 (INDIRU01 from County study) above Fairview Avenue in Pocono Township, near the headwaters.

BWA site 225 is Indian Run above the Swiftwater Confluence. County does not collect data for this site.

BWA site 224 is Swiftwater Creek above the Falls (SWIFCR08 in the Paradise Creek Watershed Management Plan.)

BWA site 226 is Swiftwater Creek above the Indian Run Confluence (SWIFCR07 from County study.)

BWA site 227 is Swiftwater Creek above Route 611 (SWIFCR03 from County study.)

USGS gage, located on the Sanofi property. The gage has provided real-time and statistical discharge amounts for the Swiftwater Creek since April of 2001. Following is a link to the data on the internet: <http://waterdata.usgs.gov/pa/nwis/uv?01440485>

5) **Description of Discharges**

The sole existing point source discharge in the upper Swiftwater watershed is the Pocono Manor Sewage Treatment Plant (NPDES permit # 0029149 under the name “Ireland Hotels/Pocono Manor.”) **(See Figure E-5 Appendix B.)** The current facility is permitted to discharge 0.14 mgd. A proposal exists for the replacement of this facility and is contingent upon the appeal by Pocono Manor Investors, LLC of the recent decision by the Pennsylvania Gaming Board not to award a casino license to the owners of Pocono Manor LLC. Pocono Manor LLC has submitted and received approval for a Sewage Facilities Planning Module dated October 16, 2006 which provides for development of the property using land application of effluent from a new, enlarged wastewater treatment plant. Plans include spray irrigation of golf courses in the summer and snow making in the winter. The Brodhead Watershed Association supports the concept of spray irrigation and snowmaking.

The current potential non-point source pollution sources include Interstate 380, Route 314, Route 940, a grain mill, railroad, minor roadways, parking lots, golf courses, a decaying pump house on Indian Run, and a farm.

If not managed properly, the wastewater and stormwater generated by future developments within the watershed will degrade the exceptional quality of the upper Swiftwater Creek.

6) **EV Qualifiers**

Biological assessment qualifier.

Existing data indicates that the streams are optimal due to the existence of pollution intolerant mayflies, caddisflies and stoneflies. Petitioners have not chosen a reference stream for comparison.

Surveys of aquatic fauna have indicated exceptional water quality in Swiftwater Creek and Indian Run. Benthic macroinvertebrate surveys in the segment of Swiftwater Creek

proposed for EV designation and downstream have documented diverse, well balanced benthic communities consisting predominantly of very pollution-sensitive taxa (Baylor 1997, 2000, and 2001). Benthic samples from Indian Run in 1986 were indicative of exceptional water quality (Baylor 1986).

The fish population of Indian Run was surveyed in 2003. The fish community of Indian Run consisted primarily of trout and sculpins, indicating excellent cold water habitat. Brook and brown trout were about equally represented in a total trout biomass of approximately 48 pounds per acre – well above the Pennsylvania Fish & Boat Commission’s standard for Class A Wild Trout Streams for combined brook and brown trout (Hartzler 2003). Excellent trout reproduction was indicated in the survey by abundant young-of-year.

Electrofishing surveys were conducted in 2000 and 2002 at five sites on Swiftwater Creek (Hartzler 2000 and 2002). One site below Swiftwater Lake and four above were sampled. The uppermost site was above the Route 611 crossing of Swiftwater Creek in the stream segment of interest. Trout populations in Swiftwater Creek consisted primarily of brown trout with a few brook and rainbow. Biomass estimates ranged from 70 to 220 pounds per acre among the five sites. All sites had trout biomass well above the requirements for Class A Wild Trout, with one site having several times the minimum requirement – an exceptional biomass for an infertile freestone stream. The four sites above Swiftwater Lake had abundant young-of-year brown trout, indicating excellent reproduction. There was some indication of natural reproduction of rainbow trout at the uppermost site.

Surface water of exceptional ecological significance.

Petitioners believe the upper Swiftwater Creek watershed qualifies for EV protection because it is a surface water of exceptional ecological significance. The wetlands draining into the headwaters likely represent the water source for numerous private wells adjacent to the wetlands. Older homes on Long Pond Road in Tobyhanna Township with shallow wells, built in the 1950’s and 1960’s, as well as two newer subdivisions adjacent to the Swiftwater Creek headwaters in the commercially zoned parcel along Route 380 likely rely upon these wetlands for their drinking water. Those subdivisions are named White Birches and Emerald Lakes. As mentioned on page one, Kettle Spring on Indian Run is a drinking water source for the Pocono Manor community.

A “surface water of exceptional ecological significance” is defined “as a surface water which is important, unique or sensitive ecologically, but whose water quality as measured by traditional parameters (for example chemical, physical or biological) may not be particularly high, or whose character cannot be adequately described by these parameters. These waters include wetlands that are exceptional value wetlands under § 105.17(1) (relating to wetlands).” 25 Pa. Code § 93.1. Exceptional value wetlands include wetlands that are located along an existing public or private drinking water supply, including both surface and groundwater sources, that maintain the quality or quantity of the drinking water supply. See 25 Pa. Code § 105.17(1).

7) Land Use and Development Patterns in the Watershed

The upper Swiftwater Creek watershed, in the area pertaining to the requested amendment, is primarily forested and contains wetlands, ponds, and waterfalls. This entire watershed is privately owned. The watershed area is zoned for recreational, residential, commercial, and industrial uses. The Indian Run, the County's coldest stream, begins in an undeveloped industrial zone adjacent to a railroad line. Swiftwater Creek's headwaters are adjacent to Interstate 380 and PA Route 940 in an undeveloped commercially zoned parcel. The developed areas of the watershed contain residential structures, Pocono Manor Resort buildings and golf courses, a horseback riding facility, a trap-shooting course, the Amber Tavern, and the Swiftwater Inn. The vast majority of the Pocono Manor property is located in Pocono Township, zoned RD for Recreational District. (See **Figure E-7 Appendix C.**)

The rate of growth in the upper Swiftwater Creek Watershed is anticipated to increase in the near future due to the following factors:

- Monroe County has the second fastest growing population in comparison to all counties in the Commonwealth of Pennsylvania based on year 2000 census data.
- An Act 537 Plan for Pocono Township has recently been approved by Pocono Township and submitted to the DEP and the Delaware River Basin Commission. This Plan allows for a sewage treatment facility and sewage line to be constructed along the Route 611 corridor, servicing customers in the vicinity of the Swiftwater Creek, including Sanofi Pasteur. As stated in the Department's Water Quality Antidegradation Implementation Guidance book, traditional sewage disposal systems, without carefully developed land use planning, could contribute to the problems of urban sprawl and unplanned development (see Chapter 7 § 14.a of the Antidegradation Guidance book). It is likely that, with the development pressures this area faces and with the addition of this new sewer line and treatment plant, the undeveloped areas may soon be developed.
- The 3,500-acre Pocono Manor Resort is divided into recreationally, commercially, and industrially zoned parcels. This resort has plans to expand with the addition of a casino, pending the outcome of an appeal of the Pennsylvania Gaming Commission's decision not to award Pocono Manor Investors, LLC a license.

Protecting the existing exceptional quality of the upper Swiftwater Creek and its tributaries as development occurs is important for the sustainability of recreational activities and private wells in the watershed, as well as to water users downstream.

8) Municipalities in Watershed

Lori Yocum Secretary/Treasurer
Mount Pocono Borough
303 Pocono Boulevard
Mount Pocono, PA 18344
570-839-8436
www.borough.mountpocono.pa.us

Reda Briglia, Secretary/Treasurer
Paradise Township
RR 1 Box 1226
Cresco, PA 18326
570-595-9880
www.paradisetownship.com

Jane Cilurso Secretary/Treasurer
Pocono Township
PO Box 197
Tannersville, PA 18372
570-629-1922
www.poconotownship.org

John Kerrick, Chair
Board of Supervisors
Tobyhanna Township
HC 89 Box 289
Pocono Pines, PA 18350
570-646-1212
www.tobyhannatownship.org

9) Locational information relevant to items E-4 through E-8

Figure E-9 Map of Sampling Stations for Chemical and Biological Data
used by Monroe County Water Quality Study

Appendices

- A. **Figure E-1** Upper Swiftwater Indian Run Watershed
- Figure E-3** USGS Map of Area to be Redesignated
- B. **Figure E-5** Point and Non-Point Source Discharges
- C. **Figure E-7** Land Use and Zoning/Development
- D. **Figure E-9** Map of Sampling Stations for Chemical and Biological Data used by Monroe County Water Quality Study

- E. Monroe County Annual Water Quality Study (2005)
- F. Monroe County Annual Water Quality Study (2006)
- G. Spreadsheet, Benthic Macroinvertebrate Metric Scores 1996 – 2005
- H. Paradise Creek Watershed Management Plan (2005)
- I. Spreadsheet, Paradise Creek Watershed Study Field Water Chemistry (2003 – 2004)
- J. Paradise Watershed Historical Biological Data (1999 – 2003)
- K. Stream Morphology and Water Quality Based Restoration Plan for the Paradise Creek Watershed (2005)
- L. Biological & Fish Data Gap Analysis. Paradise Watershed Historical Biological Data, Benthic Macroinvertebrates (undated) prepared by Don Baylor, Aquatic Resource Consulting
- M. Fish Inventory of Paradise Creek and Tributaries (2003) prepared by Jim Hartzler, Aquatic Biologist for Paradise Township
- N. Land Use and Impervious Cover in the Paradise Creek Watershed An Initial Assessment (2003) prepared by James Sheehan
- O. Benthic Macroinvertebrates of Swiftwater Creek above and below the Pocono Manor Sewage Treatment Plant Discharge (2001) by Don Baylor for Paradise Township Supervisors
- P. Electrofishing Survey of Swiftwater Creek (2000) prepared by Jim Hartzler, Aquatic Resource Consulting, for Paradise Township Supervisors.
- Q. Benthic Macroinvertebrates of Swiftwater Creek (2000) prepared by Donald Baylor, Aquatic Resource Consulting, for Paradise Township

- R.** Benthic Macroinvertebrates of Swiftwater Creek (1997) prepared by Don Baylor, Aquatic Resource Consulting for Lake Swiftwater Association.
- S.** Benthic Invertebrates of Swiftwater (1986) prepared by Don Baylor, Aquatic Resource Consulting.
- T.** Memo, Department of Environmental Protection, October 25, 2000 written by Sherrill R. Wills, Water Pollution Biologist. Subject: Phosphorous Criteria, Swiftwater Creek.
- U.** Memo, Department of Environmental Resources, August 3, 1992 written by Edward P. Kupsky, Water Pollution Biologist.
- V.** Brodhead Watershed Association, (1991 - 2005) Data collected by volunteers at several sites along Indian Run and Swiftwater Creek.
- W.** Paradise Creek Subwatershed. (2000) Description and relevant facts, Brodhead Watershed Association.
- X.** Pocono Manor: Historical information, marketing materials.
- Y.** Map circa 1930 showing location of Kettle Springs and letter from former owner of Pocono Manor, Jim Ireland, regarding water quality of Indian Run.