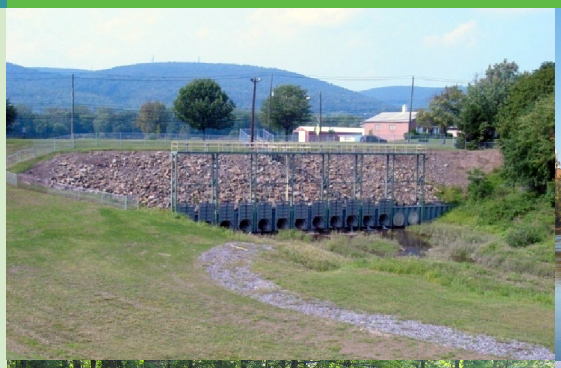
BI-COUNTY HAZARD MITIGATION PLAN
FOR LACKAWANNA & LUZERNE COUNTIES, PA




Lackawanna County

County of Luzerne
Pennsylvania
Established 1786

Prepared For:

Lackawanna County Planning Commission
Luzerne County Planning Commission
Lackawanna County Emergency Management Agency
Luzerne County Emergency Management Agency

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October 2009

ACKNOWLEDGEMENTS

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INSTRUCTIONS FOR USING THE PLAN REVIEW CROSSWALK FOR REVIEW OF LOCAL MITIGATION PLANS

Attached is a Plan Review Crosswalk based on the ***Local Multi-Hazard Mitigation Planning Guidance***, published by FEMA in July, 2008. This Plan Review Crosswalk is consistent with the *Robert T. Stafford Disaster Relief and Emergency Assistance Act* (Stafford Act), as amended by Section 322 of the *Disaster Mitigation Act of 2000* (P.L. 106-390), the *National Flood Insurance Act of 1968,* as amended by the *National Flood Insurance Reform Act of 2004* (P.L. 108-264) and *44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning,* inclusive of all amendments through October 31, 2007.

SCORING SYSTEM
N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.
S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

When reviewing single jurisdiction plans, reviewers may want to put an N/A in the boxes for multi-jurisdictional plan requirements. When reviewing multi-jurisdictional plans, however, all elements apply. States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements. Optional matrices for assisting in the review of sections on profiling hazards, assessing vulnerability, and identifying and analyzing mitigation actions are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.:

Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	Section II, pp. 4-10	The plan describes the types of assets that are located within geographically defined hazard areas as well as those that would be affected by winter storms.		
B. Does the **new or updated** plan address the **impact** of each hazard on the jurisdiction?	Section II, pp. 10-20	The plan does not address the impact of two of the five hazards addressed in the plan. **Required Revisions:** • Include a description of the impact of floods and earthquakes on the assets. **Recommended Revisions:** This information can be presented in terms of dollar value or percentages of damage.		
		SUMMARY SCORE		

LOCAL MITIGATION PLAN REVIEW SUMMARY

The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

Prerequisite(s) (Check Applicable Box)	**NOT MET**	**MET**
1. Adoption by the Local Governing Body: §201.6(c)(5) OR		
2. Multi-Jurisdictional Plan Adoption: §201.6(c)(5) **AND**		
3. Multi-Jurisdictional Planning Participation: §201.6(a)(3)		

Planning Process	**N**	**S**
4. Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)		

Risk Assessment	**N**	**S**
5. Identifying Hazards: §201.6(c)(2)(i)		
6. Profiling Hazards: §201.6(c)(2)(i)		
7. Assessing Vulnerability: Overview: §201.6(c)(2)(ii)		
8. Assessing Vulnerability: Addressing Repetitive Loss Properties. §201.6(c)(2)(ii)		
9. Assessing Vulnerability: Identifying Structures, Infrastructure, and Critical Facilities: §201.6(c)(2)(ii)(B)		
10. Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)		
11. Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)		
12. Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii)		

*States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Mitigation Strategy	**N**	**S**
13. Local Hazard Mitigation Goals: §201.6(c)(3)(i)		
14. Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)		
15. Identification and Analysis of Mitigation Actions: NFIP Compliance. §201.6(c)(3)(ii)		
16. Implementation of Mitigation Actions: §201.6(c)(3)(iii)		
17. Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)		

Plan Maintenance Process	**N**	**S**
18. Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(ii)		
19. Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)		
20. Continued Public Involvement: §201.6(c)(4)(iii)		

Additional State Requirements*	**N**	**S**
Insert State Requirement		
Insert State Requirement		
Insert State Requirement		

LOCAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	
See Reviewer's Comments	
PLAN APPROVED	

LOCAL MITIGATION PLAN REVIEW CROSSWALK

Local Mitigation Plan Review and Approval Status

Jurisdiction: Luzerne and Lackawanna Counties, Pennsylvania	**Title of Plan: Bi-County Hazard Mitigation Plan – Lackawanna and Luzerne Counties, PA**	**Date of Plan: June 2009**
Local Point of Contact: Adrian Merolli	**Address:** **Penn Place** **20 N. Pennsylvania Avenue** **Wilkes-Barre** **Pennsylvania 18711**	
Title: Director		
Agency: Luzerne County Planning Commission		
Phone Number: (570)825-1560	**E-Mail: Adrian.Merolli@luzernecounty.org**	

State Reviewer:	**Title:**	**Date:**

FEMA Reviewer:	**Title:** **Date:**
Date Received in FEMA Region [Insert #]	
Plan Not Approved	
Plan Approved	
Date Approved	

Jurisdiction:	**DFIRM**		**NFIP Status***			
	In Plan	**NOT in Plan**	**Y**	**N**	**N/A**	**CRS Class**
1. Luzerne County		Not Available	All except Slocum Township			Only 1 municipality (Wilkes Barre Class 7))
2.Lackawanna County		Not Available	All Municipalities			None
3.						
4.						

5. [ATTACH PAGE(S) WITH ADDITIONAL JURISDICTIONS]						

*** Note s:** **Y = Participating** **N = Not Participating** **N/A = Not Mapped**

Effective Map Date by Municipality – Lackawanna and Luzerne Counties

Lackwanna County		Luzerne County		Luzerne County (continued)	
Community Name	Curr Eff Map Date	Community Name	Curr Eff Map Date	Community Name	Curr Eff Map Date
Abington Township	9/30/1981	Ashley Borough	9/30/1980	Larksville Borough	4/1/1977
Archbald Borough	1/16/1980	Avoca Borough	9/30/1980	Laurel Run Borough	09/01/87(L)
Benton Township	06/01/86(L)	Bear Creek Village Borough	1/1/1950	Lehman Township	12/2/1980
Blakely Borough	1/16/1980	Bear Creek Township	9/29/1978	Luzerne Borough	4/15/1977
Carbondale City	12/16/1980	Black Creek Township	9/3/1980	Nanticoke City	4/15/1977
Carbondale Township	9/30/1981	Buck Township	4/15/1981	Nescopeck Borough	2/1/1980
Clarks Green Borough	06/25/76(M)	Butler Township	12/16/1980	Nescopeck Township	8/1/1980
Clarks Summit Borough	1/7/2000	Conygham Borough	7/16/1980	New Columbus Borough	3/16/1981
Clifton Township	2/2/1990	Conygham Township	2/16/1977	Newport Township	12/02/80(M)
Covington Township	09/01/86(L)	Courtdale Borough	01/20/82(M)	Nuangola Borough	01/20/82(M)
Dalton Borough	11/1/1978	Dallas Borough	1/2/1981	Penn Lake Park Borough	12/05/80(M)
Dickson City Borough	1/16/1980	Dallas Township	04/01/88(L)	Pittston City	5/2/1977
Dunmore Borough	9/28/1979	Dennison Township	4/15/1981	Pittston Township	6/15/1981
Elmhurst Township	2/2/1990	Dorrance Township	8/15/1980	Plains Township	4/6/1998
Fell Township	9/30/1981	Dupont Borough	6/15/1981	Plymouth Borough	4/1/1977
Glenburn Township	11/2/1990	Duryea Borough	6/18/1980	Plymouth Township	4/15/1977
Greenfield Township	7/16/1990	Edwardsville Borough	4/15/1977	Pringle Borough	5/2/1977
Jefferson Township	06/01/86(L)	Exeter Borough	5/16/1977	Rice Township	1/2/1981
Jermyn Borough	12/18/1979	Exeter Township	9/15/1983	Ross Township	4/15/1981
Jessup Borough	4/15/1980	Fairmount Township	4/1/1981	Salem Township	3/18/1980
La Plume Township	09/03/82(M)	Fairview Township	01/20/82(M)	Shickshinny Borough	12/31/1976
Madison Township	06/01/86(L)	Forty Fort Borough	7/3/1981	Sugar Notch Borough	(NSFHA)
Mayfield Borough	9/30/1981	Foster Township	4/1/1981	Sugarload Township	7/2/1980
Moosic Borough	11/1/1979	Franklin township	5/19/1981	Swoyersville Borough	11/5/1982
Moscow Borough	12/1/1981	Freeland Borough	(NSFHA)	Union Township	9/30/1980
Newton Township	7/3/1990	Hanover Township	1/2/1981	Warrior Run Borough	06/25/76(M)
North Abington Township	01/16/81(M)	Harveys Lake Borough	12/02/80(M)	West Hazelton Borough	(NSFHA)

Old Forge Borough	10/16/1979	Hazle Township	4/1/1981	West Pittston Borough	4/15/1977
Olyphant Borough	9/28/1979	City of Hazelton	(NSFHA)	West Wyoming Borough	9/15/1983
Ransom Township	4/15/1980	Hollenback Township	9/17/1980	White Haven Borough	4/15/1981
Roaring Brook Township	9/28/1979	Hughestown Borough	(NSFHA)	Wilkes-Barre City	3/16/1992
Scott Township	5/17/1990	Hunlock Township	4/1/1980	Wilkes-Barre Township	12/02/80(M)
Scranton City	8/15/1980	Huntington Township	4/15/1981	Wright Township	1/16/1981
South Abington Township	12/15/1982	Jackson Township	9/17/1980	Wyoming Borough	7/3/1981
Springbrook Township	01/20/82(M)	Jeddo Borough	(NSFHA)	Yatesville Borough	(NSFHA)
Taylor Borough	8/15/1980	Jenkins Township	5/16/1977		
Thornhurst Township	6/15/1981	Kingston Borough	6/1/1977		
Throop Borough	9/28/1979	Kingston Township	3/12/1982		
Vandling Borough	09/01/86(L)	Laflin Borough	12/02/80(M)		
West Abington Township	01/20/82(M)	Lake Township	9/3/1980		

Source: FEMA Community Status Book Report, 05/26/08;
NSFHA - No special flood hazard area - all zone C;
M - No elevation determined. All zone A, C, and X; L - Original FIRM by letter. All zone A, C, and X

LOCAL MITIGATION PLAN REVIEW CROSSWALK

PREREQUISITE(S)

1. Adoption by the Local Governing Body

***Requirement §201.6(c)(5)*:** *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the local governing body adopted **new or updated** plan?	Pending upon PEMA/FEMA approval			
B. Is supporting documentation, such as a resolution, included?	Pending upon PEMA/FEMA approval			
		SUMMARY SCORE		

2. Multi-Jurisdictional Plan Adoption

***Requirement §201.6(c)(5)*:** *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **new or updated** plan indicate the specific jurisdictions represented in the plan?	Chapter 2 Pages 15-17 Tables 2.2&2.3			
B. For each jurisdiction, has the local governing body adopted the **new or updated** plan?	Pending upon adopting of plan by county commission			
C. Is supporting documentation, such as a resolution, included for each participating jurisdiction?	Pending upon adopting of plan by county commission			
		SUMMARY SCORE		

3. Multi-Jurisdictional Planning Participation

***Requirement §201.6(a)(3)*:** *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multi-jurisdictional plans.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET

LOCAL MITIGATION PLAN REVIEW CROSSWALK

A. Does the **new or updated** plan describe **how** each jurisdiction participated in the plan's development?	Chapter 2 Pages 12-18			
B. Does the updated plan identify all participating jurisdictions, including new, continuing, and the jurisdictions that no longer participate in the plan?	N/A			
		SUMMARY SCORE		

PLANNING PROCESS: *§201.6(b): An open public involvement process is essential to the development of an effective plan.*

4. Documentation of the Planning Process

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the plan provide a narrative description of the process followed to prepare the **new or updated** plan?	Chapter 2 Pages 11-12			
B. Does the **new or updated** plan indicate who was involved in the **current** planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, *etc*.?)	Chapter 2 Page 12			
C. Does the **new or updated** plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)	Chapter 2 Pages 18-20			
D. **Does the new or updated plan discuss the** opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?	Chapter 2 Page 19			
E. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?	Chapter 2 Pages 20-39			

LOCAL MITIGATION PLAN REVIEW CROSSWALK

4. Documentation of the Planning Process

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

			SCORE	
F. Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?	N/A			
		SUMMARY SCORE		

RISK ASSESSMENT: *§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

5. Identifying Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE N	SCORE S
A. Does the **new or updated** plan include **a description** of the types of **all natural hazards** that affect the jurisdiction?	Chapter 3 Pages 41-48			
		SUMMARY SCORE		

6. Profiling Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (*i.e.*, geographic area affected) of each natural hazard	Chapter 3 Pages 50-65			

addressed in the **new or updated** plan?				
B. Does the risk assessment identify the **extent** (*i.e.*, magnitude or severity) of each hazard addressed in the **new or updated** plan?	Chapter 3 Pages 50-65			
C. Does the plan provide information on **previous occurrences** of each hazard addressed in the **new or updated** plan?	Chapter 3 Pages 50-65			
D. Does the plan include the **probability of future events** (*i.e.*, chance of occurrence) for each hazard addressed in the **new or updated** plan?	Chapter 3 Pages 50-65			
		SUMMARY SCORE		

7. Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	Chapter 4 Pages 69-70			
B. Does the **new or updated** plan address the **impact** of each hazard on the jurisdiction?	Chapter 4 Pages 74-99			
		SUMMARY SCORE		

8. Assessing Vulnerability: Addressing Repetitive Loss Properties

Requirement §201.6(c)(2)(ii): *[The risk assessment] **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe vulnerability in terms of the types and numbers of *repetitive loss properties* located in the identified hazard areas?	Chapter 4 Pages 72-73 & Mapping Section	***Note: This requirement becomes effective for all local plans approved after October 1, 2008.***		
		SUMMARY SCORE		

9. Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): *The plan **should** describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area … .*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Chapter 4 Pages 74-99	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
B. Does the **new or updated** plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Chapter 4 Pages 74-99	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

10. Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate … .*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan estimate **potential dollar losses** to vulnerable structures?	Chapter 4 Pages 74-99	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
B. Does the **new or updated** plan describe the **methodology** used to prepare the estimate?	Chapter 4 Pages 74-99	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

11. Assessing Vulnerability: Analyzing Development Trends

Requirement §201.6(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe land uses and development trends?	Chapter 4 Pages 99-100	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

12. Multi-Jurisdictional Risk Assessment

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	Chapter 4 Pages 74-99			
		SUMMARY SCORE		

MITIGATION STRATEGY: *§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

13. Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the **new or updated** plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?	Chapter 4 Pages 121-124			
		SUMMARY SCORE		

14. Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	Chapter 5 Pages 126-132 Tables 5.2&5.3; Pages 144-155 Tables 5.9 &5.10			
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	Chapter 5 Pages 126-132 Tables 5.2&5.3; Pages 144-155 Tables 5.9 &5.10			
C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	Chapter 5 Pages 126-132 Tables 5.2&5.3; Pages 144-155 Tables 5.9 &5.10			
		SUMMARY SCORE		

15. Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Requirement: §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe the jurisdiction (s) participation in the NFIP?	Chapter 5 Page 140 Table 5.6	***Note: This requirement becomes effective for all local mitigation plans approved after October 1, 2008.***		
B. Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?	Chapter 5 Pages 126-132 Tables 5.1&5.2 *Actions in gray address NFIP and continued compliance Page 140	***Note: This requirement becomes effective for all local mitigation plans approved after October 1, 2008.***		
		SUMMARY SCORE		

16. Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE	
			N	**S**
A. Does the **new or updated** mitigation strategy include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	Chapter 5 Pages 133-139			
B. Does the **new or updated** mitigation strategy address how the actions will be implemented and administered, including the responsible department , existing and potential resources and the timeframe to complete each action?	Chapter 5 Pages 126-132			
C. Does the **new or updated** prioritization process include an emphasis on the use of a **cost-benefit review** to maximize benefits?	Chapter 6 Page 158			
D. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	N/A			
		SUMMARY SCORE		

17. Multi-Jurisdictional Mitigation Actions

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the **new or updated** plan include identifiable **action items** for each jurisdiction requesting FEMA approval of the plan?	Chapter 6 Pages 144-155			
B. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	N/A			
		SUMMARY SCORE		

PLAN MAINTENANCE PROCESS

18. Monitoring, Evaluating, and Updating the Plan

Requirement §201.6(c)(4)(i): *[The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the method and schedule for **monitoring** the plan, including the responsible department?	Chapter 6 Page 157			
B. Does the **new or updated** plan describe the method and schedule for **evaluating** the plan, including how, when and by whom (*i.e.* the responsible department)?	Chapter 6 Page 157			
C. Does the **new or updated** plan describe the method and schedule for **updating** the plan within the five-year cycle?	Chapter 6 Page157			
		SUMMARY SCORE		

19. Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): *[The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?	Chapter 6 Page158			
B. Does the **new or updated** plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	Chapter 6 Pages 158-160			
C. Does the **updated** plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	N/A			
		SUMMARY SCORE		

Continued Public Involvement

Requirement §201.6(c)(4)(iii): *[The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Chapter 6 Page 158			
		SUMMARY SCORE		

MATRIX A: PROFILING HAZARDS

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the jurisdiction. **Completing the matrix is not required**.

Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each** applicable **hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Location		B. Extent		C. Previous Occurrences		D. Probability of Future Events	
	Yes	N	S	N	S	N	S	N	S
Avalanche	☐	☐	☐	☐	☐	☐	☐	☐	☐
Coastal Erosion	☐	☐	☐	☐	☐	☐	☐	☐	☐
Coastal Storm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dam Failure	☐	☐	☐	☐	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐	☐	☐	☐	☐
Expansive Soils	☐	☐	☐	☐	☐	☐	☐	☐	☐
Levee Failure	☐	☐	☐	☐	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hailstorm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hurricane	☐	☐	☐	☐	☐	☐	☐	☐	☐
Land Subsidence	☐	☐	☐	☐	☐	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☐	☐	☐	☐	☐
Severe Winter Storm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tornado	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐	☐	☐	☐	☐
Volcano	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐	☐	☐	☐	☐
Windstorm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐	☐	☐

To check boxes, double click on the box and change the default value to "checked."

Legend:

§201.6(c)(2)(i) Profiling Hazards
A. Does the risk assessment identify the location (*i.e.*, geographic area affected) of each hazard addressed in the **new or updated** plan?
B. Does the risk assessment identify the extent (*i.e.*, magnitude or severity) of each hazard addressed in the **new or updated** plan?
C. Does the plan provide information on previous occurrences of each natural hazard addressed in the **new or updated** plan?
D. Does the plan include the probability of future events (*i.e.*, chance of occurrence) for each hazard addressed in the plan?

MATRIX B: ASSESSING VULNERABILITY

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that the new or updated plan addresses each requirement. **Completing the matrix is not required**.

*Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk. Note: Receiving an N in the shaded columns will not preclude the plan from passing.*

To check boxes, double click on the box and change the default value to "checked."

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	§201.6(c)(2)(ii) Assessing Vulnerability: Overview					§201.6(c)(2)(ii) Assessing Vulnerability: Identifying Structures				§201.6(c)(2)(ii) Assessing Vulnerability: Estimating Potential Losses							
		A. Overall Summary Description of Vulnerability		B. Hazard Impact			A. Types and Number of Existing Structures in Hazard Area (Estimate)		B. Types and Number of Future Structures in Hazard Area (Estimate)		A. Loss Estimate		B. Methodology					
	Yes	N	S	N	S		N	S	N	S	N	S	N	S				
Avalanche	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Coastal Erosion	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Coastal Storm	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Dam Failure	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Drought	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Earthquake	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Expansive Soils	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Levee Failure	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Flood	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Hailstorm	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Hurricane	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Land Subsidence	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Landslide	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Severe Winter Storm	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Tornado	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Tsunami	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Volcano	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Wildfire	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Windstorm	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Other _____	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Other _____	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				
Other _____	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐				

Legend:

§201.6(c)(2)(ii) Assessing Vulnerability: Overview

A. Does the **new or updated** plan include an overall summary description of the jurisdiction's vulnerability to each hazard?

B. Does the **new or updated** plan address the impact of each hazard on the jurisdiction?

§201.6(c)(2)(ii)(A) Assessing Vulnerability: Identifying Structures

A. Does the **new or updated** plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?

B. Does the **new or updated** plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

§201.6(c)(2)(ii)(B) Assessing Vulnerability: Estimating Potential Losses

A. Does the **new or updated** plan estimate potential dollar losses to vulnerable structures?

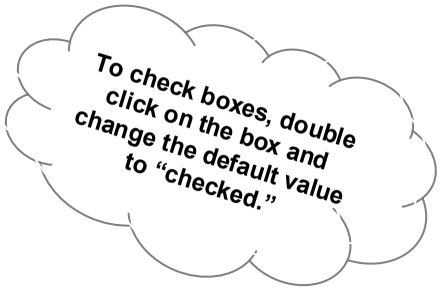
B. Does the **new or updated** plan describe the methodology used to prepare the estimate?

MATRIX C: IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure consideration of a range of actions for each hazard. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An "N" for any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Comprehensive Range of Actions and Projects	
	Yes	N	S
Avalanche	☐	☐	☐
Coastal Erosion	☐	☐	☐
Coastal Storm	☐	☐	☐
Dam Failure	☐	☐	☐
Drought	☐	☐	☐
Earthquake	☐	☐	☐
Expansive Soils	☐	☐	☐
Levee Failure	☐	☐	☐
Flood	☐	☐	☐
Hailstorm	☐	☐	☐
Hurricane	☐	☐	☐
Land Subsidence	☐	☐	☐
Landslide	☐	☐	☐
Severe Winter Storm	☐	☐	☐
Tornado	☐	☐	☐
Tsunami	☐	☐	☐
Volcano	☐	☐	☐
Wildfire	☐	☐	☐
Windstorm	☐	☐	☐
Other _____	☐	☐	☐
Other _____	☐	☐	☐
Other _____	☐	☐	☐



Legend:
§201.6(c)(3)(ii) Identification and Analysis of Mitigation Actions
A. Does the **new or updated** plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?

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LIST OF MAPS

List of Tables

Please note that the official title of this document is
Bi-County Hazard Mitigation Plan for Lackawanna and Luzerne Counties, PA.
Throughout this document it may also be referred to as The Plan or The Joint County Plan.

1. Adoption by the Local Governing Body

Requirement §201.6(c)(5)**:** *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).*

2. Multi-Jurisdictional Plan Adoption

Requirement §201.6(c)(5)**:** *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan* ***must*** *document that it has been formally adopted.*

Chapter 1 – INTRODUCTION

A. Overview of Hazard Mitigation

Hazard Mitigation is defined by the Federal Emergency Management Agency (FEMA) as any "sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects". The hazard mitigation planning process involves identifying risks and developing appropriate actions to reduce injuries, deaths, property damage, economic losses, and degradation of natural resources due to natural and human-caused disasters. Hazard mitigation is considered one of four phases in emergency management activities. **Figure 1.1** indicates that the other phases in emergency management include preparedness, response, and recovery.

Figure 1.1: Phases in Emergency Management

- Preparedness activities involve planning and preparing for when a disaster strikes and include response capability actions to ensure an effective and efficient use of resources and efforts to minimize damage.

- Mitigation activities involve actions that reduce or eliminate the probability of an occurrence or reduce the impact of a disaster. The goal of the mitigation phase is to decrease the need for a response.

- Response activities involve providing emergency assistance to victims and minimizing property loss. The response phase begins during or immediately after the onset of a disaster.

- The Recovery phase includes short and long term activities that help return individuals and communities to normalcy as soon as possible. Recovery actions involve clean-up efforts, temporary housing, and replacement of infrastructure.

1. Hazard Mitigation Planning Acts and Regulations

This Hazard Mitigation Plan for Lackawanna and Luzerne Counties is based on *the Stafford Act; the Disaster Mitigation Act of 2000; and the 44 Code of Federal Regulations Part 201.6.*

The *Stafford Act* was enacted to support state and local governments and their citizens in the event of a disaster. This Act establishes a process for states and local governments to request federal assistance, defines the type and scope of the assistance available, and lays down the conditions to obtain the assistance. Sections 203 and 322 of the Stafford Act have the most significant amendments pertaining to local and state governments. Section 203 requires local jurisdictions to have a state and federally approved mitigation plan in place in order to be eligible for Pre-Disaster Mitigation (PDM) Grant funds and Hazard Mitigation Grant Program (HMGP) funds. Section 322 requires local governments to develop and submit mitigation plans as a condition to obtain funding.

The *Disaster Mitigation Act of 2000* (DMA 2000) that came into effect in October of 2000 is an amendment to the Stafford Act to emphasize the importance of pre-disaster mitigation planning at the local level. DMA 2000 underscores the concept of sustainability for disaster resistance and encourages and rewards state and local pre-disaster planning. Its ultimate goal is to assist state and local governments to better articulate needs for mitigation and secure funding to implement effective risk reduction projects.

44 Code of Federal Regulations Part 201.6: The Code of Federal Regulations (CFR) focuses on natural hazards and emphasizes an opportunity for public comment and involvement in the mitigation plan development process. The CFR requires that each jurisdiction within the study area participate in the planning process and adopt the plan.

2. Hazard Mitigation Planning Principles

FEMA has developed 10 fundamental principles for hazard mitigation plans that have been taken into consideration during the development of this Bi-County Hazard Mitigation Plan. They include the following:

1. Risk reduction measures should ensure long-term economic success for the community as a whole rather than address short-term benefits for special interests.
2. Risk reduction measures for one natural hazard must be compatible with risk reduction measures for other natural hazards.
3. Risk reduction measures must be evaluated to achieve the best mix for a given location.
4. Risk reduction measures for natural hazards must be compatible with risk reduction measures for technological hazards and vice versa.
5. All mitigation is local.
6. Disaster costs and the impacts of natural hazards can be reduced by emphasizing pro-active mitigation before emergency response; both pre-disaster (preventive) and post-disaster (corrective) mitigation are needed.
7. Hazard identification and risk assessment are the cornerstones of mitigation.
8. Building new federal-state-local partnerships and public-private partnerships is the most effective means of implementing measures to reduce the impacts of natural hazards.
9. Those who knowingly choose to assume greater risk must accept responsibility for that choice.
10. Risk reduction measures for natural hazards must be compatible with the protection of natural and cultural resources.

B. Scope

In October of 2007, governments of Lackawanna and Luzerne Counties contracted the McCormick Taylor Team (comprised of McCormick Taylor, Vision Planning and Consulting, and Borton-Lawson) to develop the Bi-County Hazard Mitigation Plan for Lackawanna and Luzerne Counties in compliance with the requirements of DMA 2000. The Bi-County Plan was funded by pre-disaster mitigation funds from FEMA and administered by the Pennsylvania Emergency Management Agency (PEMA). The Plan is a regional multi-jurisdictional plan that covers the two counties and their 116 jurisdictions (40 municipalities in Lackawanna County and 76 municipalities in Luzerne County).

It must be noted that future funding for mitigation projects will be contingent upon having each jurisdiction in both counties adopt the plan after Lackawanna and Luzerne Counties adopt their plans. Any jurisdiction that does not adopt the plan will become ineligible for pre- and post-disaster mitigation funds.

C. Organization of the Plan

The Bi-County Hazard Mitigation Plan comprises six chapters. The Prerequisites of the Plan, including letters of adoption by Lackawanna and Luzerne County Commissions and of the individual municipalities in both counties, can be found prior to this Introduction chapter, immediately following the Table of Contents. Chapter 1 provides an introduction to hazard mitigation and an overview of the socioeconomic and demographic characteristics of the two counties. Chapter 2 documents the planning process and includes a review of existing plans and ordinances from the counties and municipalities. Chapters 3 and 4 comprise the hazard identification and risk assessment and provide an in-depth look at the potential losses from various hazards experienced by the two counties. Chapter 3 includes a historical profile of hazard types and associated losses, and Chapter 4 includes a vulnerability assessment which analyzes the potential for future damages due to the hazards identified in Chapter 3. Chapter 5 discusses the mitigation strategy including mitigation goals and objectives, identification of mitigation actions, and the method for prioritization and implementation of mitigation actions. Chapter 6 outlines how Lackawanna and Luzerne Counties and their municipalities will implement the Plan once it is adopted and addresses ways to monitor progress and ensure continued public involvement.

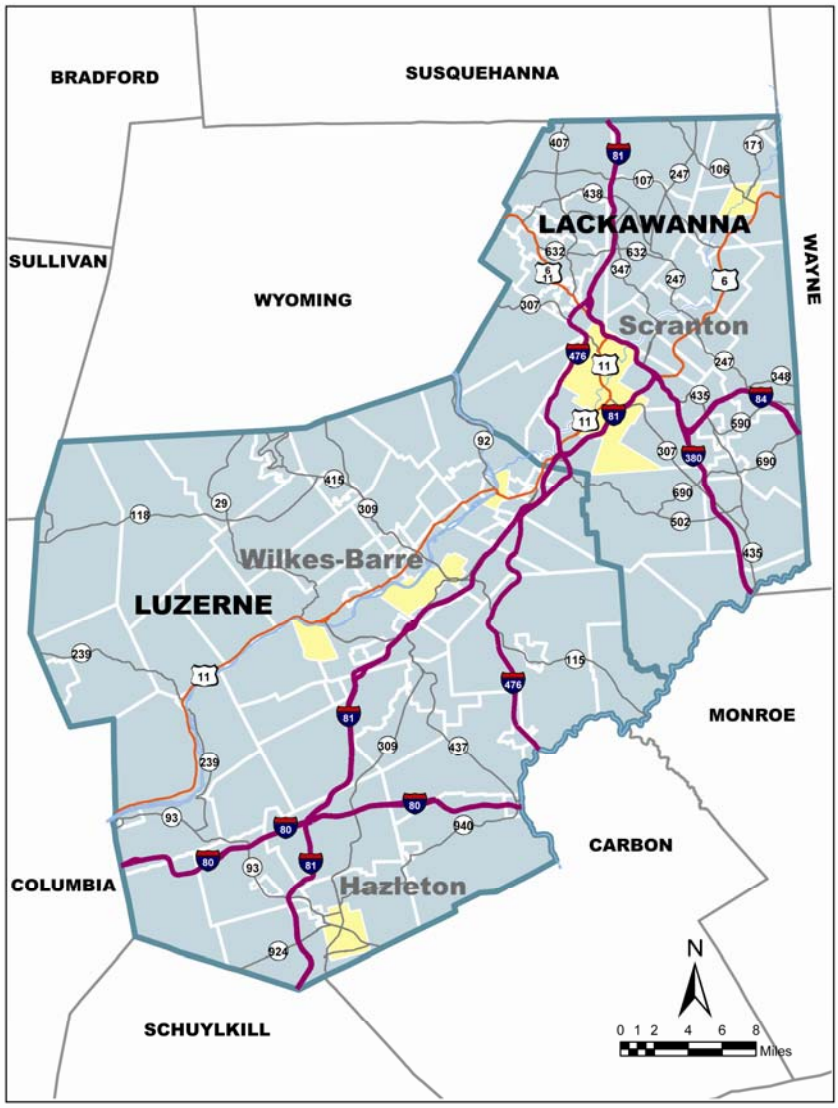
D. Community Profile

1. Location

Lackawanna and Luzerne Counties are located in the northeastern region of Pennsylvania. Lackawanna County consists of 40 municipalities (21 townships, 17 boroughs, and 2 cities) and is bordered by Susquehanna County to the north, Wayne County to the east, Monroe County to the southeast, Luzerne County to the southwest, and Wyoming County to the west. Luzerne County consists of 76 municipalities (36 townships, 36 boroughs, and 4 cities) and is bordered by Wyoming County to the north, Lackawanna County to the northeast, a small portion of Monroe County to the east, Carbon County to the southeast, Schuylkill County to the south, Columbia County to the west, and Sullivan County to the northwest (see **Figure 1.2**).

Three rivers flow through Lackawanna and Luzerne Counties. The Susquehanna River runs for approximately 44 miles in a southwest direction through Luzerne County. The Lackawanna River runs for about 31 miles in a southwest direction through Lackawanna County and continues for approximately 2.5 miles through Luzerne County before its confluence with the Susquehanna River near the City of Pittston. The Lehigh River flows in a southwest direction for approximately 14 miles along the southern border of Lackawanna County and continues for about 22 miles along a portion of Luzerne County's eastern border.

Figure 1.2: Project Location and Major Transportation Routes



2. Transportation

Major traffic routes that traverse Lackawanna County include Interstates 81, 84, 380, and 476 and U.S. Routes 6 and 11. Interstate 81 runs in a north-south direction for approximately 30 miles, while Interstate 84 runs in an east-west direction for about 15 miles through the southeastern portion of the county. Interstate 380 runs for approximately 11 miles through the southeastern portion of the county. Interstate 476 runs in a north-south direction for about 13

miles and terminates at the intersection of Routes 6, 11, and 81 in Clarks Summit Borough. U.S. Route 6 runs in a northwest-southeast direction for approximately 10 miles and U.S. Route 11 runs in a northeast-southwest direction for about 16 miles through the county. Major State Routes that traverse Lackawanna County include SR106, SR107, SR247, SR307, SR347, SR407, SR435, SR438, SR502, and SR690.

The major traffic routes in Luzerne County include Interstates 80, 81, and 476 and U.S. Route 11. Interstate 80 runs in an east-west direction for approximately 25 miles through the southern portion of Luzerne County. Interstate 81 runs in a north-south direction for about 38 miles through the county. Interstate 476, also known as the Northeast Extension of the Pennsylvania Turnpike, runs for approximately 20 miles through the eastern portion of Luzerne County. U.S. Route 11 runs for about 36 miles through the county and mainly follows the Susquehanna River. Major State Routes that traverse Luzerne County include SR29, SR92, SR93, SR115, SR118, SR239, SR309, SR315, and SR940 (see **Figure 1.2**).

3. Climate

The Bi-County area experiences an average annual temperature of about 49 degrees Fahrenheit and an average annual precipitation of approximately 36 inches. During the winter months (December through February), the average temperature is around 27º F, and the average precipitation is about 6.7 inches in which fluctuations during dry and wet years are not noticeably extreme. Spring months (March through May) bring moderate average temperatures of 48º F and precipitation levels of 9.4 inches. Average summer (June through August) temperatures are 70º F and average precipitation values are about 10.6 inches. As the year enters the fall season (September through November), moderate temperatures and precipitation levels are prevalent. The average temperature is 52º F and the average precipitation is 9.7 inches.

E. Demographic Profile

The demographics of a community – population, labor force, employment, and housing – are a reflection of how a community has evolved in the past and have a direct bearing on how and where a community wants to develop in the long term. Some of Lackawanna and Luzerne Counties' demographic characteristics have been examined to provide an insight into how the community has changed over the last 40-45 years.

1. Population

The past population trends and projections as well as the employment characteristics help to better understand the socio-economic characteristics that have and will continue to shape the future of the two counties.

In 2000, Lackawanna County's population was 213,295 (1.7 percent of the State's total population). Overall, the County's population declined by 9 percent between 1960 and 2000 (see **Figure 1.3**); the largest decrease in population was from 1980 to 1990 (3.9 percent). Despite a steady decrease in population, the total housing units within Lackawanna County rose 4 percent during the 1990s (see **Table 1.1**).

In 2000, Luzerne County had a population of 319,224 (2.6 percent of State's total population). The population indicated a decrease of 9 percent between 1960 and 2000 (see **Figure 1.3**); the largest decrease in population was between 1980 and 1990 (4.4 percent). The number of housing units rose during the 1990s by 4.2 percent (see **Table 1.1**).

Figure 1.3: Total Population by County

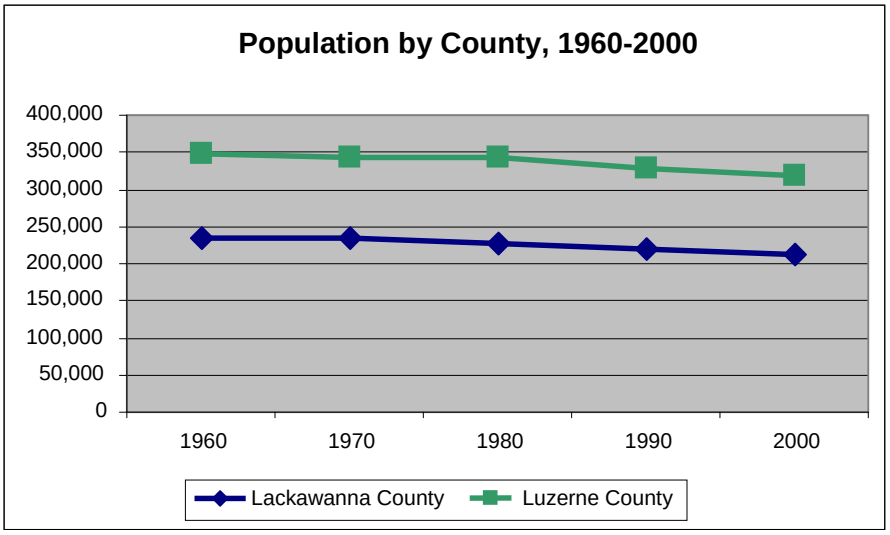


Table 1.1: Total Housing Units

Total Housing Units	1990	2000	1990-2000
Luzerne County	138,724	144,686	4.3%
Lackawanna County	91,707	95,362	4.0%
Bi-County Total	230,431	240,048	4.2%

Overall, the growth trends in Lackawanna and Luzerne Counties have mirrored one another; both have seen a steady decline in population since the 1960s with their greatest decline during the 1980s, while the State's population increased by 8.5 percent during the same time period. While the population decreased in both counties, the total number of housing units increased.

2. Employment

Employment distribution by industry in Lackawanna and Luzerne Counties are similar in nature (see **Figures 1.4** and **1.5**). Of those employed in the various industries, educational, health, and social services indicate the highest percent in both counties. Manufacturing and retail trade are the second and third largest categories in terms of employment by industry, respectively. Together, the top three industries account for over one half of all employment in both Lackawanna and Luzerne Counties. Other key industries include transportation, warehousing and utilities; finance, insurance, real estate and rentals; professional, administrative and management; and arts and entertainment.

Figure 1.4: Total Employment by Industry – Lackawanna County, 2000

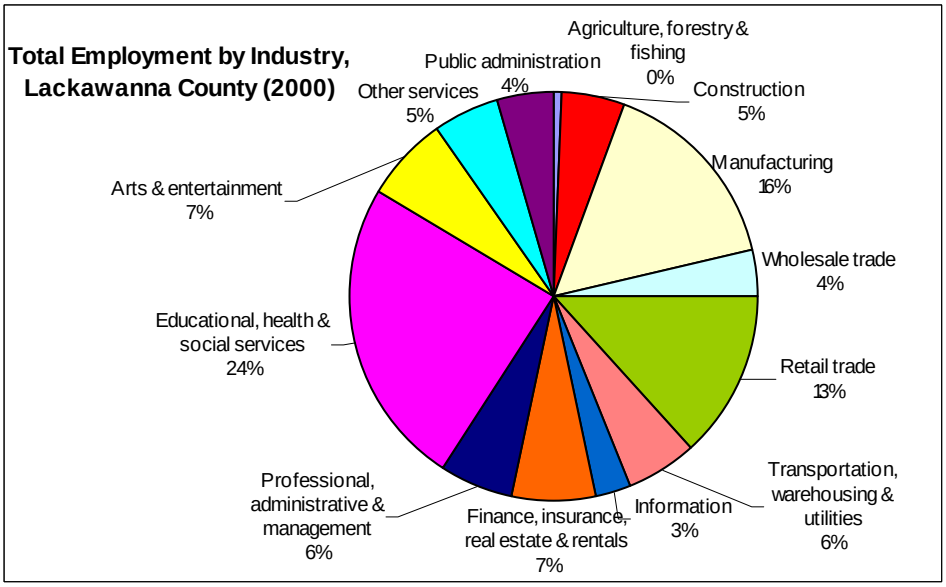
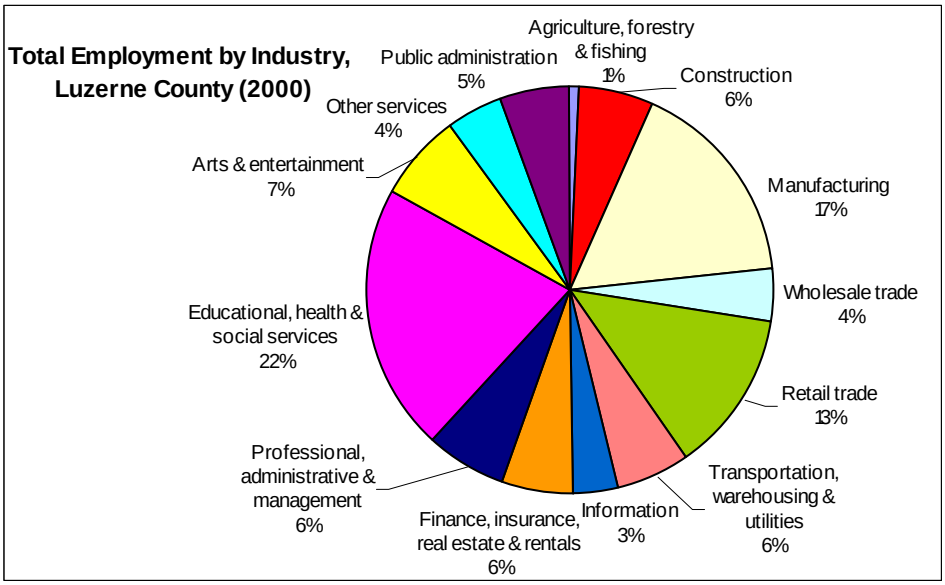


Figure 1.5: Total Employment by Industry – Luzerne County, 2000



3. Major Industries

Lackawanna County has major employers in a variety of industries, including finance; insurance and real estate; tourism; health services; plastics; electronics; printing and publishing; and information technology. The largest private employers in Lackawanna County (based on data from County Lines 2007) include the Pennsylvania State Government, Allied Services Foundation, the Scranton School District, Lackawanna County, and the Community Medical Center. Colleges and universities within the county also employ a considerable number of people. These institutions include Baptist Bible College, Johnson College, Keystone College,

Lackawanna College, Marywood University, Penn State Worthington Scranton, and the University of Scranton.

In Luzerne County, health care is the largest industry, employing 3,500 people within the Wyoming Valley Health Care System alone. Other top employers include Proctor & Gamble Paper Products Co. (2,450 employees), Keystone Automotive Group (1,425 employees), Commonwealth Telephone Operations, Inc. (1,350 employees), and PG Energy (1,269 employees).

4. Special Needs Populations

Special needs populations are critical from the standpoint of emergency management, as these groups require greater attention during hazard events via increased public information and detailed evacuation procedures to ensure that they are not isolated during a hazard event . Identifying the locations of the special needs populations is key to ensuring their safety during emergencies. Those who require special attention during a disaster include the elderly, handicapped/disabled, hospitalized, minority, single parent, poverty, and language-isolated.

Lackawanna County

The majority of the county is considered to be in the moderate income category ($51,001-$65,000) with highest median incomes ($65,001+) in the northwest. The strata of the population living below poverty level are centered in the Cities of Scranton and Carbondale. The population making less than $51,000 annually is located in the urban core of the county from Fell Township in the north to Old Forge and Moosic Boroughs in the south.

The concentrations of minority populations are evident in the City of Scranton and South Abington Township. They include African Americans, Native Americans, Asians or Pacific Islanders, Hispanics or Latinos, and Europeans. Some municipalities in the south including Springbrook, Thornhurst, Clifton, Covington, and Madison Townships also account for a larger minority population (between 150 and 200 persons). Over the past 20 years, the Abington area has seen the greatest increase in minority population.

Approximately 1,406 people (0.7 percent of the total population) speak little or no English. Of these individuals, 450 (32 percent) speak Spanish and are mainly concentrated in the City of Scranton, Carbondale, and Dunmore Borough. Municipalities with a high percentage of disabled individuals are dispersed throughout the county. The largest concentration (5 - 7.5 percent) is found in Thornhurst, Clifton, Jefferson, and LaPlume Townships; Taylor and Jermyn Boroughs; and the Cities of Scranton and Carbondale (see **Figure 1.6**).

The highest concentration of elderly persons in Lackawanna County is in Fell Township (40-45 percent of all households with a person age 65+). Other municipalities with a high percentage of households with an elderly person include Mayfield, Jessup, Olyphant, Blakely, Dickson City, Dunmore, and Old Forge Boroughs, and the Cities of Carbondale and Scranton (see **Figure 1.7**).

Figure 1.6: Disabled Population – Lackawanna County

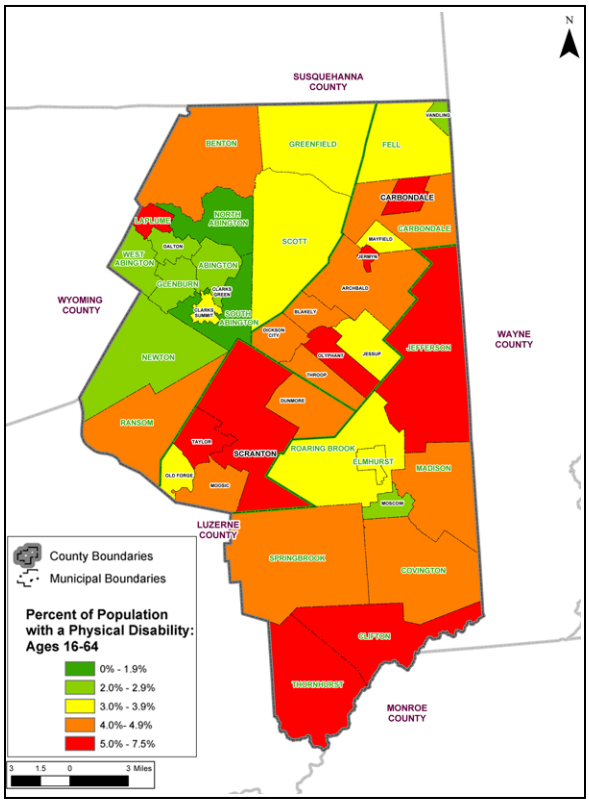
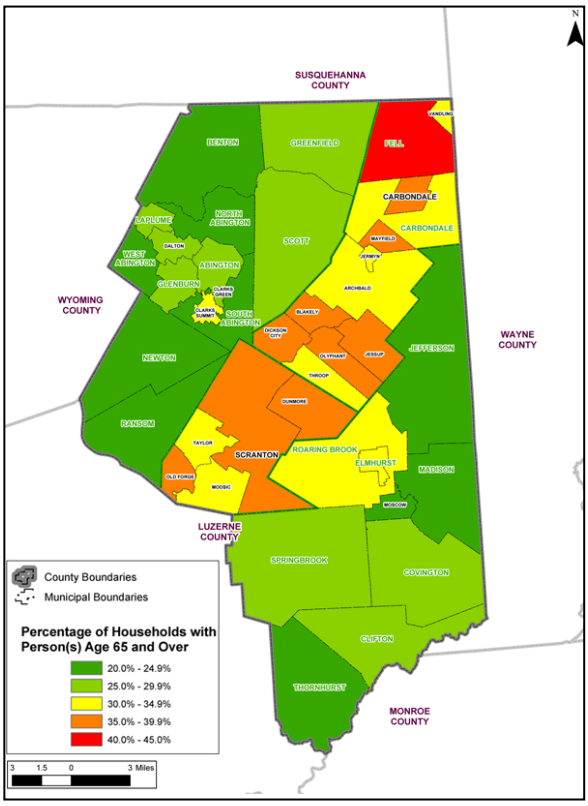


Figure 1.7: Elderly Population – Lackawanna County



Luzerne County

The lowest annual median family income range ($18,000 - $51,000) is found in and around the urban areas of the cities of Wilkes-Barre and Hazleton and Black Creek, Nescopeck, Hollenback, Conyngham, Newport, Hanover, Hunlock, and Plymouth Townships, Ashley, Sugar Notch, Warrior Run, Nanticoke, Plymouth, Larksville, Pittston, West Pittston, Exeter, Duryea, Avoca, and Dupont Boroughs. The majority of the county falls into the moderate or middle income category ($51,001- $65,000). Municipalities with the highest median income ($65,001+) include Dallas Borough, Dallas Township, Kingston Township, Luzerne Borough, Jackson Township, Laflin Borough, Rice Township, Wright Township, Fairview Township, Conyngham Borough, and Sugarloaf Township. The highest percent of individuals living below the poverty line are concentrated in the Cities of Wilkes-Barre and Hazleton.

The highest numbers of minority population reside in Jackson Township, Conyngham Township, and Newport Township followed by Wilkes-Barre, Hazleton and Wright Township. The Cities of Wilkes-Barre and Hazleton have higher than 10 percent of the population that is minority.

In Luzerne County, 1,789 people (0.6 percent of the total population) speak little or no English. Approximately 48 percent of all non-English speakers speak Spanish and reside around the City of Hazleton including Hazle Township and West Hazleton Borough. Hanover Township and West Pittston Borough also contain a non-English speaking population.

The highest concentration of population with a disability (5 - 7.5 percent) reside in Hanover, Nanticoke, and Conyngham Townships, Dupont, Pittston, Wyoming, Luzerne, Kingston, Pringle, Plymouth, Wilkes-Barre, Ashley, Shickshinny, Freeland, and West Hazleton Boroughs, and the City of Hazleton (see **Figure 1.8**).

Those municipalities that have 40 – 45 percent of their households containing an elderly person include Shickshinny, Sugar Notch, Luzerne, Wyoming, and Dupont Boroughs (see **Figure 1.9**).

Figure 1.8: Disabled Population – Luzerne County

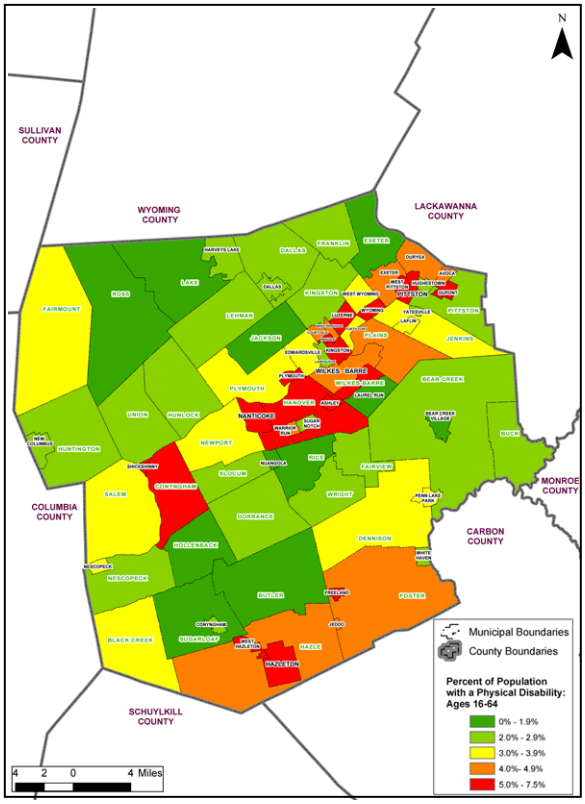
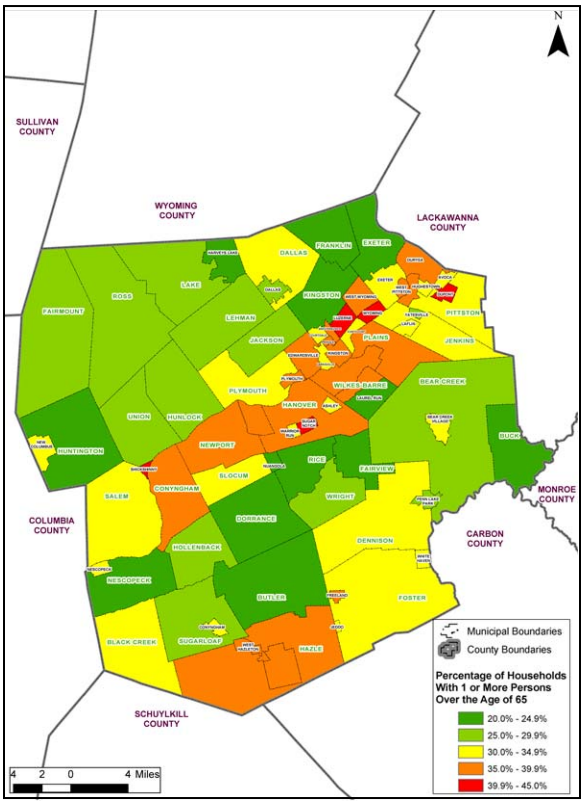


Figure 1.9: Elderly Population – Luzerne County



Within Lackawanna County, the City of Scranton accounts for a large portion of special needs individuals containing the largest concentration of non-English speaking residents, elderly individuals, and minority population. Other municipalities that contain a considerable special needs population include South Abington, Jefferson, and Fell Townships, and Jermyn Borough in the north; and Springbrook, Thornhurst, Clifton, Covington, and Madison Townships in the south.

Areas in Luzerne County that contain a high proportion of special needs individuals include the Cities of Wilkes-Barre and Hazleton; Wyoming, Luzerne, Kingston, Pringle, Black Creek, Nescopeck, Hollenback, Conyngham, Newport, Hanover, Hunlock, and Plymouth Townships; and Ashley, Sugar Notch, Warrior Run, Nanticoke, Plymouth, Larksville, Pittston, West Pittston, Exeter, Duryea, Avoca, Kingston, and Dupont Boroughs.

Chapter 2 – PLANNING PROCESS

The Bi-County Hazard Mitigation planning process was conducted over a 12-month period (December 2007 to December 2008) and comprised the following four main phases:
Phase 1 – Organize Work Group and Process: The first phase involved getting people to become interested, involved, and educated in the planning process. In order to achieve this goal, input was solicited throughout the planning process via three avenues: 1) Steering Committee Meetings; 2) Municipal Workshops; and 3) Open Houses. Each of these avenues for public involvement served its own purpose and required a different tier of involvement to ensure participation from local, county, state, and regional levels. Each of these will be discussed in detail in the next section of this chapter.

Phase 2 – Assess Hazards, Risks, Vulnerability, and Mitigation Capability: In this step, information on past hazard events that affected the two counties and their municipalities was gathered and specific hazard areas were identified. This step also involved a literature review of publications addressing historical hazard events, an internet search for data related to historic events, and an inventory and review of the existing GIS coverages and other documentation pertinent to the two counties. The hazard identification included summaries on past occurrences and the probability of future events. The vulnerability analysis identified specific areas including critical facilities that were vulnerable to hazards and included estimates of potential losses. Past and future development trends were also analyzed as part of this step. This phase also discussed land uses and development trends in the two counties and identified high hazard areas that were not suitable for future development.

The Mitigation Capability Assessment was conducted to document the roles of various departments/agencies in the two counties that develop and implement the various plans and ordinances. The purpose of the capability assessment was to identify areas for coordination and/or improvement; identify joint county initiatives; and provide a platform to integrate plans and other documents so recommendations and strategies are not in contradiction with one another. The Assessment also involved a review of sample plans and ordinances from various municipalities in the two counties and identified sections in these documents that addressed or had the potential to address hazard mitigation issues.

Phase 3 – Develop a Mitigation Plan: Based on data from the hazard, vulnerability, and capability assessments, mitigation goals were developed that were aimed at protecting the two counties from long-term vulnerability to the identified hazards. A comprehensive range of mitigation actions and projects to reduce the effects of each hazard, with emphasis on new and existing buildings and infrastructure, were developed in this step.

The Plan explored mitigation actions in the following six categories to attain the goals:

- preventive measures – e.g., zoning, floodplain, stormwater, and other ordinances
- structural projects – e.g., levees, reservoirs, channel improvements
- property protection – e.g., relocation, flood-proofing, insurance
- emergency services – e.g., warning, sandbagging, evacuation
- natural resource protection – e.g., wetlands protection, best management practices
- public information – e.g., outreach projects, technical assistance

While some mitigation actions were ‘broad’ in nature and covered the entire county or the two-county region, others were specific to each municipality within the two counties. It was ensured

that each of the 116 municipalities (both counties) had at least one or more mitigation actions identified in the plan, along with a timeline and entity(ies) responsible for implementation.
Phase 4 – Implement the Plan: In the final phase, an action plan was developed that described how the mitigation strategies and activities identified would be prioritized, implemented, funded, and administered by the two counties and their municipalities. Cost estimates and possible funding sources to implement recommended projects were identified. In this phase, the methods to monitor, evaluate, and update the mitigation plan within a five-year cycle were discussed along with recommendations on incorporating community participation into the plan maintenance process.

A. Multi-Jurisdictional Planning Participation

***Requirement §201.6(a)(3)*:** *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multi-jurisdictional plans.*

A kick-off meeting was held between the Consultant Team and Lackawanna and Luzerne County administrators on December 6, 2007, at the Luzerne County Emergency Management Building in Wilkes-Barre. This meeting officially initiated the planning process and covered the tasks involved, project schedule, and deliverables.

A Steering Committee for the Bi-County Plan was formed for the purposes of this planning process. The Steering Committee comprised a total of 26 members who represented various departments from the two counties, representatives from municipalities, and the Pennsylvania Emergency Management Agency. **Table 2.1** includes the members of the Steering Committee and the agencies represented. The Consultants worked closely with the Bi-County Hazard Mitigation Steering Committee and met with them four times during the planning process.

Table 2.1 – Lackawanna Luzerne Joint Hazard Mitigation Plan Steering Committee

Name	Title	Organization
Bekanich, Steve	Director	Luzerne County EMA
Bridge, David	Director	Hazleton City EMA
Brozena, Jim, P.E.	Executive Director	Luzerne County Flood Protection Authority
Davis, Rich	Member	Hunlock Twp. EMA
Dodson, Jack	Director	Dallas Twp. EMA
Gibbons, Joe, P.E.	County Engineer	Luzerne County Engineering Department
Gutkowski, Jr., Stanley	Member	Wright Twp. EMA
Krommes, Charlie	Coordinator	Plains Twp. EMA
Longmore, Josh	Director	Luzerne Conservation District
McMonagle, Julie	Director	NEPA PEC
Sharksnas, William	Fire Inspector	Wilkes-Barre City EMA
Skoronski, David	GIS Director	Luzerne County
Tamm, Alan	Mitigation Planner	Pennsylvania Emergency Management Agency
Merolli, Adrian	Executive Director	Luzerne County Planning Commission
Snee, Nancy	MPO Coordinator/Farmland Preservation Program Administrator	Luzerne County Planning Commission
Bales, Fred	Fire Chief	Greenfield Township Fire Company
Flanagan, Robert	Coordinator	Lackawanna County EMA
Howard, Kevin	Operations Officer	Lackawanna County EMA
Jamison, Lee	Member	Abington Area Council of Governments
Keller, Ernie	Director	Lackawanna County Conservation District
King, Don	City Planner	City of Scranton
McGurl, Birney	Executive Director	Lackawanna River Corridor Association
White, William	Township Manager	Abington Township
Lindsay, Harry	Executive Director	Lackawanna County Dept. of Planning & Economic Development
Pitoniak, Steve	Transportation Planning Manager	Lackawanna County Regional Planning Commission
Donato, Mary Liz	Regional Planning Manager	Lackawanna County Regional Planning Commission

The first Steering Committee meeting was held on March 4, 2008 at the Luzerne County Emergency Management Building in Wilkes-Barre. At this meeting, the DMA 2000 and FMA (Flood Mitigation Assistance) planning process, and integration of the Hazard Mitigation Plan with the Bi-County Comprehensive Plan and Long Range Transportation Plans, were discussed. A summary of key findings of the identified hazards for the two counties was provided to the Committee for input.

The second Steering Committee Meeting was held on May 28, 2008 at the Luzerne County Emergency Management Building in Wilkes-Barre. At this meeting, key findings from the risk assessment including vulnerabilities and loss estimates were presented, along with the mitigation capabilities of the two counties. Based on the results of the risk and capability assessments, an exercise was facilitated by the Consultant to develop goals for the two counties.

The third Steering Committee meeting was held on September 23, 2008 at the Luzerne County Emergency Management Building in Wilkes-Barre. The purpose of this meeting was to identify mitigation projects based on the goals that were identified. Mitigation projects were divided into two broad categories: 1) county-level projects – those that were to be implemented by the two counties; and 2) municipal-level projects – specific projects for the individual municipalities in the two counties.

The fourth and final Steering Committee meeting was held on December 3, 2008 at the Lackawanna County Emergency Management Agency in Jessup. At this meeting, mitigation alternatives were finalized and criteria for ranking projects were developed. Implementation techniques and a plan maintenance schedule were also examined.

"EACH jurisdiction MUST participate on their own, adhere to the hazard mitigation planning process, or they cannot adopt the Plan and will not get funding."

This message was emphasized to the 76 jurisdictions in Luzerne County and 40 jurisdictions in Lackawanna County to solicit their participation in the Bi-County hazard mitigation planning process. An extensive municipal participation network was established to allow for maximum participation throughout the process.

In December 2007, a Letter of Intent to Participate was mailed to all jurisdictions in both counties that explained the hazard mitigation process, federal requirements, and deliverables. Municipalities were required to sign onto or opt-in to the Bi-County planning process (and commit to participation) or opt-out of the process (in which case, they would be responsible for developing their own plan in order to obtain Federal funding following a disaster). Those who decided to opt-in were required to identify and provide information for a local point of contact. All 40 municipalities in Lackawanna County and all 76 municipalities in Luzerne County opted to participate in the Joint Hazard Mitigation planning process (see **Tables 2.2** and **2.3**).

The first municipal hazard mitigation workshop was held on March 12, 2008. During this workshop, the hazard mitigation planning process and the federal requirements were discussed and the importance and opportunities for municipal participation were emphasized. Hazard mitigation feedback forms were distributed to those municipal representatives in attendance. A total of 47 persons attended the workshop; of these attendees, 16 represented Luzerne County municipalities and seven represented Lackawanna County municipalities. Other participants included County staff, and school districts. At this meeting, two other planning processes were

being conducted simultaneously for the two counties – the Bi-County Comprehensive Plan and the Long Range Transportation Plan, were also discussed.

Feedback forms were mailed to all municipalities that were not in attendance at the meeting. The feedback forms comprised questions related to past hazard events; critical facilities in high hazard areas; mitigation projects; and municipal mitigation capabilities (technical and staffing). Follow-up phone calls were made to all invitees to encourage municipalities to complete their feedback forms and attend a second hazard mitigation workshop scheduled for May 2008. A total of 27 forms were returned from Lackawanna County and 53 forms were returned from Luzerne Counties.

A second meeting reminder was sent via email in advance of the meetings to further urge municipal attendance. The second hazard mitigation workshop was held on May 28, 2008 at the Tribeca Banquet & Convention Center, Quality Inn in Pittston Township (Luzerne County). The purpose of the workshop was to provide municipalities with an opportunity to become educated on the hazard mitigation planning process by:

- Reviewing maps and identifying high hazard areas;
- Identifying critical facilities within their community;
- Discussing risks and vulnerabilities within their community;
- Identifying and discussing potential mitigation projects; and
- Discussing future participation opportunities and next steps.

A series of exhibits was developed for the workshop including maps of critical facilities, floodplains, and steep slopes. Attendees were encouraged to initiate discussion and mark up maps to indicate updated or missing data. Examples of potential mitigation projects were shared and municipalities were encouraged to recommend additional mitigation projects for their municipalities based on past hazard experiences. The Consultants requested municipal representatives to review the map information and provide feedback on any changes to the maps.

Table 2.2 Lackawanna County Municipal Participation

Lackawanna County Municipal Participation					
	Intent To Participate	Attendance at 1st workshop (3/12/08)	Provided Data (Questionnaire/ Meetings)	Attendance at 2nd workshop (5/28/08)	Responded or Reviewed Draft Plan
Abington Twp	1		1		1
Archbald Bor	1		1	1	
Benton Twp	1		1		
Blakely Bor	1		1	1	
Carbondale Twp	1		1		
City of Carbondale	1	1	1		
City of Scranton	1	1	1		
Clarks Green Bor	1		1		
Clarks Summit Bor	1		1	1	
Clifton Twp	1				
Covington Twp	1		1		
Dalton Bor	1	1	1	1	
Dickson City Bor	1		1	1	
Dunmore Bor	1		1	1	
Elmhurst Twp	1			1	
Fell Twp	1		1		
Glenburn Twp	1		1	1	
Greenfield Twp	1		1		
Jefferson Twp	1		1	1	1
Jermyn Bor	1		1	1	
Jessup Bor	1		1	1	
LaPlume Twp	1		1	1	1
Madison Twp	1	1	1		
Mayfield Bor	1		1		1
Moosic Bor	1		1	1	1
Moscow Bor	1	1	1	1	
Newton Twp	1		1		1
North Abington Twp	1		1	1	1
Old Forge Bor	1		1	1	
Olyphant Bor	1		1		
Ransom Twp	1		1	1	1
Roaring Brook Twp	1		1		1
Scott Twp	1		1		1
South Abington Twp	1		1		1
Spring Brook Twp	1		1	1	
Taylor Bor	1	1	1	1	
Thornhurst Twp	1		1	1	
Throop Bor	1		1		
Vandling Bor	1	1	1		1
West Abington Twp	1		1	1	
Total	**40**	**7**	**38**	**21**	**12**

Table 2.3 Luzerne County Municipal Participation

Luzerne County Municipal Participation					
	Intent to Participate	Attendance at 1st workshop (3/12/08)	Provided Data (Questionnaire/ Meetings)	Attendance at 2nd workshop (05/28/08)	Responded or Reviewed Draft Plan
Ashley Bor	1				
Avoca Bor	1		1		1
Bear Creek Twp	1			1	
Bear Creek Village	1		1	1	
Black Creek Twp	1		1	1	1
Buck Twp	1		1		1
Butler Twp	1	1		1	
City of Hazleton	1				
City of Nanticoke	1		1	1	
City of Pittston	1		1	1	
City of Wilkes-Barre	1	1	1	1	
Conyngham Bor	1		1	1	
Conyngham Twp	1		1	1	
Courtdale Bor	1				
Dallas Bor	1		1		1
Dallas Twp	1	1	1	1	
Dennison Twp	1		1	1	
Dorrance Twp	1	1			
Dupont Bor	1		1	1	
Duryea Bor	1		1		1
Edwardsville Bor	1		1		
Exeter Bor	1	1	1		1
Exeter Twp	1	1	1	1	1
Fairmount Twp	1		1		
Fairview Twp	1				1
Forty Fort Bor	1		1	1	
Foster Twp	1		1		
Franklin Twp	1		1	1	
Freeland Bor	1		1	1	1
Hanover Twp	1		1		
Harveys Lake Bor	1				1
Hazle Twp	1				
Hollenback Twp	1		1		
Hughestown Bor	1		1	1	1
Hunlock Twp	1	1	1		1
Huntington Twp	1		1	1	1
Jackson Twp	1		1		
Jeddo Bor	1				1
Jenkins Twp	1		1		1
Kingston Bor	1				
Kingston Twp	1	1	1		
Laflin Bor	1	1	1	1	
Lake Twp	1				
Larksville Bor	1		1	1	
Laurel Run Bor	1		1		
Lehman Twp	1		1	1	

Table 2.3 Luzerne County Municipal Participation

Luzerne County Municipal Participation					
	Intent to Participate	Attendance at 1st workshop (3/12/08)	Provided Data (Questionnaire/ Meetings)	Attendance at 2nd workshop (05/28/08)	Responded or Reviewed Draft Plan
Luzerne Bor	1		1		
Nescopeck Bor	1		1		1
Nescopeck Twp	1		1		
New Columbus Bor	1		1		
Newport Twp	1		1		
Nuangola Bor	1		1	1	
Penn Lake Park Bor	1				
Pittston Twp	1				1
Plains Twp	1	1	1	1	1
Plymouth Bor	1		1	1	1
Plymouth Twp	1		1		
Pringle Bor	1		1		
Rice Twp	1		1	1	1
Ross Twp	1		1		1
Salem Twp	1	1	1	1	1
Shickshinny Bor	1	1	1	1	
Slocum Twp	1				
Sugar Notch Bor	1		1		
Sugarloaf Twp	1		1		1
Swoyersville Bor	1		1		
Union Twp	1	1	1		1
Warrior Run Bor	1		1		
West Hazleton Bor	1		1	1	
West Pittston Bor	1	1	1	1	1
West Wyoming Bor	1	1	1		
White Haven Bor	1				
Wilkes-Barre Twp	1		1		1
Wright Twp	1	1	1	1	
Wyoming Bor	1				1
Yatesville Bor	1				
Total	**76**	**16**	**58**	**30**	**27**

Mitigation Project Sheets were distributed to municipalities at the workshops and via email/fax to solicit projects that were desired by the municipalities (based on the natural hazard threat that they faced), but that they did not have an opportunity to implement due to time, staffing, or budget constraints. All of these opportunities for municipal participation were tracked in an Excel spreadsheet. A total of 75 persons attended the workshop; of these attendees, 30 municipalities were represented from Luzerne County and 21 municipalities were represented from Lackawanna County. Other individuals included the consultants and staff from the two counties.

In addition to steering committee meetings and municipal workshops, stakeholder meetings were also conducted to convene residents from both counties. (The stakeholder meetings were held to discuss all three Bi-County plans including the Comprehensive and Long-Range Transportation Plans and were not specific to the Hazard Mitigation Plan.) Stakeholder focus groups were held on January 15, 2007 at the Scranton Cultural Center in Scranton and on January 16, 2007 at the Luzerne County Emergency Management Agency Building in Wilkes-Barre. Topics discussed included issues related to transportation; land development and housing; economic revitalization; utilities; historic preservation; and natural resources and open space conservation. A focus group was not formed specifically for hazard mitigation since the hazard mitigation steering committee was in place to focus on those issues. However, topics discussed in the aforementioned focus groups related to hazard mitigation issues and were therefore critical in the development of this plan.

A second Municipal and Stakeholder Coordination Meeting was held on March 12, 2008 at the Tribeca Banquet and Convention Center in Pittston. This meeting was conducted to introduce the three planning processes – comprehensive plan, long-range transportation plan, and hazard mitigation plan – and to describe the current stages and overall progress. The major concerns, ideas, and themes from the focus groups held in January were summarized and information was gathered regarding current planning topics.

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process* ***shall*** *include:*

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; …

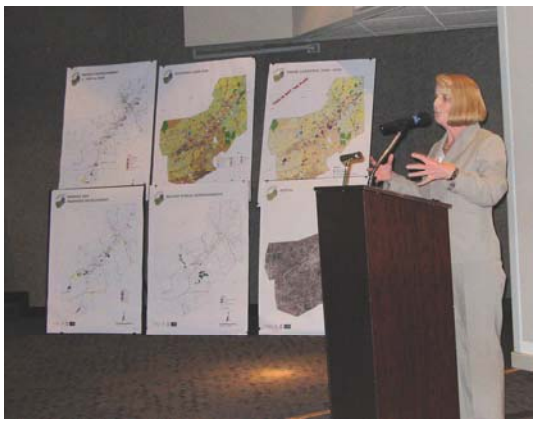
Public input was solicited twice during the planning process. These public meetings/open houses were held as a combined opportunity for all to comment on the hazard mitigation plan, long range transportation plan, and comprehensive plans being developed for the two counties to ensure that all of the three simultaneous planning processes could be integrated.

A round of three public meetings was held in the two counties: October 14, 2008 at Luzerne County Community College in Nanticoke, Luzerne County; October 15, 2008 at Hazleton Area High School in Hazleton, Luzerne County; and October 16, 2008 at the Lackawanna County Emergency Management Agency in Jessup. These public meetings served as an opportunity for residents to learn about assets, liabilities, opportunities, and threats with respect to land use,

transportation, and high hazard areas in the two counties as well as to discuss goals and recommendations for hazard mitigation. A total of 54 attendees participated in the three meetings. The meetings were advertised in the local media, a website, and through individual mailings and emails to municipalities, county and resource agency officials. The adjacent list of media outlets **(Table 2.4)** received press releases announcing the meetings. Three news articles were published after the meetings. In addition to the municipalities, the planning process also ensured regional participation. Neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests were invited to the meetings so they could become involved in the planning process and provide input.

Table 2.4 Media Organizations

Media Organizations
Abington Journal
Bold Gold Media
Carbondale News
Citadel Broadcasting
Citizens Voice
Electric City
Forest City News
Happenings Communications Group
Luzerne County Community College
Melanian News
New Age-Examiner
PA Homepage
Pocono Record
Republican Herald
Rock 107
Scranton Post
SS PTV
Standard Speaker
The Villager
The Weekender
Times Leader
Times-Tribune
WBRE
Wilkes-Barre News Radio
WNEP
Wyoming County Press Examiner
WYOU



The website *www.lackawanna-luzerneplans.com* included information on the planning process, schedule, plan elements, and purpose of each of the three planning processes. It also contained maps for various plan elements; public input via surveys and email feedback; past and upcoming meetings; and major milestones. The website was updated throughout the planning process and was widely used by the client, municipalities, and consultants, and provided an avenue for businesses and nonprofit interests, neighboring communities, and those in academia to become educated on the planning process.

The final public meeting will be held this summer, in conjunction with the final public meeting for the Long Range Transportation Plan and Comprehensive Plan. At this meeting the hazard mitigation actions will be presented, in conjunction with other planning recommendations. Draft copies of the Hazard Mitigation Plan will be available at this meeting for review.

B. Documentation of the Planning Process

Requirement §201.6(b): *(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

The purpose of conducting a plan/ordinance review for the two counties as part of this planning process was tri-fold:

- To identify joint county initiatives that demonstrate the Lackawanna-Luzerne partnership;
- To provide an inventory and review of sample plans and ordinances and identify sections in these documents that address hazard mitigation related issues; and
- To provide a platform to integrate plans and other documents so recommendations and strategies are not in contradiction with one another in the hazard mitigation plan as well as the comprehensive plan.

1. Commonwealth of Pennsylvania Document Review

Uniform Construction Code - The Uniform Construction Code (UCC) is the statewide building code (Act 45 of 1999) that took effect in April of 2004. The UCC is mandated by the state for all municipalities in Pennsylvania and establishes minimum regulations for most new construction, including additions and renovations to existing structures. All new construction is required to meet the UCC requirements statewide. In Pennsylvania, approximately 800 of the state's 2,567 communities have adopted the national model building code developed by the Building Officials and Code Administrators (BOCA) or another national code. The building code consists of most of the International Code Council's 2003 code series including the International Building Code (IBC) and the International Residential Code (IRC) that replace the BOCA and CABO building codes, respectively.

Comprehensive Planning - Commonwealth of Pennsylvania Governor's Executive Order 1999-1 (Land Use Planning) provides the basis for the requirement to integrate hazard mitigation into comprehensive land use planning. As part of this executive order, the Interagency Land Use Team was established, comprising the following state agencies: Department of Agriculture; Department of Community and Economic Development; Department of Conservation and Natural Resources; Department of Environmental Protection; Governor's Green Government Council; Fish and Boat Commission; Game Commission; Department of Transportation; and the Pennsylvania Emergency Management Agency.

The purpose of the team is to improve communication and coordination between those state agencies most involved in land use and land use management. Major land use policy decisions (as well as hazard mitigation projects) are reviewed by each agency to determine their appropriateness, benefits and shortfalls. One of the most significant outcomes of PEMA's participation on the team is the integration of hazard mitigation goals and objectives (sustainable communities through hazard avoidance and reduction) into the comprehensive land use planning process. Some highly developed and flood-prone counties (Allegheny, Lycoming, Lehigh, and Northampton) have included hazard mitigation planning as an integral

part of their county land use plans, as is the case of the Lackawanna/Luzerne Bi-County Comprehensive Plan.

The Pennsylvania Code – Chapter 102 Title 25 Sediment and Erosion Control - This Code requires all earthmoving projects in the Commonwealth to develop an erosion and sediment pollution control plan to ensure that proper site development practices are employed for land development and implement best management practices for the control of sediment pollution during construction. Pennsylvania DEP requires a National Pollution Discharge Elimination System (NPDES) permit for earthmoving activities exceeding five acres. In 2002, DEP reduced the permitted threshold to one acre and required the post-construction stormwater management component under the Phase II NPDES Program. The permit provides for additional assurance of water quality protection at construction sites.
Projects which disturb between 1.0 and 5.0 acres, and have a point-source discharge to waters of the Commonwealth, require a NPDES permit for stormwater discharges associated with construction activities. As part of this permit, an approved erosion control plan is required. Projects that disturb more than 5.0 acres require an NPDES permit for stormwater discharges associated with construction activities as well as an approved erosion control plan.

Growing Greener - Growing Greener is a state program that addresses critical environmental concerns. Projects include farmland preservation projects; protection of open space; restoration of watersheds; funding for recreational trails and local parks; land use; and provision of new and upgraded water and sewer systems. Projects of special interest include those that implement stormwater management, particularly innovative approaches consistent with the Stormwater Best Management Practices Manual (December 2006) including construction and post-construction management, projects that address flood mitigation, and projects that implement stormwater management. Recognizing that there was great similarity between the goals of the Hazard Mitigation Grant Program and Growing Greener, PEMA and the Department of Environmental Protection entered into a cooperative agreement in which Growing Greener funding would be used to pay the non-federal share for HMGP projects that resulted in creating open space. This infusion of funds provides financial leverage for the Commonwealth's property acquisition program, the goal of which is to return the floodplain to its natural function.

Commonwealth of Pennsylvania Enhanced All-Hazard Mitigation Plan, August 2007
The following objectives from the State Plan are applicable to the Bi-County Hazard Mitigation Plan and have been taken into consideration during development of the plan:

- Ensure that local and state agencies identify critical buildings, facilities, and infrastructure that are at risk of damage due to natural hazards, and to undertake feasible and cost-effective hazard mitigation measures to minimize future losses and expenditures.
- Promote economic development consistent with floodplain management, building codes, and similar guidance.
- Develop an effective public awareness program for the natural hazards that Pennsylvania is most likely to experience.
- Encourage scientific study of natural hazards and the development of data to support mitigation strategies for those hazards that are a threat to the Commonwealth.
- Implement mitigation actions to reduce loss of life and property.
- Support zoning codes that foster floodplain management objectives throughout the Commonwealth.

This Hazard Mitigation Plan looks to reduce the hazard vulnerability by following the State's objectives by:

- Identifying hazards, communicating and assessing hazard risk.
- Using planning and regulatory measures to influence the location, type and amount of community development in hazardous areas, as well as the standard to which such development must be constructed.
- Recommending acquiring and managing lands that are vulnerable to damage from hazards; installing and maintaining flood forecasting and warning systems; and implementing structural mitigation measures to protect people and property at risk.

The State Hazard Mitigation Plan has been made part of the State Emergency Operations Plan (SEOP) and contains the Hazard Identification and Risk Assessment that the state uses as the fundamental base of the SEOP.

The Commonwealth of Pennsylvania's Hazard Mitigation Plan and Enhanced Mitigation Plan have been integrated to the extent practicable with other Commonwealth planning initiatives, local plans and FEMA mitigation programs. This integration is demonstrated in the pre-disaster environment in the form of plan development, and in the post-disaster environment in the form of the execution of mitigation actions identified through the hazard mitigation planning process.

The following goals and objectives pertain directly to local governments including Luzerne and Lackawanna Counties:

- Primary consideration is given to acquisition and demolition, and relocation projects, as removal of structures from the floodplain is the only 100 percent effective strategy for the health, safety and well-being of those Pennsylvanians unfortunate enough to reside in the floodplain.
- Secondary goals are to encourage actions that support public safety during hazard events; natural hazard identification and awareness; hazard avoidance; damage minimization; environmental historic protection; and the mitigation of future severe and repetitive damage due to natural hazards.
- To ensure that local and state agencies identify critical buildings, facilities, and infrastructure that are at risk of damage due to natural hazards, and to undertake feasible and cost-effective hazard mitigation measures to minimize future losses and expenditures.
- To reduce hazard vulnerability by encouraging education programs for municipal officials and the public where emphasis has been in community development of hazardous areas.

The following mitigation actions pertain directly to local governments including Luzerne and Lackawanna Counties, where assistance from the state could become available:

- Acquisition, Relocation, Flood-proofing, Elevation of Structures: Identify areas of repetitive flooding in flood-prone municipalities; offer alternatives (elevation, relocation, flood-proofing) to those parties not interested in acquisition or where acquisition is not feasible; and work with county and municipal governments in the execution of the selected alternative(s).
- Stormwater Conveyance Upgrade Actions: Design and construct the relocation of specific low-lying roadways that flood on a continuous basis; contract the design and construction of flood diversion to roadways in low-lying areas that flood on a regular basis; and design and construct adequate size bridge/culvert openings.
- Streambank Stabilization Actions: Consider the construction of low-head debris dams to protect critical infrastructure such as roads, bridges, and water treatment facilities etc.; and

establish local stream corridor management and planning zones based on complete and accurate FEMA mapping.

- Structural Alternatives to Flood Hazard Mitigation Actions: Identify areas of repetitive flooding in flood-prone municipalities; construct projects that will effectively address flood threats and significantly reduce threats to life and property; and work closely with the DEP to provide technical assistance as well as leveraging finances through their Flood Protection Project Program.
- Stormwater Management Actions: Municipal governments should adopt and enforce stormwater management ordinances to protect natural stormwater runoff patterns and minimize or avoid increased flooding; county government should formulate stormwater plans based on comprehensive analysis of each watershed in its boundaries; and the state should continue to provide technical and financial assistance to encourage a consistent statewide approach to solving runoff problems.

2. Joint County Planning Initiatives Review

Luzerne and Lackawanna Counties in general have a close working relationship and are jointly involved in some initiatives. The three other major planning efforts that are undertaken by Luzerne and Lackawanna Counties are the Comprehensive Plan, Long Range Transportation Plan, and Open Space Plan.

Bi-County Comprehensive Plan – Lackawanna and Luzerne Counties are currently involved in a Bi-County Comprehensive Plan. This comprehensive plan will result in recommendations for various planning elements such as housing, economic development, community facilities, environment, and historic preservation.

Bi-County Long Range Transportation Plan – The Intermodal Surface Transportation Equity Act (ISTEA) of 1991 requires all Metropolitan Planning Organizations (MPOs) to prepare 20-year transportation plans. The original plan for the Lackawanna/Luzerne MPO was prepared in 1994. This plan has been updated every three years since then. The Plan covers all modes of transportation and provides an in-depth look at various transportation initiatives and future needs. A Long Range Transportation Plan that will cover the years 2009-2030 is currently in preparation for the two counties.

The Lackawanna/Luzerne MPO consists of three committees: the Transportation Advisory Committee (TAC), the Technical Committee, and the Coordinating Committee. The TAC consists of people who represent interests including environment, business and industry, automotive and trucking, rail freight, and para-transit, among others. It acts as an advisory body to the Technical Committee.
The Technical Committee comprises representatives from the Pennsylvania Department of Transportation (PennDOT), both counties, the Cities of Scranton, Wilkes-Barre, and Hazleton, and all modes of transportation. The Technical Committee prepares all plans and documents required by the Federal Highway Administration (FHWA) and PennDOT and presents them to the Coordinating Committee which reviews the material and takes the appropriate action. The Coordinating Committee has a similar make-up as the Technical Committee.

Other Bi-County efforts between Luzerne and Lackawanna Counties include:

1) Their partnership to purchase Theta Land (watershed land that was previously owned by the water company, but was later sold to another division of that company called Theta). Luzerne

County has already purchased several parcels of Theta land and Lackawanna County recently started their efforts to do likewise, and;

2) The Wilkes-Barre/Scranton International Airport; the Boards of Commissioners of both counties comprise the Board that oversees airport operations.

2004 Open Space, Greenways, and Outdoors Master Plan for Lackawanna and Luzerne Counties – The Open Space, Greenways and Outdoor Recreation Master Plan provides recommendations for achieving a balance between natural resources and the built environment in the two counties. While the Plan does not address existing or future land use or other components of a comprehensive plan and does not consider future development areas, it looks at the resources of the land, irrespective of future plans, and identifies areas that offer opportunities for preserving and protecting valuable natural resources.

The Plan recommends a number of different approaches that should be pursued by county and local governments, landowners, conservation groups, not-for-profit organizations and other interested parties, to protect, conserve or acquire the recommended conservation lands.

Implementation includes a combination of conservation tools including land management plans and easements; regulatory methods like density transfers, zoning overlays, buffer zones, and subdivision exactions; and land acquisition made possible through donation and purchase, and purchase of development rights.

FEMA Region III Post-Flood Community Flood Risk Evaluation for Bradford, Lackawanna, Luzerne, Susquehanna, Sullivan, and Wyoming Counties, Pennsylvania – April 2008 – The report includes information related to the flooding and accuracy of the effective FEMA Flood Insurance Rate Maps and uses the data to prioritize the spending of federal dollars during the upcoming Map Modernization projects for these counties. A recommendation summary table is included along with maps displaying the effective study type for each stream reach and future study recommendations.

Lackawanna County - The study recommends the restudy of all 261.8 miles of effective approximate flood hazard areas and conducting approximately 33 miles of new approximate flood studies on currently unstudied streams. The study includes a summary of approximately 22.9 miles of reach and 43 hydraulic structures to be studied in detail by FEMA on the following flooding sources: Ackerly Creek, Lackawanna River, Leggetts Creek Tributary1, Mill Creek No. 2, Saint John's Creek, and Tiklepaugh Creek.

Luzerne County - The study recommends the restudy of all 386 miles of effective approximate flood hazard areas and conducting approximately 61 miles of new approximate studies on currently unstudied streams. The study includes a summary of approximately 30.1 miles of reach and 22 hydraulic structures to be studied in detail by FEMA on the following flooding sources: Abrahams Creek of Forty Fort, Big Wapwallopen Creek, Lackawanna River, Nescopeck Creek, Solomon Creek, and Toby Creek.

A table of final recommendations is included for each county that provides the following information: flooding source, municipality, recommended type of study (detailed or approximate), priority, effective zone, approximate length of reach, and its final prioritization score.

3. Lackawanna County Document Review

Comprehensive Planning Efforts – The Lackawanna County Comprehensive Plan was completed in the 1970s but never adopted. The Lackawanna and Luzerne County Commissions are currently undertaking a joint effort to develop a Bi-County Comprehensive Plan. The Plan is expected to be completed in early 2009. At the local and regional levels, 28 out of Lackawanna County's 40 municipalities have developed and formally adopted comprehensive plans and 15 municipalities are currently involved in three regional comprehensive planning projects. Of the 15 municipalities involved in the regional planning effort, eleven are part of the Scranton-Abington Planning Association plan that is currently being prepared.

Zoning – Article VI of Act 247 governs the implementation of zoning ordinances in the Commonwealth of Pennsylvania. There is no County zoning ordinance in place. All 40 municipalities have zoning ordinances.

Subdivision and Land Development Regulations – Article V of Act 247 governs the implementation of the subdivision and land development ordinance in the Commonwealth of Pennsylvania. Similar to zoning, there is no subdivision and land development ordinance for the County. The 40 municipalities implement their own subdivision and land development ordinances.

Building Code – All municipalities within Lackawanna County are covered by the Uniform Construction Code (UCC). The UCC sets uniform standards for construction of new residential and commercial structures and certain renovations to existing buildings. The UCC also contains minimum construction standards for wind loads and snow loads to ensure the strength of structures and the ability to withstand storms. Manufactured homes are required to meet specific UCC criteria as well.

Local governments have a number of options in administering the UCC. If a local government chooses to provide code services for residential structures (one- and two-family), the municipality must still provide for non-residential code services using the variety of options available to them. Under the regulations, if a local government chooses not to administer the UCC, that municipality will no longer have the right to issue building permits. In that case, a contractor or building owner would have to retain a certified third-party agency (for one- and two-family homes) or go to the Department of Labor and Industry (for all non-residential structures) to obtain a UCC construction permit, all necessary inspections, and a certificate of occupancy. The municipality can "contract" with the Department of Labor and Industry to provide non-residential inspection and plan review services pending a mutually acceptable agreement and availability of personnel at the Department. The City of Scranton conducts its own inspections with municipal inspectors. The other 39 municipalities contract with private firms to conduct inspections on behalf of the municipality.

Lackawanna River Watershed Act 167 Stormwater Management Ordinance – The Ordinance serves as the County's stormwater management ordinance. The purpose of the Lackawanna River Watershed Act 167 Stormwater Management Ordinance is to promote the public health, safety and welfare within the Lackawanna River Watershed by minimizing stormwater related damages through provisions designed to: control accelerated runoff and erosion and sedimentation problems at their source by regulating activities which cause such problems; preserve and restore the flood carrying capacity of streams; and provide for proper maintenance of all permanent municipal stormwater management structures.

The stormwater management regulations include a number of provisions for the safe conveyance of excess stormwater and floodwaters:

- Water obstructions (e.g. culverts, bridges, outfalls, or stream enclosures), designed in accordance with Chapter 105 do require a permit from Pennsylvania Department of Environmental Resources. However, all other drainage conveyance facilities that do not fall under Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm with a minimum of one foot of freeboard measured below the lowest point along the top of the roadway.
- Roadway crossings located within designated floodplain areas must be able to convey runoff from a 100-year design storm with a minimum 1.1 foot of freeboard measured below the lowest point along the top of the roadway. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.
- All stormwater management facilities are required to be designed to provide a minimum one foot of freeboard above the maximum 100-year water surface elevation for post-development conditions.
- Any regulated activity which would create 10,000 square feet or less of additional imperious cover is exempt from preparing a Drainage Plan.
- New land development controls are required to incorporate infiltration of the first 1.5 inches of runoff from impervious surfaces. At a minimum, infiltration facilities design/overflow capacity should be for the 10-year event.

Lackawanna River Citizens Master Plan – 1990 – One goal in this Master Plan for the restoration and use of the Lackawanna River and its adjacent lands is to revamp local ordinances and plans to protect the river and provide for economic development opportunities. Safety and hazard mitigation principles should be taken into consideration to ensure that the development along the river does not increase the flood risk to the communities on the river.

Lackawanna County Emergency Operations Plan – June 2004 – The Emergency Operations Plan (EOP) is based upon the structure of emergency management within the Commonwealth of Pennsylvania. This Plan serves as an emergency management link between the municipalities' emergency management agencies and the Pennsylvania Emergency Management Agency (PEMA). It also coincides with the concepts of the National Response Plan.

Lackawanna County operates a 911 Center and an Emergency Operations Center (EOC). The 911 Center and the EOC have listings of resources available from County assets as well as from the municipalities via mutual aid agreements. The County Emergency Management Coordinator (EMC) and elected officials develop mutual aid agreements with adjacent counties for reciprocal emergency assistance as needed. The County Emergency Management Coordinator prepares and maintains the EOP for the County subject to the direction of the elected officials; maintains coordination with the local municipalities and PEMA, and provides prompt information in emergencies, as available; identifies hazards and vulnerabilities that may affect the municipalities in coordination with the municipal EMAs; identifies resources within the county that can be used to respond to a major emergency or disaster situation and requests needed resources from PEMA; and mobilizes the EOC during an emergency, among other duties.

Lackawanna County Emergency Management maintains a flood warning system, applicable to all watersheds in the county, and can activate an EMA warning system.

The County Emergency Operations Plan includes the following language with respect to mitigation, response, and recovery: 1) Integration of response, recovery and mitigation actions - Following a disaster, immediate response operations have precedence over recovery and mitigation; and 2) Recovery actions will be coordinated and based upon availability of resources, and mitigation opportunities are considered throughout disaster operations.

Evacuation Plans: There is no current plan for evacuation of Lackawanna County. A map exists that was used to design a county evacuation to the neighboring five counties. Some municipalities include evacuations in their Emergency Operations Plans. They also include route alerting and pick up points for those without transportation.

Shelters: There are 44 shelters designated by the Red Cross that are spread throughout the county. Most are schools or church halls. None of the facilities are hardened to be more resistant to disasters.

4. Lackawanna County Municipalities Document Review

A few comprehensive plans, zoning, floodplain, land development and subdivision, and stormwater regulations from various municipalities in Lackawanna and Luzerne Counties were reviewed as sample documents to provide a flavor for, and highlight some of the language included in these documents on hazard mitigation related issues. Summaries of the plans are included below:

Carbondale Regional Comprehensive Plan 2003-2013 – Carbondale City, Carbondale Township, and Fell Township – General goals for the region include preserving harmonious land use relationships and neighborhood amenities for residential and non-residential development and providing for a broad mix of uses including residential, commercial, manufacturing, and open space. No specific goals that relate to preserving the natural environment or developing away from environmentally sensitive areas such as steep slopes, floodplains, or land subsidence areas are included.

Carbondale Township - The Plan identifies a need to study areas subject to flooding and create proposals for remedial actions to address issues including the lack of storm sewers in the South Side and Childs neighborhoods.

Fell Township - Under environmental goals, the Plan identifies dredging the Lackawanna River to remove the flooding hazards. The Plan recommends studying areas subject to flooding and developing proposals for remedial actions. The Fell Township Future Land Use Plan has a conservation category, the goal of which is to conserve areas of steep slope, woodlands, aquifer recharge areas, and cultural resources. The proposed uses of these areas would include a variety of residential and recreational uses that support the basic principle of conserving land and maintaining open space areas for non-urban purposes, such as clustering.
The Plan includes a stormwater drainage study that identifies major watersheds and stormwater facilities in Carbondale City, Carbondale Township and Fell Township, delineates problem drainage areas, and includes the following action plan:

- Installation of inlets and storm piping to the Lackawanna River;
- Installation of inlets and storm piping to Racket Brook;
- Construction of a drainage ditch and storm drain system to Powderly Creek;

- Installation of inlets and storm piping to Fallbrook Creek to correct flooding of North Scott Street and Shamrock Avenue;
- Flooding and backup problems along 7th and 8th Street;
- Drainage study for Main Street;
- New stormwater drainage collection system and inlets on Morse Avenue;
- Special projects for Carbondale Township include: storm sewer improvements; a storm drainage study to address runoff related to Casey Highway; and a need for dry hydrants on Salem Road.

The projects help reduce the impact of flooding and should continue to be implemented.

The 2001 Lackawanna River Watershed Conservation Plan was developed to protect the Lackawanna and all the brooks, creeks and runs in the watershed. The Conservation Plan recommends that the Regional Comprehensive Plan and Carbondale and Fell Townships' and the City of Carbondale's zoning ordinances and subdivision and land development ordinances should include adequate requirements to achieve this goal. The Conservation Plan contains specific recommendations aimed at protecting and maintaining the Lackawanna River and its tributaries as well as creating recreational areas around rail lines that run along the River. Specific recommendations for each municipality have been included on pages XI-36 to XI-38 on improvements to the Lackawanna River, Powderly Creek, Lees Creek, Brookside Run, Racket Brook, Fall Brook, Coal Brook, and Wilson Creek. Recommendations that are relevant to hazard mitigation and that have not yet been implemented should be strongly considered as hazard mitigation planning projects.

Regional Comprehensive Plan – Jefferson, Madison, and Salem Townships – May 2007 – In the Plan, areas of development opportunities and constraints are identified based on soils with seasonal high water tables, soils with rocky and steep terrain, steep slopes, soils with shallow depth to bedrock, and soils suitable for on-site septic systems. The Conservation land use category identifies steep slopes, water bodies, floodplains, and wetlands. This category is primarily intended for the conservation of open space and protection of environmentally sensitive areas. Low density (lots of 2 acres or more) and cluster housing development are encouraged in this area. While the Plan does address conservation areas, there is no mention of acquisition of properties, or specific conservation programs.

North Abington Township – Zoning Ordinance, September 2001 – The Ordinance contains specific objectives for conservation design for residential development that are relevant to hazard mitigation. They include:

- Conserving open land, including those areas containing unique and sensitive natural features such as woodlands, steep slopes, streams, floodplains and wetlands by setting them aside from development.
- Reducing erosion and sedimentation of existing vegetation and minimizing development on steep slopes.
- Providing multiple options for landowners in order to minimize impacts on environmental resources including wetlands, floodplain, and steep slopes and disturbance of natural features.

The Township requires that a stormwater management plan and soil erosion control plan are required to be prepared according to the Township's Subdivision Ordinance and the Lackawanna County Conservation District.

The floodplain overlay district is created in conjunction with FEMA's Flood Insurance Rate map. In addition to all the applicable standards of this zoning ordinance, the requirements of the Township Floodplain Ordinance apply in the Floodplain Overlay District. All uses permitted by this zoning ordinance are subject to special conservation performance standards which apply to any lands that are characterized as steep slopes, wetlands or floodplain (50-foot buffer zone).

Covington Township – Zoning Ordinance, 2007 – The Ordinance contains the following objectives for development that address hazard mitigation principles:

- In order to protect water quality and ensure recreational access to water bodies, a 50-foot buffer zone is required from any water body; no buildings or structures can be placed within these buffer zones.
- In all zoning districts, conservation design development may be used; however, in the Special Conservation District, conservation design development is required. In this type of development, the maximum lot size is the critical element, as it really defines the minimum open space that must be conserved. The proposed design is required to strictly minimize disturbance of environmentally sensitive areas and primary conservation areas such as wetlands, floodway, floodplain, slopes greater than 25 percent, and the area within 100 feet of the top of bank of any stream.
- A stormwater management plan and soil erosion control plan is required to be prepared according to the Township's Subdivision Ordinance and the County Conservation District.
- Mobile homes on individual lots have criteria for placement, in terms of bulk requirements and foundations; however, there is no mention of anchoring or tie-downs.
- All uses are subject to special conservation performance standards that apply to land characterized as steep slopes (in excess of 25 percent grade), wetlands, and floodplains.
- The floodplain is in an overlay zone, and no development is permitted that is not in accordance with the 1979 Township Floodplain Development Ordinance.

Borough of Dunmore – Zoning Ordinance, August 2000 – The zoning ordinance is intended to assist the Borough in directing its growth and development in accordance with the goals defined in the Dunmore Borough Master Plan. The following environmental goals from the Master Plan have a direct relevance on hazard mitigation:

1) Protect the environmentally sensitive areas of the Borough; and
2) Protect groundwater, floodplain, wetlands, mature woodlands, and steep slopes and establish environmental protection standards that will apply to all developments.

The Resource Conservation Residential Zone calls for compact cluster standards for single-family, two-family, and town house residential dwellings. This allows for concentrating development in certain areas and preservation of high hazard areas as open spaces. Lands that are unsuitable for development – including floodplains, wetlands, and areas where 50 percent of the site or more exceeds a 15 percent grade – are excluded in the density calculation of ratio of land to dwelling units.

Manufactured home lots are required to be improved to provide an adequate foundation for the placement of the manufactured home, thereby securing the superstructure against uplift or sliding. The homes are required to be provided with anchors and tie-downs imbedded in concrete foundations, anchors, or other devices that secure their stability.

Thornhurst Township – Subdivision and Land Development Ordinance, December 1993 – In areas where development could create an environmental problem, or affect the public health,

safety, or welfare, the Township may require a plan that addresses environmental factors such as erosion and sedimentation control, soil conservation, wetland identification, avoidance of drainage problems, natural and historic preservation, protection of floodplain areas and avoidance of future flooding problems, and lake, stream and river frontage preservation.

Stormwater management is required to conform to the Design Standards for Drainage and Stormwater Management, and bridges, culverts, dams and other drainage facilities affecting the flow of water in a watershed area are required to meet State requirements. All subdivision and land development requires the preparation of an Erosion and Sedimentation Control Plan as per requirements of the Pennsylvania Department of Environmental Protection. No subdivision or land development is approved if it increases the 100-year elevation more than one foot at any point in the floodplain.

All water supply and sanitary sewer systems located in a designated floodplain district are required to be flood-proofed up to the regulatory flood elevation. All development proposed in the 100-year floodplain is required to be designed in accordance with the following sound floodplain management principles:

1) Development in the floodway portion of the floodplain to be kept free of any encroachment which obstructs or limits the flow of water; and
2) Development in the floodway fringes to be permitted provided that hazardous velocities are not produced. Building sites for residences or other types of buildings are not permitted in the floodway.

An adequate number of foundation anchors for the placement and tie-down of each mobile home are required to stabilize the structure and anchors are required to be positioned at random distances as required for tie-down purposes.

Subdivision and Land Development Ordinance – Borough of Old Forge – A stormwater management plan is required for each subdivision or land development plan at the preliminary and the final submittal stage, and erosion and sedimentation control measures are required to be included as part of the Stormwater Management Plans. Any expansion or construction greater than 20,000 square feet requires a land development plan and a Stormwater Management Plan. The stormwater management plan is required to effectively demonstrate the control of post-development peak discharge rates to pre-development peak discharge rates. Culverts, pipes and other water carrying structures are required to be designed to handle the peak discharge from the 10-year post-development storm event.

Mobile homes are required to be provided with anchors and tie-downs imbedded in concrete foundations or run-ways, screw augers, arrowhead anchors, or other devices securing the mobile home. All structures are required to be firmly anchored to prevent floating away and threatening life or property downstream or to further restrict bridge openings and other restricted sections of the waterway.

All structures intended for human occupancy or storage are required to be constructed at an elevation of at least one foot above the elevation of the 100-year flood. Building sites for residences or any other type of dwellings or accommodations and building sites for structures or buildings other than residential uses are permitted in the floodplain only when they are in compliance with the appropriate zoning ordinance and building code and other applicable regulations of the Borough.

All sanitary sewer and water systems and other public/private utilities and facilities located in floodplain areas are required to be flood-proofed to two feet above the regulatory flood elevation.

Subdivision and Land Development Ordinance for the Township of Fell, 2000 – The Ordinance does not mention floodplain areas and elevation of structures and utilities with respect to the floodplain. The Ordinance requires that the construction of on- and off-site drainage structures comply with the Township's stormwater management ordinance. It also requires the measures used to control erosion and reduce sedimentation to meet the standards and specifications of the Lackawanna County Soil Conservation District and the Pennsylvania Department of Environmental Protection, and Bureau of Soil and Water Conservation.

Spring Brook Township Floodplain Management Ordinance 1983 – Updated February 2007 – All plans for any proposed development in the floodplain to be considered for approval are also required to be reviewed by the County Conservation District. Development within the 100-year floodplain is permitted so long as it is in compliance with the requirements in the codes and ordinances, and buildings are elevated to 1.5 feet above the base flood elevation. Within the floodway, no development is permitted that would cause any increase in the 100-year flood elevation. Non-residential structures that have the lowest floor that is not elevated to at least 1.5 feet above the base flood elevation are required to be flood-proofed based on flood-proofing regulations by the Army Corps of Engineers.

No part of any on-site sewage system can be located within any identified floodplain area unless it is in strict compliance with state and local regulations. Electrical distribution panels are required to be at least 3 feet above the 100-year flood elevation.

Buildings are required to be firmly anchored in accordance with accepted engineering practices (UCC standards) to prevent flotation, collapse, or lateral movement. Manufactured homes are required to be 1.5 feet above the base flood elevation in the 100-year floodplain and anchored to resist flotation, collapse or lateral movement and are required to be installed based on requirements of the 2003 International Building Code.

Improvements to existing structures in the floodplain are allowed only so long as the expansion would not cause any increase in the elevation of the 100-year floodplain. No variances are granted for any construction, development, use or activity within any floodway area if it causes an increase in the elevation of the 100-year floodplain.

Other floodplain ordinances for Lackawanna County municipalities contain similar language as they were prepared by the same consultant during the same time period.

5. Luzerne County Document Review

Municipal Hazard Mitigation Plans – In 1999, the Wyoming Valley Levee-Raising Project was funded by the US Army Corps of Engineers, Baltimore District, to study the impact of building a levee upstream of the Susquehanna River, on the downstream communities. The project involved assisting 53 downstream municipalities located along the Susquehanna River in Luzerne, Columbia, Montour, Northumberland, and Snyder Counties in the Wyoming Valley. The communities included those that could be adversely affected by a Levee-Raising Project in Wilkes-Barre, built to mitigate against potential damages from flooding. The project was administered by the Luzerne County Flood Protection Authority. The plans were designed to be compliant with Section 510 of the Community Rating System (CRS), with Federal Mitigation Assistance (FMA) plan requirements, and with Pennsylvania State Hazard Mitigation Planning requirements. The communities would be applying for approximately $16.2 million dollars in funds allocated for mitigation projects.

The plans were first developed as Flood Hazard Mitigation Plans consistent with FEMA's ten-step hazard mitigation planning process, and then upgraded to include all hazards, per FEMA's DMA 2000 requirements. The plans identified the municipalities' flood hazard areas and assessed existing flood problems. Various mitigation options were evaluated to determine their potential effectiveness within the subject municipality, which included such measures as structural flood-control projects, property protection techniques, natural resource protection, preventive measures, emergency services, and public information venues.

DMA 2000 Hazard Mitigation Plans have been completed and approved for six boroughs, eight townships, and one city along the Susquehanna River. The municipalities that have approved all-hazard mitigation plans include Duryea Borough, Exeter Borough, Larksville Borough, West Pittston Borough, Nescopeck Borough, Shickshinny Borough, Exeter Township, Hunlock Township, Hanover Township, Jenkins Township, Nescopeck Township, Plains Township, Plymouth Township, Conyngham Township, and the City of Pittston (**Table 2.5**).

Table 2.5: All-Hazard Mitigation Plans

Luzerne County Jurisdiction	Approval Date	Expiration Date
Conyngham Township	7/1/2005	6/30/2010
Duryea Borough	7/14/2005	7/13/2010
Exeter Borough	7/14/2005	7/13/2010
Exeter Township	7/14/2005	7/13/2010
Hanover Township	3/10/2004	3/9/2009
Hunlock Township	3/10/2004	3/9/2009
Jenkins Township	7/14/2005	7/13/2010
Larksville Borough	3/10/2004	3/9/2009
Nescopeck Borough	3/10/2004	3/9/2009
Nescopeck Township	3/10/2004	3/9/2009
Pittston City	7/14/2005	7/13/2010
Plains Township	7/14/2005	7/13/2010
Plymouth Township	5/10/2005	5/9/2010
Shickskinny Borough	3/10/2004	3/9/2009

As part of the plan integration effort for the Bi-County Plan, activities that are still viable but have not been completed have been included in this Plan for future implementation.

In the past, a number of mitigation projects have been implemented in Luzerne County. **Table 2.6** includes some of the major the mitigation projects that have been completed in various municipalities between 1959 and 1994.

Community Rating System (CRS) – Of the 15 municipalities in Luzerne County that had approved hazard mitigation plans, 12 municipalities applied to join the community rating system. They include City of Pittston, Conyngham Township, Duryea Borough, Exeter Borough, Hunlock Township, Hanover Township, Jenkins Township, Nescopeck Borough, Nescopeck Township, Plains Township, Plymouth Township, and West Pittston Borough. The application process included an assessment of the current compliance of the communities' floodplain management system with NFIP requirements, and determining CRS creditable activities that are currently being conducted or could be potentially implemented to help maximize the number of CRS points available to the communities and eventually the residents' flood insurance premiums. CRS applications were completed in 2005. The communities are awaiting the Community Assistance Visits (CAVs) to be conducted by the State and expect to become active in the CRS program in 2009. Currently only one municipality (City of Wilkes-Barre) is a member of the CRS. Wilkes-Barre is a Class 7 community

Luzerne County Zoning Regulations – Luzerne County comprises 76 municipalities – 4 cities, 36 boroughs, and 36 townships. The County administers the zoning ordinance for 19 of the 76 municipalities. The County prepares zoning maps for all municipalities that follow the County zoning ordinance. Over time, some municipalities took responsibility and developed their own zoning ordinance and map. However, over the last 10 years, due to budgetary constraints or lack of administrative staff, some of these municipalities gave up control and were administered by the County. While the County has no control over the municipalities that have their own zoning ordinances, these municipalities still have to meet the Act 247 guidelines – State Municipal Planning Code.

Specific language in the Luzerne County Zoning Ordinance that relates directly to hazard mitigation is documented below:

- The 100-year floodplain districts can be treated as an overlay zone; however, if there is a conflict between the provisions of the 100-year overlay or the underlying district, the more restrictive provisions and those pertaining to the 100-year floodplain district apply. All development within the 100-year floodplain is required to be in strict compliance with this ordinance and with the building code and subdivision and land development ordinance.
- No development is permitted in the floodway except where the development on flood heights is fully offset by accompanying stream improvements which have been approved by all appropriate local and/or State authorities.
- In the 100-year flood fringe and general flood conservation districts, development has to be in strict compliance with the flood-proofing and related provisions contained in all other applicable codes and ordinances. In the 100-year special flood conservation district, the same provisions apply; however, specific uses are required to be flood-proofed or elevated above the crown of the nearest street as set forth in all applicable building codes and/or building permit ordinances and the subdivision and land development ordinances.

Table 2.6: Luzerne County Previous Mitigation Projects

Project	Location	Municipality	Description	Cost	Year Completed
Wyoming channel improvement	Wordan Place	Borough of Harvey's Lake	Construction of a concrete channel	$29,116	1979
Wyoming – West Wyoming FP	Abrahams Creek	Wyoming Borough West Wyoming Borough	Construction of a concrete channel	$1,181,000	1978
	Abrahams Creek	Wyoming Borough	Channel excavation, realignment, and widening of channel	$47,000	1962
Abrahams Creek Stream Improvement	Abrahams Creek	West Wyoming Borough	Placement of rock riprap on the stream sides	$36,000	Unknown
Abrahams Creek Stream Improvement Unit 2	Abrahams Creek	West Wyoming Borough	Correction of an erosion problem upstream of existing debris basin and riprap onside slopes above existing basin	$227,000	1994
Plymouth FP Brown Creek	Brown Creek	Borough of Plymouth	Construction of an earth fill dam and debris basin	$492,000	1959
Plymouth, Wadham Creek Debris Basin	Wadham Creek and Duffey Run	Borough of Plymouth	Construction of an earth fill dam and debris	$123,000	1959
Duffey Run Debris Dam	Duffey Run	Borough of Plymouth	Construction of a high concrete cell rock filed dam	$43,000	1965
Mocanaqua Flood Protection	Turtle Creek	Conyngham Township	Concrete channel	$142,000	1963
Duryea flood protection	Lackawanna River	Duryea Borough	Improvement of river channel, Construction of an earth levee on left bank of the river	$375,000	1967
Duryea levee rehabilitation		Duryea Borough	Replacement of lost riprap	$233,000	1978
Swoyersville – Forty Fort FP	Abrahams Creek and Wade Run	Borough of Swoyersville	Channel improvements	$134,000	1994
Wade Run Stream Improvement	Wade Run	Borough of Swoyersville	Concrete channel and boxed culvert	$248,000	1992
Hicks Creek Channel improvement	Hicks Creek	Exeter Borough	Channel improvements	$667,000	1980
Mercer Avenue Pump Station	Mercer Avenue Pump Station; Slocum Street Pump Station	Municipality of Kingston; Borough of Swoyersville	Replacement and repair of existing pumps, upgrades to automation and electrical systems and refurbishment of existing piping	$133,000	2008
Hicks Creek Railroad Culvert Removal	Hicks Creek	Exeter Borough	Removal of railroad culvert to reduce upstream flooding	$40,000	2008

Source: Luzerne County Flood Protection Authority

The Zoning Ordinance does not contain any language related to other environmental features such as wetlands, woodlands, steep slopes and unstable soils. These issues are expected to be addressed in the 2009 Update of the County's Zoning Ordinance.

Floodplain Ordinance – The floodplain ordinance is included in the individual municipalities' zoning ordinances. The required free board is 1.5 feet above base flood elevation and no building permits are issued for structures in the floodway. Elevation certificates are required by all municipalities for structures in the floodplain.

Subdivision Regulations – Subdivision regulations are administered similar to the zoning ordinance. Communities can elect to opt in and have the County administer their subdivision regulations or opt out and develop their own subdivision ordinance. The County administers the subdivision ordinance for 27 out of the 76 municipalities.

Luzerne County Subdivision and Land Development Ordinance – Stormwater drainage systems are required to be designed to provide protection from a 10- to 100-year storm. No new buildings or additions are allowed within any delineated floodway.

All sanitary sewer and water systems and other public utilities and facilities in the 100-year floodplains are required to be flood-proofed 1.5 feet above the 100-year base flood elevation. At a minimum, the finished elevation of proposed streets is required to be at the 100-year base flood elevation. Drainage openings are required to be adequate to discharge flood flows within unduly increasing flood heights.

No specific language is included for forest stands, wetlands, soil types, land for active/passive recreation, or slopes. The only references to these issues are in the Subdivision/Land Development Ordinance (Access-Drainage-Geology, Public Uses, and Street Grades). The only other regulation of these items is through the State and Federal regulations. However, these issues are considered by the County Engineer and County Planning Department in the review and approval process.

Building Code – All municipalities within Luzerne County are covered by the Uniform Construction Code (UCC). The UCC sets uniform standards for construction of new residential and commercial structures and certain renovations to existing buildings. The UCC also contains minimum construction standards for wind loads and snow loads to ensure the strength of structures and the ability to withstand storms. Manufactured homes are required to meet specific UCC criteria as well.

Local governments have a number of options in administering the UCC. If a local government chooses to provide code services for residential structures (one- and two-family), the municipality must still provide for non-residential code services using the variety of options available to them. Under the regulations, if a local government chooses not to administer the UCC, that municipality will no longer have the right to issue building permits. In that case, a contractor or building owner would have to retain a certified third-party agency (for one- and two-family homes) or go to the Department of Labor and Industry (for all non-residential structures) to obtain a UCC construction permit, all necessary inspections and a certificate of occupancy. The municipality can "contract" with the Department of Labor and Industry to provide non-residential inspection and plan review services pending a mutually acceptable agreement and availability of personnel at the Department. A total of 53 of the 76 municipalities issue permits and have a building code that is based on the UCC code. Six municipalities do not issue permits or perform UCC functions. They include: Jeddo, New Columbus, and Warrior Run

Boroughs and Ross, Union, and Conyngham Townships. The following list is a breakdown of the municipal functions with regard to building code:

- Municipality issues permits; separate entity performs UCC function – 3 municipalities
- Municipality issues permits; does not perform UCC function – 4 municipalities
- Municipality issues permits; building codes based on UCC codes – 53 municipalities
- Municipality does not issue permits but performs UCC functions – 3 municipalities
- Municipality issues permits but does not perform UCC functions – 3 municipalities
- Does not issue permits or perform UCC functions – 7 municipalities
- Did not report – 3 municipalities

Erosion and Sediment Control Regulations – Sediment and erosion control is administered by the Luzerne County Conservation District. For those municipalities that have their own subdivision ordinance regulations, the stormwater regulations are included in the subdivision ordinance. The level of enforcement of these regulations varies by municipality and is based on staff availability and technical capability. If a project requires a sediment and erosion control permit, a plan is required to be submitted.

Stormwater Management Regulations – The Luzerne County Act 167 General Stormwater Management Ordinance is included as an appendix to the County Land Development and Subdivision Ordinance. The Stormwater Management Ordinance applies to those watersheds within the County with officially adopted stormwater management plans, maps and model ordinances. The following activities are regulated by the stormwater management ordinance – land development, subdivision, diversion of a stream channel, installation of stormwater systems, earth disturbances greater than 30,000 square feet of total distributed area, and forest management operations. Each watershed in the county has specific regulations. Once Phase II hydrology studies are completed and adopted, any development that occurs within that watershed has to adhere to its specific standards of the designated Act 167 watershed.

Drainage Improvements – Drainage improvements are mostly conducted at the municipal level. The municipalities request new developers or the State (for DEP projects) to make drainage improvements. In the case of projects completed by the DEP, individual municipalities are required to provide right-of-way costs, relocation costs, and annual maintenance costs. All other costs are absorbed. Some drainage improvement projects are done at the regional level.

Luzerne County Emergency Operations Plan - February, 2004 – Luzerne County operates a separate 911 Center and an Emergency Operations Center (EOC). The 911 Center and the EOC have listings of resources available from County assets as well as resources available from the municipalities via mutual aid agreements for reciprocal emergency assistance as needed. The Emergency Operations Plan (EOP) mentions the most likely and damaging hazards for the county to be flooding, winter storms, and drought. Training and response checklists and other accompanying documents are based upon this assessment.

Most disasters and emergencies are handled by local responders. The County is called upon to provide supplemental assistance and coordination whenever the consequences of a disaster or emergency exceed local capabilities. If the disaster, emergency, or terrorism incident exceeds the capabilities of the County, the regional counterterrorism task force is requested to provide assistance in the form of specialized response teams. Additionally, the State (PEMA) will be requested to provide assistance. If needed, the State can mobilize an array of resources including specialized response teams, support personnel, and specialized equipment to support disaster or emergency affairs.

The Plan embraces an "all-hazards" principle: most emergency response functions are similar, regardless of the hazard, and the County Emergency Management Coordinator (EMC) will mobilize functions and personnel as required by the emergency situation. The Plan mentions that mitigation opportunities will be considered throughout disaster operations.

The EMC is entrusted with maintaining coordination with the local municipal emergency management officials and PEMA, and providing prompt information in emergencies, as available; identifying hazards and vulnerabilities that may affect the municipalities in coordination with the municipal EMAs; and identifying resources within the county that can be used to respond to a major emergency or disaster situation and requesting needed resources from the Commonwealth EMA. A detailed table of emergency responsibilities by organization entity (both primary and support functions) is included.

Evacuation Plans: The County currently does not have a formal evacuation plan. However, it does have a plan in place for route alerting and general sharing of evacuation orders. Municipalities handle evacuations similarly; i.e., route alerting and general sharing of evacuation orders. There are 19 towns that fall within the Emergency Planning Zone (EPZ) that have established evacuation routes for emergencies at the Susquehanna Steam Electric Station in Berwick, which can also be used for other hazards.

Shelters: A total of 44 shelters exist in the county that are designated and maintained by the Red Cross. The shelters are widely dispersed throughout the county. All shelters follow the Red Cross guidelines for shelters and shelter management.

6. Luzerne County Municipalities Document Review

Fairview Township Comprehensive Plan, July 2002 – Development within the Big Wapwallopen Creek watershed is regulated by the Wapwallopen Creek Watershed Stormwater Management Plan, under the Stormwater Management Act 167. Over 99 percent of all development in the Township has occurred in the Big Wapwallopen Creek watershed and is expected to continue in the foreseeable future, thereby increasing the potential for stream channel encroachments. The Plan states that it is imperative that the Creek's Stormwater management ordinance be followed and implemented. The Plan identifies existing problems and anticipated growth, and offers recommendations for managing stormwater flows from communities into the watershed.

The Plan identifies the following goal that addresses hazard mitigation planning principles: To prohibit development in extensive steep slope areas, wetlands, and other environmentally sensitive areas and areas adjacent to main streams. In areas where little or no development has occurred, the Plan recommends limiting development to low density; consideration of non-typical planning practices, and encouraging development on suitable land while leaving large tracts of sensitive landscapes untouched; and promoting higher density development in areas that have water and sanitary sewer service.

West Hazleton Borough Comprehensive Plan, 1994 – One of the Plan's goals is to achieve and ensure optimal positive environmental, social, economic, and fiscal consequences and impact of development. The Plan identifies a correlation between environmental conservation and recreation/park development in that all proposed open space and park systems integrate those environmentally sensitive areas (wetland, steep slopes, streams) unsuitable for development with parkland for public recreational use. The Plan also recommends revising the zoning ordinance to add a general environmental protection provision, including regulations regarding stream, wetlands, steep slopes and stormwater runoff management.

Bear Creek Township Comprehensive Plan Update, 1996 – The Plan includes the following objectives to conserve the Township's natural resources that address hazard mitigation principles:

1) Identify sensitive areas (wetlands, groundwater recharge areas, woodlands, steep slopes, poor soils and floodplains) and adopt regulations to protect such areas;
2) Maintain up-to-date standards in Township ordinances for stormwater control, soil erosion and sedimentation control and other environmental concerns; and
3) Consider the use of "open land" zoning to cluster residential development away from natural and cultural features and preserve the resulting open spaces.

The Plan advocates directing development away from environmentally sensitive areas and conserving large blocks of open land. The Plan contains a section that describes natural features, land suitability for development, and development concerns; and identifies geology, soils, slopes, wetlands, and the floodplain.

The Pennsylvania Municipalities Planning Code dictates that planning and development in contiguous municipalities, the county, and the region be considered when a local plan is adopted. The Township plan states that it is consistent with the County Comprehensive Plan and Land Use Plan and although the comprehensive plans of contiguous municipalities vary in content, all of the plans concentrate on land use issues and there are no significant inconsistencies between those plans and the Bear Creek Township Plan Update.

City of Pittston Floodplain Ordinance – 1985 – In accordance with the Pennsylvania Floodplain Management act and the regulations adopted by the Department of Community Affairs as required by the Act, any new or substantially improved structure used for the production or storage of dangerous materials or radioactive substances is prohibited in the floodway. Where permitted within the flood fringe district, they are required to be elevated up to 1.5 feet above the 100-year floodplain and designed to prevent pollution from the structure during the course of the 100-year flood.

City of Pittston Land Development and Subdivision Ordinance – 1999 – A stormwater management plan is required for all subdivision and development proposals. The rate of stormwater runoff from any proposed subdivision or land development is not allowed to exceed the rate of runoff prior to development. Prior to the commencement of any subdivision or land development, no changes in the contour of the land and no grading, excavating, removal or destruction of the topsoil, trees, or other vegetative cover of the land can commence until a plan for minimizing soil erosion and sedimentation is submitted to and approved by the City Council and reviewed by the Luzerne Soil Conservation District.

City of Pittston Stormwater Management Ordinance – 2005 – All regulated earth disturbance activities within the City are required to be implemented through 1) erosion and sediment control during the earth disturbance activities during construction; and 2) water quality protection measures after completion of earth disturbance activities after construction, including operations and maintenance. Best Management Practices (BMPs) used to meet the requirements are required to conform to the State Water Quality requirements.

Low impact development techniques are encouraged as they reduce the costs of complying with the requirements of the City Stormwater Management Ordinance and the State Water Quality Requirements. Regulated earth disturbance activities within the City are not allowed to

commence without a plan that demonstrates compliance with State Water Quality requirements after construction is complete.

Plymouth Township Floodplain Ordinance – 1997 – Within the floodplain, all new construction or substantial improvement of a residential structure is required to have the lowest floor (including basement) elevated to, or above, the regulatory flood elevation. The same applies for non-residential structures, or they could be designed and constructed so that the spaces enclosed remain essentially dry during any flood up to that height. The finished elevation of all new streets cannot be more than one foot below the regulatory flood elevation. Water heaters, furnaces, air conditioning and ventilating units and other electrical, mechanical equipment or apparatus are prohibited below the regulatory flood elevation. Manufactured homes are prohibited within the floodway.

Plymouth Township Land Development and Subdivision Regulations – 1993 – All stormwater retention/detention facilities are required to be designed to provide adequate control of all storms of a 24-hour duration and for frequencies of 2,10, 25, and 50 years. Changes made to the contour of the land (grading, excavating, removal, or destruction to the topsoil, trees or other vegetative cover) cannot commence until a plan to minimize erosion and sedimentation has been approved by the Township Engineer or the County Soil and Water Conservation District.

Landowners engaged in the alteration or development of land which may affect stormwater runoff characteristics are required to implement measures consistent with the provisions of the applicable watershed stormwater plan to ensure that the maximum rate of stormwater runoff is no greater after development than it was prior to development activity.

Jenkins Township Stormwater Management Ordinance – 2001 – Regulated earth disturbance activities cannot commence until an Erosion and Sediment Control Plan for construction activities is approved. Department of Environmental Protection regulations require an Erosion and Sediment Control Plan for any earth disturbance activity over 5,000 square feet.

Exeter Borough Zoning Ordinance – 1994 – All structures within the floodway are required to be flood-proofed to a minimum of 1.5 feet above the base flood elevation. Any non-residential structure having a lowest floor that is not elevated to at least 1.5 feet above the 100-year base flood elevation should be flood-proofed in accordance with the standards in the US Army Corps of Engineers Flood-proofing regulations.

All new construction or substantial improvement of residential and non-residential structures located completely or partially within the 100-year floodplain is required to be designed so that the lowest floor is elevated to a minimum of 1.5 feet above the base flood elevation.

Manufactured homes are required to be elevated so that the lowest floor of the home is 1.5 feet or more above the base flood elevation. Water heaters, furnaces, air conditioning and ventilating systems, electrical distribution panels and other mechanical equipment or apparatus are required to be elevated to a minimum of 1.5 feet above the base flood elevation.

Exeter Borough Subdivision Ordinance – 1994 – All proposed subdivisions and land developments which include construction, grading, excavation or any form of earth moving activities should provide for both temporary and permanent erosion and sedimentation facilities in conformance with the Erosion and Sedimentation Pollution Control Program Manual and submit an Erosion and Sediment Control Plan for review and approval.

Stormwater detention facilities are required to be used whenever the post-development runoff rate for each point of discharge exceeds the pre-development runoff rates unless the increase does not cause an overload of the downstream drainage system or significant increases in the flood levels in any downstream area. Storm detention basins are required to be designed to detain a 25-year frequency storm to pre-developed rates.

Chapter 3 – HAZARD IDENTIFICATION AND PROFILING

A risk assessment is a vital step in preparing a hazard mitigation plan and identifying appropriate mitigation actions. Included in the risk assessment are the identification of all hazards affecting the study area, profiling of hazards based on historical data including economic losses and affected areas, and a vulnerability assessment. This chapter focuses on the first two elements: hazard identification and hazard profiling. Chapter 4 comprises the vulnerability assessment, which focuses on the potential effects of each hazard on the study area.

RISK ASSESSMENT: *§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

A. Hazard Identification

Identifying Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction.*

In the past, Lackawanna and Luzerne Counties have been affected by a variety of natural hazards including floods, high winds, winter storms, tornadoes, wildfires, mine-related hazards (subsidence, minefires, and flooded mine problems), drought, and technological hazards such as hazardous material spills. Although some steps, such as the Wyoming Valley Levee System in Luzerne County and the Scranton/Olyphant Levee System in Lackawanna County, have been taken to protect the counties from disasters such as flooding, jurisdictions in both counties still remain vulnerable to these hazards.

The process of identifying hazards and their locations in the two counties involved a number of steps. Multiple sources were examined in order to comprehensively identify all potential hazards affecting the counties. These included the National Climatic Data Center (NCDC), Spatial Hazards and Events Losses Database for the U.S. (SHELDUS), United States Geologic Survey (USGS), Department of Conservation and Natural Resources (DCNR), Pennsylvania Department of Environmental Protection (DEP), PEMA Disaster History, and local newspaper archives, among others.

A workshop held on May 28, 2008, offered municipal representatives the opportunity to identify locations where hazards frequently occurred, and present issues regarding hazards in the area. Once the data was compiled, discussions with the Steering Committee and PEMA resulted in the following list of natural and technological hazards for review. These natural hazards include: 1) Flooding, 2) High Wind, 3) Winter Storms, 4) Mine-Related Hazards, 5) Drought, 6) Tornadoes, 7) Wildfires, 8) Landslides, and 9) Earthquakes. Technological hazards include: 10) Hazardous Material Release, 11) Nuclear Power Plant Failure and 12) Dam Failure. The following section provides descriptions of these hazards.

1. Flooding

Flooding occurs when stream capacities are exceeded due to large volumes of water developing from precipitation or from winter snow melt entering streams as surface runoff. Flooding can also occur from undersized culverts, bridges, or storm pipes that cannot accept the increased flow of water during storm events. This causes water to back up behind the structures and overtop the natural stream channel banks in what is referred to as the "backwater effect". Another form of flooding, flash flooding, occurs when a short duration intense rainfall event develops. Although the total amount of precipitation is often much less than standard 24-hour design storm (1-, 2-, 5-, 10-, 25-, 50-, and 100-year) precipitation depths, the precipitation falls in a short time period. This leads to intense surface runoff, and stream levels rise quickly in response to the runoff. The effects of flash flooding are exacerbated by increases in impervious surfaces from new developments.

Floods caused by ice jams also occur within the area along the main stems and tributaries of the larger rivers (Susquehanna River and Lackawanna River) in the counties. Ice jam flooding is comparable to flash flooding. The formation of ice jams causes water upstream to rise rapidly and, when the jam releases, sudden flooding occurs downstream. Ice jams occur during the fall, when ice begins to form; during mid-winter, when channels freeze solid and form anchor ice; and in the spring, when the breakup of surface ice results in large floating masses of ice. The force of impact from ice carried by floodwaters typically causes more damage to buildings, bridges, and other structures than ice-free flooding. Snowmelts typically occur between the months of January and April. As the temperature increases in spring months, snow begins to melt. Because the ground often remains frozen under the snow, it cannot absorb the water from the melt and large volumes of runoff are produced. Extreme flooding events occur during snowmelts when additional rainfall combines with the snowmelt runoff.

The two counties have experienced some of the worst flooding as the result of precipitation from tropical storms and hurricanes and from snowmelt events. Tropical storms and hurricanes occur between the months of June and November, with the peak season lasting from September to October. These storms bring torrential rains and high winds, and often cause flash flooding as well as overbank flooding of inland streams and rivers.

2. High Wind

High winds most frequently occur during intense storm events and hurricanes or tropical storms. Hurricanes and tropical storms form when warm ocean water supplies energy to a rotating storm system and typically occur between June and November. Hurricanes that affect northeastern Pennsylvania typically originate in the Atlantic Ocean or Gulf of Mexico. Pennsylvania is located far north and inland compared with the areas where hurricanes typically reach landfall. Since a hurricane needs warm sea water to keep its strength, once over land, it dissipates energy and will typically be downgraded to a tropical storm system before it reaches Pennsylvania since it is away from the coast. Even so, high winds could prevail and pose a significant threat to the two counties.

High winds can also develop from the general west to east movement of the jet stream, and as front systems move through the area. Although often less intense than hurricane force winds, winds developed by these storm systems or pressure systems occur more frequently.

3. Winter Storms

A variety of weather types and precipitation methods are associated with winter storms, the most typical of which is snowfall. A second type of winter precipitation is in the form of freezing rain which occurs in situations where a warm layer of air (above 32^{o} F) exists above a layer of air that is below freezing (less than 32^{o} F); precipitation will melt in the warm layer, become supercooled in the colder layer, and will freeze upon impact with the ground. Freezing rain is particularly dangerous because it is not clearly visible on road surfaces, and temperatures are typically not much lower than freezing near the ground, which creates a false impression that the precipitation is simply liquid rain. A third type of winter precipitation is sleet, which forms when rain freezes before it hits the ground.

Winter storms pose threats to the safety of people as well as infrastructure in the following ways:

1) exposure can lead to medical conditions such as frostbite, and can cause serious injury or loss of life;

2) disruptions in electrical/utility systems, transportation systems and business activities.

3) failure of power lines either directly by the weight or force of these conditions, or indirectly because of the higher demand for electricity during winter storm events;

4) prevent the delivery of fuel sources such as oil and propane for heating purposes when roads close or become too dangerous to drive on; and

5) could lead to an increase in traffic accidents and blocking of evacuation routes.

Winter weather leaves the two counties vulnerable not only during the winter months, but also has an effect on the upcoming spring months. After a season of snow and ice, spring thaw brings another threat of flooding to low lying lands in the counties.

4. Mine-Related Hazards

Both Lackawanna and Luzerne Counties have a history of mine-related hazards which include mine subsidence, mine flooding, mine fires, burning refuse piles from strip mining, and flooded strip mines with high walls. Of these mine-related issues, the most common is mine subsidence; the unpredictability of which also makes it the most dangerous.

Mine subsidence is movement of the ground surface as a result of the collapse or failure of underground mine workings. In active underground mining operations that use longwall mining or high extraction pillar recovery methods and where full extraction takes place, subsidence can occur concurrently with the mining operation in a predictable manner. In abandoned mines where rooms and unmined coal pillars are often left in various sizes and patterns, it may be impossible to predict if and when subsidence would occur. Mine subsidence resulting from abandoned room and pillar mines can generally be classified as either sinkhole subsidence or trough subsidence. Significant flood events can also cause mine subsidence to occur in areas with a history of mining.

Sinkhole subsidence occurs in areas overlying underground mines that are relatively close to the ground surface. This type of subsidence is fairly localized in extent and is usually recognized by an abrupt depression evident at the ground surface as overburden materials collapse into the mine void. Sinkhole subsidence is perhaps the most common type of subsidence that occurs, and has been responsible for extensive damage to many structures in Pennsylvania throughout the years. Sinkhole subsidence often occurs after a flood event, when stormwater enters the mines more rapidly. The rapid flow of stormwater into the mines compromises the geologic stability of the surrounding mine voids, and builds pressure internally in the mine. When water discharges from the mine, the pressure decreases inside the mine, and the above ground surface subsides from the reduced support. This subsidence can occur gradually after many storm events, or rapidly from just one event.

Note: Acid mine drainage, which is the contamination of water sources due to mine discharges, is regulated by the Environmental Protection Agency (EPA) and is not addressed as a hazard in this Plan.

5. Drought

Drought is the result of a natural reduction in precipitation expected to fall over a period of time. The *Commonwealth of Pennsylvania Multi-Hazard Identification and Risk Assessment July 2000* identifies three categories of drought:

1) A *meteorological drought* occurs when there is a deficiency in atmospheric moisture. Depending on pre-drought conditions, a meteorological drought typically has little effect on crops or water resources.

2) A more serious drought is an *agricultural drought*, which occurs when the lack of sufficient moisture starts to inhibit crop growth.

3) Should an agricultural drought last on the order of months, a *hydrologic drought* can develop.

In the same way that rainfall events are characterized by their return frequencies, the intensity of droughts is also measured by a return period. As a 25-year rainfall event has a 4 percent (1/25) chance of occurring in any given year, a 25-year drought also has a 4 percent probability of occurring in that same year. The level of intensity increases as the return period lengthens (i.e., a 100-year drought is more intense than a 10-year drought).

The hydrologic drought is the most devastating of the three types, as water resources can become significantly depleted and crops can be greatly damaged.

6. Tornadoes

A tornado is defined as a rapidly rotating vortex or funnel of air extending toward the ground from a cumulonimbus cloud. Although the classic image of a tornado is a dust and material laden funnel, tornadoes are not always seen before they reach the ground as they are simply air currents that develop horizontally in pressure systems, and twist vertically toward the ground when an instability or obstruction forces them earthward. This makes tornadoes especially dangerous because they are not always visible. Smaller than a tornado, a “microburst” can occur during thunderstorms and other weather systems where relatively high winds prevail. A

microburst is basically a small tornado that does not quite reach tornado status because it has lower wind speeds and does not last for an extended period of time.

Tornadoes often occur during the warmest periods of the day, but can form at any time and rarely last more than 30 minutes. A typical tornado moves at speeds between 30-125 miles per hour (mph) with internal winds of as much as 300 mph. The damage swaths vary greatly in size and can be as long as several hundred miles and over a mile in width.

Tornadoes are classified according to the Fujita scale which is based on wind speed. Until recently, the Fujita scale used estimated wind speeds based on observed damages alone, and resulted in an overestimation of the actual wind speeds for the different category tornadoes. To correct this, the Enhanced Fujita (EF) Scale was developed in 2006. The EF scale takes into account 28 different degrees of damages and applies these to various structure types. There are six categories of tornadoes with the weakest labeled as EF0 and the most intense as EF5 (see **Table 3.1**), as compared to the previous categories F0 through F5. The EF scale offers revised wind speed ranges while maintaining the damage descriptions and the damage levels.

Table 3.1: Enhanced Fujita Scale

Category	Wind Speed (mph)	Damage Level	Type of Damage Done
EF0	65-85	Light	Some damage to chimneys; breaks branches off trees.
EF1	86-110	Moderate	Peels surface off roofs; mobile homes pushed off foundations or overturned.
EF2	111-135	Considerable	Roofs torn off frame houses; mobile homes demolished; large trees snapped or uprooted.
EF3	136-165	Severe	Roof and some walls torn off well-constructed houses; trains overturned; most trees uprooted.
EF4	166-200	Devastating	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	>200	Incredible	Strong frame houses lifted off foundations; automobile sized missiles carried in excess of 100 meters; steel reinforced concrete structures badly damaged.

Source: http://www.tornadoproject.com/alltorns/patorn.htm

7. Wildfires

Wildfires occur as a result of human negligence, lightning strikes, prolonged droughts and dry conditions or, in rare cases, by spontaneous combustion. Wildfires typically occur in more rural areas or in agricultural areas that contain a high concentration of shrub-like vegetation. The two counties are most susceptible to wildfires during hot, dry weather.

Wildfires pose a safety risk to humans and can also kill wildlife and livestock. Wildfires have environmental consequences as well, such as the destruction of woodlands, severe erosion, streambed siltation, and even flooding as the vegetation that helps to reduce surface runoff from rainfall is destroyed. They also pose the threat of damage to property and are most dangerous in locations where forest and open grassland are adjacent to residential or urban areas.

8. Landslides

Landslides occur due to a variety of geologic instabilities in the Earth's crust. However, the primary cause of landslides is when colluvial (loose) soil and old landslide debris on steep slopes give way. The geologic instabilities that cause landslides are often exacerbated by highway projects in which the earth is cut and soil is loosened. Other primary culprits of landslides are rainfall or rain-on-snow events that can weaken debris on steep mountain slopes. Given the right conditions, landslides can occur anywhere in the counties as the geologic formations are consistent in both counties.

Most of the damage caused by landslides is to transportation routes, utility systems, and structures, but the side effects such as traffic delays and clean-up can greatly accumulate. A 1991 estimate from the Pennsylvania Department of Transportation (PennDOT) states that approximately $10 million is needed on an annual basis for highway repair work associated with landslides. Direct deaths or injuries from landslides have not been a common occurrence in Pennsylvania; however, in instances where landslides form as a result of highway cutting, deaths have occurred from rock falling on vehicles. Casualties can also arise from rainfall and snowmelt-induced debris flows. As residential and recreational development increases on and near steep mountain slopes, the hazard from these rapid events will also increase.

The following excerpt from the Pennsylvania DCNR illustrates the side effects that landslide hazards can cause: "One small landslide in 1990 that involved a broken petroleum pipeline is an extreme example of the costs of related damages. Spilled petroleum products entered a major river, causing city water systems to shut down. The identified costs of repair of this landslide damage, clean-up of the spill, technical investigations, legal and court costs and environmental fines were approximately $12 million. The incalculable costs include: lost productivity while people stayed at home because their businesses were closed or to care for children normally in schools that were closed due to lack of water supply, costs for the National Guard to deliver water to neighborhoods, and costs to the pipeline company and its customers due to business loss for several months. Although this example is extreme, 'associated damages' such as this occur with many landslides." (Source: http://www.dcnr.state.pa.us/topogeo/hazards/slidecost.aspx.)

9. Earthquakes

Earthquakes are the result of sudden releases of energy in the Earth's crust. These energy releases and the resulting movement of the ground surface create seismic waves. The

magnitude of an earthquake was traditionally measured by the now obsolete Richter scale. Earthquake intensity is now more frequently measured by the modified Mercalli scale, which utilizes 12 categories ranging from I – Instrumental (felt by few people) to XII – Catastrophic.

Earthquakes result from the generation of seismic waves in the Earth's surface. Earthquakes are most commonly caused by geological fault rupture, gas migration (typically methane deep within the earth) through the Earth's crust, volcanic activity, landslides, mine blasts, and nuclear experiments.

The main effects of earthquakes are shaking and ground rupture. These can often result in damage to buildings or other rigid superstructures on the Earth's surface, depending on several factors which control the local effects of an earthquake. These factors include the earthquake magnitude, the distance of the local area to the earthquake epicenter, and the local geological and geomorphological conditions (conditions that either intensify or reduce the earthquake effects).

In northeast Pennsylvania, including Lackawanna County and Luzerne County, the cause of earthquakes is still being researched. A likely explanation is the "pre-existing zones of weakness" model, in which the cause of earthquakes in the northeast U.S. is the failure of old fault lines created millions of years ago. It remains incredibly difficult to predict when and where an earthquake will occur in the northeast U.S. and Pennsylvania.

10. Hazardous Materials Release

Hazardous materials are defined as "any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors." (Source: Institute of Hazardous Materials Management.) A hazardous material can be released into the environment from a variety of sources. Most often, the source is from vehicular accidents involving transportation of the hazardous materials. Other sources include the unintentional release from production facilities, and negligence. These types of unintentional releases are often through stored material being leaked into groundwater or surface water systems when storage containers corrode over time.

Impacts of hazardous material releases are health related issues due to contaminated air or water sources.

11. Nuclear Power Plant Failure

Although the most notable occurrence was the Three Mile Island incident in Middletown, PA in 1979, there is a history of accidents and accidental releases due to various component failures in plants throughout the U.S. Most often, an accidental release of radioactive material occurs when contaminated water or steam is leaked either directly from the facility or from storage containers that are mishandled.

The only nuclear power plant in the two counties is the Susquehanna Steam Electric nuclear facility near Shickshinny, Luzerne County. This facility is powered by a boiling water reactor (BWR) characterized by two-phase flow (water and steam) in the upper part of the reactor core. This type of system is notably one of the safest nuclear power systems, and component failures in any part of the system will automatically shut down the plant.

The failure of a nuclear power facility can result in devastating and far-reaching effects. Problems and health effects from nuclear power failure are from the high levels of radioactive material that are used or produced during the power generation process.

12. Dam Failure

Dam failure typically occurs when a large storm event creates surface runoff that exceeds the storage capability of an impoundment, which causes a dam to be overtopped by the excess water (i.e., weir flow). Typically, spillways are designed to pass flow rates between the 100-year 24-hour storm event and the full Probable Maximum Flood (PMF); therefore, a storm larger than these events would be required to develop enough runoff to cause prolonged overtopping. When the impoundment is an earthen dam, the prolonged overtopping and weir flow can cause erosion in the earthen portion of the dam. That erosion will become accelerated by higher flows that begin to discharge the steadily enlarging opening in the dam. The compound effect of higher flows causing increased erosion, resulting in higher flows, means that a very large amount of water can discharge from the reservoir during a dam breach. Depending on the area and size of the channel overbanks, the overtopping and breaching of dams can flood structures in a very wide path.

Dam breaches result in flood waves that often flood the downstream channel to a greater extent than the 100-year flood. This can cause significant destruction to residential and commercial areas.

B. Hazard Profiling

Profiling Hazards
Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

This section of the Plan discusses the above mentioned hazards in detail. For each hazard, a historical account of the hazard and a probability description of future occurrences are included. For the hazards that have more detailed historic accounts, the history of the hazard includes a description of the severity of the hazard in terms of losses to property, loss of life, and economic values for the incurred damages. The May 2008 workshop provided municipal representatives the opportunity to map locations and provide descriptions of local hazards. These maps are included in the Map Section at the end of Chapter 4.

Table 3.2 lists the Gubernatorial and Presidential declarations of emergencies that have been issued for the counties in the past 50 years.

Table 3.2: Presidential and Gubernatorial Declarations of Emergencies

Date of Hazard	Type of Hazard	Affected Area	Type of Declaration
Aug 1955	**Flood (Diane)**	Northeastern counties	Presidential
Jan 1959	**Mine Flood**	Luzerne (Pittston)	Presidential; Gubernatorial
Aug 1962	**Refuse Bank Fire**	Luzerne (Plymouth)	Gubernatorial
Jan 1966	**Heavy Snow**	Statewide	Gubernatorial
Feb 1972	**Heavy Snow**	Statewide	Gubernatorial
Jun 1972	**Flood (Agnes)**	Statewide	Presidential; Gubernatorial
Feb 1974	**Truckers Strike**	Statewide	Gubernatorial
Oct 1976	**Flood**	Lackawanna; Luzerne	Presidential; Gubernatorial
Jan 1977	**Gas Shortage/ Severe Winter Weather**	Luzerne	Presidential; Gubernatorial
Jan 1978	**Heavy Snow**	Statewide	Gubernatorial
Feb 1978	**Blizzard**	Statewide	Gubernatorial
Nov 1980	**Drought**	Lackawanna; Luzerne	Gubernatorial
Sep 1985	**Flood**	Lackawanna; Luzerne	Presidential; Gubernatorial
Sep 1985	**Flood**	Lackawanna; Luzerne	SBA - Physical Disaster Loans & Economic Injury Disaster Loan
Jan 1988	**Fire**	Luzerne	SBA - Physical Disaster Loans & Economic Injury Disaster Loan
Mar 1993	**Blizzard**	Statewide	Presidential; Gubernatorial
Jan 1994	**Severe Winter Storms**	Statewide	Presidential; Gubernatorial
Jan 1996	**Flooding**	Statewide	Presidential; Gubernatorial
Apr 1997	**Snowstorm**	Lackawanna; Luzerne	Gubernatorial
Sep 1999	**Hurricane Floyd**	Statewide	Presidential; Gubernatorial
Aug 2003	**High Winds and Heavy Rains**	Lackawanna	Presidential; Gubernatorial
Sep 2003	**Hurricane Isabel/Henri**	Statewide	Gubernatorial
Sept 2004	**Flooding**	Lackawanna; Luzerne	Gubernatorial
Apr 2005	**Flooding and Mudslides**	Lackawanna; Luzerne	Presidential; Gubernatorial
June 2006	**Flooding**	Lackawanna; Luzerne	Gubernatorial
Nov 2006	**Severe Storms and Flooding**	Lackawanna; Luzerne	SBA - Physical Damage and Economic Injury
Nov 2006	**Flooding**	Lackawanna; Luzerne	Presidential; Gubernatorial
Dec 2006	**Severe Storms and Tornadoes**	Lackawanna; Luzerne	SBA - Physical Damage and Economic Injury
Feb 2007	**Severe Winter Storm**	Statewide	Gubernatorial
Apr 2007	**Severe Winter Storm**	Statewide	Gubernatorial
Aug 2007	**Hail**	Luzerne	SBA - Economic Injury

Source: Pennsylvania Emergency Management Agency

1. Flooding

Location

All municipalities in Lackawanna County and Luzerne County have experienced flooding. Some municipalities are more prone to frequent flood events (smaller events such as the 1-year and 2-year storms) due to inadequate flood control measures, or development adjacent to streams. Based on the *2008 Luzerne County Act 167 Phase I Stormwater Management Plan* several municipalities reported flooding incidents. These municipalities include Avoca Borough, Conyngham Borough, Dorrance Township, Duryea Borough, Exeter Borough, Exeter Township, Fairmount Township, Hanover Township, Hunlock Township, Kingston Borough, Kingston Township, Lake Township, Luzerne Borough, Nuangola Borough, Rice Township, Sugarloaf Township, Swoyersville Borough, Warrior Run Borough, West Wyoming Borough, Wilkes-Barre Township, and Wright Township.

The Scranton-Abington Planning Association (SAPA) comprises eleven municipalities in Lackawanna County. A Comprehensive Plan for these communities was prepared in 2008 that identified flooding issues. The municipalities include Abington Township, Clarks Green Borough, Clarks Summit Borough, Dalton Borough, Dunmore Borough, Glenburn Township, Newton Township, North Abington Township, Scranton City, South Abington Township, and West Abington Township.

The following municipalities in Lackawanna County reported flooding incidents at the May 2008 workshop, and some of them identified specific locations that had experienced flooding problems: Archbald Borough, Benton Township, Blakely Borough, Carbondale Township, Clarks Summit Borough, Dalton Borough, Fell Township, Glenburn Township, Greenfield Township, Jermyn Borough, Jessup Borough, Laplume Township, Moosic Borough, North Abington Township, Scott Township, South Abington Township, Springbrook Township, Thornhurst Township, and West Abington Township.

A number of municipalities in Luzerne County reported flooding problems at the May 2008 workshop: Avoca Borough, Bear Creek Township, Bear Creek Village Borough, Black Creek Township, Butler Township, Conyngham Borough, Dallas Township, Dennison Township, Exeter Borough, Exeter Township, Freeland Borough, Hanover Township, Huntington Township, Laflin Borough, Nescopeck Borough, Nescopeck Township, Newport Township, Nuangola Borough, Plymouth Township, Rice Township, Salem Township, Shickshinny Borough, Slocum Township, West Pittston Borough, Wilkes-Barre City, Wilkes-Barre Township, and Wright Township.

A map of the issues documented at the May 28, 2008 workshop for Lackawanna County and Luzerne County, and the flooding issues reported during the Luzerne County Act 167 Phase I Stormwater Management Plan and the SAPA Comprehensive Plan, are provided in the Map Section at the end of Chapter 4.

In an attempt to control flooding on the Susquehanna River in Luzerne County, the United States Army Corps of Engineers (USACOE) constructed the Wyoming Valley Levee System in the 1980s. The height of the levee was raised from the 100-year flood to 'Agnes level protection' in recent years. Although the levee raising project helped to alleviate some of the problems associated with flooding along the Susquehanna River, several tributaries are still vulnerable to flooding in the two counties. A similar levee system is currently being constructed along the

Lackawanna River in Olyphant Borough/Scranton City, Lackawanna County. The majority of this levee system has been built; only the lower Greenridge portion remains.

Wyoming Valley Levee System at Outlet of
Abrahams Creek in West Wyoming Borough, Luzerne County

The Wyoming Valley Levee System protects Susquehanna River communities from flooding in Luzerne County; however, interior drainage issues continue to cause flooding in communities without pump stations or flood control systems. Exeter Borough does not have a County-operated pump station, and flooding occurs in the Borough behind the levee when the Susquehanna River is high. Furthermore, the levee is not continuous throughout Luzerne County, and there are communities that are not protected against river flooding. Both Jenkins Township and Shickshinny Borough contain structures that are flooded by the Susquehanna River during low to moderate flood events (i.e. 2-year and 5-year river elevations).

In Lackawanna County, a levee system was constructed through Olyphant Borough and Scranton City along the Lackawanna River by the USACOE. As of 2008, portions of the levee system through Scranton were still being constructed. Similar to the Wyoming Valley Levee System, the Olyphant Borough/Scranton City levee system is not continuous. A levee was not constructed on the east side of the Lackawanna River through portions of Scranton City. Some communities in Scranton City remain exposed to flooding from the Lackawanna River.

Previous Occurrences and Extent (Severity and Frequency)

Tropical Storm/Hurricane Agnes (June 1972) is an example of a severe storm that caused a record flood along the Susquehanna River. Tropical Storm Agnes hit Pennsylvania in June after an earlier rainfall had saturated the ground. Agnes brought as much as 18 inches of rain. The River peaked at 40.91 feet, 18.9 feet above flood stage, at Wilkes-Barre, recording a maximum discharge of 345,000 cfs. Most communities along the river experienced severe flooding and damage. In September 2004, Hurricane Ivan brought significant amounts of rainfall and caused flooding in the two counties. The Susquehanna River reached a peak stage of 34.96 feet.

The most recent severe flooding event in Luzerne County occurred between June 23 and June 28, 2006. Four days of rainfall brought intense flooding to the county. Although the Susquehanna River did not overtop the levee, the predicted flood elevation forced the evacuation of several communities in Luzerne County.

One of the most severe flood events in Lackawanna County occurred in 1985, which was the impetus for the construction of the Olyphant Borough/Scranton City levee system. Although the flood was strictly along the main stem of Lackawanna River, and did not result in significant economic losses, the river peaked at 16.49 feet at the Old Forge stream gauge, which prompted officials to construct a levee to mitigate future events.

In Lackawanna County, flooding events in the last 50 years resulted in $112 million ($162 million in 2008 dollars). The highest amount of flood hazard damages in Lackawanna County occurred in 2006: $55.0 million ($57.8 million in 2008 dollars). In Luzerne County, flooding events in the last 50 years resulted in $787 million ($3.02 billion in 2008 dollars). The highest amount of flood hazard damages in Luzerne County occurred in 1972: $539 million ($2.73 billion in 2008 dollars). Bar charts showing the total flood related damages by year for Lackawanna County and Luzerne County over the past 50 years are included in the Appendix. (Source: National Climatic Data Center (NCDC) and SHELDUS.)

Future Probability

The U.S. Army Corps of Engineers developed a Flood Warning Response System which allows for the inundation area of the Susquehanna River to be plotted for various flood frequencies and river elevations. **Table 3.3** displays the return frequency, corresponding probability, and river elevation at the Wilkes-Barre stream gauge. A similar analysis was performed on the Lackawanna River at Old Forge using USGS stream gauge data. **Table 3.4** displays the results.

Table 3.3: **Susquehanna River Elevations at Wilkes-Barre Stream Gauge and Corresponding Annual Probability**

Return Period	Annual Probability	River Depth (ft)	River Elevation at Wilkes-Barre
2-Year	50%	22.54	533.4
5-Year	20%	26.14	537.0
10-Year	10%	28.44	539.3
25-Year	4%	32.14	543.0
50-Year	2%	34.84	545.7
100-Year	1%	37.74	548.6
200-Year	0.5%	40.24	551.1
500-Year	0.2%	44.94	555.8

Table 3.4: **Lackawanna River Elevations at Old Forge Stream Gauge and Corresponding Annual Probability**

Return Period	Annual Probability	River Depth (ft)	River Elevation at Old Forge
2-Year	50%	8.2	603.46
5-Year	20%	11.2	606.46
10-Year	10%	12.8	608.06
25-Year	4%	15.5	610.76
50-Year	2%	17.9	613.16
100-Year	1%	20.8	616.06
200-Year	0.5%	24.2	619.46
500-Year	0.2%	29.6	624.86

Flooding on smaller streams in the two counties can vary greatly between water courses depending on the terrain, channel geometries, soil type, and other hydrologic parameters. Therefore, independent hydrologic studies would need to be performed to determine flood stages and flood flows for the various return frequency storms on smaller streams, and probabilities were not determined for this Plan. Based on the historic data, however, it is clear that municipalities traversed by smaller streams experience flooding from smaller more frequent storms compared to larger storms that affect the major rivers in the two counties.

2. High Wind

Location

High winds can affect any part of the two counties and are not location specific. However, stronger winds typically occur on the mountain ridges surrounding the Susquehanna River and Lackawanna River valleys. All municipalities in Lackawanna County reported a minimum of 33 occurrences of wind related damages in the past 50 years (Source: NCDC and SHELDUS). Scranton City experienced the highest number of historic wind events; 46 incidents resulted in damages. All municipalities in Luzerne County reported a minimum of 66 occurrences of wind related damages in the past 50 years (Source: NCDC and SHELDUS). Wilkes-Barre City experienced the highest number of historic wind events; 75 incidents resulted in damages. One municipality, Freeland Borough in Luzerne County, reported two severe wind events in the last 25 years.

Previous Occurrences and Extent (Severity and Frequency)

In Lackawanna County, wind events in the last 50 years resulted in $3.44 million ($7.46 million in 2008 dollars). The highest dollar value in wind damage in Lackawanna County occurred in 1999: $0.86 million ($1.10 million in 2008 dollars). In Luzerne County, wind events in the last 50 years resulted in $4.59 million ($8.72 million in 2008 dollars). The highest dollar value in wind damage in Luzerne County occurred in 1999: $0.88 million ($1.11 million in 2008 dollars). Bar charts showing the total wind related damages by year for Lackawanna County and Luzerne County over the past 50 years are included in the Appendix (Source: NCDC and SHELDUS).

Future Probability

Taking the average recurrence interval from the historic data, high winds occur and result in damages in the two counties annually. Therefore, the probability of a high wind event resulting in damages occurring in any given year is 100 percent. The average annual economic loss is approximately $200,000 (in 2008 dollars), based on the damages reported in the past 50 years.

3. Winter Storms

Location

Winter storms have affected all municipalities in the two counties in the past and are therefore considered a regional hazard. Although winter storms are a regional hazard, the following municipalities in Luzerne County reported issues with winter storms relating to road closures: West Hazleton Borough I-81 and I-80 road closures, and Wright Township S.R. 309 road closures.

Previous Occurrences and Extent (Severity and Frequency)

In Lackawanna County, winter storms in the last 50 years resulted in $1.84 million ($3.06 million in 2008 dollars). The highest amount of winter storm related damages in Lackawanna County occurred in 1994: $0.77 million ($1.10 million in 2008 dollars). In Luzerne County, winter storms in the last 50 years resulted in $5.21 million ($6.96 million in 2008 dollars). The highest amount of wind hazard damages in Luzerne County occurred in 2003: $2.90 million ($3.34 million in 2008 dollars). Bar charts showing the total winter storm related damages by year for Lackawanna County and Luzerne County over the past 50 years are included in the Appendix (Source: NCDC and SHELDUS).

Future Probability

Taking the average recurrence interval from the historic data, winter storms occur and result in damages in the two counties on a 2-year frequency. Therefore, the probability of a winter storm event resulting in damages occurring in any given year is 50 percent. The average 2-year economic loss is approximately $300,000 (in 2008 dollars), based on the damages reported in the past 50 years.

4. Mine-Related Hazards

Location

The number of abandoned mine lands in the two counties is high, as the level of mining activity has steadily decreased in the counties. In Lackawanna County, 14 municipalities have experienced incidents of underground mine subsidence in the past. These include Archbald Borough, Blakely Borough, Carbondale Township, Carbondale City, Dickson City Borough, Dunmore Borough, Fell Township, Jermyn Borough, Jessup Borough, Mayfield Borough, Olyphant Borough, Scranton City, Taylor Borough, and Throop Borough. Underground mine fires have occurred in Carbondale Township, Carbondale City, Olyphant Borough, Scranton City, and Throop Borough. Only underground mine fires in two municipalities continue to burn: Carbondale City and Olyphant Borough. It is difficult to delineate the exact boundary of the

flooded pool underlying the Lackawanna River and Susquehanna River valleys; however, it is estimated the pool extends from Carbondale City in Lackawanna County south to Nanticoke City in Luzerne County, a great portion of the pool underlying Scranton City and Old Forge Borough in Lackawanna County.

In Luzerne County, 26 municipalities have experienced underground mine subsidence incidents in the past. These include Avoca Borough, Conyngham Township, Courtdale Borough, Duryea Borough, Edwardsville Borough, Exeter Borough, Forty Fort Borough, Foster Township, Hanover Township, Hazleton City, Jenkins Township, Kingston Borough, Laurel Run Borough, Nanticoke City, Newport Township, Pittston City, Pittston Township, Plains Township, Plymouth Borough, Plymouth Township, Swoyersville Borough, West Pittston Borough, West Wyoming Borough, Wilkes-Barre Township, Wilkes-Barre City, and Wyoming Borough. Historically, Pittston City has experienced some of the most problems with mine subsidence in Luzerne County. Underground mine fires have occurred in Hanover Township, Hazleton City, Laurel Run Borough, Newport Township, and Wilkes-Barre Township, of which the mine fires in Laurel Run Borough and Wilkes-Barre Township, and in Newport Township continue to burn. In 1959, mining operations dug within six feet of the Susquehanna River in Jenkins Township near Pittston City. Known as the Knox Mine Disaster, the flooded underground mines affected, and have resulted in a flooded mine pool, in the following municipalities: Duryea Borough, Edwardsville Borough, Exeter Borough, Forty Fort Borough, Hanover Township, Jenkins Township, Kingston Borough, Larksville Borough, Luzerne Borough, Nanticoke City, Pittston City, Plains Township, Plymouth Township, Plymouth Borough, Pringle Borough, Swoyersville Borough, West Pittston Borough, West Wyoming Borough, Wilkes-Barre City, and Wyoming Borough. This flooded mine pool is connected to the aforementioned mine pool in Lackawanna County and extends through most of the Susquehanna River valley south to Nanticoke City.

The following municipalities reported mine related issues: in Lackawanna County – Archbald Borough, Abington Township, Carbondale City, and Jermyn Borough; and in Luzerne County – Black Creek Township, Butler Township, Freeland Borough, Laflin Borough, Plains Township, Wilkes-Barre City, and Wright Township.

Previous Occurrences and Extent (Severity and Frequency)

Limited data is available concerning the economic losses resulting from the subsidence incidents in the two counties. The Knox Mine Disaster of 1959 (Luzerne County) resulted in the death of 12 miners and left 7,500 miners unemployed, depriving the County of a total annual economic value of $35 million (Source: www.minecountry.com).

Future Probability

Predicting when and where a mine will collapse or a fire will develop without geologic monitoring is difficult. Quite often, underground mine subsidence occurs after a flood, when flood waters infiltrate into the mine and discharge after the flood, leaving the above ground unstable. In this way, the probability of mine collapse can be linked to the frequency of flooding in mine areas. Those mines within the 100-year floodplain can be reasonably assumed to have a 1 percent annual chance of experiencing subsidence (a 100-year flood has a 1/100 = 1 percent chance of occurring in any given year). A map of abandoned mine lands and 100-year floodplain is provided in the Map Section at the end of Chapter 4.

5. Drought

Location

Drought is considered a regional hazard and has affected both counties in the past. Although drought hazards are regional, Nuangola Borough in Luzerne County reported issues with wells going dry during the 1991 drought (from the May 2008 workshop).

Previous Occurrences and Extent (Severity and Frequency)

Although dry periods characterized as summer droughts have occurred in the past 50 years, the most significant droughts that resulted in economic losses have occurred in the two counties in the last 20 years. The most significant drought occurred in 1991, and affected both counties. Economic losses totaled $25.1 million between the two counties ($39.0 million in 2008 dollars). Other significant droughts affecting water supply systems and agriculture occurred in 1988 and 1999. The total economic loss due to drought in the two counties over the past 20 years is $30.4 million ($47.0 million in 2008 dollars). A bar chart showing the damages due to drought by year for the two counties is included in the Appendix (Source: NCDC and SHELDUS).

Future Probability

Drought probability is calculated in a similar manner to flooding probability. The probability of a drought occurring in any given year is the inverse of the return period. Therefore, a 25-year drought has a 1/25 = 4 percent chance of occurring in any year. Based on the historical data over the past 20 years, it was determined that the frequency of drought resulting in damages is approximately three years. The average 3-year economic loss including the 1991 drought data is approximately $9 million (in 2008 dollars) for the two counties. Taking the 1991 drought data as an outlier, the average 3-year economic loss for the two counties is approximately $3 million (in 2008 dollars).

6. Tornadoes

Location

In the past 50 years, the paths of tornadoes have passed through all municipalities in the two counties. Additional tornadoes were reported in Lackawanna County by Elmhurst Township, Laplume Township, and Old Forge Borough (Source: NCDC and SHELDUS). Additional tornadoes were reported in Luzerne County by Bear Creek Township, Dallas Township, Duryea Borough, Hollenback Township, Pittston Township, and Wright Township (Source: NCDC and SHELDUS).

Previous Occurrences and Extent (Severity and Frequency)

In Lackawanna County, tornadoes in the last 50 years resulted in $0.50 million ($0.66 million in 2008 dollars). The highest amount of tornado related damages in Lackawanna County occurred in 1998: $0.48 million ($0.62 million in 2008 dollars). In Luzerne County, tornadoes in the last 50 years resulted in $1.68 million ($2.66 million in 2008 dollars). The highest amount of tornado hazard damages in Luzerne County occurred in 2006: $1.10 million ($1.16 million in 2008 dollars). Although damages were not reported with the NCDC, tornadoes were said to have developed in December 2007 in parts of western Luzerne County. Bar charts showing the total

tornado related damages by year for Lackawanna County and Luzerne County over the past 50 years are included in the Appendix (Source: NCDC and SHELDUS)

Future Probability

Tornadoes can occur at any time and at any place as long as atmospheric conditions are correct. The history of tornadoes in the Luzerne County shows that on average, every three years a significant tornado has developed that has resulted in damage (source: NCDC and SHELDUS); the most recent major tornado event occurred in 2006. Tornadoes appear to develop less frequently in Lackawanna County; the most recent major tornado event occurred in 1998. The average 3-year economic loss due to tornadoes in Luzerne County is approximately $120,000. Although the location or time that a tornado will develop is incredibly difficult to predict due to the chaotic nature of the phenomena that cause these hazards, it can be expected that Luzerne County will experience another significant tornado event within three years. Limited historical trends of tornadoes in Lackawanna County make it difficult to estimate the return period of tornadoes. Therefore, a conservative estimate of three years is used as the frequency for tornadoes in Lackawanna County.

7. Wildfires

Location

Wildfires typically occur in forest land and open grasslands or meadows. An analysis conducted by NOAA for wildfires in Pennsylvania between 1983 and 2001 revealed that 16 wildfires with sizes of 100 acres or greater occurred in Lackawanna County, and 25 wildfires with sizes of 100 acres or greater occurred in Luzerne County in that time period. **Table 3.5** summarizes the data by municipality and the number of fires based on acreage burned.

Recent wildfires in Luzerne County were reported in Bear Creek Township and Pittston Township (2006); Bear Creek Township, Jenkins Township, Newton Township and Duryea Borough (2005); and Exeter Borough, Pittston Township, and Crystal Lake (2004). Recent wildfires in Lackawanna County were reported in Scranton City, South Abington Township, and Taylor Borough (2006). These fires were cited in the Scranton Times and the Wilkes-Barre Times Leader. Wildfires incidents were reported by Dennison Township, Fairview Township, and Wright Township in Luzerne County; and Archbald Borough in Lackawanna County.

Previous Occurrences and Extent (Severity and Frequency)

Economic losses are not available for the wildfires cited above. However, the extent of the wildfires in terms of acreage burned was reported; reference **Table 3.5** for this data, and **Figure 3.1** for the corresponding map.

Future Probability

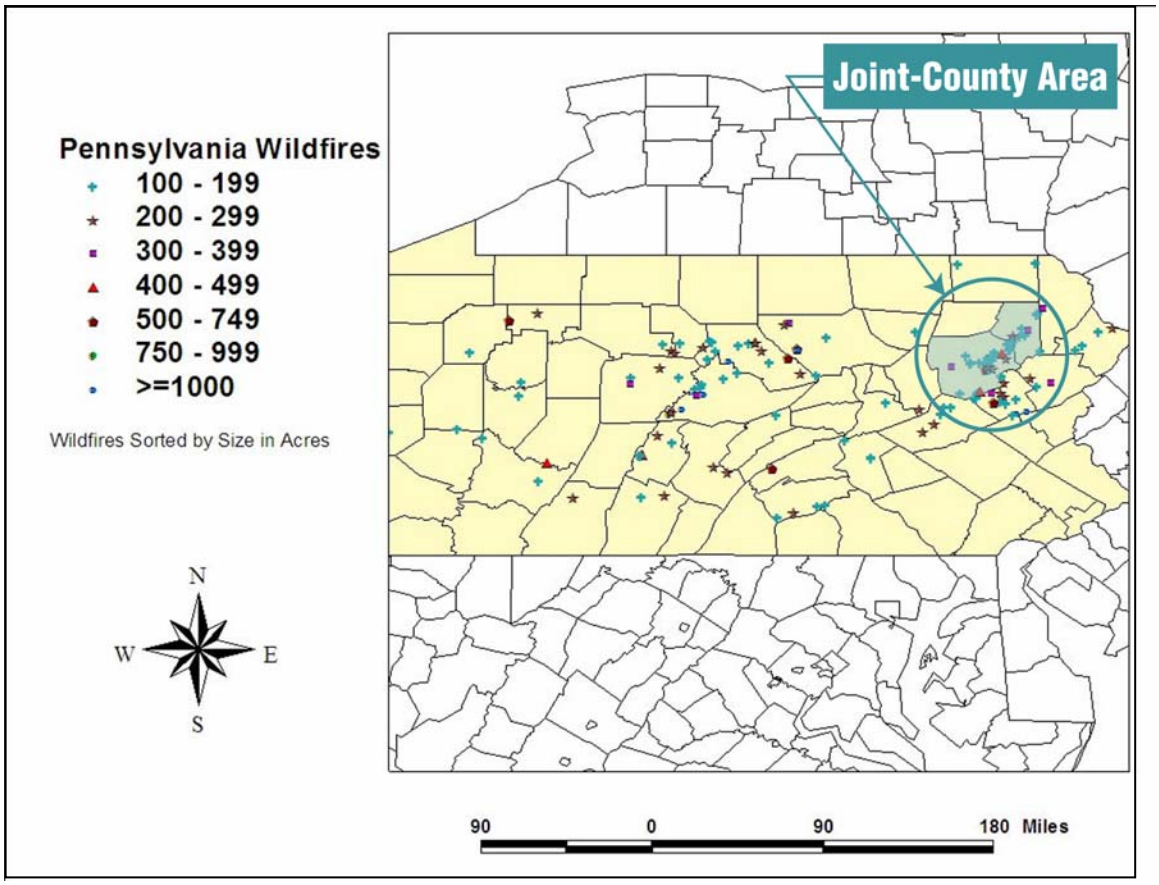
As stated previously, wildfires typically develop in abnormally dry or drought conditions. However, there have been incidents of wildfires in Luzerne County and Lackawanna County during months with normal precipitation levels. The cause of wildfires ranges from lightning strike to human negligence. These facts make the predictability of wildfires difficult. Newspaper articles from the two counties in the past 5 years, however, reveal that a wildfire has developed somewhere in the area, on an annual basis. Assuming that this trend continues, it can be conservatively estimated that there will be at least one incident of a wildfire in the two-county area annually.

Table 3.5: **Lackawanna-Luzerne County Wildfires 1983 to 2001 by Number and Acreage Burned**

Municipality	Number of Fires Based on Acres Burned			
	100-199 AC	200-299 AC	300-399 AC	400-499 AC
Lackawanna County				
Carbondale Township	2	-	-	-
Covington Township	1	-	-	-
Dunmore Borough	1	-	-	-
Jefferson Township	-	-	1	-
Jessup Borough	-	-	1	-
Moosic Borough	1	-	-	-
Olyphant Borough	1	-	1	-
Roaring Brook Township	2	-	-	-
Scranton City	1	1	-	-
Springbrook Township	2	-	-	-
Throop Borough	1	-	-	-
Total	**12**	**1**	**3**	**-**
Luzerne County				
Bear Creek Township	3	1	-	1
Conyngham Township	-	-	1	-
Dennison Township	1	1	-	-
Fairview Township	1	1	-	-
Hanover Township	1	-	-	-
Hazle Township	1	-	-	1
Laurel Run Borough	1	-	-	-
Nanticoke City	1	-	-	-
Newport Township	1	-	-	-
Pittston Township	2	-	-	-
Plains Township	2	-	-	-
Plymouth Township	1	-	-	-
Rice Township	1	-	-	-
Salem Township	-	-	1	-
Shickshinny Borough	-	-	1	-
Union Township	-	-	1	-
Total	**16**	**3**	**4**	**2**

Source: Using Climatic Anomalies to Forecast Wildfires in Pennsylvania, Barry C. Lambert, NOAA/NWS, State College, PA; and R. H. Grum.

Figure 3.1: Wildfires in Pennsylvania 1983 to 2001



Source: Using Climatic Anomalies to Forecast Wildfires in Pennsylvania, Barry C. Lambert, NOAA/NWS, State College, PA; and R. H. Grum.

8. Landslides

Location

Landslides are not common hazards in either Lackawanna County or Luzerne County due to the physiographic province (bedrock geology and geologic constituents) underlying the two counties (see Figure 3.2). However, the Susquehanna River and Lackawanna River valleys are prone to larger landslides triggered by the rivers' undercutting of the slope material consisting of stratified sedimentary rock. A 1989 report by the Geological Society of America identified thirteen potential "rock block" slides on Shickshinny Mountain. At the time when the report was written, one rock block slide had occurred when slopes were undercut by the construction of a roadway. In 1986, a slide developed approximately 3 km southeast of Nanticoke when I-81 was constructed.

Limited data is available for small local landslides that occur along roadways and developments. Two municipalities in Luzerne County reported landslide hazards: Black Creek Township and Nuangola Borough. One municipality in Lackawanna County reported landslide hazards: Carbondale Township.

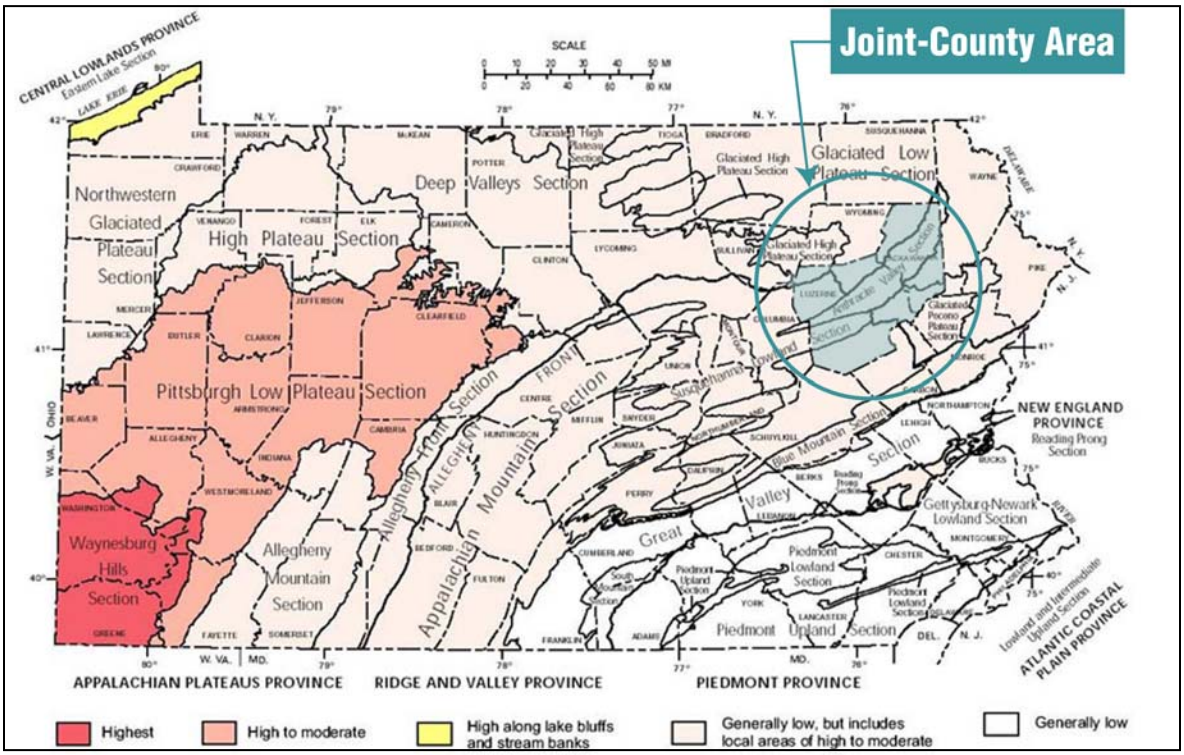
Previous Occurrences and Extent (Severity and Frequency)

Limited data is available for landslide hazards in the two counties. Economic losses are unavailable for past occurrences.

Future Probability

Although landslides do not frequently occur in the two counties, a location of a potential landslide has been determined near the Plymouth Township and Hunlock Township boundary line. Ground separation in the surface geology along the mountain ridge between Nanticoke City and Shickshinny Borough has been spotted through aerial imagery, and a sizeable rift has been identified just to the northwest of the Susquehanna River at the Plymouth Township and Hunlock Township boundary line. The *annual* probability of this rift developing into a landslide is very low; the Susquehanna River valley is filled with material from the surrounding mountain ridges, but the deposits occurred over millions of years. However, the probability that a landslide *will* develop at some time in the future is very high. It is recommended that geologic monitoring stations be implemented to collect data on this area. A landslide potential map for Pennsylvania from the DCNR is provided in **Figure 3.2**.

Figure 3.2: Landslide Potential in Pennsylvania for the Physiographic Provinces



Source: Department of Conservation and Natural Resources
http://www.dcnr.state.pa.us/topogeo/hazards/images/slidemap.jpg

9. Earthquakes

Location

In the past 100 years, only one earthquake has been reported in the two counties. In 1954, a local disturbance that caused an underground mine collapse occurred in Wilkes-Barre; the source of the disturbance is uncertain, but was most likely not due to fault movement (Source: USGS).

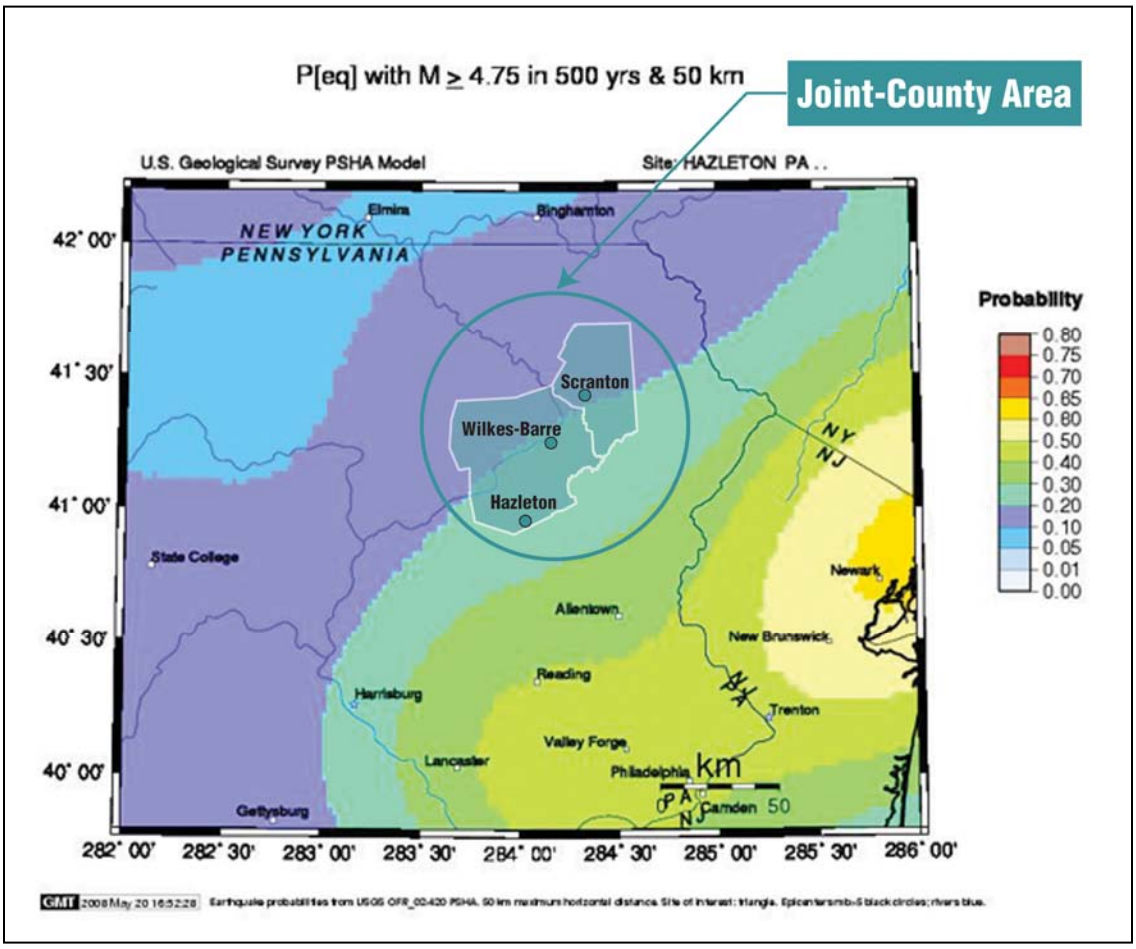
Previous Occurrences and Extent (Severity and Frequency)

The earth disturbance of 1954 in Wilkes-Barre resulted in hundreds of damaged homes and water and gas main breakages throughout the affected area. The size of the affected area was approximately five city blocks. An estimated $1 million in damages resulted from the event (Source: USGS). Although severe earthquakes (magnitude 5.0 and greater) are not common in Pennsylvania, eastern Pennsylvania is susceptible to minor earthquakes (magnitude 5.0 and lower).

Future Probability

The USGS has an interactive earthquake probability model that allows the user to input a location, magnitude, and time period, and the program develops a map of probability ranges for the specified criteria. Using the USGS model, it was determined that the probability of a magnitude 5.0 earthquake occurring in the next 100 years is 6 percent for the majority of Luzerne County and the municipalities east of the Lackawanna River in Lackawanna County, and is 4 percent for Northwestern Luzerne County and the municipalities west of the Lackawanna River in Lackawanna County. The probability of a magnitude 5.0 earthquake occurring in the next 500 years is 30 percent for the municipalities east of the Susquehanna River in Luzerne County and the municipalities east of the Lackawanna River in Lackawanna County, and is 20 percent for the municipalities west of the Susquehanna River in Luzerne County and the municipalities west of the Lackawanna River in Lackawanna County. Figure 3.3 displays the 500 year / 5.0 magnitude earthquake probability map for the two counties.

Figure 3.3: 500-Year Earthquake Potential – Northeastern Pennsylvania



Source: United States Geologic Survey**.**

10. Hazardous Materials Release

Location

The Environmental Protection Agency (EPA) provides funding for sites contaminated by hazardous materials. Most often this is through the EPA Superfund program, which designates highly contaminated sites as high priority for remediation. Therefore, these locations are not under the jurisdiction of PEMA and FEMA funding programs, and are not identified in this Plan. Projects that do fall under PEMA/FEMA authority are those that are related to hazardous materials spills. Areas with high incident vehicular accident sites and high volume hazardous material transport routes could have a high potential for hazardous material release. Crash rate data for Luzerne County and Lackawanna County was obtained from PennDOT, and high incident sites were selected from the data. The selection criteria utilized the crash rate of the location versus the average crash rate for the state, and is therefore weighted appropriately to illustrate the accident potential. Thirteen municipalities in Luzerne County contain roads with high accident rates: Black Creek Township, Fairview Township, Hazle Township, Hazleton City, Kingston Township, Kingston Borough, Nescopeck Township, Plains Township, Plymouth Borough, Sugarloaf Township, West Hazleton Borough, Wilkes-Barre Township, and Wilkes-

Barre City. Ten municipalities in Lackawanna County contain roads with high accident rates: Carbondale Township, Clarks Green Borough, Clarks Summit Borough, Dickson City Borough, Dunmore Borough, Moosic Borough, Old Forge Borough, Scranton City, South Abington Township, and Taylor Borough.

Municipalities also expressed concern regarding hazardous materials during the May 28, 2008 workshop. One additional municipality in Lackawanna County reported issues with hazardous materials: Archbald Borough. Five municipalities in Luzerne County reported issues with hazardous materials: Hanover Township, Newport Township, Salem Township, West Hazleton Borough, and Wright Township.

A map of the accident rates in the two counties is contained in the Map Section at the end of Chapter 4.

Previous Occurrences and Extent (Severity and Frequency)

Limited data prevents accurate estimates for damages incurred from hazardous material related issues in the two counties. Economic losses were not reported, and are difficult to estimate.

Future Probability

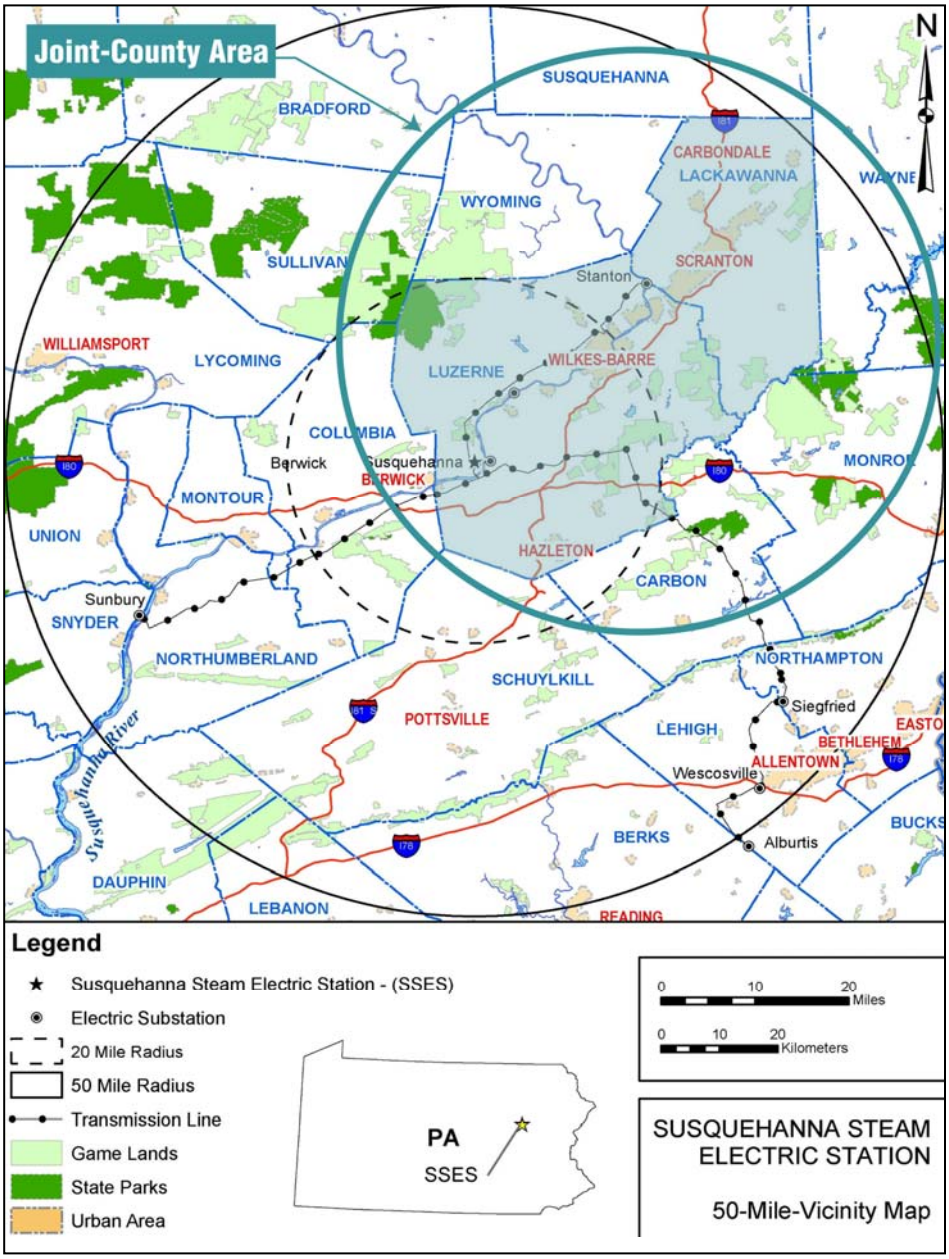
All of the accident sites have a crash rate greater than or equal to 1.0 per year. The highest accident rate is on Keyser Avenue in Scranton City at 20.0 per year. Therefore, the range of probabilities is great, but for the listed sites, the future probability of occurrence is 100 percent annually.

11. Nuclear Power Plant Failure

Location

The only nuclear power plant in the two counties is the Susquehanna Steam Electric Station in Salem Township in southwestern Luzerne County. A map of the plant and the 20- and 50-mile fallout zones is provided in **Figure 3.4**. Almost all of Luzerne County is covered by the 20-mile fallout zone, and both Luzerne County and Lackawanna County are covered by the 50-mile fallout zone.

**Figure 3.4: 20-Mile and 50-Mile Radii from
Susquehanna Steam Electric Nuclear Power Station**



Previous Occurrences and Extent (Severity and Frequency)

No failures have occurred at the plant resulting in damages, injuries, or fatalities. Although no failures have occurred at the plant, an ALERT was declared at the station on March 2, 2006. "An Alert is the second-lowest of four emergency classifications for nuclear power plants. It is declared when an event has occurred that could reduce the plant's level of safety, but backup plant systems still work." (Source: PEMA News Archive.)

Future Probability

The history of nuclear power plant failure in the U.S includes very few incidents relative to the number of active power plants (2 failures for over 100 plants). Thus, the probability of a well-monitored, well-regulated nuclear facility experiencing a failure is low. The Susquehanna Steam Electric Station is regulated by the Nuclear Regulatory Commission (NRC), and is inspected according to NRC guidelines.

12. Dam Failure

Location

Several dams are located in the two counties. Lackawanna County contains 82 dams, of which 33 are classified as high-hazard by the Pennsylvania DEP. High hazard dams are defined as those dams that pose a significant threat to downstream properties, and are based on the height of the dam and volume of stored water. Luzerne County contains 101 dams, of which 32 are classified as high-hazard by the DEP. The following 24 Luzerne County municipalities contain high-hazard dams, or would be affected by a dam breach: Bear Creek Township, Bear Creek Village Borough, Black Creek Township, Buck Township, Butler Township, Dennison Township, Duryea Borough, Fairmount Township, Franklin Township, Hanover Township, Hazle Township, Hunlock Township, Huntington Township, Jackson Township, Jenkins Township, Kingston Township, Lehman Township, Newport Township, Plains Township, Plymouth Township, Plymouth Borough, Rice Township, Ross Township, and Union Township. The following 19 Lackawanna County municipalities contain high-hazard dams, or would be affected by a dam breach: Archbald Borough, Benton Township, Carbondale Township, Clifton Township, Covington Township, Dunmore Borough, Elmhurst Township, Glenburn Township, Jefferson Township, Jessup Borough, Madison Township, Moosic Borough, Newton Township, North Abington Township, Olyphant Borough, Roaring Brook Township, Scranton City, South Abington Township, and Springbrook Township.

Previous Occurrences and Extent (Severity and Frequency)

The most recent reported dam failure in the Bi-County area occurred during the June 2006 storm event. Mountain Springs Dam #2 in Luzerne County failed, but did not result in injuries, loss of life, or significant property damages due to the low-hazard nature of the dam.

Future Probability

Emergency spillways (structures that allow discharge from a dam without overtopping) are designed to pass very high flows such as the 100-year and larger storm events. Dam breach analyses are performed using the Probable Maximum Flood (PMF) based on the Probable Maximum Storm (PMS), which are incredibly intense storms that have a very low probability of occurring. Also, because high hazard dams are required to maintain yearly inspections and up to date Emergency Action Plans (EAPs), there are warnings posted by the media that will allow evacuations to take place before a breach occurs. The next section, Vulnerability Assessment, provides information on which dams in the two counties have EAPs, and which do not. For those dams that have an EAP in place, the probability of loss of life or injuries resulting from a dam breach is low. The probability for casualties is higher for those dams without an EAP because media warning systems have not been identified, nor has the downstream inundation area.

C. Hazard Ranking

The above section illustrates the historic hazard events and probability of future occurrence for each hazard. Based on the results of the profiling and consensus from the Steering Committee, each hazard is ranked in terms of its priority for assessing its vulnerability. The criteria used to prioritize hazards consisted of the following:

- Frequency – Very Low (less than 100 years), Low (less than 10 years), Medium (5 to 10 years), High (annual to 5 years);

- Damage – Low (less than $200,000 per event), Medium (between $200,000 and $1,000,000 per event), High (greater than $1,000,000 per event).

By ranking the hazards, the top few hazards are identified for the vulnerability assessment. It should be noted that not all municipalities face the same hazards; for example, Fairmount Township in northwest Luzerne County does not have a history of mining activity and is not highly susceptible to mine subsidence. These differences are documented in the Hazard Profiling and Vulnerability Assessment portions of this Plan; therefore, the prioritization presented here reflects susceptibility to hazards for both counties. Both counties experience flooding regularly and in a range of intensities, and flood hazards are therefore the highest mitigation priority. High winds and winter storms have affected the two counties on several occasions, and were documented by individual municipalities as resulting in major damages. Therefore, high winds and winter storms have been prioritized as the second and third most important hazards facing the counties. **Table 3.6** lists the hazard groupings in order of priority.

Table 3.6: Hazard Prioritization List for Both Counties

Natural Hazards	Frequency	Damage	Typical Causes of Hazards
1.) Flooding[1]	Medium	High	Local Storms, Hurricanes, Snowmelt
2.) High Wind	High	Medium	Local Storms, Hurricanes, Jet Stream Movement
3.) Winter Storms	High	Medium	Snow, Freezing Rain, Sleet
4.) Mine Related Hazards[2]	Medium	Medium	Mine Subsidence, Mine Fires, Flooded Mines
5.) Drought[3]	Low	High	Prolonged Dry Period, Low Water Table
6.) Tornadoes	Medium	Medium	Thunderstorms, Tropical Storms
7.) Wildfires	Medium	Low	Lightning Strike, Human Negligence
8.) Landslides[4]	Very Low	High	Highway Projects, Intense Rainfall, Erosion
9.) Earthquakes	Very Low	High	Tectonic Activity, Blasting
Technological Hazards	**Frequency**	**Damage**	**Causes of Hazards**
10.) Hazardous Material Release	Medium	Low	Vehicular Accidents, Storage Container Releases
11.) Nuclear Power Plant Failure	Very Low	High	Radioactive Material Release, Poor Safety Systems
12.) Dam Failure[5]	Low	Medium	Intense Rainfall, Poorly Monitored Dams

1 – Some municipalities experience flooding more frequently than others; on average the frequency for major flood damages is between 5 and 10 years.

2 – Not all municipalities are susceptible to mine subsidence.

3 – Drought damage estimates are regional, and do not affect individual municipalities as much as the data shows.

4 – Major landslides have return periods on the order of thousands of years; local small events occur more frequently.

5 – Only municipalities in a dam's inundation area are affected by dam failure

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Chapter 4 – VULNERABILITY ASSESSMENT

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

A vulnerability assessment comprises two parts: an asset inventory that identifies the structures and critical facilities located in hazard areas, and a loss estimation that quantifies the potential damage to these structures. Potential losses associated with each hazard are determined once the area of vulnerability, in terms of structures and population, is identified. By characterizing the hazard and its effect on the community in terms of a dollar amount, it becomes more evident *what* mitigation measures and projects are most effective, and *where* those measures and projects will have the most effect. Based on the hazards identified and profiled in Chapter 3, the two counties' vulnerability to these hazards is assessed in this chapter.

Future losses are also important to be determined in order to guide decision making for proposed construction projects. Proposed construction projects have been identified by the counties and the location of the projects were overlain with high hazard areas in GIS.

[Note: Loss estimates for flooding, high wind, and earthquake hazards were developed using FEMA's HAZUS-MH-MR2 loss estimation software package (hereafter referred to as HAZUS). This program calculates economic losses based on census blocks within the region that are susceptible to flooding, high winds, and earthquakes. For the remaining hazards, loss estimates were developed based on the historic data.]

Details of the vulnerability for each hazard are contained in Section D, Hazards Vulnerability. An overall summary of the effect of each hazard on the two counties is provided in **Table 4.1**.

Table 4.1: Overall Summary of Hazard Vulnerability

Hazard	Lackawanna County			Luzerne County		
	Vulnerable Area	# of Impacted Structures	Economic Exposure (Million $)	Vulnerable Area	# of Impacted Structures	Economic Exposure (Million $)
Natural Hazards						
Flood	Floodplains – Countywide	6,621	2,590	Floodplains – Countywide	8,021	2,990
High Wind	Countywide	310	13.0	Countywide	608	19.2
Winter Storms	Countywide		0.3	Countywide		0.3
Mine-Related Hazards	Mainly along Lackawanna River	13,284	5,190	Mainly along Susquehanna River	11,857	4,420
Drought	Countywide	N/A	3.0	Countywide	N/A	3.0
Tornadoes	Countywide	310	13.0	Countywide	608	19.2
Wildfires	Forest/Urban Interface	39,628	15,485	Forest/Urban Interface	44,080	16,437
Landslides	Local roadways	N/A	N/A	Susquehanna River communities	5,023	962
Earthquakes	Countywide	3,392	46.2	Countywide	5,509	63.3
Technological Hazards						
Hazardous Material	Mainly Scranton Area	N/A	Not Determined	Mainly Hazleton Area	N/A	Not Determined
Nuclear Power Failure	50-Mile Fallout – Countywide	N/A	16,900	20-Mile Fallout – Countywide	N/A	23,400
Dam Failure	Near Dams w/o EAP	Not Determined	Not Determined	Near Dams w/o EAP	Not Determined	Not Determined

Note: “N/A” implies this information is not applicable to the identified hazard.
“Not Determined” signifies this information could not be determined due to data constraints.

A. Buildings Inventory

In assessing vulnerability, it is imperative to identify structures that can be affected by the pertinent hazards, as well as economic values associated with losses, should a hazard occur. Some hazards occur locally (i.e. floods, wildfires, and landslides); i.e., they are location specific, while other hazards affect the entire Bi-County area (i.e. winter storms or high winds). A mix of datasets was used to determine the vulnerability to structures in each county; structural data containing the location of buildings was obtained from the counties, and economic exposure values and construction materials were derived from the HAZUS database.

There are approximately 64,874 structures in Lackawanna County. Of the total structures, over 81 percent are residential, 14 percent are commercial, 4 percent are industrial, and the remainder of the structures are agricultural, religious, government, and educational institutions. These structures amount to a total dollar exposure of approximately $16.9 billion.

There are approximately 103,245 structures in Luzerne County. Of those total structures, over 80 percent are residential in nature, 14 percent are commercial, 5 percent are industrial, and the remainder are agricultural, religious, government, and educational institutions. These structures amount to a total dollar exposure of approximately $23.4 billion.

FEMA's HAZUS software was utilized to develop crucial information concerning the structures in the counties, and the number of structures and corresponding economic value of the structures can be seen in **Table 4.2**.

Table 4.2: Building Inventory and Economic Exposure for the Two Counties

Lackawanna County			Luzerne County		
Building Type	**Number of Structures**	**Value ($1,000)**	**Building Type**	**Number of Structures**	**Value ($1,000)**
Agricultural	33	$32,004	Agricultural	63	$92,904
Residential	63,215	$11,376,663	Residential	100,853	$16,623,234
Commercial	1,196	$3,727,581	Commercial	1585	$4,199,393
Industrial	279	$1,139,291	Industrial	523	$1,586,619
Religious	67	$253,616	Religious	99	$401,603
Government	44	$183,368	Government	69	$262,728
Educational	40	$199,891	Educational	53	$270,417
Total	**64,874**	**$16,912,414**	**Total**	**103,245**	**$23,436,898**

Source: Federal Emergency Management Agency, HAZUS-MH-MR2

The Bi-County Comprehensive Planning process involved the development of alternative development trend scenarios in order to represent the most feasible development trends up to the year 2030. A "chip" method was employed to determine various trends, and identify areas in the county that would experience residential, commercial, and industrial development; the chips represented the number of units and acres of development for the various land use categories. The preliminary alternative development trend indicated that a total of 6,450 new structures are estimated to be constructed in Lackawanna County by the year 2030, and 8,810 new structures are estimated to be constructed in Luzerne County during the same period. The scenario strived to utilize the results of this Hazard Mitigation Plan; i.e., to avoid development in high hazard areas. Even so, the trend scenarios relied on recent development data in addition to other parameters, and some municipalities may experience development in or near high hazard areas.

For the purposes of this Plan, the preliminary development alternative prepared for the Comprehensive Plan was utilized for future vulnerability assessment. The number of new units (represented by the development "chips" for each category: residential, commercial, and industrial) was determined for each municipality, and overlain with high hazard areas such as floodplains and deep mines. Loss estimates were then prepared for each hazard. The results of the existing vulnerability assessment were extrapolated to include the future units for each hazard. These future vulnerability assessments are included under the "Future Buildings"

section under each hazard in Section D, *Hazards Vulnerability*, later in this chapter. A more detailed discussion of the development trends based on the method described above is provided in Section E, *Land Use and Development Trends*, later in this chapter.

B. Critical Facilities Inventory

Critical facilities require specific attention, as they play an important role in the proper functioning of a community. Critical facilities include emergency response buildings, government buildings, hospitals, nursing homes, schools, airports, bridges, dams, power plants, pipeline stations, electrical substations, pump station electrical substations, sanitary facilities, switching stations, hazardous storage facilities, and prisons. The locations of these facilities were identified and mapped by the two counties. A map of the critical facility locations is included in the Map Section at the end of Chapter 4.

Properties that are significant for their historical, architectural, and archaeological value to a community and enhance its quality of life are typically known as historic properties. These properties are documented as historic by communities and evaluated for inclusion with the National Registry of Historic Properties. There are 29 historic properties in Lackawanna County and 28 historic properties in Luzerne County. Historic property locations are included on the critical facilities maps presented in the Map Section at the end of Chapter 4.

C. Repetitive Loss Structures

Assessing Vulnerability: Addressing Repetitive Loss Properties
Requirement §201.6(c)(2)(ii): *[The risk assessment]* ***must*** *also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

A *repetitive loss property* is defined by FEMA as any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Furthermore, the NFIP definition for a ***severe*** *repetitive loss structure* is any property for which four or more flood insurance claims have been paid of more than $5,000, or at least two claims where the building portion of the total payment exceeds the property value. These structures are important indicators of flood-prone areas, as they show the increased probability that a hazard will occur. There are 137 reported repetitive loss structures in Lackawanna County, and 349 reported repetitive loss structures in Luzerne County. There are 12 reported severe repetitive loss structures in Lackawanna County, and 15 reported severe repetitive loss structures in Luzerne County. **Table 4.3** displays the repetitive loss structures and severe repetitive loss structures by municipality.

Table 4.3: Repetitive Loss Structures and Severe Repetitive Loss Structures

Lackawanna County			Luzerne County		
Municipality	**# of Repetitive Loss Structures**	**# of Severe Repetitive Loss Structures**	**Municipality**	**# of Repetitive Loss Structures**	**# of Severe Repetitive Loss Structures**
Archbald Borough	2	1	Ashley Borough	2	-
Blakely Borough	1	-	Avoca Borough	4	-
Carbondale City	7	-	Black Creek Township	1	-
Clarks Summit Borough	2	1	Buck Township	1	-
Fell Township	1	-	Butler Township	7	2
Jermyn Borough	3	-	Conyngham Borough	13	-
Mayfield Borough	2	2	Dallas Borough	1	-
Moosic Borough	2	-	Exeter Borough	8	-
Old Forge Borough	2	-	Hanover Township	6	1
Olyphant Borough	5	-	Hunlock Township	4	1
Scranton City	109	7	Jenkins Township	29	1
South Abington Township	1	1	Kingston Borough	2	-
			Kingston Township	2	-
			Luzerne Borough	1	-
			Nanticoke City	9	1
			Nescopeck Borough	3	-
			Plains Township	30	2
			Plymouth Township	39	2
			Salem Township	3	-
			Shickshinny Borough	56	3
			Swoyersville Borough	2	-
			West Pittston Borough	44	-
			Wilkes-Barre City	79	2
			Wright Township	3	-

Source: Federal Emergency Management Agency

D. Hazards Vulnerability

Assessing Vulnerability: Identifying Structures
Requirement §201.6(c)(2)(ii)(A): *The plan **should** describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.*

Assessing Vulnerability: Estimating Potential Losses
Requirement §201.6(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.*

1. Flooding

Existing Buildings and Infrastructure

In order to determine the number of existing buildings and infrastructure susceptible to flooding, three methods were employed:

1) Spatial structures data obtained from the counties were overlain with the 100-year FEMA floodplains in GIS.

2) The U.S. Army Corps of Engineers developed an Early Warning Response System for the Susquehanna River in Luzerne County, which includes river depths throughout the entire county for the 2- through 500-year storms. The floodplains for the river for these storms were overlain with structures data to produce a more accurate depiction of the vulnerable structures in the communities adjacent to the river.

3) Roads in both counties were intersected with streams to produce a comprehensive dataset of bridges, culverts, and drainage pipes, which was overlain with the 100-year floodplains.

Table 4.4, presents the number of existing buildings and infrastructure in both counties located within the 100-year floodplain.

Table 4.4: Number of Existing Buildings and Bridges in 100-Year Floodplain

	Lackawanna County	Luzerne County
# of Buildings	6,621	8,021
# of Bridges	293	630

Tables of all municipalities and the corresponding number of buildings and infrastructure within the 100-year floodplains in both counties are provided in the Appendix.

The most populated areas of the counties are the most vulnerable to flooding. These are Scranton City and Dickson City Borough in Lackawanna County and Wilkes-Barre Township and Kingston Township in Luzerne County. A summary of the top 10 most vulnerable municipalities is provided in Table 4.8 under the "Potential Losses" portion of this section, as the table also includes economic exposure values. In Luzerne County, Shickshinny Borough is not protected by the Wyoming Valley Levee System, and floods during events much more frequent

than the 100-year storm. **Table 4.5** provides information on the number of structures expected to flood on the main streets in Shickshinny Borough for each flood event.

Table 4.5: Number of Existing Buildings in 5-Year Through 100-Year Floodplains in Shickshinny Borough by Street

	Number of Structures Per Flood Event				
Street Name	**5-Year**	**10-Year**	**25-Year**	**50-Year**	**100-Year**
Canal St.	4	33	37	37	37
Union St.	1	14	29	36	40
Susquehanna Ave.	-	34	41	46	46
Main St.	-	11	34	46	50
McClintock St.	2	13	17	17	17
Butler St.	1	7	13	13	14
Vine St.	-	-	5	5	7
Oak St.	-	-	2	2	2
Spruce St.	-	-	2	2	2
Furnace St.	-	3	7	8	8
Ash St.	-	1	2	2	2
Bridge St.	-	2	2	2	2
TOTAL	**8**	**118**	**191**	**216**	**227**

Critical Facilities

Lackawanna County has 28 critical facilities exposed to flooding; seven of these are emergency response facilities. Luzerne County has 45 critical facilities exposed to flooding; seven of these are also emergency response facilities. **Tables 4.6** and **4.7** present the municipalities in Lackawanna County and Luzerne County, respectively, which have critical facilities located in the 100-year floodplain.

Table 4.6: Lackawanna County Critical Facilities in 100-Year Floodplain

	Type of Critical Facility					
Municipality	**Dams**	**Emergency Response**	**Government**	**Hazardous Storage**	**Sanitary Facility**	**Schools**
Archbald Borough	-	-	-	-	1	-
Blakely Borough	-	-	-	-	-	1
Carbondale Township	1	-	1	-	-	-
Carbondale City	-	-	1	-	-	2
Clarks Summit Borough	-	1	-	-	-	-
Dalton Borough	-	2	2	-	-	-
Dickson City Borough	-	1	-	-	-	-
Elmhurst Township	1	-	1	-	1	-
Moosic Borough	-	-	-	-	1	-
Olyphant Borough	-	2	1	-	-	-
Ransom Township	-	-	-	1	-	-
Scranton City	-	-	-	-	-	1
South Abington Township	-	1	2	-	-	1
Springbrook Township	2	-	-	-	-	-
Total Facilities (28)	**4**	**7**	**8**	**1**	**3**	**5**

Source: Federal Emergency Management Agency,

Table 4.7: Luzerne County Critical Facilities in 100-Year Floodplain

Municipality	Type of Critical Facility									
	Dam	Emg. Resp.	Govt.	Haz. Sto.	Hos.	Nur. Hm.	Elec. Sub.	Pris.	San. Fac.	Schl.
Black Creek Township	4	-	-	-	-	-	-	-	-	-
Buck Township	1	-	-	-	-	-	-	-	-	-
Butler Township	2	-	-	-	-	-	1	-	-	-
Dallas Borough	-	1	1	-	-	-	-	-	-	-
Dupont Borough	-	-	-	-	-	-	-	-	-	1
Franklin Township	3	-	-	-	-	-	-	-	-	-
Hazle Township	2	-	-	-	-	-	-	-	-	-
Hunlock Township	-	-	-	1	-	-	-	-	-	-
Huntington Township	1	-	-	-	-	-	-	-	-	-
Jenkins Township	1	-	-	-	-	-	-	-	-	-
Kingston Borough	-	-	-	-	-	-	-	-	-	1
Kingston Township	1	1	-	-	-	-	-	-	1	-
Laurel Run Borough	-	-	1	-	-	-	-	-	-	-
Lehman Township	1	-	-	-	-	-	-	-	-	-
Luzerne Borough	-	1	-	-	-	-	-	-	-	-
Nescopeck Township	-	-	-	-	-	-	-	-	1	-
Newport Township	-	-	-	-	-	-	-	1	-	-
Nuangola Borough	-	1	-	-	-	-	-	-	-	-
Penn Lake Park Borough	1	-	-	-	-	-	-	-	-	-
Pittston City	-	-	-	1	-	-	-	-	-	-
Plains Township	1	-	-	-	-	-	-	-	-	-
Plymouth Township	1	2	-	-	-	-	-	-	-	-
Ross Township	3	-	-	-	-	-	-	-	-	-
Salem Township	1	-	-	-	-	-	-	-	-	-
Shickshinny Borough	-	1	1	-	-	-	-	-	-	-
Union Township	1	-	-	-	-	-	-	-	-	-
Wilkes-Barre City	-	-	-	-	1	1	1	-	-	-
Total Facilities (45)	**24**	**7**	**3**	**2**	**1**	**1**	**2**	**1**	**2**	**2**

Nur. Hm. = Nursing Home; Elec. Sub. = Primary Electrical Substation; Pris. = Prison; San. Fac. = Sanitary Facility.

Potential Losses

Census data from HAZUS was used to estimate losses due to flooding for the two counties. The results are countywide, and were therefore refined to reflect potential losses for each municipality in the counties. Based on the census block data utilized by HAZUS to calculate losses, the data was extrapolated to determine economic exposure values within the 100-year floodplains in each municipality. Lackawanna County has an estimated $2.59 billion in economic exposure to the 100-year flood; Luzerne County has an estimated $2.99 billion in economic exposure to the 100-year flood. As stated previously, the top 10 most vulnerable municipalities in each county and the corresponding potential losses are provided in **Table 4.8**.

Table 4.8: Top 10 Most Vulnerable Municipalities to Flooding Based on Number of Affected Buildings and Potential Losses

Lackawanna County			Luzerne County		
Municipality	# of Buildings	Potential Loss (Million $)	Municipality	# of Buildings	Potential Loss (Million $)
Scranton City	2,264	885	Wilkes-Barre City	1,330	496
Dickson City Borough	773	302	Kingston Township	497	185
Olyphant Borough	470	184	West Pittston Borough	393	147
Blakely Borough	380	148	Hanover Township	328	122
Fell Township	212	83	Luzerne Borough	310	116
Jessup Borough	186	73	Plymouth Borough	279	104
Covington Township	184	72	Shickshinny Borough	254	95
Jermyn Borough	183	72	Salem Township	251	94
Old Forge Borough	172	67	Plains Township	243	91
Moosic Borough	153	60	Hunlock Township	176	66

Many other municipalities have several structures in the 100-year floodplain, and a full list of all municipalities and exposure to flooding can be found in the Appendices. Some other municipalities of note are Avoca Borough, Black Creek Township, Butler Township, Conyngham Borough, Fairmount Township, Forty Fort Borough, Jenkins Township, Kingston Borough, Plymouth Township, and Ross Township.

Future Buildings

Utilizing the preliminary "chip" development scenario method from the Comprehensive Plan, it was determined that additional new structures may potentially be constructed in the floodplains. **Table 4.9** displays the municipalities in the two counties that could experience new construction in the floodplains, the number of new structures in the floodplains, and the corresponding potential economic losses. This analysis represents a worst-case scenario that could arise if development continues to occur in high hazard areas, notably the floodplains.

Table 4.9: Municipalities With New Construction in the 100-Year Floodplain and Number of Affected Buildings and Potential Losses

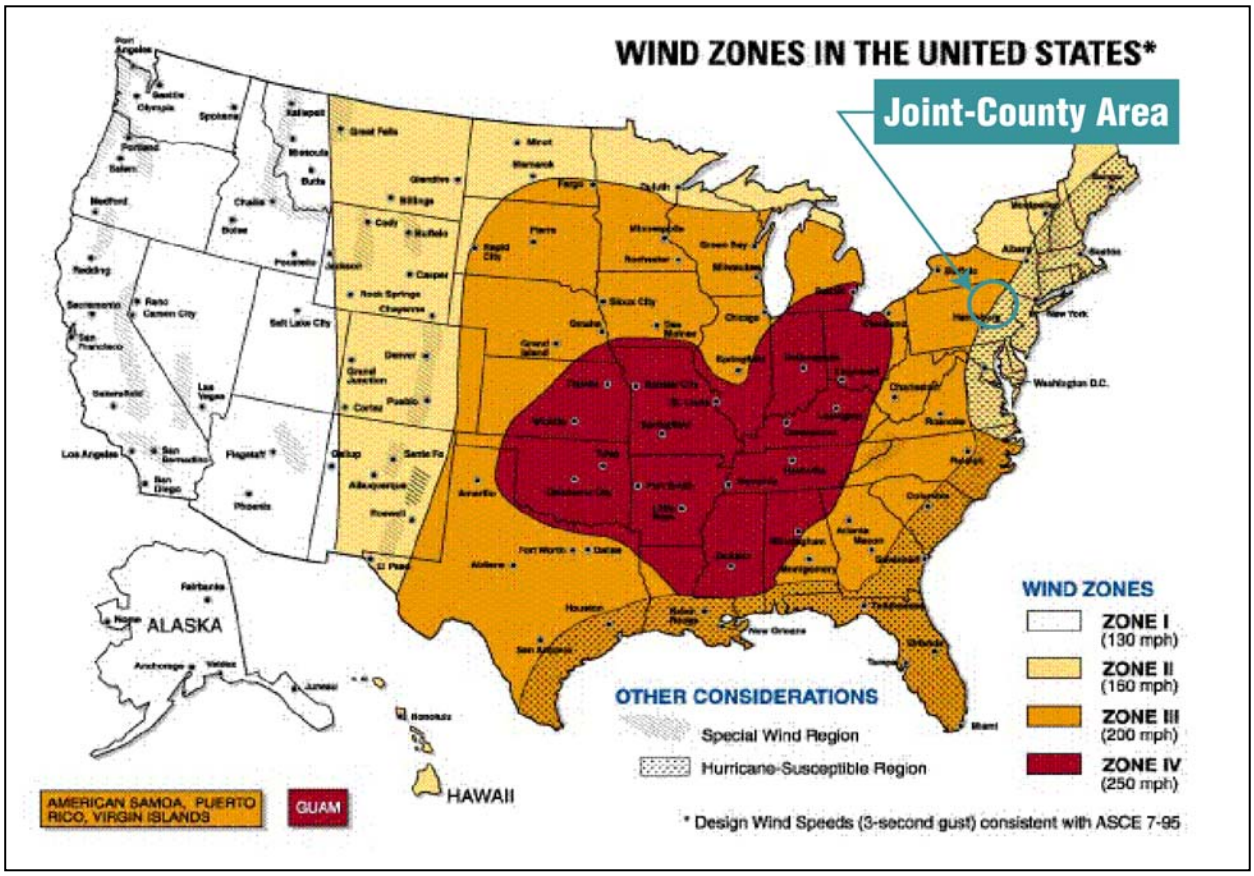
Lackawanna County			Luzerne County		
Municipality	**# of New Buildings**	**Additional Potential Loss (Million $)[1]**	**Municipality**	**# of New Buildings**	**Additional Potential Loss (Million $)[1]**
Dickson City Borough	420	164	Plains Township	20	7
Blakely Borough	400	156	Jenkins Township	400	149
Covington Township	320	125	Foster Township	150	56
Carbondale City	440	172	Dallas Township	320	119
Dalton Borough	170	66	Nanticoke City	400	149
Clifton Township	150	59	Swoyersville Borough	400	149
West Abington Township	20	8	Jackson Township	20	7
			Sugarloaf Township	150	56
			Rice Township	150	56
			Plymouth Township	40	15
			Newport Township	170	63
			Wilkes-Barre City	820	306
			Slocum Township	150	56

Note 1: These numbers are only the potential losses associated with the new construction. The total future potential losses are contained in the tables in the Appendices.

2. High Wind

FEMA has developed wind zones in the United States that designate regions susceptible to high winds based on wind speed. Luzerne County and Lackawanna County both fall in Zone II and Zone III, which are classified as 160 mph and 200 mph wind zones, respectively. This implies that structures designed to withstand the potential wind speeds in this region should use a design wind speed of 160-200 mph. **Figure 4.1** displays the FEMA wind zone map. HAZUS calculates wind speeds for the return period of a wind event. The results show that for the 1,000-year wind event (0.1 percent chance of occurrence for a given year), the maximum wind speed is 83 mph. Wind speeds for all return periods as calculated by HAZUS are presented in **Table 4.10**. The potential for damages and wind speed correlation matches the historical trend discussed in Chapter 3 of this Plan. Historically, wind events have been frequent but not intense.

Figure 4.1: FEMA Wind Zone Map of the United States



Source: http://www.fema.gov/graphics/library/wmap.gif

Table 4.10: Maximum Wind Speeds for Lackawanna and Luzerne Counties Based on Return Period

Return Period	Corresponding Maximum Wind Speed (mph)
10-Year	22
20-Year	36
50-Year	49
100-Year	58
200-Year	66
500-Year	77
1000-Year	83

Source: Federal Emergency Management Agency, HAZUS-MH-MR2.

Existing Buildings and Infrastructure

HAZUS was used to determine the damage to existing buildings and infrastructure due to high winds. Significant damages are not incurred until the 100-year event, but drastically increase between the 100-year and 500-year events. Therefore, only the 100-year and 500-year event results are presented here to summarize the potential damages expected for high wind events in the two counties (**Table 4.11**). For the full HAZUS reports, refer to Appendix C.

Table 4.11: Potential Damage to Buildings Due to High Wind for Lackawanna and Luzerne Counties

		Lackawanna County		Luzerne County	
Return Period	Wind Speed (mph)	Buildings Damaged	Economic Loss (Million $)	Buildings Damaged	Economic Loss (Million $)
100-Year	58	32	0.10	43	0.32
500-Year	77	310	13.0	608	19.2

Source: Federal Emergency Management Agency, HAZUS-MH-MR2.

Critical Facilities

High winds could affect any of the critical facilities in the two counties given the right conditions. No reports of critical facility damages due to high winds were identified in the hazard profiling.

Potential Losses

An estimated $13.0 million in damages are estimated for Lackawanna County in an event with wind speeds of 77 mph. The same wind speeds would result in $19.2 million of damages in Luzerne County. This worst-case scenario corresponds to the 500-year high wind event (1/500 = 0.2 percent chance of occurring in any given year). As evidenced by the historical data, the average annual economic loss due to high winds for both Lackawanna County and Luzerne County is $200,000. The strongest wind recorded in the two counties was during a tornado in 1998 in which wind speeds reached 150 mph.

Future Buildings

All future construction is required to meet the International Buildings Code (IBC) 2006 and new buildings must be designed to a maximum wind tolerance of 200 mph. Therefore, if designed to code requirements, future buildings are not anticipated to be vulnerable to high winds.

3. Winter Storms

Existing Buildings and Infrastructure

Winter storms have the greatest impact on older buildings constructed out of material such as wood, or manufactured housing. **Table 4.12** summarizes the buildings in the two counties by construction material type. In both counties, approximately 61 percent of the buildings are

constructed out of wood, and are therefore more vulnerable to snow loadings and winds associated with winter storms.

Winter storms often have a greater effect on infrastructure and transportation routes than buildings. Multiple municipalities reported issues with I-80, I-81, and S.R. 309 due to winter storms. No one roadway is more vulnerable than another; however, the major thoroughfares have a greater impact on the counties when closed or when difficult driving conditions exist. Luzerne County roadways that are most susceptible to winter storms are I-80, I-81, I-476, S.R. 11, and S.R. 309. Lackawanna County roadways that are most susceptible to winter storms are I-81, I-476, I-380, I-84, S.R. 11, and S.R. 6. For route locations, please refer to the Transportation Route Map in Chapter 1 of this Plan (Figure 1.3).

Table 4.12: Construction Materials of Structures in Lackawanna and Luzerne Counties

	Lackawanna County		Luzerne County	
Material	Number of Structures	% of Total	Number of Structures	% of Total
Concrete	623	1.0	675	0.5
Masonry	20,750	32.0	32,758	31.5
MH	2,590	4.0	5,549	5.5
Steel	1,091	1.5	1,382	1.5
Wood	39,820	61.5	62,881	61.0
Total	**64,874**	**100.0**	**103,245**	**100.0**

Source: Federal Emergency Management Agency, HAZUS-MH-MR2.

Critical Facilities

Winter storms could affect any of the critical facilities in the two counties given the right conditions. There have been no reports of damage to any critical facility due to winter storms.

Potential Losses

Based on the historical data, approximately $300,000 in economic losses occurs in both Lackawanna County and Luzerne County every two years. The majority of these losses are due to infrastructure interruption. It can be anticipated that this trend will continue without additional measures.

Future Buildings

All future construction is required to meet the IBC 2006 and new buildings must be designed to a maximum snow loading of 35 pounds per square foot (psf). Therefore, if designed to code requirements, future buildings are not anticipated to be vulnerable to winter storms.

4. Mine-Related Hazards

Existing Buildings and Infrastructure

The number one mine-related hazard that poses a threat to buildings and infrastructure is underground mine subsidence. In order to determine the number of existing buildings and infrastructure susceptible to mine subsidence, spatial structures data obtained from the counties were overlain with the abandoned mine land (AML) data for underground mines from the DEP. The bridges dataset created for the flooding vulnerability analysis, and the roads dataset from PennDOT, were overlain with underground mines to determine the vulnerability of infrastructure to mine subsidence.

The following summary table, **Table 4.13**, presents the number of existing buildings and infrastructure in both counties located over potential subsidence areas.

Table 4.13: Number of Existing Buildings and Bridges in Potential Subsidence Areas

	Lackawanna County	Luzerne County
# of Buildings	13,284	11,857
# of Bridges	13	9

Tables of all municipalities and the corresponding number of buildings and infrastructure within potential subsidence areas (deep mines) in both counties are provided in the Appendix.

Similar to flooding, the most populated areas of the counties are the most vulnerable to mine subsidence. These are Scranton City and Old Forge Borough in Lackawanna County and Kingston Borough, Pittston City and Wilkes-Barre Township in Luzerne County. A summary table of the top 10 most vulnerable municipalities is provided in **Table 4.16** under the "Potential Losses" portion of this section, as the table also includes economic exposure values.

Critical Facilities

Lackawanna County has 34 critical facilities in potential subsidence areas; nine of these are emergency response facilities. Luzerne County has 35 critical facilities in potential subsidence areas; 13 of these are also emergency response facilities. **Tables 4.14** and **4.15** present the municipalities in Lackawanna County and Luzerne County, respectively, that have critical facilities located in potential subsidence areas.

Table 4.14: Lackawanna County Critical Facilities in Potential Subsidence Areas

	Type of Critical Facility				
Municipality	Emergency Response	Government	Hazardous Storage	Nursing Home	School
Jermyn Borough	-	1	-	-	-
Mayfield Borough	4	1	-	-	1
Old Forge Borough	2	2	-	-	2
Scranton City	2	9	2	2	4
Taylor Borough	1	1	-	-	-
Total Facilities (34)	**9**	**14**	**2**	**2**	**7**

Table 4.15: Luzerne County Critical Facilities in Potential Subsidence Areas

	Type of Critical Facility									
Municipality	**Air.**	**Dam**	**Emg.**	**Govt.**	**Hos.**	**Nur.**	**Elec.**	**Pump**	**San.**	**Schl.**
Avoca Borough	-	-	-	-	-	-	1	-	-	-
Duryea Borough	-	-	2	1	-	-	-	-	-	-
Forty Fort Borough	1	-	-	-	-	-	-	-	-	-
Kingston Borough	-	-	1	1	1	1	-	-	-	3
Nanticoke City	-	-	-	-	-	-	-	-	-	1
Pittston Township	-	1	2	1	-	-	-	-	-	-
Pittston City	-	-	1	1	-	-	-	-	-	-
Plains Township	-	-	3	1	-	-	-	-	-	2
Plymouth Borough	-	3	1	-	-	-	-	-	-	-
West Pittston Borough	-	-	1	1	-	-	-	-	-	-
Wilkes-Barre City	-	-	1	-	-	-	-	1	1	-
Wilkes-Barre Township	-	-	1	-	-	-	-	-	-	-
Total Facilities (35)	**1**	**4**	**13**	**6**	**1**	**1**	**1**	**1**	**1**	**6**

Air. = Airport; Emg. = Emergency Building; Govt. = Government Building; Hos. = Hospital; Nur. = Nursing Home; Elec. = Primary Electrical Substation; Pump = Pump Station; San. = Sanitary Facility; Schl. = School.

The above analyses were conducted utilizing abandoned mine land (AML) data from the DEP which is compiled by the Eastern PA Coalition for Abandoned Mine Land Reclamation (EPCAMR). Because many mines remain active and have limited data, this dataset only represents a portion of underground mining activities in the Lackawanna River and Susquehanna River valleys. Therefore, it is likely that other municipalities not explicitly identified in Tables 4.14 and 4.15 within the River valleys contain critical facilities over mined areas, and may be prone to subsidence.

Potential Losses

Census data from HAZUS was used to estimate losses due to subsidence for the two counties. The subsidence areas were overlain with the census block data in GIS to determine economic exposure values within these areas. The data was then extrapolated to include each municipality, rather than census block. Lackawanna County has an estimated $5.19 billion in economic exposure to mine subsidence; Luzerne County has an estimated $4.42 billion in economic exposure to mine subsidence. As stated previously, the top 10 most vulnerable municipalities in each county and the corresponding potential losses are provided in **Table 4.16**.

Table 4.16: Top 10 Most Vulnerable Municipalities to Mine Subsidence Based on Number of Affected Buildings and Potential Losses

Lackawanna County			Luzerne County		
Municipality	**# of Buildings**	**Potential Loss (Million $)**	**Municipality**	**# of Buildings**	**Potential Loss (Million $)**
Scranton City	6,614	2,584	Kingston Borough	2,339	872
Old Forge Borough	2,292	896	Wilkes-Barre Township	1,927	719
Mayfield Borough	786	307	Plains Township	1,104	412
Olyphant Borough	756	295	Pittston City	1,044	389
Jessup Borough	611	239	Plymouth Township	955	356
Dunmore Borough	587	229	Jenkins Township	521	194
Carbondale City	557	218	Forty Fort Borough	500	186
Jermyn Borough	299	117	Nanticoke City	396	148
Taylor Borough	293	114	Wilkes-Barre City	394	147
Carbondale Township	168	66	Duryea Borough	355	132

As stated previously, these analyses were conducted using AML data. Due to many areas in the River valleys experiencing current mining operations and limited data availability of these currently mined areas, additional structures in other municipalities may be exposed to potential mine subsidence

Future Buildings

Utilizing the preliminary "chip" method development analysis from the Comprehensive Plan, it was determined that additional new structures may potentially be constructed over deep mines. **Table 4.17** displays the municipalities in the two counties that may experience new construction over deep mines, the number of new structures over deep mines, and the corresponding potential economic losses. This analysis represents a worst-case scenario that could arise if development continues to occur in high hazard areas; notably, mine subsidence-prone areas.

Table 4.17: Municipalities With New Construction Over Deep Mines and Number of Affected Buildings and Potential Losses

Lackawanna County			Luzerne County		
Municipality	**# of New Buildings**	**Additional Potential Loss (Million $)[1]**	**Municipality**	**# of New Buildings**	**Additional Potential Loss (Million $)[1]**
Scranton City	3,060	1,196	Plains Township	20	7
Dunmore Borough	20	8	Pittston City	20	7
Dickson City Borough	420	164	Wilkes-Barre City	1,420	530
			Newport Township	300	112
			Hazleton City	1,040	388

Note 1: These numbers are only the potential losses associated with the new construction. The total future potential losses are contained in the tables in the Appendices.

5. Drought

Existing Buildings and Infrastructure

Drought does not have direct impact on buildings or infrastructure; indirect impacts could result from fires and wildfires. The effects of drought are felt by potable water distribution systems (treatment plants, wells, etc.) and agricultural facilities, although the damages are incurred from economic losses rather than physical damage.

Critical Facilities

A drought would have the most impact on water distribution systems, and specifically wells. There are a total of 577 water supply wells in the two counties: 211 in Lackawanna County and 366 in Luzerne County. The top 10 most vulnerable municipalities to drought based on the number of wells per municipality are presented in **Table 4.18**.

Table 4.18: Top 10 Most Vulnerable Municipalities to Drought Based on Number of Wells

Lackawanna County		Luzerne County	
Municipality	# of Wells	Municipality	# of Wells
Scott Township	31	Butler Township	37
Covington Township	30	Hazle Township	33
Jefferson Township	21	Dallas Township	29
South Abington Township	19	Lehman Township	29
Greenfield Township	13	Sugarloaf Township	29
Newton Township	10	Kingston Township	17
Abington Township	9	Bear Creek Township	16
Clifton Township	9	Salem Township	15
Spring Brook Township	9	Fairmount Township	14
Elmhurst Township	8	Union Township	14

Potential Losses

Although the economic loss data from the NCDC is a regional estimate that includes both Lackawanna and Luzerne Counties, the data revealed a $39.0 million loss (in 2008 dollars) during the 1991 drought for the region. As stated in Chapter 3 of this Plan, the average 3-year economic loss is approximately $3 million for the two counties.

Future Buildings

The damage to future buildings due to drought is not applicable.

6. Tornadoes

Since a tornado is a very unpredictable hazard that does not have a set path, it is impossible to determine the exact effect that one would have on the existing buildings and infrastructure. For the purpose of this Plan, the HAZUS wind model was used to determine the damage to existing buildings and infrastructure due to high winds.

Existing Buildings and Infrastructure

Reference the High Wind portion of this chapter. Also reference Table 4.12, which shows construction materials of housing structures in the two counties. Manufactured housing structures are more susceptible to tornadoes; Lackawanna County contains 2,590 manufactured housing units, and Luzerne County contains 5,549 manufactured housing units (from HAZUS data, 2000 Census data).

Critical Facilities

Reference the High Wind portion of this chapter.

Potential Losses

An average 3-year economic loss is $120,000 for Luzerne County due to tornado events. Due to limited data availability an estimate of economic losses cannot be made for Lackawanna County. The strongest wind speed recorded in the Bi-County area was during a tornado on May 31, 1998 in which wind speeds reached 150 mph. One confirmed tornado during this event in Luzerne County, east of Hughestown, caused damage to utility poles and trees with damage totaling $50,000. In Lackawanna County two confirmed tornados, one west of Wimmers and one west of Old Forge, caused damage to trees and blew the windows out of an Old Forge restaurant, causing $475,000 in damage. Referencing the HAZUS results for high wind events, it is possible that $13.0 million in damages could result from tornadoes in Lackawanna County, and $19.2 million in Luzerne County.

Future Buildings

All future construction is required to meet the International Buildings Code (IBC) 2006 and new buildings must be designed to a maximum wind tolerance of 200 mph. Therefore, if designed to code requirements, future buildings are not anticipated to be vulnerable to high winds.

7. Wildfires

Existing Buildings and Infrastructure

Structures vulnerable to wildfires are those located in or adjacent to forested and open space areas. County structures datasets were overlain with these areas to determine the number of structures vulnerable to wildfires for each municipality in the two counties. Lackawanna County has a total of 39,628 structures located in potential wildfire areas, and Luzerne County has a total of 40,080 structures located in potential wildfire areas. A summary table of the top 10 most vulnerable municipalities is provided in Table 4.19 under the “Potential Losses” portion of this section, as the table also includes economic exposure values as well. Tables of all

municipalities and the corresponding number of buildings within potential wildfire areas in both counties are provided in the Appendix.

Critical Facilities

Lackawanna County has 39 critical facilities in potential wildfire areas and Luzerne County has 130 critical facilities in potential wildfire areas. Almost every municipality in Luzerne County and almost half of the municipalities in Lackawanna County have critical facilities vulnerable to wildfires. Tables of these critical facilities are provided in the Appendix.

Potential Losses

Census data from HAZUS was used to estimate losses due to wildfires for the two counties. The wildfire areas were overlain with the census block data in GIS to determine economic exposure values within these areas. The data was then extrapolated to include each municipality, rather than census block. Lackawanna County has an estimated $15.48 billion in economic exposure to wildfires; Luzerne County has an estimated $16.44 billion in economic exposure to wildfires. As stated previously, the top 10 most vulnerable municipalities in each county and the corresponding potential losses are provided in **Table 4.19**. It is important to note that although the data suggests a very high vulnerability to wildfires, the numbers presented represent the total number of buildings in or near forested areas.

Table 4.19: Top 10 Most Vulnerable Municipalities to Wildfires Based on Number of Affected Buildings and Potential Losses

Lackawanna County			Luzerne County		
Municipality	# of Buildings	Potential Loss (Million $)	Municipality	# of Buildings	Potential Loss (Million $)
Scranton City	3,848	1,503.6	Hazle Township	2,796	1,042.6
Scott Township	2,827	1,104.6	Butler Township	2,654	989.7
Covington Township	2,715	1,060.9	Foster Township	2,057	767.0
South Abington Township	2,335	912.4	Dallas Township	1,716	639.9
Jefferson Township	2,006	783.8	Bear Creek Township	1,612	601.1
Carbondale City	1,667	651.4	Wright Township	1,579	588.8
Clarks Summit Borough	1,563	610.7	Hunlock Township	1,506	561.6
Madison Township	1,419	554.5	Kingston Township	1,435	535.1
Greenfield Township	1,379	538.8	Hazleton City	1,355	505.3
Newton Township	1,325	517.7	Ross Township	1,264	471.3

Future Buildings

Future development is planned to occur in already urbanized and populated regions of the two counties, which minimizes development in open space and forested areas. As a result, the vulnerability to wildfires will not necessarily increase if proper planning techniques and zoning and subdivision requirements are followed.

8. Landslides

Existing Buildings and Infrastructure

As mentioned in Chapter 3 of this Plan, rock block slides have been identified along Shickshinny Mountain in Luzerne County. A potential slide displaying characteristics of recent surface slippage has been identified along the ridge between Shickshinny Borough and Nanticoke City. Although the Lackawanna River valley could experience a similar event, no such surface geological features have been identified indicating the potential for such a landslide to develop. Therefore, this section focuses on the effects of a rock block slide on Luzerne County.

This potential landslide would have catastrophic effects, both immediately from the slide itself, and also from the material depositing in the Susquehanna River. The slide would deposit material throughout Shickshinny Borough and Nanticoke City, and an estimated 300 structures would be affected. The deposition of landslide material in the river would fill the river channel and act as a dam, backing up river water upstream of the slide. It is difficult to estimate the volume of material that would be deposited, but the upstream inundation area could potentially include communities upstream of the slide to the northern limits of Luzerne County. Eventually the material acting as a dam would breach, and a flood wave would travel downstream along the river. It is possible that the resulting upstream inundation area and downstream flood wave would rival the limits of the 100-year or 500-year floodplain. Therefore, to estimate the number of structures affected by this event, the 100-year, 200-year, and 500-year floodplains were overlain with the Susquehanna River communities' structures data. **Table 4.20** displays the results.

Table 4.20: Structures within Susquehanna River Communities Vulnerable to Shickshinny Mountain Landslide Events

Municipality	Number of Structures Vulnerable to Various Sized Inundation Areas and Flood Waves			Potential Economic Loss (Million $)
	100-Year Flood Limits	200-Year Flood Limits	500-Year Flood Limits	
Conyngham Township	135	199	269	3.7
Duryea Borough	31	32	34	22.4
Edwardsville Borough	15	21	30	5.2
Exeter Borough	45	54	206	28.0
Exeter Township	110	128	212	49.2
Forty Fort Borough	-	-	4	1.0
Hanover Township	27	51	658	122.3
Hunlock Township	116	122	129	65.6
Jenkins Township	108	148	191	38.4
Kingston Borough	1	1	1	0.7
Larksville Borough	22	25	26	6.7
Nanticoke City	32	37	55	24.6
Nescopeck Borough	11	38	91	30.6
Nescopeck Township	55	56	62	6.3
Newport Township	5	8	8	3.7
Pittston City	10	20	57	6.7
Plains Township	148	192	223	90.6
Plymouth Borough	39	41	959	104.0
Plymouth Township	270	302	354	12.7
Salem Township	104	135	155	93.6
Shickshinny Borough	227	239	248	94.7
Union Township	1	1	2	0.8
West Pittston Borough	397	637	996	146.5
Wilkes-Barre City	21	25	32	3.0
Wyoming Borough	2	6	21	0.9
Total	**1,932**	**2,518**	**5,023**	**962**

Critical Facilities

Critical facilities that would be disrupted by the landslide and the resulting inundation area and flood wave are displayed in **Table 4.21**.

Table 4.21: Critical Facilities Vulnerable to Shickshinny Mountain Landslide Events

Municipality	# of Facilities	Type of Facility
Hunlock Township	1	Hazardous Material Storage
Jenkins Township	1	Dam
Kingston Borough	1	School
Nescopeck Township	1	Sanitary Station
Newport Township	1	Prison
Pittston City	1	Hazardous Material Storage
Plains Township	1	Dam
Plymouth Township	2	Emergency Response
Salem Township	1	Dam
Shickshinny Borough	2	1 Emergency Response, 1 Government
Union Township	1	Dam
Wilkes-Barre City	3	1 Hospital, 1 Nursing Home, 1 Electrical Substation

Potential Losses

The potential losses were estimated based on the economic exposure values due to flooding, and are provided in Table 4.20. These losses are only a rough estimate of the economic losses that would result from a landslide event, as direct losses due to the landslide itself are difficult to estimate. However, the results do show that significant damages would occur should a rock block slide event develop on Shickshinny Mountain.

Future Buildings

Utilizing the preliminary "chip" method development analysis from the Comprehensive Plan, it was determined that additional new structures may potentially be constructed along the Susquehanna River such that a mountain landslide would affect new structures. **Table 4.22** displays the municipalities along the River that may experience new construction, the number of vulnerable new structures, and the corresponding potential economic losses. This analysis represents a worst-case scenario that could arise if development continues to occur in high hazard areas; in this case, along the Susquehanna River.

Table 4.22: Future Structures Within Susquehanna River Communities Vulnerable to Shickshinny Mountain Landslide Events

Municipality	# of New Structures	Potential Economic Loss (Million $)[1]
Jenkins Township	400	149
Nanticoke City	400	149
Newport Township	170	63
Plains Township	20	7
Plymouth Township	40	15
Wilkes-Barre City	820	306
Total	**1,850**	**2,621**

Note 1: These numbers are only the potential losses associated with the new construction.

9. Earthquakes

Existing Buildings and Infrastructure

Estimated damages to buildings and infrastructure were calculated with the HAZUS earthquake function. Damages were estimated for the 500-year 5.0 magnitude earthquake (probability map presented in Figure 3.3). **Table 4.23** summarizes the results for the two counties.

Although the HAZUS predicts 3,392 buildings in Lackawanna County would be damaged and 5,509 in Luzerne County, the flooded underground mines underlying the Lackawanna River and Susquehanna River valleys would amplify the effects of an earthquake and could damage more structures than indicated. New fractures would develop and create new discharge points for the underground mine pools. Furthermore, the stability of the earth is weakened over the abandoned mines and an earthquake would most likely induce more damage than is predicted by HAZUS.

Table 4.23: Potential Damage to Buildings Due to 500-Year Earthquake Event for Lackawanna and Luzerne Counties

	Lackawanna County		Luzerne County	
Material	Buildings Damaged	% of Total	Buildings Damaged	% of Total
Wood	733	21.6	1,263	22.9
Steel	58	1.7	73	1.3
Concrete	27	0.8	27	0.5
Precast	6	0.2	9	0.2
RM	56	1.7	52	1.0
URM	2,202	64.9	3,466	62.9
MH	310	9.1	619	11.2
Total	**3,392**	**100.0**	**5,509**	**100.0**

Source: Federal Emergency Management Agency, HAZUS-MH-MR2.

Critical Facilities

HAZUS model predicts no damage to critical facilities. However, there is potential for damage to pipeline systems such as potable water, waste water, natural gas, and oil. The damages to these systems due to a 500-year earthquake for both Lackawanna County and Luzerne County are summarized by number of expected breaks and leaks, and are presented in **Table 4.24**.

Table 4.24: Potential Damage to Pipelines Due to 500-Year Earthquake Event for Lackawanna and Luzerne Counties

Pipeline	Lackawanna County		Luzerne County	
	# of Leaks	# of Breaks	# of Leaks	# of Breaks
Potable Water	16	4	24	6
Waste Water	13	3	19	5
Natural Gas	13	3	21	5
Oil	0	0	0	0

Source: Federal Emergency Management Agency, HAZUS-MH-MR2.

Potential Losses

The economic loss associated with the 500-year 5.0 magnitude earthquake reported by HAZUS for Lackawanna County is $46.2 million, and is $63.3 million for Luzerne County.

Future Buildings

The HAZUS software utilized for the existing conditions earthquake analysis uses specific dataset types, and future development data compatible with HAZUS was not available to estimate future damages due to earthquakes.

10. Hazardous Materials Release

Existing Buildings and Infrastructure

Hazardous materials would not affect buildings or infrastructure in the way that other hazards do. Rather, a release would affect the public's health through either direct contact or by making its way into the soil and contaminating potable water sources. As evidenced in Chapter 3 of this Plan, there are several locations where hazardous material has a high potential for being released through traffic accidents. Also, as previously discussed, Luzerne County is home to the Susquehanna Steam Electric Station. Refer to the maps in the Map Section at the end of Chapter 4 for locations of high accident rates and to **Figure 3.4** in Chapter 3 and **Figure 4.2** in this chapter for a map of the nuclear facility and affected areas within various radii from the plant.

Critical Facilities

There are 165 hazardous storage plants in the two county areas of which 67 are located in Lackawanna County and 98 are located in Luzerne County. **Table 4.25** summarizes the number of facilities by municipality for the counties.

Table 4.25: Hazardous Material Storage Facilities by Municipality

Lackawanna County		Luzerne County	
Municipality	**# of Haz. Mat. Facs.**	**Municipality**	**# of Haz. Mat. Facs.**
Archbald Borough	1	Dallas Township	3
Carbondale City	5	Duryea Borough	5
Dunmore Borough	7	Exeter Township	1
Fell Township	3	Foster Township	4
Moosic Borough	3	Freeland Borough	4
Olyphant Borough	1	Hazle Township	15
Ransom Township	1	Hazleton City	5
Scott Township	6	Hunlock Township	2
Scranton City	27	Jenkins Township	4
Thornhurst Borough	1	Larksville Borough	10
Throop Borough	12	Nanticoke City	1
		Salem Township	6
		Sugarloaf Township	3
		Union Township	1
		West Hazleton Borough	9
		West Wyoming Borough	3
		Wilkes-Barre City	5
		Wright Township	17

Potential Losses

Direct economic losses cannot be estimated for hazardous materials releases based on the limited data available for this Plan. More data should be collected about the type of hazardous material stored, and storage methods for each plant identified in this Plan. Indirect losses would result from increased health and medical issues and disruption to basic services such as water distribution.

Future Buildings

Hazardous materials would not affect buildings or infrastructure in the way that other hazards do. Therefore, estimating damages to future buildings is not applicable.

11. Nuclear Power Plant Failure

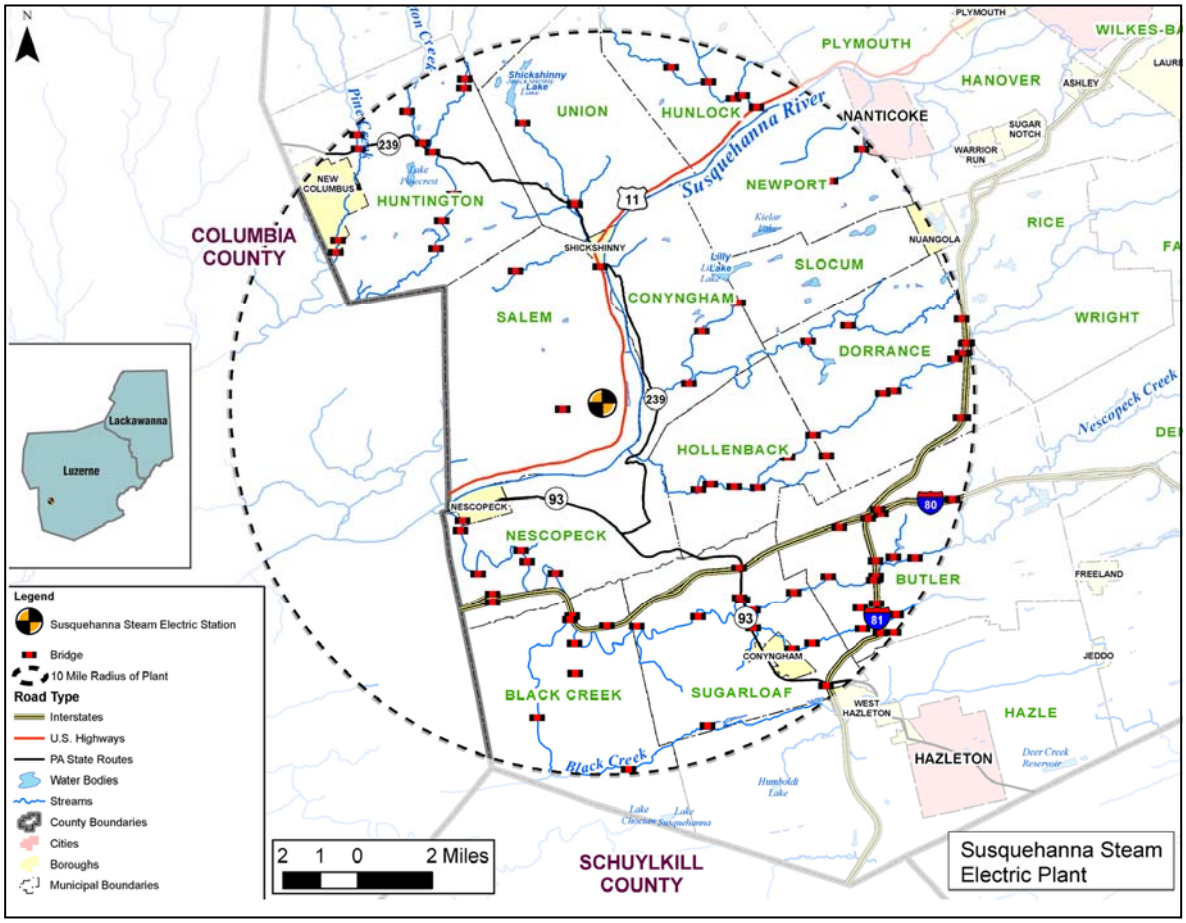
Existing Buildings and Infrastructure

The failure of the Susquehanna Steam Electric Station would not directly damage buildings or infrastructure. However, the failure of the plant would require all roads within a 10-mile radius of the plant to be shut down. A worst-case scenario would be a simultaneous hazard event such as a flood that requires evacuation utilizing these roadways. This would cause traffic on local and state-owned roadways as residents are evacuating. **Figure 4.2** displays the location of the Susquehanna Steam Electric Station and the 10-mile radius including all roadways and bridges that would be shut down during an emergency.

Critical Facilities

The failure of the Susquehanna Steam Electric Station would not directly damage buildings or infrastructure. Therefore, critical facilities would not be directly affected by the failure of the nuclear power plant.

Figure 4.2: Susquehanna Steam Electric Station and Roads Within the 10-Mile Radius



Potential Losses

As stated earlier, the potential loss due to a Nuclear Power Plant Failure release would not affect buildings or infrastructure permanently. Rather a release would affect the public's health through either air or water transport.

A nuclear power plant failure has four levels of emergency classifications listed below.

Alert Type	Description
Notification of Unusual Event	The least serious of the four levels. The event poses no threat to surrounding residents or the plant employees, but emergency officials are notified. No action by the public is necessary.
Alert	Declared when an event has occurred that could reduce the plant's level of safety, but backup plant systems still work. Emergency agencies are notified and kept informed, but no action by the public is necessary.
Site Area Emergency	Declared when an event involving major problems with the plant's safety systems has progressed to the point that a release of some radioactivity into the air or water is possible, but is not expected to exceed Environmental Protection Agency Protective Action Guidelines (PAGs) beyond the site boundary. Thus, no action by the public is necessary.
General Emergency	The most serious of the four classifications and is declared when an event at the plant has caused a loss of safety systems. If such an event occurs, radiation could be released that would travel beyond the site boundary. State and local authorities will take action to protect the residents living near the plant. The alert and notification system will be sounded. People in the affected areas could be advised to evacuate promptly or, in some situations, to shelter in place. When the sirens are sounded, radio, television and tone alert radios for site-specific information and instructions are utilized.

Problems and health effects from nuclear power failure are due to the high levels of radioactive material that is used or produced during the power generation process. Although the most notable occurrence was the Three Mile Island incident in Middletown, PA in 1979, there is a history of accidents and accidental releases due to various component failures in plants throughout the U.S. Most often, an accidental release of radioactive material occurs when contaminated water or steam is leaked either directly from the facility or from storage containers that are mishandled.

Should the worst case scenario of the full 50-mile fallout zone be affected through a power plant failure, both Lackawanna County and Luzerne County would be fully exposed. Without proper evacuation, significant loss of life could occur. The economic loss could total the economic values of the two counties; $16.9 billion for Lackawanna County and $23.4 billion for Luzerne County.

Future Buildings

The failure of the Susquehanna Steam Electric Station would not directly damage buildings or infrastructure. Therefore, future buildings would not be directly affected by the failure of the nuclear power plant.

12. Dam Failure

Existing Buildings and Infrastructure

Of the 32 high hazard dams in Luzerne County, eight do not have an Emergency Action Plan (EAP) in effect. Those dams that do not have an EAP are more dangerous because the resulting inundation area below the dam during a breach is unknown, and it is unclear which residents or businesses may be affected. A breach analysis specific to each dam would need to be performed to determine the impacts of a dam breach. For this Plan, the dams without an EAP and the municipalities that are downstream of each dam were determined. These are presented in **Table 4.26**.

Table 4.26: Luzerne County High Hazard Dams Without EAPs and Impacted Municipalities

Dam Name	Municipalities Affected
Dam G	Hazle Township
Dam F	Hazle Township
Bear Creek Lake	Bear Creek Township, Bear Creek Village Borough
Humboldt Reservoir	Hazle Township, Sugarloaf Township, Nescopeck Township, Black Creek Township
Lake Irena	Hazle Township, Sugarloaf Township, Nescopeck Township, Black Creek Township, West Hazleton Borough
Beech Mountain Lake	Sugarloaf Township, Nescopeck Township, Black Creek Township, Butler Township
Upper Mount Pleasant	Hazle Township
Lower Mount Pleasant	Hazle Township

Other municipalities in Luzerne County that have noted issues with hazardous dams are: Fairmount Township (Lake Jean) and Franklin Township (dam near Flat Rock Road, and Lake Louise).

In Lackawanna County, there are 33 high hazard dams located in the following municipalities: Archbald Borough, Benton Township, Carbondale Township, Clifton Township, Covington

Township, Dunmore Borough, Elmhurst Township, Glenburn Township, Jessup Borough, Madison Township, Moosic Borough, Newton Township, North Abington Township, Olyphant Borough, Roaring Brook Township, the City of Scranton, South Abington Township, and Springbrook Township. Of these, 10 high hazard dams in Lackawanna County would affect more than 1,000 residents in the event of a dam breach. These are listed in **Table 4.27.**

Table 4.27: Lackawanna County High Hazard Dams and Impacted Municipalities with Over 1,000 Affected Residents

Dam Name	Municipality Affected	Number of Residents Affected
Lake Scranton Dam	Roaring Brook Township	28,000
Dunmore #7 Dam	Dunmore Borough	21,400
Carbondale #4 Dam	Carbondale Township	20,000
Elmhurst Dam	Roaring Brook Township	20,000
Griffin Dam	South Abington Township	20,000
Brownell Dam	Carbondale Township	8,000
Williams Bridge Dam	Roaring Brook Township	5,000
Maple Lake Dam	Springbrook Township	3,500
Nesbitt Dam	Springbrook Township	3,500
Springbrook Intake Dam	Springbrook Township	3,500

Source: Lackawanna County Emergency Management Agency

Critical Facilities

Critical facilities could be disrupted by any of the dam failures above that do not have emergency action plans. It is recommended that dam breach analyses be performed for the eight dams in Luzerne County and any dams in Lackawanna County that do not have EAPs to determine the inundation area limits, and the critical facilities that may be affected.

Potential Losses

Without actual inundation area limits, the exposure to dam failure is uncertain. It is recommended that EAPs including dam breach analyses be developed to determine the flood extents of a dam breach for the above mentioned dams. Also, existing EAPs that were developed more than five years ago should be updated to determine if additional construction has occurred since the time of the EAP adoption.

Future Buildings

Since inundation areas have not been identified for the high hazard dams mentioned above, it is not possible to determine if future construction will be impacted by dam failure.

E. Land Use and Development Trends

Requirement §201.6(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

The vulnerability assessment includes a description of land uses and future development trends so that mitigation actions can reflect the changing land use and development patterns in the two counties. The majority of the Lackawanna and Luzerne County region is rural with primary land uses comprising farmland, woodlands, wetlands, water bodies, and mining areas.

Table 4.28 displays current percentages of land use in Lackawanna and Luzerne Counties. The most prevalent land uses in the two counties include Agriculture and Vacant Land; Residential Development, and Protected Open Space. These three uses combined account for over 90 percent of the land in the two counties. Approximately one-half of the land in the two counties is classified as Agriculture and Vacant Land (59% in Lackawanna County and 63% in Luzerne County). Residential development is the next largest category in Lackawanna County and accounts for approximately 22 percent of the total land area. Protected open space accounts for approximately 12.5 percent in Lackawanna County. In Luzerne County, 15.4 percent of the total land area comprises protected open space and 12.5 percent is residential in nature.

Table 4.28: Existing Land Use for Lackawanna and Luzerne Counties

Existing Land Use	Lackawanna County		Luzerne County	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**
Agricultural and Vacant	164,254.93	58.7%	357,320.08	63.0%
Commercial	10,059.12	3.6%	10,122.03	1.8%
Industrial	2,551.22	0.9%	9,179.84	1.6%
Institutional	6,220.39	2.2%	10,852.93	1.9%
Private Open Space			4,727.18	0.8%
Protected Open Space	24,877.70	8.9%	87,224.72	15.4%
Quarry or Mine or Landfill	2,615.59	0.9%	4,443.32	0.8%
Residential	63,224.51	22.6%	71,111.18	12.5%
Transportation and Utilities	1,740.96	0.6%	11,327.86	2.0%
Unknown	4,194.63	1.5%		
Urban Center	176.68	0.1%	897.15	0.2%
Total	279,915.74	100.0%	567,206.28	100.0%

Table 4.28 displays the land use categories and corresponding areas and percent area for each type of land use. The urbanized spines in the two counties lie along the Susquehanna and Lackawanna Rivers. Luzerne County's major urban core spans from Pittston to Wilkes-Barre

including Jenkins, Hugheston, and Pittston Townships. The southern part of Luzerne County – Hazle, Sugarloaf, Hazleton and Butler Townships – is also relatively developed. Developed areas in Lackawanna County lie primarily around and north of the City of Scranton and include Taylor, Blakely, Archbald, and Jermyn Boroughs. An Existing Land Use map is provided in the Map Section at the end of Chapter 4.

Private development (activity over the last decade) in the two-county region consists primarily of residential development (52% and 64% in Lackawanna and Luzerne Counties, respectively). Industrial development in Lackawanna County accounts for approximately 23 percent of all the recent private development and that in Luzerne County accounts for approximately 31 percent. New industrial developments were noted in Covington Township and Olyphant and Jessup Boroughs in Lackawanna County and in Butler, Hazle, Hanover, and Pittston Townships in Luzerne County.

In terms of open space preservation, approximately 18,000 acres of private land are protected by conservation easements. Public conservation land occupies approximately 22,500 acres in Lackawanna County and 70,000 acres in Luzerne County, respectively. The two-county area comprises publicly conserved land in six state parks, seven county parks (four in Lackawanna and three in Luzerne), and 15 state game lands. Benton and Thornhurst Townships and Jessup Borough in Lackawanna County contain some state forests and park land and Fairmount, Dennison, Butler, Plymouth Townships and Kingston Township in Luzerne County contain public forests and parks. There are other areas in Jefferson and Clifton Townships in Lackawanna County and Bear Creek, Dennison, Ross, and Salem Townships in Luzerne County that are protected by various land trusts, conservancies, and conservation easements. A Land Preservation Map is provided in the Map Section at the end of Chapter 4.

Based on county planning data, there are 35 development proposals in the bicounty region, of which 24 are residential, three commercial, and eight are industrial in nature. Lackawanna's planned development is centered on the 11 municipality Scranton-Abingtons Planning Association area in South Abington and Newton Townships, Clarks Green and Clarks Summit Boroughs, and in the City of Scranton. In Luzerne County, development is planned in Pittston, Jenkins, Plains, Salem, Dennison, Hazle, Dallas, Lehman and Butler Townships, and in Laflin, and Yatesville Boroughs. The Bi-County Comprehensive Plan includes a map showing recent and pending development in the two counties.

In terms of future development, residential use is expected to account for the largest amount of future land to be developed. Based on a trend scenario that assumes current development trends and land use regulations and policies, the trend indicates a continuation of suburban residential development, and it is estimated that by 2030, approximately 24,000 new housing units will be constructed. Particular attention will need to be paid to ensure that the development proposals incorporate hazard mitigation planning principles.

The Bi-County Comprehensive Plan includes a development suitability map that identifies areas that range from least to most suitable for development based on composite natural and physical constraints such as floodplain, wetlands and steep slopes, moderate slopes, and prime farmland. As discussed in the Mitigation Strategy, limited development should be promoted in these environmentally sensitive areas. Adequate land with characteristics suitable for development is available to accommodate projected growth over the planning period.

F. Government Structure and Funding Sources

This section is comprised of two parts. The first part (Government Structure) summarizes the roles of agencies in Lackawanna and Luzerne Counties, respectively that implement hazard mitigation-related activities directly or indirectly, and describes the government structure; the second part identifies financial resources available for mitigation-related activities.

The purpose of this section is to look beyond the local municipalities (cities, boroughs, and townships) to the next highest level of governmental responsibility; i.e., the County; and identify functions and protections that are in effect at the various levels of government. The section also documents the roles of various departments/agencies in the two counties that develop and implement the various plans and ordinances to identify areas for coordination and/or improvement.

1. Government Structure

a. Lackawanna County Government Structure

Department of Planning and Economic Development – This Department oversees a number of agencies including the Lackawanna County's Office of Economic and Community Development, Lackawanna County Regional Planning Commission, and the Lackawanna County Redevelopment Authority.

> Office of Economic and Community Development – The Office of Economic and Community Development is responsible for coordinating Lackawanna County's economic and community development programs, including administering the Community Development Block Grant Program (CDBG). This program assists communities by providing funding for decent, safe and sanitary housing; opportunities for a suitable living environment, especially for persons of low to moderate income; and the elimination of slums, blight and blighting influences within neighborhoods. The county contains 11 entitlement communities that receive between $1.6 and $1.8 million each year, in addition to the county's non-entitlement communities, which receive approximately $300,000. The Cities of Scranton and Carbondale administer their own CDBG programs. In addition to the CDBG, the Office of Economic and Community Development administers the First Time Homebuyer Program, Housing Rehabilitation Assistance Program, and the Emergency Repair Assistance Program.
>
> Lackawanna County Regional Planning Commission – The Lackawanna County Regional Planning Commission is responsible for making policy decisions on planning, subdivision and land development issues, and proposals on local land use regulations. The Commission is involved in subdivision and land development, land use ordinance, and comprehensive plan reviews. The Commission is responsible for transportation and environmental planning, census data and demographic analysis. Commission staff also provides planning and technical assistance to municipalities, and maintains the County's mapping and GIS. The Lackawanna County Regional Planning Commission is also part of the Metropolitan Planning Organization for Transportation Planning in Lackawanna and Luzerne Counties.

Lackawanna Redevelopment Authority – The Lackawanna Redevelopment Authority is responsible for acquiring and redeveloping blighted areas so that they become available for economically and socially sound redevelopment.

Lackawanna County Emergency Management Agency – The County Emergency Management Agency is responsible for the planning, assignment and coordination of resources in the areas of mitigation, preparedness, response and recovery for natural or human-caused emergencies. The purpose of the Agency is to mitigate the effects of disasters, prepare to respond and recover from disasters, respond to emergency conditions, and recover from the effects of disasters. The County Emergency Management Agency is also responsible for organizing all locally available manpower, supplies, equipment and services necessary for disaster emergency readiness, response and recovery. The EMA also contains a Local Emergency Planning Committee (LEPC) which is responsible for overseeing the Hazardous Materials Response Account and approving Off-Site Emergency Response Plans. The LEPC is comprised of the county emergency management coordinator, a county commissioner, local government representative, law enforcement official, firefighter, and emergency management personnel, among others.

Lackawanna County Emergency Communications Center – The Lackawanna County Emergency Communication Center is the designated 9-1-1 center, responsible for the dispatch of police, fire, rescue and emergency medical services during emergency situations. The Center is staffed by professional Public Safety Telecommunicator/Emergency Medical Dispatchers. The Center provides emergency dispatch and communication services for various police, fire, rescue and emergency medical services throughout Lackawanna County, as well as for County and Municipal Emergency Management Agency (EMA) operations. Each of the municipalities in the county has its own police, fire, and ambulance services.

Lackawanna County Conservation District – The Lackawanna County Conservation District (LCCD) is the agency responsible for the conservation of soil and water resources through the control and prevention of soil erosion and conservation, restoration and planning of the county's watersheds. The Conservation District serves the public by being a clearinghouse for information, erosion and sedimentation control, watershed conservation, environmental education and public outreach.

Environmental Education Programs – The County Conservation District implements educational activities through the Willary Water Resource Center. Examples of educational programs include lake and pond management workshops, the Environmental Classroom for regional educators, the Lackawanna County Envirothon, and the Water Discovery Day Camp. The Center has been successful in building cooperation and partnerships between federal, state and local government agencies, local non-profit organizations, school districts, civic groups, watershed associations, and lake associations.

Lackawanna County Department of Public Works – The Lackawanna County Department of Public Works has overall responsibility for maintenance of non-park county property including all county buildings, the county road network and county-owned bridges. The County Roads and Bridges Department is responsible for snowplowing and salting, filling potholes, maintaining storm and drainage pipes, black topping, repairing guide rails and installing signs on county-owned roadways. The Department is also responsible for the 151 county-owned bridges within the county and ensures that waterways are kept open, bridge decks are replaced and repaired as needed, and railings, sidewalks, culvert pipes and bridges are replaced as needed.

Lackawanna County Department of Buildings and Grounds – The Department of Building and Grounds is responsible for the maintenance and operation of all county-owned buildings including the County Courthouse, County Administration Building, and the Emergency Services Center.

Transportation **-** The County's Transportation Department's operations include the County of Lackawanna Transit System, the Lackawanna County Railroad Authority and the Lackawanna Coordinated Transportation System.

Lackawanna Heritage Valley Authority (LHVA) – The Authority creates, supports and funds partnerships with government, business, civic and educational organizations and individuals dedicated to the development of the valley's historic, cultural, natural and economic resources. This strategy of "heritage development" is implemented through coordinated efforts in preservation, education and promotion of regional heritage. The LHVA is a municipal authority under the sponsorship of Lackawanna County and is funded by the Pennsylvania Department of Conservation and Natural Resources and the National Park Service.

Communications - The Communications Office informs the public about county government, serves as a liaison with the news media, and performs various public activities for the Commissioners and county departments.

Engineering – Engineering projects are contracted to a private consulting firm, Acker Associates, located in Moscow, Pennsylvania. The firm serves as the County Engineer.

b. Luzerne County Government Structure and Hazard Mitigation-Related Programs

Luzerne County Engineers Office - The County Engineer's office is responsible for the technical review and the administrative aspect of county projects, subdivision and land development review, design and construction of road and bridge projects, and contract administration for county projects. The Engineers Office is staffed by engineers, support staff, and district, levee, warehouse and bridge crews. The County Engineer's Office comments on all new land development projects. Those municipalities that are administered by the County are required to incorporate comments. Other municipalities that are not administered by the County can use the County comments at their discretion.

Luzerne County Planning Commission - In general, the function of the Luzerne County Planning Commission is to make recommendations to the governing body on a number of issues, including zoning, subdivision/land development and comprehensive planning. The Planning Commission administers a zoning ordinance for 19 municipalities within the county, and administers the subdivision/land development ordinance for 27 municipalities. The Planning Commission also reviews subdivision/land development plans for all municipalities within the county, including those over which the County does not have control.

The Planning Commission is involved with stormwater management planning, the administration of the Luzerne County Agricultural Preservation Program, provides assistance to the Bureau of the Census, participates in the Luzerne County Flood Protection Authority/Mitigation Board, and provides information and assistance to various federal, state, and local governmental agencies as well as the general public on a regular basis.

The Planning Commission is involved in transportation planning via the Metropolitan Planning Organization (MPO). The MPO decides how federal and state transportation funds will be

allocated in the two-county MPO region. One member of the Luzerne County Planning Commission staff serves as the secretary for the MPO, and two members serve as both members of the MPO committees and as staff.

Luzerne County Emergency Management Agency - The Emergency Management Agency is responsible for protection of the county's public health, safety and environment, and management through and recovery from natural disasters, emergencies or threats to security. The EMA also contains a Local Emergency Planning Committee (LEPC) which is responsible for overseeing the Hazardous Materials Response Account and approving Off-Site Emergency Response Plans. The LEPC is comprised of the county emergency management coordinator, a county commissioner, local government representative, law enforcement official, firefighter, and emergency management personnel, among others.

Luzerne County Office of Community Development - The Luzerne County Office of Community Development is entrusted with the provision of decent housing, a suitable living environment, and expanded economic opportunities that will improve the quality of life of county residents. The Office of Community Development administers three federally funded Housing and Urban Development (HUD) programs:

- Community Development Block Grant Program (CDBG) - community development activities directed toward revitalizing neighborhoods, economic development, and providing improved community facilities and services. CDBG funds may be used for activities such as acquisition of real property; relocation and demolition; rehabilitation of residential and non-residential structures; and construction of public facilities and improvements to facilities such as water, sewer, and streets.

- Home Investment Partnership Program (HOME) - grant to State and local governments designed exclusively to create affordable housing for low-income households.

- Emergency Shelter Grant Program (ESG) - provides homeless persons with basic shelter and essential supportive services. It also provides short-term homeless prevention assistance to persons at imminent risk of losing their own housing due to eviction, foreclosure, or utility shut-offs.

Luzerne Conservation District – The Luzerne Conservation District strives to conserve natural resources in Luzerne County through public awareness, technical assistance, and encouraging regulatory compliance. They work closely with property owners, public and private organizations and citizens to increase their responsibility to the natural environment.

Luzerne County Department of Roads and Bridges – This department maintains county roads and bridges. State highways are maintained by PennDOT and local roads are maintained by individual municipalities (roads bridges, culverts, pipes, inlets, etc.).

Public Information - The county has a Public Information Officer position, whose role is to serve as the Commissioners' liaison to the press and play an instrumental role in relaying information to the public in times of emergency, such as the flooding threat experienced in the summer of 2006. The Public Information Officer works closely with the commissioners and the County Engineer during emergency events.

Luzerne County Flood Protection Authority – All flood control facility maintenance falls under the auspices of the Luzerne County Flood Protection Authority by contractual agreement with the

Corps of Engineers. The Flood Protection Authority contracts with County Government (Levee Department in the County Engineer's Office). The Floodplain Acquisition Program is administered by the Luzerne County Flood Protection Authority. The Authority is currently using approximately $7 million of the levee funds from this floodplain acquisition program to buy out properties that have been repeatedly flooded. The buyout involves 20 communities, including Plymouth Township, Shickshinny Borough, and Jenkins Township. The list includes 30 projects: three acquisition/demolition which have been completed, two acquisition/demolition projects which are in process; and the remaining 25 that are yet to begin. The estimated cost for the County is $125,000 per property. Once the buyout occurs, the property deed is tagged by the County for the property to remain open space in perpetuity.

- Shickshinny Borough is the first community impacted by the 25-year flood event. Most properties that are vulnerable to flooding lie on South Canal Street.

- Plymouth Township has 150 properties in the floodplain. Currently 19 projects are being implemented from the Plymouth County Hazard Mitigation Plan. They include buyouts at the intersection of South River and Harvey's Creek, Allen Street, East Popular Street, West Popular Street, East Canal Street, West Main Street, and South Mill Street.

- Jenkins Township has approximately 40-50 mitigation projects listed. Of these, approximately five homes will be removed from the list to accommodate the new bridge that is being built.

Flood warning systems – For flood warning on small streams, the County Emergency Management Agency is the coordinating agency. Bulletins are issued to municipalities who in turn, disseminate the information to the residents. For river flooding and major events (above 27 feet) the Luzerne County Flood Protection Authority serves as the technical arm for the EMA and prepares maps and detailed information on limits of flooding based on a projected crest, list of impacted communities, name/address and also impacted infrastructure (which roads need to be closed, etc.). This information is used by the EMA to issue notifications. There is a need for additional stream gauges on small streams to give residents adequate warning and also a need to reestablish more rain gauges across the county.

Storm Ready Program - In June 2007, Luzerne County was certified as a Storm Ready Community by the National Weather Service and the Pennsylvania Eastern Region Storm Ready Advisory Board. The Storm Ready program was established to help local governments improve the timeliness and effectiveness of hazardous weather-related warnings for the public. By participating in this program, local agencies can earn recognition for their jurisdiction by meeting the guidelines established by the National Weather Service in partnership with federal, state, and local emergency management professionals. The certification makes Luzerne County and its municipalities eligible for 25 points in the community rating system, awarded to local governments that meet the flood threat recognition system.

Pennsylvania State Association of Township Supervisors (PSATS) - The Pennsylvania State Association of Township Supervisors strives to preserve and strengthen township government and to improve involvement for townships in the state. PSATS sponsors training opportunities to provide township officials with the information and skills they need to meet the challenges of township office.

2. Financial Resources

The following funding sources provide grants for mitigation planning and project-related activities:

- Hazard Mitigation Grant Program (HMGP) – HMGP is administered by FEMA and provides grants to states, tribes and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation activities to be implemented as a community recovers from a disaster. Eligible projects include elevating flood-prone homes or businesses; acquisition of flood-prone homes from willing owners and returning the property to open space; retrofitting buildings; and construction of floodwall systems to protect critical facilities.

- Pre-Disaster Mitigation (PDM) Program – The PDM program provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. The program provides technical and financial assistance to state and local governments to assist in the implementation of pre-disaster mitigation actions, which must be cost-effective and designed to reduce injuries, loss of life and damage and destruction of property.

- Flood Mitigation Assistance (FMA) Program – FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, or other National Flood Insurance Program (NFIP) insurable structures, with a focus on repetitive loss properties. The NFIP enables property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. Three types of FMA grants are available to states and communities: 1) Planning Grants to prepare Flood Mitigation Plans; 2) Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures; and 3) Technical Assistance Grants for the state to help administer the FMA program and activities. Up to 10 percent of Project Grants may be awarded to states for Technical Assistance Grants.

- Repetitive Flood Claims (RFC) Program – The program provides funding to states and communities to reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have had one or more claims for flood damages, and that cannot meet the requirements of the Flood Mitigation Assistance (FMA) program for either cost share or capacity to manage the activities. Eligible activities include: 1) acquisition of properties, and either demolition or relocation of flood-prone structures, where the property is deed restricted for open space uses in perpetuity; 2) elevations; 3) dry flood-proofing of non-residential structures; and 4) minor localized flood control projects.

- Severe Repetitive Loss (SRL) - An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and: 1) that has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or 2) for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. Eligible flood mitigation project activities under the SRL program include: 1) acquisition and demolition or relocation of at-risk structures and conversion of the property to open space; 2) elevation of

existing structures to at least the base flood elevation; 3) minor physical localized flood reduction projects; and 4) dry flood-proofing for historic properties.

- Emergency Management Performance Grants (EMPG) – The EMPG program provides resources to state and local governments to develop an all-hazards planning approach to emergency management. The EMPG program provides resources to assist state and local governments to sustain and enhance all-hazards emergency management capabilities.

- National Dam Safety Program (NDSP) – This program provides financial assistance to the states for strengthening their dam safety programs. The program includes grant assistance to the states, dam safety research, and dam safety training.

- Community Development Block Grant (CDBG) – The program provides grants and technical assistance to federally designated and non-designated municipalities for any type of community development. These grants may be used for infrastructure improvement, public services, or development and planning, of which 70 percent of the project must benefit low- and moderate-income persons.

- Growing Greener - Growing Greener is a state grant program that provides funding for the Pennsylvania DEP to: 1) clean up rivers and streams; 2) address environmental issues at abandoned mines and contaminated industrial sites; and 3) finance advanced energy projects.

- Floodplain Land Use Assistance Program – The program provides grants of 50 percent of the eligible costs and technical assistance to encourage the proper use of land and the management of floodplain lands within the Commonwealth of Pennsylvania.

- Land Use Planning and Technical Assistance Program (LUPTAP) – The program provides a 50 percent match of funds and technical assistance in the preparation of community comprehensive plans and the ordinances to implement them. In addition to land development and water resource planning, the grants provide help in implementing zoning ordinances and subdivision regulations.

- Local Municipal Resources and Development Program (LMRDP) – The program provides grants from a minimum of $5,000 up to $25,000 for infrastructure rehabilitation, acquisition and demolition of structures, and revitalization of community facilities.

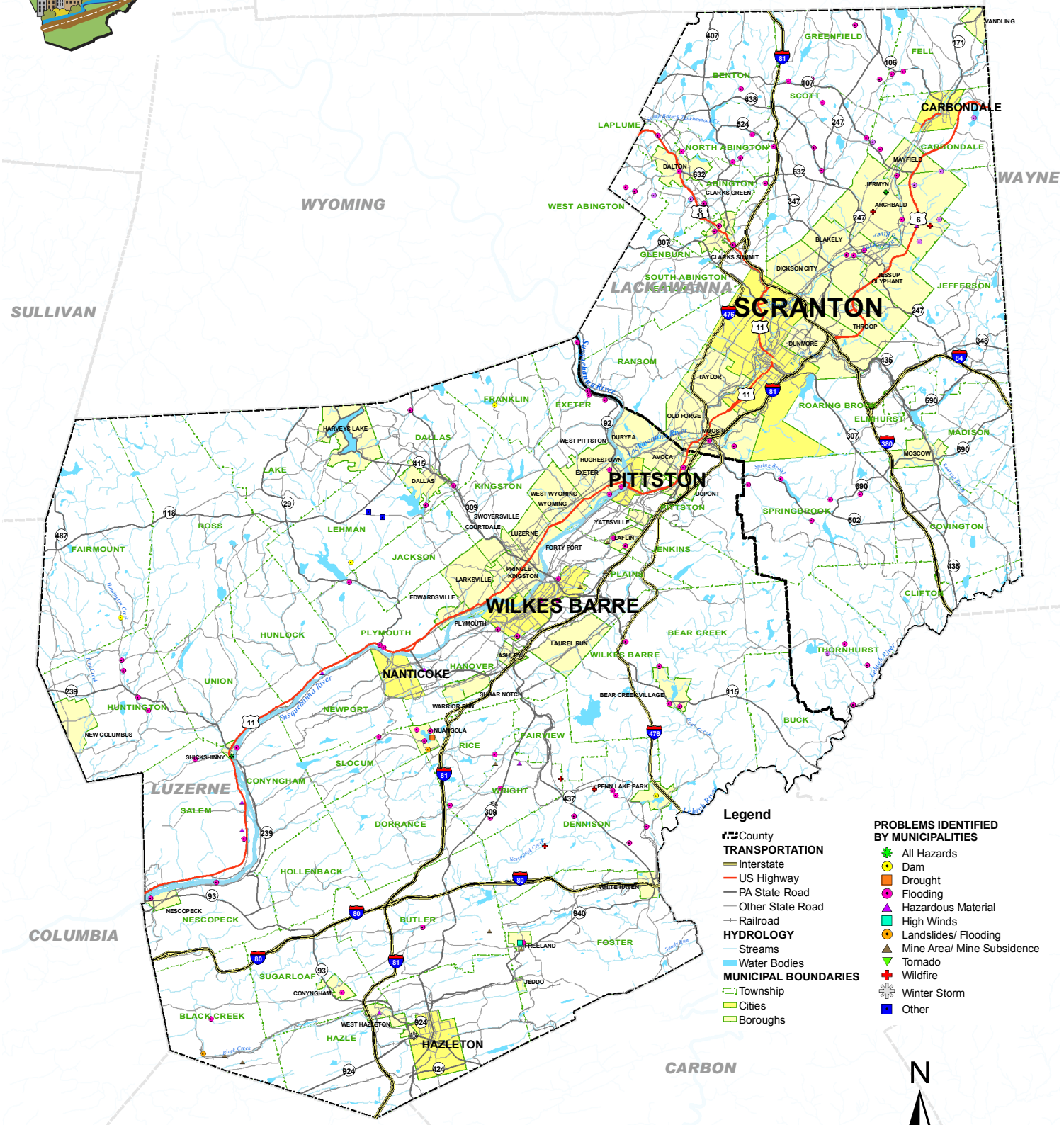
- Urban Development Program (UDP) - The program provides grants from a minimum of $5,000 up to $25,000 for construction or rehabilitation of infrastructure, acquisition and demolition of structures, rehabilitation of structures, planning of community assets, and public safety training (i.e. first responder training).

Other state agencies that have funding programs related to mitigation include: Department of Community and Economic Development; Department of Transportation; Department of Environmental Protection; Department of Conservation and Natural Resources; and Department of Agriculture.

Most state and federal grant programs require local communities to provide at least part of the necessary project funding in real dollars or through “in-kind” services. While the percentage of local contribution varies between programs, local communities need to assess their financial capability and resources to implement their hazard mitigation action plans.

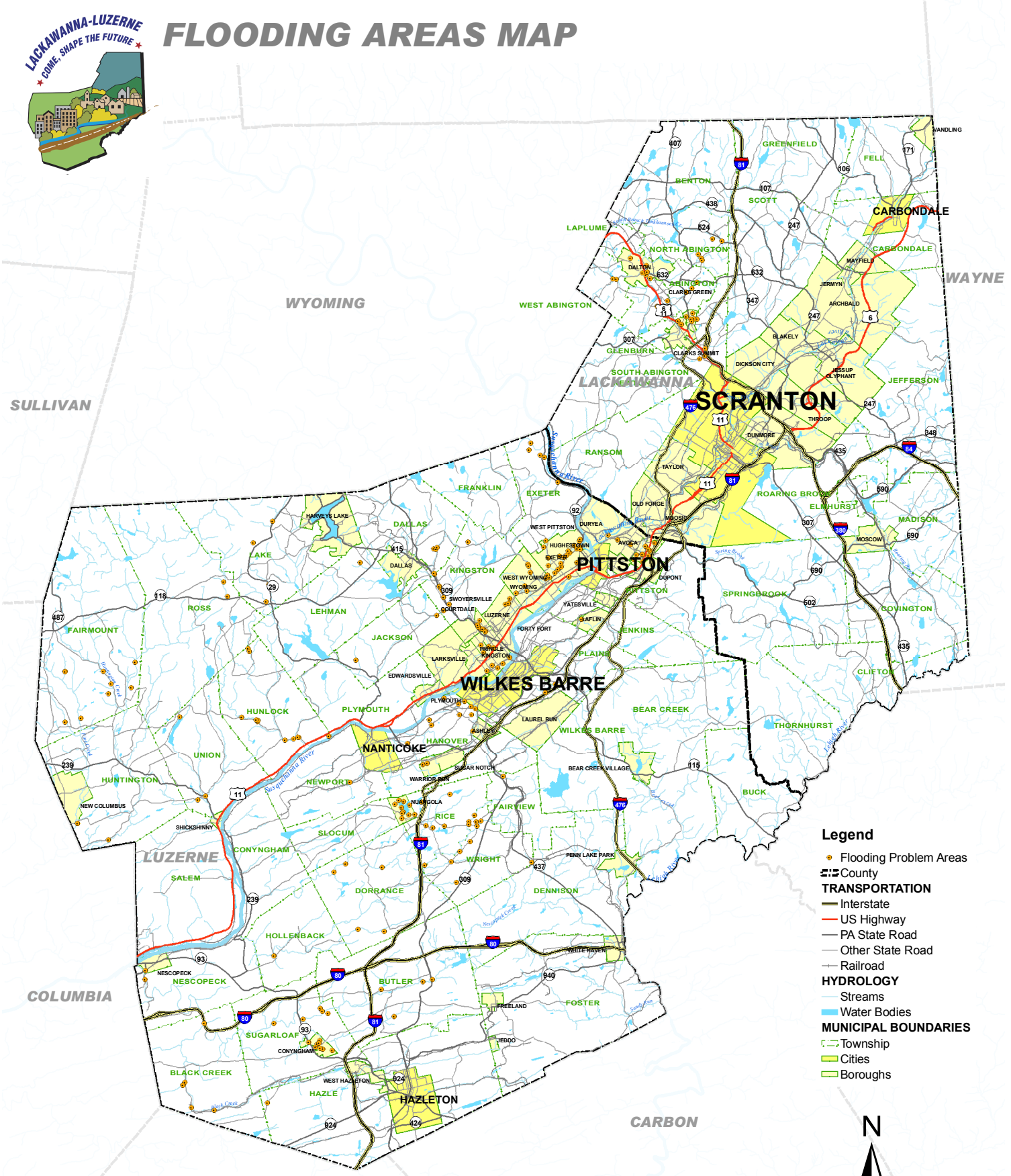
Chapter 4 - Map Section

PROBLEM AREAS IDENTIFIED BY MUNICIPALITIES



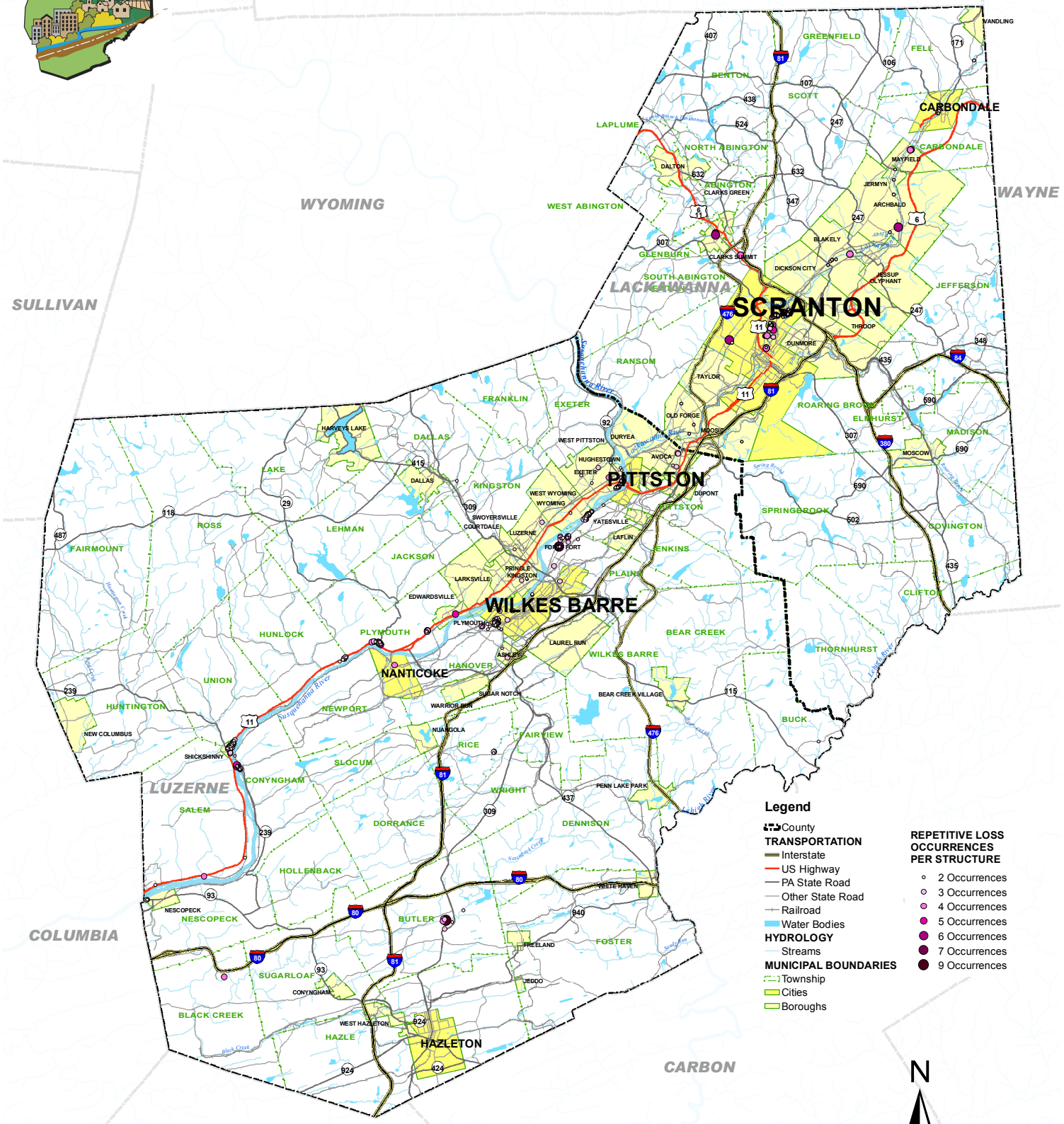
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, Luzerne and Lackawanna County Municipalities

FLOODING AREAS MAP



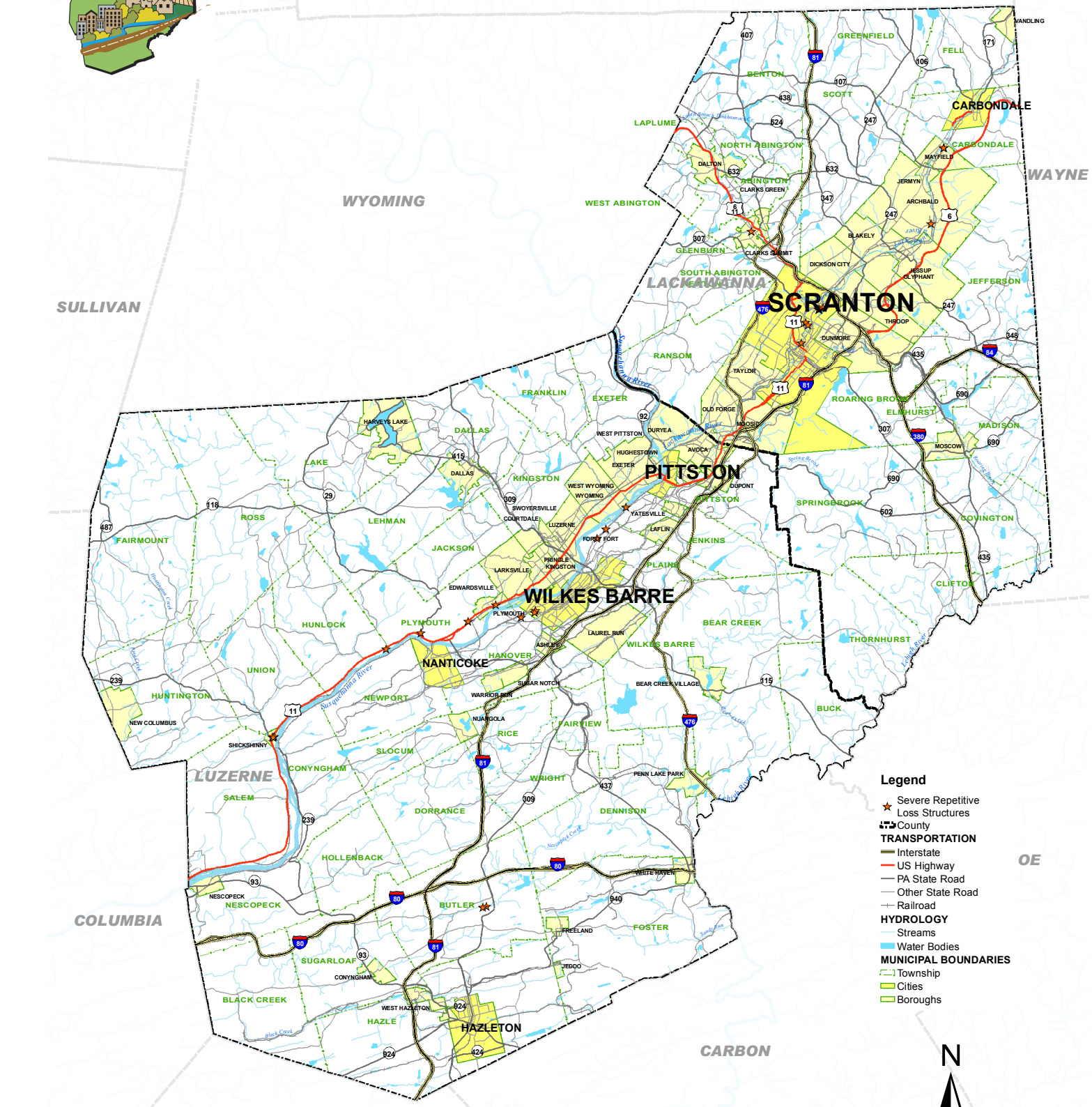
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, Luzerne County Conservation District, Luzerne County Phase I Act 167 Plan, South Abington Planning Association Comprehensive Plan

REPETITIVE LOSS STRUCTURES MAP



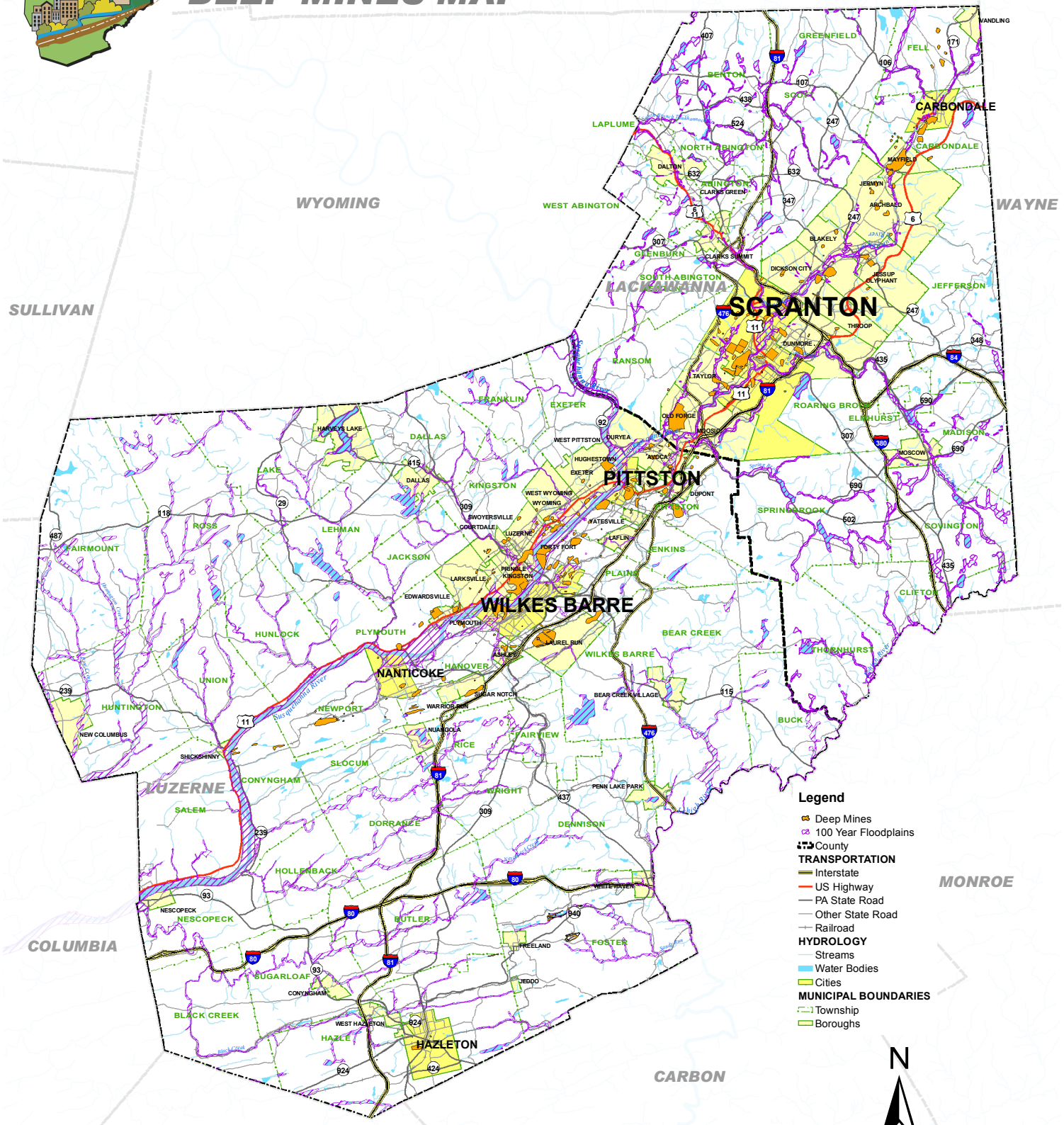
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, Luzerne and Lackawanna County Emergency Management Agencies

SEVERE REPETITIVE LOSS STRUCTURES MAP



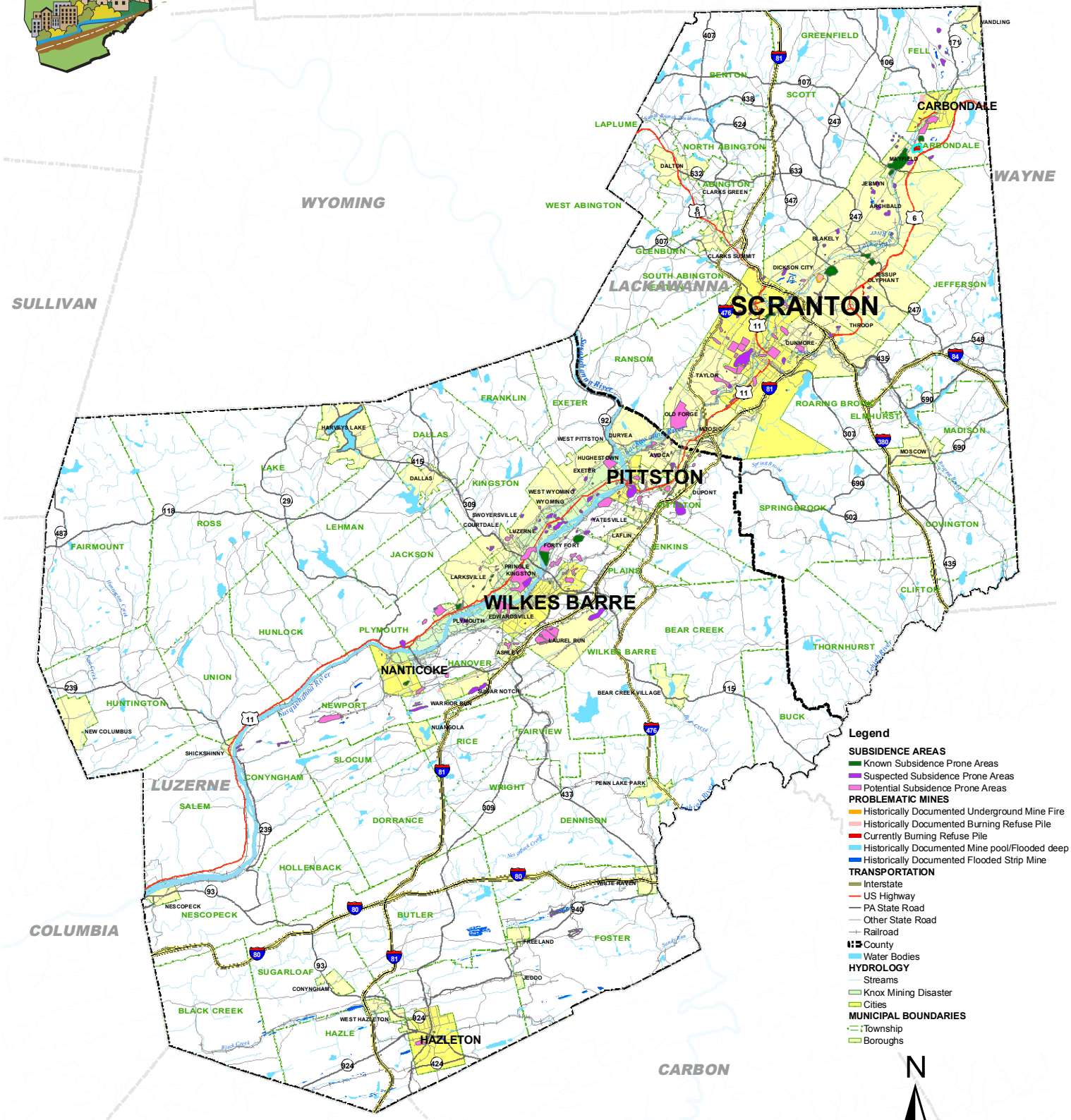
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, Luzerne and Lackawanna County Emergency Management Agencies

FLOODPLAINS AND DEEP MINES MAP



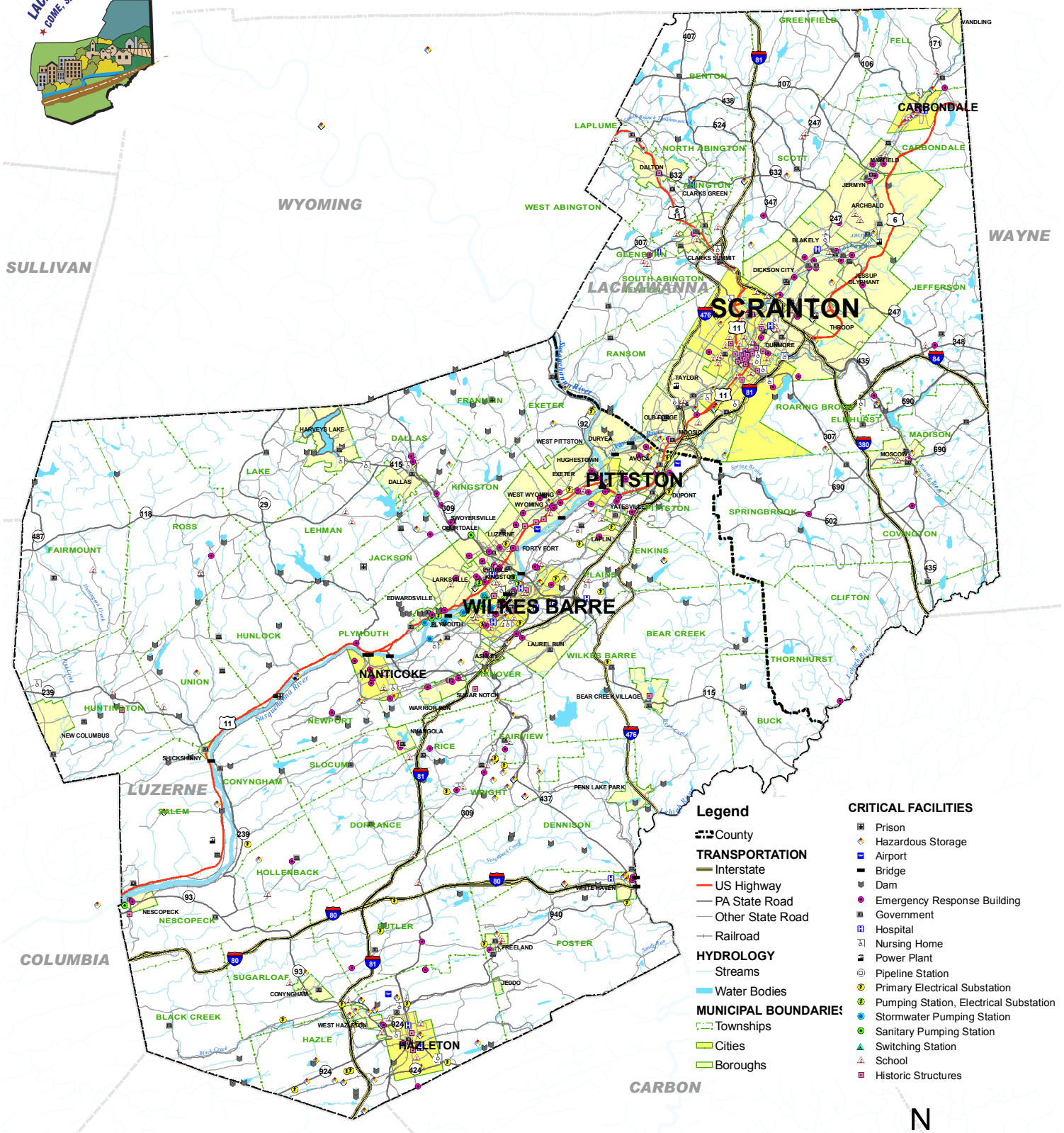
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, PaDEP

PROBLEMATIC MINES AND SUBSIDENCE AREAS MAP



July 2007
Source: Luzerne/Lackawanna County Open Space Plan, Luzerne County, PaDEP

CRITICAL FACILITIES MAP



Legend

- County

TRANSPORTATION
- Interstate
- US Highway
- PA State Road
- Other State Road
- Railroad

HYDROLOGY
- Streams
- Water Bodies

MUNICIPAL BOUNDARIES
- Townships
- Cities
- Boroughs

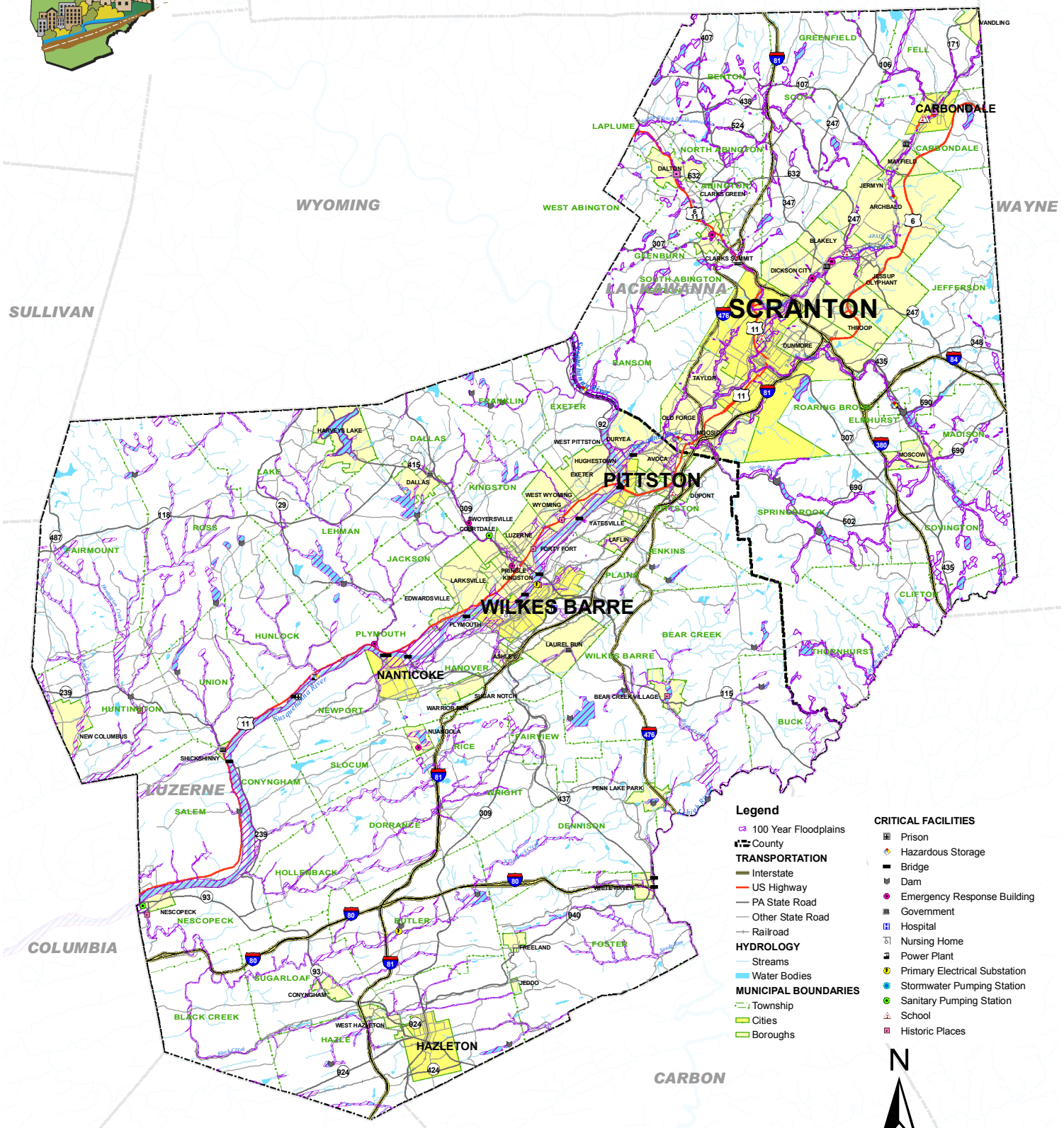
CRITICAL FACILITIES
- Prison
- Hazardous Storage
- Airport
- Bridge
- Dam
- Emergency Response Building
- Government
- Hospital
- Nursing Home
- Power Plant
- Pipeline Station
- Primary Electrical Substation
- Pumping Station, Electrical Substation
- Stormwater Pumping Station
- Sanitary Pumping Station
- Switching Station
- School
- Historic Structures

N

0 1 2 4 6 8 Miles

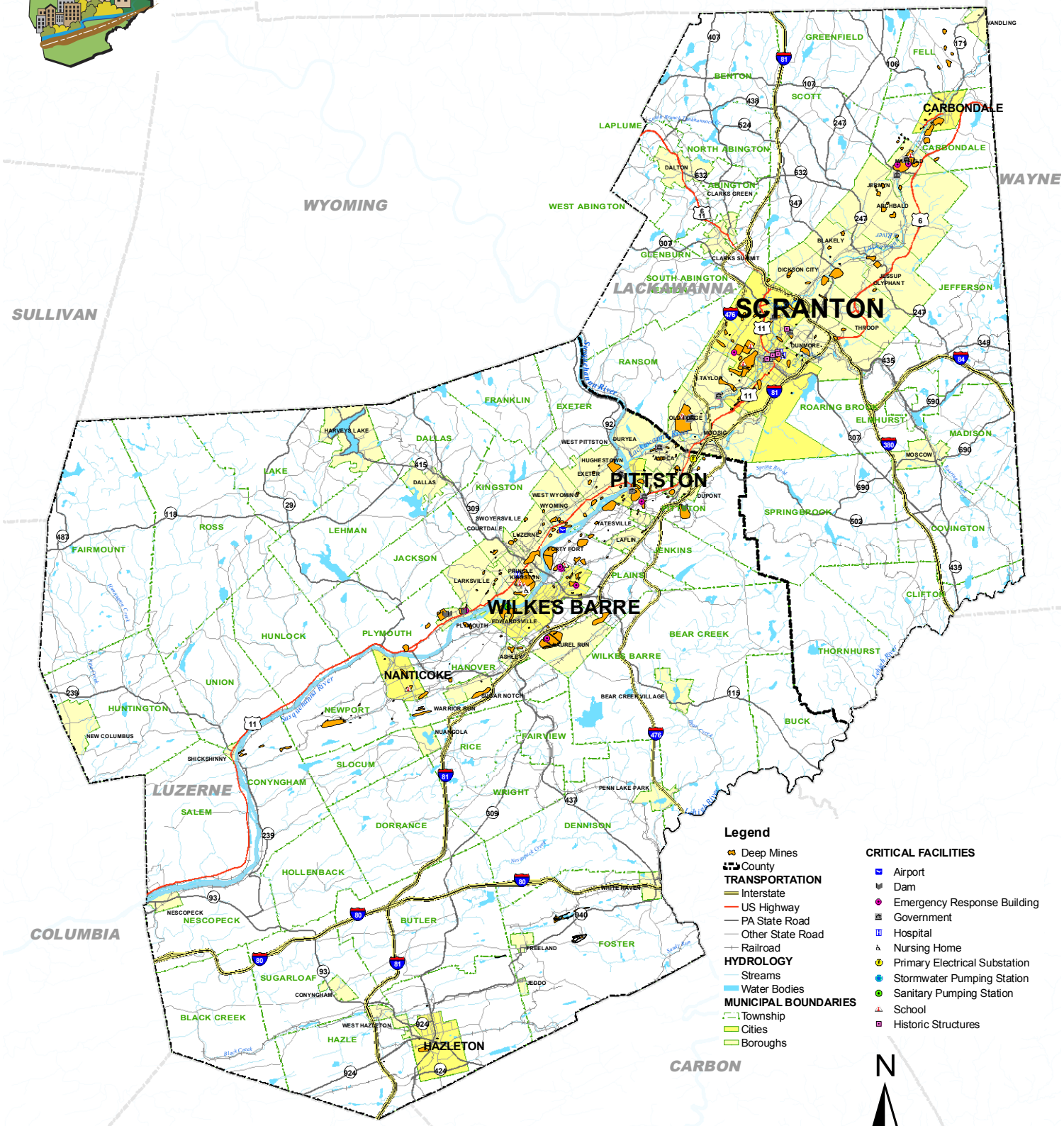
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, National Register Information System, Luzerne County, Lackawanna County

CRITICAL FACILITIES IN FLOODPLAINS MAP



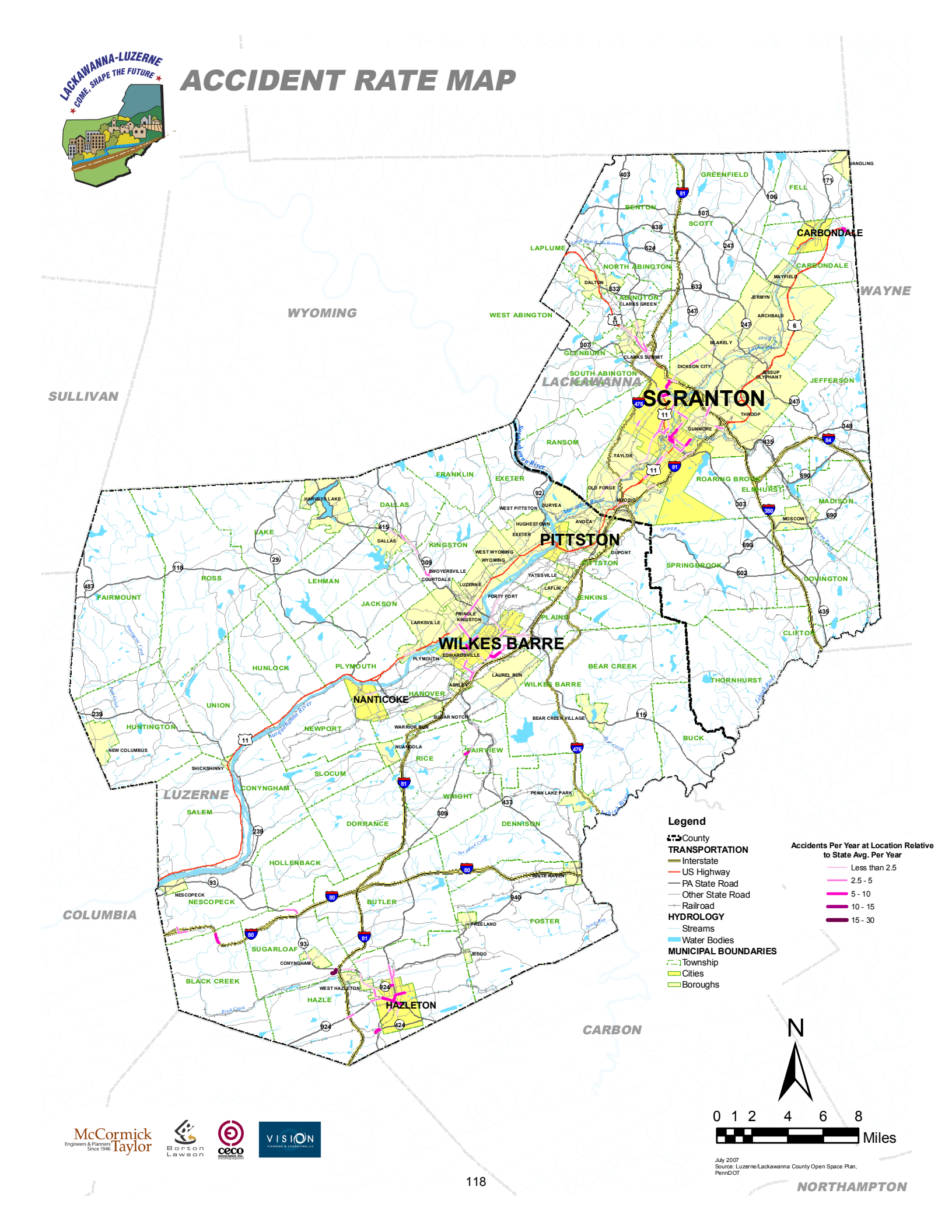
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, National Register Information System, Luzerne County, Lackawanna County

CRITICAL FACILITIES OVER DEEP MINES MAP



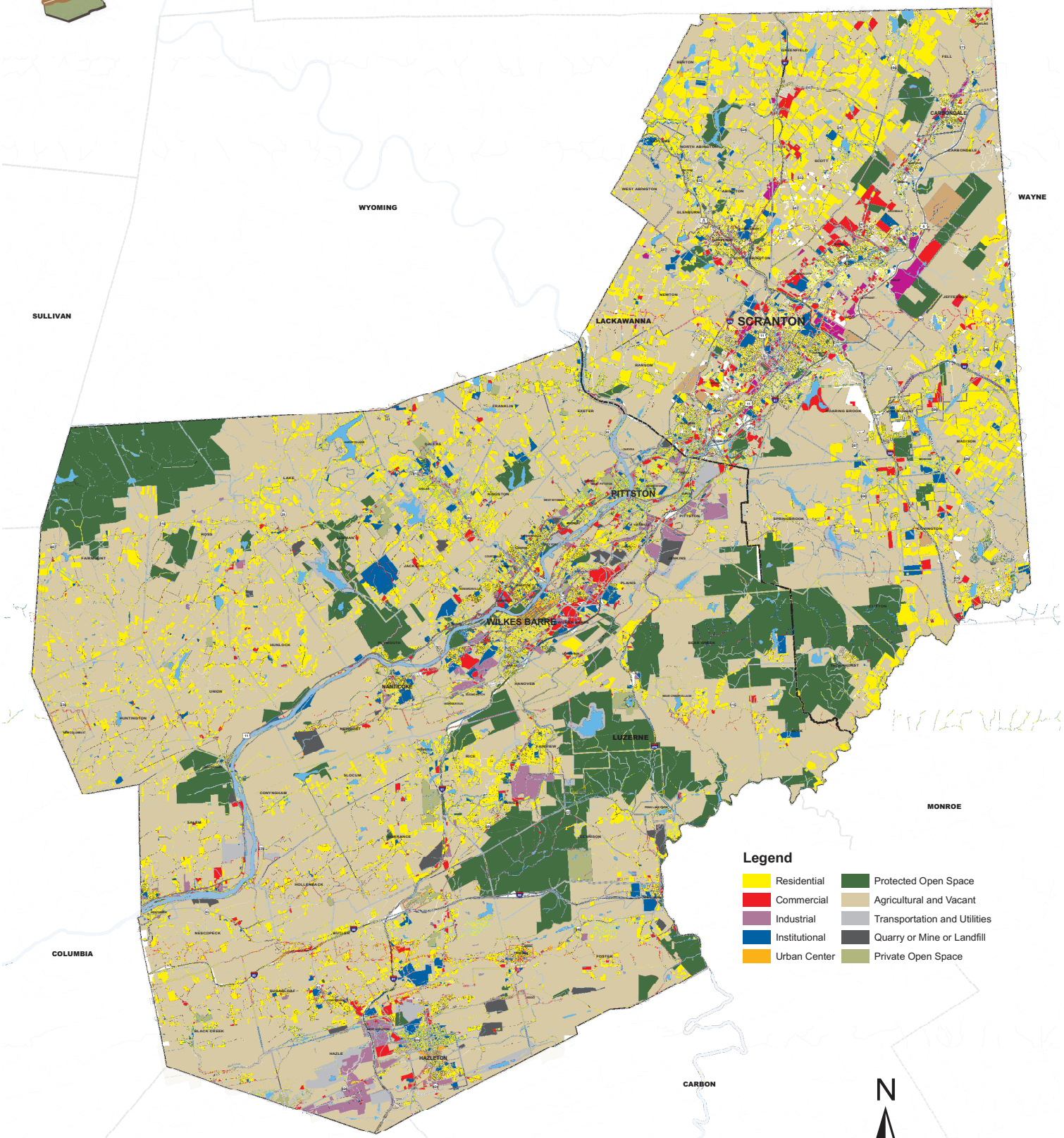
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, National Register Information System, Luzerne County, Lackawanna County

ACCIDENT RATE MAP



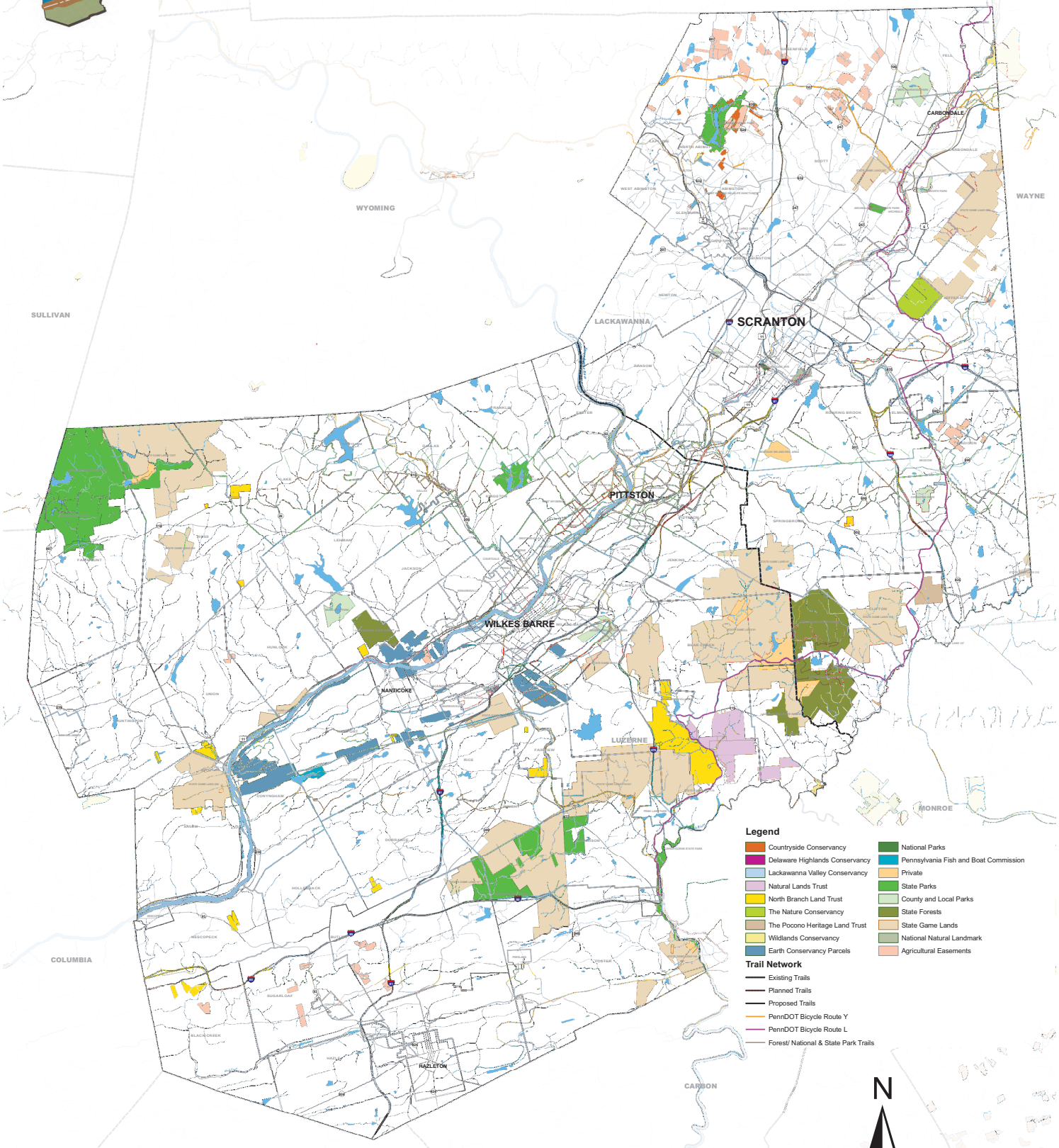
July 2007
Source: Luzerne/Lackawanna County Open Space Plan, PennDOT

EXISTING LAND USE



December 2008
Source: Luzerne/Lackawanna County Open Space Plan, Lackawanna Planning Commission & Luzerne County

LAND PRESERVATION



November 2008
Source: Luzerne/Lackawanna County Open Space Plan, Pennsylvania Conservation Stewardship, Lackawanna Valley Nature Conservancy, North Branch Land Trust & The Pennsylvania Environmental Council

Chapter 5 – MITIGATION STRATEGY

MITIGATION STRATEGY: *§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

The mitigation strategy serves as the long-term road map to reducing the potential losses, vulnerabilities and shortcomings identified in Chapters 3 and 4. A typical mitigation strategy includes a list of goals and objectives and mitigation actions to address the goals and objectives, which are then prioritized based on the community's requirements. The mitigation strategy in this Plan comprises the following five subsections:

- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Actions (County Level)
- Implementation of Mitigation Actions
- Implementation of the National Flood Insurance Program
- Multi-jurisdictional Mitigation Actions (Municipal Level)

A. Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Goals and Objectives

For the purposes of this Plan, goals are defined as general policy guidelines or broad statements that represent a vision for a community. Objectives define strategies or implementation steps to attain the identified goals. Compared to goals, objectives are more specific and measurable. The goals for this planning process have been developed in close coordination with the Steering Committee based on the findings of the hazard identification and risk assessment. The goals and objectives are also designed to serve as the basis for the mitigation actions at the county and municipal levels. Each mitigation action (in the next section) is linked to one or more goals and objectives in this chapter.

The goals and objectives have been formulated in the following areas: preventive measures, property protection, emergency services, structural projects, natural resources and open space protection, and public information.

a. Preventive Measures

Goal A: *Ensure hazard mitigation goals and objectives are consistent with goals of other plans and ordinances in the counties and municipalities.*

Objectives:

A1: Promote responsible growth and development through the incorporation of hazard mitigation principles in municipal plans; and zoning, subdivision and land development, and floodplain ordinances, as appropriate.
A2: Incorporate hazard mitigation planning projects into capital improvement plans.
A3: Continue to regulate development in conservation areas and within floodplains to prevent flood damage.
A4: Ensure that the current building codes are properly enforced in municipalities.
A5: Regulate development in accordance with stormwater management ordinances to prevent increases in runoff and subsequent increases in flood flows.
A6: Ensure subdivision and land development ordinances follow regulations consistent with plans for abandoned mines.
A7: Encourage municipalities to join the Community Rating System (CRS).
A8: Ensure that municipalities continue to be compliant with the National Flood Insurance Program (NFIP) requirements and that flood risk maps are accurate and up-to-date.
A9: Encourage municipalities to implement recommendations in the Bi-County Hazard Mitigation Plan and update their mitigation plans.

b. Property Protection

Goal BI: Minimize structural damage caused by flooding, wind, winter storms, wildfires, underground mine hazards, landslides, earthquakes, and drought.
Goal BII: Minimize damage to critical facilities in high hazard areas, 100-year floodplains, heavily-forested areas, and areas of geologic subsidence, and develop measures to prevent future damages.

Objectives:

B1: Ensure that structures are not repeatedly flooded by using retrofitting or demolition techniques to reduce the flood risk to properties.
B2: Identify ways to reduce the impact to structures and infrastructure from winter storms.
B3: Examine mitigation alternatives to reduce wind damage, particularly to mobile homes.
B4: Reduce risk to buildings and infrastructure located in wildfire high-risk areas.
B5: Develop measures to protect wellheads near abandoned mine lands and locations of hazardous materials storage.
B6: Identify measures to reduce the impact of drought.
B7: Develop actions to monitor ground movement in areas that are sensitive to landslides, particularly throughout the Susquehanna River and Lackawanna River corridors.
B8: Develop measures to address the risk to vulnerable critical facilities and infrastructure to prevent future damages in the two counties.
B9: Identify areas for study along various creeks in the two counties.
B10: Investigate ways to protect against sewer back-up damage.
B11: Identify ways to reduce the impact to structures and infrastructure from earthquakes.

c. Emergency Services

Goal CI: Ensure continuity of emergency management services during flooding and other hazard events.
Goal CII: Ensure adequacy of shelters and efficiency of evacuation routes in both counties.

Objectives:

C1: Ensure that flooding and other hazards do not interrupt emergency response services and critical facilities functions.
C2: Identify safe and efficient evacuation routes during floods and other hazard events, including nuclear power plant emergencies, to ensure continued service during hazard events.
C3: Identify methods to provide residents with adequate warning of potential hazards.
C4: Provide for adequate shelters in the two-county area during flood and other hazard events.

d. Structural Projects

Goal D: Encourage high construction standards on structural projects.

Objectives:

D1: Ensure that existing drainage systems (pipes, culverts, bridges, and channels) are adequate and functioning properly through regular maintenance or upgrades.
D2: Ensure regular maintenance of structural projects.
D3: Investigate structural solutions to flooding at various locations in the two counties, as necessary.
D4: Investigate the need for structural remediation of critical infrastructure near abandoned underground mines.

e. Natural Resources and Open Space Protection

Goal E: Promote sustainable development to improve the quality of life in the two-county region.

Objectives:

E1: Protect existing natural resources and open space, including parks and wetlands, within the floodplain and watershed areas.
E2: Ensure all properties acquired are cleared of structures and remain in public ownership in perpetuity.

f. Public Information

Goal F: Promote public understanding, support and involvement in mitigation- related activities.

Objectives:

F1: Identify lowest-cost partners, including television, radio and newspaper, to promote public awareness on the potential impacts of natural hazards and actions to reduce those impacts.
F2: Ensure that property owners and potential property owners are aware of the availability and benefits of obtaining hazard insurance (flood insurance and mine subsidence insurance).
F3: Increase accessibility of Flood Insurance Rate Maps (FIRMs).

F4: Consider education campaigns and workshops to promote 'safe' development and other hazard mitigation principles.

B. Identification and Analysis of Mitigation Actions (County Level)

Requirement §201.6(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

The mitigation actions have been developed and organized into the same six categories as the Goals and Objectives. These categories have been elaborated below along with examples:

1. *Preventive Measures*: Preventive activities involve government administrative or regulatory actions or processes that influence land development and building construction. Examples of preventive actions include planning and zoning, modifications to building codes and stormwater management regulations, capital improvement programs, and open space preservation programs.

2. *Property Protection*: Property protection activities include the modification of existing buildings or infrastructure to protect them from a hazard, or removal from the hazard area. Examples of property protection include acquisition, elevation, relocation, structural retrofits, flood-proofing, storm shutters, and shatter-resistant glass.

3. *Emergency Services*: Emergency services are those actions that are performed by emergency management departments at local levels who respond to emergencies, such as natural disasters. Examples include staffing for the Emergency Operations Center and equipment.

4. *Structural Projects*: Structural projects involve the construction of structures to reduce the impact of a hazard. Examples include the construction of culverts, dams, floodwalls, retaining walls, and safe rooms.

5. *Natural Resources and Open Space Protection*: Natural resource protection actions are those that that minimize hazard losses as well as preserve or restore the functions of natural systems. Examples of these actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

6. *Public Information*: These activities involve actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Examples include outreach projects, real estate disclosure, hazard information centers, and environmental education programs.

Mitigation actions have been developed for the two counties as well as for each participating jurisdiction in each of the two counties. While some actions may apply to more than one jurisdiction, specific actions are identified for each jurisdiction. The mitigation actions that have been developed can be implemented through a variety of local tools such as changes in ordinances and policies, and grant applications.

The mitigation actions that were developed were based on the following: results from the risk assessment and the mitigation capability analysis, input from the two counties, input from the steering committee based on actions that have been completed in the past, recent past hazard occurrences, and feedback from the municipal workshops.

The tables that follow identify County-level mitigation actions for Lackawanna and Luzerne Counties. Lackawanna County has a total of 28 actions (shown on **Table 5.1**) and Luzerne County has a total of 29 actions (shown on **Table 5.2**).

For each mitigation action, the natural hazard(s) that would be mitigated is identified. The goals and objectives addressed by the action, along with the lead agency(ies) entrusted with the responsibility of implementation, and possible funding sources, are included. Where available, an approximate project cost is indicated, along with a timeline for implementation of each project:

- Short-range – within 1 year.
- Medium-range – between 2 and 5 years
- Long-range – between 5 and 10 years

Note: Actions shown in gray indicate those that address the National Flood Insurance Program and Continued Compliance

Table 5.1 Lackawanna County Mitigation Actions

Action No.	Mitigation Action	Hazard Mitigated	Goals and Objectives Addressed	Lead Agency	Possible Funding Source	Approx. Cost	Project Timeline
Emergency Preparedness							
1	Develop an evacuation plan for the County and municipalities in conjuction with the Long Range Transportation Plan. The Plan should include issues such as staging areas, feeding plan for displaced persons, signs, temporary housing, decontamination, and destination points such as shelters. Involve experts in emergency planning, transportation planning, and traffic engineering in developing the plan.	All hazards	Goal CII: Objective C2	County Office of Emergency Management	HMGP, EMPG,PENN DOT funds	$75,000 - $100,000	3-5 years
2	Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy with respect to beds, etc. and determine which ones would need to be retrofitted. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county.	All hazards	Goal CII: Objective C4	County Office of Emergency Management	HMGP, EMPG	$10,000 per year	Ongoing
Prevention							
3	Form a Flood Protection Department, similar to the one in Luzerne County, to serve as a one-stop shop for property owners and municipalities who have flooding problems and provide advice to municipalities on the flood hazard, availability of flood insurance, flood protection, and stormwater management methods.	Flood	Goal BI: Objective B1	County Regional Planning Commission	FMA, PDM, HMGP	Staff time	1-2 years
4	Encourage the individual municipalities to be firmly committed to continue compliance with the NFIP: a)Work with municipalities to encourage them to include language in their zoning ordinances to concur with the Model Floodplain Ordinance and the Subdivision/Land Development Ordinance with respect to what is allowed in the floodplain. b) Conduct a training program for floodplain officials in the county and those who administer the floodplain ordinance in the municipalities to educate them on sound flood management principles. c) Work with communities to ensure that there are no deficiencies when the Community Assistance Visits are conducted to ensure continued compliance.	Flood	Goal E: Objective E1, E2; Goal A: Objective A1, A8	County Regional Planning Commission, County Engineer	LUPTAP, PDM, HMGP	Staff time	1-2 years
5	Encourage regional cooperation between municipalties for multi-municipal planning and zoning administration.	All hazards	Goal A: Objective A1, A4	County Regional Planning Commission	LUPTAP, PDM	Staff time	1-2 years
6	Work with the municipalities to integrate the County's Hazard Mitigation Plan into the municipalities' comprehensive plan and zoning ordinance by: a) encouraging them to include principles and strategies for safe development; b) Including language in the zoning ordinance to discourage development in the 100-year floodplain; and c) encouraging municipalities to include measures in their zoning ordinance to enhance the concept of defensible space practice; and d) discourage development on permeable soils to reduce the impacts of drought.	All hazards	Goal A: Objective A1, A2, A3	County Regional Planning Commission, County Engineer	LUPTAP, FLUAP	Staff time	3-5 years
7	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	All hazards	Goal A: Objective A1, A3	County Regional Planning Commission	LUPTAP	Staff time	1-2 years
8	Coordinate the preparation of the countywide Act 167 Stormwater Management Plan with the Joint-County Comprehensive Plan and work with municipalities to adopt and enforce the ordinance requirements.	Flood, Drought	Goal A: Objective A1, A5 Goal B: Objective B6	County Regional Planning Commission, County Engineer, County Conservation District	DEP	Staff time	3-5 years
9	Develop a Source Water Protection Plan to properly utilize and protect ground water resources in the two counties.	Drought	Goal A: Objective A5	County Regional Planning Commission, County Engineer	DEP	$100,000	3-5 years
10	Work with municipalities, particularly those along the Lackawanna and Lehigh Rivers and large streams, to join the CRS by educating them on the benefits of CRS and also providing them with technical assistance.	Flood	Goal A: Objective A7	County Regional Planning Commission, County Engineer	PDM, FMA, HMGP	$5,000 - $10,000 per community	6-10 years

Table 5.1 Lackawanna County Mitigation Actions

11	Work with each municipality to identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	All hazards	Goal A: Objective A9	County Regional Planning Commission	PDM	Staff time	1-2 years
12	Mine pool maps are available that extend from the Lackawanna/Susquehanna County line in the north to lower Luzerne County in the south and from part way up the mountainsides across the valley floor. Analyze the effects of the mine pools on the surface lands during seismic events.	Earthquake, Mine related hazards	Goal B: Objective B11	Department of Environmental Protection, County Emergency Management Agency	DEP	$200,000	6-10 years
	Property Protection						
13	Coordinate efforts between the Joint-County Comprehensive Plan and the countywide Act 167 Stormwater Management Plan to identify groundwater recharge areas and sensitive groundwater areas such as mine lands. Work closely with the municipalities to enforce infiltration and groundwater recharge requirements in these areas to reduce the impacts of drought.	Drought	Goal BI: Objective B6	County Conservation District, County Engineer	DEP	Staff time	1-2 years
14	For those parties not interested in acquisition or where acquisition is not feasible, continue to work with municipalities to advise homeowners with a preferred mitigation alternative such as elevation or flood proofing.	Flood	Goal BI: Objective B1	County Office of Emergency Management	FMA, PDM, HMGP, RFC	Staff time	3-5 years
15	Conduct a structural assessment and engineering inspection of all County-owned critical facilities that have been identified in high hazard areas. The assessment should include the ability of each facility to sustain damage from any hazard event and a recommendation of specific retrofitting measures in a technical report.	All hazards	Goal B2: Objective B8	Department of Buildings and Grounds	FMA, PDM, HMGP	$200,000	3-5 years
16	Work with Old Forge Borough and DEP to conduct annual inspections of the structures that discharge stormwater and groundwater from the flooded minepool and identify any structural repairs needed.	Land subsidence, Flood	Goal BI: Objective B1, B5	Pennsylvania Department of Environmental Protection	Growing Greener (DEP), CDBG	$10,000 - $20,000	1-2 years
17	Encourage municipalities to reduce the vulnerability of critical facilities to wildfires by: increasing buffers and introducing defensible spaces; identifying farm roads, service roads, and other private access corridors in high hazard areas that could be used as fire breaks; and providing assistance to the County Emergency Management to identify vulnerable structures (firewise communities).	Wildfire	Goal B2: Objective B4, B8	Pennsylvania Department of Environmental Protection - Bureau of Forestry	PDM, HMGP	Staff time	3-5 years
18	Work with FEMA to conduct detailed studies for Ackerly Creek, Lackawanna River, Leggetts Creek Tributary1, Mill Creek No. 2, Saint John's Creek, and Tinklepaugh Creek as identified in the FEMA Region III Post-Flood Community Flood Risk Evaluation for Lackawanna County.	Flood	Goal BI: Objective B9	County Engineer	PDM, HMGP	To be determined	6-10 years
19	Explore methods to secure funding to initiate a structural survey for older communities in the Joint-County area. The survey should involve an inventory of all buildings - age of structure, construction material, and structural flaws.	All hazards	Goal BI: Objective B3	County Engineer, Office of Economic and Community Development	PDM, HMGP	$200,000	3-5 years
20	Conduct a flood mapping study to identify continuously connected flood courses where severe flooding has occurred in recent events in addition to isolated problem areas.	Flood	Goal BI, Objective B1	County Conservation District/County Engineer	PDM HMGP	$50,000	1-2 Years

Table 5.1 Lackawanna County Mitigation Actions

Public Information							
21	Designate specific locations throughout the County such as the County Emergency Management Agency, County Planning Department, municipal libraries, and events such as fairs to provide information to the public on flooding and other hazards. Encourage these locations to stock a variety of FEMA publications on various natural and human caused hazards and also the most recent FIRMs; also include information on the County's website.	All hazards	Goal F: Objective F1, F3	County Regional Planning Commission, Public Information Office	PDM	Staff time	1-2 years
22	Conduct an educational campaign and develop brochures on topics such as: the impacts of drought, proper sediment and erosion control, and dangers of developing on old mines and dumps.	Drought, Flood, Mine related hazards	Goal F: Objective F4	County Engineer, County Flood Protection Department, Communications Office, Department of Environmental Protection	PDM	$10,000	1-2 years
23	Stay closely involved with the activities of the Susquehanna River Basin Commission, Delaware River Basin Commission, Water Board, and other water planning organizations by encouraging a staff member from the County Regional Planning Commission to be present at their meetings.	Flood	Goal F: Objective F4	County Regional Planning Commission	LUPTAP	Staff time	1-2 years
24	Work with State agencies, professional organizations, and non-government organizations to conduct an annual workshop at a key location in each county for private developers to involve them in hazard mitigation activities and and educate them on 'safe' development principles that can be incorporated into their development proposals.	All hazards	Goal F: Objective F4	Department of Community and Economic Development, Pennsylvania Association of Township Supervisors, County Emergency Management Agency	FMA, PDM	$10,000	1-2 years
25	Continue to provide inquirers with technical advice and information from the community's FIRM and FEMA's website on a property's location in a Special Flood Hazard Area, zone, and its base flood elevation.	Flood	Goal F: Objective F3	County Regional Planning Commission, County Flood Protection Department	PDM	Staff time	Ongoing
26	Work with real estate agents throughout the county and encourage them to advise prospective property purchasers in flood prone and mine subsidence areas to obtain flood or mine subsidence insurance. Seek avenues with DEP and DCED to help provide this information to municipalities.	Flood, Mine Related Hazards	Goal F: Objective F2	County Flood Protection Department, County Regional Planning Commission, County Emergency Management Agency, State agencies	PDM	Staff time	1-2 years
Plan Implementation							
27	Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event.	All hazards	Goal A: Objective A1	County Planning Commission	PDM	Staff time	Ongoing
28	Provide technical assistance to municipalities in implementing individual hazard mitigation actions.	All hazards	Goal A: Objective A9	County Planning Commission	PDM, HMGP	Staff time	Ongoing

Table 5.2 Luzerne County Mitigation Actions

Luzerne County Mitigation Actions							
Action No.	**Mitigation Action**	**Hazard Mitigated**	**Goals and Objectives Addressed**	**Lead Agency**	**Possible Funding Source**	**Approx. Cost**	**Project Timeline ***
Emergency Preparedness							
1	Develop an evacuation plan for the County and municipalities in conjuction with the Long Range Transportation Plan. The Plan should include issues such as staging areas, feeding plan for displaced persons, signs, temporary housing, decontamination, and destination points such as shelters. Involve experts in emergency planning, transportation planning, and traffic engineering in developing the plan.	All hazards	Goal CII: Objective C2	County Office of Emergency Management	HMGP, EMPG, PENNDOT	$75,000 - $125,000	3-5 years
2	Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy with respect to beds, etc. and determine which ones would need to be retrofitted. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county.	All hazards	Goal CII: Objective C4	County Office of Emergency Management	HMGP, EMPG	$10,000 per year	Ongoing
Prevention							
3	Make the Luzerne County Flood Protection Authority a one-stop shop for property owners and municipalities who have flooding problems and expand the Authority's mission to provide advice to municipalities on flood hazards, availability of flood insurance, and flood protection methods.	Flood	Goal BI: Objective B1	Luzerne County Flood Protection Authority, County Engineers Office	FMA, Wyoming Valley Levee-Raising Project Mitigation Funds, PDM, HMGP	Staff time	1-2 years
4	Include the following language in the new county zoning ordinance to: 1) concur with the Model Floodplain Ordinance and/or regulations and the Subdivision/Land development Ordinance (SALDO) with respect to what is allowed in the floodplain; and 2) for all development to construct first floors above the base flood elevation for areas that are protected by the levee systems.	Flood	Goal A: Objective A3 Goal E: Objective E1, E2	PA DCED, County Planning Commission, County Engineers Office, Luzerne County Flood Protection Authority	LUPTAP	Staff time	1-2 years
5	Encourage the municipalities to come under the control of the County Zoning & Subdivision/Land Development ordinances.	All hazards	Goal A: Objective A1, A4	County Planning Commission	LUPTAP, PDM	$40,000-$50,000 per year	1-2 years
6	Conduct an annual workshop for floodplain officials in the county and those who administer the floodplain ordinance in the municipalities to educate them on sound flood management principles.	Flood	Goal A: Objective A1, A8	PA DCED, Luzerne County Flood Protection Authority, County Office of Emergency Management	FMA, PDM, FLUAP	$10,000	1-2 years
7	Work with the following four municipalities to encourage them to issue building permits and perform UCC functions including inspections: Jeddo, New Columbus, and Warrior Run Boroughs and Ross Township.	All hazards	Goal A: Objective A4	County Planning Commission	LUPTAP	Staff time	1-2 years
8	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	All hazards	Goal A: Objective A1, A3	County Planning Commission	LUPTAP	Staff time	1-2 years

Table 5.2 Luzerne County Mitigation Actions

9	Work with municipalities, particularly those along the Susquehanna River and large streams, to join the CRS by educating them on the benefits of CRS and also providing them with technical assistance; work with municipalities to adopt and enforce the requirements of the Countywide ACT 167 plan.	Flood, Drought	Goal A: Objective A1, A5, A7 Goal B: Objective B6	Luzerne County Flood Protection Authority, County Engineers Office	DEP , PDM, FMA, HMGP	$5,000 - $10,000 per community	6-10 years
10	Develop a Source Water Protection Plan to properly utilize and protect ground water resources in the two counties.	Drought	Goal A: Objective A5	DEP	DEP	$100,000	3-5 years
11	Encourage the county to include in their zoning ordinance, measures to: enhance the concept of defensible space practice; and discourage development on permeable soils to reduce the impacts of drought.	Wildfire, Drought	Goal A: Objective A1	County Planning Commission	LUPTAP	Staff time	1-2 years
12	Currently, all municipalities are in the NFIP Program. Encourage the individual municipalities to be firmly committed to continued compliance with the NFIP by regulating development and redevelopment through the adoptions of provisions that exceed the minimum NFIP requirements. Work with communities to ensure that there are no deficiencies when the Community Assistance Visits are conducted to ensure continued compliance.	Flood	Goal A: Objective A8	Luzerne County Flood Protection Authority	PDM, FMA, HMGP, FLUAP	Staff time	1-2 years
13	Work with each municipality to identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	All hazards	Goal A: Objective A9	County Planning Commission	PDM	Staff time	1-2 years
14	Initiate a research and education program with local universities to map the extents of the mine pools in the Lackawanna and Susquehanna River valleys. Because earthquakes will have the greatest effect in areas of abandoned mine lands, this program will seek to quantify the effects of earthquakes on destabilized earth, such as that over flooded mine pools.	Earthquake, Mine related hazards	Goal B: Objective B11	Department of Environmental Protection	DEP	$200,000	6-10 years
Property Protection							
15	Coordinate efforts between the Joint-County Comprehensive Plan and the countywide Act 167 Stormwater Management Plan to identify groundwater recharge areas and sensitive groundwater areas such as mine lands. Work closely with the municipalities to enforce infiltration and groundwater recharge requirements in these areas to reduce the impacts of drought.	Drought	Goal BI: Objective B6	DEP	DEP	Staff time	1-2 years
16	For those parties not interested in acquisition or where acquisition is not feasible, continue to work with municipalities to advise homeowners with a preferred mitigation alternative such as elevation or flood proofing.	Flood	Goal BI: Objective B1	Luzerne County Flood Protection Authority, County Engineers Office	FMA, PDM, HMGP, RFC, Wyoming Valley Levee-Raising Project Mitigation Funds	Staff time	3-5 years
17	Continue to stay involved with the Mitigation Board of the Wyoming Valley Flood Authority to implement hazard mitigation plan recommendations.	Flood	Goal BI: Objective B1	Luzerne County Flood Protection Authority, County Engineers Office	FMA, PDM, HMGP, RFC, Wyoming Valley Levee-Raising Project Mitigation Funds	Staff time	1-2 years

Table 5.2 Luzerne County Mitigation Actions

18	Work with Duryea Borough and DEP to conduct annual inspections of the structures that discharge stormwater and groundwater from the flooded minepool and identify any structural repairs needed.	Land subsidence, Flood	Goal BI: Objective B1, B5	Pennsylvania Department of Environmental Protection	Growing Greener (DEP), CDBG	$10,000 - $20,000	1-2 years
19	Encourage municipalities to reduce the vulnerability of critical facilities to wildfires by: increasing buffers and introducing defensible spaces; identifying farm roads, service roads, and other private access corridors in high hazard areas that could be used as fire breaks; and providing assistance to the County Emergency Management to identify vulnerable structures (firewise communities).	Wildfire	Goal B2: Objective B4, B8	Pennsylvania Department of Environmental Protection - Bureau of Forestry	PDM, HMGP	Staff time	3-5 years
20	Work with FEMA to conduct detailed studies for Abrahams Creek of Forty Fort, Big Wapwallopen Creek, Lackwannna River, Nescopeck Creek, Solomon Creek, and Toby Creek as identified in the FEMA Region III Post-Flood Community Flood Risk Evaluation for Luzerne County.	Flood	Goal BI: Objective B9	FEMA, County Engineers Office, Luzerne County Flood Protection Authority	PDM, HMGP	To be determined	6-10 years
21	Construct and install a monitoring station to detect and measure earth movement of the potential landslide on Shickshinny Mountain.	Landslide	Goal BI and Goal BII, Objective B7	County Emergency Management Office	HMGP PDM	$250,000	3-5 years
Public Information							
22	Designate specific locations throughout the County such as the County Emergency Management Agency, County Planning Department, municipal libraries, and events such as fairs to provide information to the public on flooding and other hazards. Encourage these locations to stock a variety of FEMA publications on various natural and human caused hazards and also the most recent FIRMs; also include information on the County's website.	All hazards	Goal F: Objective F1, F3	County Planning Commission, Public Information Office	PDM	Staff time	1-2 years
23	Conduct an educational campaign and develop brochures on topics such as: the impacts of drought, proper sediment and erosion control, and dangers of developing on old mines and dumps.	Drought, Flood, Mine related hazards	Goal F: Objective F4	Public Information Office, Department of Environmental Protection	PDM	$10,000	1-2 years
24	Stay closely involved with the activities of the Delaware Regional Basin Commission, Susquehanna River Basin Commission, Water Board, and other water planning organizations by encouraging a staff member from the County Planning Commission to be present at their meetings depending on their availability.	Flood	Goal F: Objective F4	County Planning Commission	LUPTAP	Staff time	1-2 years
25	Work with State agencies, professional organizations, and non-government organizations to conduct an annual workshop at a key location in each county for private developers to involve them in hazard mitigation activities and and educate them on 'safe' development principles that can be incorporated into their development proposals.	All hazards	Goal F: Objective F4	Department of Community and Economic Development Pennsylvania Association of Township Supervisors	FMA, PDM	Staff time	1-2 years
26	Continue to provide inquirers with technical advice and information from the community's FIRM and FEMA's website on a property's location in a Special Flood Hazard Area, zone, and its base flood elevation if data is available.	Flood	Goal F: Objective F3	County Planning Commission	PDM	Staff time	Ongoing

Table 5.2 Luzerne County Mitigation Actions

27	Work with real estate agents throughout the county and encourage them to advise prospective property purchasers in flood prone and mine subsidence areas to obtain flood or mine subsidence insurance in municipalities over which the County has jurisdiction.	Flood, Mine Related Hazards	Goal F: Objective F2	Luzerne County Flood Protection Authority, County Planning Commission, Department of Environmental Planning, Department of Community and Economic Development	PDM	Staff time	1-2 years
Structural Projects							
28	Continue to conduct an annual inspection of all county-owned flood control structures, including the Wyoming Valley levee system.	Flood	Goal D: Objective D1	County Engineers Office	PDM, FMA, NDSP	$50,000 per year	1-2 years
Plan Implementation							
29	Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event and provide technical assistance to municipalities in implementing individual hazard mitigation actions.	All hazards	Goal A: Objective A1, A9	EMA, Luzerne County Flood Protection Authority, County Planning Commission	PDM, HMGP	Staff time	Ongoing

* The ability of the Lead Agency to perform the action item is dependent on the availability of non-county funds.

C. Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii)*: [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Once adopted, the Bi-County Hazard Mitigation Plan and its identified mitigation projects will have a 'shelf-life' of five years, before the Plan is updated. It is therefore important that the projects included are prioritized so they can be executed once funding becomes available.

The following evaluation criteria have been used to prioritize the county projects: Life/Safety Impact, Administrative element, Statutory element, and Project Cost. **Table 5.3** further clarifies the criteria rankings for County-level projects.

1) The Life/Safety Impact element evaluates the impact of the mitigation measure on the life and safety of local residents, businesses, and properties.

    a) "Low" if the mitigation action would have a minimal or negligible impact on the life and safety of residents, businesses and properties; up to a value of "High" if the action would significantly impact public safety.

    b) If the project will be implemented countywide, the Life/Safety Impact rating would be "High". However, if the project impacts a few jurisdictions or a few structures, the Life/Safety Impact rating would be either "Medium" or "Low".

    c) The impact of the hazard event - if the project addresses a frequent storm event (such as a 10-year storm), it would be ranked as "High"; a 100-year event would be ranked as "Medium"; and a catastrophic but infrequent storm event (such as the 500-year event) would be ranked as "Low".

2) The Administrative element evaluates the anticipated staffing, funding, and maintenance requirements for the proposed mitigation measures.

3) The Statutory element evaluates the degree to which the proposed measure would address a statutory requirement such as adopting ordinances, increasing freeboard requirements, or integrating the hazard mitigation plan with other planning efforts.

4) The Project Cost element evaluates the costs incurred to implement the mitigation action.

Table 5.3: Criteria Rankings for County Level Projects

Evaluation Criteria	Low	Medium	High
Life/Safety Impact	Minimal/negligible impact	Direct impact	Significant impact on public safety
Administrative	Additional staff and/or training required	Additional staff/training or funding may be needed to implement project	Adequate staff and funding to implement project
Statutory	Does not satisfy a statutory requirement	Improves data collection and storage	Satisfies a statutory requirement
Project Cost	>$150,000	$50,000 to $150,000	<$50,000

The criteria rankings in Table 5.3 were assigned a numerical score and then totaled.

- 10 points for a “high” score;
- 5 points for a “medium” score; and
- 1 point for a “low” score.

Tables 5.4 and **5.5** identify the rankings received for each of the aforementioned criteria. The top five projects that received the highest scores in Lackawanna County include the following:

1. Work with the municipalities to integrate the County's Hazard Mitigation Plan into the municipalities' comprehensive plans and zoning ordinances.

2. Encourage the individual municipalities to be firmly committed to continue compliance with the NFIP.

3. Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county.

4. Work with FEMA to conduct detailed studies for Ackerly Creek, Lackawanna River, Leggetts Creek Tributary 1, Mill Creek No. 2, Saint John's Creek, and Tinklepaugh Creek as identified in the *FEMA Region III Post-Flood Community Flood Risk Evaluation for Lackawanna County*.

5. Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event.

The top five projects that received the highest scores in Luzerne County include the following:

1. Include the following language in the new county zoning ordinance: 1) to concur with the Model Floodplain Ordinance and/or regulations and the Subdivision/Land Development Ordinance (SALDO) with respect to what is allowed in the floodplain; and 2) for all development to construct first floors above the base flood elevation for areas that are protected by the levee systems.

2. Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county.

3. Work with FEMA to conduct detailed studies for Abrahams Creek of Forty Fort, Big Wapwallopen Creek, Lackawanna River, Nescopeck Creek, Solomon Creek, and Toby Creek as identified in the FEMA Region III Post-Flood Community Flood Risk Evaluation for Luzerne County.

4. Continue to conduct an annual inspection of all county-owned flood control structures.

5. Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event, and provide technical assistance to municipalities in implementing individual hazard mitigation actions.

Table 5.4 Lackawanna County Mitigation Actions - Prioritization Matrix

Lackawanna County Mitigation Actions - Prioritization Matrix							
Action No.	**Mitigation Action**	**Life/Safety Impact**	**Statutory**	**Administrative**	**Project Cost**	**Total Points**	**Top 5 Rank**
Emergency Preparedness							
1	Develop an evacuation plan for the County and municipalities in conjuction with the Long Range Transportation Plan.	H	H	L	L	22	
2	Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy and determine which ones would need to be retrofitted. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county.	H	M	H	H	35	2
Prevention							
3	Form a Flood Protection Department, similar to the one in Luzerne County, to serve as a one-stop shop for property owners and municipalities who have flooding problems and provide advise to municipalities on the flood hazard, availability of flood insurance, flood protection, and stormwater management methods.	M	L	L	L	8	
4	Encourage the individual municipalities to be firmly committed to continue compliance with the NFIP: a)Work with municipalities to encourage them to include language in their zoning ordinances to concur with the Model Floodplain Ordiance and the Subdivision/Land development Ordiance with respect to what is allowed in the floodplain. b) Conduct a training program for floodplain officials in the county and those who administer the floodplain ordinance in the municipalities to educate them on sound flood management principles. c) Regulate development and redevelopment through the adoption of provisions that exceed the minimum NFIP requirements. d) Work with communities to ensure that there are no deficiencies when the Community Assistance Visits are conducted to ensure continued compliance.	H	H	M	H	35	2
5	Encourage regional cooperation between municipalties for multi-municipal planning and zoning administration.	L	L	M	M	12	
6	Work with the municipalities to integrate the County's Hazard Mitigation Plan into the municipalities' comprehensive plan and zoning ordinance by: a) encouraging them to include principles and strategies for safe development; b) Including language in the zoning ordinance to discourage development in the 100-year floodplain; and c) encouraging municipalities to include measures in their zoning ordinance to enhance the concept of defensible space practice; and d) discourage development on permeable soils to reduce the impacts of drought.	H	H	H	H	40	1
7	Work with the following four municipalities to encourage them to issue building permits and perform UCC functions including inspections: Jeddo, New Columbus, and Warrior Run Boroughs and Ross Township.	M	L	M	M	16	
8	Coordinate the preparation of the countywide Act 167 Stormwater Management Plan with the Joint-County Comprehensive Plan and work with municipalities to adopt and enforce the ordinance requirements.	M	M	L	L	12	
9	Develop a Source Water Protection Plan to properly utilize and protect ground water resources in the two counties.	L	L	L	L		
10	Work with municipalities, particularly those along the Lackawanna and Lehigh Rivers and large streams, to join the CRS by educating them on the benefits of CRS and also providing them with technical assistance.	L	M	M	L	12	
11	Work with each municipality to identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	L	M	H	L	17	
12	Analyze the effects of the mine pools on the surface lands during seismic events.	L	L	L	L	4	
Property Protection							
13	Coordinate efforts between the Joint-County Comprehensive Plan and the countywide Act 167 Stormwater Management Plan to identify groundwater recharge areas and sensitive groundwater areas such as mine lands. Work closely with the municipalities to enforce infiltration and groundwater recharge requirements in these areas to reduce the impacts of drought.	L	L	H	H	12	
14	For those parties not interested in acquisition or where acquisition is not feasible, continue to work with municipalities to advise homeowners with a preferred mitigation alternative such as elevation or flood proofing.	L	L	L	L	4	
15	Conduct a structural assessment and engineering inspection of all County-owned critical facilities that have been identified in high hazard areas. The assessment should include the ability of each facility to sustain damage from any hazard event and recommendation of specific retrofitting measures in a technical report.	H	L	L	L	13	
16	Work with Old Forge Borough and DEP to conduct annual inspections of the structures that discharge stormwater and groundwater from the flooded minepool and identify any structural repairs needed.	L	L	L	L	4	
17	Encourage municipalities to reduce the vulnerability of critical facilities to wildfires by: increasing buffers and introducing defensible spaces; identifying farm roads, service roads, and other private access corridors in high hazard areas that could be used as fire breaks; and providing assistance to the County Emergency Management to identify vulnerable structures.	M	L	M	H	21	

Table 5.4 Lackawanna County Mitigation Actions - Prioritization Matrix

18	Work with FEMA to conduct detailed studies for Ackerly Creek, Lackawanna River, Leggetts Creek Tributary1, Mill Creek No. 2, Saint John's Creek, and Tinklepaugh Creek as identified in the FEMA Region III Post-Flood Community Flood Risk Evaluation for Lackawanna County.	H	L	H	H	31	4
19	Explore methods to secure funding to initiate a structural survey for older communities in the Joint-County area which would involve an inventory of all buildings - age of structure, construction material, and structural flaws.	M	L	L	L	8	
20	Conduct a flood mapping study to identify continuously connected flood courses where severe flooding has occurred in recent events in addition to isolated problem areas.	M	M	M	H	25	5
Public Information							
21	Designate specific locations throughout the County such as the County Emergency Management Agency, County Planning Department, municipal libraries, and events such as fairs to provide information to the public on flooding and other hazards. Encourage these locations to stock a variety of FEMA publications on various natural and human caused hazards and also the most recent FIRMs; also include information on the County's website.	M	M	M	M	20	
22	Conduct an educational campaign and develop brochures on topics such as: the impacts of drought, proper sediment and erosion control, and dangers of developing on old mines and dumps.	L	L	M	M	12	
23	Stay closely involved with the activities of the Susquehanna River Basin Commission, Delaware River Basin Commission, Water Board, and other water planning organizations by encouraging a staff member from the County Regional Planning Commission to be present at their meetings.	L	L	H	H	22	
24	Work with State agencies, professional organizations, and non-government organizations to conduct an annual workshop at a key location in each county for private developers to involve them in hazard mitigation activities and and educate them on 'safe' development principles that can be incorporated into their development proposals.	L	L	H	H	22	
25	Continue to provide inquirers with technical advice and information from the community's FIRM and FEMA's website on a property's location in a Special Flood Hazard Area, zone, and its base flood elevation.	L	L	H	H	22	
26	Work with real estate agents throughout the county and encourage them to advise prospective property purchasers in flood prone and mine subsidence areas to obtain flood or mine subsidence insurance. Seek avenues with DEP and DCED to help provide this information to municipalities.	L	L	M	M	12	
Plan Implementation							
27	Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event.	M	H	M	M	25	5
28	Provide technical assistance to municipalities in implementing individual hazard mitigation actions.	H	L	M	M	21	

Table 5.5 Luzerne County Mitigation Actions -Prioritization Matrix

Luzerne County Mitigation Actions - Prioritization Matrix							
Action No.	**Mitigation Action**	**Life/Safety Impact**	**Statutory**	**Administrative**	**Project Cost**	**Total Points**	**Top 5 Rank**
Emergency Preparedness							
1	Develop an evacuation plan for the County and municipalities in conjuction with the Long Range Transportation Plan.	H	H	L	L	22	
2	Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy and determine which ones would need to be retrofitted. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county.	H	M	H	H	35	2
Prevention							
3	Make the Luzerne County Flood Protection Authority a one-stop shop for property owners and municipalities who have flooding problems and expand the Authority's mission to provide advice to municipalities on flood hazards, availability of flood insurance, and flood protection methods.	M	L	H	H	26	
4	Include the following language in the new county zoning ordinance to: 1) concur with the Model Floodplain Ordinance and/or regulations and the Subdivision/Land development Ordinance (SALDO) with respect to what is allowed in the floodplain; and 2) for all development to construct first floors above the base flood elevation for areas that are protected by the levee systems.	H	H	H	H	40	1
5	Encourage the municipalities to come under the control of the County Zoning & Subdivision/Land Development ordinances.	M	H	M	M	25	
6	Conduct an annual workshop for floodplain officials in the county and those who administer the floodplain ordinance in the municipalities to educate them on sound flood management principles.	M	L	H	H	26	
7	Work with the following four municipalities to encourage them to issue building permits and perform UCC functions including inspections: Jeddo, New Columbus, and Warrior Run Boroughs and Ross Township.	L	L	M	H	27	
8	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	M	L	M	M	16	
9	Work with municipalities, particularly those along the Susquehanna River and large streams, to join the CRS by educating them on the benefits of CRS and also providing them with technical assistance; work with municipalities to adopt and enforce the requirements of the Countywide ACT 167 plan.	L	M	M	L	12	
10	Develop a Source Water Protection Plan to properly utilize and protect ground water resources in the two counties.	L	L	L	L	4	
11	Encourage the county to include in their zoning ordinance, measures to: enhance the concept of defensible space practice; and discourage development on permeable soils to reduce the impacts of drought.	L	L	L	L	4	
12	Encourage the individual municipalities to be firmly committed to continued compliance with the NFIP by regulating development and redevelopment through the adoptions of provisions that exceed the minimum NFIP requirements. Work with communities to ensure that there are no deficiencies when the Community Assistance Visits are conducted to ensure continued compliance.	M	M	L	L	12	
13	Work with each municipality to identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	L	M	H	L	17	
14	Initiate a research and education program with local universities to map the extents of the mine pools in the Lackawanna and Susquehanna River valleys.	L	L	L	L	4	
Property Protection							
15	Coordinate efforts between the Joint-County Comprehensive Plan and the countywide Act 167 Stormwater Management Plan to identify groundwater recharge areas and sensitive groundwater areas such as mine lands. Work closely with the municipalities to enforce infiltration and groundwater recharge requirements in these areas to reduce the impacts of drought.	L	L	H	H	12	
16	For those parties not interested in acquisition or where acquisition is not feasible, continue to work with municipalities to advise homeowners with a preferred mitigation alternative such as elevation or flood proofing.	L	L	H	H	12	
17	Continue to stay involved with the Mitigation Board of the Wyoming Valley Flood Authority to implement hazard mitigation plan recommendations.	L	L	H	H	12	
18	Work with Duryea Borough and DEP to conduct annual inspections of the structures that discharge stormwater and groundwater from the flooded minepool and identify any structural repairs needed.	L	L	L	L	4	
19	Encourage municipalities to reduce the vulnerability of critical facilities to wildfires by: increasing buffers and introducing defensible spaces; identifying farm roads, service roads, and other private access corridors in high hazard areas that could be used as fire breaks; and providing assistance to the County Emergency Management to identify vulnerable structures (firewise communities).	M	L	M	H	21	
20	Work with FEMA to conduct detailed studies for Abrahams Creek of Forty Fort, Big Wapwallopen Creek, Lackwannna River, Nescopeck Creek, Solomon Creek, and Toby Creek as identified in the FEMA Region III Post-Flood Community Flood Risk Evaluation for Luzerne County.	H	L	H	H	31	3

Table 5.5 Luzerne County Mitigation Actions -Prioritization Matrix

21	Construct and install a monitoring station to detect and measure earth movement of the potential landslide on Shickshinny Mountain.	H	L	L	L	13	
Public Information							
22	Designate specific locations throughout the County such as the County Emergency Management Agency, County Planning Department, municipal libraries, and events such as fairs to provide information to the public on flooding and other hazards. Encourage these locations to stock a variety of FEMA publications on various natural and human caused hazards and also the most recent FIRMs; also include information on the County's website.	M	M	M	M	20	
23	Conduct an educational campaign and develop brochures on topics such as: the impacts of drought, proper sediment and erosion control, and dangers of developing on old mines and dumps.	L	L	M	M	12	
24	Stay closely involved with the activities of the Delaware Regional Basin Commission, Susquehanna River Basin Commission, Water Board, and other water planning organizations by encouraging a staff member from the County Planning Commission to be present at their meetings depending on their availability.	L	L	H	H	22	
25	Work with State agencies, professional organizations, and non-government organizations to conduct an annual workshop at a key location in each county for private developers to involve them in hazard mitigation activities and and educate them on 'safe' development principles that can be incorporated into their development proposals.	L	L	H	H	22	
26	Continue to provide inquirers with technical advice and information from the community's FIRM and FEMA's website on a property's location in a Special Flood Hazard Area, zone, and its base flood elevation if data is available.	L	L	H	H	22	
27	Work with real estate agents throughout the county and encourage them to advise prospective property purchasers in flood prone and mine subsidence areas to obtain flood or mine subsidence insurance in municipalities over which the County has jurisdiction.	L	L	M	M	12	
Structural Projects							
28	Continue to conduct an annual inspection of all county-owned flood control structures.	H	H	M	L	26	4
Plan Implementation							
29	Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event and provide technical assistance to municipalities in implementing individual hazard mitigation actions.	M	H	M	M	25	5

D. Implementation of the National Flood Insurance Program

Requirement: §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

Communities that participate in the NFIP are required to adopt flood maps and local requests for map updates; adopt and enforce minimum floodplain management regulations that help mitigate the effects of flooding on new and improved structures in the Special Flood Hazard Area; offer property owners flood insurance as a protection against flood losses in exchange for floodplain management regulations that reduce future flood damages; and perform community assistance and monitoring activities.

Currently, all 40 municipalities in Lackawanna County participate in the NFIP. All 76 municipalities except for Slocum Township in Luzerne County participate in the NFIP. **Table 5.6** indicates the community and its effective map date/date of participation. Mitigation actions for Lackawanna and Luzerne Counties that address NFIP and continued compliance have been included in Tables 5.1 and 5.2 and are highlighted.

Table 5.6: Effective Map Date by Municipality – Lackawanna and Luzerne Counties

Lackwanna County		Luzerne County		Luzerne County (continued)	
Community Name	Curr Eff Map Date	Community Name	Curr Eff Map Date	Community Name	Curr Eff Map Date
Abington Township	9/30/1981	Ashley Borough	9/30/1980	Larksville Borough	4/1/1977
Archbald Borough	1/16/1980	Avoca Borough	9/30/1980	Laurel Run Borough	09/01/87(L)
Benton Township	06/01/86(L)	Bear Creek Village Borough	1/1/1950	Lehman Township	12/2/1980
Blakely Borough	1/16/1980	Bear Creek Township	9/29/1978	Luzerne Borough	4/15/1977
Carbondale City	12/16/1980	Black Creek Township	9/3/1980	Nanticoke City	4/15/1977
Carbondale Township	9/30/1981	Buck Township	4/15/1981	Nescopeck Borough	2/1/1980
Clarks Green Borough	06/25/76(M)	Butler Township	12/16/1980	Nescopeck Township	8/1/1980
Clarks Summit Borough	1/7/2000	Conygham Borough	7/16/1980	New Columbus Borough	3/16/1981
Clifton Township	2/2/1990	Conygham Township	2/16/1977	Newport Township	12/02/80(M)
Covington Township	09/01/86(L)	Courtdale Borough	01/20/82(M)	Nuangola Borough	01/20/82(M)
Dalton Borough	11/1/1978	Dallas Borough	1/2/1981	Penn Lake Park Borough	12/05/80(M)
Dickson City Borough	1/16/1980	Dallas Township	04/01/88(L)	Pittston City	5/2/1977
Dunmore Borough	9/28/1979	Dennison Township	4/15/1981	Pittston Township	6/15/1981
Elmhurst Township	2/2/1990	Dorrance Township	8/15/1980	Plains Township	4/6/1998
Fell Township	9/30/1981	Dupont Borough	6/15/1981	Plymouth Borough	4/1/1977
Glenburn Township	11/2/1990	Duryea Borough	6/18/1980	Plymouth Township	4/15/1977
Greenfield Township	7/16/1990	Edwardsville Borough	4/15/1977	Pringle Borough	5/2/1977
Jefferson Township	06/01/86(L)	Exeter Borough	5/16/1977	Rice Township	1/2/1981
Jermyn Borough	12/18/1979	Exeter Township	9/15/1983	Ross Township	4/15/1981
Jessup Borough	4/15/1980	Fairmount Township	4/1/1981	Salem Township	3/18/1980
La Plume Township	09/03/82(M)	Fairview Township	01/20/82(M)	Shickshinny Borough	12/31/1976
Madison Township	06/01/86(L)	Forty Fort Borough	7/3/1981	Sugar Notch Borough	(NSFHA)
Mayfield Borough	9/30/1981	Foster Township	4/1/1981	Sugarload Township	7/2/1980
Moosic Borough	11/1/1979	Franklin township	5/19/1981	Swoyersville Borough	11/5/1982
Moscow Borough	12/1/1981	Freeland Borough	(NSFHA)	Union Township	9/30/1980
Newton Township	7/3/1990	Hanover Township	1/2/1981	Warrior Run Borough	06/25/76(M)
North Abington Township	01/16/81(M)	Harveys Lake Borough	12/02/80(M)	West Hazelton Borough	(NSFHA)
Old Forge Borough	10/16/1979	Hazle Township	4/1/1981	West Pittston Borough	4/15/1977
Olyphant Borough	9/28/1979	City of Hazelton	(NSFHA)	West Wyoming Borough	9/15/1983
Ransom Township	4/15/1980	Hollenback Township	9/17/1980	White Haven Borough	4/15/1981
Roaring Brook Township	9/28/1979	Hughestown Borough	(NSFHA)	Wilkes-Barre City	3/16/1992
Scott Township	5/17/1990	Hunlock Township	4/1/1980	Wilkes-Barre Township	12/02/80(M)
Scranton City	8/15/1980	Huntington Township	4/15/1981	Wright Township	1/16/1981
South Abington Township	12/15/1982	Jackson Township	9/17/1980	Wyoming Borough	7/3/1981
Springbrook Township	01/20/82(M)	Jeddo Borough	(NSFHA)	Yatesville Borough	(NSFHA)
Taylor Borough	8/15/1980	Jenkins Township	5/16/1977		
Thornhurst Township	6/15/1981	Kingston Borough	6/1/1977		
Throop Borough	9/28/1979	Kingston Township	3/12/1982		
Vandling Borough	09/01/86(L)	Laflin Borough	12/02/80(M)		
West Abington Township	01/20/82(M)	Lake Township	9/3/1980		

E. Multi-jurisdictional Mitigation Actions (Municipal Level)

Table 5.7 breaks down the municipal projects in each of the counties, by hazard. A total of 620 projects have been identified by the municipalities in the two counties (94 for Lackawanna County and 526 for Luzerne County). Of the total projects, 548 projects (88.4%) are flood mitigation projects.

Table 5.7: Mitigation Project Tally by Hazard – Lackawanna and Luzerne County Municipalities

Totals	Lackawanna County	Luzerne County	Total
Projects Mitigating All Hazards	6	44	50
Dam Failure		4	4
Flood Projects	84	464	548
Hazardous Materials Projects		3	3
Landslide Projects		1	1
Mine Projects	6	9	15
Wildfire Projects		1	1
Winter Storm Projects		2	2
Total Mitigation Projects *	**94**	**526**	**620**

* Totals are less than sum of all projects by hazard because some projects address more than one hazard

Table 5.8 shows the number of acquisition and flood-proofing projects in Luzerne County by municipality.

Table 5.8: Acquisition and Flood-proofing Projects in Luzerne County

Acquisition and Floodproofing Projects in Luzerne	
Municipality	**Number of Projects**
Plymouth Township	107
Plains Township	42
West Pittston Borough	19
City of Pittston	17
Nescopeck Township	27
Nescopeck Borough	4
Jenkins Township	78
Larksville Borough	4
Duryea Borough	16
Hanover Township	5
Hunlock Township	6
Exeter Township	12
Exeter Borough	21
Conyngham Township	35
Total	393

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Multi-jurisdictional plans require all municipalities to have at least one mitigation action to be included in the hazard mitigation plan. Included in **Tables 5.9** and **5.10** are the mitigation actions identified for each municipality in the two counties. These actions were developed in the same manner as the county-level projects, and in addition, drew heavily from the municipal workshops and suggestions from local representatives via email, feedback forms, and mitigation request sheets. Each municipality includes a mitigation action, the natural hazard mitigated by the action, project source, goals and objectives addressed, responsible entity for implementing the project, possible funding sources, and project timeline.

Municipal projects have been prioritized using the STAPLEE criteria. STAPLEE uses seven evaluation categories to assess the importance of each action. The evaluation categories include Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects. The following considerations were used within each criterion to help rank each hazard mitigation project as high, medium, or low priority. The counties took the first cut at ranking the projects. The municipalities reviewed the projects and rankings and provided any comments or changes.

- Social
  - Community Acceptance
  - Adversely Affects Segment of Population
- Technical
  - Technical Feasibility
  - Long-term Solution
- Administrative
  - Staffing (sufficient number of staff and training)
  - Funding Allocated
  - Maintenance/Operations
- Political
  - Political Support
  - Local Champion or Plan Proponent (respected community member)
  - Public Support (stakeholders)
- Legal
  - State Authority
  - Existing Local Authority
  - Action Potentially Subject to Legal Challenges by Opponents (stakeholders negatively affected)
- Economic
  - Benefit of Mitigation Action
  - Cost of Mitigation Action
  - Contributes to Economic Goals
  - Outside Funding Required

- Environmental
    - Affects Land/Water Bodies
    - Affects Endangered Species
    - Affects Hazardous Materials and Waste Sites
    - Consistent with Community's Environmental Goals
    - Consistent with Federal Laws

It should be noted that the municipal actions each have been prioritized as high, medium or low. The tables do not include a prioritization of municipal projects within a category; i.e., there is no ranking of projects listed within the High Priority category because they pertain to various municipalities who would implement projects based on their capacities. The projects are simply listed in alphabetical order by municipality. For the purposes of funding, a benefit-cost analysis should be conducted. The projects would be prioritized as individual municipalities prepare applications for specific funding agencies for particular projects. The overall timeline for the completion of projects is dependent on available funding and involvement and commitment by the municipality. **Tables 5.9** and **5.10** include the project priorities within each municipality in the two counties.

* Note: Some Luzerne County municipalities in Table 5.10 have ** in their actions to indicate that specific properties for demolition/acquisition in those municipalities are included in Tables 6.2-1 through 6.2-15

Table 5.9 Lackawanna County Mitigation Actions by Municipality

Municipality	Action No.	Hazard Mitigated	Mitigation Action	Priority
Abington Twp	1	Flood	Since Ackerly Creek has overtopped its banks on several occassions conduct a watershed study to determine the sources of the flooding problems.	High
	2	Flood	The pump station works well for sewage. Improvement needed for flooding at the station. Conduct a study to determine appropriate upgrades to the pump station	High
Archbald Bor	1	Flood	Preserve the Theta Company lands in the Laurel Run Watershed through acquisition or easements to reduce flooding in the downstream portions of the watershed.	Low
	2	Flood	The headwater of Tinklepaugh Creek has numerous encroachments and mine impacts. Conduct a study to address flooding problems (eliminate flow diversion into the Gravity Slope mine outfall).	High
	3	Flood	Consider the feasiblity of constructing a levee from Gilmartin Street to South Laurel to control flooding on the Lackawanna River.	Med
	4	Flood	Consider stream channelization on Oak Creek Run and upgrade the culvert from Ash Street to the Lackawanna River.	Med
	5	Flood	Consider approximately 2000 feet of stream channelization of Laurel Run from the Lackawanna River upstream.	Med
	6	Flood	Consider stream channelization of Tinklepaugh Creek from Kennedy Boulevard, downstream to Blakely Borough.	Med
	7	Flood	Develop mitigation measures including an implementation strategy for Archbald House #2 that is located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Benton Twp	1	Flood	Develop mitigation measures including an implementation strategy for Seaman's Airport that is located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Blakely Bor	1	Flood	Conduct an engineering study for the design of flood control projects in Blakely Borough to mitigate flooding at the Hull Creek/Lackawanna River confluence, and maintain and restore a forested riparian buffer through this reach.	High
	2	Flood	Identify options to reduce flooding on Riverside Drive and Adele Drive.	High
	3	Flood	Conduct a channelization study at Tinklepaugh Creek at the Lackawanna River to avoid back up into the channel from flooding of the Lackawanna River.	High
Carbondale Twp	1	Mine related hazards	Investigate the need for additional mine fire control measures (trenches or barriers) to contain the underground mine fire near S.R. 6, southwest of Carbondale City and prevent it from spreading to adjacent mines.	Med
City of Carbondale	1	Flood	Construct retaining walls to replace the degraded flood walls at Racket Brook Creek.	High
	2	Flood	Restore the riparian corridor along Fall Brook Creek to mitigate flooding along Fall Brook Creek and the Lackawanna River.	Low
Clarks Green Bor	1	Flood	Since Ackerly Creek has overtopped its banks on several occassions conduct a watershed study to determine the sources of the flooding problems.	High
	2	Flood	Include language in the Borough's zoning, land development and subdivision plans to improve the management of small lot subdivisions, especially relative to slope, soil and drainage conditions.	High
	3	All hazards	Include language in the Borough's zoning, subdivision and land development ordinances and comprehensive plans to protect: open space, natural areas, wetlands, woodlands, and stream corridors.	High
	4	Flood	Include language in the Borough's zoning, subdivision and land use ordinances and comprehensive plan to protect Landsdowne Creek.	High
Clarks Summit Bor	1	Flood	Since Ackerly Creek has overtopped its banks on several occassions conduct a watershed study to determine the sources of the flooding problems.	High
	2	Flood	Conduct a Corridor Stormwater Management Study to analyze the hydrology of the tributary to Summit Lake Creek.	High

Table 5.9 Lackawanna County Mitigation Actions by Municipality

	3	Flood	Provide information on the importance of purchasing flood insurance to all property owners in the floodplain.	High
	4	Flood	Conduct a study to identify areas within the Borough that require the replacement of storm drains and culverts along roadways to handle stormwater effectively.	High
	5	Flood	Conduct a study to determine the replacement and/or upgrade of the major sewer main running along the railroad.	High
	6	Mine related hazards	Conduct a workshop to educate residents on the impacts of stormwater infiltration in the sewer system.	High
	7	Flood	Develop mitigation measures including an implementation strategy for the Sewer Authority that is located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	Med
Clifton Twp	1	Flood	Identify measures to reduce flooding for the 92 structures in the floodplain.	High
Covington Twp	1	Flood	Identify measures to reduce flooding for the 184 structures in the floodplain.	High
Dalton Bor	1	Flood	Since Ackerly Creek has overtopped its banks on several occassions conduct a watershed study to determine the sources of the flooding problems.	High
	2	All hazards	Upgrade fire company communications system that serves the Borough fire company, emergency management agency, and other Borough departments.	Med
	3	Flood	Identify ways to protect the sewage treatment plant on the creek through creek bank restoration and other means such as levees or floodwalls.	High
	4	Flood	Conduct a study to identify the work needed on Ackerly Creek north and south of Route 632 (Main Street) to protect the businesses and residences on Main Street from flooding.	High
Dickson City Bor	1	Flood	Include language in the Borough's ordinances for stream corridor buffer and set back requirements and emphasize the protection of stream and river corridors, flood plains and habitat values and functions.	High
Dunmore Bor	1	Flood	Restore the stream channels of Roaring Brook to restore the capacity of the stream.	Low
Elmhurst Twp	1	Flood	Conduct an engineering study to identify the most appropriate mitigation measure for the Township Government Building on South Main Street and the sanitary station on Main Street.	High
Fell Twp	1	Flood and Mine related hazards	Consider a channel restoration project on Wilson Creek to reduce flooding and eliminate infiltration into the mine pool from Richmondale to Simpson.	Low
Glenburn Twp	1	Flood	Since Ackerly Creek has overtopped its banks on several occassions conduct a watershed study to determine the sources of the flooding problems.	High
	2	All hazards	Identify the most appropriate mitigation measures for Edgewood Trailer Park since there is a sewage treatment plant nearby.	High
Greenfield Twp	1	Flood	Include language in the Township's zoning, subdivision and land development ordinances for the protection of upper headwater reaches of Rush Brook and Fall Brook.	High
	2	Flood	Consider enhancements to the Township's zoning, land development and subdivision plans to improve the management of small lot subdivisions, especially relative to slope, soil and drainage conditions and participate with other municipalities, county agencies in programs to better manage minor subdivision development.	High
	3	Flood	Include language in the Township's zoning, subdivision and land development ordinances and comprehensive plans to further define and protect: open space, natural areas, wetlands, woodlands, and stream corridors.	High

Table 5.9 Lackawanna County Mitigation Actions by Municipality

	4	Flood	Develop mitigation measures including an implementation strategy for the Greenfield Sewer Station that is located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Jefferson Twp	1	Flood	Incorporate language in the Township's plans and ordinances to protect appropriate resources in the Wallenpaupack headwaters along Moosic Mountain. Support the acquisition, protection and conservation of these resources	High
Jermyn Bor	1	Flood	Consider additional streambank stabilization along Aylesworth Creek upstream of the confluence with the Lackawanna River.	M
	2	Flood	Identify flood control measures on Rushbrook Creek including the construction of concrete channels.	High
	3	Flood	Conduct a study to address stormwater issues on the 700 blocks of Lincoln, Jefferson, and Madison Aveues.	High
	4	All hazards	Determine the feasibility of setting up a command center in the Borough to provide support during emergencies.	High
	5	Flood	Determine the feasibility of constructing a levee in the Borough along the Lackawanna River.	High
	6	Flood	Remove sand bars and gravel bars in the Lackwanna River on Evergreen Drive and Delaware Street to restore the flood carrying capacity of the River.	Low
Jessup Bor	1	Flood	Include language in the Borough's subdivision and land development ordinance to require a 75-foot building setback from each side of the creek's channel center and from the bank full line along the Lackawanna River for all new development.	High
LaPlume Twp	1	Flood	Work with DEP to remove fallen trees and large branches that have fallen into the stream during past storms to prevent future flooding of the stream.	High
	2	Flood	Conduct a watershed study for Kennedy Creek and South Branch Tunkhannock Creek.	High
Madison Twp	1	Flood	Consider the acquisition of a majority of the Theta Company properties within the Elmhurst and Curtis Reservoir sheds Reservoirs in Madison Township, or the development of a conservation easement program to ensure that these lands are maintained as open space in the future.	Low
Mayfield Bor	1	Flood	Construct flood control berms along the Lackawanna River at Hosey Creek.	Low
	2	Flood	Replace the undersized bridge over Lees Creek near its confluence with the Lackawanna River.	Low
	3	Flood	Develop mitigation measures including an implementation strategy for Mayfield Elementary School that is located in the floodplain and on an underground mine. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Moosic Bor	1	Flood	Consider using the lower reaches of Spring Brook in Moosic, Spike Island and Belin Village for educational interpretation of the various types of structural and nonstructural responses to issues related to bank stabilization, flood control and mine water infiltration.	Med
	2	Flood	Provide upgrades to the pump station.	Med
Moscow Borough	1	Flood	Identify measures to reduce flooding for the 76 structures in the floodplain.	High
Newton Twp	1	Flood	Conduct a regional watershed study for Gardner, Keyser, Buttermilk, and Falls Creek.	High
	2	Flood	Include language for the protection of Keyser Creek, in Newton Township's zoning, subdivision and land development ordinances and comprehensive plans.	High
	3	Flood	Consider enhancements to the Township's zoning, land development and subdivision plans to improve the management of small lot subdivisions, especially relative to slope, soil and drainage conditions. Participate with local municipalities and county agencies in programs to better manage minor subdivision development.	High

Table 5.9 Lackawanna County Mitigation Actions by Municipality

	4	Flood	Include language in the Township's zoning, subdivision and land development ordinances and comprehensive plans to further define and protect: open space, natural areas, wetlands, woodlands, and stream corridors.	High
	5	Flood	Consider conservation easements, acquisition or other protection measures for headwaters of Keyser Creek.	Med
North Abington Twp	1	Flood	Conduct a watershed study for Kennedy Creek and South Branch Tunkhannock Creek.	High
Old Forge Bor	1	Flood and Mine related hazards	Replace the borehole culvert at the Old Forge, Duryea and Butler Mine outfalls.	Low
	2	Flood	Consider easements through acquisition to reduce flooding to structures along St. John's Creek in the Borough.	Low
	3	Mine related hazards	Conduct annual inspections of the structures that discharge stormwater and groundwater from the flooded minepool and identify any structural repairs needed.	High
Olyphant Bor	1	Mine related hazards	Work with the Office of Surface Mining (OSM) to continue to contain the mine fire in Olyphant Borough near S.R. 6 with trenches and barriers and ensure the fire does not spread to adjacent mines or properties.	High
Ransom Twp	1	Flood	Consider easements or acquisitions to conserve upper headwater areas of St. Johns Creek and its tributary streams, Race Brook and Sawmill Creek.	Med
	2	Flood	Consider conservation easements or acquisition for the headwaters of Keyser Creek and its tributary streams Lucky Run and Lindy Creek.	Med
Roaring Brook Twp	1	Flood	Consider property acquisitions along Simerson Road and the Stafford Meadow Brook corridor to prevent the repeated flooding of structures.	Low
Scott Twp	1	Flood	Consider the acquisition of a majority of Theta Company lands in the Leggetts Creek watershed, including property around Griffin Reservoir, by public or private conservation agencies for long-term preservation.	Low
	2	Flood	Consider acquisition of conservation easements along upper reaches of Hull Creek to protect the properties from flooding.	Low
	3	Flood	Address flooding problems along the South Branch Tunkhannock Creek through culvert and bridge repair/replacement at Ball Road, Bayarsky Road, and S.R. 247.	High
	4	Flood	Address flooding problems along the Oak Creek tributary to the South Branch Tunkhannock Creek through culvert and bridge repair/replacement at Matechak Road and Scott Hill Road.	High
	5	Flood	Consider property acquisition and/or conduct a study to identify flood protection measures for properties in the Village of Montdale.	Med
City of Scranton	1	Flood	Replace the culvert through south Scranton.	Low
	2	Flood	Conduct a regional watershed study of the Pine Brook Watershed and engineering studies for the local drainage and nuisance flooding problems in the residential areas of the watershed.	High
	3	Flood	Identify appropropriate measures for the undersized bridges on Greenbush Run.	High
South Abington Twp	1	Flood	Conduct a watershed study for Leggetts and Summit Lake Creek.	High
	2	Flood	Consider the acquisition of majority of Theta Company lands in the Leggetts Creek watershed, including property around Griffin Reservoir and downstream along the creek and Maple Lake, by public or private conservation agencies for long-term preservation.	Low
	3	Flood	Develop mitigation measures including an implementation strategy for the municipal building that is located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Spring Brook Twp	1	Flood	Consider the acquisition of a majority of the Theta Company properties within the Spring Brook Intake, and Nesbitt and Watres Reservoir sheds, or the development of a conservation easement program to ensure that these lands are maintained as open space in the future.	Low

Table 5.9 Lackawanna County Mitigation Actions by Municipality

	2		Clear fallen debris (trees) from Rattle Snake Creek and Trout Run to allow maximum flow during high volume times.	High
Taylor Bor	1	Flood	Consider acquisition of conservation easements in Taylor Borough along the Lackawanna River.	Low
	2	Flood	Acquire protective easements along restored stream reaches on St. Johns Creek	Low
	3	Flood	Develop easements or acquisitions to conserve upper headwater areas of St. Johns Creek and two of its tributaries, Race Brook and Sawmill Creek.	Low
	4	Flood	Develop mitigation measures including an implementation strategy for the sewer pump station on the border of Scranton and Taylor Borough and is located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Thornhurst Twp	1	Flood	Replace undersized culverts at the intersection of Bear Lake and River Road.	Low
	2	Flood	Replace or repair the two dams (Kahulitus Dam) at Thornhurst Country Club Estates.	Low
	3	All hazards	Since the firehouse is also used as a shelter during emergencies, determine the feasiblity of constructing a building next to fire house to store fire trucks during disasters.	High
	4	Flood	Identify means to alleviate the erosion problem along the banks of the Lehigh River through river bank stabilization.	High
	5	Flood	Develop mitigation measures including an implementation strategy for the Township building and firehouse that are both located in the floodplain. Use FEMA publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures, which* provides guidance on determining appropriate mitigation measures.	High
Throop Bor	1	Flood	Consider a flood control project in Throop Borough to mitigate flooding along the Lackawanna River and Eddy Creek, while maintaining and restoring a forested riparian buffer through this reach of Eddy Creek.	Low
Vandling Bor	1	Flood	Consider acquisition of conservation easements in Vandling Borough along the Lackawanna River.	Low
West Abington Twp	1	Flood	Identify areas throughout the Township that need to be replaced with drainpipes of a larger diameter to handle increase water flow due to flooding.	High
	2	All hazards	Identify areas in the Township where the road widths are not wide enough to allow passage of emergency/utilities vehicles during an emergency.	High

Table 5.10 Luzerne County Mitigation Actions by Municipality

Municipality	Action No.	Hazard Mitigated	Mitigation Action	Priority
Ashley Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Avoca Borough	1	Flood	Identify mitigation options to address the flooding of Mill Creek on the 700 block of Grove Street. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	High
Bear Creek Township	1	Flood	Replace the undersized culvert on SR 115 near Bear Creek Lake to reduce flooding in parts of the Township.	Med
Bear Creek Village Borough	1	Flood	Replace the undersized culvert below Bear Creek to reduce flooding in parts of the Village.	Med
Black Creek Township	1	Landslide	Investigate ways to mitigate landslides on SR 3020 (Tomhicken Road) at the crossing of the road and with Black Creek.	Low
	2	Flood	Correct a flooding problem from an un-named tributary of the Black Creek at the site of the Municipal Building	Med
	3	Flood	Study for future possible mitigation of the flooding during the June 2006 event along Pine, Falls and Mountain Streets in Rock Glen	Low
	4	Landslide	Conduct a study to determine appropriate methods to mitigate landslides on Mt. Laurel Trail.	Med
	5	Flood	Address the flooding problem along Racoon Creek at Hazle Street in Weston through repairing the retaining wall that was damaged in June, 2006.	High
Buck Township	1	Flood	Identify specific mitigation actions for the structures on Wilkes Barre and Easton Roads that are vulnerable to flooding.	Low
Butler Township	1	Flood	Identify mitigation options to address the flooding action on Nescopeck Creek and St. Johns Road and State Route 222. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Med
Conyngham Borough	1	Flood	The urbanization of the Borough without stormwater management controls has led to flooding issues from stormwater run-off upstream of the Borough. Develop a plan to implement stormwater management features in the Borough. Pursue recommendations identified in the Act 167 Plan (estimated date of completion 2010).	Low
Conyngham Township	1	Flood	** Acquire and demolish/elevate residential structures located in Kadtke Court, Pulaski Court, Italy Street, Park Street, Pulaski Circle, Lincoln Street, and Nicely Street that lie within the Susquehanna River's flood hazard area.	High
	2	All hazards	Work with the County to develop a procedure to issue building permits and perform UCC functions including inspections.	Low
Courtdale Borough*	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Dallas Borough*	1	Flood	Conduct an engineering study to identify the most appropriate mitigation measure for the Borough's Government Building and the Police Department on Main Street.	Low
	2	Flood	Identify measures to protect low-lying properties from flooding of Toby Creek.	High
Dallas Township*	1	Flood	Conduct a study to identify ways (e.g., property acquisitions and stream widening) to mitigate the continual flooding of properties at the confluence of Toby's Creek and Trout Run (Fernbrook Corners).	Med

Table 5.10 Luzerne County Mitigation Actions by Municipality

	2	Flood	Flooding along Leonard's Creek has caused severe damage to two bridges and channel improvements. FEMA funding has been secured to rebuild one bridge and wall improvements. Identify additional actions that should be taken at the Kunkle/Leonard's and Shady Side Creek area.	High
	3	Flood	Conduct a study to identify stream bed improvements along public roads which continue to be heavy flooded.	Low
	4	Flood	Conduct a study to identify the need for retaining structures with creek bed improvements at Toby Creek from Offset Paperback and Route 309 to the Dallas Township - Kingston Township municipal boundary.	High
Dennison Township	1	All hazards	Conduct an engineering study to identify the most appropriate mitigation measures for the multiple structures in the 100-year floodplains throughout the Township.	Low
Dorrance Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Dupont Borough	1	Flood	Conduct a study to identify problems on Dupont Creek (Lidy, Collins, Mill) and Mill Creek.	High
Duryea Borough	1	Flood	Install sewer backflow protection valves, sump pumps or drain plugs in buildings that are subject to potential sewer backup during significant flood events.	High
	2	Flood	Conduct an engineering study of existing levee system and identify potential improvements. Complete levee certification.	High
	3	Flood	Identify improvements to the Stephenson Street Bridge including the installation of a closure structure and flood wall panels.	High
	4	Flood	Purchase and install pumps for the Borough's underground stormwater system to prevent the backup and overflow of collected runoff when system flapper valves are closed. Also identify the need for a pump station.	Low
Edwardsville Borough*	1	Mine Subsidence	Identify specific mitigation for the structures on Hillside Avenue, Elm, Green, and Cherry Streets that are vulnerable to mine subsidence.	Low
Exeter Borough	1	Flood	** Acquire residential structures located along Susquehanna Avenue and Schooley Avenue and within the Susquehanna River's flood hazard area	High
	2	Flood	Conduct a feasibility study for floodwall protection improvements required for the problem areas of Susquehanna Avenue and Grant Street.	Low
	3	Flood	Continue to identify creek and river bank maintenance and stabilization activities along strategic areas of the Susquehanna River and Hicks Creek.	Low
	4	Flood	Post a digital version of the FIRM (when completed) and flood protection documents including this Hazard Mitigation Plan on the Borough's Website www.exeterboro.com	Low
	5	All hazards	Develop a Borough newsletter to update residents on hazard awareness, preparedness and mitigation activities.	Low
	6	Flood	Adopt a resolution to ensure Real Estate Disclosure of properties in the floodplain to potential residents interested in these properties. Work with real estate agencies to accurately relay information to potential property owners if the subject property is in a high hazard area such as a floodplain.	Low
	7	Flood	Identify the most appropriate mitigation measure for the Exeter Park Hose Company on Lehigh Street and Exeter Hose Company Station #1 on Susquehanna Avenue.	High

Table 5.10 Luzerne County Mitigation Actions by Municipality

	8	Flood	Pursue the recommendations for culvert removal/replacement along the Hicks Creek, and pump station upgrades made in the 2006-2007 Hicks Creek and Abrahams Creek Flood Study. Continue to work with the Luzerne County Flood Protection Authority during the Detailed Feasibility Assessment of Hicks Creek concerning the construction of a pressure conduit, pump station, levee culvert modifications, or combination of these solutions.	High
Exeter Township	1	Flood	** Acquire and demolish/elevate residential structures located in Riverview Village and within the Susquehanna River's flood hazard area.	High
	2	Flood	Conduct a feasibility study to determine improvements for the problem areas along Route 92, Dymond Creek, Sutton Creek and Appletree Road.	Low
	3	Flood	Identify creek and river bank maintenance and stabilization activities along strategic areas of the Susquehanna River and the Township's tributary creeks.	Med
	4	Flood	Develop a website for the Township and post a digital version of the FIRM and availability of flood protection guidance documents.	Low
	5	All hazards	Include hazard mitigation updates in the Township Newsletter.	Low
	6	Flood	Install a local flood warning gauge to improve river threat monitoring.	Low
	7	Flood	Identify additional flood protection measures beyond property acquisition for the Gentile property.	High
	8	Flood	Adopt a resolution to ensure Real Estate Disclosure of properties in the floodplain to potential residents interested in these properties.	Low
Fairmount Township	1	Dam Failure	An Emergency Action Plan for Lake Jean was adopted in 2006. Continue annual inspection of the dam and perform updates of the EAP as necessary.	Low
Fairview Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Forty Fort Borough	1	Flood	Conduct a study to correct combined stormwater and sewer overflows.	Med
Foster Township	1	Flood	Foster Township – Identify specific mitigation actions for the structures on Shadetree Drive, Brookside Drive, and Tannery Road that are vulnerable to flooding.	Low
Franklin Township	1	Flooding	Identify mitigation options to reduce flooding on Municipal Road and Valley View Road.	Low
	2	Dam Failure	Make repairs to the dam on Flat Rock Road.	Low
	3	Dam Failure	Make repairs to the existing high hazard dam on Lake Louise.	Low
Freeland Borough	1	Mine related hazards	Conduct a survey of structures in the Central Business District to address areas structural remediation is necessary.	Low
Hanover Township	1	Flood	Adopt a resolution to ensure Real Estate Disclosure of properties in the floodplain to potential residents interested in these properties.	Low
Harveys Lake Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
City of Hazleton	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Hazle Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low

Table 5.10 Luzerne County Mitigation Actions by Municipality

Hollenback Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Hughestown Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Hunlock Township	1	Flood	** Acquire and demolish/elevate residential structures located on Garden Drive and within the Susquehanna River's flood hazard area.	High
	2	Hazardous materials	The UGI propane tank storage facility lies along State Route 11. Construct guardrails alongside the road to protect the roadway for motorists.	Low
Huntington Township	1	Flood	Ftorkowski, Daro, Hubbards Flats Roads and State Route 239 close during storm events as the Huntingdon Creek overtops roadway. Replace culverts at these locations.	Med
Jackson Township*	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Jeddo Borough	1	All hazards	Work with the County to develop a procedure to issue building permits and perform UCC functions including inspections.	Low
Jenkins Township	1	Flood	** Acquire and demolish/elevate residential structures located along River Road, Tennant Street, Miller Road, lots on Paradise TP and within the Susquehanna River's flood hazard area.	High
Kingston Borough*	1	Mine related hazards	Conduct an engineering study to identify the most appropriate mine subsidence mitigation measure for the Government Building and Police Department on Wyoming Avenue.	Low
	2	Mine related hazards	Conduct an engineering study to identify the most appropriate mine subsidence mitigation measure for the Chester Street Elementary School and Wyoming Valley West Middle School on Chester Street.	Low
Kingston Township*	1	All hazards	Identify the most appropriate mitigation measures for the Dallas Area Municipal Authority and the PA Water Treatment plant. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	High
	2	Flood	Conduct a study to identify the most appropriate mitigation measure for two small dams in the southwestern part of the township near mined areas.	Low
Laflin Borough	1	Flood	Investigate solutions to the flooding issues along Gardner Creek.	Low
Lake Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Larksville Borough*	1	Flood	Provide watertight seals for manholes impacted by the Susquehanna River's 500-year flood.	Low
	2	Flood	Identify clearing and dredging activities for Boston Creek upstream of US 11 in order to maintain its flood carrying and storage and capacity.	Low
	3	Flood	Provide dry floodproofing measures for metal doors/windows for structures within the Susquehanna River's flood hazard area.	Low
Laurel Run Borough	1	Flood	Conduct an engineering study to identify the most appropriate mitigation measure for the Municipal Building on Dupont Drive.	Low

Table 5.10 Luzerne County Mitigation Actions by Municipality

Lehman Township*	1	Flood	The dam on Harvey's Creek has recently been classified as a high-risk dam. Develop a program to conduct regular maintenance of this dam.	Low
Luzerne Borough*	1	Flood	Conduct an engineering study to identify the most appropriate mitigation measure for the Luzerne Borough Volunteer Fire Department on Academy Street.	Low
City of Nanticoke	1	Flood	Conduct an engineering study to identify the most appropriate mitigation measure to address land subsidence for the Luzerne County Community College on South Prospect Street.	Low
Nescopeck Borough	1	Flood	** Acquire and demolish structures within the Susquehanna River's flood hazard area on West Third Street.	High
Nescopeck Township	1	Flood	** Acquire and demolish/elevate residential structures located along River Road and within the Susquehanna River's flood hazard area.	High
New Columbus Borough	1	All hazards	Work with the County to develop a procedure to issue building permits and perform UCC functions including inspections.	Low
Newport Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Nuangola Borough	1	All hazards	Purchase a generator to assist the Borough during power outages.	Low
	2	Flood	Conduct a study to identify flooding problems at North End Road	Low
Penn Lake Park Borough	1	Dam Failure	An Emergency Action Plan for Penn Lake was adopted in 2008. Continue annual inspection of the dam and perform updates of the EAP as necessary.	Low
City of Pittston	1	Flood	** Elevate/floodproof structures on Benedict Street and Towpath Court.	High
	2	Flood	Evaluate storm drainage needs and sewer system improvements required for problem areas of Benedict Street, Towpath Court, KOZ area and New Street.	Low
	3	All hazards	Establish a Pittston City Newsletter for hazard mitigation information updates.	Low
	4	Mine Subsidence	Work with DEP and EPC AMR to conduct a delineation of underground mines and depth below the surface. Subsequently identify structures that are vulnerable to mine subsidence.	Med
Pittston Township	1	Mine related hazards	Conduct an engineering study to identify the most appropriate mitigation measure to address mine subsidence for the Intake Dam, Mill Creek, on Armstrong Road.	Low
	2	Mine related hazards	Conduct an engineering study to identify the most appropriate mitigation measure to address mine subsidence for the Pittston Township Police Department on Broad Street.	Low
Plains Township	1	Flood	Conduct a study to identify channels that have been re-routed and damaged causing flooding in the Township's residential areas.	Low
	2	Flood	** Acquire and demolish/elevate residential structures located along Gallagher Drive, McCullough Street, North River Road, North River Street, South River Street, Mitchell Street, Courtright Street, Reese Street, and Roberts Street that lie within the Susquehanna River's flood hazard area.	High
Plymouth Borough	1	Mine related hazards	Conduct an engineering study to identify the most appropriate mitigation measure to address mine subsidence for the following three dams: 1)Brown Creek Dam on Cherry Street, Wadham Creek Dam on Shawnee Street, and Duffy's Run Dam on 1st Street.	Low

Table 5.10 Luzerne County Mitigation Actions by Municipality

Plymouth Township	1	Flood	Acquire and demolish/elevate residential structures located along West Poplar Street, East Poplar Street, Mill Street, Allen Street, Elkton Street, Houseman Street, Canal Street, East Canal Street, Flats Road, West Main Street, East Main Street, Garden Drive, and Ferry Street that lie within the Susquehanna River's flood hazard area.	High
	2	All hazards	Develop mitigation measures including an implementation strategy for the fire station and water treatment plant that are located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	High
Pringle Borough*	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Rice Township	1	All hazards	Purchase a generator for the fire company to serve as back-up during power outages.	Low
	2	Flood	Replace the bridge on Nuangola Road over Big Wapwallopen Creek (approx. 2,200 feet west of intersection with South Main Road), and remove sediment and debris.	High
Ross Township	1	All hazards	Purchase a generator for the Ross Township Municipal Building to serve as a back-up during power outages	Low
Salem Township	1	Hazardous materials	Since the nuclear material transported to and from the Susquehanna Steam Electric Nuclear Facility could pose a threat to the Township, make residents aware of the procedures to follow after a hazardous materials incident. Develop a brochure on what to do when an incident occurs.	Low
Shickshinny Borough	1	Flood	** Acquire and demolish/elevate residential structures located along South Canal Street, North Canal Street, Susquehanna Avenue, East Union Street, Oak Street, McClintock Street, and South Main Street that lie within the Susquehanna River's flood hazard area.	High
Slocum Township	1	Winterstorms	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Sugar Notch Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Sugarloaf Township	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Swoyersville Borough	1	Flood	Work with a consultant to determine the causes of, and investigate solutions to, the three flooding issues along Main Street.	Low
Union Township	1	All hazards	Work with the County to develop a procedure to issue building permits and perform UCC functions including inspections.	Low
Warrior Run Borough	1	All hazards	Work with the County to develop a procedure to issue building permits and perform UCC functions including inspections.	Low
West Hazleton Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
	2	Hazardous materials	Since the hazardous materials from the Humboldt and Valmont industrial parks could pose a threat to the Borough, make residents aware of the procedures to follow after a hazardous materials incident. Develop a brochure on what to do when an incident occurs.	Low

Table 5.10 Luzerne County Mitigation Actions by Municipality

West Pittston Borough	1	Flood, Mine related hazards	Identify structural solutions to stormwater ponding and sewer back-ups area in the Borough that had been subject to mine subsidence.	Low
	2	Flood	Offer a cost-sharing program for residents affected by sewage back-up damage and publicize use of backflow valves within the community to residents subject to sewer backups and associated damages.	Low
	3	Flood, Mine related hazards	Include information in the Borough newsletter on the availability of flood insurance, basement back-up insurance, and mine subsidence insurance.	Low
	4	All hazards	Purchase a portable generator to power heating systems at shelter locations.	Low
	5	Flood	Develop and implement a procedure for regular drainage maintenance.	Low
	6	Flood	Advertise the availability of FIRMS at the Borough Building and Borough Public Works Garage.	Low
	7	All hazards	Display mitigation publications and resources in the City library.	Low
	8	Flood	Develop annual mailers for public information about flood mitigation and flood warning and response activities.	Low
West Wyoming Borough	1	Flood	Pursue the recommendations for culvert removal/replacement along the Abrahams Creek made in the 2006-2007 Hicks Creek and Abrahams Creek Flood Study. The undersized structures are the Upper 8th Street bridge and the Erie-Lackawanna Railroad bridge.	High
White Haven Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
Wilkes-Barre Township	1	Flood	Work with the Luzerne County Flood Protection Authority to finalize a solution, most likely a pressure conduit system, to the flooding issues along Coal Brook.	High
City of Wilkes-Barre	1	All hazards	Conduct a study to identify the most appropriate mitigation measure for the Geisinger South Hospital located near historic mining operations and the 100 year floodplain.	High
	2	Flood	Identify the most appropriate manner to floodproof the electrical sub-station at Mill Creek.	High
	3	Flood	Consider the stabilization of Laurel Run Creek and Mill Creeks.	High
	4	Flood	Restore the wall along Solomon Creek.	High
Wright Township	1	All hazards	Purchase a generator for the Wright Township Fire Department to ensure uninterrupted power supply when the facility is used as a communications and evacuation center during emergencies.	Low
	2	Flood	Improve drainage at the creek at Glendale Drive, Laurel Drive, and Terrace Drive to prevent them from flooding.	Low
	3	Flood	Conduct a study to determine the feasibility of replacing stormwater catch basins so they can handle additional runoff.	Low
	4	Winter storms	Work with the utility and cable companies to develop a plan for the preventive right-of-way maintenance of trees near powerlines particularly during the winter.	Low
	5	Wildfire	Develop informational materials to educate and assist homeowners near wildfire prone areas of firewise concepts including safe zones and defensible spaces.	Low
	6	All hazards	Purchase a generator for the Wright Township Municipal Building.	Low
	7	Flood	Replace the bridge on Nuangola Road over Big Wapwallopen Creek (approx. 2,200 feet west of intersection with South Main Road), and remove sediment and debris.	High

Table 5.10 Luzerne County Mitigation Actions by Municipality

Wyoming Borough	1	Flood	Pursue the recommendations for culvert removal/replacement along the Abrahams Creek made in the 2006-2007 Hicks Creek and Abrahams Creek Flood Study.	High
Yatesville Borough	1	All hazards	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Low
*** for the municipalities noted with an asterisk, the following mitigation action applies: Pursue the recommendations in the Luzerne Conservation District's Growing Greener Watershed Assessment of Toby Creek to address high priorty stream erosion and flood problems.**				
**** specific properties for the municipalities are listed are listed in Tables 6.2-1 to 6.2-15**				

Chapter 6 – PLAN MAINTENANCE PROCESS

Requirement §201.6(c)(4)(i): *[The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

A. Monitoring, Evaluating, and Updating the Plan

Once this Plan has been reviewed by the Pennsylvania Emergency Management Agency (PEMA) and the Federal Emergency Management Agency (FEMA), the Plan will be adopted by the Lackawanna and Luzerne County Board of Commissioners and their participating jurisdictions (40 in Lackawanna County and 76 in Luzerne County). Since the Bi-County Hazard Mitigation Plan is envisioned to be a 'living document', plan adoption is not considered the final step in the planning process but rather as a first step to 'realization'. The plan monitoring and maintenance schedule is a cycle of events that involves periodic review, adjustments, and improvement. This chapter establishes a method to monitor how the Plan will be evaluated and maintained in the future.

In order to ensure that the Plan continues to provide a framework for reducing risk in the two counties, the Emergency Management Agencies of both Lackawanna and Luzerne Counties will take responsibility for convening an annual meeting of the Joint Hazard Mitigation Plan Steering Committee. The Committee will comprise the members who were involved in the preparation of the Plan as well as municipal representatives, the Red Cross, members of the two County Planning Commissions, and representatives from the public schools.

Two annual report forms have been developed and are included in the Appendices: 1) the County form that will be completed for each high priority project; and 2) a Municipal Annual Report Form (matrix) that will be completed by each municipality to provide an update to the County on the status of their mitigation projects. This form will be distributed to all municipalities requesting them to document the status of each hazard mitigation action for their respective jurisdiction. Each action proposed in the Mitigation Plan will be categorized as one of the following: completed, in progress, not started/delayed, modified, or cancelled. The Steering Committee will assist the Emergency Management Directors of the two counties in preparing a status report on the mitigation actions based on the annual report forms from the municipalities and the high priority county mitigation projects.

In addition to conducting an annual review of the Plan, the Steering Committee will review the Plan within 30 days after a disaster. Each goal and objective will be examined for its relevance and its validity to the changing situation in each county, and the mitigation actions will be reviewed to ensure that they address any recent issues that may have stemmed from the disaster. During quiet times, the Plan will be updated every five years to reflect the current risk, vulnerabilities, development trends and appropriate mitigation actions. While an annual report will be competed each year, any State and Federal mandates from PEMA and FEMA, respectively, will be addressed in the five-year update. The counties will not be responsible for making any changes to the Hazard Mitigation Plan based on PEMA or FEMA requirements in between the five-year updates. All federal/state requirements will be incorporated during the five-year update cycle.

B. Benefit-Cost Analysis

A benefit-cost analysis determines the cost effectiveness of a project to minimize damage or prevent future damage from future hazard events. By determining the benefit cost of the proposed mitigation project, the analysis will provide the counties as well as project developers with additional knowledge about the feasibility of the proposed mitigation alternative. If the costs outweigh the benefits, then other alternatives that are more effective can be identified to accomplish the Plan's goals.

C. Continued Public Involvement

The preparation of this Plan has involved the public throughout the process through municipal workshops, public meetings, public hearings, and via the internet. Lackawanna and Luzerne Counties are dedicated to continuing to solicit public participation during the five-year update as required by FEMA. Copies of the Bi-County Hazard Mitigation Plan will be provided to the public libraries in both counties and be placed on each County's website along with a mechanism for submission of comments.

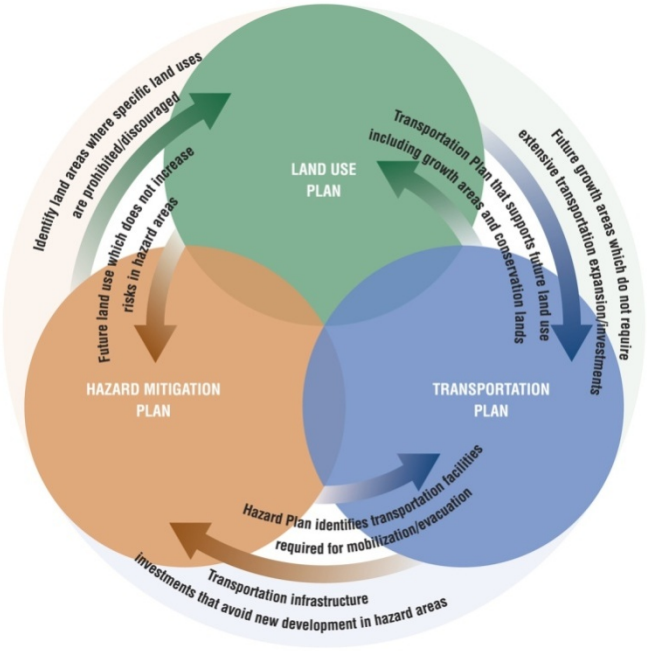
D. Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): *[The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

The two counties currently use several mechanisms to guide development: comprehensive land use planning, transportation planning, and floodplain and stormwater management regulations. Each of these mechanisms will continue to be used to meet the intent of this Plan, as appropriate. Once this Bi-County Hazard Mitigation Plan is adopted by the two counties, mitigation strategies discussed in this Plan will be implemented via the aforementioned mechanisms as well as through incorporation into the new planning mechanisms (the Bi-County Comprehensive Plan, Transportation Plan, Subdivision and Land Development and Zoning Ordinance).

Since all of the planning processes are being conducted simultaneously, the two counties are undertaking an integrated approach to developing the three plans. **Figure 6.1** highlights how the hazard mitigation planning effort has been integrated into the development of the other plans. For example, the Hazard Mitigation Plan helped to identify where specific land uses are prohibited or discouraged, which was taken into consideration while developing the Future Land Use Plan for the two counties to reduce the risk in high hazard areas by discouraging development in those areas.

Figure 6.1: Integration of Hazard Mitigation Plan, Comprehensive Plan, and Long Range Transportation Plan



The Bi-County Comprehensive Plan, Long Range Transportation Plan, Emergency Operations Plan, and Zoning Ordinance are identified for incorporation of hazard mitigation actions once the Plan is adopted. Specific recommendations have been made in Tables 5.1 and 5.2 (county mitigation projects) to include language in the zoning ordinance and also for the incorporation of specific goals and recommendations in the Comprehensive Plan as it is being updated. For other plans and regulations, such as the Emergency Operations Plan, that are already in existence, mitigation actions should be incorporated as an amendment to the plan.

The approach to integrate and unify the three planning processes proved to be highly successful for the following reasons:

- It allowed for an effective working relationship with the two counties: Meetings were combined when possible to discuss issues related to land use, transportation, and hazard mitigation in a comprehensive manner, particularly when it came to ensuring that future land uses were not planned in high hazard areas.

- Integration of the three plans provided for an efficient use of resources, with respect to public meetings. The rounds of public meetings presented findings and issues on various comprehensive plan elements, hazard identification and risk assessment, as well as hazard mitigation actions that would guide future land uses.

- It provided a linkage between plans. During the goal-setting process, the three planning processes interfaced often to ensure that the goals were all-encompassing and strived for better and safer communities. The processes also interfaced during the development of recommendations and actions to ensure that actions in various plans were in harmony with one another and created an opportunity for the incorporation of mitigation actions into the Comprehensive Plan and the Long Range Transportation Plan.

1. Incorporation of Mitigation Actions into Existing Planning Mechanisms – Municipalities

Once the Lackawanna and Luzerne County Board of Commissioners adopts the Bi-County Hazard Mitigation Plan, each individual jurisdiction within the two counties will be required to adopt the Plan. Once this is completed, the Planning Departments of Lackawanna and Luzerne Counties will continue to assist local jurisdictions with the implementation of mitigation projects. Each participating municipality will be responsible for implementing the specific mitigation actions identified in this Plan and incorporating these actions as amendments into their local planning documents, such as comprehensive plans, zoning ordinances, land development and subdivision regulations. The municipalities will also identify capital improvement projects that are consistent with this Plan's goals and be responsible for obtaining funds from suggested State and Federal sources to implement the mitigation actions.

2. Wyoming Valley Municipal Hazard Mitigation Plans

A total of 15 municipal plans have been completed and approved for Luzerne County communities under the auspices of the Wyoming Valley Flood Protection Authority. **Table 6.1** provides a list of communities with approved plans and their dates of FEMA approval and expiration.

Table 6.1: Approved Hazard Mitigation Plans – Luzerne County

Luzerne County Community	Approval Date	Expiration Date
Conyngham Township	7/1/2005	6/30/2010
Duryea Borough	7/14/2005	7/13/2010
Exeter Borough	7/14/2005	7/13/2010
Exeter Township	7/14/2005	7/13/2010
Hanover Township	3/10/2004	3/9/2009
Hunlock Township	3/10/2004	3/9/2009
Jenkins Township	7/14/2005	7/13/2010
Larksville Borough	3/10/2004	3/9/2009
Nescopeck Borough	3/10/2004	3/9/2009
Nescopeck Township	3/10/2004	3/9/2009
Pittston City	7/14/2005	7/13/2010
Plains Township	7/14/2005	7/13/2010
Plymouth Township	5/10/2005	5/9/2010
Shickskinny Borough	3/10/2004	3/9/2009
West Pittston Borough	2/10/2005	2/9/2010

For these 15 communities, the 2008 Bi-County Hazard Mitigation Plan will serve as the Plan Update. Mitigation actions from the Wyoming Valley Plans that have not been implemented to date have been rolled over into this Plan. All projects have been prioritized based on their original Plan priorities. In the following tables **(Tables 6.2-1 through 6.2-15)** the status of each project is indicated in the Project Status column where each project's status is noted as: completed, in progress, not started/delayed, modified, or removed. As these communities adopt this 2008 Bi-County Hazard Mitigation Plan for their individual municipalities, they can continue to implement their projects. In the future, the status of these projects will be documented on an Annual Report Form that will be distributed by the Luzerne County Emergency Management Agency.

Table 6.2-1 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Conyngham Township

Conyngham Township										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
150 Kadtke Court	Acquire and demolish/elevate (7.7 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.47	0.19	$37,500	$75,528	H	
149 Pulaski Court	Acquire and demolish/elevate (3.9 ft) residential structure located in Pulaski Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.13	0.43	$62,500	$13,000	H	
144 Kadtke Court	Acquire and demolish/elevate (4.2 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.14	0.42	$62,500	$15,442	H	
142 Kadtke Court	Acquire and demolish/elevate (4.3 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.16	0.39	$62,500	$19,212	H	
145 Kadtke Court	Acquire and demolish/elevate (3.0 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.10	0.27	$62,500	$14,608	H	
146 Pulaski Circle	Acquire and demolish/elevate (2.5 ft) residential structure located in Pulaski Circle and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.08	0.23	$62,500	$12,232	H	
152 Kadtke Court	Acquire and demolish/elevate (2.3 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.21	$81,250	$11,524	H	

103 Italy Street	Acquire and demolish/elevate (2.6 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.09	0.20	$75,000	$18,235	M	
138-1/2 Kadtke Court	Acquire and demolish/elevate (2.9 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.09	0.18	$50,000	$15,519	M	
on Kadtke Court	Acquire and demolish/elevate (2.0 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.13	0.17	$37,500	$11,934	M	
130 Kadtke Court	Acquire and demolish/elevate (1.9 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.08	0.16	$62,500	$13,804	M	
121 Park Street	Acquire and demolish/elevate (1.7 ft) residential structure located along Park Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.07	0.16	$62,500	$12,200	M	
137 Kadtke Court	Acquire and demolish/elevate (2.3 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.09	0.15	$62,500	$18,827	M	
138 Kadtke Court	Acquire and demolish/elevate (2.2 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.08	0.15	$62,500	$16,721	M	
135 Kadtke Court	Acquire and demolish/elevate (2.1 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.08	0.15	$62,500	$16,938	M	

136 Kadtke Court	Acquire and demolish/elevate (1.8 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.09	0.13	$62,500	$16,694	M	
148 Pulaski Circle	Acquire and demolish/elevate (1.5 ft) residential structure located in Pulaski Circle and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.13	$62,500	$12,444	M	
120 Italy Street	Acquire and demolish/elevate (1.5 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.07	0.12	$50,000	$10,000	M	
147 Pulaski Circle	Acquire and demolish/elevate (1.4 ft) residential structure located in Pulaski Circle and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.11	$62,500	$13,532	L	
122 Park Street	Acquire and demolish/elevate (0.7 ft) residential structure located along Park Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.11	$62,500	$16,201	L	
140 Kadtke Court	Acquire and demolish/elevate (1.8 ft) residential structure located in Kadtke Court and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.08	0.09	$62,500	$19,482	L	
118 Italy Street	Acquire and demolish/elevate (1.4 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.07	0.08	$62,500	$19,499	L	
144 Lincoln Street	Acquire and demolish/elevate (1.2 ft) residential structure located along Lincoln Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.07	$75,000	$21,998	L	

105 Italy Street	Acquire and demolish/elevate (0.2 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.05	0.05	$62,500	$13,889	L	
on Italy Street	Acquire and demolish/elevate (0.6 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.04	$81,250	$20,300	L	
142 Lincoln Street	Acquire and demolish/elevate (0.3 ft) residential structure located along Lincoln Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.05	0.04	$62,500	$14,331	L	
110 Italy Street	Acquire and demolish/elevate (0.1 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.05	0.04	$62,500	$12,000	L	
119 Italy Street	Acquire and demolish/elevate (0.1 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.05	0.04	$81,250	$16,898	L	
on Italy Street	Acquire and demolish/elevate (0.3 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.04	0.04	$62,500	$14,756	L	
27 Nicely Street	Acquire and demolish/elevate (2.1 ft) residential structure located along Nicely Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.02	$50,000	$61,198	L	
79 and 81 Italy Street	Acquire and demolish/elevate (0.8 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.05	$93,750	$27,897	L	

83 and 85 Italy Street	Acquire and demolish/elevate (0.6 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.03	$81,250	$27,761	L	
87 and 89 Italy Street	Acquire and demolish/elevate (0.7 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.04	$75,000	$28,322	L	
91 and 93 Italy Street	Acquire and demolish/elevate (1.5 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.07	$87,500	$32,368	L	
95 and 97 Italy Street	Acquire and demolish/elevate (0.9 ft) residential structure located along Italy Street and within the Susquehanna River's flood hazard area	Township supervisors, Township Engineer and mitigation committee members, property owner	X	No	0.06	0.05	$87,500	$31,909	L	

Priority – H-High; M-Medium; L-Low
Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-2 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Duryea Borough

Duryea Borough					
Project Description	Responsible Entity	Potential Funding Sources	Preliminary Project Costs	Priority	Project Status
Installation of sewer backflow protection valves, sump pumps or drain plugs in buildings that are subject to potential sewer backup during significant flood events.	Project Team consisting of Borough Council and Mitigation Planning Committee Members, Building Code Inspector Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program HUD's Community Development Block Grant		H	
Complete an investigation by a qualified engineering firm to identify alternatives, improvements and associated costs required to decrease overloads and stormwater infiltrations at the sewage treatment plant.	Borough Council, Lower Lackawanna Sewage Authority officials and mitigation committee members Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds PA Infrastructure Investment Authority (PennVEST) HUD's Community Development Block Grant USACE Section 22 – Water Resources Development Act Duryea Borough General Fund		H	
Engineering study of existing levee system and identification of potential improvements	Borough Council with technical assistance from PEMA or engineering consultant	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Stephenson Street Bridge Improvements (road bollard and flood wall panels)	Borough Council and Mitigation Planning Committee Members with technical assistance from Pa DEP	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program Pa. DEP		H	
Maintenance, repair and replacement/installation of flap gates throughout the borough	Borough Council, Mitigation Planning Committee and Borough DPW personnel Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds HUD's Community Development Block Grant FEMA's Hazard Mitigation Grant Program		M	
Purchase and install pumps for the borough's underground stormwater system to prevent the backup and overflow of collected runoff when system flapper valves are closed	Project Team consisting of Borough Council and Hazard Planning Committee Members	FEMA's Hazard Mitigation Grant Program		M	
Maintain an updated Emergency Response Plan	Point of Contact – Borough Council President	FEMA's Flood Mitigation Assistance Program		M	

Table 6.2-2 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Duryea Borough

Maintain readiness of Borough emergency operational center and sandbag supplies	Borough Emergency Management Director, with oversight of Borough Council	HUD's Community Development Block Grant		M	
Supplement the borough's existing Emergency Management Plan and Operating Procedures with the new FWRS data	Borough Emergency Management Director with technical assistance from FEMA/PEMA or planning consultant	Wyoming Valley Levee-Raising Project Mitigation Funds USACE Floodplain Management Services Program and Duryea Borough General Fund		M	
Post a digital version of the FIRM and a notice of the public availability of guidance documents on the borough's website.	Borough's Web-page designer Borough Council Members	Duryea Borough General Fund Monies		M	
Dike Stabilization Maintenance Activities	Borough Council, Mitigation Planning Committee and Borough DPW personnel	FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program Duryea Borough General Fund		M	
Establishment of a Duryea Borough Newsletter for hazard mitigation info updates	Point of Contact – Borough Council President	Duryea Borough General Fund Monies		M	
Illegal stormwater drains into sewer system	Borough Council, Borough Code Enforcement Officer and Lower Lackawanna Sewage Authority representative	N/A		L	
Removal of silt deposits in strategic areas of the Lackawanna River.	Borough Council, Mitigation Planning Committee and Borough DPW personnel Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		L	
Adoption of Real Estate Disclosure Resolution	Adoption – Borough Council President	N/A		L	
Work to make sure that the more restrictive floodplain management regulations that are currently in effect, remain enforced as the International Building Code is adopted.	Adopt – Borough Council President Enforce – Building Code Enforcement Officer	N/A		L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-3a Wyoming Valley Municipal Hazard Mitigation Plan Projects - Exeter Borough

Exeter Borough										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
Schooley Ave.	Acquire residential structure located along Schooley Avenue and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.01	N/A*	$54,752	N/A*		
315 Susquehanna Ave.	Acquire residential structure located along Susquehanna Avenue and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.01	N/A*	$48,224	N/A*		
309 Susquehanna Ave.	Acquire residential structure located along Susquehanna Avenue and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	N/A*	$53,248	N/A*		
307 Susquehanna Ave.	Acquire residential structure located along Susquehanna Avenue and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.01	N/A*	$61,600	N/A*		
305 Susquehanna Ave.	Acquire residential structure located along Susquehanna Avenue and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	N/A*	$67,328	N/A*		
301 Susquehanna Ave.	Acquire residential structure located along Susquehanna Avenue and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.01	N/A*	$54,528	N/A*		

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-3b Wyoming Valley Municipal Hazard Mitigation Plan Projects - Exeter Borough

Exeter Borough					
Project Description	Responsible Entity	Potential Funding Sources	Approximate Project Cost	Priority	Project Status
Maintenance of storm sewer system and flap gates throughout the Borough Acquire and demolish residential structures located along Susquehanna Avenue and Schooley Avenue within the Susquehanna River's flood hazard area.	Project Team consisting of Borough Council and Mitigation Planning Committee Members	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Maintenance of storm sewer system and flap gates throughout the Borough	Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds HUD's Community Development Block Grant FEMA's Hazard Mitigation Grant Program Borough General Funds		H	
Feasibility Study for floodwall protection improvements required for problem area of Susquehanna Avenue and Grant Street	Borough Council, Borough engineer and mitigation committee mem-bers Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds PA Infrastructure Investment Authority (PennVEST) HUD's Community Development Block Grant USACE Section 22 - Water Resources Development Act Borough General Fund		H	
Upgrading Improvements and/or transfer of ownership of the Hicks Creek Pump Station	Borough Council, Borough engineer and mitigation committee mem-bers Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds HUD's Community Development Block Grant FEMA's Hazard Mitigation Grant Program Borough General Funds		H	
Creek and River bank maintenance and stabilization activities along strategic areas of the Susquehanna River and Hicks Creek.	Borough Council, Mitigation Planning Committee and Borough DPW personnel, Luzerne County Conservation District, HCWA volunteers Point of Contact – Borough Council President	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Maintain an updated Emergency Operations Plan	Borough Emergency Management Coordinator with technical assistance from Luzerne County EMA	Exeter Borough General Fund		M	

Table 6.2-3b Wyoming Valley Municipal Hazard Mitigation Plan Projects - Exeter Borough

Supplement the Borough's existing Emergency Operations Plan and Operating Procedures with the new FWRS data	Borough Emergency Management Coordinator with technical assistance from FEMA/PEMA or planning consultant	Wyoming Valley Levee-Raising Project Mitigation Funds USACE Floodplain Management Services Program and Exeter Borough General Fund		M	
Develop a Borough internet website and post a digital version of the FIRM and a notice of the public availability of flood protection guidance documents	Borough Secretary Borough Council Members	Exeter Borough General Fund Monies		M	
Periodic informational mailings via a Exeter Borough Newsletter for hazard mitigation info updates	Borough Council, Borough Administrative Staff	Exeter Borough General Fund Monies		M	
Maintain readiness of Borough Emergency Operations and agency relationships	Borough Emergency Management Coordinator, with oversight of Council President and Borough Council	Exeter Borough General Fund		L	
Adoption of Real Estate Disclosure Resolution	Adoption – Borough Council	N/A		L	
Work to make sure that the more restrictive floodplain management regulations that are currently in effect, remain enforced as the International Building Code is adopted.	Adopt – Borough Council Enforce – Building Code Enforcement Officer	N/A		L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-4a Wyoming Valley Municipal Hazard Mitigation Plan Projects - Exeter Township 1

Exeter Township 1					
Project Description	Responsible Entity	Potential Funding Sources	Approximate Project Cost	Priority	Project Status
Acquire and demolish residential structures located within Riverview Village as identified on Table 14 within the Susquehanna River's flood hazard area.	Project Team consisting of Township Board of Supervisors, Mitigation Planning Committee Members and property owners Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Feasibility Study for levee system and/or floodwall protection improvements required for problem areas along Rt. 92, Dymond Creek, Sutton Creek and Appletree Road.	Township Board of Supervisors, Township engineer and mitigation committee members Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds PA Infrastructure Investment Authority (PennVEST) HUD's Community Development Block Grant USACE Section 22 – Water Resources Development Act Township General Fund		H	
Creek and River bank maintenance and stabilization activities along strategic areas of the Susquehanna River and the township's tributary creeks.	Township Board of Supervisors, Mitigation Planning Committee and Township DPW personnel, Luzerne County Conservation District, HCWA volunteers Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Maintain an updated Emergency Operations Plan	Township Emergency Management Coordinator with technical as-sistance from Luzerne County EMA	Exeter Township General Fund		M	
Supplement the Township's existing Emergency Operations Plan and Operating Procedures with the new FWRS data	Township Emergency Management Coordinator with technical assistance from FEMA/PEMA or planning consultant	Wyoming Valley Levee-Raising Project Mitigation Funds USACE Floodplain Management Services Program and Exeter Township General Fund		M	
Develop a Township internet website and post a digital version of the FIRM and a notice of the public availability of flood protection guidance documents	Township Secretary Township Board of Supervisors Members	Exeter Township General Fund Monies		M	
Periodic informational mailings via a Exeter Township Newsletter for hazard mitigation info updates	Township Board of Supervisors, Township Administrative Staff	Exeter Township General Fund Monies		M	
Installation of a local flood warning gauge to improve river threat monitoring	Township Emergency Management Coordinator and Board of Supervisors with technical assistance from Luzerne County EMA	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		M	

Table 6.2-4a Wyoming Valley Municipal Hazard Mitigation Plan Projects - Exeter Township 1

Maintain readiness of Township Emergency Operations and agency relationships	Township Emergency Management Coordinator, with oversight of Board of Supervisors Chairman and Township Board of Supervisors	Exeter Township General Fund		L	
Acquisition and demolition of the residential parcel known as the Gentile property	Project Team consisting of Township Board of Supervisors, Mitigation Planning Committee Members and property owner Point of Contact – Township Board of Supervisors Chairman	USACE Mitigation Funds, FEMA's Hazard Mitigation Grant Program, FEMA's Flood Mitigation Assistance Program, USACE's Floodplain Management Services Program, and the Department of Housing and Urban Development's (HUD) Community Development Block Grant - Disaster Recovery Initiative Program		L	
Adoption of Real Estate Disclosure Resolution	Adoption – Township Board of Supervisors	N/A		L	
Work to make sure that the more restrictive floodplain management regulations that are currently in effect, remain enforced after the International Building Code is adopted.	Adopt – Township Board of Supervisors Enforce – Building Code Enforcement Officer	N/A		L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-4b Wyoming Valley Municipal Hazard Mitigation Plan Projects - Exeter Township 2

Exeter Township 2										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
Lot 503, Riverview Village	Acquire and demolish/elevate (1.8 ft) residential structure located in Riverview Village and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.11	$39,332	$12,172		
Lot 505, Riverview Village	Acquire and demolish/elevate (1.1 ft) residential structure located in Riverview Village and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	0.04	$51,671	$19,941		
Lot 505, Riverview Village	Acquire and demolish/elevate (0.3 ft) residential structure located in Riverview Village and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.05	0.00	$49,430	$18,530		

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-5 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Hanover Township

Hanover Township					
Project Description	Responsible Entity	Potential Funding Sources	Approximate Preliminary Project Costs	Priority	Project Status
Solomon Creek Flood Protection Project Feasibility Study (Revised April 2003)	Township supervisors and mitigation committee members – Ongoing	Funding received for study phase	$160,000±		
USACE Solomon Creek Pump Station Upgrades	Township maintenance staff, USACE – Ongoing	Funding received	$5.7M±		
Solomon Creek Stream Gage	Mitigation committee members, township supervisors	1,2,5,6,8, USGS or NOAA/NWS funding	$20,000±		
Adoption of Model Stormwater Management Ordinance from Solomon Creek Act 167 Plan	Township supervisors, zoning officer, and mitigation committee members	None/Staff time	Staff time		
Adoption of Real Estate Disclosure by resolution	Township supervisors, zoning officer, and mitigation committee members	None/Staff time	Staff time		

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-6 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Hunlock Township

Hunlock Township										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
68 Garden Dr.	Acquire and demolish residential structure #16649	Township supervisors, zoning officer, and mitigation committee members	X	No	0.47		$83,000		H	
107 Garden Dr.	Acquire and demolish residential structure #16727	Township supervisors, zoning officer, and mitigation committee members	X	No	5.9		$75,000		H	
75 Garden Dr.	Acquire and demolish residential structure #16654	Township supervisors, zoning officer, and mitigation committee members	X	No	5.4		$70,000		H	
80 Garden Dr.	Acquire and demolish residential structure #16679	Township supervisors, zoning officer, and mitigation committee members	X	No	3.3		$115,000		H	
108 Garden Dr.	Acquire and demolish residential structure #16743	Township supervisors, zoning officer, and mitigation committee members	X	No	1.9		$100,000		H	IP
87 Garden Dr.	Acquire and demolish auto sales structure #16668	Township supervisors, zoning officer, and mitigation committee members	X	No	1		$457,800		H	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-7a Wyoming Valley Municipal Hazard Mitigation Plan Projects - Jenkins Township

Jenkins Township										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
1633 River Rd.	Acquire and demolish/elevate (6.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.24	1.23	$75,000	$15,965	H	
8 Tennant St.[2]	Acquire and demolish/elevate (3.5 ft) residential structure located along Tennant Street and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.08	0.39	$87,500	$18,796	H	
6 Tennant St.[2]	Acquire and demolish/elevate (3.1 ft) residential structure located along Tennant Street and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.07	0.36	$62,500	$13,155	H	
R1633 River Rd.	Acquire and demolish/floodproof(5.6 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.15	0.35	$250,000	$98,257	H	
10 Tennant St.[2]	Acquire and demolish/elevate (3.5 ft) residential structure located along Tennant Street and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.08	0.40	$87,500	$18,723	H	C
1605 River Rd.	Acquire and demolish/elevate (1.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	Yes	0.04	0.07	$110,000	$48,841	H	
11 Tennant St.[2]	Acquire and demolish/elevate (0.8 ft) residential structure located along Tennant Street and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.08	$75,000	$14,977	H	

Table 6.2-7a Wyoming Valley Municipal Hazard Mitigation Plan Projects - Jenkins Township

1569 River Rd.[2]	Acquire and demolish/elevate (3.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.08	0.15	$87,500	$35,675	H	
13 Miller St.[2]	Acquire and demolish/elevate residential structure located along Miller Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	------	------	$87,500	$20,000	H	
9 Miller St.[2]	Acquire and demolish/elevate residential structure located along Miller Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	Yes	------	------	$87,500	$20,000	H	C
15 Tennant St.[2]	Acquire and demolish/elevate (0.1 ft) residential structure located along Tennant Street and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.02	$62,500	$27,812	M	
1646 River Rd	Acquire and demolish/elevate (2.7 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.13	$25,000	$19,438	M	
1650 River Rd.	Acquire and demolish/elevate (3.7 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.12	0.19	$106,250	$58,718	M	
1521 River Rd.	Acquire and demolish/elevate (3.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.09	0.29	$87,500	$24,192	M	

1567 River Rd.	Acquire and demolish/elevate (3.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.09	0.25	$87,500	$25,653	M	
1519 River Rd.	Acquire and demolish/elevate (3.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.07	0.22	$87,500	$23,279	M	
1517 River Rd.	Acquire and demolish/elevate (2.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.06	0.18	$87,500	$24,232	M	
1575 River Rd.	Acquire and demolish/elevate (3.8 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.07	0.14	$241,250	$104,146	M	
1611 River Rd.	Acquire and demolish/elevate (2.7 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	Yes	0.06	0.16	$75,000	$19,628	M	
1723 River Rd.	Acquire and demolish/elevate (1.2 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.06	0.16	$152,006	$45,798	L	
1619 River Rd.	Acquire and demolish/elevate (2.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.07	0.16	$87,500	$28,653	L	

1639 River Rd.	Acquire and demolish/elevate (0.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.03	$87,500	$34,986	L	
1627 River Rd.	Acquire and demolish/elevate (1.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.03	$75,000	$54,162	L	
1623 River Rd.	Acquire and demolish/elevate (1.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.05	$75,000	$24,038	L	
1648 River Rd.	Acquire and demolish/elevate (1.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.01	0.02	$125,000	$88,548	L	
Lot 1 Paradise TP	Acquire and demolish/elevate (0.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.00	$37,500	$19,329	L	
Lot 2 Paradise TP	Acquire and demolish/elevate (1.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.06	$37,500	$17,799	L	
Lot 3 Paradise TP	Acquire and demolish/elevate (0.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.01	$37,500	$19,329	L	
Lot 4 Paradise TP	Acquire and demolish/elevate (0.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.00	$37,500	$18,836	L	

Lot 10 Paradise TP	Acquire and demolish/elevate (0.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.02	$31,250	$12,954	L	
Lot 11 Paradise TP	Acquire and demolish/elevate (0.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.02	$37,500	$16,864	L	
Lot 12 Paradise TP	Acquire and demolish/elevate (0.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.04	$31,250	$14,739	L	
Lot 13 Paradise TP	Acquire and demolish/elevate (1.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.05	$31,250	$14,603	L	
Lot 14 Paradise TP	Acquire and demolish/elevate (1.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.04	$31,250	$14,841	L	
Lot 15 Paradise TP	Acquire and demolish/elevate (0.5 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.02	$37,500	$19,941	L	
Lot 16 Paradise TP	Acquire and demolish/elevate (0.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.00	$37,500	$18,275	L	
River Rd.	Acquire and demolish/elevate (2.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.01	0.01	$75,000	$92,738	L	

1719 River Rd.	Acquire and demolish/elevate (1.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.12	$75,000	$13,056	L	
1717 River Rd.	Acquire and demolish/elevate (0.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.07	$75,000	$15,453	L	
R1715 River Rd.	Acquire and demolish/elevate (0.6 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.09	$75,000	$10,455	L	
1709-1711 River Rd.	Acquire and demolish/elevate (0.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.04	$87,500	$31,858	L	
1653 River Rd.	Acquire and demolish/elevate (3.5 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.09	0.10	$382,500	$117,678	L	
1605 River Rd.	Acquire and demolish/elevate (1.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.07	$87,500	$48,841	L	
1515 River Rd.	Acquire and demolish/elevate (2.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.06	0.12	$87,500	$29,128	L	

1513 River Rd.	Acquire and demolish/elevate (2.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.06	0.14	$87,500	$24,081	L	
1497 River Rd.	Acquire and demolish/elevate (2.7 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	Yes	0.06	0.15	$87,500	$27,357	L	
1495 River Rd.	Acquire and demolish/elevate (1.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	Yes	0.04	0.07	$87,500	$23,290	L	
1493 River Rd.	Acquire and demolish/elevate (2.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.05	0.13	$87,500	$25,852	L	
1491 River Rd.	Acquire and demolish/elevate (2.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.05	0.14	$87,500	$23,905	L	
1489 River Rd.	Acquire and demolish/elevate (2.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.05	0.14	$87,500	$24,902	L	
1487 River Rd.	Acquire and demolish/elevate (2.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.05	0.14	$87,500	$23,667	L	
1485 River Rd.	Acquire and demolish/elevate (2.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.05	0.12	$75,000	$24,267	L	

1479 River Rd.	Acquire and demolish/elevate (1.9 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.10	$75,000	$21,216	L	
1477 River Rd.	Acquire and demolish/elevate (0.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.05	$87,500	$18,428	L	
1475 River Rd.	Acquire and demolish/elevate (1.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.04	0.11	$87,500	$19,550	L	
1700 River Rd.	Acquire and demolish/elevate (1.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.07	$62,500	$12,818	L	
1679 River Rd.	Acquire and demolish/elevate (1.2 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.02	$324,419	$280,543	L	
1675 River Rd.	Acquire and demolish/elevate (2.1 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.03	$378,070	$276,330	L	
29 Grant St.	Acquire and demolish/elevate (0.2 ft) residential structure located along Grant Street and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.02	$80,512	$32,147	L	

Table 6.2-7a Wyoming Valley Municipal Hazard Mitigation Plan Projects - Jenkins Township

1662 River Rd.	Acquire and demolish/elevate (0.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.02	0.03	$67,904	$25,449	L	
1659 River Rd.	Acquire and demolish/elevate (1.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.06	$69,760	$26,435	L	
1657 River Rd.	Acquire and demolish/elevate (1.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, engineer and mitigation committee members, property owner	X	No	0.03	0.05	$64,352	$23,562	L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-7b Wyoming Valley Municipal Hazard Mitigation Plan Projects - Jenkins Township 1

Jenkins Township 1					
Project Description	Responsible Entity	Potential Funding Sources	Preliminary Project Costs	Priority	Project Status
Acquire/demolish or elevate high priority residential and commercial structures as identified on Table 14 within the Susquehanna River's flood hazard area.	Project Team consisting of Township Board of Supervisors, Mitigation Planning Committee Members and property owners Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Feasibility Study for levee system and/or floodwall protection improvements required for problem areas in Port Blanchard area along River Road.	Township Board of Supervisors, Township engineer and mitigation committee members Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds PA Infrastructure Investment Authority (PennVEST) HUD's Community Development Block Grant USACE Section 22 - Water Resources Development Act Township General Fund		H	
Maintenance of storm sewer system and flap gates throughout the township	Township Board of Supervisors, Mitigation Planning Committee and Township DPW personnel Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds HUD's Community Development Block Grant FEMA's Hazard Mitigation Grant Program Township General Fund		H	
Evaluation of storm drainage needs, outfall and manhole improvements required for problem areas in Port Blanchard and Port Griffith areas.	Township Board of Supervisors, Township Manager, Township Engineer and mitigation committee members Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds PA Infrastructure Investment Authority (PennVEST) HUD's Community Development Block Grant USACE Section 22 - Water Resources Development Act Township General Fund		H	
Investigate feasibility of creating an emergency access/exit route roadway for the residents located in the area of Port Blanchard.	Township Board of Supervisors, Mitigation Planning Committee and Township Engineer Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program HUD's Community Development Block Grant		H	
Discern as to whether a new Township Floodplain Management Ordinance is needed to be developed and adopted.	Township Board of Supervisors, Township Manager and mitigation committee members Point of Contact – Township Board of Supervisors Chairman	Pa. DCED's Floodplain Land Use Assistance Program; Jenkins Township General Fund		M	

Table 6.2-7b Wyoming Valley Municipal Hazard Mitigation Plan Projects - Jenkins Township 1

Acquire/demolish or elevate medium priority residential and commercial structures as identified on Table 14 within the Susquehanna River's flood hazard area.	Project Team consisting of Township Board of Supervisors, Mitigation Planning Committee Members and property owners Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		M	
Maintain an updated Emergency Operations Plan	Township Emergency Management Coordinator with technical assistance from Luzerne County EMA	Jenkins Township General Fund		M	
Supplement the Township's existing Emergency Operations Plan and Operating Procedures with the new FWRS data	Township Emergency Management Coordinator with technical assistance from FEMA/PEMA or planning consultant	Wyoming Valley Levee-Raising Project Mitigation Funds USACE Floodplain Management Services Program and Jenkins Township General Fund		M	
Further develop the Township internet website and post a digital version of the FIRM and a notice of the public availability of flood protection guidance documents	Township Manager Township Board of Supervisors Members	Jenkins Township General Fund Monies		M	
Periodic informational mailings via a Jenkins Township Newsletter for hazard mitigation info updates	Township Board of Supervisors, Township Administrative Staff	Jenkins Township General Fund Monies		L	
Creek and River bank maintenance and stabilization activities along strategic areas of Gardner creek and the Susquehanna River.	Township Board of Supervisors, Mitigation Planning Committee and Township DPW personnel, Luzerne County Conservation District Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds USACE Floodplain Management Services Program Pa. DEP and DCNR Growing Greener Program Jenkins Township General Fund Monies		L	
Acquire/demolish or elevate low priority residential and commercial structures as identified on Table 14 within the Susquehanna River's flood hazard area.	Project Team consisting of Township Board of Supervisors, Mitigation Planning Committee Members and property owners Point of Contact – Township Board of Supervisors Chairman	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		L	
Maintain readiness of Township Emergency Operations and agency relationships	Township Emergency Management Coordinator, with oversight of Board of Super-visors Chairman and Township Board of Supervisors	Jenkins Township General Fund		L	
Adoption of Real Estate Disclosure Resolution	Adoption - Township Board of Supervisors	N/A		L	
Work to make sure that the more restrictive floodplain management regulations that are currently in effect, remain enforced after the International Building Code is adopted.	Adopt – Township Board of Supervisors Enforce – Building Code Enforcement Officer/Engineer	N/A		L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-8 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Larksville Borough

Larksville Borough					
Project Description	Responsible Entity	Potential Funding Sources	Preliminary Project Costs	Priority	Project Status
Study, design, and construction for the replacement of the existing culvert for Boston Creek	Borough Council members, zoning officer, and mitigation committee members, DEP, PennDOT		$4,100,001		
Provide watertight seals for manholes impacted by the Susquehanna River's 500-year flood	Borough Council members, zoning officer, and mitigation committee members		$22,000		
Clearing and dredging activities for Boston Creek upstream of U.S. 11.	Borough Council members, zoning officer, and mitigation committee members, DEP, PennDOT		$15,000		
Provide dry floodproofing measures for metal doors/windows for structures within the Susquehanna River's flood hazard area.	Borough Council members, zoning officer, and mitigation committee members		$274,500		

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-9 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Nescopeck Borough

Nescopeck Borough					
Project Description	Responsible Entity	Potential Funding Sources	Preliminary Project Costs	Priority	Project Status
Acquire and demolish structure within the Susquehanna River's flood hazard area. (99 West Third Street)	Borough Council members, zoning officer, and mitigation committee members		$1,818,001		
Acquire and demolish structure within the Susquehanna River's flood hazard area. (113 West Third Street)	Borough Council members, zoning officer, and mitigation committee members		$376,900		
Acquire and demolish structure within the Susquehanna River's flood hazard area. (115 West Third Street)	Borough Council members, zoning officer, and mitigation committee members		$9,640,001		
Acquire and demolish structure within the Susquehanna River's flood hazard area. (119 West Third Street)	Borough Council members, zoning officer, and mitigation committee members		$2,745,001		

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-10 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Nescopeck Township

Nescopeck Township										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
556 River Rd.	Acquire and demolish/elevate (4.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	31.6	72.8	$80,000	$36,518	H	
516 River Rd.	Acquire and demolish/elevate (4.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	25.5	113.6	$90,000	$19,140	H	
522 River Rd.	Acquire and demolish/elevate (0.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	8.6	28.8	$80,000	$17,830	H	
546 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	8.0	*	$80,000	N/A	H	IP
762 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.3	*	$100,000	N/A	H	
524 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.0	*	$80,000	N/A	H	
526 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.6	*	$80,000	N/A	M	

512 River Rd.	Acquire and demolish/elevate (4.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.3	0.9	$63,000	$16,850	M	
518 River Rd.	Acquire and demolish/elevate (3.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.1	0.4	$70,000	$18,300	M	
552 River Rd.	Acquire and demolish/elevate (3.4 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.2	0.4	$35,000	$14,639	L	
574 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.3	*	$100,000	N/A	L	
600 River Rd.	Acquire and demolish/elevate (2.8 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.2	0.3	$40,000	$16,915	L	
598 River Rd.	Acquire and demolish/elevate (3.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.2	0.3	$40,000	$18,762	L	
701 River Rd.	Acquire and demolish/elevate (6.7 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.2	0.2	$80,000	$59,500	L	
623 River Rd.	Acquire and demolish/elevate (0.7 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.2	0.2	$40,000	$13,100	L	

612 River Rd.	Acquire and demolish/elevate (4.0 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	0.3	$70,000	$16,500	L	
570 River Rd.	Acquire and demolish/elevate (2.7 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	0.3	$80,000	$13,300	L	
532 River Rd.	Acquire and demolish/elevate (2.6 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	0.2	$65,000	$21,500	L	
604 River Rd.	Acquire and demolish/elevate (3.5 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	0.1	$95,000	$90,475	L	
586 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	*	$40,000	N/A	L	
580 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	*	$18,495	N/A	L	
588 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	*	$50,000	N/A	L	
562 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.1	*	$80,000	N/A	L	

506 River Rd.	Acquire and demolish/elevate (0.3 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.0	0.0	$60,000	$21,675	L	
496 River Rd.	Acquire and demolish/elevate (1.1 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.0	0.1	$60,000	$9,900	L	
540 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.0	*	$65,000	N/A	L	
530 River Rd.	Acquire and demolish residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.0	*	$55,000	N/A	L	

Priority – H-High; M-Medium; L-Low
Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

City of Pittston										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
100 Benedict Street	Floodproof (8.0 ft) industrial structure located along Benedict Street and within the Susquehanna River's flood hazard area	City Council, zoning officer and mitigation committee members, property owner	X	Yes	2.03		$285,000		H	
119 Towpath Court	Elevate (6.5 ft) residential structure located along Towpath Court and within the Susquehanna River's flood hazard area	City Council, zoning officer and mitigation committee members, property owner	X	No	1.00		$23,126		H	
111 Towpath Court	Elevate (6.2 ft) residential structure located along Towpath Court and within the Susquehanna River's flood hazard area	City Council, zoning officer and mitigation committee members, property owner	X	Yes	0.80		$23,354		H	
103/105 Towpath Court	Elevate (6.1 ft) residential structure located along Towpath Court and within the Susquehanna River's flood hazard area	City Council, zoning officer and mitigation committee members, property owner	X	Yes	0.77		$34,469		M	
100 Benedict Street	Floodproof (4.5 ft) industrial structure located along Benedict Street and within the Susquehanna River's flood hazard area	City Council, zoning officer and mitigation committee members, property owner	X	Yes	0.40		$156,000		M	
101 Towpath Court	Elevate (1.5 ft) residential structure located along Towpath Court and within the Susquehanna River's flood hazard area	City Council, zoning officer and mitigation committee members, property owner	X	No	0.18		$15,000		L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-11b Wyoming Valley Municipal Hazard Mitigation Plan Projects - City of Pittston 1

City of Pittston 1					
Project Description	Responsible Entity	Potential Funding Sources	Preliminary Project Costs	Priority	Project Status
Elevate and/or floodproof the high priority industrial and residential structures located along Benedict Street and Towpath Court as identified on Table 14 within the Susquehanna River's flood hazard area.	Project Team consisting of City Council and Mitigation Planning Committee Members Point of Contact – City Mayor	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		H	
Maintain readiness of City Emergency Operational Center and agency relationships	City Emergency Management Coordinator, with oversight of Mayor and City Council	Pittston City General Fund		H	
Maintain an updated Emergency Operations Plan	City Emergency Management Coordinator with technical assistance from Luzerne County EMA	Pittston City General Fund		H	
Maintenance of storm sewer system and flap gates throughout the city	City Council, Mitigation Planning Committee and City DPW per-sonnel Point of Contact – City Mayor	Wyoming Valley Levee-Raising Project Mitigation Funds HUD's Community Development Block Grant FEMA's Hazard Mitigation Grant Program		H	
Evaluation of storm drainage needs and sewer system improvements required for problem area of Benedict Street, Towpath Court, KOZ area and New Street	City Council, city engineer and mitigation committee members Point of Contact – City Mayor	Wyoming Valley Levee-Raising Project Mitigation Funds PA Infrastructure Investment Authority (PennVEST) HUD's Community Development Block Grant USACE Section 22 - Water Resources Development Act City General Fund		H	
Elevate and/or floodproof the medium priority industrial and residential structures located along Benedict Street and Towpath Court as identified on Table 14 within the Susque-hanna River's flood hazard area.	Project Team consisting of City Council and Mitigation Planning Committee Members Point of Contact – City Mayor	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		M	
Supplement the City's existing Emergency Operations Plan and Operating Procedures with the new FWRS data	City Emergency Management Coordinator with technical assistance from FEMA/PEMA or planning consultant	Wyoming Valley Levee-Raising Project Mitigation Funds USACE Floodplain Management Services Program and Pittston City General Fund		M	
Post a digital version of the FIRM and a notice of the public availability of guidance documents on the city's website.	City's Web-page designer City Council Members	Pittston City General Fund Monies		M	

Table 6.2-11b Wyoming Valley Municipal Hazard Mitigation Plan Projects - City of Pittston 1

River bank maintenance and stabilization activities along strategic areas of the Susquehanna River.	City Council, Mitigation Planning Committee and City DPW per-sonnel, Luzerne County Conservation District Point of Contact – City Mayor	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		M	
Establishment of a Pittston City Newsletter for hazard mitigation info updates	City Council, City Administrative Staff	Pittston City General Fund Monies		M	
Elevate and/or floodproof the low priority residential structure located along Towpath Court as identified on Table 14 within the Susquehanna River's flood hazard area.	Project Team consisting of City Council and Mitigation Planning Committee Members Point of Contact – City Mayor	Wyoming Valley Levee-Raising Project Mitigation Funds FEMA's Hazard Mitigation Grant Program FEMA's Flood Mitigation Assistance Program		L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

Plains Township										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
Gallagher Dr.	Acquire and demolish/elevate (4.6 ft) residential structure located along Gallagher Drive and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.61	$75,000	$11,266	H	
3 McCullough St.	Acquire and demolish/elevate (6.2 ft) residential structure located along McCullough Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.24	0.48	$75,000	$29,500	H	
306 N. River Rd.	Acquire and demolish/floodproof (4.2 ft) commercial structure located along North River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.14	0.35	$75,000	$21,970	H	
1279 River St.	Acquire and demolish/elevate (5.5 ft) residential structure located along River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.20	0.34	$37,500	$15,877	H	
8 McCullough St.	Acquire and demolish/elevate (4.4 ft) residential structure located along McCullough Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.15	0.34	$62,500	$17,973	H	
329 River Rd.	Acquire and demolish/elevate (2.4 ft) commercial structure located along River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.12	0.29	$352,500	$80,000	H	

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

1 McCullough St.	Acquire and demolish/elevate (3.7 ft) residential structure located along McCullough Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.11	0.19	$62,500	$21,382	H	C
3 Mitchell St.	Acquire and demolish/elevate (1.0 ft) residential structure located along Mitchell Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.21	$93,750	$8,000	H	
371 River Rd.	Acquire and demolish/elevate (4.2 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.15	0.19	$8,200	$3,861	M	
274 River St.	Acquire and demolish/floodproof (3.8 ft) commercial structure located along River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.18	$200,000	$80,000	M	
327 River Rd.	Acquire and demolish/floodproof (2.2 ft) industrial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.09	0.18	$625,000	$21,213	M	
N. River St.	Acquire and demolish/elevate (4.0 ft) residential structure located along North River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.14	0.17	$75,000	$30,063	M	
242R S. River Rd.	Acquire and demolish/elevate (1.2 ft) residential structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.10	0.17	$125,000	$36,085	M	C

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

301 N. River St.	Acquire and demolish/elevate (3.3 ft) commercial structure located along North River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.12	0.15	$50,000	$15,333	M	
329 River Rd.	Acquire and demolish/elevate (3.5 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.12	0.13	$352,500	$172,175	M	
301 S. River St.	Acquire and demolish/elevate (3.3 ft) commercial structure located along S. River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.15	0.06	$12,500	$15,333	M	
4 McCullough St.	Acquire and demolish/elevate (2.0 ft) residential structure located along McCullough Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.14	$62,500	$15,436	M	
16 Mitchell St.	Acquire and demolish/elevate (1.4 ft) residential structure located along Mitchell Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.09	$62,500	$16,184	L	
325 River Rd.	Acquire and demolish/elevate (1.1 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	0.09	$2,500,000	$625,000	L	

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

McCullough St.	Acquire and demolish/elevate (1.4 ft) residential structure located along McCullough Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.05	$87,500	$38,284	L	
1350 River Rd.	Acquire and demolish/elevate (1.0 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	0.04	$12,500	$3,553	L	
1316 River Rd.	Acquire and demolish/floodproof (1.0 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	0.04	$250,000	$70,000	L	
333 River Rd.	Acquire and demolish/elevate (1.1 ft) commercial structure located along River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.05	0.01	$326,513	$80,000	L	
Courtright St.	Acquire and demolish commercial structure located along Courtright Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.05	N/A	$444,000	N/A	L	
Reese St.	Acquire and demolish/elevate (0.7 ft) residential structure located along Reese Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	0.02	$75,000	$37,978	L	
18 Roberts St.	Acquire and demolish residential structure located along Roberts Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	N/A	$37,500	N/A	L	

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

163 Courtright St.	Acquire and demolish residential structure located along Courtright Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	N/A	$81,250	N/A	L	
1158 N. River Rd.	Acquire and demolish residential structure located along North River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.05	N/A	$25,000	N/A	L	
N. River Rd. (office bld)	Acquire and demolish commercial structure located along River North Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.05	N/A	$1,562,500	N/A	L	
2 Roberts St.	Acquire and demolish residential structure located along Roberts Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.05	N/A	$62,500	N/A	L	
6 Mitchell St.	Acquire and demolish residential structure located along Mitchell Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	N/A	$75,000	N/A	L	
S. River Rd.	Acquire and demolish residential structure located along S. River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	N/A	$25,000	N/A	L	
20 Roberts St.	Acquire and demolish residential structure located along Roberts Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	N/A	$68,750	N/A	L	

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

69 Courtright St.	Acquire and demolish residential structure located along Courtright Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	N/A	$62,500	N/A	L	
67 Courtright St.	Acquire and demolish residential structure located along Courtright Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	N/A	$87,500	N/A	L	
274R River St.	Acquire and demolish commercial structure located along River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	N/A	$287,500	N/A	L	
N. River Rd.	Acquire and demolish residential structure located along North River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	N/A	$87,500	N/A	L	
242 N. River Rd.	Acquire and demolish residential structure located along North River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.03	N/A	$62,500	N/A	L	
220 N. River St.	Acquire and demolish commercial structure located along North River Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.03	N/A	$1,875,000	N/A	L	
Courtright St.	Acquire and demolish residential structure located along Courtright Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	N/A	$250,000	N/A	L	

Table 6.2-12 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plains Township

S. River Rd.	Acquire and demolish residential structure located along South River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	N/A	$150,000	N/A	L	
237 N. River Rd.	Acquire and demolish residential structure located along North River Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	N/A	$93,750	N/A	L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

Plymouth Township										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
64 W. Poplar St.	Acquire and demolish/elevate (5.8 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.29	0.62	$58,336	$23,780	H	
9 Mill St./Route 29	Acquire and demolish/elevate (7.9 ft) residential structure located along Mill Street/Route 29 and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.31	0.83	$104,329	$36,872	H	
23 Allen St.	Acquire and demolish/elevate (7.3 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.43	0.90	$63,200	$28,316	H	IP
25/27 Allen St.	Acquire and demolish/elevate (6.8 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.36	0.73	$65,664	$29,396	H	
56 W. Poplar St.	Acquire and demolish/elevate (6.2 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.30	0.62	$63,712	$27,525	H	
46 W. Poplar St.	Acquire and demolish/elevate (7.5 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.53	1.09	$41,843	$17,090	H	IP

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

44 W. Poplar St.	Acquire and demolish/elevate (7.6 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.55	1.24	$53,984	$22,514	H	IP
40 W. Poplar St.	Acquire and demolish/elevate (7.7 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.54	1.17	$57,024	$24,615	H	
39 W. Poplar St.	Acquire and demolish/elevate (5.4 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.29	0.57	$39,278	$13,959	H	
46 Elkton St.	Acquire and demolish/elevate (6.8 ft) residential structure located along Elkton Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.42	0.96	$54,048	$21,918	H	
2 Houseman St.	Acquire and demolish/elevate (9.3 ft) residential structure located along Houseman Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	1.05	2.24	$55,424	$25,240	H	IP
56-58 E. Poplar St.	Acquire and demolish/elevate (6.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.27	0.51	$79,712	$37,880	H	IP
68 E. Poplar St.	Acquire and demolish/elevate (6.0 ft) commercial structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.27	0.52	$71,040	$31,900	H	

59 Allen St.	Acquire and demolish/elevate (6.1 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.34	0.76	$55,552	$22,303	H	
51-53 Allen St.	Acquire and demolish/elevate (8.5 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.55	1.04	$77,056	$39,226	H	
45-47 Allen St.	Acquire and demolish/elevate (7.5 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.44	0.89	$67,040	$31,054	H	
56 Allen St.	Acquire and demolish/elevate (9.5 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.08	3.39	$59,249	$18,423	H	
64 Allen St.	Acquire and demolish/elevate (7.1 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.40	0.84	$64,160	$28,739	H	
86 Allen St.	Acquire and demolish/elevate (6.5 ft) commercial structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.23	0.62	$97,714	$32,315	H	
88 Allen St.	Acquire and demolish/elevate (7.7 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.54	1.14	$60,896	$27,189	H	

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

92 Allen St.	Acquire and demolish/elevate (7.4 ft) residential structure located along Allen Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.59	1.43	$48,640	$18,840	H	
318 E. Canal St.	Acquire and demolish/elevate (7.6 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.60	1.40	$50,144	$19,970	H	IP
320 E. Canal St.	Acquire and demolish/elevate (5.3 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.31	0.59	$49,376	$17,878	H	
322 E. Canal St.	Acquire and demolish/elevate (5.3 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.28	0.52	$53,600	$20,449	H	
330 E. Canal St.	Acquire and demolish/elevate (4.8 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.29	0.57	$45,952	$15,490	H	
380 E. Canal St.	Acquire and demolish/elevate (6.3 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.22	0.60	$91,442	$29,488	H	
Flats Rd.	Acquire and demolish/elevate (11.5 ft) residential structure located along Flats Road and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.57	3.70	$116,971	$49,475	H	

1008 W. Main St.	Acquire and demolish/elevate (5.8 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.30	0.65	$56,000	$22,331	H	
1008 1/2 W. Main St.	Acquire and demolish/elevate (6.6 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.47	1.21	$44,704	$15,787	H	IP
1026 W. Main St.	Acquire and demolish/elevate (7.5 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.47	1.01	$58,304	$25,287	H	C
1034 W. Main St.	Acquire and demolish/elevate (6.7 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.37	0.79	$58,176	$24,486	H	IP
1038 W. Main St.	Acquire and demolish/elevate (6.4 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.37	0.84	$53,280	$21,112	H	
47 E. Poplar St.	Acquire and demolish/elevate (6.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.33	0.67	$65,728	$29,009	H	
51 E. Poplar St.	Acquire and demolish/elevate (8.3 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.79	1.80	$52,160	$21,909	H	
55 E. Poplar St.	Acquire and demolish/elevate (7.9 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.58	1.21	$61,216	$27,595	H	IP

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

61 E. Poplar St.	Acquire and demolish/elevate (6.9 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.45	1.01	$55,296	$22,805	H	
18 Garden Drive	Acquire and demolish/elevate (7.7 ft) commercial structure located along Garden Drive and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.69	1.57	$53,376	$22,190	H	
200 Canal St.	Acquire and demolish/elevate (5.4 ft) residential structure located along Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.32	0.63	$47,584	$16,852	H	
200 Canal St.	Acquire and demolish/elevate (9.4 ft) residential structure located along Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.22	2.57	$35,963	$16,558	H	
200 Canal St.	Acquire and demolish/elevate (13.0 ft) residential structure located along Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.81	2.56	$84,721	$59,947	H	
200 Canal St.	Acquire and demolish/elevate (7.2 ft) residential structure located along Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.48	0.94	$43,112	$17,890	H	
26 W. Poplar St.	Acquire and demolish/elevate (6.5 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.30	0.61	$68,832	$31,092	H	IP

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

17 W. Poplar St.	Acquire and demolish/elevate (6.5 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.32	0.67	$64,640	$28,423	H	
24 W. Poplar St.	Acquire and demolish/elevate (6.6 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.32	0.64	$67,616	$30,430	H	
63 E. Poplar St.	Acquire and demolish/elevate (6.6 ft) commercial structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.38	0.82	$59,936	$25,522	H	
67 E. Poplar St.	Acquire and demolish/elevate (7.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.45	0.92	$64,544	$29,302	H	IP
1094 W. Main St.	Acquire and demolish/elevate (6.4 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.29	0.58	$68,320	$30,653	H	IP
1092 W. Main St.	Acquire and demolish/elevate (7.2 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.34	0.68	$71,680	$33,754	H	IP
1056 W. Main St.	Acquire and demolish/elevate (5.7 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.32	0.73	$51,040	$19,182	H	

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

W. Main St.	Acquire and demolish/elevate (10.2 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	1.06	2.06	$66,208	$34,223	H	
60 W. Poplar St.	Acquire and demolish/elevate (5.1 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.25	0.46	$54,848	$21,045	M	
8/10 E. Poplar St.	Acquire and demolish/elevate (5.8 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.18	0.32	$93,824	$45,794	M	
45 W. Poplar St.	Acquire and demolish/elevate (3.3 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.19	0.31	$47,808	$15,620	M	
46 E. Poplar St.	Acquire and demolish/elevate (5.2 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.22	0.37	$66,240	$28,033	M	
98-100 E. Poplar St.	Acquire and demolish/elevate (5.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.27	0.48	$58,304	$23,401	M	
106 E. Poplar St.	Acquire and demolish/elevate (5.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.25	0.66	$62,630	$17,009	M	

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

310 E. Canal St.	Acquire and demolish/elevate (7.8 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.28	0.47	$118,144	$65,480	M	
214 E. Canal St.	Acquire and demolish/elevate (6.8 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.25	0.45	$92,384	$46,597	M	
326 E. Canal St.	Acquire and demolish/elevate (5.2 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.24	0.41	$60,256	$24,405	M	
328 E. Canal St.	Acquire and demolish/elevate (5.5 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.26	0.45	$60,256	$24,688	M	
R328 E. Canal St.	Acquire and demolish/elevate (6.0 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.25	0.49	$36,116	$15,800	M	
5 E. Poplar St.	Acquire and demolish/elevate (6.6 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.16	0.41	$132,553	$46,974	M	IP
7 E. Poplar St.	Acquire and demolish/elevate (4.8 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.24	0.41	$54,016	$20,303	M	IP

35 E. Poplar St.	Acquire and demolish/elevate (4.8 ft) commercial structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.20	0.32	$66,048	$27,485	M	
30 W. Poplar St.	Acquire and demolish/elevate (5.1 ft) commercial structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.23	0.40	$59,328	$23,750	M	
R13 Poplar St.	Acquire and demolish/elevate (4.2 ft) commercial structure located along Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.24	0.37	$42,113	$15,274	M	
1084/1086 W. Main St.	Acquire and demolish/elevate (6.4 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.24	0.45	$81,952	$39,301	M	
84 W. Poplar St.	Acquire and demolish/elevate (3.6 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.16	$76,224	$31,977	L	
72 W. Poplar St.	Acquire and demolish/elevate (5.5 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.19	0.29	$81,216	$37,543	L	
59 W. Poplar St.	Acquire and demolish/elevate (3.1 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.16	0.25	$51,968	$17,807	L	

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

51 W. Poplar St.	Acquire and demolish/elevate (0.4 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.09	0.03	$58,176	$20,281	L	
49 W. Poplar St.	Acquire and demolish/elevate (0.8 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.10	0.07	$53,088	$17,578	L	
83 E. Poplar St.	Acquire and demolish/elevate (4.8 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.17	0.26	$75,936	$33,387	L	IP
87-89 E. Poplar St.	Acquire and demolish/elevate (0.7 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.04	$69,568	$26,333	L	
101 E. Poplar St.	Acquire and demolish/elevate (0.1 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.03	$61,344	$21,964	L	
121 E. Poplar St.	Acquire and demolish/elevate (0.5 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.03	$61,376	$21,981	L	
Corner of Ferry St. and Route 11	Acquire and demolish/elevate (2.1 ft) residential structure located on Ferry Street and Route 11 and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.06	0.04	$109,127	$56,365	L	

Ferry St.	Acquire and demolish/elevate (2.9 ft) residential structure located along Ferry Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.03	0.03	$146,276	$118,043	L	
324-324 1/2 E. Canal St.	Acquire and demolish/elevate (5.1 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.18	0.29	$76,480	$34,109	L	
342 E. Canal St.	Acquire and demolish/elevate (2.6 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.15	$61,024	$22,371	L	
350 E. Canal St.	Acquire and demolish/elevate (3.7 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.18	0.29	$56,480	$20,834	L	
360 E. Canal St.	Acquire and demolish/elevate (4.9 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.18	0.27	$75,584	$33,307	L	
390 E. Canal St.	Acquire and demolish/elevate (5.9 ft) residential structure located along East Canal Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.15	$70,286	$49,226	L	
1130 W. Main St.	Acquire and demolish/elevate (3.6 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.19	$72,864	$30,066	L	
1126 W. Main St.	Acquire and demolish/elevate (2.0 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.12	$48,296	$17,816	L	

1116 W. Main St.	Acquire and demolish/elevate (3.1 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.16	0.25	$53,248	$18,520	L	
15 Mill St./Route 29	Township supervisors, zoning officer and mitigation committee members, property owner	Township supervisors, zoning officer and mitigation committee members, property owner		No					L	IP
14 Mill St./Route 29	Acquire and demolish/elevate (0.3 ft) residential structure located along Mill Street/Route 29 and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.03	$57,056	$19,686	L	
9 E. Poplar St.	Acquire and demolish/elevate (5.3 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	Yes	0.14	0.32	$102,712	$32,874	L	IP
E. Poplar St.	Acquire and demolish/elevate (1.0 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.02	0.01	$290,529	$93,857	L	
R21 E. Poplar St.	Acquire and demolish/elevate (0.2 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.04	0.00	$69,011	$45,167	L	
31 E. Poplar St.	Acquire and demolish/elevate (3.0 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.11	0.20	$76,938	$20,626	L	
33 E. Poplar St.	Acquire and demolish/elevate (2.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.09	0.14	$86,150	$23,355	L	

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

R33 E. Poplar St.	Acquire and demolish/elevate (0.4 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.09	0.04	$53,280	$17,680	L	
38 E. Poplar St.	Acquire and demolish/elevate (1.1 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.08	0.06	$67,840	$25,415	L	
42 E. Poplar St.	Acquire and demolish/elevate (3.0 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.17	$65,760	$25,383	L	
39 E. Poplar St.	Acquire and demolish/elevate (4.8 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.07	0.14	$188,266	$65,589	L	
37 E. Poplar St.	Acquire and demolish/elevate (5.1 ft) residential structure located along East Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.17	0.25	$84,896	$39,191	L	
96 W. Poplar St.	Acquire and demolish/elevate (0.9 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.09	0.06	$61,440	$22,015	L	
33 W. Poplar St.	Acquire and demolish/elevate (3.6 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.16	0.24	$59,040	$22,204	L	

Table 6.2-13 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Plymouth Township

13 W. Poplar St.	Acquire and demolish/elevate (4.0 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.10	0.13	$104,320	$48,748	L	
14 W. Poplar St.	Acquire and demolish/elevate (4.6 ft) residential structure located along West Poplar Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.12	0.24	$104,231	$32,575	L	
2-4 Mill St.	Acquire and demolish/elevate (2.3 ft) residential structure located along Mill Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.11	0.12	$68,768	$26,251	L	
6-8 Mill St.	Acquire and demolish/elevate (2.2 ft) residential structure located along Mill Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.11	0.13	$63,200	$23,153	L	
1100 W. Main St.	Acquire and demolish/elevate (3.4 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.14	0.20	$64,672	$25,198	L	
W. Main St.	Acquire and demolish/elevate (5.9 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.16	$65,084	$44,134	L	
1089 W. Main St.	Acquire and demolish/elevate (5.8 ft) residential structure located along West Main Street and within the Susquehanna River's flood hazard area	Township supervisors, zoning officer and mitigation committee members, property owner	X	No	0.13	0.16	$63,860	$42,871	L	

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-14 Wyoming Valley Municipal Hazard Mitigation Plan Projects - Shickskinny Borough

Shickshinny Borough										
Address	Project Description	Responsible Entity	Hazard Mitigation Plan Project	Repetitive Loss Property	Benefit-Cost Ratio		Approximate Project Costs		Priority	Project Status
					Acquisition	Elevation	Acquisition	Elevation		
28 S. Canal Street	Elevate structure above BFE (523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
42 Susquehanna Ave	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
30 Susquehanna Ave	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
34 Susquehanna Ave	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
16 Susquehanna Ave	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
22-24 Susquehanna Ave	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
18-20 Susquehanna Ave	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
150-152.5 Susquehanna Ave	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
10 Susquehanna Ave	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
70 Susquehanna Ave.	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
27 E. Union St	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP

61 McClintock St	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
11 McClintock St	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
14 McClintock St	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
6 N. Susquehanna Ave	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
21 E. Union St	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
46 S. Main Street	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
158 Susquehanna Ave.	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
67 N. Canal St.	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
69 N. Canal St.	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
15 McClintock St	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
170 Susquehanna Ave	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
166-168 Susquehanna Ave	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						

49-51 McClintock	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
35 S. Main Street	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
53 N. Canal Street	Elevate structure above BFE (523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
7 McClintock Street,	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
172 Susquehanna Ave	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
73 N. Main Street	Elevate structure above BFE (524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
122 Susquehanna Ave	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
128 Susquehanna Ave	Elevate structure above BFE (524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
18 E. Union Street	Elevate structure above BFE (523.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
51 Canal Street	Elevate structure above BFE (523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
22 S. Canal Street	Acquire Structure and demolish. (BFE, 523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
70 Susquehanna Ave1	Acquire Structure and demolish. (BFE, 524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						

34-36 Canal Street	Acquire Structure and demolish. (BFE, 523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
140 Susquehanna Ave.	Relocate structure to appropriate area. (BFE, 524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
26 S. Canal Street	Acquire Structure and demolish. (BFE, 523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
174 Susquehanna Ave	Acquire Structure and demolish. (BFE, 524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
180 Susquehanna Ave	Acquire Structure and demolish. (BFE, 524.5).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
49-51 McClintock1	Acquire Structure and demolish. (BFE, 524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
66 Susquehanna Ave.	Relocate structure to appropriate area. (BFE, 524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
53 N. Canal Street1	Acquire Structure and demolish. (BFE, 523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
35-37 Main Street	Relocate structure to appropriate area. (BFE, 524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
73 N. Main Street1	Acquire Structure and demolish. (BFE, 524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
31 N. Canal Street	Acquire Structure and demolish. (BFE, 524).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						
42 S. Canal Street	Acquire Structure and demolish. (BFE, 523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP

38 S. Canal Street	Acquire Structure and demolish. (BFE, 523).	Borough Council, Zoning Officer, Mitigation Committee, Property Owner	X	No						IP
1 S. Main Street	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
15 East Union	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
71 N. Canal St.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
27 N Canal St.	Acquire Structure and demolish.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
41 N. Canal St.	Acquire Structure and demolish.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
76 N Susquehanna Ave.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
158 N. Canal St.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
156 N. Canal St.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
151 N. Canal St.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
160 N. Canal St.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
74 Susquehanna Ave.	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						

80 Oak St.	Acquire Structure and demolish.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
18 N. Main St.	Acquire Structure and demolish.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
43 N. Canal St.	Acquire Structure and demolish.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						
61 McClintock St	Relocate structure to appropriate area.	Borough Council, Zoning Officer, Mitigation Committee, Property Owner		No						

Priority – H-High; M-Medium; L-Low

Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed

Table 6.2-15 Wyoming Valley Municipal Hazard Mitigation Plan Projects - West Pittson Borough

West Pittston Borough					
Project Description	Responsible Entity	Potential Funding Sources	Preliminary Project Costs	Priority	Project Status
When the building codes are from the International Code Series, ensure that the current floodplain development regulations remain properly enforced.	Borough's building official	Borough operating budget		H	
Continue to support the Wyoming Valley Sewer Authority in their project to elevate pumps at the pumping station located in southwest West Pittston along the river.	Borough	Borough operating budget		H	
Provide a structural solution to stormwater ponding and sewer back-ups reported in an area in West Pittston that had been subject to land subsidence.	Borough Council	• FEMA's Pre-Disaster Mitigation Program • FEMA's Hazard Mitigation Grant Program • FEMA's Flood Mitigation Assistance Program • PA's Infrastructure Investment Authority (PENNVEST)		H	
Ensure borough council will adopt this hazard mitigation plan.	Members of the Hazard Mitigation Planning Committee including Borough Council Representatives and the Borough Manager	Borough operating budget		H	
West Pittston Borough should plan to join the CRS program	The Borough Manager in coordination with community and planning consultants.	Borough operating budget		H	
Create a Hazard Mitigation Review Committee for West Pittston Borough to perform annual reviews of the implementation of this plan.	The Borough Manager and Borough Council members of the Hazard Mitigation Planning committee, citizens, and township employees.	Borough operating budget		H	
Create a Hazard Mitigation Review Committee for West Pittston Borough to perform annual reviews of the implementation of this plan.	Team consisting of Borough Manager, members of the Hazard Mitigation Planning Committee, citizens, and township employees.	Borough operating budget		H	
Modify current C-1 Conservation District regulations to prohibit new development within the district.	West Pittston Borough Council, West Pittston Borough Attorney	Borough operating budget		M	
Offer a cost-sharing program for residents affected by sewage back-up damage. Publicize use of backflow valves within the community to residents subject to sewer backups and associated damages.	The Borough Manager, Borough employees, Hazard Mitigation Planning Committee, and volunteers.	• Borough operating budget • Creation of separate borough funding source		M	
Include information in Borough newsletter on availability of flood insurance and basement back-up insurance.	The Borough Manager, Borough employees, Hazard Mitigation Planning Committee, volunteers.	Borough operating budget		M	
Inform residents of availability of mine subsidence insurance.	The Borough Manager, Borough employees, Hazard Mitigation Planning Committee, volunteers.	Borough operating budget		M	

Table 6.2-15 Wyoming Valley Municipal Hazard Mitigation Plan Projects - West Pittson Borough

Fund purchase of a portable generator for use in powering heating systems at shelter locations.	The Borough Emergency Manager and the Borough Manager	• Emergency Operations Center Grants • Borough operating budget		M	
Request funding for additional emergency services response equipment	The Borough Emergency Manager and the Borough Manager	Emergency Operations Center and Interoperable Communications Grants		M	
Use borough's existing Emergency Response Plan along with information provided by current borough officials to create a written document describing emergency flooding response.	The Borough Emergency Manager, the Borough Manager, representatives of the Borough Council and the Hazard Mitigation Planning Committee	• Emergency Management Performance Grants • Borough operating budget		M	
Formalize a procedure for regular drainage maintenance and implement it.	Borough council and the street commissioner.	Borough operating budget		M	
Advertise the availability of FIRMS at the Borough Building and Borough Public Works Garage	The Borough Manger, Borough employees, representatives of the Hazard Mitigation Planning Committee, and volunteers.	Borough operating budget		M	
Create a Mitigation library with educational resources for residents and business owners	A Hazard Mitigation Planning Committee Member and staff from the West Pittston Library.	Borough operating budget		M	
Produce a public information mailing about flood mitigation and flood warning and response activities and distribute it annually.	The Borough Manger, Borough employees, the Hazard Mitigation Planning Committee, and volunteers.	Borough operating budget		M	
Work with Eagle Scouts to create Environmental Education programs to help teach residents about flooding and about some possible mitigation measures.	Eagle Scouts and the Borough Manager	Borough operating budget		L	

Priority – H-High; M-Medium; L-Low
Project Status – C-Completed; IP-In Progress; D-Delayed; M-Modified; R-Removed