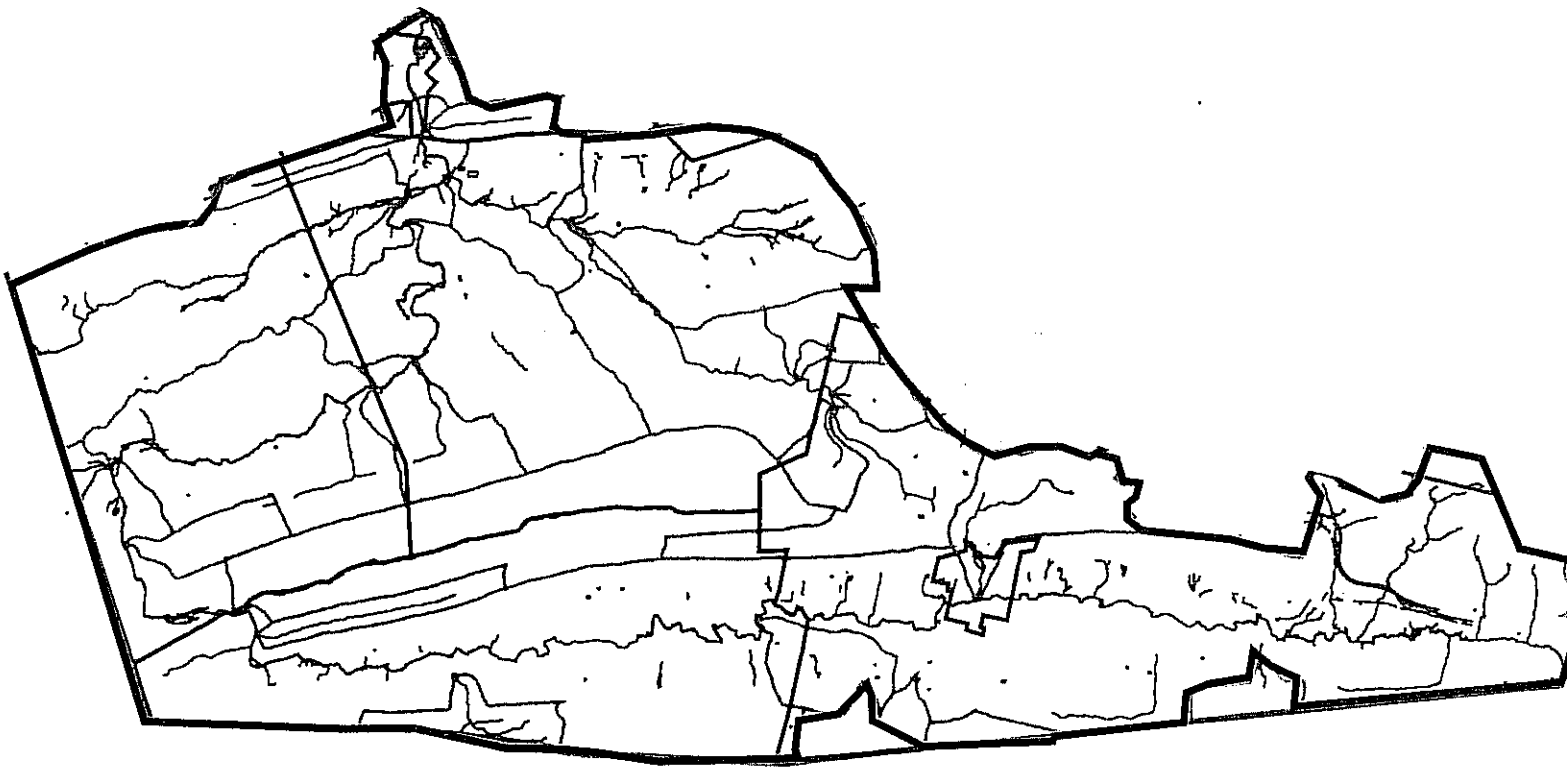
Fishing Creek/Cedar Run Watershed
Act 167
Stormwater Management Plan



Clinton County, Pennsylvania

June 2006

By:
Clinton County Conservation District
And
Pysher and Associates, Inc.

FISHING CREEK/CEDAR RUN WATERSHED
- ACT 167 -
STORMWATER MANAGEMENT PLAN

The Clinton County Conservation District prepared this storm water management plan update with assistance from Pysher and Associates, Inc. and the Department of Environmental Protection. The Department of Environmental Protection, under the authority of Act 167, has provided a grant covering 75% of the funding required to produce the Plan.

Adopted by Clinton County Board of Commissioners, June 22, 2006

Approved by PA DEP Bureau of Watershed Management, Storm Water Management Section,

September 2006

ACKNOWLEDGMENTS

The Original Fishing Creek/Cedar Run Storm Water Management Plan was developed and adopted in 1995. For the 2006 Update of this Stormwater Management Plan, most of the original watershed study information is being retained. The Model Ordinance has been revised.

The following is an excerpt from the 1995 Plan:

Sweetland Engineering & Associates, Inc. would like to thank the Clinton County Board of Commissioners for the opportunity to work on this project. It has been challenging and rewarding.

The Clinton County Board of Commissioners, represented by Commissioners Larry Kephart, Robert Ohl and Miles Kessinger, have been actively involved with this project. A Watershed Plan Advisory Committee (WPAC) was formed in 1991 to encourage mutual understanding and cooperation among various groups that have an interest in the Fishing Creek/Cedar Run Watershed. Meetings of this WPAC were held in the Porter Township Municipal Building during the formative period of this Fishing Creek/Cedar Run Watershed Storm Water Management Plan.

Members of the 1995 Watershed Plan Advisory Committee:

James C. Bechdel, Bald Eagle Township Supervisor
Harry McKeague, Castanea Township Secretary
Nancy Sember, Crawford Township Secretary
Ralph Brungart, Greene Township Supervisor
Robert Miller, Lamar Township Supervisor
R. Dale Weaver, Logan Township Secretary
Beulah Brungard, Loganton Borough Secretary
Ted Jodun, Mill Hall Borough Secretary
Elaine Miller, Porter Township Secretary
Helen & Joe Fahy, Gregg Township Supervisor
Ruth Ann Weight, Marion Township Secretary
Rick Bair, Miles Township Secretary
Samuel Markel, Spring Township Secretary
Charles Snyder, Walker Township Secretary
Henry Sanders, Lewis Township Supervisor
Janet Lynch, Washington Township Secretary
Nevin Courter, 64 Water Company, Inc.
Lamar Township Authority
Fritz McGrail, Walker Township Water Association
Harry M. Barner, Nittany Water Company
Jon McCloskey, Eastville Water Company
William Leitch, Greenburr Water Company
Richard Miller, Jr., Tylersville Water Company

Martin Tressler, Booneville Water Company
Cheryl Donnely, Spring Township Water Authority
Fred Courter, Rote Mutual Water Company
Robert Gentzel, Bull Run Water Association
Dr. Lester Kleckner
Kerry Moore
Perry Ilgen
Richard C. Bowman, Jr.
Larry Dotterer
David B. Proctor, Lock Haven University
Dr. John Way, Lock Haven University
Robert Roach, Big Fishing Creek Cottage Association
Leslie W. Johnson, Bald Eagle State Forest
Byron J. McKernan, DEP Bureau of Public Water Supply
PA Fish & Boat Commission
David Jostenski, DEP-SWM & Sediment Control
Durla Lathia, Chief, DEP-SWM & Sediment Control
Dennis Bernhardy, PA Game Commission
Robert Orso, PA Department of Transportation
Paul Brann, Union County Solicitor
Union County Commissioners
Shannon Rossman, Union County Planning Commission
Ted Retallack, Union County Conservation District
Lycoming County Solicitor
Lycoming County Commissioners
Bill Jamison, Lycoming County Planning Commission
Lycoming County Conservation District
James M. Raback, Centre County Solicitor
Centre County Commissioners
Robert Donaldson, Centre County Planning Office
Robert Sweitzer, Centre County Conservation District
Lewis Steinberg, Clinton County Solicitor
Larry Kephart, Clinton County Commissioner
Miles Kessinger, Clinton County Commissioner
Robert Ohl, Chairman, Clinton County Commissioners
Timothy Holladay, Director, Clinton County Planning Commission
Rich Manning, Sweetland Engineering & Associates
Dave Sweetland, Sweetland Engineering & Associates
Suzanne Foust, Conservation District Manager

District Manager Sue Foust and Storm Water Management Planning/GIS Consultant Scott Mazzetti of the Clinton County Conservation District directed and managed this (1995) project for the Clinton County Commissioners. Brad Baylor, Michael Seyler, Harry Rippey, and Harold Gardner assisted during the data collection phase of the project. The efforts of all members of the staff and board of directors of the conservation district are appreciated.

We would like to thank everyone who reviewed the draft before final publication of this plan. Especially, we would like to thank the following reviewers for written comments: Timothy Holladay of Clinton County Planning Commission and Durla Lathia and David Jostenski of DEP Land and Water Conservation, Storm Water Management and Erosion Control.

The following members of the staff at Sweetland Engineering & Associates, Inc. were assigned to this project and were directly responsible for its completion:

Anthony Sundle	*Project Engineer*
Richard Manning	*Project Manager*
David Sweetland	*Principal-in Charge*

Pennsylvania Department of Environmental Protection

Rachel Carson State Office Building
P.O. Box 8775
Harrisburg, PA 17105-8775
September 15, 2006

Bureau of Watershed Management 717-787-6827

Mr. Thomas Bossert, Chairman
Clinton County Commissioners
232 E. Main St.,
3rd Floor Garden Bldg.
Lock Haven, PA 17745

Re: Fishing Creek/Cedar Run Watershed Storm Water Management Update Plan Approval

Dear Commissioner:

On June 27, 2006 we received a letter from the Clinton County Conservation District, notifying the Department of Environmental Protection that the Clinton County Commissioners adopted the Fishing Creek and Cedar Run watershed Storm Water Management Plan Update on June 29, 2006. We have received documentation certifying compliance with the municipal and regional review and adoption procedures specified in Sections 6 and 8 of the Storm Water Management Act.

The Department and the Department of Community and Economic Development have reviewed the Plan and find it to be consistent with municipal floodplain management plans, state programs that regulate dams, encroachments and water obstructions, and state and federal flood control programs. The Plan is also compatible with other watershed stormwater management plans in the watershed and is consistent with the policies and purposes of the Storm Water Management Act.

Since the Plan meets the requirements of Section 9 of the Storm Water Management Act, the Department approves the Fishing Creek/ Cedar Run Watershed Storm water Management Plan Update.

Any person aggrieved by this decision may appeal pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa. C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, telephone 717-787-3483. TDD users may contact the board through the Pennsylvania Relay Service at 1-800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this decision, unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in Braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

Thank you for participating in the Department's Stormwater Management Program. If you have any questions, or need further assistance, please contact me at the above number.

Sincerely,

Barry A. Newman

Barry A. Newman, M.S., P.E.
Stormwater Planning and Management
Division of Waterways, Wetlands, and
Stormwater Management

cc: Mary Ann Bower, CCCD
Lyman Adams

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CHAPTER 1

INTRODUCTION

Background of the Fishing Creek/Cedar Run Study

Clinton County prepared this document to comply with the Stormwater Management Act of 1978 (Act 167). This Act requires each county in Pennsylvania to prepare and adopt stormwater management plans for each designated watershed in their county. The Fishing Creek/Cedar Run Watershed (hereinafter referred to as the Combined Watershed) was Clinton County's second stormwater management plan. It is an important plan because the potential for development and land use change in this watershed is increasing due to its proximity to both The Pennsylvania State University and Lock Haven University. Accordingly, this plan provides a mechanism for municipalities within the Combined Watershed to plan for and manage increased runoff associated with possible future development and land use change. Figure 1-1 contains the location maps of the Combined Watershed.

Requirements of Act 167

The following summary includes the basic elements of Act 167 in terms of specific responsibilities assigned to various units of state and local government:

1. Each county shall develop regional stormwater management plans for each watershed within its boundaries, recognizing that most watersheds will cross county boundaries, and will require collaboration with neighboring counties.
2. Each municipality will adopt local ordinances and engineering design criteria which conform to the provisions of their respective stormwater management plans.
3. Developers must implement stormwater management techniques that meet the standards and criteria set forth in the appropriate municipal ordinances, as supported by the watershed stormwater management plan. In general, these stormwater management techniques will ensure that post-development runoff rates throughout the watershed do not exceed pre-development levels.
4. PA DEP will serve as the review agency for each watershed stormwater management plan submitted by the counties. The Act 167 planning process involves three essential steps:

a. Documentation of existing watershed characteristics, including land use, soils, runoff conditions, peak flows, sub-area timing relationships, existing storm drainage problems, and flow obstructions. The existing conditions in the watershed represent the base line for evaluating the effects of future runoff caused by land development.

b. Preparation of a watershed stormwater management plan to manage stormwater based on possible future development and land use change within the watershed. The plan would include criteria and performance standards for managing urban runoff, and a listing of alternative stormwater management techniques.

c. Development of priorities for implementing stormwater management practices within each municipality in accordance with the objectives set forth in the watershed stormwater management plan. This step is crucial to the entire planning process, since local level control is the only mechanism by which we can achieve total watershed-wide stormwater management. While this may seem contradictory to our objective of watershed-wide planning, we ask the reader to bear in mind that responsibility for managing excessive stormwater would reside with each municipality, in accordance with Act 167.

Goals and Limitations of Fishing Creek/Cedar Run Watershed Stormwater Management Plan

Attempts at stormwater management often are on a municipal boundary or development site basis and do not consider downstream communities or properties. Accordingly, the purpose of this plan is to provide a watershed-wide approach to stormwater management since runoff does not recognize municipal boundaries. By treating the watershed as a single unit, it is possible to achieve a coordinated approach to stormwater management that to maintains runoff peaks, by considering the timing relationships of runoff.

This stormwater management plan will not control or reduce development within the Combined Watershed. However, the plan will provide standards and criteria that can be incorporated into local ordinances to manage and maintain peak runoff flows throughout the Combined Watershed as development occurs. Also, it is not the intent of this plan to solve existing flooding or runoff problems, but to identify them for future correction and assure that problems do not get worse. More specifically, this plan does not require the municipalities to correct the existing drainage problems.

Watershed Plan Advisory Committee (WPAC)

The Act allows municipalities, conservation districts and other interest groups to provide input and direction during the planning process through participation in a Watershed Plan Advisory Committee. The original committee representatives included:

COUNTY AGENCIES

- Clinton County Commissioners
- Clinton County Conservation District
- Clinton County Planning Commission
- Clinton County Solicitor's Office
- Centre County Commissioners
- Centre County Conservation District
- Centre County Planning Commission
- Centre County Solicitor
- Union County Commissioners
- Union County Conservation District
- Union County Planning Commission
- Union County Solicitor
- Lycoming County Commissioners
- Lycoming County Cons. District
- Lycoming County Planning Comm.
- Lycoming County Solicitor

STATE AGENCIES

- Bald Eagle State Forest
- PA Fish and Boat Commission
- PA Game Commission
- PA Department of Transportation
- PA DEP Water Supply and Community Health

FEDERAL AGENCIES

- USDA Natural Resources Conservation Service (Formerly SCS)

CLINTON COUNTY MUNICIPALITIES

- Bald Eagle Township
- Castanea Township
- Crawford Township
- Greene Township
- Lamar Township
- Logan Township
- Loganton Borough
- Mill Hall Borough
- Porter Township

CENTRE COUNTY MUNICIPALITIES

- Gregg Township
- Marion Township
- Miles Township
- Spring Township
- Walker Township

LYCOMING COUNTY MUNICIPALITIES

- Washington Township

UNION COUNTY MUNICIPALITIES

- Lewis Township

WATER COMPANIES

Booneville Water Company
Bull Run Water Assoc. Inc.
Eastville Water Company
Greenburr Water Company
Mackeyville Water Company
Nittany Water Company
Rote Mutual Water Company
Spring Township Water Authority
Tylersville Water Company
Walker Township Water Assoc.
64 Water Company, Inc.

OTHER PARTIES

Big Fishing Creek Cottage Association
Lock Haven University

This committee promoted municipal involvement that insured inter-municipal cooperation and ultimately aided in the overall preparation of the plan. The success and effectiveness of the Fishing Creek/Cedar Run Stormwater Management Plan are contingent upon the continued cooperation and input from the municipalities.

Other Plan Participants

Sweetland Engineering & Associates, Inc., was the engineering consultant for original Stormwater Management Plan. The Consultant was responsible for preparing the technical components of this plan including model selection, calibration, and runs, and developing the technical standards and criteria of the Model Ordinance.

The Clinton County Conservation District (hereinafter referred to as the Lead Agency) was the agency responsible for preparing this stormwater management plan, while Centre, Lycoming and Union County Government Offices were participating organizations during the preparation of the original. Specific government offices from each county that participated in the original planning process are listed under the WPAC section above. The 2006 update was completed for the Clinton County Watershed area only.

CHAPTER 2

CHARACTERISTICS OF THE FISHING CREEK CEDAR RUN WATERSHED

Hydrologic Features

The Combined Watershed consists of four subwatersheds including Fishing Creek (99.5 square miles), Little Fishing Creek (42.1 square miles), Long Run (24.4 square miles) and Cedar Run (15 square miles). The total drainage area of the Combined Watershed is approximately 181 square miles.

The Fishing Creek watershed originates east of the Borough of Carroll in Union County, flowing first through Sugar Valley and then through the upper portion of Nittany Valley for a total distance of 42 miles. Sinkholes are very prominent throughout the 27 miles of southwestward travel through Sugar Valley. As a result, this section of Fishing Creek experiences intermittent flow during dry months as the water drains underground through the limestone topography. The northwest flowing segment from Tylersville to Lamar exhibits perennial flow except for a small area of intermittent flow upstream of the Fish Hatchery at Tylersville. From Lamar, Fishing Creek flows northeast to Mill Hall where it discharges into Bald Eagle Creek.

Little Fishing Creek, with its Roaring Run and Laurel Run tributaries, emanates near Pleasant Gap in Centre County, flowing a distance of 15.8 miles northeast to its confluence with Fishing Creek at Lamar.

Long Run, including the Cooper Run, Pepper Run, Washburn Run, and Chub Run tributaries, travels 13.3 miles northwest from its origin near Logan Mills in Clinton County to Salona where it discharges into Fishing Creek.

The Cedar Run Watershed, beginning east of Jacksonville, Centre County, travels 8.7 miles northeast and merges with Fishing Creek at Cedar Springs in Clinton County.

Topography & Regional Geology

As a part of the Appalachian Mountains, the Combined Watershed exhibits the classic topography of this mountain system, consisting of three (3) northeast-southwest trending mountain ridge complexes separated by two (2) inter-mountain valleys. The Sugar Valley mountain complex forms the eastern boundary of the watershed succeeded to the northwest by the Big Mountain Complex. The western border of the watershed is delineated by the crestline of Bald Eagle Mountain. These mountain ridges are composed of sedimentary sandstones and

quartzite of the Bald Eagle, Juniata, Tuscarora and Clinton Formations. The Reedsville shale and the shaly limestone Coburn-Nealmont Formations provide the transition between ridge and valley.

Of the two inter-mountain valleys, Sugar Valley is situated on the eastern side of the watershed while the upper portion of Nittany Valley composes the western member of the valley sequence. These valleys are constructed from Ordovician Carbonates of the Bellefonte, Axeman, and Nittany Formations. The Upper Cambrian Gatesburg Formation, the oldest geologic formation in the watershed, is expressed in the western region of Nittany Valley.

Drainage System

The Combined Watershed displays the classic transverse drainage system found almost exclusively within the central and southern Appalachian Mountains of the eastern United States. The mainstem of the Combined Watershed, Fishing Creek, is the dominant consequent stream carving three (3) watergaps through the mountain ridges. The main tributaries flowing on the valley floors compose the subsequent streams of the system, while the streams flowing from the slopes of the mountain ridges form the obsequent and resequent streams and complete the classic drainage pattern of the watershed.

Soil Associations and SCS Hydrologic Soil Groups

The primary soil associations in the Combined Watershed include Dekalb-Clymer-Cookport, Hagerstown-Wiltshire, Murril-Buchanon-Laidig, Pope-Barbour-Sequatchie and Lehew-Ungers-Albrights. Dekalb-Clymer-Cookport soil association makes up the majority of the Combined Watershed. The most common land use associated with these soils is forest land. Hagerstown-Wiltshire soils primarily occur in Nittany and Sugar Valleys. Extensive farming operations dominate these valleys. Murril-Buchanon-Laidig soils occur on the moderately sloping edges of Nittany and Sugar Valleys. Pope-Barbour-Sequatchie soils border Fishing Creek and Long Run in Mackeyville and Rote, respectively. Lastly, Lehew-Ungers-Albrights association occurs primarily on the north facing slope of Rainsares Mountain in Lamar Township. Soil association data (IDRISI-GIS map images) are available for review at the Clinton County Conservation District.

The USDA Natural Resources Conservation Service (formerly SCS) collected and digitized the soil data for the Combined Watershed as a part of the 1995 update of the Clinton County Soil Survey. Towson State University converted these data into IDRISI-GIS. A Hydrological Soil Group (HSG) category was assigned to each soil type according to the HSG inventory in

Appendix A of the SCS Technical Release-55 (TR-55), 1986. The basis for Hydrologic Soil Group classification is the infiltration rate of the bare soil after prolonged wetting. This classification system includes four (4) categories: Hydrologic Soil Groups A, B, C, and D. Table 2-1 lists the infiltration rate, runoff potential, and soil texture for each HSG.

Table 2-1
Runoff Potential, Infiltration Rate and Soil Texture
of the Hydrologic Soil Groups
(from Soil and Water Conservation Technical Guide Pennsylvania, 1991)

Hydrologic Soil Group	Runoff Potential	Infiltration Rate	Soil Texture
A	low	high	sand, or sandy loam
B	moderate	moderate	silt loam or loam
C	moderate to high	low	sandy clay loam
D	high	very low	clay loam or clay

Only hydrologic soil groups B, C, and D occur within the Combined Watershed (Plate 4). Specifically, HSG B soils occupy 28% of the Combined Watershed. HSG B soils occur primarily in the agricultural valleys. The majority (59%) of the soils within the Combined Watershed are classed as HSG C, and are associated with the steeper, forested regions. Hydrologic soil group D soils exist mostly in Centre County just south of Little Fishing Creek and immediately south of Roaring Run. In Clinton County, HSG D soils are common in Mill Hall and Sugar Valley, but occupy only very small areas throughout the remainder of the Clinton County portion of the Combined Watershed. Overall, HSG D soils occupy 8% of the Combined Watershed. The remainder of the Combined Watershed is primarily stony land and quarries (5%).

Existing Land Use and Land Cover

The United States Geological Survey (USGS) derived the land use and land cover data from digital USGS, 1:250,000-scale base maps. Towson State University converted these data into IDRISI GIS. These data identify nine (9) land use types according to an Anderson Level II categorization. Table 2-2 lists the total acreage and percentages of each land use type in the Combined Watershed.

Table 2-2
Land Use Classification for the
Fishing Creek/Cedar Run Watershed

LAND USE TYPE	ACRES	PERCENTAGE
Residential	841	0.72
Comm/Indust	111	0.10
Impervious Surfaces	1421	1.22
Crop, Pasture	35,822	30.79
Orchards, Nurseries	30	0.03
Other Agriculture	66	0.06
Forest	77,624	66.72
Strip Mines	72	0.06
Open Space	354	0.30
Total	116,341	100.00

Existing land use in the Combined Watershed (Plate 1) is primarily forest with agriculture dominating the valleys. Forest land comprises about 67% of the Combined Watershed. A large portion of this forest land is either Bald Eagle State Forest, Tiadaghton State Forest, or State Game Lands 255 and 295. Most of the logging in the Combined Watershed occurs on private land, but some does occur on state lands. Recreationists have private hunting and summer camps dispersed throughout the forest land.

Agriculture is the second most common land use in the Combined Watershed. Most of the farmlands are located in the wide limestone valleys. Major farming enterprises include dairy, beef, poultry, grain, and produce. The most common crops are corn, wheat and hay.

Residential land use is centered around Mackeyville, Lamar, Cedar Springs, Mill Hall, Mingoville, Nittany, Hublersburg, and Loganton. State Routes 880, 64 and 220, and Interstate 80 are major highways. Commercial land in the Combined Watershed is primarily in Mill Hall.

Future Land Use and Land Cover

The future land use data were derived for the Combined Watershed from the existing land use data using IDRISI-GIS. Plate 2 (Future Land Use and Land Cover) contains the primary changes to the existing land use plate.

The future land use changes were determined based on the planning studies, growth rates, and other information that was available as of February 1995. Please note that the parameters of planning studies may change prior to actual plan implementation.

Sub-Area Characteristics

As shown on Plate 4, the Combined Watershed was divided into 118 subareas. Fishing Creek, Little Fishing Creek, Long Run, and Cedar Run subwatersheds contain 58, 33, 15, and 12 subareas, respectively. The original Consultant delineated the subarea boundaries and Towson State University digitized them into IDRISI-GIS. The Consultant determined the subarea boundaries based on drainage and land use characteristics, and adjusted the boundaries of some subareas in order to utilize stream crossings with known flow characteristics as points of interest through which all runoff from that subarea flows. Table A-1 in Appendix A contains a summary of the average hydrologic characteristics for each sub-area and sub-watershed.

SCS Runoff Curve Numbers

SCS runoff curve numbers (CN) were calculated for each sub-area in the Combined Watershed using land use classes in Chapter 2 of SCS TR-55. Geology, land use, hydrologic soil groups, hydrologic connectivity, and time of concentration of runoff were used to determine the curve numbers. The hydrologic connectivity (Figure 6-1) is the flow direction or pattern of runoff from subarea to subarea. The time of concentration for each sub-area is the time for runoff to travel from the hydraulically most distant point within the sub-area to the sub-area outlet. Both the hydrologic connectivity and time of concentration are important in determining the impact of upstream runoff on downstream areas. Average weighted curve numbers were calculated for each sub-area and listed in Table A-1. The table includes both existing and future average weighted CN's.

Precipitation and Design Storms

There are no known rain gauges within the Combined Watershed. In the absence of actual storm rainfall data, "design" storms that have a time distribution as devised by Natural Resource

Conservation Service or Pennsylvania Department of Transportation (PA DOT) are used for hydrologic modeling. The original Consultant obtained the depths of the design storms from the PA DOT Field Manual of Storm Intensity-Duration-Frequency (IDF) Charts, Region 3 (1986). Table 2-3 shows the 24-hour design storm depths for the 2 through 100-year return period storms.

The mean annual precipitation throughout the Combined Watershed averages 40 to 42 inches according to the Water Resources Bulletin No. 16, Pennsylvania Gazetteer of Streams Part II, 1984.

Table 2-3
24-Hour Design Storm Depths
and 24 Hour Duration's
(after PA DOT IDF Charts, 1986)

Return Period (years)	24-Hour Duration (inches)
2	2.60
5	3.10
10	3.70
25	4.60
50	5.10
100	6.00

Stream Flow and Estimated Design Floods

The stream flows utilized in the Flood Insurance Studies within the Combined Watershed were based on approximate statistical methods. These flows, and flows computed from other methods, were compared to estimated streamflows from the hydrologic model during model calibration, as discussed later in this report.

Flood Insurance Studies

Flood Insurance Studies were prepared by the Federal Emergency Management Agency (FEMA) or the Department of Housing and Urban Development (HUD), to aid in the administration of the National Flood Insurance Act of 1968, and the Flood Disaster Protection Act of 1973. Many of these Flood Insurance Studies include detailed delineation studies.

Detailed delineation studies in the Combined Watershed include: Little Fishing Creek from its confluence with Fishing Creek in Porter Township to an access road in Walker Township about 3,000 feet from the Clinton and Centre County boundary, and from Legislative Route 14027 to the old railroad grade in Mingoville; Long Run from its confluence with Fishing Creek to approximately 0.6 mile upstream of Township Route 362 (Wetzel Road) in Lamar Township; Roaring Run from its confluence with Little Fishing Creek to the intersection of T-907 and T-605 in Walker Township; and Fishing Creek from its confluence with Bald Eagle Creek to the Legislative Route 18006 bridge over Fishing Creek in Porter Township. Data from detailed studies include floodplain boundaries, floodways, design storm-flood profiles for the 10-, 50-, 100-, and 500- year storms, and summaries of the drainage area/peak discharge relationships for specific streams. These Flood Insurance Studies are available for review from either the municipality in which the stream is located or from the Clinton and Centre County Conservation Districts.

Existing and Future Floodplain Development

Development within currently urbanizing areas of the Combined Watershed will be primarily regulated by floodplain management regulations enacted by the local municipalities. Act 166 required all municipalities in the Combined Watershed to enact ordinances that regulate the type and extent of development within floodplain areas. Specifically, these ordinances limit future floodplain development to that which would not significantly alter the carrying capacity of the floodplain or be subject to a high damage potential.

The Combined Watershed shall be regulated by the following criteria:

1. Damage potential of existing floodplain development will remain unchanged, for storm events representing the two-year through 100-year return period events, through implementation of the stormwater management criteria included in the Fishing Creek/Cedar Run Watershed Stormwater Management Plan.
2. Damage potential for future floodplain development will be minimized by only permitting specific types of development which are damage resistant consistent with the Floodplain Management Act as implemented through municipal floodplain regulations and the Department of Environmental Protection Chapter 105 - Dam Safety and Waterway Management Regulations, and Chapter 106 - Floodplain Management Regulations.
3. Damage potential of existing and future floodplain development may be reduced with implementation of remedial measures in areas subject to inundation. The effectiveness

and design life of any remedial measures would be enhanced by implementation of the Stormwater Management Plan.

CHAPTER 3

EXISTING STORM DRAINAGE PROBLEMS AND HYDRAULIC OBSTRUCTIONS

Existing Drainage Problems

Existing drainage problems in the Combined Watershed include the flooding of residential streets, township routes, state routes, residential properties, and commercial properties. The Lead Agency obtained this information from the local municipalities via questionnaires and other letters of request. Table 3-1 is an inventory of the existing storm drainage and flooding problems in the Combined Watershed.

Table 3-1
Inventory of Existing Drainage Problems in the Fishing Creek/Cedar Run Watershed

Sub-Area	Identifier	Calculated Capacity	Comments	Preliminary Recommended Solutions
FC12	T6-1 * Greene Twp	848	Property flooding SR2002	
FC12-14 (border)	T3-22 * Greene Twp	6376	Roadway and property flooding T352 (Stover Rd)	
FC17, 18	T3-11, T3-8 Greene Twp	18, 194	Roadway and property flooding T415 (Hopple Hollow)	
FC62-63 (border)	T5-7 * Walker Twp	950	Roadway and property flooding T467 at Little Fishing Creek Bridge	
FC75	T5-5 Walker Twp	21	Soil erosion and sedimentation T467 (McClain, Rodgers Rd) at the Roaring Run Bridge	

* Designates a significant obstruction

Table 3-1 (cont.)
Inventory of Existing Storm Drainage Problems in the Fishing Creek/Cedar Run Watershed

Sub-Area	Identifier	Calculated Capacity	Comments	Preliminary Recommended Solutions
FC77	T1-32 Porter Twp	5509	Sedimentation SR0064 east of T468	
FC77	T1-34 * Porter Twp	4917	Property flooding SR0064 left branch of Fishing Creek too much flow for stream crossing	
FC79	T2-62 * Porter Twp	1289	Roadway and property flooding SR2004 between Mackeyville and Clintondale	
FC79	T2-62 * Porter Twp	1289	Roadway and property flooding SR2004 between Mackeyville and Clintondale	
FC80	T2-64 * Porter Twp	19399	Roadway and property flooding SR2004 between Mackeyville and Clintondale	
FC83	T2-66 Porter Twp	4075	Roadway and property flooding T328 & SR2004 at Walizer Brdg.	
FC111	T2-23 Lamar Twp	21	Flooding Bob Quiggle property	

- Designates a significant obstruction

Table 3-1 (Cont.)
Inventory of Existing Storm Drainage Problems in the Fishing Creek/Cedar Run Watershed

Sub-Area	Identifier	Calculated Capacity	Comments	Preliminary Recommended Solutions
FC112	T2-32 Lamar Twp	5	Roadway and property flooding and soil erosion East end of T353	
FC114	T2-15 Lamar Twp	288	Roadway and property flooding SR 477 across from Karstetter's Welding	
FC118	T2-6 * Mill Hall Boro	11336	Roadway and property flooding Church Street Hse #600-#622	
FC118	T2-84 Lamar Twp	8806	Property flooding SR 477 Confer's Gas	

Survey of Significant Obstructions

Obstructions along channels limit flow capacity and can potentially cause significant ponding or diversion of water. The Lead Agency identified one hundred three (103) significant hydraulic obstructions within the Combined Watershed. These obstructions were determined "significant" based on the following distinction:

> An obstruction in a stream or channel shall be deemed "significant" if it has an estimated flow capacity which is less than the 10-year return period peak flow from the calibrated hydrologic model of a watershed prepared as part of the Act 167 Plan.

Table 3-2 lists the significant obstructions and their structure sizes and hydraulic capacities (bank full).

Table 3-2
Inventory of Significant Hydraulic Obstructions in the Fishing Creek/Cedar Run Watershed

Identifier	Sub-area	Calculated Capacity	Pipe Size	Description
T4-24	FC1	385	72"	Breon Road
T4-25	FC2	5	16"	SR 2002
T4-27, 28	FC2	1550, 1464	18x8, 17x8	SR 0080
T4-12	FC3	624	11x6	Sugar Valley Narrows Road
T4-17	FC3	129	53"	Sugar Valley Narrows Road
T4-13	FC4	133	54"	Sugar Valley Narrows Road
T4-18	FC5	107	54"	Breon Road
T4-11	FC7	56	42"	Fourth Gap Road
T4-18	FC8	107	54"	I-80
T4-1	FC10	3217	45x7	Winter Rd - Summer Road connection

Table 3-2 (cont.)
Inventory of Significant Hydraulic Obstructions in the Fishing Creek/Cedar Run Watershed

Identifier	Sub-area	Calculated Capacity	Pipe Size	Description
NONE	FC11			Sinkhole - @ Eastville
T3-22	FC12	6376	36x13	Connect Rd 13,000 feet East of 477 (Stover Rd)
NONE	FC13			Sinkhole -
T3-25	FC14	1594	22.3x7	Private Drive
T3-27	FC15	1584	19.4x7.7	Private Drive
T3-10	FC17	106	50"	Hopple Hollow Road
T3-18	FC18	1304	124"	Rte 477
T3-29	FC19	6536	48.4x11	Rte 477
NONE	FC20			Sinkhole - East of Sugar Grove School
T3-30	FC21	1072	3 - 6.7'	T351
T3-34	FC22	3015	35x8	SR 2009
NONE	FC23			Sinkhole - Bull Run Gap
T3-33	FC24	54	36"	SR 2009
NONE	FC25			Sink - Green Burr Gap
NONE	FC26			Sinkhole - Wolfs Gap
T2-78	FC27	50557	23x10.3	SR 2007-Logan Mills
NONE	FC28			Sink Schrekengast Gap
T6-7	FC29	18365	136x11	Rte 880
NONE	FC30			Sinkhole Spangler Gap

Table 3-2 (cont.)
Inventory of Significant Hydraulic Obstructions in the Fishing Creek/Cedar Run Watershed

Identifier	Sub-area	Calculated Capacity	Pipe Size	Description
T6-5	FC31	3144	38x8	Summer Road
NONE	FC32			Sinkhole Colvey Gap
T6-3	FC33	5744	49x10	SR 2002
T6-2	FC35	105	48"	Bear Run (SR 2002)
T6-1	FC40	848	19x5	SR 2002
T5-1	FC41	8728	74x10	SR 2002
T1-35	FC43	6097	25.8'x 7.2'	LR 18041 Hatchery below Sink
T4A-6	FC45	1421	23x6.3	34000’ east of 0144
T4A-5	FC46	625	15.1x4.7	Private Drive
T4A-11	FC47	105	48"	T461
T4A-3	FC48	193	5.8x4	T470
T4A-2	FC50	1043	15.5x6.7	Private Drive
T4A-1	FC51	527	19.6x3.4	Private Drive
T5-17	FC54	316	10.9x3.6	Private Drive
T5-22	FC55	473	13x4	T695
T5-13	FC56	436	14.5x3.7	Private Drive
T5-11	FC58	4540	56x8	Rte 64
T5-8	FC61	5767	61x8	Rte 64
T5-7	FC62	950	21x5	T467
T5-3	FC63	21	24"	SR 0064

Table 3-2 (cont.)
Inventory of Significant Hydraulic Obstructions in the Fishing Creek/Cedar Run Watershed

Identifier	Sub-area	Calculated Capacity	Pipe Size	Description
T5-1	FC64	8728	74x10	SR 2002
T1-41	FC65	1014	25.8'x 4.52'	Private Drive
NONE	FC74			Sinkhole
T1-40	FC75	3177	27.8x 9.78	Rte 64
T1-33	FC76	4501	48'x8.5'	Private Drive
T1-34	FC77	4917	42.9'x 9.8'	SR 0064 @ Clintondale
T1-30	FC77	11132	100x9.6	SR 0064
T2-62	FC79	1289	42x9	Rte 120
T2-64	FC80	19399	42x12	Rte 120
T2-65	FC81	4075	57x7	Rte 120
T2-69	FC82	58	7.9x2.6	Mackeyville Road
T2-51	FC83	24060	59x15	LR 18030
T2-48	FC84	2939	36x8	Rte 120
T2-44	FC85	1131	14.8x9.8	I-80
T2-45	FC86	25	4.5x3	Mackeyville Rote Rd LR 18030
T2-47	FC87	612	12.5x5.3	T358
T2-85,90	FC88	15137	69x9.5	Rte120 Cedar Springs
T1-17	FC91	285	15'x2.6	LR 18008
T1-15	FC92	54	42"	LR 18008
T1-12	FC93	314	60" & 54"	T321

Table 3-2 (cont.)
Inventory of Significant Hydraulic Obstructions in the Fishing Creek/Cedar Run Watershed

Identifier	Sub-area	Calculated Capacity	Pipe Size	Description
T1-5	FC97	522	14.2'x 4.3'	SR 2018 above Pavin
T1-3	FC98	1511	38.8x4.5	T321 @ Pavin
T1-2	FC99	3879	77.6x5.4	SR 2018
T3-14	FC101	88	4.7x3.2	Cherry Run Road
T3-7E	FC102	2148	161"	I-80
T3-7	FC103	2316	166"	I-80
T3-3	FC104	1136	20.6x5.8	Mt. Riansares Road
T3-39	FC105	907	15x6.2	Mt. Riansares Road
T3-1	FC106	1010	16x6	Rte 477
T2-40	FC107	364	6x6	I-80
T2-37	FC108	2431	34x7	Private Drive Just above Sinkhole
T2-28	FC109	88	40"	T357 Int Nittany Rd
T2-31C	FC110	196	52"	T364
T2-21	FC112	288	17x3	T364
T2-33	FC113	1594	35x5	Rte 477
T2-14	FC114	288	11x3.5	Rte 477 below Lamar School (Chub Run)

Table 3-2 (cont.)
Inventory of Significant Hydraulic Obstructions in the Fishing Creek/Cedar Run Watershed

Identifier	Sub-area	Calculated Capacity	Pipe Size	Comments
T2-10	FC115	1436	28'x5.5	Salona Stone Quarry
T2-12	FC115	1820	36x5.5	Rte 477 @ Salona
T2-8	FC116	222	66"	Rte 220
T2-9	FC117	341	8x5	Rte 64
T2-1,2,3,4, 5,6,7	FC118	4310, 15073, 21819	82x5.5	3 @ Rte 220

CHAPTER 4

EXISTING MUNICIPAL ORDINANCES

Municipal Ordinance Evaluation

Table 4-1 shows the types of land use and land development ordinances governing each of the sixteen municipalities in the Combined Watershed. Please take note that the majority of the municipalities do not have a specific requirement for stormwater management. However, stormwater management for Crawford and Logan Townships is regulated by the Clinton County Subdivision and Land Development Ordinance (SDLD). Likewise, stormwater management for Gregg, Walker, Marion, and Miles Townships is regulated by the Centre County SDLD Ordinance. These SDLD Ordinances require that post-development runoff levels do not exceed pre-development runoff levels.

Table 4-1
Existing Municipal Ordinance Matrix
Fishing Creek/Cedar Run Watershed

MUNICIPALITY	Stormwater Regulation	Sub-division and Land Development Ordinance	Floodplain Management Regulation	Zoning Ordinance
Washington Twp.	Y	Y	Y	Y
Lewis Twp.	N	N	Y	N
Spring Twp.	Y	Y	Y	Y
Gregg Twp.	N	Y	Y	N
Walker Twp.	N	N	Y	Y
Marion Twp.	N	N	Y	Y
Miles Twp.	N	N	Y	N
Porter Twp.	Y	Y	Y	Y
Logan Twp.	N	N	Y	N

Y = Yes N = No

Table 4-1 (cont.)
Existing Municipal Ordinance Matrix
Fishing Creek/Cedar Run Watershed

MUNICIPALITY	Stormwater Regulation	Sub-division and Land Development Ordinance	Floodplain Management Regulation	Zoning Ordinance
Lamar Twp.	Y	Y	Y	Y
Mill Hall Boro.	Y	Y	Y	Y
Bald Eagle Twp.	Y	Y	Y	Y
Castanea Twp.	N	Y	Y	Y
Greene Twp.	N	Y	Y	Y
Loganton Boro.	N	N	Y	Y
Crawford Twp.	N	N	Y	Y
Clinton County	Y	Y	Y	Y
Centre County	Y	Y	N	N

Y = Yes N = No

Municipalities with existing comprehensive zoning, building, subdivision and land development codes and ordinances can incorporate stormwater standards into their existing ordinances. Alternatively, the municipalities in the Combined Watershed may consider adopting a freestanding stormwater management ordinance. Also, this plan contains a model ordinance that the municipalities can adopt either unchanged or amended, but all amended versions must retain the exemption criteria. Chapter 10 (Model Ordinance), Chapter 8 (Standards and Criteria), and Chapter 11 (Plan Implementation) of this plan each offer more information about the model ordinance.

CHAPTER 5

FLOOD PROTECTION PROJECTS AND STORMWATER COLLECTION SYSTEMS

Existing and Proposed Stormwater and Flood Protection Facilities

The PA DEP Bureau of Flood Protection Projects provided the Lead Agency with the results of the Flood Protection Feasibility Study along Fishing and Bald Eagle Creeks in Mill Hall and Bald Eagle Township, Clinton County. The Pennsylvania Department of Environmental Protection (PA DEP) publication "SWP-10 STATE WATER PLAN FOR SUBBASIN #9" recognized this as a severe floodprone area. Both communities are subject to overbank flows from Fishing and Bald Eagle Creeks with $6.35 million in damages reported from the 1972 disaster. The 100-year flood damages in Mill Hall were updated for the study to $10,700,000. This figure does not include some companies that went out of business as a result of the 1972 flood.

A flood protection project was devised to protect Mill Hall and the commercial district along Hogan Boulevard in Bald Eagle Township from 100-year floods on Fishing Creek and backwater along Bald Eagle Creek. Compacted earth levees and concrete capped sheet pile walls were considered to contain floods within the channel. Four bridges (Peale, Church, and Main Streets, and Conrail) would have to be removed or replaced to a higher level at the expense of the owners or the local project sponsor. The estimated construction cost of this project, including the local costs of replacing bridges and removing buildings is more than $20 million.

The levees and walls extending above the ground along the streambanks would detract from the aesthetics of the area. The higher bridges with raised approaches would disrupt the existing street network and alter traffic patterns. These factors, and the high cost and complexity of the project make it impractical from a structural, as well as an economic standpoint. For this reason, the project is not recommended.

This feasibility study, the only proposed flood protection project considered in the Combined Watershed, provides an example of the costs for a large scale flood protection project in this watershed. Any organization producing plans for new facilities in the future should develop and submit the plans to the appropriate municipalities, as described in the model ordinance contained in Chapter 11 of this Report.

CHAPTER 6

HYDROLOGY MODEL SELECTION

Criteria for Model Selection

During the original study, it was essential for the hydrologic model for this watershed-wide stormwater management plan to have the capability to represent variable land use throughout the watershed, and to produce a full hydrograph response from each sub-area. The objective of model development was to provide a hydrologic analysis tool that could: (1) establish baseline runoff conditions under present land use in the Combined Watershed; (2) quantify the impact of future land use conditions on runoff peaks, volumes, and sub-area timing relationships; and (3) evaluate alternative stormwater runoff management techniques.

The following criteria were used to select a hydrologic computer model for the Combined Watershed:

1. The model should produce a full hydrograph, and must be capable of evaluating variable soils and land use conditions. The model should be able to route hydrographs through different stream reaches, and identify principal runoff source areas at selected points-of-interest. The model should also compute sub-area release rates, or provide travel time and peak flow information from which these release rates may be developed.
2. The model must be able to evaluate the hydrologic effects of land use change, channel modification, and stormwater management practices.
3. The selected model must be computationally efficient, and its data input requirements must be compatible with data readily obtained for the Combined Watershed.

Models Considered for the Fishing Creek/Cedar Run Watershed{tc “ Models Considered for Fishing Creek/Cedar Run Watershed” \l 2}

There were a number of hydrologic models and methods that satisfied the criteria described above. The following list includes the most prominent hydrology models and methods that were available at the time of the original study:

1. The HEC-1 computer program developed by the U.S. Army Corps of Engineers, Hydrologic Engineering Center, is a comprehensive rainfall-runoff computer model for simulating runoff hydrographs from multiple storm events. It was developed originally for large natural watersheds, but has been modified recently to accommodate small,

urbanizing basins. This program has the capability to model flow diversions, and provides output regarding travel times and peak flows that can be used to compute sub-area release rates. HEC-1 is appropriate for use on the Combined Watershed.

2. PSRM (Aron, 1992) is a single-event, rainfall-runoff computer model that was developed to simulate small urban and suburban watersheds having simple storm drainage networks. PSRM assumes that all runoff occurs as sheet flow on an overland surface. The "peak flow presentation table" is a feature of PSRM output that identifies sub-areas that contribute a substantial amount of runoff to the total hydrograph peak at a downstream point-of-interest. This feature can be used to locate possible sites for regional stormwater management facilities. The channel routing capability of PSRM is adequate for short reaches of channel or storm sewer. The channel routing technique is capable of modeling storm sewer surcharge and out-of-bank channel flow. PSRM is appropriate for use on the Combined Watershed.

3. The SCS computer model TR-20 (1969), revised in 1983, has been an important tool for stormwater and flood protection project formulation in undeveloped watersheds for many years. TR-20 is based on the SCS soil-cover-complex or runoff curve number (CN) for rainfall losses, a dimensionless unit hydrograph for sub-area runoff, and an attenuated kinematic wave routing method for channels. Reservoir routing is accomplished using the Modified Plus or Storage Indication Method. TR-20 was developed for the purpose of evaluating hydraulic structures and their impacts on watershed hydrology. TR-20 can model flow diversions, and provides travel time and peak flow output that can be used to develop release rates. TR-20 is appropriate for use on the Combined Watershed.

4. The SCS TR-55 procedure (1986) is a design storm method for analyzing small, developing watersheds. It has full hydrograph capability, based on the tabular hydrograph application to a 24-hour design storm, and is able to determine local impacts and downstream effects of land use change on the hydrology of an area. It was developed as a simple approximation to TR-20 by SCS in 1975, and was revised in 1986. TR-55 does not have the capability to model diversion or reservoir flows; therefore, it was not considered appropriate for use on the Combined Watershed.

Summary of the Hydrology Model Used for Fishing Creek/Cedar Run

The model that was selected for the original Combined Watershed study was the SCS computer model TR-20. From a practical perspective, it is likely that the majority of hydrologic computations for future land development projects within the Combined Watershed will be completed using a desktop hydrologic procedure, such as TR-55 which is a simplification of the TR-20 methodology. The 24-hour storm was selected because there are no provisions in the TR-55 procedure to compute runoff for storm duration's other than the 24-hour storm. It was expected that the use of the 24-hour storm in the hydrologic model selected for the combined watershed, and in all future hydrologic computations using a procedure such as TR-55, would result in consistent peak flow results.

CHAPTER 7

APPLICATION OF SELECTED HYDROLOGIC MODEL

Development of a Model for the Fishing Creek/Cedar Run Watershed

1. The Combined Watershed was divided into sub-areas to analyze flows and flow relationships. The sub-areas were delineated based on the location of stream confluence points and surveyed hydraulic (in-stream) obstructions using information provided by the Lead Agency. Data concerning land use, curve number, impervious fraction, overland slope, overland flow length, and Manning's roughness coefficient (n) were compiled for each sub-area. This information was compiled using data input into the IDRISI-GIS supplied to the original Consultant by the Lead Agency and USGS Quadrangle mapping.
2. The hydrologic connectivity of each of the individual sub-areas and major drainage elements located within the study area was established.
3. The 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour design rainfall depths were determined based on the Pennsylvania Department of Transportation Intensity-Duration-Frequency curves for Region 3 (Aron, et al., 1986). Design hydrographs were generated for use in the hydrologic model. Storm events of various durations were computed for TR-20 test runs. The peak flows at various points of interest in the test runs were compared to flows based on peak flow computational methods (PSU IV, USGS Regional Flood Frequency Estimates, and FEMA FIS).
4. Channel travel times and bank-full discharge capacities were computed for the major drainage elements connecting each sub-area in the Combined Watershed. Cross-section and longitudinal slope information provided by field survey and topographic mapping were used to determine these values.

The sequence of hydrologic operations in TR-20 for the Combined Watershed is basic to any watershed rainfall-runoff simulation, and is described below:

1. Surface runoff was computed by the SCS unit hydrograph method for each sub-area to produce a sub-area outflow hydrograph. The SCS curve number was applied to the design storm rainfall to produce rainfall excess.
2. Each sub-area hydrograph was routed along the main channel of each stream length to the next sub-area inflow point using the Modified Attenuated Kinematic (Modified Att-Kin) Procedure. This procedure results in no attenuation of the peak for channel reaches

with short hydraulic travel times (amounts of time it takes sub-area runoff to reach a downstream point-of-interest) relative to the overall modeling time step.

3. Sub-area hydrographs and routed hydrographs from upstream sub-areas were hydrologically combined at selected points of interest along the main channel to produce watershed peak flows.

4. Due to the significant presence of karst features within the Combined Watershed, a runoff curve number (CN) reduction technique was employed to calibrate the runoff model to various peak flow methodologies. The CN reduction technique used was developed for and utilized in the Hogestown Run/Trindle Spring Run Act 167 Stormwater Management Plan in Cumberland County prepared by Hartman & Associates, Inc., and provided by the Pennsylvania Department of Environmental Protection for use in this Plan. Table 7-1 lists the reduced runoff curve numbers.

Table 7-1
Curve Number (CN) Reduction Relationship
(Hogestown Run/Trindle Spring Run Act 167 Stormwater Management Plan in Cumberland County)

SCS Curve Number	Adjusted Curve Number
100	100
90	84
80	68
70	52
60	36
50	20

The data collection within the Combined Watershed included land use, soils, and geology. The use of these three parameters resulted in the land use being categorized by SCS hydrologic soil group (A - D) and either karst or non-karst geology. The procedure outlined above was used to reduce the CN based on karst geology while the CN in non-karst regions remained unchanged.

The SCS Curve Number weighting procedure that was used in the Combined Watershed is outlined below:

1) Analyze each sub-area based on land use, SCS soil type, and karst or non-karst geology.
2) Assign SCS CN's to soil type/land use category for non-karst regions based on Table 2-2 of the USDA SCS Technical Release 55.
3) Assign the same SCS CN's to soil type/land use categories for karst regions (with no reduction factors).
4) To establish a baseline comparison for the peak flows within the Combined Watershed, PSU IV (Aron, Kibler, and White 1981) and USGS-IND were used to estimate peak flows at various places within the Combined Watershed. The Federal Emergency Management Agency (FEMA) predicted peak flows within the limits of their detailed study area in the Flood Insurance Study (FIS). All three of these peak flow generators were used in comparison with the TR20 computed peak flows for the Combined Watershed.
5) TR-20 test runs were made for comparison with the peak flow methods above. Test runs were developed varying from no karst area CN reduction to a maximum reduction (indicator = 20). Four rainfall duration events were considered for the model test run comparison (6 hr, 8 hr, 12 hr, & 24 hour storm events). However, due to the size of the Combined Watershed (181 sq mi), only the 12 hour and 24 hour duration events were considered for use. Table 7-2 presents a comparison of flows using various indicators and peak flow methods.

Table 7-2
12 Hour Duration 100-Year Storm Event Peak Flow Comparison
Fishing Creek/Cedar Run Watershed
Crop/Pasture CN = Pasture CN

Sub-Area No.	Drainage Area (sq mi)	Adjusted CN (cfs)	Unadjusted CN (cfs)	USGS-IND (cfs)	PSU IV (cfs)	F.I.S. (cfs)	PA Bull 13 (cfs)
FC19	28.9	5947	7758	4890			
FC27	42.7	7585	9262	6617			
FC29	47.2	7772	9891	7151			
FC40	10.8	4622	4422	2280			
FC43	74.8	12165	14837	10218			
FC55	15.2	4118	5064	2972			
FC64	25.5	4759	6047	4438			
FC74	14.7	4677	4784	2896			
FC75	15.3	4677	4809	2987			
FC77	118.2	18611	22901	14567			
FC83	129.5	19013	23514	15635			
FC88	138.8	19803	25164	16498			
FC100	15.1	4102	8590	2957	2762		4854
FC108	11.4	6123	6272	2518			
FC112	7.7	4159	6036	1754			
FC115	23.1	9498	11835	4110	4402	3820	6939
FC118	181.8	27156	34735	20337	19610	22300	32600

Based on the flow comparison in Table 7-2, it appeared that TR-20 would produce results closest to peak flow values if a CN reduction based on an indicator value of 20 was used. However, to verify that using such a reduction would not skew the model, we compared hydrograph timing relationships and percentage of contribution to peak flows were compared for the 100-year storm event using four comparison test models:

24 Hour Duration - AB indicator = 40

12 Hour Duration - AB indicator = 40

24 Hour Duration - AB indicator = 20

12 Hour Duration - AB indicator = 20

The results of these model runs showed that the AB indicator and shortened duration event did not affect the timing relationship of the hydrologic models, while the peaks were reduced to values more in line with the various peak flow methods - especially the lower frequency storm events. Table 7-3 presents a comparison of the TR20 flows for all computed storm events versus the USGS-IND peak flows.

Table 7-3
24 Hour Storm Flow Peak Comparison Between TR20 and USGS-IND Values
Fishing Creek/Cedar Run Watershed
(Curve Numbers are based on Crop/Pasture CN = Pasture CN)
(AB Indicator = 20 for all Data - Existing Conditions)

Peak Flow Values for TR20 and USGS												
Design Storm	Flow Source	Sub-area Number/Drainage Area (sq mi)										
		19	27	29	40	43	55	64	83	88	108	118
		28.85	42.71	47.23	10.77	74.84	15.18	25.52	129.46	138.75	11.37	181.76
1-YR	TR20	181	183	175	156	257	103	115	499	505	203	589
1-YR	USGS	717	972	1051	334	1501	436	652	2296	2422	349	2986
2-YR	TR20	533	519	520	430	729	280	308	1424	1475	531	1814
2-YR	USGS	1178	1597	1726	549	2467	716	1071	3772	3980	573	4906
5-YR	TR20	1059	988	1010	810	1513	579	631	2830	2895	1018	3571
5-YR	USGS	1878	2545	2752	875	3932	1142	1708	6012	6344	913	7820

Table 7-3 (cont.)
24 Hour Storm Flow Peak Comparison Between TR20 and USGS-IND Values
Fishing Creek/Cedar Run Watershed
(Curve Numbers are based on Crop/Pasture CN = Pasture CN)
(AB Indicator = 20 for all Data - Existing Conditions)

Peak Flow Values for TR20 and USGS												
Design Storm	Flow Source	Sub-area Number/Drainage Area (sq mi)										
		19	27	29	40	43	55	64	83	88	108	118
		28.85	42.71	47.23	10.77	74.84	15.18	25.52	129.46	138.75	11.37	181.76
10-YR	TR20	1746	1690	1730	1360	2857	1057	1157	5103	5177	1801	6352
10-YR	USGS	2476	3356	3628	1154	5183	1505	2251	7925	8362	1203	10309
25-YR	TR20	3067	3073	3144	2329	5424	1980	2223	9622	9655	3248	11801
25-YR	USGS	3356	4549	4917	1564	7025	2040	3052	10743	11336	1631	13974
50-YR	TR20	3921	3983	4074	3018	7209	2605	2954	12758	12750	4181	15386
50-YR	USGS	4090	5544	5993	1906	8562	2487	3719	13093	13815	1988	17031
100-YR	TR20	5759	5923	6033	4569	10680	3944	4505	18655	18587	5977	22173
100-YR	USGS	4890	6617	7151	2280	10218	2972	4438	15635	16494	2373	20337

Table 7-4 presents a percentage comparison between the TR20 peak flows and the USGS-IND peak flows. Of note in Table 7-4 is that the peak flows in general show a high correlation in the lower frequency events such as the 50-year and 100-year storms. This would be expected in a karst region where large flows exceed the capacity of karst features. In the higher frequency events, the TR20 peak flows are significantly lower than the USGS-IND. Again, this is to be expected since the USGS-IND peak generation does not account for karst geology, which can significantly reduce higher frequency storm peaks.

Table 7-4
Percentage Comparison of TR20/USGS Peak Flows
Fishing Creek/Cedar Run Watershed
(Curve Numbers are based on Crop/Pasture CN = Pasture CN)
(AB = 20 for all Data - Existing Conditions)

Percentage Comparison of Flow Values by Storm Event and Sub-area											
Storm	Sub-Area Number										
Event	19	27	29	40	43	55	64	83	88	108	118
1-YR	25%	19%	17%	47%	17%	24%	18%	22%	21%	58%	20%
2-YR	45%	33%	30%	78%	30%	39%	29%	38%	37%	93%	37%
5-YR	56%	39%	37%	93%	38%	51%	37%	47%	46%	112%	46%
10-YR	71%	50%	48%	118%	55%	70%	51%	64%	62%	150%	62%
25-YR	91%	68%	64%	149%	77%	97%	73%	90%	85%	199%	84%
50-YR	96%	72%	68%	158%	84%	105%	79%	97%	92%	210%	90%
100-YR	118%	90%	84%	200%	105%	133%	102%	119%	113%	252%	109%

Based on the results of the analysis, the SCS Curve Numbers were reduced using an AB Indicator value of 20. The Curve Numbers for the hydrologic models are presented in Table A-1.

Table 7-5 presents the existing conditions sub-area and sub-watershed peak discharges where the sub-area flows represent the peak runoff from the individual sub-area at the sub-area outlet, and the sub-watershed flows represent the portion of the total watershed above the sub-area outlet.

Table 7-5
Existing Conditions Sub-Area and Sub-Watershed Peak Discharges (cfs)
Fishing Creek/Cedar Run Watershed

Sub-Area No.	Drainage Area		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed
FC1	1.26	1.26	49	49	111	111	211	211	402	402	527	527	776	776
FC2	0.31	1.57	70	73	117	136	183	251	293	471	359	611	484	889
FC3	1.30	1.30	79	79	155	155	271	271	484	484	618	618	882	882
FC4	1.63	1.63	104	104	210	210	377	377	681	681	874	874	1252	1252
FC5	0.88	0.88	49	49	99	99	176	176	318	318	408	408	585	585
FC6	1.29	6.67	101	334	198	687	344	1244	609	2268	776	2923	1099	4217
FC7	0.92	0.92	99	99	185	185	313	313	542	542	683	683	955	955
FC8	1.38	2.29	70	142	144	286	260	510	475	914	614	1172	886	1677
FC9	1.57	1.57	115	115	242	242	442	442	809	809	1041	1041	1496	1496
FC10	2.40	12.94	76	501	185	1054	371	1931	734	3507	977	4520	1461	6531
FC11	1.51	1.51	68	68	153	153	292	292	555	555	726	726	1066	1066
FC12	3.28	17.73	18	423	60	856	157	1463	380	2632	541	3432	882	5114
FC13	1.72	1.72	98	98	188	188	323	323	570	570	726	726	1030	1030
FC14	2.89	22.34	8	474	31	961	141	1615	475	2906	737	3734	1320	5492
FC15	0.60	22.94	1	464	5	932	21	1556	73	2751	116	3545	211	5238
FC16	1.13	1.13	8	8	35	35	101	101	255	255	365	365	596	596
FC17	0.94	0.94	45	45	86	86	148	148	262	262	334	334	476	476
FC18	1.53	2.47	292	295	493	503	775	794	1250	1291	1536	1593	2079	2171
FC19	2.31	28.85	6	533	23	1059	94	1746	315	3067	489	3921	876	5759
FC20	0.56	0.56	55	55	107	107	186	186	326	326	413	413	582	582

Table 7-5 (cont.)
Existing Conditions Sub-Area and Sub-Watershed Peak Discharges (cfs)
Fishing Creek/Cedar Run Watershed

Sub-Area No.	Drainage Area		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed
FC21	2.51	31.92	10	531	33	1039	87	1736	214	3107	306	3989	504	5899
FC22	1.52	33.43	6	467	20	892	61	1535	164	2795	241	3631	407	5429
FC23	2.09	2.09	101	101	232	232	450	450	861	861	1128	1128	1657	1657
FC24	1.64	3.73	11	83	42	215	119	450	297	936	425	1277	698	1924
FC25	0.91	0.91	53	53	122	122	235	235	446	446	582	582	850	850
FC26	1.53	1.53	90	90	169	169	288	288	503	503	639	639	903	903
FC27	3.11	42.71	26	519	82	988	196	1690	446	3073	622	3983	992	5923
FC28	0.96	0.96	81	81	154	154	262	262	455	455	577	577	813	813
FC29	3.56	47.23	21	520	77	1010	215	1730	541	3144	777	4074	1280	6033
FC30	3.14	3.14	122	122	268	268	505	505	956	956	1251	1251	1838	1838
FC31	2.83	53.20	9	530	35	1051	119	1811	352	3289	530	4257	920	6281
FC32	1.32	1.32	55	55	149	149	309	309	632	632	841	841	1256	1256
FC33	1.08	55.59	21	528	73	1054	171	1833	375	3347	514	4329	797	6369
FC34	2.54	58.13	199	533	386	1084	669	1884	1179	3434	1500	4435	2128	6507
FC35	1.28	1.28	35	35	92	92	193	193	394	394	528	528	801	801
FC36	2.27	2.27	246	246	456	456	765	765	1308	1308	1645	1645	2300	2300
FC37	1.91	4.18	139	341	277	652	487	1085	870	1924	1115	2452	1588	2485
FC38	1.67	5.85	146	389	292	714	517	1202	922	2163	1177	2787	1671	4021
FC39	3.14	8.99	168	425	335	811	593	1379	1069	2376	1372	3082	1967	4663
FC40	1.78	10.77	120	430	243	810	432	1360	780	2328	1003	3018	1435	4569

Table 7-5 (cont.)
Existing Conditions Sub-Area and Sub-Watershed Peak Discharges (cfs)
Fishing Creek/Cedar Run Watershed

Sub-Area No.	Drainage Area		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed
FC41	2.59	72.78	173	699	370	1460	678	2769	1253	5283	1618	7036	2334	10423
FC42	1.27	1.27	150	150	274	274	457	457	780	780	989	979	1359	1359
FC43	0.79	74.84	5	729	21	1513	62	2857	158	5424	228	7209	375	10680
FC44	2.14	2.14	81	81	184	184	351	351	672	672	882	882	1299	1299
FC45	2.12	4.26	12	66	42	175	116	382	290	820	416	1124	685	1748
FC46	1.73	5.98	12	72	62	188	193	408	521	877	751	1206	1231	1877
FC47	0.97	0.97	131	131	228	228	368	368	608	608	754	754	1033	1033
FC48	0.66	1.63	32	141	68	262	124	444	229	769	297	973	430	1367
FC49	1.70	1.70	0	0	3	3	11	11	52	52	96	96	207	207
FC50	0.59	9.91	89	182	162	390	270	744	456	1481	569	1997	786	3056
FC51	1.13	11.04	146	233	269	477	448	887	759	1682	950	2221	1317	3345
FC52	0.41	11.46	96	264	164	521	265	944	429	1743	528	2285	716	3423
FC53	1.28	1.28	0	0	0	0	4	4	23	23	50	50	135	135
FC54	0.87	13.61	32	276	80	548	165	998	328	1859	436	2445	651	3695
FC55	1.57	15.18	10	280	36	579	104	1057	263	1980	379	2605	624	3944
FC56	1.22	16.40	76	306	160	616	292	1100	537	2039	693	2682	1000	4055
FC57	1.63	1.63	9	9	41	41	131	131	348	348	505	505	844	844
FC58	0.86	18.88	119	336	216	672	357	1194	601	2210	751	2905	1037	4395
FC59	1.41	20.29	1	311	1	622	1	1130	1	2143	1	2837	1	4322
FC60	1.15	21.44	0	306	0	615	0	1120	7	2137	15	2835	52	4318

Table 7-5 (cont.)
Existing Conditions Sub-Area and Sub-Watershed Peak Discharges (cfs)
Fishing Creek/Cedar Run Watershed

Sub-Area No.	Drainage Area		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed
FC61	1.60	23.03	3	306	11	624	41	1142	143	2186	226	2901	417	4417
FC62	0.75	23.79	5	308	18	628	50	1150	125	2203	179	2924	294	4454
FC63	0.80	24.58	3	309	14	631	46	1157	132	2218	195	2943	334	4483
FC64	0.94	25.52	0	308	0	631	0	1157	6	2223	13	2954	54	4505
FC65	0.82	26.34	0	307	0	629	1	1154	6	2223	14	2956	55	4512
FC66	2.08	2.08	112	112	258	258	493	493	942	942	1229	1229	1798	1798
FC67	1.66	3.74	131	191	252	421	434	724	761	1356	966	1736	1363	2443
FC68	1.53	5.26	125	233	243	483	421	768	743	1499	945	1948	1336	2741
FC69	2.11	7.37	166	291	319	571	550	881	963	1752	1223	2290	1725	3270
FC70	1.16	1.16	46	46	107	107	206	206	398	398	523	523	772	772
FC71	1.51	2.68	147	159	287	322	500	576	879	1051	1115	1348	1572	1925
FC72	1.59	11.64	71	413	139	789	242	1285	432	2498	554	3271	792	4746
FC73	0.46	0.46	9	9	31	31	75	75	167	167	232	232	362	362
FC74	2.58	14.68	31	406	107	768	261	1253	595	2432	825	3193	1305	4691
FC75	0.63	15.31	0	403	2	763	6	1251	41	2426	78	3187	172	4689
FC76	0.69	42.34	0	637	0	1234	3	2169	13	4032	28	5377	72	7995
FC77	1.02	118.2	2	1352	7	2698	31	4878	114	9297	182	12440	337	18321
FC78	2.87	121.1	33	1362	98	2727	224	4940	491	9372	676	12475	1060	18285
FC79	1.97	123.0	54	1374	145	2752	306	4983	629	9441	844	12555	1279	18391
FC80	0.76	123.8	33	1383	70	2768	130	5009	241	9486	313	12611	456	18467

Table 7-5 (cont.)
Existing Conditions Sub-Area and Sub-Watershed Peak Discharges (cfs)
Fishing Creek/Cedar Run Watershed

Sub-Area No.	Drainage Area		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed
FC81	2.13	125.9	87	1404	217	2804	438	5069	870	9586	1151	12733	1712	18634
FC82	2.23	2.23	140	140	327	327	329	329	1207	1207	1575	1575	2300	2300
FC83	1.31	129.5	17	1424	60	2830	146	5103	331	9622	459	12758	724	18655
FC84	1.64	1.64	29	29	84	84	185	185	396	396	539	539	834	834
FC85	3.26	3.26	361	361	677	677	1152	1152	1982	1982	2496	2496	3484	3484
FC86	1.68	4.95	5	303	16	576	48	1005	137	1822	204	2340	353	3356
FC87	1.11	6.06	34	312	91	616	190	1090	387	1982	517	2554	778	3692
FC88	1.59	138.8	111	1475	227	2895	406	5177	733	9655	941	12750	1436	18587
FC89	0.77	0.77	3	3	13	13	54	54	165	165	254	254	441	441
FC90	1.42	2.20	0	3	0	13	0	54	8	165	17	254	61	454
FC91	0.99	3.18	9	10	32	38	80	108	188	288	263	421	421	715
FC92	1.07	1.07	0	0	0	0	3	3	14	14	33	33	104	104
FC93	1.22	5.47	5	14	19	49	73	133	219	361	328	551	568/	1018
FC94	1.49	6.96	31	31	91	105	201	269	426	657	579	952	893	1662
FC95	1.85	1.85	9	9	9	9	9	9	9	9	9	9	9	9
FC96	0.64	0.64	6	8	24	24	64	64	155	155	219	219	353	353
FC97	0.73	3.22	9	17	30	45	72	121	164	294	227	418	360	680
FC98	1.78	11.96	36	60	117	192	270	477	591	1157	807	1672	1248	2800
FC99	0.81	12.77	34	74	87	229	180	554	357	1312	473	1914	705	3249
FC100	2.33	15.10	27	90	91	263	220	645	500	1556	694	2266	1100	3893

Table 7-5 (cont.)
Existing Conditions Sub-Area and Sub-Watershed Peak Discharges (cfs)
Fishing Creek/Cedar Run Watershed

Sub-Area No.	Drainage Area		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed	Sub-Area	Sub-Shed
FC101	0.91	0.91	71	71	127	127	209	209	352	352	441	441	612	612
FC102	1.13	2.04	87	112	107	217	298	277	531	667	667	854	960	1214
FC103	0.87	2.91	76	164	154	323	275	608	491	1085	627	1387	891	1977
FC104	2.12	5.04	178	256	346	522	502	995	1060	1833	1347	2368	1903	3421
FC105	0.80	0.80	37	37	86	86	165	165	317	317	415	415	609	609
FC106	1.27	1.27	98	98	202	202	361	361	655	655	840	840	1200	1200
FC107	1.06	1.06	184	184	336	336	555	555	951	951	1187	1187	1638	1638
FC108	3.20	11.37	232	531	410	1020	670	1801	1129	3248	1415	4181	1963	5977
FC109	1.38	1.38	125	125	256	256	460	460	841	841	1078	1078	1538	1538
FC110	2.21	3.60	42	153	132	367	300	724	652	1411	890	1863	1377	2764
FC111	2.18	2.18	7	7	27	27	87	87	249	249	371	371	639	639
FC112	1.93	7.70	78	174	184	413	359	891	694	1850	915	2508	1353	3889
FC113	1.51	20.59	7	664	28	1365	97	2549	275	4768	407	6236	693	9140
FC114	1.36	21.95	2	656	3	1357	34	2548	133	4798	215	6284	403	9254
FC115	1.15	23.10	3	649	13	1353	48	2545	149	4769	226	6232	397	9157
FC116	0.90	0.90	14	14	45	45	105	105	233	233	321	321	505	505
FC117	1.07	1.07	84	84	168	168	297	297	531	531	679	679	966	966
FC118	2.84	181.8	144	1814	284	3571	497	6352	891	11801	1142	15386	1633	22173

CHAPTER 8

STANDARDS AND CRITERIA

Introduction

Stormwater management problems are not confined to site or municipal boundaries; they may be watershed-wide in scope. Therefore, effective stormwater management is accomplished through the development of performance standards and criteria that consider the basin-wide impacts of runoff caused by site development. Traditionally, stormwater management has been applied to individual sites only, without consideration for the impact of post-development runoff from individual sites on the entire watershed. Prior to early 1980, effects of the traditional stormwater management approach were not considered. Watershed planning during the past decade has utilized an approach known as the “release rate method” to address the impact of post-development runoff from individual sites on the entire watershed.

In an effort to simplify the regulations and requirements for rural watersheds where development potential is limited to a few areas or corridors, other stormwater techniques have been utilized to identify critical development areas within the Combined Watershed. This method is based on the future development conditions within the Combined Watershed as identified by the planning organizations involved in the study. Future conditions peak flow projections were compared to the existing conditions peak flow estimates to compute the increased peak flows due to projected development within the Combined Watershed. Critical development areas within the watershed were identified as areas where sub-watersheds peak flows increased by ten (10%) percent or greater in the 10-year storm event.

The Fishing Creek/Cedar Run Watershed is a rural watershed where future development impacts are predicted to be limited along a corridor as shown on Plate 2. These critical areas are identified in Table 8-1. This corridor has been identified as an area of critical development where additional stormwater requirements may need to be implemented beyond traditional standards where post-development flow cannot exceed pre-development levels.

Table 8-1
Adjusted Curve Number Comparison and
Critical Development Area Identification in the
Fishing Creek/Cedar Run Watershed
(Curve Numbers are based on Crop/Pasture CN = Pasture CN)

Sub-area No.	Area (sq mi)	Exist CN AB=20	Future CN AB=20	% Karst	CN Change	Critical Devel. Area	Sub-area No.	Area (sq mi)	Exist CN AB=20	Future CN AB=20	% Karst	CN Change	Critical Devel. Area
FC1	1.25	64.0	64.0	0%		NO	FC21	2.51	55.0	55.6	90%	0.6	NO
FC2	0.32	72.5	72.5	0%		NO	FC22	1.51	54.5	54.5	97%		NO
FC3	1.30	66.9	66.9	2%		NO	FC23	2.09	63.9	63.9	3%		NO
FC4	1.64	66.3	66.3	19%		NO	FC24	1.65	56.5	56.5	65%		NO
FC5	0.88	66.4	66.4	0%		NO	FC25	0.91	64.3	64.3	0%		NO
FC6	1.30	67.4	67.4	31%		NO	FC26	1.53	67.9	67.9	1%		NO
FC7	0.92	68.7	68.7	0%		NO	FC27	3.12	57.7	57.7	62%		NO
FC8	1.38	65.8	65.8	11%		NO	FC28	0.95	68.2	68.3	2%		NO
FC9	1.58	65.8	65.8	16%		NO	FC29	3.55	56.1	56.1	62%		NO
FC10	2.40	62.6	62.6	79%		NO	FC30	3.17	64.2	64.3	1%		NO
FC11	1.52	64.1	64.1	6%		NO	FC31	2.81	53.8	53.8	65%		NO
FC12	3.27	56.1	56.1	78%		NO	FC32	1.31	62.3	62.3	0%		NO
FC13	1.72	67.4	67.4	2%		NO	FC33	1.07	59.8	59.9	47%		NO
FC14	2.89	53.0	53.0	72%		NO	FC34	2.55	67.5	67.5	0%		NO
FC15	0.60	52.2	52.2	90%		NO	FC35	1.28	61.7	61.7	20%		NO
FC16	1.13	56.8	56.8	63%		NO	FC36	2.26	69.0	69.0	0%		NO
FC17	0.93	67.1	67.1	0%		NO	FC37	1.92	66.9	66.9	0%		NO
FC18	1.54	72.2	72.2	0%		NO	FC38	1.67	67.0	67.0	0%		NO
FC19	2.30	52.8	52.8	72%		NO	FC39	3.14	66.4	66.4	0%		NO
FC20	0.56	67.8	67.8	6%		NO	FC40	1.78	66.5	66.5	0%		NO

Table 8-1 (cont.)
Adjusted Curve Number Comparison and
Critical Development Area Identification in the
Fishing Creek/Cedar Run Watershed
(Curve Numbers are based on Crop/Pasture CN = Pasture CN)

Sub-area No.	Area (sq mi)	Exist CN AB=20	Future CN AB=20	% Karst	CN Change	Critical Devel. Area
FC41	2.59	65.6	65.6	0%		NO
FC42	1.27	69.4	69.4	0%		NO
FC43	0.79	56.3	58.1	34%	1.9	YES
FC44	2.13	63.8	63.8	0%		NO
FC45	2.12	56.0	56.0	0%		NO
FC46	1.72	56.4	56.4	0%		NO
FC47	0.97	71.0	71.1	0%		YES
FC48	0.67	65.4	73.1	36%	7.8	YES
FC49	1.70	46.5	51.2	79%	4.8	YES
FC50	0.59	69.6	78.6	3%	9.0	YES
FC51	1.13	69.4	69.4	0%		YES
FC52	0.42	71.7	71.7	0%		YES
FC53	1.28	43.8	43.8	77%		YES
FC54	0.88	62.5	62.5	10%		YES
FC55	1.57	56.2	56.2	40%		YES
FC56	1.22	65.6	65.6	27%		YES
FC57	1.63	55.9	55.9	0%		YES
FC58	0.86	69.8	69.8	3%		YES
FC59	1.41	49.1	49.1	90%		YES
FC60	1.15	39.9	39.9	92%		YES
FC61	1.59	51.5	51.5	67%		YES
FC62	0.75	56.4	56.4	49%		YES
FC63	0.80	54.7	56.4	57%	1.7	YES
FC64	0.94	40.0	41.7	99%	1.7	YES
FC65	0.82	40.6	42.7	100%	2.1	YES
FC66	2.07	64.3	64.3	0%		NO
FC67	1.66	67.9	67.9	0%		NO
FC68	1.52	67.6	67.6	0%		NO
FC69	2.10	67.8	67.8	0%		NO
FC70	1.16	63.7	63.7	0%		NO
FC71	1.52	67.6	67.6	0%		NO
FC72	1.59	66.5	66.5	0%		NO
FC73	0.46	59.5	59.5	0%		NO
FC74	2.58	58.6	58.6	0%		NO
FC75	0.64	47.7	55.9	45%	8.2	YES
FC76	0.68	44.1	53.5	100%	9.4	YES
FC77	1.03	51.6	53.5	100%	1.9	YES
FC78	2.86	58.9	61.2	63%	2.3	YES
FC79	1.96	61.6	62.5	76%	0.9	YES
FC80	0.76	64.9	65.5	68%	0.7	NO

Table 8-1 (cont.)
Adjusted Curve Number Comparison and
Critical Development Area Identification in the
Fishing Creek/Cedar Run Watershed
(Curve Numbers are based on Crop/Pasture CN = Pasture CN)

Sub-area No.	Area (sq mi)	Exist CN AB=20	Future CN AB=20	% Karst	CN Change	Critical Devel. Area
FC81	2.13	62.9	62.9	22%		NO
FC82	2.23	64.2	64.2	13%		NO
FC83	1.31	58.9	58.9	69%		NO
FC84	1.64	60.2	60.6	82%	0.4	NO
FC85	3.25	68.7	68.7	1%		NO
FC86	1.69	53.1	53.1	96%		NO
FC87	1.11	61.9	61.9	69%		NO
FC88	1.59	66.4	66.4	39%		NO
FC89	0.77	54.1	54.1	94%		NO
FC90	1.42	39.6	39.6	97%		NO
FC91	0.99	57.8	57.8	73%		NO
FC92	1.07	42.6	42.6	100%		NO
FC93	1.22	54.3	54.3	85%		NO
FC94	1.49	60.5	60.5	74%		NO
FC95	1.86	55.9	56.3	100%	0.4	NO
FC96	0.64	57.6	57.6	100%		NO
FC97	0.73	58.6	58.6	100%		NO
FC98	1.78	60.0	60.2	80%	0.2	NO
FC99	0.81	62.6	62.6	61%		NO
FC100	2.33	58.6	58.6	85%		NO
FC101	0.90	69.9	69.9	0%		NO
FC102	1.13	67.2	67.2	6%		NO
FC103	0.87	66.9	66.9	2%		NO
FC104	2.12	67.6	67.6	0%		NO
FC105	0.81	64.0	64.0	0%		NO
FC106	1.27	66.4	66.4	0%		NO
FC107	1.06	69.5	69.5	0%		NO
FC108	3.22	69.9	69.9	1%		NO
FC109	1.38	66.5	66.5	12%		NO
FC110	2.21	60.0	60.0	46%		NO
FC111	2.19	53.9	53.9	71%		NO
FC112	1.93	63.5	63.5	18%		NO
FC113	1.50	54.9	54.9	60%		NO
FC114	1.36	51.1	51.1	98%		NO
FC115	1.15	53.5	53.5	100%		NO
FC116	0.91	59.3	59.3	39%		NO
FC117	1.07	66.8	66.8	15%		NO
FC118	2.84	66.6	66.6	36%		NO

Performance Standards

The standards set forth in the Model Ordinance shall apply to all development within the Combined Watershed to promote flow attenuation, erosion and sediment control, and flood control. However, areas identified as "Critical Areas" shall be subject to the performance standards in Table 8-2.

Table 8-2
Stormwater Control for Critical Areas in the Fishing Creek/Cedar Run Watershed

Type of Storm	Control for Development in any sub-area	Control for Development in Sub-areas Designated as "Critical Areas"
1 Year	1 Year Pre-development Peak Run-Off	1 Year Pre-development Peak Run-Off
2 Year	2 Year Pre-development Peak Run-Off	2 Year pre-Development Peak Run-Off
10 Year	10 Year Pre-development Peak Run-Off	2 Year Pre-development Peak Run-Off
25 Year	25 Year Pre-development Peak Run-Off	25 Year Pre-development Peak Run-Off
100 Year	100 Year Pre-development Peak Run-Off	100 Year Pre-development Peak Run-Off

CHAPTER 9

STORMWATER MANAGEMENT TECHNIQUES

Introduction

Techniques to lessen the impact of stormwater runoff from both existing and proposed land uses fall into two broad categories; structural, and non-structural. Structural stormwater management techniques utilize physical means to reduce or manage runoff. Stormwater detention basins, infiltration trenches, and grassed waterways are all examples of structural stormwater management techniques. It is important to note that many structural techniques should not be used in areas where limestone is prevalent, especially infiltration trenches because they accelerate sinkhole production. Non-structural stormwater management techniques generally refer to land use restrictions used to manage the amount and extent of land use changes. Floodplain, stormwater management, subdivision, and zoning regulations are all examples of effective non-structural stormwater management techniques.

The following sections present a summary of stormwater management alternatives for the Combined Watershed. The applicability of particular stormwater management techniques in individual sub-areas is site specific. It is important to consider on-site characteristics such as topography, soils, sub-surface geology, water table configuration, existing and proposed land uses, land requirements, and regulatory controls to determine the suitability of a particular stormwater management technique.

Structural Stormwater Management Techniques

Structural stormwater management techniques can be divided into two categories, volume reduction and peak reduction techniques. Volume reduction techniques decrease the amount of stormwater that runs off a site by increasing the infiltration fraction of precipitation. Peak reduction techniques decrease the magnitude of peak flows while increasing the duration of runoff period.

The next section provides a discussion of volume reduction and rate reduction techniques that may be appropriate for use in the Combined Watershed. Table 9-1 lists a description of the techniques, applicability, advantages and disadvantages, maintenance requirements, and approximate construction costs (where available) of these techniques.

Volume Reduction Techniques

Land use changes and development in the watershed will increase the volume of runoff. Reductions in the amount of runoff from new developments accomplished through the prudent implementation of a stormwater management plan for the site will play an important role in the success or failure of the watershed-wide stormwater management plan. Volume reduction techniques can be a valuable part of any stormwater management plan.

Some volume reduction techniques decrease runoff from a site by routing water to the subsurface and the local water table. Planners and developers must ensure that these types of volume reduction techniques do not degrade the water quality of local aquifers. Title 25, Chapter 97 (Industrial Wastes) Underground Disposal, Section 97.71, clearly refers to stormwater runoff as potential pollution unless, "the disposal is close enough to the surface so that the wastes will be absorbed in the soil mantle and be acted upon by the bacteria naturally present in the mantle before reaching the underground or surface waters." Discharges to sinkholes are not acceptable because of accelerated sinkhole production and groundwater contamination.

Developers typically use volume reduction techniques in conjunction with peak reduction techniques as part of the overall stormwater management plan. Volume reduction techniques normally are not sufficient by themselves to provide adequate attenuation of stormwater runoff, except for use at individual homes and small parking lots. Volume reduction techniques help decrease the size of the peak reduction facilities, thereby lowering capital costs.

Peak Reduction Techniques

Peak reduction techniques are generally temporary storage facilities that decrease peak flows from a site. Proper design of peak reduction facilities can decrease peak discharges to acceptable values within the constraints of the watershed-wide stormwater management plan. The design of peak reduction facilities must consider pre-development peak flows, anticipated post-development peak flows, applicable release rates, and site constraints. A site-by-site approach to the design of peak reduction facilities in the watershed is undesirable, and may actually increase downstream peak flows.

Non-Structural Stormwater Management Techniques

Non-structural stormwater management techniques rely primarily on federal, state, and local regulations. Applicable federal laws regulating activities in waters of the United States include, but are not limited to, Section 404 of the Clean Water Act (PL 92-500) and the River and Harbor Act of 1899. These laws regulate activities such as filling, dredging, and wetland encroachment. State regulations include, but are not limited to, the Dam Safety and Encroachment Act (P.L.177) which regulates activities such as stormwater detention pond outflows into receiving streams in or near waters of the Commonwealth. The Dam Safety and Encroachment Act is under the jurisdiction of the PA DEP. On the local level, ordinances such as, floodplain management, stormwater management, subdivision, and stormwater management, zoning regulate development. All non-structural stormwater management techniques affect runoff by regulating land use.

Table 9-1
Structural Stormwater Management Techniques
Fishing Creek/Cedar Run Watershed

Description	Applicability	Advantages	Disadvantages	Maintenance
VOLUME REDUCTION TECHNIQUES				
Drain runoff from impervious areas over pervious areas	Use in low density development areas outside principal drainageways. Do not use in natural or man made drainageways.	• Inexpensive to install and maintain • Promotes groundwater recharge • Promotes green space preservation	• May degrade groundwater quality	• Periodic inspections for sedimentation • Harvest vegetation and collect thatch
Infiltration pits, trenches and dry wells	Use when soil permeability is below bottom of structure, and runoff is free of particulate matter	• Inexpensive to construct • Provides groundwater recharge • Reduces pipe capacities and costs when used in conjunction with storm sewer bedding • Reduces ponding and local flooding • Multi-purpose use • Effective for controlling “first flush” pollutants	• Requires sediment free runoff (otherwise filters may be required) • Limited to small applications • Clogged systems must be replaced • Must provide contingencies for ponding in a clogged or full system • Accelerates sinkhole production	• Must clean and maintain sediment filters
Concrete grid and modular pavement	Use on large parking areas and on-street parking. Use as erosion control devices in drainageways and at detention basin outfalls (must be protected from undermining)	• Increased flexibility eases repair of underground utilities, replacement of pavement units, and installation of signs and plantings • Flexibility prevents buckling • Aesthetically pleasing	• Installation expensive and labor intensive • Susceptible to damage from fertilizers and de-icing agents • Shifting units result in uneven surface and present a safety hazard • Potential groundwater quality degradation	• Maintain vegetation in voids • Reset shifted units and replace broken units

Table 9-1 (cont.)
Structural Stormwater Management Techniques
Fishing Creek/Cedar Run Watershed

Description	Applicability	Advantages	Disadvantages	Maintenance
Porous asphalt pavement	Use in low volume traffic areas not subjected to heavy loads or the turning or stopping action of large vehicles. Requires a permeable soil sub-base	• Reduces or eliminates additional storage facilities • Water free surfaces enhance skid resistance • Eliminates need for crowns and cross slopes • Increases groundwater recharge	• Asphalt cement prone to stripping by de-icing agents • Prone to clogging problems • Susceptible to freeze/thaw damage if adequate sub-surface drainage is not provided • Increased aggregate base or asphalt thickness required • More expensive than conventional pavement • Conveys oils and solvents to groundwater • Weeds may grow through pavement	• Remove debris and sediment from surface
Grassed waterways, filter strips, and seepage areas	Use in small developments with open space for stormwater control and along roadside drainage systems	• Less expensive than curbs and gutters • Enhances groundwater recharge • Eliminates flooding of roadways from inlet by-passing • Multi-purpose recreational use • Plantings in filter strips effectively screens parking areas • Positive aesthetics, increases time of concentration, and enhances infiltration	• Requires more regular maintenance than curb and gutter systems • Requires wider right-of-ways • Driveway culverts trap debris • May require guide rails along roadway • May not be compatible with local subdivision • Receptacle for lawn debris • Sedimentation discourages vegetative growth • Seepage areas accumulate contaminants in upper layers of soil • Overflows from seepage areas may damage down stream areas • May accelerate sinkhole • production	• Remove obstructions along drainageways & repair erosion & sedimentation damage • Maintain vegetation & remove dead material • Maintain soil permeability to eliminate insect breeding problems

Table 9-1 (cont.)
Structural Stormwater Management Techniques
Fishing Creek/Cedar Run Watershed

Description	Applicability	Advantages	Disadvantages	Maintenance
Peak Reduction Techniques				
Detention basins	Use in practically any situation	• Provides local & watershed-wide stormwater control • Enhances sediment and debris control • Ease of constructability • Considerable design flexibility • May enhance groundwater recharge • May reduce downstream erosion problems • Effective for controlling "first flush" pollutants • Multi-purpose use	• Converts sheet flow to point discharges • May promote sinkhole development in Karst terrain • Shallow sloped bottoms discourages vegetative growth • Standing water is a safety concern • Reduces amount of salable land • Undersized outlets collect debris • Concentrates pollutants in the soil	• Maintenance access must be provided • Remove debris • Fill localized depressions to eliminate insect breeding • Maintain earth-work to prevent piping around outlet structure & erosion on spillway • Maintain veg.
Oversized conveyance system storage	Use anywhere storm sewers can be installed	• Does not use valuable land space • Minimal maintenance needs	• Sediment accumulation must be flushed from the system • Constrictions in on-line systems may trap debris in inaccessible locations • Additional cost of oversized storm sewer and constricted outlets	• Periodic inspection and cleaning of storm sewers
Parking lot storage	Use wherever large paved lots can be used to temporarily store runoff without causing safety concerns or inconvenience	• Easily incorporated into parking lot grading • Reduces downstream storage requirements	• Can cause inconvenience • Requires significant slope on parking area to limit spread of water • May cause hazardous conditions in winter weather	• Remove debris at outlet • Must keep parking lots clean

Table 9-1 (cont.)
Structural Stormwater Management Techniques
Fishing Creek/Cedar Run Watershed

Description	Applicability	Advantages	Disadvantages	Maintenance
Parking lot storage	Use wherever large paved lots can be used to temporarily store runoff without causing safety concerns or inconvenience	• Easily incorporated into parking lot grading • Reduces downstream storage requirements	• Can cause inconvenience • Requires significant slope on parking area to limit spread of water • May cause hazardous conditions in winter weather	• Remove debris at outlet • Must keep parking lots clean
Rooftop detention	Use on large flat roofs in highly urbanized settings	• Requires no additional land space • Poses no safety hazard or inconvenience to general public • Stored water con be used for landscape maintenance • May significantly impact local runoff problems	• Failure generally leads to on-site property damage • Not well suited to retrofitting • Little impact on watershed-wide runoff control • May require modification to local building codes • May not receive regular inspection and maintenance • Results in higher roof loadings	• Routine leak detection inspections • Downspouts must be kept free of debris
Cistern storage	Use anywhere construction costs are not prohibitive	• Cisterns are unobtrusive • Can easily be fit into existing sites • Provides a free source of non-potable water • Sumps are well suited for residential roof drainage • Effective for controlling “first flush” pollutants	• Difficult to clear accumulated debris • Difficult to drain, may require pump • Requires large volume if no outlet is provided • Susceptible to deterioration, expensive and difficult to maintain	• Regular inspection and debris removal

Table 9-1 (cont.)
Structural Stormwater Management Techniques
Fishing Creek/Cedar Run Watershed

Description	Applicability	Advantages	Disadvantages	Maintenance
Other Peak Reduction Techniques with Limited Potential				
Gravel parking lots & driveways	Use in log term parking areas and on very small lots	• Reduces runoff • Reduces construction costs	• Runoff fraction increases as gravel consolidates • Mud con become a major problem • Susceptible to pothole development • Material may be removed during large storm events	• Fill potholes • Excavate soft spots and muddy areas, and replace with new, clean aggregate
Rooftop gardens	Use wherever adequate space is available	• Provides free source of non-potable water	• Extremely limited effect on local and watershed-wide runoff control	• Not available

CHAPTER 10

PLAN IMPLEMENTATION

In order to implement the Fishing Creek/Cedar Run Watershed Act 167 Stormwater Management Plan, the county planners and municipal officials must review the plan. The County Board of Commissioners must then formally adopt the Plan. The Department of Environmental Protection will approve the plan after reviewing the County Adoption Resolution and Plan Review Comments, as well as the plan itself. Implementation of the Plan will be the responsibility of the municipalities within the Combined Watershed subsequent to County adoption and PA DEP approval. Options are available to the municipalities for implementing the plan. The municipalities can either adopt the Model Stormwater Management Ordinance included with this plan, or they may incorporate the provisions of the Plan into existing ordinances. The model ordinance that appears in this Plan, upon implementation by each municipality within the Fishing Creek/ Cedar Run Watershed, can apply to the entire municipality, if that municipality chooses.

Standards and criteria developed by this Plan and put forth in the model ordinance are intended to apply only to the portion of each municipality lying within the Combined Watershed. It will be necessary, therefore, to implement the model ordinance in such a way that would not only avoid conflict with existing regulations, but would allow the existing regulations to remain in effect in the areas of each municipality not covered by the Plan.

Regardless of how the municipalities implement the plan, Act 167 requires municipal compliance subsequent to County adoption and PA DEP approval. Further, the local municipality through their qualified agent (i.e. municipal engineer) should review the method used to implement the resulting regulatory structure to ensure compliance with the Plan, and to avoid regulatory conflicts and inconsistencies. Following is the sequence of events that must take place to implement this Plan:

1. Submission of the Plan to DEP, as adopted by Clinton County, and Plan approval from DEP.

2. Municipal adoption of the model ordinance or integration of the Plan's provisions into existing regulations.

Municipal adoption is a critical step. It is important that the municipalities implement the standards and criteria of the Plan correctly, especially if they choose to integrate the standards and criteria into existing regulations. In either case, we recommend that the resulting regulatory framework be reviewed by DEP for compliance with the provisions of the Plan, and consistency among the various regulations. Ideally, municipalities will adopt the model ordinance for ease of implementation, compliance with the Plan, and consistency among the watershed's municipalities. Municipalities would then tie the model ordinance into existing ordinances by referring regulated activities within the Fishing Creek/Cedar Run Basin to the adopted model ordinance. Municipalities must then send a copy of the municipal resolution to the Department of Environmental Protection, notifying them of compliance with adopted regulations.

3. Municipal Review of Drainage Plans.

The municipality, through its qualified agent such as the municipal engineer, will receive stormwater drainage plans for all activities regulated by the ordinance. The municipality will then review the plans for compliance with the standards and criteria of the plan and shall approve or disapprove the drainage plans.

4. Remediation of Existing Storm Drainage Problems.

During the planning process, the Lead Agency obtained and generated data on existing storm drainage problems. Municipalities should use these data to develop a systematic, prioritized strategy to remedy existing problems. However, neither the plan nor the Stormwater Management Act 167 mandates the remediation of these problems. Watershed planning is intended to ensure that existing problems do not intensify and that new problems do not occur. Therefore, as municipalities meet these objectives through proper implementation of this Plan's provisions, they may consider the remediation of existing problems as the next logical step in a Stormwater Management Program.

To assist municipalities in obtaining funds to address these problems, the Pennsylvania Infrastructure Investment Authority (PENNVEST) is authorized to provide low interest loans to municipalities for stormwater projects. Municipalities

within the Combined Watershed should prioritize existing problems by severity, impact, and cost and consider the PENNVEST program for their financing.

Chapter 11

FISHING CREEK/CEDARRUN WATERSHED
ACT 167 STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. _____

MUNICIPALITY OF

_____

CLINTON COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

_____, 20___

ARTICLE I -GENERAL PROVISIONS

Section 101. Short Title

This Ordinance shall be known and may be cited as the " _____ Stormwater Management Ordinance."

Section 102. Statement of Findings

The governing body of the Municipality finds that:

A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases non-point source pollution of water resources.

B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety and welfare and the protection of people of the Commonwealth, their resources and the environment.

C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

D. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES).

Section 103. Purpose

The purpose of this Ordinance is to promote health, safety, and welfare within the Municipality and its watershed by minimizing the harms and maximizing the benefits described in Section 102 of this Ordinance, through provisions designed to:

A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code Chapter 93 to protect, maintain, reclaim and restore the existing and designated uses.

B. Preserve the natural drainage systems as much as possible.

C. Manage stormwater runoff close to the source.

D. Provide the minimum procedures and performance standards for stormwater planning and management.

E. Maintain groundwater recharge, to prevent degradation of surface and groundwater quality and to otherwise protect water resources.

F. Prevent scour and erosion of stream banks and streambeds.

G. Provide proper operations and maintenance of all permanent SWM BMPs that are implemented within the Municipality.

H. Provide the minimum standards to meet NPDES permit requirements.

Section 104. Statutory Authority

A. Primary Authority:

The municipality is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), 32 P.S. Section 680.1, et seq., as amended, the "Stormwater Management Act" and the (appropriate municipal code).

B. Secondary Authority:

The Municipality also is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1968, P.L. 805, No. 247, The Pennsylvania Municipalities Planning Code, as amended.

Section 105. Applicability

All Regulated Activities and all activities that may affect stormwater runoff are subject to regulation by this Ordinance.

Section 106. Repealer

Any other ordinance provision(s) or regulation of the Municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

Section 107. Severability

In the event that a court of competent jurisdiction declares any section or provision of this Ordinance invalid, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 108. Compatibility with Other Requirements

Approvals issued and actions taken under this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other code, law, regulation or ordinance. In the event that other ordinances regulating stormwater management would be more restrictive than this ordinance, then the stormwater management provisions of the more restrictive ordinance shall apply.

ARTICLE II -DEFINITIONS

For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.

B. The word “includes” or “including” shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.

C. The words “shall” and “must” are mandatory; the words “may” and “should” are permissive.

D. The word “person” includes an individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity.

E. The words “used or occupied” include the words “intended, designed, maintained, or arranged to be used or occupied.”

Agricultural Activity - The work of producing crops including tillage, land clearing, plowing, disking, harrowing, planting, harvesting crops, or pasturing and raising of livestock and installation of conservation measures. Construction of new buildings or impervious area is not considered an Agricultural Activity.

Applicant - A landowner, developer or other person who has filed an application for approval to engage in any Regulated Earth Disturbance activity at a project site in the Municipality.

BMP (Best Management Practice) - Activities, facilities, designs, measures or procedures used to manage stormwater impacts from Regulated Activities, to meet State Water Quality Requirements, to promote groundwater recharge and to otherwise meet the purposes of this Ordinance. BMPs include but are not limited to infiltration, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, forested buffers, sand filters and detention basins. Structural SWM BMPs are permanent appurtenances to the project site.

Conservation District - A conservation district, as defined in section 3(c) of the Conservation District Law (3 P. S. § 851(c)), which has the authority under a delegation agreement executed with the Department to administer and enforce all or a portion of the erosion and sediment control program in this Commonwealth.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g. a 5-year storm) and duration (e.g. 24-hours), used in the design and evaluation of stormwater management systems.

Detention - the volume of runoff that is captured and released into the Waters of this Commonwealth at a controlled rate.

DEP - The Pennsylvania Department of Environmental Protection.

Development Site (Site) - See Project Site.

Earth Disturbance Activity - A construction or other human activity which disturbs the surface of the land, including, but not limited to clearing and grubbing; grading; excavations; embankments; road maintenance; building construction; conversion of pervious surfaces to impervious surfaces; the moving, depositing, stockpiling, or storing of soil, rock, or earth materials; or any other action that causes any alteration or an alteration to the land surface.

Erosion - The natural process by which the surface of the land is worn away by water, wind or chemical action.

Extended Detention Volume (EDV)- Release of detained runoff in excess of **Permanently Removed Volume (PRV)** over an extended period of time of 24 to 72 hours.

Floodplain - Any land area susceptible to inundation by water from any natural source or delineated by applicable Federal Emergency Management Agency (FEMA) maps and studies as being a special flood hazard area. Also included are areas that comprise Group 13 Soils, as listed in Appendix A of the Pennsylvania Department of Environmental Protection (PADEP) Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by PADEP).

Floodway - The channel of the watercourse and those portions of the adjoining floodplains that is reasonably required to carry and discharge the 100-year flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year floodway, it is assumed - absent evidence to the contrary - that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

Forest Management / Timber Operations - Planning and activities necessary for the management of forestland. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

Hydrologic Soil Group (HSG) - Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSG's (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The Natural Resources Conservation Service (NRCS) of the US Department of Agriculture defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less pervious as the HSG varies from A to D.

Impervious Surface (Impervious Area) - A surface that prevents the infiltration of water into the ground. Impervious surfaces (or covers) shall include, but not be limited to, roofs, additional indoor living spaces, patios, garages, storage sheds and similar structures, and any new streets or sidewalks, decks, parking areas, and driveway areas.

Karst – A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles / uneven bedrock surface, underground drainage and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

Land Development (Development) – Inclusive of any or all of the following meanings: (i) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two or more buildings, or (b) the division or allocation of land or space between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features; (ii) any subdivision of land; (iii) development in accordance with Section 503(1.1) of the PA Municipalities Planning Code.

Municipality -_____, _____ County, Pennsylvania.

NRCS - Natural Resources Conservation Service (previously SCS).

PA DOT – Pennsylvania Department of Transportation.

Peak Discharge - The maximum rate of stormwater runoff from a specific storm event.

Permanently Removed Volume (PRV) – The volume of runoff that is permanently removed from the runoff and not released into surface Waters of this Commonwealth during or after a storm event.

Pervious Surface (Pervious Area) – Ground surfaces that may be vegetated or un-vegetated, and that are not covered with any type of impervious surface(s).

Project Site - The specific area of land where any Regulated Activities in the Municipality are planned, conducted or maintained.

Qualified Professional – Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by the Ordinance.

Regulated Activities- All activities involving land development or earth disturbance activity.

Retention / Removed - The volume of runoff that is captured and not released directly into the surface Waters of this Commonwealth during or after a storm event.

Return Period - The interval, in years, within which a storm event of a given magnitude can be expected, on average, to recur. For example, the 25-year return period rainfall would be expected, on average, to recur every twenty-five years.

Runoff - Any part of precipitation that flows over the land.

Sediment- Soils or other materials transported by surface water as a product of erosion.

State Water Quality Requirements - The regulatory requirements to protect, maintain, reclaim, and restore water quality under Pennsylvania Code Title 25 and the Clean Streams Law.

Stormwater – Drainage runoff from the surface of the land resulting from precipitation, snow, or ice melt.

Stormwater Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

Stormwater Management Plan - The plan for managing storm water runoff adopted by the County of _____ for the _____ Watershed as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the "Stormwater Management Act".

Stormwater Management BMPs- Is abbreviated as **SWM BMPs** throughout this Ordinance.

Stormwater Management Site Plan - The plan prepared by the Developer or his representative indicating how storm water runoff will be managed at the project site in accordance with this Ordinance. **Stormwater Management Site Plan** will be designated as **SWM Site Plan** throughout this Ordinance.

Subdivision - The division or re-division of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, transfer of ownership, or building or lot development.

USACE – United States Army Corps of Engineers

Waters of this Commonwealth - Rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs and other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

Watershed - Region or area drained by a river, watercourse or other body of water, whether natural or artificial.

Wetland - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, fens, and similar areas.

ARTICLE III-STORMWATER MANAGEMENT STANDARDS

Section 301. General Requirements

A. No Regulated Activities shall commence until the municipality approves a plan, which demonstrates compliance with the requirements of this Ordinance.

B. Plans approved by the Municipality shall be on site throughout the duration of the Regulated Activity.

C. The Municipality may, after consultation with DEP, approve alternative methods for meeting the State Water Quality Requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, State law including but not limited to the Clean Streams Law.

D. For all Regulated Activities equal to or greater than 1000 sq. ft. in area, implementation of peak rate controls and preparation of a SWM Site Plan are required, unless exempted by Section 302 of this Ordinance. Please note that a pre-design conference shall be required to discuss the design and implementation of peak rate controls, and the preparation of a SWM Site Plan. Also note that both the Applicant and the Qualified Professional must attend this pre-design conference. The Qualified Professional will be provided with a copy of the Municipality's applicable stormwater management design manual at this pre-design conference.

E. Impervious Areas:

1. The measurement of impervious areas shall include the all of the imperious areas in the total proposed development even if development is to take place in stages.

2. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.

3. For projects that add impervious area to a parcel, the Total Impervious Area on the parcel is subject to the requirements of this ordinance.

F. Discharges onto adjacent property shall not be created, increased, decreased, or relocated, or otherwise altered without permission of the adjacent property owner(s). Such discharges shall be subject to the requirements of this Ordinance.

G. All regulated activities shall include such measures as necessary to:

1. Protect health, safety, and property;

2. Meet State Water Quality Requirements as defined in Article II;

3. Meet the water quality goals of this ordinance by implementing measures to:

a. Minimize disturbance to floodplains, wetlands, natural slopes over 15%, and existing native vegetation.

b. Preserve and maintain trees and woodlands. Maintain or extend riparian buffers and protect existing forested buffer. Provide trees and woodlands adjacent to impervious areas whenever feasible.

c. Establish and maintain non-erosive flow conditions in natural flow pathways.

d. Minimize soil disturbance and soil compaction. Cover disturbed areas with topsoil having a minimum depth of 4 inches. Use tracked equipment for grading when feasible.

e. Disconnect impervious surfaces by directing runoff to pervious areas.

4. Incorporate the techniques described in Appendix A of this Ordinance (Low Impact Development Practices) whenever practical.

H. The design of all facilities over Karst shall include an evaluation of measures to minimize adverse effects.

I. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland, 20910. NOAA's Atlas 14 can be accessed at Internet address: http://hdsc.nws.noaa.gov/hdsc/pfds/.

J. All project sites shall be evaluated for the presence of wetlands. If wetlands are present, then the applicant shall obtain a jurisdictional determination from the USACE.

Section 302. Exemptions

A. Regulated Activities that create less than 1000 sq. ft. of new impervious area and that meet the Area of Influence (AOI) requirements shown in Table 1A are exempt from the peak rate control and the SWM Site Plan preparation requirement of this Ordinance.

B. Regulated Activities that create less than 1000 sq. ft. of new impervious area and that meet the Area of Influence (AOI) requirements shown in Table 1B are exempt from the rate control requirements of this Ordinance.

C. Use the Guidelines in Appendix D to determine the Area of Influence (AOI), in acres and the Total Impervious Area (TIA), in square feet to determine if an exemption is applicable for regulated activities less than 1000 square feet.

D. After the date of the Ordinance adoption, if a subdivision, land development plan, or any plan for a regulated activity is submitted that addresses peak rate control and includes a SWM Site Plan, then the impervious exemption is calculated from the date of approval of that plan, based upon the impervious area shown on the subdivision and land development plan.

E. Agricultural plowing and tilling are exempt from the rate control and SWM Site Plan preparation requirements of this ordinance provided the activities are performed according to the requirements of 25 Pa.Code Chapter 102.

F. Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Sections 301.F, G, H, and J.

TABLE 1A: SWM exemptions from Peak Rate Controls and SWM Site Plan preparation for Area of Influence (AOI) less than 3 acres.

Area of Influence (AOI) (acres)	**Total Impervious Area (TIA) Exempt from Peak Rate Controls and from SWM Site Plan Preparation (square feet)**
< 0.125 acre	1000
0.2	1400
0.3	1900
0.4	2300
0.5	2700
0.6	3100
0.7	3500
0.8	3900
0.9	4200
1.0	4600
1.1	4900
1.2	5200
1.3	5500
1.4	5900
1.5	6200
1.6	6500
1.7	6800
1.8	7100
1.9	7300
2.0	7600
2.1	7900
2.2	8200
2.3	8400
2.4	8700
2.5	9000
2.6	9200
2.7	9500
2.8	9800
2.9	10000

TABLE 1B: SWM exemptions from peak rate controls (ONLY) for Area of Influence (AOI) 3.0 acres and greater

Area of Influence (AOI) (acres)	**Total Impervious Area (TIA) Exempt from Peak Rate Controls ONLY (square feet)**
3	10300
3.1	10500
3.2	10800
3.3	11000
3.4	11300
3.5	11500
3.6	11700
3.7	12000
3.8	12200
3.9	12500
4	12700
4.1	12900
4.2	13200
4.3	13400
4.4	13600
4.5	13800
4.6	14100
4.7	14300
4.8	14500
4.9	14700
5	15000
> 5	15000

Notes: The Area of Influence (AOI) in acres and the Total Impervious Area (TIA) in square feet are calculated using the guidelines provided in Appendix D.

Section 303. Water Quality

Water quality control shall be implemented using the following methodologies:

A. The Simplified Method, as detailed below, is independent of site conditions.

1. Retention and detention facilities shall be sized to capture the first two inches (2") of runoff from all impervious surfaces.

2. The first **one inch** (1.0") of runoff shall be permanently removed and shall not be released into the surface Waters of this Commonwealth. This is the Permanently Removed Volume (PRV). Removal options include reuse, evaporation, transpiration, and infiltration. A list of the site conditions and BMP's generally suitable for infiltration is provided in Appendix B.

3. The subsequent **one inch** (1.0") of runoff shall be detained. This is the Extended Detention Volume (EDV).

4. Infiltration of the first **one-half inch** (0.5") of the PRV is encouraged. This portion of the PRV is the Groundwater Recharge Volume (GRV). A list of the site conditions and BMP's generally suitable for infiltration is provided in Appendix B.

5. The Permanently Removed Volume (PRV) requirement for land areas with existing cover consisting of meadow, brush, wood-grass combination, or woods proposed for conversion to any other non-equivalent type of pervious cover shall be one-fourth (1/4) inch of runoff.

6. Retention and detention facilities should be designed to drain both the PRV and EDV completely within 48 to 96 hours from the start of the storm.

7. Retention facilities should be designed to accommodate infiltration of the PRV. Infiltration areas should be spread out and located in the sections of the site that are most suitable for infiltration. A list of the site conditions and BMPs generally suitable for infiltration is provided in Appendix B.

B. The Design Storm Method, as detailed below, requires technical modeling based on site conditions.

1. Do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration rainfall.

2. Do not increase peak rate of runoff for (1-, 2-, 10-, 25-, 100-year storms (at minimum), pre-development to post-development; as necessary, provide additional peak rate control for as required by Act 167 planning.

3. Existing (pre-development) non-forested pervious areas must be considered meadow or its equivalent.

The Pennsylvania Stormwater Best Management Practices Manual (1) provides guidance on selection and application of both water quality control methodologies.

Section 304. Rate Controls

A. Areas not covered by a Release Rate Map from an approved Act 167 Stormwater Management Plan:

Post-development discharge rates shall not exceed the predevelopment discharge rates for the 1-, 2-, 10-, 25-, and 100-year storms. If it is shown, that the peak rates of discharge indicated by the post-development analysis are less than or equal to the peak rates of discharge indicated by the pre-development analysis for 1-, 2-, 10-, 25-, and 100-year, 24-hour storms, then the requirements of this section have been met. Otherwise, the applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.

B. Areas covered by a Release Rate Map from an approved Act 167 Stormwater Management Plan:

For the 1-, 2-, 10-, 25-, and 100-year storms, the post-development discharge rates will follow the release rate maps in this Ordinance. For any areas not shown on the release rate maps, the post-development discharge rates shall not exceed the predevelopment discharge rates.

C. BMPs for Rate Controls

A list of BMPs for peak rate controls is provided in Appendix B, Item C.

ARTICLE IV-STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS

Section 401. Plan Contents

The following items shall be included in the SWM Site Plan:

A. Appropriate sections from the Municipal Subdivision and Land Development Ordinance shall be followed in preparing the SWM Site Plans. In instances where the Municipality lacks Subdivision and Land Development regulations, the County Subdivision and Land Development Ordinance shall be followed.

B. The SWM Site Plan shall provide the following supplemental information:

1. The overall stormwater management concept for the project.

2. A determination of Site Conditions in accordance with Appendix B. A detailed site evaluation shall be completed for projects proposed in karst topography.

3. Stormwater runoff computations as specified in this Ordinance.

4. Expected project time schedule.

5. An erosion and sediment pollution control plan, as prepared for and submitted to the approval authority.

6. The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.

7. Plan and profile drawings of all SWM BMP's including open channels and swales.

8. SWM Site Plan shall show the locations of existing and proposed septic tank infiltration areas and wells.

9. A permanent fifteen-foot wide pathway for use by vehicles shall be provided around all SWM BMPs, such as ponds and infiltration structures. The pathways shall connect to a public thoroughfare.

10. The following signature block for the Municipality:

"_____, on this date (date of signature), has reviewed this SWM Site Plan in accordance with the design standards and criteria of the applicable Municipal Ordinances."

11. The following signature block for the Qualified Professional:

"_____, on this date (date of signature), herby certify that this SWM Site Plan was prepared in strict accordance with all of the design standards and criteria of all applicable Municipal Ordinances."

Section 402. Plan Submission

A. Five (5) copies of the SWM Site Plan shall be submitted as follows:

1. Two (2) copies to the Municipality.

2. One copy to the Municipal Engineer (when applicable)

3. One (1) copy to the County Conservation District.

4. One (1) copy to the County Planning Commission/Office

B. Additional copies shall be submitted as requested by the Municipality, DEP, or PA DOT.

Section 403. Plan Review

A. The SWM Site Plan shall be reviewed by a qualified professional for the Municipality for consistency with the provisions of this ordinance. After review, the qualified professional shall provide a written recommendation for the municipality to approve or disapprove the SWM Site Plan. If it is recommended to disapprove the SWM Site Plan, the qualified professional shall state the reasons for the disapproval in writing. The qualified professional also may recommend approval of the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing. The SWM Site Plan review and recommendations shall be completed within the time allowed by the Municipalities Planning Code for reviewing subdivision plans.

B. The Municipality shall notify the applicant in writing within 45 calendar days whether the SWM Site Plan is approved or disapproved. If disapproved, the Municipality shall cite the reasons for disapproval.

C. The Municipality's approval of a SWM Site Plan shall be valid for a period not to exceed five (5) years. This five-year time period shall commence on the date that the Municipality signs the approved SWM Site Plan. If stormwater management facilities included in the approved SWM Site Plan have not been constructed, or if an As-Built Survey of these facilities has not been approved within this five-year time period, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 405 of this Ordinance.

Section 404. Modification of Plans

A modification to a submitted SWM Site Plan that involves a change in SWM BMPs or techniques, or that involves the relocation or re-design of SWM BMPs, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the Municipality, shall require a resubmission of the modified SWM Site Plan in accordance with this Article.

Section 405. Resubmission of Disapproved SWM Site Plans

A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the Municipality's concerns, to the Municipality in accordance with this Article. The applicable Review Fee must accompany a resubmission of a disapproved SWM Site Plan.

Section 406. As Built Surveys, Completion Certificate, and Final Inspection

A. The Developer shall be responsible for completing an "As-Built Survey" of all SWM BMPs included in the approved SWM Site Plan. The As-Built Survey and an explanation of any discrepancies with the design plans shall be submitted to the Municipality.

B. The submission shall include a certification of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent SWM BMPs have been constructed according to the plans and specifications and approved revisions thereto.

C. After receipt of the completion certification by the Municipality, the Municipality may conduct a final inspection.

ARTICLE V- OPERATION AND MAINTENANCE

Section 501. Responsibilities

A. The Municipality shall make the final determination on the continuing maintenance responsibilities prior to final approval of the SWM Site Plan. The Municipality may require a dedication of such facilities as part of the requirements for approval of the SWM Site Plan. Such a requirement is not an indication that the Municipality will accept the facilities. The Municipality reserves the right to accept the ownership and operating responsibility for any or the entire stormwater management controls.

B. Structural SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions.

Section 502. Operation and Maintenance Agreements

The owner is responsible for Operation and Maintenance of the SWM BMP's, and for preparing an Operation and Maintenance Agreement in accordance with Appendix C. If the owner fails to adhere to the Operation and Maintenance Agreement, the Municipality may perform the services required and charge the owner appropriate fees. Non-payment of fees may result in a lien against the property.

ARTICLE VI-FEES AND EXPENSES

Section 601. General

The Municipality may include all costs incurred in the Review Fee charged to an Applicant.

The Review Fee may include but not be limited to costs for the following:

A. Administrative/clerical processing.

B. Review of the SWM Site Plan.

C. Attendance at Meetings.

D. Inspections.

E. Engineering Review Costs

ARTICLE VII-PROHIBITIONS

Section 701. Prohibited Discharges

A. Any drain or conveyance, whether on the surface or subsurface, which allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter the Waters of this Commonwealth is prohibited.

B. Discharges, which may be allowed, if they do not significantly contribute to pollution to the Waters of this Commonwealth, are:

-Discharges from fire fighting activities	-Flows from riparian habitats and wetlands
-Potable water sources including dechlorinated water line and fire hydrant flushings	-Uncontaminated water from foundations or from footing drains
-Irrigation drainage	-Lawn watering
-Air conditioning condensate	-Dechlorinated swimming pool discharges
-Springs	-Uncontaminated groundwater
-Water from crawl space pumps	-Water from individual residential car washing
-Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used	-Routine external building wash down (which does not use detergents or other compounds)

C. In the event that the Municipality or DEP determines that any of the discharges identified in Subsection 701.B, significantly contribute to pollution of the Waters of this Commonwealth, the Municipality or DEP will notify the responsible person(s) to cease the discharge.

Section 702. Roof Drains

Roof drains and sump pumps shall discharge to infiltration or vegetative BMP's to the maximum extent practicable.

Section 703. Alteration of BMPs

No person shall modify, remove, fill, landscape, or alter any SWM BMPs without the written approval of the Municipality.

ARTICLE VIII-ENFORCEMENT AND PENALTIES

Section 801. Right-of-Entry

As a condition of approval of an Applicant's stormwater management site plan, and upon presentation of proper credentials, the Applicant agrees that the Municipality, and/or their agents, may enter upon any property within the Municipality to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

Section 802. Inspection

SWM BMPs shall be inspected by the land owner/developer (including Municipality for dedicated facilities) according to the following list of frequencies:

1. Annually for the first 5 years.

2. Once every 3 years thereafter,

3. During or immediately after the cessation of any storm event.

Section 803. Enforcement

A. It shall be unlawful for a person to undertake any Regulated Activity except as provided in an approved SWM Site Plan.

B. It shall be unlawful to alter, remove, or fail to implement any control structure required by the SWM Site Plan.

C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the Municipality.

804. Suspension and Revocation

A. Any approval for a Regulated Activity may be suspended or revoked (in writing) by the Municipality for:

1. Non-compliance with, or failure to implement any provision of the approval, including As-Built Surveys and Completion Certificates.

2. A violation of any provision of this Ordinance or any other applicable law, Ordinance, rule or regulation relating to the Regulated Activity.

3. The creation of any condition or the commission of any act during the Regulated Activity which constitutes or creates a hazard or nuisance, pollution, or which endangers the life or property of others.

B. A suspended approval may be reinstated by the Municipality when:

1. The Municipality has inspected and approved the corrections to the violations that caused the suspension.

2. The Municipality is satisfied that the violation has been corrected.

C. An approval that has been revoked by the Municipality cannot be reinstated. The Applicant may apply for a new approval under the provisions of this Ordinance.

D. Prior to revocation or suspension of a permit, if there is no immediate danger to life, public health, or property the Municipality may notify the land owner/ developer to discuss the non-compliance.

Section 805. Penalties

A. Anyone violating the provisions of this Ordinance may be assessed a civil penalty of not more than $_____ for each violation, recoverable with costs. Each day that the violation continues constitutes a separate violation, and penalties shall be cumulative.

B. In addition, the Municipality, may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

Section 806. Appeals

A. Any person aggrieved by any action of the Municipality or its designee, relevant to the provisions of this Ordinance, may appeal to the Municipality within thirty (30) days of that action.

B. Any person aggrieved by any decision of the Municipality, relevant to the provisions of this Ordinance, may appeal to the County Court Of Common Pleas in the county where the activity has taken place within thirty (30) days of the Municipality's decision.

ARTICLE IX - REFERENCES

1. Pennsylvania Department of Environmental Protection. 2005. *Draft Pennsylvania Stormwater Best Management Practices Manual.* Harrisburg, PA.

ENACTED and ORDAINED at a regular meeting of the

_____

on this _____ day of _____, 20__.

This Ordinance shall take effect immediately.

_____

[Name] [Title]

_____

[Name] [Title]

_____

[Name] [Title]

ATTEST:

_____

Secretary

APPENDIX A

LOW IMPACT DEVELOPMENT PRACTICES ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF

Natural hydrologic conditions may be altered by development practices, which may create impervious surfaces, destroy drainage swales, construct storm sewers, and change local topography. A traditional approach to drainage has been to remove runoff from sites as quickly as possible and capture it in downstream detention basins. This approach leads to the degradation of water quality as well as additional expenditures for detaining and managing concentrated runoff.

The recommended approach is to promote practices that will minimize post-development runoff rates and volumes and minimize needs for artificial conveyance and storage facilities. To simulate pre-development hydrologic conditions, increased infiltration often is helpful to offset the effects of increasing the area of impervious surfaces. The ability to increase infiltration depends upon the soil types and land use.

Preserving natural hydrologic conditions requires careful site design that includes preservation of natural drainage features, minimization of impervious surfaces, reduction of hydraulic connectivity of impervious surfaces, and protection of natural depression storage areas. A well-designed site will contain a mix of all these features. The following describes various techniques to achieve this:

A. **Preserve Drainage Features**. Protect natural drainage features, particularly vegetated drainage swales and channels. Locate streets and adjacent storm sewers away from valleys and swales.

B. **Protect Natural Depression Storage Areas**. Depression storage areas have no surface outlet, or they drain very slowly. Depressions should be protected and the storage capacity should be incorporated into required detention facilities.

C. **Avoid Creating Impervious Surfaces.** Reduce impervious surfaces to the maximum extent possible. Building footprints, sidewalks, driveways and other features should be minimized.

D. **Avoid Connecting Impervious Surfaces**. Route roof runoff over lawns and avoid using storm sewers. Grade sites to increase the travel time of stormwater runoff. Avoid concentrating runoff.

E. **Use Pervious-Paving Materials**. Use pervious materials for driveways, parking lots, access roads, sidewalks, bike trails and hiking trails. Provide pervious strips between streets and sidewalks.

F. **Reduce Setbacks**. Reduce setbacks for buildings to shorten the driveways and entry walks.

G. **Construct Cluster Developments**. Construct Cluster Developments to reduce street length per lot.

APPENDIX B

A. LIST OF SITE CONDITIONS SUITABLE FOR INFILTRATION

1. Depth of bedrock below the invert of infiltration BMPs should be greater than or equal to 2 feet.

2. Depth of seasonal high water table below the invert of infiltration BMPs should be greater than or equal to 2 feet.

3. Soil permeability tests should be greater than or equal to 0.10 inches / hour and less than or equal to 10 inches per hour.

4. Setback distances or buffers of infiltration BMPs should be a minimum of:

   a. 50 feet from individual water supply wells and 100 feet from community or municipal water supply wells.

   b. 20 feet from building foundations.

   c. 50 feet from septic system drain fields.

   d. 50 feet from karst geologic contacts such as sinkholes, closed depressions, fracture traces, faults, and pinnacles.

   e. 20 feet from the property line unless documentation is provided to show that all setbacks from wells, foundations and drain fields on neighboring properties will be met

B. EFFECTIVE BMPs FOR INFILTRATION

1. Infiltration trench

2. Infiltration Basin

3. Biofilters, rain gardens, bioinfiltration, bio swales

4. Filters for pre-treatment.

C. EFFECTIVE BMPs FOR RATE CONTROL

1. Wet ponds
2. Stormwater wetlands
3. Extended detention (dry) ponds
4. Swales
5. Runoff volume reduction BMPs listed and B and C above such as retention, infiltration and re-vegetation.

D. EFFECTIVE BMPs FOR EVAPOTRANSPIRATION

1. Rain gardens
2. Green roofs

APPENDIX C

OPERATION AND MAINTENANCE AGREEMENT
STORMWATER BEST MANAGEMENT PRACTICES

THIS AGREEMENT, made and entered into this _____ day of _____, 200__, by and between _____, (hereinafter the "Landowner"), and _____, _____ County, Pennsylvania, (hereinafter "Municipality");

WITNESSETH

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of _____ County, Pennsylvania, Deed Book _____ at Page _____, (hereinafter "Property").

WHEREAS, the Landowner is proceeding to build and develop the Property; and

WHEREAS, the stormwater management BMP Operation and Maintenance Plan approved by the Municipality (hereinafter referred to as the "Plan") for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the Municipality, provides for management of stormwater within the confines of the Property through the use of Best Management Practices (BMPs); and

WHEREAS, the Municipality, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site stormwater Best Management Practices be constructed and maintained on the Property; and

WHEREAS, the Municipality requires, through the implementation of the SWM Site Plan, that stormwater management BMP's as required by said Plan and the Municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, his successors and assigns.

NOW, THEREFORE, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The Landowner shall construct the BMPs in accordance with the plans and specifications identified in the SWM Site Plan.

2. The Landowner shall operate and maintain the BMPs as shown on the Plan in good working order accordance with the specific maintenance requirements noted on the approved SWM Site Plan.

3. The Landowner hereby grants permission to the Municipality, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the BMPs whenever necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.

4. In the event the Landowner fails to operate and maintain the BMPs per paragraph 2, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the Municipality to erect any permanent structure on the land of the Landowner. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.

5. In the event the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred within 10 days of receipt of invoice from the Municipality.

6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMPs by the Landowner; provided, however, that this Agreement shall not be deemed to create or affect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.

7. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the Municipality from all damages, accidents, casualties, occurrences or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality.

8. The Municipality shall inspect the BMPs at a minimum of once every three years to ensure their continued functioning.

This Agreement shall be recorded at the Office of the Recorder of Deeds of _____ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, and

shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL) For the Municipality:

_____

(SEAL) For the Landowner:

_____

ATTEST:

_____ (City, Borough, Township)

County of _____, Pennsylvania

I, _____, a Notary Public in and for the County and State aforesaid, whose commission expires on the _____ day of _____, 20__, do hereby certify that _____ whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20__, has acknowledged the same before me in my said County and State.

GIVEN UNDER MY HAND THIS _____ day of _____, 200_.

_____ _____

NOTARY PUBLIC **(SEAL)**

APPENDIX D

EXAMPLE CALCULATIONS TO DETERMINE
EXEMPTION FROM SWM SITE PLAN PREPARATION REQUIREMENTS

Example 1

1. The proposed new impervious area B of a garage is 900 sq. ft which is next to the house and a driveway which are 1920 and 700 sq. ft respectively.

2. Determine the longest dimension of the area by connecting the out to out points of the area (the diagonal D). This measures 102 ft. (the driveway is 32 ft by 30 ft and the house is 60 ft by 32 ft)

3. Extend the area of the house and driveway (60 ft. by 82 ft) in every direction by 102 ft and draw a rectangle. This is a 264 ft. by 286 ft. rectangle. The area of this rectangle is designated as the Area of Influence (AOI) and is equal to 75,504 sq. ft, which is 1.7 acres.

4. Now, calculate the Total Impervious Area (TIA) inside this Area of Influence (AOI) which is designated as a = area of the existing house +area of the new garage+ area of the driveway+ portion of neighbor's house on the right + area of hickory lane on the bottom.

5. a= 1920+900+700+1200+ 264*10= 7360 sq. ft.

6. According to Table 1A, maximum exemption for 1.7 Acres is 6800 sq. ft. 7360 sq. ft. is larger than 6800 sq. ft.

7. So, construction of this new garage requires preparation of SWM Site Plan that includes Peak Rate Control.

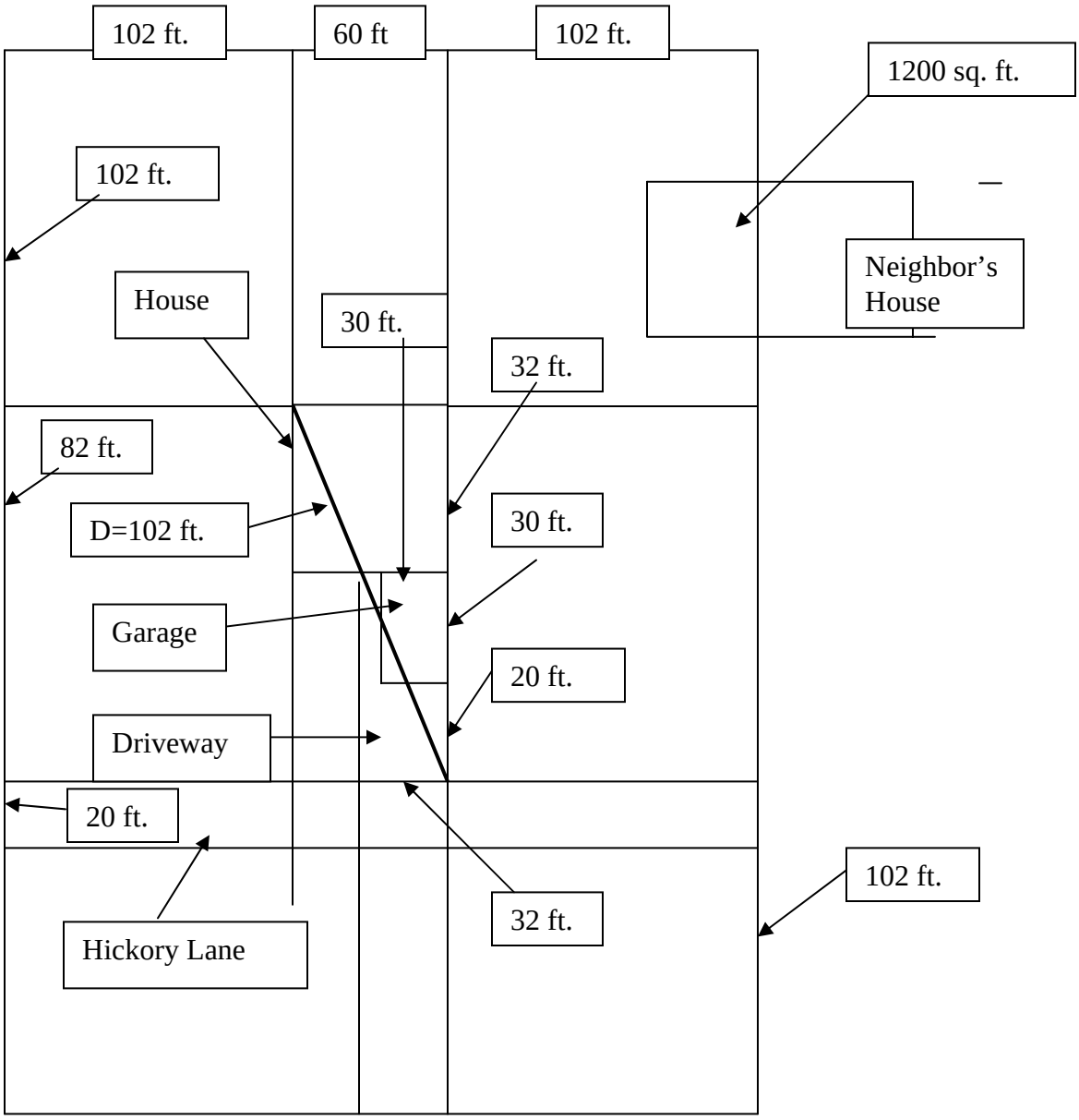

102 ft.
60 ft
102 ft.
1200 sq. ft.
102 ft.
Neighbor's House
House
30 ft.
32 ft.
82 ft.
D=102 ft.
30 ft.
Garage
20 ft.
Driveway
20 ft.
102 ft.
32 ft.
Hickory Lane

Figure D.1.

Example 2

1. Proposed new impervious area, B= Area of the garage = 600

2. Total Impervious Area (TIA) within the Area of Influence (AOI) is
a = Area of the house+ area of the garage+ area of the driveway+ Area of the Rhubarb's lane

=50*30+600+30*5+20*25+(94*2+50)*10
=5130 sq. ft

3. Area of Influence (AOI)=(94*2+50)*(94+30+50+94)
=(238*268) sq. ft
=63784 sq. ft.
=1.5 acres

4. From Table 1A, Total Impervious Area allowed from Peak Rate Control and SWM Site Plan preparation is 6200 sq. ft., corresponding to the Area of Influence (AOI), is 1.5 acres. The Total Impervious Area 5130 sq. ft. within the Area of Influence (AOI) is less than 6200 sq. ft.; therefore, construction of the 600 sq. ft. garage is exempt from preparation of the SWM Site Plan (and from peak rate control) requirement.

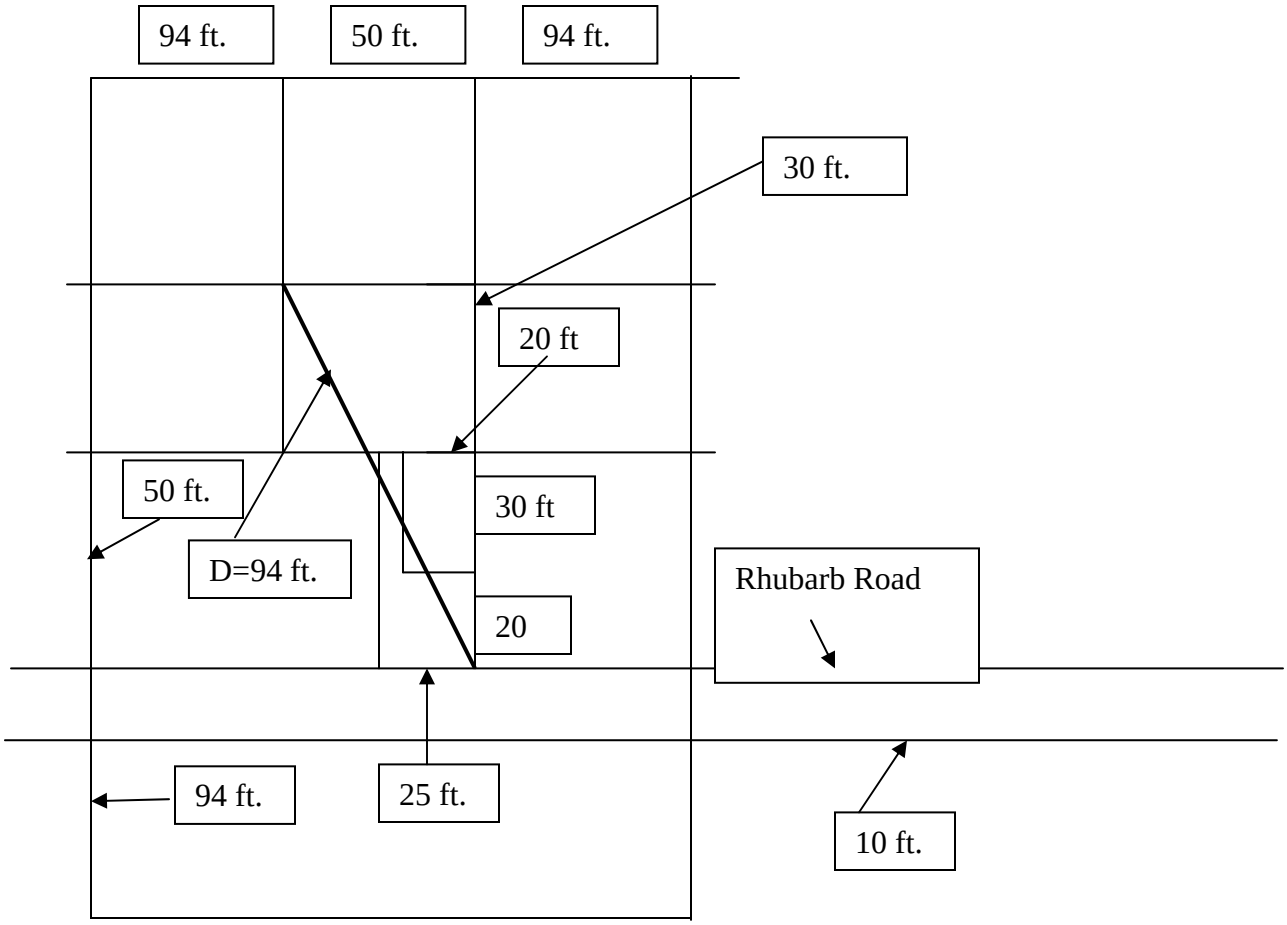
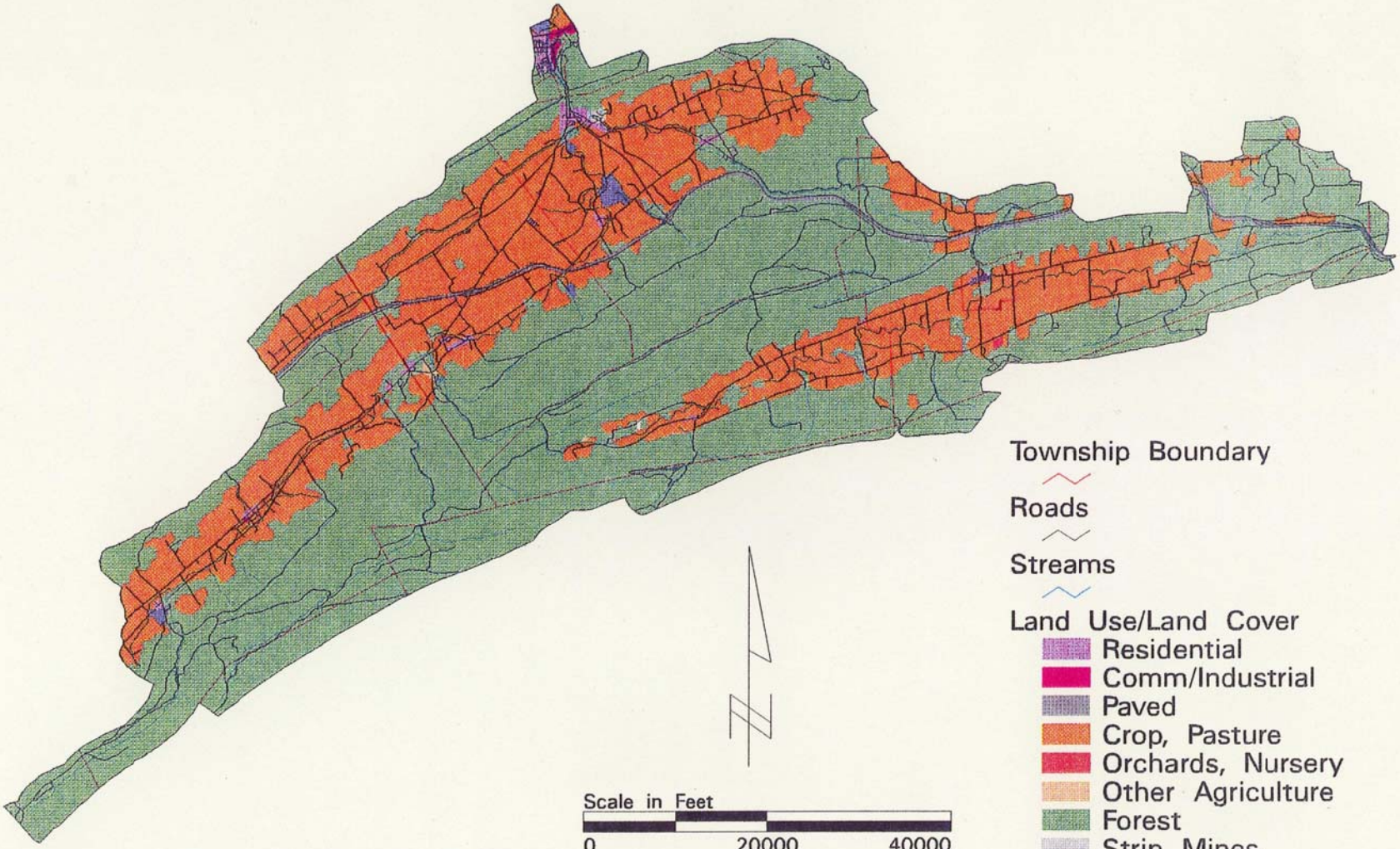

94 ft.
50 ft.
94 ft.
30 ft.
20 ft
50 ft.
30 ft
D=94 ft.
Rhubarb Road
20
94 ft.
25 ft.
10 ft.

Figure D.2.

Existing Land Use/Land Cover
Fishing Creek/Cedar Run Watershed



Prepared by: Towson State University GIS Lab

PLATE #1

Future Land Use/Land Cover
Fishing Creek/Cedar Run Watershed

Prepared by: Towson State University GIS Lab

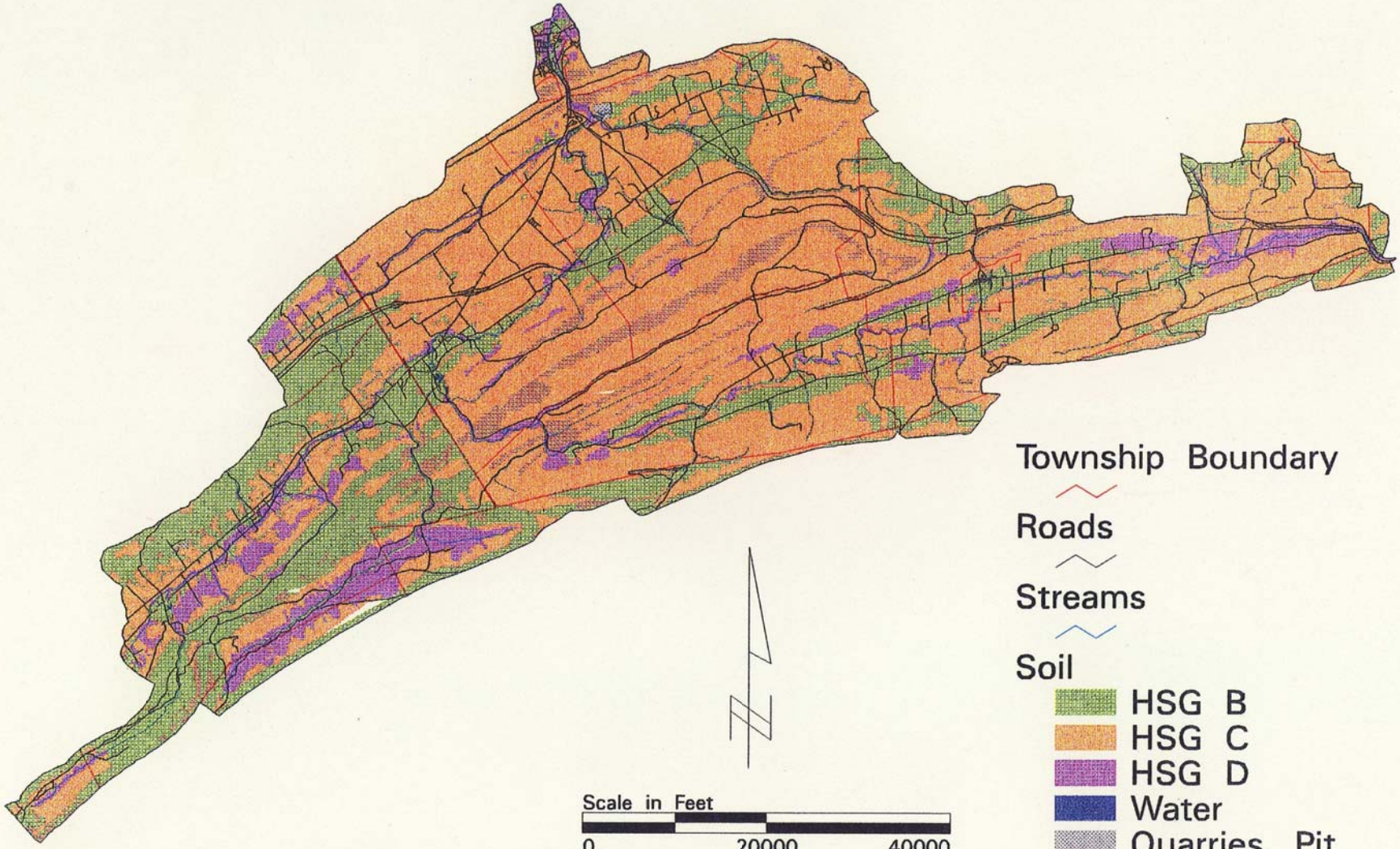
PLATE #2

Plate 3 is an outline of the watershed, accompanying this manual.

If it is not included or available, please call Clinton County Conservation District. This information can be provided for the portion of the watershed in which you are interested.

Plate #3

Hydrologic Soil Groupings
Fishing Creek/Cedar Run Watershed



Prepared by: Towson State University GIS Lab

PLATE #4

Table A-1
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Fishing Creek Mainstem Sub-Watershed

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC1	803	Paved Forest	0.6 99.4	0.0	0.96	64	64
FC2	200	Paved Forest	26.5 73.5	0.0	0.44	72.5	72.5
FC3	833	Paved Crop,Pasture Forest	0.9 3.1 96.0	2.3	1.04	66.9	66.9
FC4	1050	Paved Crop,Pasture Forest	2.3 13.1 84.6	19.3	0.85	66.3	66.3
FC5	562	Forest	100	0.0	1.03	66.4	66.4
FC6	829	Paved Forest	5.5 94.5	31.3	0.78	67.4	67.4
FC7	589	Crop,Pasture Forest	9.8 90.2	0.0	0.64	68.7	68.7
FC8	881	Paved Crop,Pasture Forest	0.4 12.0 87.6	10.5	1.05	65.8	65.8
FC9	1008	Paved Crop,Pasture Forest	7.7 30.3 62.0	A-1 16.1	0.59	65.8	65.8
FC10	1538	Paved Crop,Pasture Forest	5.8 25.1 69.1	78.9	0.88	62.6	62.6
FC11	970	Crop,Pasture Forest	6.5 93.5	6.1	0.81	64.1	64.1
FC12	2096	Crop,Pasture Forest	49.8 50.2	78.3	1.51	56.1	56.1
FC13	1103	Crop,Pasture Forest	0.8 99.2	2.4	1.28	67.4	67.4

Table A-1 (cont.)

Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Fishing Creek Mainstem Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC14	1847	Crop,Pasture Forest	56.7 43.3	71.9	0.49	53	53
FC15	381	Crop,Pasture Forest	62.4 37.6	90.1	0.65	52.2	52.2
FC16	725	Crop,Pasture Forest	53.9 46.1	62.8	0.63	56.8	56.8
FC17	597	Crop,Pasture Forest	9.4 90.6	0.0	1.55	67.1	67.1
FC18	985	Paved Crop,Pasture Forest	15.3 15.4 69.3	0.0	0.53	72.2	72.2
FC19	1475	Residential Paved Crop,Pasture Orchards,Nur Forest	2.1 0.4 54.2 1.5 41.8	72.2	0.63	52.8	52.8
FC20	359	Crop,Pasture Forest	4.1 95.9	6.1	0.6	67.8	67.8
FC21	1604	Residential Crop,Pasture Orchards,Nur Forest	1.3 65.9 0.5 32.3	90.1	2.01	55	55.6
FC22	967	Residential Crop,Pasture Forest	1.1 71.2 27.7	97.3	1.28	54.5	54.5
FC23	1340	Crop,Pasture Forest	3.1 96.9	3.0	0.67	63.9	63.9
FC24	1053	Crop,Pasture Forest	62.6 37.4	64.8	0.84	56.5	56.5
FC25	584	Crop,Pasture Forest	6.5 93.5	0.0	0.54	64.3	64.3
FC26	979	Crop,Pasture Forest	0.1 99.9	1.3	1.35	67.9	67.9

Table A-1 (cont.)

Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Fishing Creek Mainstem Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC27	1994	Residential Crop,Pasture Forest	0.7 58.0 41.3	61.9	1.41	57.7	57.7
FC28	609	Crop,Pasture Forest	0.6 99.4	1.5	0.82	68.2	68.3
FC29	2271	Residential Crop,Pasture Forest	0.1 47.6 52.3	62.4	1.01	56.1	56.1
FC30	2017	Crop,Pasture Forest	2.0 98.0	0.2	1.07	64.2	64.3
FC31	1813	Residential Crop,Pasture Forest	1.1 37.1 61.8	64.9	0.9	53.8	53.8
FC32	838	Forest	100	0.0	0.44	62.3	62.3
FC33	687	Crop,Pasture Other Agric. Forest	26.3 1.3 72.4	47.2	0.51	59.8	59.9
FC34	1629	Crop,Pasture Forest	0.1 99.9	0.0	0.81	67.5	67.5
FC35	821	Forest	100	19.8	0.79	61.7	61.7
FC36	1446	Forest	100	0.0	0.67	69	69
FC37	1228	Forest	100	0.0	0.78	66.9	66.9
FC38	1070	Forest	100	0.0	0.6	67	67
FC39	2010	Forest	100	0.0	1.12	66.4	66.4
FC40	1142	Forest	100	0.0	0.8	66.4	66.5
FC41	1657	Forest	100	0.0	0.63	65.6	65.6
FC42	813	Forest	100	0.0	0.64	69.4	69.4

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Fishing Creek Mainstem Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC43	508	Crop,Pasture Other Agric Forest	30.6 4.5 64.9	34.4	0.7	56.3	58.1
FC77	657	Residential Paved Crop,Pasture Other Agric Forest	7.3 0.2 78.9 1.4 12.2	100.0	0.67	51.6	53.5
FC78	1829	Residential Paved Crop,Pasture Forest	1.7 2.4 58.3 37.6	62.8	1.28	58.9	61.2
FC79	1252	Paved Crop,Pasture Forest	4.8 70.3 24.9	75.6	0.74	61.6	62.5
FC80	489	Paved Crop,Pasture	7.1 92.9	67.7	1.08	64.9	65.5
FC81	1365	Paved Crop,Pasture Forest Open Space	0.8 15.4 81.6 2.2	21.5	0.61	62.9	62.9
FC82	1429	Paved Crop,Pasture Forest	0.2 5.4 94.4	13.0	0.46	64.2	64.2
FC83	839	Residential Paved Crop,Pasture Forest	0.3 14.0 79.0 6.7	69.0	0.74	58.9	58.9
FC84	1050	Residential Crop,Pasture	1.6 98.4	82.2	0.93	60.2	60.6
FC85	2082	Paved Forest	2.8 97.2	1.3	0.61	68.7	68.7
FC86	1084	Paved Crop,Pasture Forest	8.5 68.5 23.0	95.5	1.55	53.1	53.1

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Fishing Creek Mainstem Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC87	713	Paved Crop,Pasture Open Space	1.0 84.7 14.3	68.9	0.68	61.9	61.9
FC88	1018	Residential Crop,Pasture Open Space	4.1 85.3 10.6	39.2	0.74	66.4	66.4
FC116	582	Forest	100	38.8	0.76	59.3	59.3
FC117	683	Forest	100	14.7	0.68	66.8	66.8
FC118	1818	Residential Comm/Indust Crop,Pasture Forest Strip Mines Open Space	22.5 5.8 20.8 44.6 3.7 2.7	35.5	1.28	66.6	66.6
Fishing Creek Mainstem Sub-Watershed Total	64798	Residential Comm/Indust Paved Crop,Pasture Orchards,Nur Other Agric. Forest Strip Mines Open Space	1.0 0.2 1.4 27.8 0.1 0.1 68.8 0.1 0.5	34.6	0.86 (average)	62.8 (average)	62.95 (average)

Little Fishing Creek Sub-Watershed

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC44	1365	Forest	100	0.0	0.97	63.8	63.8
FC45	1355	Forest	100	0.0	1.16	56	56
FC46	1102	Forest	100	0.0	0.37	56.4	56.4
FC47	618	Crop,Pasture Forest	49.8 50.2	0.0	0.7	71.0	71.1

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Little Fishing Creek Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC48	428	Residential Crop,Pasture Forest Open Space	4.5 79.2 2.8 13.5	36.3	1.02	65.4	73.1
FC49	1089	Crop,Pasture Forest	48.2 51.8	78.9	1.24	46.5	51.2
FC50	379	Residential Crop,Pasture Forest Open Space	0.5 36.1 61.5 1.9	3.4	0.46	69.6	78.6
FC51	723	Crop,Pasture Forest	34.7 65.3	0.0	0.56	69.4	69.4
FC52	266	Crop,Pasture Forest	59.7 40.3	0.0	0.34	71.7	71.7
FC53	817	Crop,Pasture Forest	48.3 51.7	76.5	0.82	43.8	43.8
FC54	560	Crop,Pasture Forest	38.9 61.1	9.7	0.66	62.5	62.5
FC55	1005	Residential Comm/Indust Crop,Pasture Forest	1.7 0.6 43.3 54.4	40.3	0.89	56.2	56.2
FC56	779	Residential Crop,Pasture Forest	1.5 58.5 40.0	27.4	0.72	65.6	65.6
FC57	1044	Forest	100	0.0	0.59	55.9	55.9
FC58	550	Crop,Pasture Forest	44.7 55.3	3.3	0.54	69.8	69.8
FC59	903	Crop,Pasture Forest	76.2 23.8	89.7	0.5	49.1	49.1
FC60	735	Crop,Pasture Forest	50.2 49.8	91.6	0.87	39.9	39.9

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Little Fishing Creek Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC61	1017	Crop,Pasture Forest	53.8 46.2	67.2	0.91	51.5	51.5
FC62	480	Crop,Pasture Forest	48.4 51.6	48.8	0.93	56.4	56.4
FC63	511	Crop,Pasture Forest	72.2 27.8	56.9	0.7	54.7	56.4
FC64	599	Crop,Pasture Forest	59.2 40.8	98.8	0.53	40	41.7
FC65	526	Residential Crop,Pasture Forest	2.3 47.1 50.6	100.0	0.53	40.6	42.7
FC66	1328	Forest	100	0.4	0.61	64.3	64.3
FC67	1064	Forest	100	0.0	0.86	67.9	67.9
FC68	974	Forest	100	0.0	0.76	67.6	67.6
FC69	1346	Forest	100	0.0	0.85	67.8	67.8
FC70	745	Forest	100	0.0	0.86	63.7	63.7
FC71	972	Forest	100	0.0	0.59	67.6	67.6
FC72	1018	Forest	100	0.0	1.54	66.5	66.5
FC73	295	Forest	100	0.0	0.46	59.5	59.5
FC74	1650	Forest	100	0.0	0.81	58.6	58.6
FC75	407	Crop,Pasture Forest	17.8 82.2	44.9	0.45	47.7	55.9

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Little Fishing Creek Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC76	437	Residential Crop,Pasture Other Agric Forest	8.2 40.5 5.7 45.6	100.0	0.89	44.1	53.5
Little Fishing Creek Sub-Watershed Total	27089	Residential Comm/Indust Crop,Pasture Other Agric. Forest Open Space	0.4 0.0 24.1 0.1 75.2 0.2	25.0	0.75 (average)	58.52 (average)	59.87 (average)

Cedar Run Sub-Watershed

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC89	496	Crop,Pasture Forest	70.7 29.3	94.3	0.41	54.1	54.1
FC90	906	Paved Crop,Pasture Forest	6.0 23.8 70.2	96.9	0.84	39.6	39.6
FC91	634	Crop,Pasture Forest	65.4 34.6	72.6	0.95	57.8	57.8
FC92	683	Paved Crop,Pasture Forest	9.0 36.6 54.4	100.0	0.63	42.6	42.6
FC93	781	Paved Crop,Pasture Forest	4.5 49.9 45.6	85.4	0.57	54.3	54.3
FC94	955	Crop,Pasture Forest	51.9 48.1	73.7	0.76	60.5	60.5
FC95	1189	Paved Crop,Pasture Forest	5.3 82.4 12.3	100.0	3.42	55.9	56.3

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Cedar Run Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC96	410	Crop,Pasture Forest	99.5 0.5	100.0	0.65	57.6	57.6
FC97	465	Crop,Pasture	100	100.0	0.83	58.6	58.6
FC98	1137	Crop,Pasture Forest	67.0 33.0	80.3	0.57	60	60.2
FC99	521	Crop,Pasture Forest	54.9 45.1	60.9	0.52	62.6	62.6
FC100	1491	Residential Crop,Pasture Forest	0.6 73.5 25.9	84.8	0.89	58.6	58.6
Cedar Run Sub-Watershed Total	9669	Residential Paved Crop,Pasture Forest	0.1 2.2 63.2 34.5	87.1	0.92 (average)	55.18 (average)	55.23 (average)

Long Run Sub-Watershed

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC101	579	Forest	100	0.0	1.26	69.9	69.9
FC102	725	Paved Crop,Pasture Forest	2.1 4.2 93.7	5.8	0.77	67.2	67.2
FC103	559	Paved Crop,Pasture Forest	13.3 55.2 31.5	1.8	0.58	66.9	66.9
FC104	1359	Paved Crop,Pasture Forest	4.9	0.0	0.74	67.6	67.6
FC105	521	Crop,Pasture Forest	67.0 33.0	0.0	0.74	64	64

Table A-1 (cont.)
Summary of Existing and Future Hydrologic/Land Use Characteristics by Sub-Area

Long Run Sub-Watershed (continued)

Sub-Area #	Area (acres)	Land Use Type	Amount of Land Use (%)	% Carbonate	Time of Concentration	Existing Weighted Curve Number	Proposed Weighted Curve Number
FC106	810	Crop,Pasture Forest	9.3 90.7	0.0	0.62	66.4	66.4
FC107	676	Paved Forest	2.9 97.1	0.0	0.35	69.5	69.5
FC108	2058	Residential Paved Crop,Pasture Forest	0.1 6.7 0.1 93.1	0.6	1.45	69.9	69.9
FC109	884	Crop,Pasture Forest	10.4 89.6	12.1	0.5	66.5	66.5
FC110	1413	Crop,Pasture Forest	41.3 58.7	45.7	0.68	60	60
FC111	1399	Crop,Pasture Forest	57.2 42.8	70.9	1.06	53.9	53.9
FC112	1232	Residential Crop,Pasture Forest	0.5 60.2 39.3	18.2	0.77	63.5	63.5
FC113	962	Residential Crop,Pasture Forest	5.3 61.9 32.8	59.8	0.62	54.9	54.9
FC114	871	Residential Crop,Pasture Forest	0.5 80.0 19.5	97.9	0.72	51.1	51.1
FC115	736	Residential Crop,Pasture Forest Strip Mines	3.9 75.3 20.2 0.6	100.0	0.8	53.5	53.5
Long Run Sub-Watershed Total	14785	Residential Paved Crop,Pasture Forest Strip Mines	0.6 2.1 34.3 62.9 0.1	28.4	0.78 (average)	62.99 (average)	62.99 (average)

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Attachments

WPAC Meeting Minutes
- March 22, 2006 (Solicitors and Engineers)
- March 22, 2006 (WPAC)
- May 30, 2006 (WPAC)

Public Hearing Minutes
- June 15, 2006

Clinton County Resolution – adoption of plan, June 29, 2006

Stormwater Management Plan Comments
- Clinton County Planning Department
- O'Connor & Salisbury for Woodward Township
- Coploff, Ryan, & Welch for Mill Hall Borough Council

(Please note that some comments are related to either the Chatham Run or the Fishing Creek Stormwater Management Plans, but the Model Ordinance included with both are the same).

Clinton County Commissioners Comments re: Municipality Enactment

Lewis Steinberg, Clinton County Solicitor
- Review of Comments and Model Ordinance

Board of Commissioners

Thomas H. Bossert
Chairman
Harold C. Yost, Jr.
Vice Chairman
Richard K. Kyle
Commissioner

Kathy Z. Conrad, *Chief Clerk*
Lewis G. Steinberg, *Solicitor*

Phone: (570) 893-4000
(800) 509-6697
Fax: (570) 893-4041

RESOLUTION NO. 13 OF 2006

WHEREAS, The Act 167 planning process is directed primarily at mitigating the effects of future land use change on watershed hydrology, as well as ensuring that existing storm drainage problems are not aggravated.

WHEREAS, The Act 167 Storm Water Management Plan presented herein for the Fishing Creek/Cedar Run watershed will not require municipalities to correct existing storm drainage problems.

WHEREAS, The Plan identifies and documents conceptual solutions to existing drainage problems.

WHEREAS, The Fishing Creek/ Cedar Run Watershed plan includes Bald Eagle Township, Castanea Township, Crawford Township, Greene Township, Lamar Township, Logan Township, Loganton Borough, Mill Hall Borough and Porter Township.

ADOPTED BY the Clinton County Commissioners at a special meeting on June 29, 2006.

CLINTON COUNTY COMMISSIONERS

Thomas H. Bossert, Chairman

Harold C. Yost, Jr., Vice-Chairman

Richard K. Kyle, Commissioner

SEAL

Kathy Z. Conrad, Chief Clerk

ATTEST:

I, Kathy Z. Conrad, Chief Clerk of the County of Clinton, Pennsylvania, do hereby certify that the foregoing is a true and correct copy of the Resolution adopted at a special meeting of the Board of Commissioners of Clinton County, Pennsylvania, held on June 29, 2006.

June 29, 2006
Date

Kathy Z. Conrad, Chief Clerk

CLINTON COUNTY CONSERVATION DISTRICT

45 COOPERATION LANE, MILL HALL, PA 17751
PHONE: (570) 726-3798
FAX: (570) 726-7977

May 30, 2006

Watershed Planning Advisory Committee Meeting
Chatham Run and Fishing Creek
Act 167 Stormwater Management Plan Updates

Fishing Creek Act 167 Stormwater Management Plan Update
Bald Eagle, Castanea, Crawford, Greene, Logan, Lamar, Logan, Porter Township and Mill Hall & Loganton Borough
Chatham Run Act 167 Stormwater Management Plan Update
Dunnstable, Gallagher, Pine Creek, Woodward Township

The Watershed Planning Advisory Committee meeting for both the Chatham Run and Fishing Creek watershed was held on Wednesday, March 22, 2006. A copy of the Draft Stormwater Management Plan and Model Ordinance for your watershed area was distributed at that meeting. All comments were due to our office by May 5, 2006. Attached are those comments, which we will discuss at our meeting tonight.

We also distributed a copy of the March 22nd meeting minutes, as well as, any pages with changes to the model ordinance to each municipality after the meeting.

The Clinton County Commissioners plan to hold a Public Hearing on **June 15, 2006.** They will then adopt the updated Stormwater Management Plans for both Fishing Creek and Chatham Run, possibly at their Commissioners meeting on June 22nd. All affected Municipalities will have 6 months from that date to adopt the new Model Ordinance.

Once finalized each Municipality will receive a copy of their respective Stormwater Management Plan and Model Ordinance with any changes. You will also receive a copy of a Stormwater Management Best Management Practices Design Manual.

PLANNING DEPARTMENT

Timothy L. Holladay
Director
William B. Suydam, Sr.
Asst. Planner/Grant Administrator
Elisabeth L. Lynch
Admin. Assistant

April 28, 2006

Mary Ann Bower
District Manager
Clinton County Conservation District
45 Cooperation Lane
Mill Hall, PA 17751

Dear Ms. Bower:

The Clinton County Planning Commission reviewed the Chatham Run and Fishing Creek Stormwater Management Plan updates during our April 18th Board meeting. We would like to make the following comments.

Our review of Act 167 indicates that stormwater management plans are to be watershed specific and that runoff management techniques are to be watershed specific. For these reasons we recommend that the plan updates should make it optional for each of the affected Municipalities to adopt their own implementation ordinance covering their entire Municipality. The adoption of an ordinance, covering the specific studied watershed, would remain mandatory. We also suggest that a Solicitor review the legal issues of how the County, requiring Municipal wide ordinances, is authorized under Act 167.

We are also concerned that the exemptions allowed under Section 302 are overly complicated. A homeowner may have difficulty doing the calculations. Additionally, Municipal zoning/permitting officers may have difficulty checking the exemption calculations. In many cases, it will take an engineer or other professional to determine if an activity is exempt or not. We recommend that the exemption criteria be simplified so that homeowners can determine whether or not their project is exempt.

Thank you for this opportunity to provide review comments. Please call me if you have any questions.

Sincerely,

Tim Holladay
Planning Director

Kathy Z. Conrad, Chief Clerk
Lewis G. Steinberg, Solicitor

Phone: (570) 893-4000
(800) 509-6697
Fax: (570) 893-4041

April 25, 2006

Mary Ann Bower
Clinton County Conservation District
45 Cooperation Lane
Mill Hall PA 17751

Dear Ms. Bower:

The Clinton County Commissioners after reviewing the Conservation District's 5 year strategy of Act 167, are considering your proposal of moving Act 167 implementation into the County Planning Department. However, at this time, it is impossible to do that due to a manpower shortage in the Planning Department. We are currently exploring the possibility of relieving this problem.

We are also in agreement with the Clinton County Planning Commission's comments in regard to the Chatham Run Stormwater Management Plan updates. Each municipality should have the option as to whether or not they adopt the Act 167 Ordinance.

Sincerely,

Clinton County Commissioners

Thomas H. Bossert, Chairman

Harold C. Yost, Jr., Vice Chairman

Richard K. Kyle, Commissioner

O'Connor & Salisbury

Robert D. O'Connor, Jr.
Michael F. Salisbury
Attorneys at Law

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Lock Haven, PA 17745
(570) 748-9666 Tel
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April 18, 2006

RECEIVED
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Clinton County Commissioners
Clinton County Courthouse Annex
232 East Main Street
Lock Haven, Pennsylvania 17745

Clinton County Planning Commission
Clinton County Courthouse Annex
232 East Main Street
Lock Haven, Pennsylvania 17745

Clinton County Conservation District
45 Cooperation Lane
Mill Hall, Pennsylvania 17751

Pennsylvania Department of Environmental Protection
208 West Third Street
Williamsport, Pennsylvania 17751

RE: WOODWARD TOWNSHIP/PROPOSED CHATHAM RUN WATERSHED ACT 167 STORM WATER MANAGEMENT PLAN AND ORDINANCE

Dear Ladies and/or Gentlemen:

In my capacity as Solicitor for the Township of Woodward, Clinton County, Pennsylvania, I have been authorized and directed to forward this reply in response to the proposed Chatham Run Watershed Act 167 Stormwater Management Plan and the Ordinance adopting the same. Currently, the Township maintains a Watershed Stormwater Management Plan for the Chatham Run Watershed together with a Stormwater Management Plan applicable to the remaining land of the Township. The Stormwater Management Plan governing the Chatham Run Watershed is considerably more restrictive for development and requires rather extensive involvement by Engineers to develop

appropriate Plans and the accompanying cost factor for the preparation and processing of said Plans.

In this regard, it is noted that the proposed Ordinance would apply the Chatham Run Watershed Act 167 Stormwater Management Plan to any development occurring within the jurisdictional limits of the Township. While it is recognized that the Pennsylvania Stormwater Management Act is mandatory, Section 680.5 of the Act only requires a specifically-tailored Stormwater Management Plan for Watersheds to be applicable to Watersheds, not areas unaffected by the Watershed. (32 P.S.§680.5)

Accordingly, while the Board of Supervisors of Woodward Township is receptive to adoption of the proposed Chatham Run Watershed Act 167 Stormwater Management Plan to be applicable to the areas covered by the Watershed, the Township is not receptive to having the proposed Watershed Stormwater Management Plan applicable to the entire Township. Truly, each individual municipality should have the option of adopting a Watershed Stormwater Management Plan applicable to the entire Township or applicable to the Watershed areas only.

If you should have any questions or comments with respect to any of the above, please feel free to contact either a Township Representative or myself at your convenience.

Thank you for your consideration.

Yours very truly,

Robert D. O'Connor, Jr.

RDO/rah

xc: Woodward Township Board of Supervisors

COPLOFF, RYAN & WELCH
ATTORNEYS AT LAW
136 EAST WATER STREET
LOCK HAVEN, PENNSYLVANIA 17745
crwlaw@kcnet.org

LARRY E. COPLOFF
PAUL J. RYAN
PAUL D. WELCH, JR.

AREA CODE 570
748-7771
FAX # 570-748-7120

April 10, 2006

Mill Hall Borough Council
215 Beech Creek Avenue
Mill Hall, PA 17751

Dear Folks:

Per your request, I have reviewed the proposed Fishing Creek/Cedar Run Watershed Stormwater Management Plan. As part thereof, I also reviewed the proposed Stormwater Management Ordinance and compared same with the Borough's present Ordinance.

As to the Plan, I understand the need for same and the desire of the State to assure "uniformity" in a particular watershed. A lot of the material is best understood by an engineer. In that regard, I believe you should refer same to the Borough's expert in that area.

I do note that Page 7 indicates that "Act 166" requires all municipalities in the combined watershed to enact ordinances that regulate the type and extent of development within flood plain areas. I am unfamiliar with Act 166. Perhaps Borough Council can learn whether "Act 166" is a "typo" and whether same should be "Act 167".

Otherwise, I confine my comments to the proposed Ordinance.

Under Article II (Definitions), I believe that there should be additional subparagraphs D and E adding the following:

> D. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity.
>
> E. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used or occupied."

I believe the definition for "earth disturbance activity" in the Definitions section should be as follows:

> A construction or other human activity which disturbs the surface of the land, including, but not limited to, clearing and grubbing; grading;

excavations; embankments; road maintenance; building construction; conversion of pervious surfaces to impervious surfaces; the moving, depositing, stock piling or storing of soil, rock, or earth materials; and any other action that causes any alteration or an alteration to the present condition of the land.

I believe that the definition of "land development" in the Definitions section should be as follows:

> Inclusive of any or all of the following meanings: (i) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purposes involving (a) a group of two or more buildings, or (b) the division or allocation of land or space between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features; (ii) any subdivision of land; (iii) any lot improvements regulated under the Borough Zoning Regulations (Chapter 27 of the Mill Hall Borough Code of Ordinances); (iv) development in accordance with Section 503(1.1) of the Pennsylvania Municipalities Planning Code.

As to the definition for "qualified professional", why does it indicate that the person must be licensed by the Department of State? What does "otherwise qualified by law to perform the work required by the Ordinance" mean? If it is the intent of the Borough to have its engineer be involved as a qualified professional, I believe that the definition should so indicate. If there are individuals otherwise qualified to perform the work required by the Ordinance, I believe that these qualifications should be specifically listed.

The following comments apply to Article III:

1. What is the purpose of Section 301(b)? Should the plans approved by the Borough not be, at all times, in the possession of the person carrying out the regulated activity?

2. Should there not be a provision for a waiver of a pre-design conference in Section 301(d)? This is especially true for "small" projects. Perhaps the language in the second sentence in the paragraph could read as follows:

> Please note that a pre-design conference shall be required to discuss the design and implementation of peak rate

controls, and the preparation of an SWM site plan, unless specifically waived, in writing, by the Borough's Engineer.

3. Subsection (D) of Section 301 also provides for provision of a copy of the Borough's "applicable stormwater management design manual at the pre-design conference". Is it the intent of the Borough to actually have a design manual? Might it be better that the language indicate that the applicant/qualified professional shall obtain a copy of the Borough's Stormwater Management Ordinance prior to the pre-design conference?

4. Section 301(E)(1) makes no sense and I am unable to decipher what is intended.

5. Section 301(E)(2) is unclear.

6. Section 301(E)(3) is unclear. Perhaps it should read:

> For projects that add impervious area to a parcel, such additional area, along with the present impervious area, shall be subject to the requirements of this Ordinance.

7. Section 301(F) is entirely too broad. For example, if a person discharges along the edge of another person's parcel (via a small ditch), and as a result of a project, will decrease any discharges through that ditch at the edge of the property, the adjacent property owner could defeat the project even though it has little or no effect on his/her/its property. This could be an especially serious problem where adjacent landowners do not "personally" care for each other. It seems to me that there has to be some measurable amount which would affect (also having to be defined) the other person's property. Perhaps the Borough should speak with its Engineer about setting up specific standards.

8. Article III, Section 302(F) should be changed to read as follows:

> Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Sections 301(F), (G), (H), and (J).

9. Section 303 deals with water quality. Section 303(A) addresses a "Simplified Method"; however, same is not defined. Subsection (B) addresses "Design Storm Method". This is not defined. In neither instance is there any indication when one or the other is to be utilized (If the landowner has a choice, this is not indicated.).

10. As to Section 304, I note that both Release Map Rate and BMP is not defined. In addition, it seems that there should be some indication that any determinations (i.e., analysis) under (A) and (B) should be made by the Borough Engineer.

Under Article IV Section 401 (Plan Contents), why not be more specific? I refer you to Section 133 of the Borough's present Stormwater Management Ordinance. Although it may be contemplated that an engineer will be providing the Plan, there may be occasions when that is not the case. Therefore, it seems that the more detail required by the owner, the better.

Article, IV, Section 403(C) provides for a limitation, in number of years, for the Borough's approval of a site plan. I suggest that the time-frame be the same as Pennsylvania's Municipalities Planning Code, i.e., five (5) years.

Article IV, Section 404 is, in my opinion, too vague in that there is no indication as to who decides whether the change involves the items listed. Perhaps there should be an indication that any proposed modification shall be submitted to the Borough, which shall determine if it involves a change listed in Section 404. If it does, then the Borough would require a re-submission.

Relative to Article VI, I do not believe that the Borough may charge legal review costs to an applicant. There was recent case law involving legal review costs for a zoning change disallowing same. I believe the principles are somewhat analogous. Accordingly, I do not believe that the Borough should include in its Ordinance anything relative to legal review costs. Of course, this does not mean that the Borough cannot seek fees for enforcement actions and the like. The particular Section in question refers to fees where an attorney reviews the plan to determine whether it adheres to the Borough's Ordinance.

In addition, I believe that Article VI should be more specific. Instead of being "general", I refer you to the provisions of Sections 151 through 155 of the present Stormwater Management Ordinance. Moreover, there should be, at a minimum, an indication that Borough Council may provide for a fee for various services, from time to time, via Resolution.

Relative to Article VIII, Section 801, I do not believe same to be sufficiently specific. There should be a definition of reasonable times (i.e., between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday/Saturday or whenever an emergency situation eminently dangerous to the public presents itself) and there should be a provision for the failure/refusal of an owner or occupant to allow an agent to inspect. On such occasion I believe the Ordinance should indicate that the Borough may obtain a Court Order upon showing of a reasonable basis to enter upon the premises and that the costs for obtaining same, including attorney's fees, be assessed against the owner and/or occupant. I do not believe, although the Borough's present Ordinance provides for same, that a Search Warrant is appropriate, in that the proposed Ordinance is not criminal in nature.

Article VIII, Section 803(B) should be amended to read as follows:

> It shall be unlawful to alter, remove, or fail to implement any control structure required by the SWM Site Plan.

Under Section 804, dealing with suspension and revocation, there is no notice requirement contained therein. It certainly seems to me that if the Borough intends to revoke a privilege extended to an individual, it must provide some kind of notification prior to doing so. Once again, I refer you to Section 172 of the present Ordinance.

Article VIII, Section 805, definitely needs to be changed. A person cannot be fined for a violation of a civil statute, ordinance, etc. and cannot be found guilty of a "summary offense". On the contrary, the person can be found in violation of an Ordinance and can be assessed a civil penalty. It seems that besides changing this language, there should be additional language providing for attorney's fees.

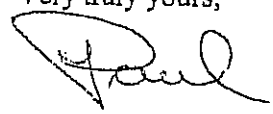
Article VIII, Section 806, relative to appeals is too general. There is no indication as to how the appeal process may work or is to occur, the mechanism for same (i.e., written notification by the landowner/occupant to the Borough, etc.), no indication as to who will make the decisions (i.e., Borough Council, etc.), and in what time-frame the decision must be rendered. Finally, I see no reason to include subsection B of 806.

At the risk of offending those individuals involved in preparation of the Plan and model ordinance (that <u>not</u> being my intent), I believe that Mill Hall Borough's present Stormwater Management Ordinance, with modifications contained in the proposed Model Ordinance, is more specific and therefore, in my opinion, will result in less uncertainty for both landowners and the Borough. As you may recollect, the Ordinance adopted by Borough Council was prepared by me based upon a model ordinance otherwise provided by the State.

In that regard, I note that I have, in one of my files, a Fishing/Cedar Run Watershed Act 167 Stormwater Management Plan adopted by the Clinton County Board of Commissioners on December 13, 1995. Is the one presently being proposed an amendment of that Plan? Why is there a need to re-enact?

I await Borough Council's thoughts/comments/recommendations/directions.

Very truly yours,



Paul D. Welch, Jr.
Attorney-at-Law

PDWJr:kw
cc: Todd Pysher

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OF COUNSEL
MICHAEL K. HANNA, SR.

June 13, 2006

Mary Ann Bower
District Manager
Clinton County Conservation District
45 Cooperation Lane
Mill Hall, PA 17751

Re: Stormwater Management Plans

Dear Mary Ann:

At your request, I have reviewed the comments received in connection with the above referenced matter. I am cognizant of the fact that the commissioners are only being asked to adopt the Stormwater Management Plans and a Model Ordinance; however, understand that the ordinances enacted by the municipalities need to be consistent with the intent of the model. Although neither the commissioners nor the Conservation District have the authority to direct the municipalities, it is appropriate to make recommendations to assist them in assuring compliance with the state enabling legislation.

It is my opinion that none of the comments received, if incorporated into municipal ordinances, would affect the required intent. The Storm Water Management Act does pertain to watershed stormwater management plans; therefore, as suggested by Bob O'Connor, a municipality could limit the impact of its ordinance to its watersheds; but, does not need to do so. I am of the opinion that many of Paul Welch's comments enhance and improve the model ordinance and none are inconsistent with its intent. I would recommend the inclusion into our model ordinance of two of his suggestions. I would suggest that we amend Article VIII, Section 803(B) to his proposed language: "It shall be unlawful to alter, remove or fail to implement any control structure required by the SWM Site Plan." In addition, I agree with Mr. Welch that it is necessary to

change Article VIII, Section 805, Subsection A, as violations of the provisions of this ordinance are civil; therefore, cannot lead to conviction of summary offenses. This provision should be amended to be consistent with Section 15 (32 P.S. § 680.15) of the Storm Water Management Act.

Very truly yours,

Lewis G. Steinberg

LGS/jab

Chatham Run and Fishing Creek
Act 167 Stormwater Management Plan Update
Meeting
March 22, 2006

5:30 PM Meeting with Engineers and Solicitors

Mary Ann Bower, District Manager Clinton County Conservation District and Todd Pysher, Pysher & Associates, Inc., the Project Engineer, welcomed the group and gave a brief update of the Stormwater Management process that was started for the Chatham Run watershed in 2002.

The Clinton County Soil Survey was recently updated during the process of the Stormwater Management (SWM) plan update. It was discovered that the original SWM Plan for Chatham Run had incorrectly identified the Hydrologic groups. Also the maps were very poor.

There will now be 2 Map Plates that will be included with the Chatham Run SWM Plan Update. The watershed release rate maps included with the original Fishing Creek SWM Plan will still remain in effect.

The Pennsylvania Act 167 Stormwater Management Planning Act requires that Municipalities adopt an ordinance to implement the SWM plan. A municipality can adopt a different ordinance than the Model Ordinance we will present tonight, as long the ordinance addresses the SWM plan that has been adopted by the County Commissioners and approved by the Department of Environmental Protection.

In regard to the municipalities who do not have their own Zoning Odinances, and are covered by the County for enforcement, that Muncipality must still adopt the Ordinance.

Todd Pysher and Tom Bittner reviewed the Model Ordinance:
Important items to note or comments made include:
Section 301 D – requirement for a pre-design conference is for better consistency with each municipality's and other agency's permit requirements. Municipalities may however add a sentence stating that "it be required unless waived by the Township Engineer",
Section 301, E, 3 – The Total Impervious Area would only be subject to requirements if it was developed after adoption of ordinance
Section 301, H – regarding Karst Topography
Section 301, J – regarding wetlands
Section 302, F – Section 301 J will be added
Section 303 – Water Quality provisions and the PA Stormwater Best Management Practices Manual for guidance (it is still in draft but will be released soon)
Section 304 – relates to areas covered by a Release Rate Map (Fishing Creek) or not covered (Chatham Run)
Section 401, B, 10 – signature block for Municipality to add review date

Section 401, B, 10 – signature block for Engineer to add certification of SWM design
Section 403, C,– Municipality can add a time period the plan would be valid. 5 years seemed to be the most favored because of other expiration dates.
Section 406, – As Built Surveys, a completion certificate or inspection date: puts the responsibility on the developer or the owner to certify to the Municipality that the project was built as designed.
Section 601, F – There were questions on whether the legal fees could be included
Section 803 – Enforcement
Section 805 – Penalties (this should be discussed with your solicitor) There were questions about it being a summary offense

Please note the Area of Influence and Total Impervious Area calculations used to determine exemptions for plan development (included as Appendix D of the Model Ordinance):

Submitted by:
Mary Ann Bower
Clinton County Conservation District
45 Cooperation Lane
Mill Hall, PA 17751
Phone: 570-726-3798

Chatham Run and Fishing Creek
Act 167 Stormwater Management Plan Update
Meeting
March 22, 2006

Watershed Planning Advisory Committee Meeting:

Meeting started at 7:10 p.m.

Mary Ann Bower welcomed everyone and introduced County Officials and key people involved in the process of updating the Chatham Run and the Fishing Creek Stormwater Management (SWM) Plans. She introduced Todd Pysher, of Pysher and Associates who is the Project Engineer.
She reported on the process of the Chatham Run SWM Plan Update since 2002. The Clinton County Soil Survey was recently updated during the process of the Stormwater Management (SWM) plan update. It was discovered that the original SWM Plan for Chatham Run had incorrectly identified the Hydrologic groups. Also the maps were very poor. Fishing Creek SWM Plan Update will involve deleting the original exemption chart and following the new exemptions listed in the Model Ordinance. The original Fishing Creek watershed rate release maps will remain the same. The State Department of Environmental Protection is recommending that Municipalities adopt the new Model Ordinance municipal-wide, not just in the watershed study area.

Tahmina Parvin from Department of Environmental Protection (DEP) Stormwater Plannining and Management Section, showed a PowerPoint Presentation overview of Act 167 Stormwater Management Planning. She reported on the purpose of Act 167 and planning process. She explained the calculations for the Area of Influence and the Impervious Area that are included as Appendix D of the Model Ordinance.

Barry Newman, DEP, Stormwater Plannining and Management Section Chief, reported that 75% of a municipality's expenses for implementing the SWM Plan is reimbursable by the State. Almost all expenses are reimbursable except litigation over implementing the plan. All other expense are reimbursable including: advertising, engineers time, municipal personnel time, solicitors time, etc.

Barry also reported that action can be taken by DEP against municipalities if they are found in violation.

Chuck Sweeney, Clinton County Planning Commission, asked, "Why haven't more plans been done in Pennsylvania over 30 years that Act 167 has been in place?" "The Act appears to be a failure."

Barry reported that initially the Act itself was viewed as a permitting tool, not a planning process. He also reported that Act 167 was not aggressively implemented as it could have and should have been over the past 30 years. When NPDES Phase II came into effect, is when the Act 167 plans were reevaluated. Act 167 is a critical tool for water quality.

Todd Pysher reported that the problems that were encountered while updating the Chatham Run SWM Plan were with soil hydrologic groups. The data that the GIS now has available from the updated Soil Survey changed engineering modeling for the plan.

He also reported that the Chatham Run SWM Plan that was distributed at the meeting is much smaller than it used to be. There were several things removed such as: compilations, tables, etc. (Todd referred to specific sections in the plan.)

The Fishing Creek SWM Plan will remain the same with the deletion of the exemption table and the new Model Ordinance..

The Model Ordinance is Chapter 8 of the Chatham Run SWM Plan and Chapter 11 of the Fishing Creek SWM Plan. This Model Ordinance is to be used by the municipalities and made specific for each individual municipality. The Model Ordinance should be adopted by each municipality at a public meeting. The municipalities should consult their municipal engineers and solicitors. This "model" ordinance can be changed to suit each municipality as long as it addresses the SWM Plan. Also, the Model Ordinance is meant to be implemented municipality-wide not just within the Chatham Run and Fishing Creek Watershed areas.

Below are some of the discussion items from that meeting as they pertain to the Model Ordinance:

- Section 301, D - Municipalities should require pre-applications meetings with developers and their engineers prior to issuing any Occupancy permits. If pre-applications meetings are required it could eliminate confusion, people being left out of the planning process, other agency permit requirements, and it could also save time and money. Municipalities may however add a sentence stating that "it be required unless waived by the Township Engineer",
- Section 304 – relates to areas covered by a Release Rate Map (Fishing Creek) or not covered (Chatham Run)
- Section 401 – Signature blocks - - The first signature block is for the municipal officials, only stating that they reviewed the plan along with the applicable ordinances. The other signature block should be for the site plan was prepared in accordance with all applicable ordinances.
- Section 402 – Plan Submission – 5 copies of the plan will need to be submitted to various departments.
- Section 403, C – The municipalities should be including an expiration date for the SWM Site Plan so that if the construction isn't completed, the permits that were issued could be revoked.
- Section 601 - The cost of the municipal Engineer's review can be passed on to the Developers. Question on whether legal fees can also be collected.
- Section 803 - Enforcement
- Section 805 – Penalties (this should be discussed with your solicitor) There were questions about it being a summary offense
- Appendix A – Low Impact Development Practices, Alternative Approach for Managing Stormwater Runoff.
- Appendix B – List of Best Management Practices
- Appendix C - Operation and Maintenance agreement between the Landowner/Developer and the Municipality could be a very important tool.
- Appendix D - Please note the Area of Influence and Total Impervious Area calculations used to determine exemptions from SWM site plan development.

The municipalities should have separate delegation agreements for Act 167. If the County Planning Commission is issuing the Occupancy Permits for the municipality, Act 167 **IS NOT** automatically included without a separate agreement. The municipality is still responsible for enforcing Act 167.

Mr. Tom Bossert asked, "Can the County opt out of having a delegation agreement for SWM enforcement even if they are issuing the Occupancy Permits?" "Can adjacent municipalities use the same Stormwater Management enforcement officer?"

Mr. Paul Welch responded, "Absolutely, two or several municipalities can have agreements to use the same SWM enforcement officer." The County does not have to be the enforcing officer for Act 167.

Barry Newman suggested adding a phrase to the Model Ordinance – Section 301D that states a Pre-Application meeting can be waived at the discretion of the municipality.

Todd and Mary Ann reported that comments on the draft plans are due by May 5, 2006, to the Conservation District. The Final Plans will be adopted by the County Commissioners on June 15, 2006, following a Public Hearing. Municipalities will have 6 months from that date to adopt their own ordinance.

Mary Ann thanked everyone for attending the meeting.

Meeting ended at 9:15 p.m.

Submitted by:
Susie Peters
Clinton County Conservation District
45 Cooperation Lane
Mill Hall, PA 17751
Phone: 570-726-3798

Chatham Run and Fishing Creek
Act 167 Stormwater Management Plan Update
Watershed Planning Advisory Committee Meeting:
May 30, 2006

Meeting started at 7:00 PM

Mary Ann Bower, Clinton County Conservation District, welcomed everyone and introduced County Officials and key people involved in the process of updating the Chatham Run and the Fishing Creek Stormwater Management (SWM) Plans. She introduced Todd Pysher, of Pysher and Associates who is the Project Engineer.

Todd Pysher reviewed the official comments received in writing. Comments received regarding the recommendation to adopt the Model Ordinance municipal-wide was discussed. It was noted that the Model Ordinance is written so that it could be adopted municipal-wide, if a Municipality chooses to do so. Act 167 states it is a watershed based Storm Water Management Plan; therefore, it is the Municipality's decision to adopt the ordinance as they choose.

Some of the reasons to consider adopting the Ordinance municipal-wide are:

- Some development projects can span two different watersheds in your municipality and therefore the ordinances would not be consistent
- Developers, being aware of the difference in ordinances, would be more inclined to develop in the areas not covered by these ordinances.
- Department of Environmental Protection is recommending that the Model Ordinance be enforced Municipal-wide, and plan to enforce a similar ordinance on all counties and municipalities in the future. This is due to the number of complaints and problems created by increased runoff from development occurring in areas with no coverage.
- This model ordinance establishes municipal authority to administer and enforce proper implementation and maintenance of Best Management Practices that would meet several state regulations.

Chuck Rine, Woodward Township stated that he would like to encourage the County to do a County-wide Stormwater Management Plan. He felt that would make ordinances consistent throughout the county. He felt that with Chatham Run being only a very small portion of his township, and adopting it township wide would be unfair. But if all the county was covered he would agree with that.

Tahmina Parvin from Department of Environmental Protection (DEP) Stormwater Plannining and Management Section, explained to the County Commissioners that it would be possible to extend their present agreement to include a county-wide plan. Chris Dwyer, Bald Eagle Townsip also encouraged the County to pursue this type of a plan. Although everyone present agreed that County-wide would be an ideal situation, the County is not prepared to pursue that at this time. County Commissioner Bud Yost requested that Tahmina or Barry Newman send a letter to the County regarding the County pursuing a County-wide Plan and Ordinance.

The original update was only planned for Chatham Run, since it was originally done in 1989. SWM plans should be reviewed every ten years. The process started in 2002, but was extended due to changes in soils information. In November, DEP asked is the County would be interested in also updating the Fishing Creek SWM Plan and Ordinance done in 1995.

Dan Eckley, Pine Creek, Greene, Lamar and Porter Townships, stated that he felt that the Apprendix D Area of Influence calculation was too difficult for most people to follow, even for a Zoning Officer to determine if someone would need to develop a SWM Plan. It also appeared to him that most would need a plan to build a house or garage. He stated that he would like the County to consider providing assistance to townships on making these determinations. It was stated that the exemption chart shows most projects under 1,000 square feet could be exempt.

Todd Pysher stated that perhaps the Area of Influence calculation could be simplified.

Larry Coploff, Solicitor for Loganton Borough, asked if any changes could be made to the Model Ordinance. It was explained that as long as the intent of the ordinance was not changed, that would be acceptable.

In order for Municipalities to get reimbursement, they must complete the DEP Reimbursement application form.

The Public Hearing will be held on Thursday, June 15, 2006, at 9:00 AM at the Garden Building, Commissioners Meeting Room.

Meeting ended at 8:15 p.m.

Submitted by:
Mary Ann Bower
Clinton County Conservation District
45 Cooperation Lane
Mill Hall, PA 17751
Phone: 570-726-3798

THURSDAY, JUNE 22, 2006

PRESENT: Thomas H. Bossert, and Harold C. Yost, Jr., Richard K. Kyle, Patricia Edwards, Treasurer.

The meeting was called to order at 10:03 am by Chairman Thomas Bossert.

MINUTES APPROVAL

Mr. Bossert asked for a motion to approve the minutes from the June 8, 2006 meeting. Motion by Mr. Yost, seconded by Mr. Kyle. Motion carried.

PROCLAMATION

Proclamation: Dairy Month
Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.
Mr. Kyle stated that that are many County employees in the room who have worked specifically in the dairy business. He stated it was nice to read the proclamation. Lori Dotterer, Clinton County Dairy Princess was in attendance and thanked the Commissioners for recognizing Dairy Month. She gave all those present ice cream made from her family's dairy farms milk.

CDBG COMPETITIVE GRANT FLEMINGTON BOROUGH

Mr. Bossert asked for a motion to file for a CDBG competitive grant on behalf of Flemington Borough in the amount of $500,000.00 for sewer line improvements. Motion by Mr. Yost, seconded by Mr. Kyle. Motion carried. Jessica Sheets from Innovative Consulting Group was in attendance and stated that this grant, if approved, will pay for a portion of the Woods Avenue project. The Borough will also be applying for Penn Vest funding in August to fund the remainder of the project. The total project cost is $987,120.00. The Borough is scheduled for a rate increase on July 1. Mr. Bossert stated that this grant will pay to improve a transmission line that Mill Hall Borough, Bald Eagle Township and East Nittany Valley use to get to the City. This is an integral part of the community effort to upgrade infrastructure.
Ms. Sheets stated that the project will need to be completed by the summer of 2007 as Penn Dot is scheduled to repave the road. Mr. Bossert asked if the project was shovel ready, Ms. Sheets stated that it is about 85% ready.

GENERAL OBLIGATION NOTE $400,000.00

Mr. Bossert asked for a motion to approve the purchase of a General Obligation Note in the amount of $400,000.00 for a period of 7 years at a fixed rate of 4.19%. Mr. Bossert stated that the money will be used for capital improvements such as the roof replacement project, the disconnect project, and two new heating units at the prison. Motion by Mr. Yost, seconded by Mr. Kyle. Motion carried. Mr. Bossert stated that this is not coming out of General Fund. Mr. Yost stated that the electrical disconnect had to be sent back to the manufacturer to be modified to work with the prison system. Mr. Kyle stated that it is the proper way to do financing. It has not been done this way in past years.

LIQUID FUELS BALD EAGLE TWP

Mr. Bossert asked for a motion to approve liquid fuels for Bald Eagle Township in the amount of $ 2,486.00 for 2006 road projects. Motion by Mr. Yost, seconded by Mr. Kyle. Motion carried.

LIQUID FUELS DUNNSTABLE TOWNSHIP

Mr. Bossert asked for a motion to approve liquid fuels for Dunnstable Township in the amount of $ 1,436.00 for shoulder work on Cider Press and Big Plum Run roads. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

BOARD REAPPOINTMENT REVOLVING LOAN FUND

Mr. Bossert asked for a motion to re-appoint James Maguire, Jr., Steve Bason, Tien Lu Chu and Susan Hanna to the Revolving Loan Fund Board for a one year term expiring June 30, 2007. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

BOARD REAPPOINTMENT R SHEETS

Mr. Bossert asked for a motion to approve the re-appointment of Roger Sheets to the Central PA Workforce Development Corp. for a three year term expiring June 30, 2009. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

RESIGNATION B HANLEY

Mr. Bossert asked for a motion to confirm the resignation of Barbara Hanley, Lieutenant at the Clinton County Correctional Facility effective June 26, 2006. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

RESIGNATION D SPECHT

Mr. Bossert asked for a motion to a confirm the resignation of Dana Specht, Corrections Officer at the Clinton County Correctional Facility effective June 30, 2006. Motion by Mr. Yost, seconded by Mr. Kyle. Motion carried.

RESIGNATION S HOLMES

Mr. Bossert asked for a motion to confirm the resignation of Sherrie Holmes, Corrections Officer at the Clinton County Correctional Facility effective June 29, 2006. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

FT STATUS J HURSH

Mr. Bossert asked for a motion to confirm the transfer of Jennifer Hursh, temporary full time Corrections Officer to full time status effective June 25, 2006, with no salary change. Motion by Mr. Yost, seconded by Mr. Kyle. Motion carried.

PT NEW HIRE D SAXTON

Mr. Bossert asked for a motion to approve the hiring of Dawn Saxton, part time Legal Secretary in the office of President Judge Richard Saxon, Jr. effective July 3, 2006. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

NEW HIRE J MITCHELL

Mr. Bossert asked for a motion to approve the hiring of Joseph Mitchell, Sr., part time Dispatcher at the Clinton County Department of Emergency Services effective June 26, 2006. Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.

SALARY BOARD

The Salary Board was called to order at 10:22 AM. Details of the Salary Board are in the Salary Board minutes.

COUNTY BILLS APPROVED

Mr. Bossert asked for a motion to approve County Bills Accounts Payable in the amount of $479,085.18; Payroll P/E 6/16/06 $ 298,551.60 Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried. Mr. Yost stated that the bill total was for 2 weeks and included the monthly health insurance payment.

STORM WATER MANAGEMENT PLAN ADOPTION

Kathy Conrad stated that an item should have been added to the agenda. The Storm Water Management Plan adoptions for Chatham Run watershed and Fishing Creek watershed. Mr. Bossert asked for a motion to adopt the Chatham Run Storm Water Management Plan (Act 167). Motion by Mr. Kyle, seconded by Mr. Yost. Motion carried.
Mr. Yost made a motion to adopt the Fishing Creek Storm Water Management Plan (Act 167), seconded by Mr. Kyle. Motion carried. Mary Ann Bower from the Clinton County Conservation District was in attendance and stated that the Plan needs to be submitted by June 30 in order to receive 75% of the funding reimbursement from the State. She stated that there is an in kind match of 25%. The cost to do the plan was around $80,000.00. She stated that a review is required by law every 10 years. The plan will now go to DEP for their approval. Once approved, each municipality will have 6 months to adopt it. Mr. Kyle asked Ms. Bower what would happen if the County did not update the plan. She stated that the County would lose 75% of the funding from the State and the taxpayers would be forced to pay for whole plan instead of just 25%. Mr. Kyle stated that he wanted the taxpayers to realize that this update of the plan was also a mandate and if not done it would have cost even more.
Mr. Yost thanked the Conservation District for their hard work and timely manner in getting the job done. Suzy Watson stated that both plans will be posted on the County website.
Mr. Kyle encouraged all municipalities to adopt this ordinance countywide, it is in their best interest.

COMMISSIONER COMMENTS

Mr. Bossert apologized on behalf of the Board of Commissioners to Richard Morris for the abuse he took at last night's hate commission meeting. He stated that it was unjust and incorrect.

Mr. Morris stated that he got a little involved with the reassessment that was done in Lycoming County. He stated that there is no question that Clinton County needs to do a reassessment. He stated that no one would go to work today for wages that were from 1973. He stated that the public needs to become more aware of the process. It is true that some people will pay more taxes and some people will not. If the reassessment issue is turned into a tennis ball between the County and the government study commission it could be tainted as something that is undesirable. Mr. Bossert stated that the Commissioners are not vindictive in their effort to do a reassessment they are only concerned with tax fairness. Mr. Kyle stated that the reassessment process has already been started. There is money in this years budget to purchase the software which is the first step in the this process. He stated that they will try to educate the public as to the process of reassessment. He stated that Tuesday afternoon after making his comment on Monday he was told he committed political suicide. He said if that is true then so be it, but he was elected to make good solid decisions on behalf of the citizens of Clinton County and will continue to do that.

Mr. Yost commended Flemington Borough for their pro-active stance and hard work to get the job done.

Mr. Bossert welcomed home the National Guard's return and wished them well for an outstanding job. They are to be commended as they are the "keepers of freedom."

ADJOURNMENT

Mr. Kyle made a motion to adjourn the meeting at 11:10 am, seconded by Mr. Yost. Motion carried.

_____
Chief Clerk

Chatham Run and Fishing Creek
Act 167 Stormwater Management Plan Update
PUBLIC HEARING MINUTES
June 15, 2006

The Public Hearing was called to order by Commissioner Thomas Bossert at 9:00 AM.

It was noted that the recorded minutes from this Public Hearing on the Chatham Run and Fishing Creek Act 167 Stormwater Management Plans and Model Ordinance would be made a part of the final plan along with the minutes from the prior two Watershed Planning Advisory Committee meetings.

Lewis Steinberg, Clinton County Solicitor, submitted his written review of the comments that were received on the draft stormwater management plans and model ordinance. His suggestions for changes will be made to the final model ordinance. It was noted that the model ordinance will be the responsibility of the municipalities to enact either within the studied watershed area or municipal wide.

Tom Bittner, Clinton County Conservation District, noted that once the final stormwater management plans which contain the model ordinance are adopted by the County Commissioners, there can still be changes made to the model ordinance if a municipality so chooses, as long as the intent of the ordinance is not changed.

Mr. Bossert invited each of those present to present their testimony.

Bill Suydam, Clinton County and Pine Creek Township Planning Commissions, stated that he would like to see all of Pine Creek Township, including the Pine Creek watershed area not just Chatham Run watershed area, protected by this ordinance.

Mr. Pysher stated that the Township has the authority to adopt the stormwater ordinance within their entire township, if they so choose. He also stated that as the Pine Creek Engineer he has made that recommendation to the township that they adopt it township-wide for consistency.

Lewis Steinberg, Clinton County Solicitor, stated that the role of the County Commissioners was to consider adoption of the Chatham Run and Fishing Creek Stormwater Management Plan which includes the Model Ordinance for use by those affected municipalities. Each municipality will have the responsibility to enact this ordinance or amend an existing stormwater management ordinance that would meet the intent of this model ordinance.

Robert Jacobs, Castanea Township Supervisor, stated that he was here to learn more about the Fishing Creek Stormwater Management Plan and its effect on his township.

Dale Copenhaver, Gallagher Township Supervisor, had questions about the Lycoming County stormwater management study being done at this time and whether the Chatham Run Stormwater Management Plan would be adopted by Watson Township, Lycoming County, that shares a small portion of the watershed.

Mr. Pysher stated that while Lycoming Creek watershed was being studied, Lycoming County decided that a similar Model Ordinance will be adopted county-wide.

David Webb, Developer, stated that he was concerned about the new regulations from many aspects and how they will affect developers and the cost to build. He was also under the impression that the watershed boundary line was being changed under the updated study. He now owns a development in the Reeds Run watershed area.

Mr. Bittner stated that the watershed boundary lines did not change with the new update.

Mr. Harold (Bud) Yost stated that as a County Commissioner he was in agreement with the changes submitted by Mr. Steinberg.

Mr. Rich Kyle, County Commissioner, stated that the County Commissioners responsibility was to have the stormwater management plan updated according to Act 167 regulations and the Department of Environmental Protection. The Commissioners will adopt the Chatham Run and Fishing Creek Stormwater Management Plan updates which include the Model Ordinance. It is the municipalities in those watersheds responsibility to proceed in adopting the ordinance as they choose. He asked that municipalities realize it is under their authority to address stormwater management, not the County. He recommended that they consider adopting the ordinance to their best benefit.

Mr. Bossert thanked everyone for attending and for their comments. He reminded everyone that the Chatham Run and Fishing Creek Stormwater Management Plans would be considered for adoption at the County Commissioners regular meeting on June 22, 2006.

Meeting ended at 9:35 p.m.

Submitted by:
Mary Ann Bower
Clinton County Conservation District
45 Cooperation Lane
Mill Hall, PA 17751
Phone: 570-726-3798

Chatham Run and Fishing Creek
Act 167 Stormwater Management Plan Update
PUBLIC HEARING
Attendance
June 15, 2006

Name	Organization/Township
Bill Suydam	Clinton County and Pine Creek Township Planning Commissions
David Webb	Developer
Robert Jacobs	Castanea Township Supervisor
Dale Copenhaver	Gallagher Township Supervisor
Lewis Steinberg	Clinton County Solicitor
Thomas Bossert	Clinton County Commissioner
Richard Kyle	Clinton County Commissioner
Harold (Bud) Yost	Clinton County Commissioner
Todd Pysher	Pysher & Associates, Inc
Thomas Bittner	Clinton County Conservation District
Mary Ann Bower	Clinton County Conservation District