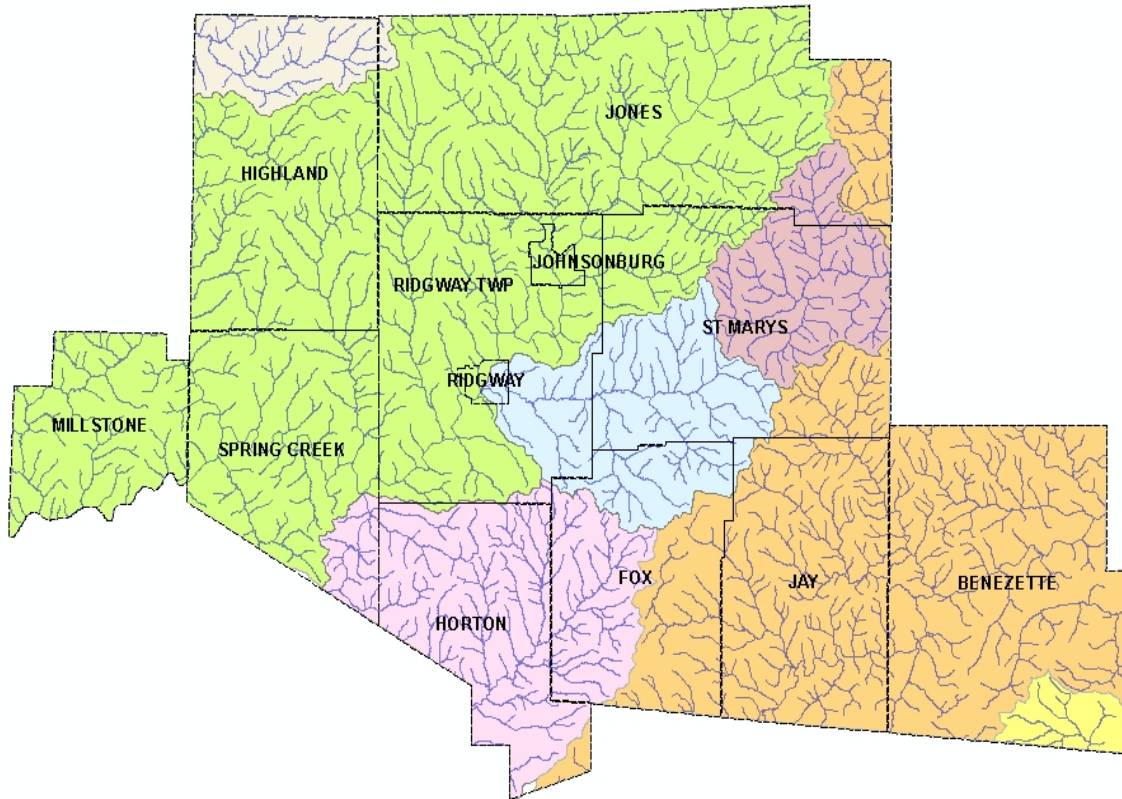


**ELK COUNTY  
ACT 167 PHASE 2  
STORMWATER MANAGEMENT PLAN**

**VOLUME 1 – EXECUTIVE SUMMARY**



**PREPARED FOR:**

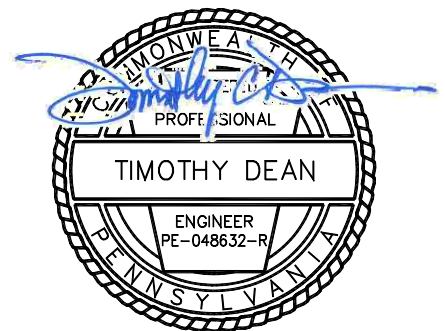
ELK COUNTY  
300 Center Street  
Ridgway, PA 15853

**PREPARED BY:**

ELK COUNTY  
PLANNING COMMISSION  
300 Center Street  
Ridgway, PA 15853

**CONSULTANT:**

L.R. KIMBALL  
415 Moon Clinton Road  
Coraopolis, PA 15108



## ELK COUNTY WATERSHED PLANNING ADVISORY COMMITTEE (WPAC)

| <u>WPAC Member</u>        | <u>Organization</u>  |
|---------------------------|--|
| Ms. Marylou Walck         | Benezette Township   |
| Mr. David Green           | City of St. Mary's   |
| Ms. Kathy Mosier          | Fox Township   |
| Ms. Leatrice Maze         | Highland Township  |
| Mr. Dennis Thompson       | Horton Township  |
| Ms. Debbie Leonard        | Jay Township   |
| Ms. Mary Polaski          | Johnsonburg Borough  |
| Ms. Laurie Storrar        | Jones Township   |
| Ms. Johanna Patton        | Millstone Township   |
| Mr. Martin Schuller       | Ridgway Borough  |
| Ms. Milly Bowers          | Ridgway Township   |
| Mr. Richard Wittman       | Spring Creek Township  |
| Mr. Bill Sabatose         | Toby Creek Watershed Assoc.  |
| Mr. Ken Rowe              | Bennett Branch Watershed Assoc.  |
| Mr. Jeff Buchheit         | Elk County Freshwater Assoc.   |
| Mr. Barry Mayes           | North Central Pennsylvania Regional<br>Planning and Development Commission |
| Mr. Matt Quesenberry      | Elk County Planning Department   |
| Mr. Robert Dippold        | County of Elk  |
| Ms. Kim Lanich            | County of Elk  |
| Mr. Michael A. McAllister | County of Elk  |
| Mr. Rob Fallon            | Marienville Ranger District  |
| Mr. Adam Dellinger        | Headwaters RC&D  |
| Mr. Timothy J. Bruno      | PA Department of Environmental<br>Protection                               |
| Mr. David Matheson        | PennDOT Engineering District 2   |

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## **PLAN FORMAT**

The format of the Elk County Stormwater Management Plan consists of three Volumes:

### **Volume 1 - Executive Summary**

Provides an overview of Act 167 and a summary of the standards and criteria developed for the Plan.

### **Volume 2 – Plan Content**

Provides an overview of stormwater management, purpose of the study, data collection, all GIS maps, present conditions, projected land development patterns, calculation methodology, the Model Ordinance and implementation discussion.

### **Volume 3 – Appendices**

Provides supporting data, watershed modeling parameters and modeling runs, peak flows, release rates, the existing municipal ordinance matrix, and obstructions inventory. Due to large volumes of data, one copy of Volume 3 will be on file at the Elk County Department of Planning.

## **SECTION I INTRODUCTION**

The Elk County Stormwater Management Plan and Model Ordinance have been developed in accordance with the requirements of Pennsylvania Stormwater Management Act 167 of 1978. According to Act 167, each county must prepare a stormwater management Plan for each of its designated watersheds in consultation with the municipalities located within the boundaries of the watershed.

Act 167 also requires municipalities to enact or amend and implement ordinances and regulations, including zoning, subdivision and development, building code, and erosion and sedimentation ordinances as are necessary to regulate development in a manner consistent with this Stormwater Management Plan and the provisions of the Act. The Plan includes a model ordinance that meets the applicable requirements.

## SECTION II WATERSHED DESCRIPTIONS

Various river and stream valleys cut through the landscape of Elk County. All of these either form or are tributaries to the Clarion River or Sinnemahoning Creek. The eastern and southeastern portion of the County lies in the Susquehanna River Basin and is drained by Sinnemahoning Creek and its tributaries. The western and central portions of the County are in the Allegheny River Basin and are drained by the Clarion River and its tributaries. See Figure II-1.

**Clarion River Watersheds:** Land uses in this watershed include the urbanized or populated areas of St. Mary's and Ridgway Borough, as well as agricultural, forestry, and State and National Forests in Jones, Ridgway, and Spring Creek Townships.

The Clarion River flows 101 miles through Elk, Forest, Jefferson, and Clarion Counties, emptying into the Allegheny River near Parker, PA. Over half the river qualifies as scenic or recreational classification, with numerous species of wildlife and vegetation along its banks. The Clarion River, from the Allegheny National Forest/State Game Land (ANF/SGL) boundary below Ridgway to the backwater of Piney Dam is located in the un-glaciated Allegheny plateau. It is free flowing and relatively slow moving with meanders and a generally steep valley with little floodplain. Tributaries to the River include Wolf Run, Little Wolf Run, Big Mill Creek, Bear Creek, Elk Creek, and Spring Creek.

**Sinnemahoning Creek Watersheds:** Land uses in this watershed include agriculture, forestry, mining, and State Forest and State Game Lands.

Sinnemahoning Creek (Native American for "stony lick") is a tributary of the West Branch Susquehanna River. The Sinnemahoning was once a route for Native Americans and eventually served as a route for 19th century loggers to transport their timber to the West Branch of the Susquehanna River. It is a slow running stream with occasional gentle rapids. Major Elk County tributaries to the Sinnemahoning Creek include Kersey Run, Trout Run, West Creek, and Dents Run.

**Tionesta Creek Watersheds:** The Tionesta Creek Watersheds are not included for modeling and detailed analysis as a part of this plan. The reasoning for this decision is that a major portion of the overall watershed lies outside of Elk County and only a small portion in the northwest corner of the County is present.

Figure II-1 below shows the seven watersheds designated by the DEP under the Act 167 Program, as well as two additional watersheds of concern in Elk County.

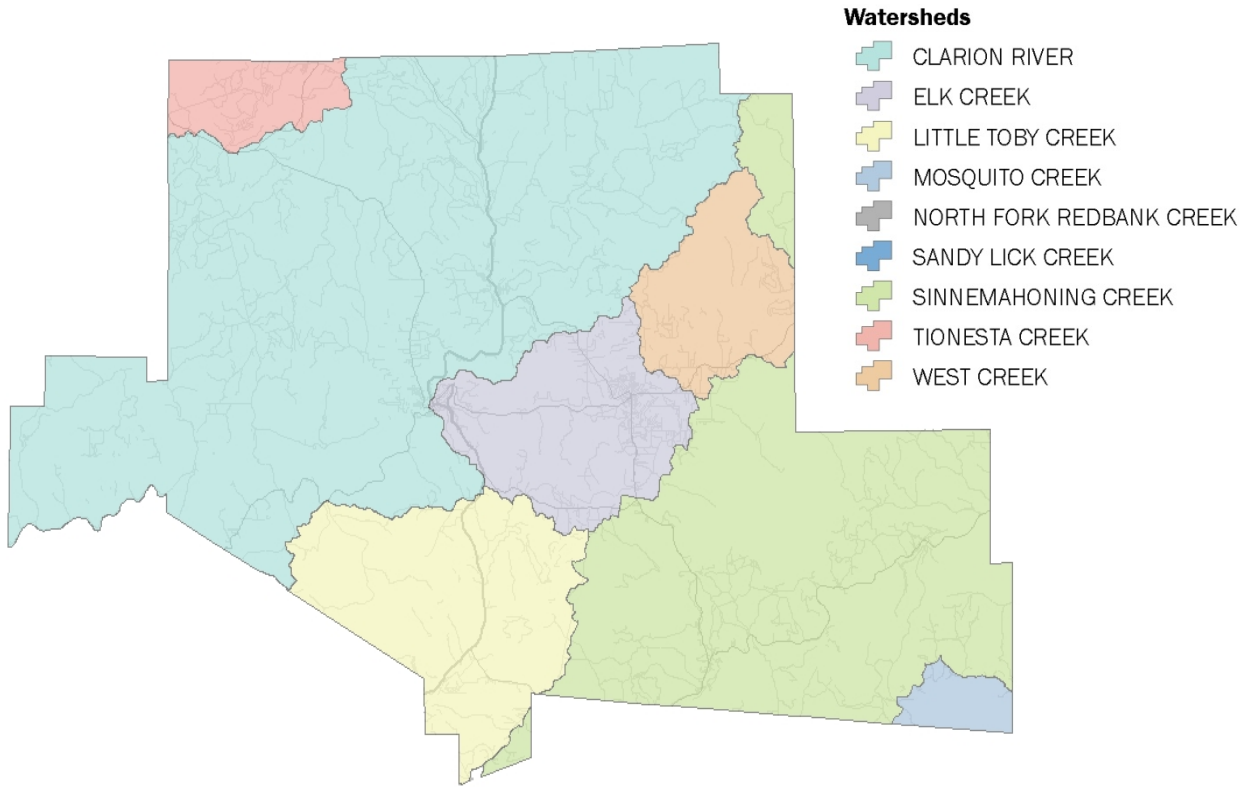


Figure II-1

## SECTION III METHODOLOGY

The engineer for this planning project is L.R. Kimball. The Plan was developed from data collected on the physical features of the watershed, such as soils, wetlands, topography, floodplains, dams and reservoirs, stream dimensions, and obstructions. Information on existing problem areas was solicited from the Watershed Planning Advisory Committee (WPAC), which consisted of representatives from the twelve (12) county municipalities as well as other interested parties including the County Conservation District and others. Although the Plan cannot solve all existing problems, knowing where and why these problems exist aided L.R. Kimball in developing the sub-watersheds, identifying points of interests, and understanding the hydrology of the County's watersheds as a whole. Information on existing land use and zoning was also collected. This information helped L.R. Kimball determine where and to what extent future development would take place. All of this data was compiled into a geographic information system (GIS) geodatabase.

The hydrologic model chosen for use on this plan was the U. S. Army Corps of Engineers (USACE), Hydrologic Engineering Center, Hydrologic Modeling System (HEC-HMS). The standalone HEC-HMS program was supplemented with the use of the USACE GeoHMS software package in order to take better advantage of the growing amount of countywide Geographic Information System (GIS) data available. The selection of the HEC-HMS and GeoHMS modeling software was based upon the following<sup>1</sup>:

- It is accepted by the Pennsylvania Department of Environmental Protection
- Provides the ability for combination modeling of the hydrology of natural watersheds as well as developed urban areas
- Provides the ability to represent engineered structures (e.g. pumps, diversions, reservoirs, etc.)
- The software places an equal value on both natural and urban watersheds (one of few software packages available that can model hydrology in watersheds with a mixture of conditions)
- The finalized model can easily be adapted for use in additional applications such as: estimating flood damage reduction, consideration of environmental restoration, future flexibility, and the ability to apply new methods that represent infiltration, new reservoir outlets, and several other components of the hydrologic cycle
- The use of the software allows for integration with other Federal, local, and private entities that are using compatible models produced from USACE software packages

While other commercially and freely developed software packages are available and possess the ability to provide similar results, HEC-HMS was chosen for the reasons outlined above as well HMS's ability to calculate flows for specific sub-watersheds along the stream/river route and then compare these flows with the overall watershed flows.

HEC-HMS has the ability to calculate runoff amounts for each specified storm or return period based on several physical, geological, and meteorological characteristics of the watershed. This flow is then generated and routed through the watershed system based on the stream's hydraulic parameters. This is one of the benefits of using the GeoHMS package in conjunction with HEC-HMS. The watershed's characteristics (listed above) are often available in GIS datasets from the County or other acceptable location. This greatly aids in streamlining the modeling process, increases the modeler's efficiency in producing the results, and helps to diminish the potential for "human error" by reducing the number of calculations that the modeler has to perform without the benefit of the software.

In essence, the amount of flow generated from any watershed is a result of the following contributing factors:

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<sup>1</sup> The list is partially adapted from reference material published by the United States Army Corp of Engineers

- Basin Slope
- Hydraulic Flow Parameters of Related Streams/Rivers
- Soil Type/Hydrologic Soil Conditions (used for determination of the Soil Conservation Service (SCS) soil curve number)
- Land Use within the Basin (e.g. wooded cover, grassy areas, urbanized areas, open fields, etc.)

Composite SCS curve numbers (CN) are then generated by the software using the available soils and land use information. This information, along with flow travel times, basin slopes, and available rainfall data, are the basis for the resulting watershed and sub-watershed model results.

Due to budgetary and schedule limitations, only one of the watersheds originally identified in the Phase 1 Scope of Study was modeled in Phase 2. The only watershed modeled in this planning cycle is Elk Creek.

The Elk Creek watershed has an existing Act 167 Plan. Elk Creek is a tributary to the Clarion River, starting in Ridgway with headwaters in the City of St. Mary's.

## SECTION IV EXEMPTIONS

The following exemptions are established in the Model Ordinance and shall be observed for regulated activities within the jurisdiction of the Plan.

**Table IV-1**

| <b>New Impervious Area</b>                     | <b>Applicant Submission Requirements</b>  |
|--|---|
| 0 SF ≤ <u>new</u> impervious area < 1000 SF    | No Submission Required  |
| 1000 SF ≤ <u>new</u> impervious area < 2500 SF | Small Project SWM Application <sup>2</sup> (See Appendix F)   |
| 2500 SF ≤ <u>new</u> impervious area < 5000 SF | Volume Control (Section 304) and Small Project SWM Application (See Appendix F)                                 |
| 5000 SF ≤ <u>new</u> impervious area           | Peak Rate Control (Section 305), Volume Control (Section 304), and Stormwater Management Site Plan (Article IV) |

All Regulated Activities must comply with the State Water Quality Requirements.

- A. New Single Family Residential activities on a single lot are exempt from the requirements of Section 304 - Volume Control, Section 305 - Peak Rate Control, and from the submission of a Small Project SWM Application provided the construction:
1. Complies with Sections 302.A, 302.B, 302.C, and
  2. Has building setbacks of at least 75 feet from downslope property lines, and
  3. Driveways:
    - a. Runoff must discharge onto pervious surface with a gravel strip or other spreading device.
    - b. No more than 1,000 square feet of paved surface may discharge to any one point.
    - c. For each discharge point, the length of flow on the pervious surface must exceed the length of flow on the paved surface.

<sup>2</sup> The municipality can require the applicant to provide supplemental and additional information beyond the Small Project SWM Application if there is a threat to property, health or safety

- B. The Municipality may, after consultation with the PA DEP, approve alternative stormwater management controls for meeting the State Water Quality Requirements other than those in this Ordinance, provided they meet the minimum requirements of, do not conflict with State law including but not limited to the Clean Streams Law, and provided that:
1. The alternative controls are documented to be acceptable to PADEP (or Delegated Authority), for NPDES requirements pertaining to post construction stormwater management requirements.
  2. The alternative controls comply with all other sections of this ordinance, including but not limited to Sections 301.C and 302.A-C.
- C. Agricultural activities are exempt from the rate and SWM Site Plan preparation requirements of this ordinance provided the activities are performed according to the requirements of 25 Pa.Code Chapter 102.
- D. Forest management and timber operations are exempt from the rate and volume 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. Refer to Section 309 for additional information and guidance concerning timber operations.
- E. Exemptions from any provisions of this Ordinance shall not relieve the Applicant from the requirements in Sections 301.D, F, G, H, I, J and K.
- F. Proposed Municipal projects are bound to the following requirements and criteria:

**Table IV-2**

| Type of Project     |               | Description:  | Requirements:  |
|---------------------|---------------|---|--|
| Roadway Restoration | Alignments*   | Change the roadway by either reducing or eliminating horizontal and vertical curves, or changing the roadway's superelevation.                                  | BMP implementation that uses non-structural and restoration practices such as: <ul style="list-style-type: none"> <li>• Street sweeping</li> <li>• Impervious disconnection</li> <li>• Slope roughening</li> <li>• Pavement width reduction</li> <li>• Riparian buffers</li> <li>• Vegetative Restoration (including road-side swales)</li> <li>• Soil Amendments</li> </ul> |
|                     | Pull-Offs*    | New, as part of a larger project or by itself.  |  |
|                     | Widening*     | Increase the width of the existing travel lanes (no new lanes added) and shoulders, or extension of acceleration/deceleration ramps in existing shoulder areas. |  |
|                     | Intersection* | Nominal channelization of intersections and addition of turning lanes.  | Minor practices and BMP implementation that uses low-impact practices such as: <ul style="list-style-type: none"> <li>• Preservation of existing vegetation</li> </ul>   |
|                     | Pavement      | Replace portions, overlay, or mill and resurface the roadway's surface.   |  |

**Table IV-2**

| <b>Type of Project</b>  |                      | <b>Description:</b>   | <b>Requirements:</b>  |
|-------------------------|----------------------|---|---|
|                         | Shoulders            | Resurface, stabilize, upgrade (dirt or gravel to paved), or widen the existing shoulders within the existing footprint.                             | <ul style="list-style-type: none"> <li>• Minimization of soil compaction</li> <li>• Maintenance of Erosion Control and any PCSM BMPs</li> <li>• Restoration and stabilization of staging areas</li> </ul> |
|                         | Other                | Replace and/or repair guide rail, signs, traffic signals, and drainage systems to their original specifications; various minor safety improvements. |   |
| <b>New Construction</b> | Major Widening*      | Addition of one or more travel lanes, including acceleration and deceleration lanes, to an existing road.   | Peak Rate Control (Section 305), Volume Control (Section 304), and Stormwater Management Site Plan  |
|                         | New Alignment*       | New roadway corridor.   |   |
|                         | Interchange*         | Reconfiguration of ramps, lane modification within interchange area, etc.   |   |
|                         | Municipal Facilities | New stockpile sites, buildings, or other structures or facilities not otherwise addressed by the requirements of this section                       |   |

\* - Projects falling into the noted categories and that have the potential to discharge into surface waters that have existing or designated HQ or EV uses (including EV wetlands), have impairments due to stormwater, are connected to combined sewer systems, or have the potential to have an adverse effect on threatened or endangered species, or critical habitat for such species, are subject to additional stormwater management requirements, beyond the requirements listed in the table. The additional BMP measures that must be considered and implemented for projects occurring in these areas are as follows:

**Table IV-3**

|   |   |
|---|---|
| Constructed wetlands / Wet ponds                                      | Significant detention of peak flow rates is needed and the contributing drainage area is large; retrofit existing detention basins are feasible.  |
| Permeable pavement  | Parking lots only.  |
| Manufactured products: Subsurface storage, water quality inlets, etc. | Subsurface storage products are designed to attenuate peak runoff events through infiltration and/or discharge rate reduction. Storm sewer inlet structures or inserts are designed to minimize the discharge of solids, floatables, and oil/grease pollutants. Regular maintenance of these products is necessary. |

Projects occurring in the areas listed above and not previously bound to such requirements (roadway restoration projects), are also required to achieve the following targeted outcomes:

1. For project areas within a release rate district, reduce the post-construction runoff peak rate as required by the release rate district in this Ordinance. For project areas not within a release rate district, reduce the post-construction runoff peak rate to the pre-construction peak rate for the 1-year through 100-year storm events.
2. Reduce the post-construction runoff volume to the pre-construction runoff volume for the 2-year 24-hour storm event and smaller.

## SECTION V NPDES REGULATIONS

New Federal regulations approved October 1999 require operators of small municipal separate storm sewer systems (MS4s) to obtain NPDES (National Pollutant Discharge Elimination System Phase II Stormwater Permitting Regulations.) Phase II permits from DEP March 2003. This program affects all municipalities in “urbanized areas” of the State. Therefore, all urbanized municipalities within Elk County will be subject to the NPDES Phase II requirements, mandated by the Federal Clean Water Act as administered by DEP. For more information on NPDES II requirements, contact the DEP Regional Office.

No municipalities in Elk County are included in an Urbanized Area (UA) as designated by the U.S. Census 2000. Therefore, no municipalities are required to comply with the National Pollutant Discharge Elimination System (NPDES) Phase II requirements for operators of municipal separate storm sewer systems (MS4s).

## **SECTION VI IMPLEMENTATION**

All municipalities are encouraged to enact and implement the model ordinance in this plan to meet the requirements in Section 11 of Act 167.

County adoption of the Plan is expected to occur in June 2010. Once this occurs, the Plan will be sent to DEP to be approved. All twelve (12) of the municipalities within Elk County will be required to adopt the model ordinance provisions within six (6) months of DEP approval.