

5.0 HAZARD MITIGATION STRATEGY

5.1 IDENTIFICATION AND ANALYSIS OF HAZARD MITIGATION MEASURES

5.1.1 Preventive Measures

Preventive measures are designed to minimize the potential development of new natural hazard problems and are intended to keep existing natural hazard problems from becoming worse. They ensure that future land development projects do not increase local and/or regional natural hazard damage potentials. Preventive measures are usually administered by local building, zoning, planning, and/or code enforcement officials and typically include the following:

- land use planning/zoning efforts;
- subdivision and land development ordinances;
- building codes;
- floodplain development regulations;
- stormwater management;
- operations and maintenance (O&M) procedures;
- subsurface investigation requirements; and
- public education programs.

Implementation of preventive measures of this nature will work towards the fulfillment of the following project-planning goals as identified by the Hazard Mitigation Planning Team.

- Ensure that local building codes/ordinances are consistent with FEMA and PA DCED guidelines and are properly enforced.
- Minimize future damage due to flooding of the Susquehanna River and its tributaries.
- Regulate construction/development in the County to prevent increases in runoff and subsequent increases in floodflows.
- Ensure that new construction is resistant to natural hazards.
- Reduce threats related to landslides.

- Reduce impacts related to flash flooding and stormwater problems.

5.1.1.1 Land Use Planning/Zoning Efforts

Comprehensive plans and other similar land use plans define how and where a community, region, or area should be developed. Similarly, zoning ordinances regulate development by dividing a community or region into zones or districts and establishing specific development criteria for each zone or district. As such, comprehensive/land use plans and zoning ordinances can be developed to include provisions for the area's known natural hazards. For example, a comprehensive/land use plan can include an assessment and associated mapping of the respective area's vulnerability to location-specific hazards (e.g., dam failure, flooding, and landslides,) and make appropriate recommendations for the planned use of these known hazard areas. Similarly, a zoning ordinance can include separate zones or districts with appropriate development criteria for these known hazard areas. As such, the Hazard Mitigation Planning Team identified the following Preventive Measure (PM) Hazard Mitigation Measures to be implemented within the County.

PM-1: Develop a new Comprehensive Plan or amend an existing Comprehensive Plan to include an assessment and associated mapping of the municipality's vulnerability to location-specific hazards and appropriate recommendations for the use of these hazard areas.

PM-2: Develop a new Zoning Ordinance or revise an existing Zoning Ordinance to include separate zones or districts with appropriate development criteria for known hazard areas.

PM-3: Make available for municipal use the digital natural hazard mapping files that were developed as part of this hazard vulnerability assessment and mitigation planning effort.

5.1.1.2 Subdivision and Land Development Ordinances

Subdivision and land development ordinances regulate how land can be subdivided into individual lots and establish certain standards/criteria for the location

and construction of buildings and associated infrastructure (i.e., roads, sidewalks, utility lines, stormwater management facilities, etc.). As such, local subdivision and land development ordinances can be written to include municipality-specific, hazard mitigation-related development criteria for the location and construction of buildings and other infrastructure in known hazard areas in an effort to avoid future damages and minimize existing problems. Examples of some hazard mitigation-related development criteria include watershed-specific stormwater management regulations (see PM-7), land use-specific erosion and sedimentation control requirements (see NR-6), hazard-specific building and infrastructure location limitations (see PM-6), and a requirement to incorporate various pre-defined, municipality-specific hazard mitigation/prevention measures into all development plans. Along these same lines, the mandatory use of conservation subdivision design principles could also be employed to minimize/mitigate the potential impacts of natural hazards. Conservation subdivision design principles involve clustering homes/development in a proposed subdivision to avoid known hazard areas (i.e., steep slopes, floodplains, etc.) and environmentally sensitive resources (i.e., wetlands, critical wildlife habitats, etc.), thereby developing the most appropriate land while permanently establishing a network of protected open spaces. As such, the Hazard Mitigation Planning Team identified the following Preventive Measure Hazard Mitigation Measures to be implemented within the County.

PM-4: Develop a new Subdivision and Land Development Ordinance or revise an existing Subdivision and Land Development Ordinance to include municipality-specific, hazard mitigation-related development criteria and/or provisions for the mandatory use of conservation subdivision design principles in order to regulate the location and construction of buildings and other infrastructure in known hazard areas.

5.1.1.3 Building Codes

Building codes regulate the construction, renovation, and alteration of new and existing structures by establishing minimum building standards and providing for routine inspections by a certified building code inspector. As such, local building codes can

include specific standards for hazard-resistant construction. Examples of some hazard mitigation-related building standards include requiring the use of fireproof/resistant building materials, specifying particular construction practices to promote wind resistance, specifying the use of waterproof/resistant building materials in known flood hazard areas, and requiring certain foundation and structure anchoring specifications in known floodwater velocity areas. In Pennsylvania, a state law was passed in 1999 establishing a statewide Uniform Construction Code (UCC). The law establishes the BOCA National Building Code (and its successor codes) as the minimum standard for the construction, alteration, and repair of commercial and residential structures throughout the Commonwealth. While the UCC includes some general hazard mitigation-related building standards, some hazard-prone municipalities may find it appropriate to adopt more stringent building standards to ensure hazard resistant construction. As such, the Hazard Mitigation Planning Team recognized the future implementation of the UCC and the potential local adoption of more stringent standards for hazard resistant construction as a Preventive Measure Hazard Mitigation Measure for the County.

PM-5: Implement the minimum building standards of the Pennsylvania Uniform Construction Code and/or consider the potential adoption of more stringent building standards to ensure hazard-resistant construction.

5.1.1.4 Floodplain Development Regulations

Floodplain development regulations establish regulatory criteria for the construction and/or alteration of buildings and other development located in the 100-year floodplain in an effort to minimize potential flood-related damages and ensure that new development does not exacerbate local flood hazards. Municipalities that participate in the NFIP must adopt and enforce floodplain development regulations that meet or exceed minimum NFIP standards and requirements. NFIP floodplain development regulations prohibit obstruction of the regulatory floodway and require new buildings being constructed in the 100-year floodplain to be protected from damage by

the base flood (i.e., 100-year or 1% annual chance flood). NFIP floodplain development regulations are intended to prevent loss of life and property as well as economic and social hardships that result from flooding. In addition to these minimum federal requirements, the Pennsylvania Floodplain Management Act (Act 166 of 1978) established more restrictive floodplain development regulations. Act 166 discourages the construction of hospitals, nursing homes, jails, and mobile home parks in the floodplain and prohibits development that “may endanger human life” in the regulatory floodway. Such development includes that which would require the production or storage of hazardous and radioactive materials. Floodplain development regulations can be incorporated into a municipality’s existing codes/ordinances or can be adopted as a separate, stand-alone ordinance. As such, the Hazard Mitigation Planning Team identified the following Preventive Measure Hazard Mitigation Measure to be implemented within the County.

PM-6: Ensure municipal compliance with NFIP and PA Act 166 floodplain development regulations and/or encourage more restrictive requirements, as appropriate.

5.1.1.5 Stormwater Management

Effective management of stormwater runoff from developed areas can go a long way in minimizing local and regional drainage problems and associated flooding hazards. In addition, stormwater management practices that promote infiltration work towards the minimization of drought impacts by contributing to the base flow of local streams and watercourses. Stormwater management regulations, which are usually incorporated into a municipality’s subdivision and land development ordinance, require developers to construct on-site stormwater management facilities that will effectively collect, convey, and store surface water runoff. Within Clinton County, the Conservation District (CCCD) is very active in the completion of watershed-specific stormwater management plans in accordance with Pennsylvania’s Stormwater Management Act (Act 167 of 1968). These watershed-specific Act 167 Stormwater Management Plans

establish stormwater management criteria based on the hydrologic and hydraulic characteristics of the subject watershed. Within six months of County adoption of an Act 167 Stormwater Management Plan, the respective watershed municipalities must adopt and enforce the stormwater management ordinance included in the Plan. As such, the Hazard Mitigation Planning Team recognized the CCCD's active participation in the Act 167 Stormwater Management Planning Program and identified municipal compliance with their respective watershed stormwater management plans as a Preventive Measure Hazard Mitigation Measure for the County.

PM-7: Ensure municipal compliance with local watershed-specific Act 167 Stormwater Management Plans and Ordinances.

5.1.1.6 Operations and Maintenance Procedures

Effective implementation of appropriate O&M procedures at the Ohi, Keller, and Castenea Dams are fundamental to the prevention of a potential failure. Routine inspections and regular maintenance (standard O&M procedures for a municipal water supply dam) are the most critical measures that can be taken to prevent a dam failure. As such, the Hazard Mitigation Planning Team recognized the City of Lock Haven's existing O&M procedures at the above listed dams and identified the continued implementation of these O&M procedures as a Preventive Measure Hazard Mitigation Measure for the County.

PM-8: Ensure continued implementation of appropriate operations and maintenance procedures (routine inspections and regular maintenance) at the Ohi, Keller, and Castenea Dams in an effort to prevent a potential failure.

5.1.2 Emergency Services

Emergency services measures protect people during and immediately following a natural hazard event. Counties and municipalities typically develop an Emergency Operations Plan (EOP) to formally document their emergency preparedness and

response planning. The local EOP identifies standard operating procedures for various emergency management personnel and establishes the location and operating conditions of the emergency operations center (EOC). As such, adopting and implementing the EOP is a critical first step in providing local emergency services measures in response to a natural hazard event.

Emergency services measures can be implemented at the local, county, state, and/or Federal level, depending on the severity of the hazard event, and typically include the following:

- hazard warning;
- hazard response;
- critical facilities protection;
- health and safety maintenance; and
- post-disaster recovery and mitigation.

Implementation of these emergency services measures will work towards the fulfillment of the following project-planning goals as identified by the Hazard Mitigation Planning Team.

- Provide residents with adequate warning of potential floods and other meteorological events.
- Ensure that emergency response services and critical facilities functions are not interrupted by natural hazards.
- Provide safe and efficient evacuation routes during floods and other natural hazards.
- Provide adequate shelters during hazard events.
- Ensure that local officials are well trained regarding natural hazards and appropriate prevention and mitigation activities.
- Provide adequate communication systems for emergency management agencies and emergency response units.
- Reduce impacts from severe storms and/or improve response procedures.
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5.1.2.1 Hazard Warning

The first step in dealing with a natural hazard is to know that one is coming. Early warning of a pending hazard enables residents and business owners to secure their property, to the greatest extent possible, and move to safety before putting themselves at risk. This consists of a dual process that incorporates both forecasting and warning procedures. In regard to flooding, forecasting, and warning services are provided for Clinton County by the NWS Mid-Atlantic River Forecast Center in State College, Pennsylvania via the Susquehanna River Basin Flood Forecast and Warning System. The Susquehanna River Basin Flood Forecast and Warning System uses a network of gauges that measure streamflow and rainfall to provide data for forecasting river levels and issuing accurate early warnings. Flood forecasts useful to Clinton County are issued from the U.S.G.S. stream gauges on the West Branch of the Susquehanna River at Renovo and Lock Haven and at Beech Creek Station on Bald Eagle Creek.

Hazard warning programs generally have two levels of notification:

- hazard watch – conditions are right for a suspected hazard, and
- hazard warning – a specific hazard has started or is expected to occur.

Under certain conditions, the NWS may issue a “flash flood watch”. This means the amount of rain expected may cause rapid increases in local stream flows and/or localized ponding. However, these events are so localized and so rapid that a “flash flood warning” is seldom issued. Warnings from the NWS are relayed to municipalities by County Emergency Management Agencies (EMA), who monitor weather radio and broadcast networks. County EMAs are alerted by PEMA.

After the Flood Forecast and Warning System alerts the local emergency management coordinator that a flood is coming, the next step is to notify the other local

emergency management personnel and the public that a flood is imminent. The earlier and more accurate the warning system, the greater the number of people who can implement protection measures. A flood or other natural hazard warning may be disseminated in a variety of ways, including the following:

- sirens;
- NOAA Weather Radio;
- commercial or public radio stations;
- commercial or public television stations;
- cable TV emergency news inserts on community bulletin boards;
- mobile public address systems;
- telephone trees;
- Internet weather related sites;
- municipal/county/state Internet sites; and
- door-to-door contact.

Multiple or redundant systems are most effective: if people do not hear one warning, they may still get the message from another part of the system.

Given the potentially life-saving importance of hazard warning programs, the Hazard Mitigation Planning Team identified the following Emergency Services (ES) Hazard Mitigation Measures to be implemented within the County.

ES-1: Establish a partnering relationship with the NWS Mid-Atlantic River Forecast Center to enhance the existing Susquehanna River Basin Flood Forecast and Warning System via the Advanced Hydrologic Prediction Services Program.

ES-2: Coordinate with the U.S.G.S., local watershed organizations, and/or the CCCD to increase the number of U.S.G.S. and Integrated Flood Observing and Warning System (IFLOWS) rain and stream gauges in the County as a potential enhancement to the existing Susquehanna River Basin Flood Forecast and Warning System.

ES-3: Increase the number of NOAA Weather Alert radios in public places across the County (i.e., municipal buildings, public libraries, police stations, fire stations, etc.)

- ES-4: Provide alphanumeric pagers to local emergency management coordinators as a means of improving the County's warning dissemination program.**
- ES-5: Conduct routine inspections, regular maintenance, and annual tests on all emergency communications equipment, public address systems, and hazard alert sirens to ensure unhindered operation during an emergency event.**
- ES-6: Ensure that a planned, coordinated, and effective public warning dissemination program exists at the local level.**

5.1.2.2 Hazard Response

After a potential hazard is recognized, the first priority is to alert others through the local warning dissemination program. The second priority is to respond with actions that can prevent or reduce damage and injuries. These actions are typically defined as standard operating procedures in an EOP. An updated EOP ensures that all bases are covered and that the response activities are coordinated and appropriate for the expected hazard. Drills and practice exercises should be conducted on a routine basis to ensure that all emergency management personnel understand their assigned duties and are capable of accomplishing them. The result is a coordinated and appropriate response that demonstrates maximum efficiency in the use of available and otherwise limited resources.

Currently, Clinton County Department of Emergency Services (CCDES) works with municipalities to develop their EOPs. Response actions associated with these plans are documented in a series of emergency response checklists that are to be provided as a part of the local EOP. Each municipality will assume responsibility for updating the plan on a bi-annual basis.

Given the potentially life-saving importance of hazard response activities, the Hazard Mitigation Planning Team identified the following Emergency Services Hazard Mitigation Measures to be implemented within the County.

ES-7: Adopt via resolution, and respond to hazards with actions that are consistent with, the Municipal-level EOP.

ES-8: Conduct hazard response practice drills and emergency management training exercises on an annual basis.

5.1.2.3 Critical Facilities Protection

Protecting critical facilities during a hazard event is a vital part of any emergency services effort. If a critical facility is threatened and/or damaged during a hazard event, workers and resources may be drawn away from protecting and assisting other hazard-prone areas of the community. However, if the vulnerable critical facility was adequately prepared, it would be better able to support (or at least not detract from) the community's hazard response efforts. As such, the Hazard Mitigation Planning Team used the Critical Facilities Inventory and regional GIS data analysis to identify vulnerable critical facilities throughout the County. As reported in Table 2-8, there are 11 critical facilities susceptible to dam failure and/or flooding. From a hazard mitigation perspective, those critical facilities susceptible to dam failure would be protected through implementation of PM-8. Therefore, the Hazard Mitigation Planning Team did not make any additional recommendations for protecting these critical facilities.

There are 11 critical facilities susceptible to dam failure and/or flooding. These are one school (Lamar Township Elementary), one police department (Mill Hall Police Department), four fire stations (Mill Hall VFD, Nittany Valley VFD, Renovo VFD, and Chapman Township VFD), two day care centers (Tomorrow's Hope Day Care Center, Bald Eagle Township, and Family Day Care Center, Mill Hall), and three water and waste water treatment facilities (Beech Creek Municipal Sewer Authority, Pine Creek Municipal Authority, and Jersey Shore Area Joint Water Authority).

ES-9:Encourage those critical facilities that are responsible for emergency response efforts to develop and implement an emergency response plan to mitigate potential flooding impacts.

5.1.2.4 Health and Safety Maintenance

Preventing and/or minimizing potential threats to public health and safety during and immediately following a natural hazard event are critical. After a disaster, many people are more interested in returning to and repairing their damaged properties than in taking personal health and safety precautions. Many flood-related drowning victims put themselves in a dangerous situation by ignoring travel warnings and driving through a flooded area, not realizing that the bridge has washed out. Cars can float in less than two feet of moving water and can be easily swept downstream into deeper waters. As such, drowning in vehicles is the number one cause of flood-related deaths. Interestingly, the second most frequent cause of flood-related deaths is through electrocution by way of floodwaters carrying a live electrical current.

Also of concern is what can be carried by floodwaters from upstream areas. Floodwaters pick up and carry whatever was on the ground upstream. This can include trash, oil, pesticides, and industrial chemicals. During significant flooding events, wastewater treatment plants can be inundated and sewer lines can back up. This can result in untreated sewage mixing with floodwaters, further increasing the public health risk.

Given the potentially life-saving importance of health and safety maintenance activities, the Hazard Mitigation Planning Team identified the following Emergency Services Hazard Mitigation Measures to be implemented within the County.

ES-10:Develop and distribute a public informational through pamphlets and the County's web page related to the potential health and safety implications of various natural hazard events.

5.1.2.5 Post-Disaster Recovery and Mitigation

After a natural disaster occurs, local governments should engage in activities that will better prepare people and property for the next disaster. These activities are implemented during the post-disaster recovery period to prevent people from immediately going “back to normal” (i.e., the way they were before the disaster) in their potentially hazard-prone location and condition. These post-disaster activities typically include such things as requiring permits, conducting inspections, and enforcing the NFIP substantial improvement/substantial damage regulations. Unfortunately, these activities can be very difficult on a post-disaster basis, especially for smaller and/or understaffed municipalities. However, if these activities are not carried out properly, not only does the municipality miss an opportunity to redevelop or clear out its known hazard areas, but it may also be violating its obligations under the NFIP. As such, the Hazard Mitigation Planning Team identified the following Emergency Services Hazard Mitigation Measures to be implemented within the County.

ES-11: Develop a technical proficiency at the municipal level for conducting post-disaster damage assessments and regulating reconstruction activities to ensure compliance with NFIP substantial damage/substantial improvement requirements.

ES-12: Develop a technical proficiency at the municipal level for assisting local residents and business owners in applying for hazard mitigation and assistance funds and identifying cost beneficial hazard mitigation measures to be incorporated into reconstruction activities.

5.1.3 Property Protection

Property protection measures are used to minimize an existing structure’s vulnerability to a known hazard, rather than trying to modify or control the hazard itself. Property protection measures involve improvements to privately owned property and must therefore be coordinated (and potentially even cost-shared) with the respective property owners. Many of these measures do not affect the appearance or use of the

structure, which make them particularly appropriate for historical sites or landmarks. Implementation of a property protection measure typically requires acquisition of a local building permit and associated coordination with the local building, zoning, planning, and/or code enforcement office. As such, property protection measures include the following:

- relocation/acquisition;
- elevation;
- insurance;
- emergency response planning.

Implementation of property protection measures of this nature will work towards the fulfillment of the following project-planning goals as identified by the Hazard Mitigation Planning Team.

- Ensure that property owners and potential property owners are aware of the availability and benefits of obtaining federal flood insurance.
- Improve the participation rate in federal flood insurance through education.
- Minimize future damage due to flooding of the Susquehanna River and its tributaries.
- Reduce impacts related to flash flooding and stormwater problems.
- Ensure that high-risk, pre-FIRM residential structures do not get repeatedly flooded by using retrofitting techniques to reduce the flood risk to the properties.
- Reduce the impact of flooding on commercial structures through retrofitting techniques.
- Investigate retrofitting alternatives to reduce impacts from other natural hazards.

As previously mentioned, representative floodplain structures were identified from throughout the County (see Section 2.4.2) and analyzed to determine approximate loss estimates for the 100-year flood event. In FEMA terms, cost effectiveness is

measured by means of a benefit-cost ratio; which is a ratio of project benefits to project costs. If the project benefits exceed the project costs, the benefit-cost ratio is greater than 1.0 and the project is considered to be cost-effective; if the project benefits do not exceed the project costs, the benefit-cost ratio is less than 1.0 and the project is not considered to be cost-effective.

While project costs are relatively simple to estimate, determining project benefits can be much more difficult. This is because project benefits measure the damages avoided as a result of a property protection project from flood events of varying frequency and intensity that can occur over the life of the project. For this reason, FEMA developed the BCA Modules to aid users in estimating project benefits and computing benefit-cost ratios.

The benefit-cost analyses conducted for these representative floodplain structures considered the following alternative property protection measures.

- **Relocation/Acquisition** – Moving/taking the existing structure outside of the floodplain.
- **Elevation** – Raising the existing structure on a foundation constructed above the flood elevation.
- **Dry Floodproofing** – Making the structure watertight by strengthening the structural elements and using sealants and shields to resist low-level flood events.
- **Wet Floodproofing** – Using flood-resistant materials and protecting utilities and other equipment to resist flood damage when waters enter the structure.

However, a detailed review of these mitigation alternatives indicated that dry floodproofing is not appropriate for any of the thirteen representative floodplain structures. Dry floodproofing is typically not appropriate for structures with basements or flood elevations greater than three feet in depth. Therefore, the dry floodproofing alternative was eliminated and not considered for benefit-cost analysis.

5.1.3.1 RELOCATION/ACQUISITION

Moving a building to higher ground (i.e., relocation) and/or purchasing and demolishing a flood-prone building (i.e., acquisition) are the surest ways to minimize potential flooding impacts. Municipalities with areas subject to ice jams, flash flooding, high velocity flows, deep water, or where the only safe approach is to remove the building, should consider relocation and/or acquisition. Removing buildings from the floodplain is not only the most effective flood protection measure available, it is also a way to convert a problem area into a community asset and obtain environmental benefits.

Relocation is preferred for large lots that include buildable area outside the floodplain or where the owner already has a new flood-free lot available. Relocation can be expensive, however. While almost any building can be moved, the cost goes up for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings. As shown in Table 5-1, the cost of moving a 1,000-square-foot building can range from \$29 to \$65 per square foot, depending on the construction type (e.g., frame or masonry) and the type of existing foundation (e.g., basement, crawlspace, or slab-on-grade). There are also a number of factors that affect the feasibility of relocation such as road width and grade, density of overhead utilities, and other related factors.

**TABLE 5-1
RELOCATION COST GUIDE**

CONSTRUCTION TYPE	EXISTING FOUNDATION	RELOCATION COST ^a
Frame ^b	Basement	\$34
	Crawlspace	\$29
	Slab-on-Grade	\$54
Masonry	Basement	\$52
	Crawlspace	\$34
	Slab-on-Grade	\$65

Source: FEMA 259 2nd Edition/June 2001 (adjusted to 2003 values)

^a per square foot of building footprint

^b for frame building with masonry veneer, add 10 percent

It should be noted that the costs shown in Table 5-1 do not represent the entire cost of a relocation project. Additional costs may be necessary for acquiring a new lot on which to place the relocated building and for restoring the old site. Also, relocation costs do not increase proportionally with the size of a building. The cost per square foot for relocating a building larger than 1,000 square feet may be less, but some larger buildings may have to be cut and the parts moved separately.

Like relocation, acquisition of buildings in a flood-prone area ensures that they will no longer be subject to damage. The major difference is that acquisition is undertaken by a government agency; so the cost is not borne by the property owner, and the land is converted to a public use, such as a park. Acquisition, followed by demolition, is most appropriate for buildings that are difficult to move, such as larger, slab-on-grade foundation or masonry structures, and dilapidated structures that are not worth protecting. An acquisition budget should be based on the median price of similar properties in the community plus \$10,000 to \$20,000 for appraisals, abstracts, title opinions, relocation benefits, and demolition. Costs may be lower after a flood. For example, the municipality may have to pay only the difference between the full price of a property and the amount of the flood insurance claim received by the owner. Municipalities should be cautious, however, to avoid creating a “checkerboard” acquisition pattern in which non-adjacent properties are acquired. This can occur when some owners, especially those who have and prefer a waterfront location, prove reluctant to leave. Creating such an acquisition pattern in a community simply adds to the maintenance costs that taxpayers must support.

Occasionally, acquisition and relocation projects are undertaken jointly. The purchasing agency typically sells the building for salvage. Sometimes, the original owner of the acquired building can make arrangements to buy it back at the salvage value. The advantage of this approach is that a new owner relocates the building rather than demolishes it. This way, the owner gets to keep the building and may have enough money from the sale to pay for a new lot and moving expenses. Based on a number of relocation or acquisition opportunities within Clinton County, the Hazard

Mitigation Planning Team identified the following Property Protection (PP) Hazard Mitigation Measure for potential implementation.

PP-1: Relocate and/or acquire known flood-prone structures.

5.1.3.2 Insurance

Insurance has the advantage that, as long as the policy is in force, the property is covered and no human intervention is needed for the measure to work. Although most homeowners' insurance policies do not cover a property for flood damage, an owner can insure a building through the NFIP. A municipality must participate in the NFIP in order to make flood insurance available to its residents. As evidenced by Table 2-3, every municipality in Clinton County participates in the NFIP, although some municipalities have no residences enrolled. As of November 2004, there were a total of 1,031 flood insurance policies in force in Clinton County. Current data from the Clinton County GIS office indicates that there are 1,983 addressable structures (from a total of 3,216 structures including out buildings, sheds, etc) in the County that are vulnerable to potential flooding impacts during a 100-year event. It is clear that, with only 1,031 policies in force, there are a number of insurable structures in the County that are not covered under a flood insurance policy. As such, the Hazard Mitigation Planning Team identified the following Property Protection Hazard Mitigation Measure for implementation within the County.

PP-2: Encourage uninsured property owners in known flood hazard areas to purchase flood insurance through the NFIP.

5.1.3.3 Emergency Response Planning

In certain situations, implementation of physical property protection measures (i.e., relocation, elevation, or floodproofing) may not be technically or fiscally appropriate. This is most often the case for larger flood-prone business and industry buildings, where relocation is undesirable and retrofitting techniques may be too costly

or not technically feasible. As such, alternatives to physical property protection measures must be explored. One alternative to implementing physical property protection measures is to develop an emergency response plan specific to the particular business or industry. An emergency response plan is a guidance document that identifies and describes specific emergency preparation and response procedures to be implemented on a pre- and post-disaster basis in order to minimize potential flooding impacts. As such, emergency response planning can serve to minimize potential impacts to both the structure and its contents/inventory. In this manner, emergency response planning for a particular business or industry would constitute a property protection measure. FEMA guidance on developing and implementing a business/industry specific emergency response plan is included in the appendices. Given the wide-scale applicability and the potential reduction in flooding impacts, the Hazard Mitigation Planning Team identified the following the Property Protection Hazard Mitigation Measure to be implemented within the County.

PP-3: Encourage local business and industry owners in known flood hazard areas to develop an emergency response plan as a potential alternative to implementing a physical property protection measure, where otherwise not technically or fiscally appropriate.

5.1.4 Structural Projects

Structural projects are typically constructed to keep floodwaters and other natural hazards away from select areas. They are usually designed by engineers and managed or maintained by public works staff. From a flood hazard mitigation standpoint, structural projects can be used to control flows and water surface elevations for both flood minimization and recreational purposes. However, due to their limiting costs and potential environmental implications, structural projects are not normally constructed to protect individual properties, but are usually large-scale undertakings designed to protect numerous people and properties. As such, structural hazard mitigation projects typically include the following:

- dams/levees/floodwalls;
- bridge/culvert modifications;
- channel modifications/diversions.

Implementation of structural projects of this nature will work towards the fulfillment of the following project-planning goals as identified by the Hazard Mitigation Planning Team.

- Ensure that existing drainage systems (pipes, culverts, channels) are adequate and functioning properly.
- Minimize future damage due to flooding of the Susquehanna River and its tributaries.
- Reduce impacts related to flash flooding and stormwater problems
- Investigate structural solutions to natural hazards.
- Reduce threats related to landslides.
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5.1.4.1 Dams/Levees/Floodwalls

Dams, levees and floodwalls are similar in that they control flooding by restricting floodwaters from reaching/inundating protected areas. Dams, levees and floodwalls are probably the best-known forms of structural flood control projects that have been implemented in the United States. In fact, examples of all three of these structural flood control projects have been constructed and used effectively in the Susquehanna River Basin to minimize flooding impacts. It is important to note, however, that just like any other engineering feature, if the design capacity of a dam, levee and/or floodwall is exceeded, its functional utility becomes compromised. As such, dams, levees and floodwalls can give a false sense of security to the property owners that they protect.

5.1.4.2 Bridge/Culvert Modifications

In the wake of a significant storm event, undersized bridge and culvert crossings of local streams and watercourses can result in floodwater backing up upstream of the structure causing significant flooding problems. Therefore, from a flood hazard mitigation standpoint, bridge/ culvert modifications typically involve the replacement, enlargement, and/or removal of existing roadway and railway bridges and culverts that are known to cause flooding problems. Regulations set forth in PennDOT Design Manual Part 4, and the PA DEP's Title 25, Chapter 105 state that all new bridges and culverts shall be designed and constructed to pass a 25-year frequency flood flow in rural areas, a 50-year frequency flood flow in suburban areas, and a 100-year frequency flood flow in urban areas. In addition, the regulations state that the structure must pass the 100-year frequency flood flow with less than a 1.0-foot increase in the natural unobstructed 100-year water surface elevation, except where the structure would be located in a regulatory floodway delineated on a FEMA Flood Boundary and Floodway Map, in which case, no increase in the 100-year water surface elevation will be permitted. While these regulations now exist for the design and construction of new bridge and culvert projects, many existing bridges and culverts throughout the County were constructed prior to these regulations being in place. Additionally, while many of these existing bridges and culverts may have been capable of passing design flows when they were built, upstream development could result in increased peak flows to a point that the existing structure is no longer hydraulically adequate. Replacing, enlarging, or removing these known problematic structures can go a long way in minimizing the County's flooding problems.

As previously mentioned, the CCCD is active in the PA DEP's Act 167 Stormwater Management Planning Program and has completed stormwater management plans for most of the County's watersheds. Part of the Act 167 stormwater management planning process involves a hydraulic capacity analysis of the subject watershed's bridge and culvert stream crossings. The Hazard Mitigation Planning Team used this existing data to identify those bridges and culverts that are

unable to pass the 10-year frequency flood flow. Structures that are not able to pass the 10-year frequency flood flow were considered to be significant obstructions in need of potential modification. As such, the Hazard Mitigation Planning Team identified the following Structural Project Hazard Mitigation Measure to be implemented within the County.

SP-1: Coordinate with the local municipality and/or PennDOT on the potential feasibility of replacing, removing, or enlarging those bridge and culvert stream crossings that were identified during the Act 167 Stormwater Management Planning process as being unable to pass the 10-year frequency flood flow.

5.1.4.3 Landslide Abatement

Landslide abatement can range from physically scaling a rock slope to installing slope stabilizing wire mesh and protective fencing. One landslide abatement project has already been completed in Clinton County. This was the Ice Mine Cut project and it was undertaken in 1997. The project goal was to minimize the amount of mass wasted material deposited on and across SR 120 in Bald Eagle Township. The project cut the mountainside back and produced a buffer on the upslope side of SR 120. This effectively moved the hazard away from the roadway, producing an area for deposition of material that can be moved from the area safely. There is no cost effective method to stabilize the hillside, so the best method of mitigation was to keep the material back away from the highway. Other sites identified as potential landslide problems can be dealt with on a site specific basis. While no mitigation method is perfect, a best fit approach may be the only cost effective mitigation technique available. As each site has unique characteristics, the Hazard Mitigation Planning Team has determined that there needs to be a coordinated approach with the Department of Transportation and other agencies to deal with each site on a case by case basis.

SP-2:Coordinate with PennDOT and the CCCD to determine the feasibility of implementing mitigation measures on a site specific basis to lessen traffic hazards from Landslides / slumps.

5.1.5 Natural Resource Protection

Natural resource protection activities that are implemented as hazard mitigation measures can be multiple in scope, purpose, and outcome. They are generally aimed at preserving (or in some cases restoring) local natural areas, environmentally sensitive resources, or the overall quality of some locally significant feature but can also play a significant role in reducing local and regional damages caused by natural hazard events. Natural resource protection activities are typically implemented by park, recreation, or conservation agencies and organizations but are not limited to these types of entities. Any responsible entity, such as a local government, can develop and implement a natural resource protection program that will minimize the impacts of natural hazards while enhancing the local and regional environment. Natural resource protection activities that can minimize the potential impacts of natural hazards include the following:

- open space preservation;
- wetland protection;
- identification and implementation of Best Management Practices (BMPs); and
- water resources management planning.

Implementation of natural resource protection activities of this nature will work towards the fulfillment of the following project-planning goals as identified by the Hazard Mitigation Planning Team.

- Preserve areas where natural hazard potential is high (i.e., steeply sloping areas, sinkhole areas, floodplains, wetlands, etc.).
- Minimize future damage due to flooding of the Susquehanna River and its tributaries.

- Reduce impacts related to flash flooding and stormwater problems.
- Regulate construction/development in the County to prevent increases in runoff and subsequent increases in floodflows.
- Protect existing natural resources and open space, including parks and wetlands, within the floodplain.
- Restore degraded natural resources and open space to improve their flood-control function.
- Ensure the adequacy of erosion and sedimentation control practices throughout the County.
- Reduce threats related to landslides.

5.1.5.1 Open Space Preservation

Keeping known hazard areas free of development and in a natural condition is the best approach to minimizing or preventing potential damages. In regard to Clinton County, this concept is applicable to natural hazards like flooding and landslides where floodplain and steep slope mitigation can effectively minimize the County's susceptibility to potential damage. Preserving open space in an undeveloped floodplain not only prevents potential flood damage but also allows for the full realization of the floodplain's natural and beneficial functions. These natural and beneficial floodplain functions include floodwater storage/flood flow attenuation, surface water infiltration/groundwater recharge, removal/ filtering of pollutants and sediments from floodwater, habitat for flora and fauna, and recreational opportunities. Similarly, keeping development away from steep slopes not only prevents potential damage but also provides valuable habitat for many plant and animal species and the potential for increased recreational opportunities. As previously mentioned, open space preservation can be accomplished locally through the adoption and enforcement of various ordinance provisions (see PM-1, PM-2, and PM-6) but can also be accomplished through property acquisition and easement. As such, the Hazard Mitigation Planning Team identified the following Natural Resource (NR) Protection Hazard Mitigation Measures to be implemented within the County.

NR-1: Conduct a detailed inventory and prioritization of local environmental resources via the Comprehensive Planning or similar natural resources planning process.

NR-2: Preserve the highest priority undeveloped floodplain areas via fee simple acquisition and/or permanent easement and retain as public open space for passive recreational uses in an effort to minimize/prevent potential flooding damages and enhance the regional environment. Less critical floodplain areas may be preserved / protected via local ordinance (see PM-2 and PM-4).

NR-3: Preserve the highest priority undeveloped steep slope areas via fee simple acquisition and/or permanent easement and retain as public open space for passive recreational uses in an effort to minimize/prevent potential landslide damages and enhance the regional environment. Less critical steep slope areas may be preserved / protected via local ordinance (see PM-2 and PM-4).

5.1.5.2 Wetland Protection

Wetlands as defined by the PA DEP and the U.S. ACE are often found in floodplains and low lying areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality and provide habitat for many species of fish, wildlife, and plants. Wetlands are regulated by the U.S. ACE under Section 404 of the Clean Water Act and by PA DEP under Chapter 105 of Pennsylvania's Dams Safety and Encroachment Act. Federal and state permits are required for projects that will impact wetlands. Before a permit is issued, the plans are reviewed by several agencies, including the U.S. ACE, PA DEP, U.S. Fish and Wildlife Service, and U.S. Environmental Protection Agency. If a permit is issued, the wetland impact is typically required to be mitigated. Wetland mitigation can include creation, restoration, enhancement, or preservation of wetlands. The appropriate type of mitigation is addressed in each independent permit action. Even with this federal and state protection, many wetlands (particularly smaller ones) continue to be impacted due to gaps (i.e., unregulated activities) in the federal and state regulations. As such, local wetland protection programs can be developed to address these gaps in the federal and

state regulations. Given the local and regional importance of wetlands, the Hazard Mitigation Planning Team identified the following Natural Resource Protection Hazard Mitigation Measures to be implemented within the County.

NR-4: Preserve high priority wetland areas (see NR-1) via fee simple acquisition and/or permanent easement and retain as public open space for passive recreational uses in an effort to minimize potential flooding damages and enhance the regional environment.

NR-5: Develop and implement a wetland protection program consisting of public education materials that highlight the functions and values of wetlands and local ordinance provisions that require the identification of wetlands in accordance with federal and state standards and minimize/eliminate their disturbance in accordance with federal and state laws.

5.1.5.3 Identification and Implementation of Best Management Practices

Best management practices (BMPs) are measures that reduce the volume of surface water runoff and associated non-point source pollutants from entering waterways. Non-point source pollutants are transported by surface water runoff and include lawn fertilizers, pesticides, farm chemicals, sediments, and oils from both pervious and impervious urban and rural areas. Non-point source pollutants not only affect the quality of our local water resources but also their ability to carry and store floodwaters. Eroded soil from farmlands and construction sites is typically deposited where streams and rivers slow down and lose energy, such as when they enter a lake or confluence with another stream. As such, sedimentation will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters. In addition, uncontrolled surface water runoff contributes to local and regional flooding problems.

From a hazard mitigation perspective, the identification and implementation of BMPs is focused on structural and non-structural erosion and sedimentation control and stormwater management facilities. Many BMP measures (structural and/or non-structural) can be implemented on a site to address specific site needs. Both erosion and sedimentation control and stormwater management BMPs can be incorporated into retention and detention basins, drainageways, and many other parts of new

developments. Depending on local ordinances, specific BMPs and structural measures may already be required on industrial sites, mined lands, construction sites, farms, forested areas, and high-use public lands.

As previously mentioned, the CCCD is very active in the completion of watershed-specific stormwater management plans in accordance with Pennsylvania's Stormwater Management Act (Act 167 of 1968). These stormwater management plans and associated stormwater management ordinances typically include provisions for local implementation of stormwater management BMPs. As such, effective completion of PM-7 would, by default, result in the identification and implementation of stormwater management BMPs at the local level. Therefore, the identification and implementation of BMPs as a natural resource protection hazard mitigation measure must be focused on erosion and sedimentation control practices on construction sites, farms, and other large disturbed areas. Fortunate for Clinton County is the fact that the Conservation District has several erosion and sedimentation control technicians who monitor construction sites to ensure contractor compliance with the approved Erosion and Sedimentation Pollution Control Plan and work with local farmers to implement erosion and sedimentation control BMPs. As such, the Hazard Mitigation Planning Team recognized the CCCD's existing efforts to control erosion and sedimentation and identified continued implementation of these efforts as a Natural Resource Protection Hazard Mitigation Measure for the County.

NR-6: Working through the Conservation District, the County should ensure continued contractor compliance with approved Erosion and Sedimentation Pollution Control Plans and should continue to work with local farmers to implement erosion and sedimentation control BMPs.

5.1.6 Public Information

Providing the public with accurate and relevant information is a key component of a successful hazard mitigation program. Public information activities advise residents,

business owners, and local officials about natural hazards and ways they can protect themselves, their property, and their constituents from these hazards. Public information activities can be aimed at the entire County or at select residents and business owners in known hazard areas. These programs are intended to motivate people to take precautionary steps on a pre-disaster basis.

Within The Clinton County Department of Emergency Services, the Public Relations Officer has sole responsibility for public information dissemination. As such, all hazard mitigation related public information activities should be coordinated and implemented through this office. These public information activities include the following:

- map information;
- library resources;
- outreach projects; and
- environmental education.

Implementation of public information measures of this nature will work towards the fulfillment of the following project-planning goals as identified by the Hazard Mitigation Planning Team.

- Ensure that all residents and business owners are aware of the potential hazards associated with their environment and the ways they can protect themselves.
- Ensure that property owners and potential property owners are aware of the availability and benefits of obtaining federal flood insurance.
- Ensure that local officials are well trained regarding natural hazards and appropriate prevention and mitigation activities.
- Develop citizen information on natural, technological, and man-made disaster response.
- Increase the length of stream reaches mapped on FIRM maps and/or increase accuracy and density of flood elevation data where this future mapping would be beneficial.

- Improve the participation rate in federal flood insurance through education.

5.1.6.1 Map Information

Many benefits stem from providing flood hazard map information to inquirers. Residents and business owners who are aware of potential flood hazards can take steps to avoid problems and/or reduce their exposure to flooding. Real estate agents and potential homebuyers can determine if a particular property is located in a known flood hazard area and whether flood insurance may be required. Even with the passage of Pennsylvania Act 84 of 1996 (which requires the seller of any residential real estate to complete a mandatory property disclosure statement) it is still important for potential buyers to review the community's flood insurance rate mapping to ensure that their prospective property is not located in a floodplain. It is important to remember, however, that flood maps are not perfect; they display only the larger flood-prone areas that have been studied. Some maps are based on data that are more than 20 years old. In some areas, watershed developments make even recent maps outdated. As such, in addition to Preventive Measure 3 (PM-3) related to the sharing of the multi-hazard mapping from this plan for municipal planning and information purposes, the Hazard Mitigation Planning Team identified the following Public Information (PI) Hazard Mitigation Measures to be implemented within the County.

PI-1: Coordinate with FEMA and the PA DCED regarding updating Clinton County's Flood Insurance Rate Mapping via FEMA's Flood Map Modernization Program to include the expansion of previously unmapped areas and additional Base Flood Elevations (BFEs).

PI-2: Municipalities should store in an easily accessible location and make available for public inspection, their community's Flood Insurance Rate Mapping and associated Flood Insurance Study. Clinton County could provide copies of these maps at the courthouse and/or conservation district offices and/or scan and post current maps on their website for all communities or those unable to provide information on their own website.

5.1.6.2 Library Resources

Local libraries are an obvious place for residents to seek information on natural hazards and natural hazard mitigation. The community library is usually the first place people turn when researching a topic. Interested property owners can read or check out handbooks or other publications that cover their particular situation. Additionally, libraries typically offer Internet access, which can be used to find a wealth of information on just about any topic, including hazard mitigation. For example, FEMA's website at <http://www.fema.gov/> is not only user friendly, but also contains great information for homeowners, engineers, lenders, and other interested citizens. Libraries also have public information campaigns with displays, lectures and other projects, which could augment the County's natural hazard mitigation activities. In addition, municipalities can keep their own library of hazard-related resources as a public service for their constituents. As such, the Hazard Mitigation Planning Team identified the following Public Information Hazard Mitigation Measures to be implemented within the County.

- PI-3: Maintain natural hazard risk assessment and mitigation publications/materials at public libraries throughout the County.**
- PI-4: Store in an easily accessible location and make available for public inspection, this hazard mitigation plan and the FEMA guidance documents that were provided as part of the hazard mitigation planning program.**
- PI-5: Post and keep current with any additions to or updates of this planning document on Clinton County Government's web site (www.clintoncountypa.com) for public review and/or comment.**

5.1.6.3 Outreach Projects

Map information and library resources are not of much use if no one knows they exist. An outreach program can remedy this. Sending notices to hazard-prone property

owners can introduce the idea of property protection and identify sources of assistance. Outreach programs are the first step in the process of orienting property owners to property protection measures and assisting them in designing and implementing a project. These programs are designed to encourage people to seek out more information and take steps to protect themselves and their properties. An outreach project can be a notice that is mailed or otherwise distributed to hazard-prone property owners and/or an article in a newsletter or local newspaper that will reach local residents. Other approaches can include the following:

- displays in public buildings or shopping malls;
- radio and TV news releases and interview shows;
- presentations at meetings or relevant local organizations;
- floodproofing open houses; and
- website notices with hyperlinks to other sources of information.

Research has proven that outreach projects work. However, awareness of the hazard is not enough; people need to know what they can do in preparation for, during and after a hazard event. Public outreach programs should include information on property protection measures, safety procedures, and post disaster clean-up tips. Outreach projects should also be locally designed and run so the public recognizes the relevance to their specific needs and local conditions. As such, the Hazard Mitigation Planning Team identified the following Public Information (PI) Hazard Mitigation Measures to be implemented within the County.

PI-6: Develop and distribute a public summary of this hazard mitigation plan including relevant information on hazard specific “do’s” and “don’ts”, hazard-prone areas, and emergency contact information.

PI-7: Develop and implement a post-disaster recovery and mitigation training program for local officials (See ES-11 and ES-12).

PI-8: Create a website links/references section on the Clinton County and/or CCDES website homepage to include links to FEMA - <http://www.fema.gov/>, PEMA - <http://www.pema.state.pa.us/>, PA DCED - <http://www.inventpa.com/>, and NWS - <http://www.nws.noaa.gov/>.

5.2 IMPLEMENTATION OF HAZARD MITIGATION MEASURES

5.2.1 Hazard Mitigation Action Plan

Table 5-2 has been developed to summarize and prioritize the identified hazard mitigation measures. This table lists the individual action items as being high-, medium-, or low-priority hazard mitigation measures for the County. The Hazard Mitigation Planning Team prioritized these projects from an overall County perspective based on their individual ability to fulfill the identified project-planning goals (see Section 3) and their relative hazard mitigation/protection afforded. To assist in this prioritization, the Hazard Mitigation Planning Team established criteria for evaluating and comparing the subject projects. These County-level project prioritization evaluation criteria were used to rank the projects as being high-, medium-, or low-priority. The prioritization evaluation criteria include the following.

- Perceived and/or calculated benefit-cost ratio
- Number of hazards addressed (i.e., single- or multi-hazard)
- Number of people the project would benefit
- Frequency of impact (i.e., repetitive losses)
- Severity of impact
- Longevity/permanence of the project
- Permanent residence vs. seasonal residence
- Human impacts v. property impacts (i.e., potential for loss of life)
- Potential for economic losses
- Preventive value
- Implications of the impact

It is recognized that the overall county-level prioritization for any given project may not be entirely applicable at the municipal implementation level. Municipalities are likely to find that their individual needs/circumstances warrant a re-prioritization of the recommended action items to more appropriately address local conditions. This concept is perfectly acceptable and is expected to occur following local adoption of the plan. In general, high-priority projects are to be implemented within the first five years projects.

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PRIORITIZED HAZARD MITIGATION ACTION PLAN
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are to be implemented within five to seven years following plan adoption, pending availability of project funding, or upon completion of the high-priority projects. Similarly, low-priority projects are to be implemented within seven to ten years following plan adoption, pending availability of project funding, or upon completion of the high-and medium-priority following plan adoption, pending availability of project funding. Medium-priority projects

In addition to prioritizing the identified hazard mitigation measures, the Hazard Mitigation Planning Team also identified a responsible person/entity for implementing and administering each of the identified mitigation measures. Depending on the scope of the project, this responsible person/entity could range from a private property owner to a County department. Table 5-2 also suggests potential funding sources for implementing the respective projects. More information on these potential funding sources is included in the next section.

5.2.2 Potential Funding Sources

FEMA's Pre-Disaster Mitigation and Hazard Mitigation Grant Programs (PDM and HMGP) assist states and local communities in implementing long-term hazard mitigation measures before and following a major disaster declaration, respectively. PDM and HMGP monies can be used to fund projects that provide protection to either public or private property. Some projects include structural hazard control, such as debris basins or floodwalls, and retrofitting measures including floodproofing, acquisition and relocation of structures. FEMA can fund up to 75 percent of the eligible costs of each project. The state or local match does not have to be cash; in-kind services or materials may be used. Federal funding under the HMGP is based on 15 percent of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster. Eligible applicants must apply for the PDM and HMGP through the Pennsylvania Hazard Mitigation Officer. More information is available through the FEMA website (<http://www.fema.gov/fima/mitgrant.shtml>).

FEMA's Flood Mitigation Assistance Program (FMAP) provides grants to states and communities for planning assistance and mitigation projects that reduce the risk of flood damage to structures covered by flood insurance. There are three types of grants: planning, project and technical assistance. Technical assistance grants are given to state agencies that provide assistance to communities, so communities apply for planning and project grants. FMAP monies are available to eligible applicants when a Flood Mitigation Plan has been developed and FEMA has approved it. FEMA may contribute up to 75 percent of the total eligible costs. At least 25 percent of the total eligible costs must be provided by a non-federal source. Of this 25 percent, no more than half can be provided as in-kind contributions from third parties. There are limits on the frequency of grants and the amount of funding that can be allocated to a state or community in any five-year period. PEMA serves as the administrator of the planning and projects portions of the grant program. More information is available through the FEMA website (<http://www.fema.gov/fima/mitgrant.shtml>).

FEMA's Public Assistance Grant Program (PA) is one way federal assistance gets to the state and local governments and to certain private nonprofit organizations. These grants allow them to respond to disasters, to recover from their impact and to mitigate impact from future disasters. While these grants are aimed at governments and organizations -- their final goal is to help a community and all its citizens recover from devastating natural disasters.

The PA Program provides the basis for consistent training and credentialing of staff who administer the program; more accessible and understandable guidance and policy for participating in the grant program; improved customer service through a more efficient grant delivery process, applicant-centered management, and better information exchange; and continuing performance evaluations and program improvements. More information is available through the FEMA website (<http://www.fema.gov/rrr/pa/>).

If the U.S. ACE determines that a project falls within the Continuing Authorities Program (CAP), they initiate a short reconnaissance effort to determine federal interest in proceeding. If there is interest, a feasibility study is performed, and the project continues through a plans and specifications phase, and finally a construction phase. A local sponsor must identify the flood-related problem and request U.S. ACE assistance. Small flood-control projects are also eligible. The cost share for the CAP is 65 percent U.S. ACE and 35 percent local. The federal project limit is \$7,000,000. The U.S. ACE's Baltimore District office would review the local sponsor's request for assistance and would request funds from the U.S. ACE's annual appropriations. More information is available through the U.S. ACE website (<http://www.spk.usace.army.mil/cespkpd/cap.html>).

The U.S. ACE's Floodplain Management Services Program aims to support comprehensive floodplain management planning to encourage and guide sponsors to prudent use of the nation's floodplains for the benefit of the national economy and welfare. Some examples of the types of projects that would be funded include the following:

- flood warning and flood emergency preparedness measures;
- floodproofing measures;
- studies to improve methods and procedures for mitigating flood damages; and
- preparation of guides and brochures on flood-related topics.

A local sponsor must identify a problem and request U.S. ACE assistance under the Floodplain Management Services Program. The U.S. ACE may provide up to 100 percent of the funding at the request of the sponsor. The U.S. ACE's Baltimore District office would review the local sponsor's request for assistance and determine if it fits within the program. More information is available through the U.S. ACE website (<http://www.nab.usace.army.mil/whatwedo/civwks/fpms.htm>).

The U.S. ACE's Water Resources Development Act, Section 22 provides authority for the U.S. ACE to assist states, local governments, and other non-federal entities in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources. Congress funds the Planning Assistance to state programs annually. Federal allotments for each state from the nationwide appropriation are limited to \$500,000 annually but typically are much less. Individual studies, of which there may be more than one per state per year, generally cost \$25,000 to \$75,000. The program can encompass many types of studies dealing with water resources issues. Types of studies conducted in recent years under the program include the following:

- Water Supply and Demand Studies;
- Water Quality Studies;
- Environmental Conservation/Restoration Studies;
- Wetlands Evaluation Studies;
- Dam Safety/Failure Studies;
- Flood Damage Reduction Studies;
- Flood Plain Management Studies;
- Coastal Zone Management/Protection Studies; and
- Harbor/Port Studies.

State or local governments that are interested in obtaining planning assistance under this program can contact the appropriate U.S. ACE office for further details.

Alternatively, interested parties can contact the appropriate state coordinator to request assistance. In either case, the U.S. ACE will coordinate all requests for assistance with the state coordinator to ensure that studies are initiated on state prioritized needs. More information is available through the U.S. ACE website (<http://www.nab.usace.army.mil/whatwedo/civwks/pas.htm>).

The U.S. Department of Housing and Urban Development's (HUD) Community Development Block Grant - Disaster Recovery Initiative (DRI) program provides flexible grants to help municipalities, counties, and states recover from Presidentially declared disasters, especially in low-income areas. Since it can fund a broader range of recovery activities than most other programs, the DRI helps communities and neighborhoods that

otherwise might not recover due to limited resources. When disasters occur, Congress may appropriate additional funding for the Community Development Block Grant Program as DRI grants to rebuild the affected areas and bring crucial seed money to start the recovery process. Grantees may use DRI funds for recovery efforts involving housing, economic development, infrastructure and prevention of further damage, if such use does not duplicate funding available from FEMA, the Small Business Administration, and the U.S. ACE. Examples of these activities include the following:

- buying damaged properties in a floodplain and relocating them to safer areas;
- relocation payments for people and businesses displaced by the disaster;
- debris removal;
- rehabilitation of homes and buildings damaged by the disaster;
- buying, constructing, or rehabilitating public facilities such as water and sewer systems, streets, neighborhood centers, and government buildings;
- code enforcement; and
- planning and administration costs (limited to no more than 20 percent of the grant).

HUD notifies eligible governments, which must then develop and submit an Action Plan for Disaster Recovery before receiving DRI grants. The Action Plan must describe the needs, strategies, and projected uses of the Disaster Recovery funds. More information is available through the HUD website (<http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/index.cfm>).

The PA DCED Governor's Center for Local Government Services sponsors the Floodplain Land Use Assistance Program. This Floodplain Management Program focuses on providing technical and financial assistance to local governments to help them adopt and administer land use regulations and controls to reduce and avoid future flood damages. Municipalities seeking assistance must be NFIP communities. Funds

are available to assist in the preparation, administration, and enforcement of floodplain management regulations.

Descriptions of state assistance programs were taken from the Catalog of Financial and Technical Resources in the Growing Smarter Toolkit developed by the Governor's Center for Local Government Services. The toolkit is provided in the appendices.

The Land Use Planning and Technical Assistance Program (LUPTAP) is also sponsored by PA DCED through the Governor's Center for Local Government Services. This program provides financial assistance for municipalities and counties of the Commonwealth for developing and strengthening community planning and management. The program encourages intergovernmental cooperation in planning, including cooperation with contiguous municipalities, counties, and school districts. The LUPTAP program provides financial assistance to fund activities such as preparing environmental protection or physical development strategies or special studies that will support comprehensive planning and developing or updating ordinances and other tools for the implementation of comprehensive community development plans and policies or environmental protection or physical development strategies. PA DCED generally funds 50 percent of the total cost of an approved application.

The PA DCNR is leading state efforts, under the Pennsylvania Greenways Initiative, to implement the Greenways Action Plan. The PA Interagency Coordination Team, a team of state agencies, will be pooling the agencies' talents and resources to assist in the implementation of the Plan. Each of Pennsylvania's 67 counties is encouraged to consider greenways as part of their land use strategy and to map their existing and proposed county greenway network in a *County Greenway and Open Space Conservation Plan*. The outcome of the Plan is county identification of priorities for conservation of open space and greenway corridors, which together comprise a county "greenway network." The "greenway network" includes linear greenway corridors, related open space, and natural or manmade features or destinations like

parks, schools, or scenic natural areas that are linked by these corridors. An overall goal is the linkage of the County Greenway and Open Space Conservation Plan to the County Comprehensive Plan and other community planning and revitalization initiatives. When aggregated, county greenway plans will lay the framework for Pennsylvania's statewide greenway network as well as provide a foundation for local greenways development. In some areas of the state where other regional, multi-county planning efforts are already underway, counties can choose to work together with neighboring counties to promote larger-scale regional planning and development of a greenways network. Since greenways are often associated with stream corridors or other important natural features, this program could easily supplement the initiatives contained herein regarding preservation of floodplains and other natural hazard-prone areas. Several funding sources and programs are available to help communities meet the goals of the greenway initiative.

Community Conservation Partnership Programs are sponsored by PA DCNR – Bureau of Recreation and Conservation. Grants are provided for planning, acquisition, development, and rehabilitation of park, recreation, conservation, greenways, and heritage areas and facilities and, in some components, maintenance of trails. Some components of the program offer funding for technical assistance, education, and training projects. Heritage Parks grants can also fund promotion and marketing, special purpose studies and other heritage conservation, tourism, and development projects. Generally, all grant components require a match, usually 50 percent of cash or in-kind contributions. Eligible applicants are county and local governments; municipal authorities; and nonprofit recreation, conservation, greenway, and watershed groups.

The Growing Greener Grant Program is sponsored by the PA DEP Growing Greener Grant Center. The purpose of this grant is to address water-quality-impaired watersheds in Pennsylvania that are polluted by non-point sources of pollution such as abandoned mine drainage, urban and agricultural runoff, atmospheric deposition, on-lot sewage systems, and earthmoving. The grant addresses these and similar concerns through local, watershed-based planning, restoration, and protection efforts.

PA DEP, Bureau of Watershed Management sponsors the state's Stormwater Management Program. This program provides grants to counties to develop stormwater management plans for designated watersheds and to municipalities to implement the plans. The Pennsylvania Stormwater Management Act (Act 167) requires that counties develop and adopt stormwater management plans for the watersheds within their boundaries and also to update those plans every five years. The municipalities located in the county-adopted watershed plan areas are required to enact, implement, and administer stormwater control ordinances. The grant assistance to counties and municipalities is limited to 75 percent of the costs for the eligible expenses. PA DEP makes \$1.2 million available for this program each fiscal year to counties and municipalities.

PA DEP offers low-interest loans through the Pennsylvania Infrastructure Investment Authority (PennVEST) for design, engineering, and construction of publicly and privately owned drinking water distribution and treatment facilities, stormwater conveyance, and wastewater treatment (WT) systems. These loans and grants are available to communities or private firms needing clean drinking water distribution and treatment facilities and/or safe sewage and stormwater conveyance and treatment facilities. Communities may apply to PennVEST for loans up to \$11 million per project for one municipality, up to \$20 million for more than one municipality, up to \$350,000 for design and engineering, and up to 100 percent of the total project cost. In regards to flood planning, communities may apply for loans or grants through PennVEST to help flood-proof sewage treatment or water treatment plant facilities. Communities may also seek out PennVEST funds to upgrade stormwater control systems to help minimize surface water flooding problems within developed areas. Through one form, communities can apply for financial assistance through PennVEST or other PA DCED funding sources.

5.3 MULTI-JURISDICTIONAL HAZARD MITIGATION STRATEGY

To fulfill FEMA requirements for multi-jurisdictional (i.e., multi-municipal) planning, each respective municipality must have identifiable action items for potential implementation. As evidenced by Table 5-2, over thirty seven hazard mitigation measures have been identified for potential implementation within Clinton County. While some of these recommended mitigation measures are to be implemented by County personnel, many are to be implemented at the local level by the appropriate municipal official(s). Additionally, given the myriad of regional differences between various municipalities, certain hazard mitigation measures are only to be implemented within select municipalities. As such, Table 5-3 has been developed to identify the multi-jurisdictional approach to implementing the identified hazard mitigation measures. Table 5-3 enables Clinton County's various municipalities to easily identify those hazard mitigation measures that are applicable to their particular jurisdiction. Development of this municipality-specific/multi-jurisdictional hazard mitigation strategy fulfills FEMA's requirements for multi-jurisdictional plan implementation.

TABLE 5-3 - INSERT HERE
MULTI-JURISDICTIONAL HAZARD MITIGATION STRATEGY
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