**DEVELOPING EMERGENCY ACTION PLANS FOR FLOOD PROTECTION PROJECTS**

**FREQUENTLY ASKED QUESTIONS**

*The purpose of this FAQ is to explain the roles and responsibilities for operation and maintenance of a flood protection project. The information in this guidance is solely advisory and does not represent a legal interpretation by the Department. Nothing in this summary shall affect any statutory requirements.*

1. **What is the purpose of a flood protection Emergency Action Plan**

The existence of an Emergency Action Plan (EAP) does not, by itself, equate to effective flood response. The process of thinking through a response to a flood scenario may be more important than the plan itself. The plan development process establishes a dialogue between the local emergency manager, agency officials, and the Department of Environmental Protection (DEP). Problems are identified and appropriate response strategies are discussed and evaluated. Participants become more familiar with each other and with the emergency actions required in the event of high water.

The EAP is a dynamic document that should serve as the first step toward exercises, drills, and increased flood/disaster awareness. A strategy or response plan is devised to counter any action that occurs during the flood event. Practice sessions must be held to repeatedly execute various elements of the response plan until each action is executed in a smooth and efficient manner. An effective emergency action plan is accurate and up to date. Constant vigilance is required to keep the plan current.

Repetition, repetition, and repetition are the three most important elements of high water preparation. The more a plan is practiced, the higher the probability of success.

An EAP must be developed for each flood protection project and designed so that flood emergency response actions are conducted in an efficient and organized manner. A plan does not prevent flood disasters, but enables public response actions to be timely and workable. A finished plan requires periodic adjustments to reflect knowledge gained by experiences and must be reviewed annually and also after each significant event. Continual plan management improves response actions.

1. **What are the key elements of the EAP for a flood protection project?**
* Analysis
* Flood Threat Recognition
* Warning Dissemination
* Flood Threat Response Actions
* Emergency Response Actions
* Post-flood Recovery
* Continued Plan Management
1. **What are the primary analyses and features required for an effective EAP?**

All EAPs should include monitoring of the stream stages and rates of rise near the locations where response actions are required. At a minimum, one staff gauge is required for each river, stream, or channel, and one staff gauge is required for each ponding area. More sophisticated systems may be applicable. Additional warning time may be obtained by monitoring upstream conditions. Stream monitoring is always desirable and significantly more reliable than determining flood levels with rainfall data. Keys to a successful plan include: identifying the potential of a flood threat quickly; continuing to monitor the event; and forecasting the magnitude of the event so that the impact of the changing high water and response actions can be determined in minimum time.

Hydrologic and hydraulic analyses are important to evaluating the feasibility of implementing flood warning measures and ensuring their validity of operation on a real-time basis for high water events. The base conditions of the plan and enhancements are to be determined and compared. Base condition analyses estimate the nature of the flood hazard for a range of events determining magnitude, velocities, depths, and rate of rise and warning times. These analyses define the existing flood warning preparedness program activities. Enhanced condition analyses include arrangements, equipment, and actions that yield better responses. The intent is to develop reliable warnings and response actions that reduce the threat to people and property.

The resulting base condition analysis provides various rates of rise that can be compared to real time events. Response actions can be determined knowing the warning or advance time available or not available. Evacuation of a community is determined based on the amount of time available and the rate of rise for that event.

Combinations of depths and velocities of flow are a serious risk to the public during high water events. Shallow flooding with high velocities often poses an unrecognized threat. High velocity flow, six inches deep, will knock a person down, and flow 24 inches deep will float a car. The community should identify emergency response actions for persons trapped in fast-moving water.

The analyses should be illustrated on EAP inundation maps. The maps show the areas inundated by a selected design storm and are the basis for developing the EAP for levees and floodwalls. This map defines the approximate limits of the maximum flood wave that would result from a sudden failure of the project. The detailed requirements for PADEP flood protection project EAP maps are outlined in the ‘Guidelines for Developing and EMERGENCY ACTION PLAN for flood protection projects’, 3110-BK-DEP4414.

#### How do you recognize an imminent flood threat?

An important element of the flood-warning plan is the warning time available. Warning time determines how much time field personnel have to respond to a specific event and the amount of flood damage reduction activities and response actions that can take place. The purpose of a flood recognition system is to provide a means of increasing the warning time and its reliability. These times must be defined to evaluate potential enhancements that increase warning time.

#### How are residents informed of an impending emergency event?

Flood warning dissemination is a key element of any flood warning preparedness program. Warning dissemination is the mechanism for local officials to be notified that a flood threat condition exists. Methods of initially warning key personnel may include audio alarms, voice dial-out systems to call key officials, mass text notifications, pager systems, social media or web-based applications designed for public outreach or simply reading a staff gauge and placing a telephone call.

#### What are the Flood Threat and Emergency Response actions?

The EAP Concept of Operations section outlines how the flood threat response should be carried out. Response action preparedness planning identifies what must be done and who must do it. The warning or lead time available, accuracy, and reliability of the forecast and warning systems dictate the types of response actions that take place.

Emergency response covers preparation for, and responses to, project emergency conditions. Plans must include how to recognize and respond to project emergencies, emergency communications, the chain of responsibility, and telephone numbers of local, state, and federal emergency response agencies.

1. **What is Post Flood Recovery?**

Post flood recovery includes those actions that must be taken after the flood to address any damages and to begin to prepare for the next high water event. Debris removal, locating high water marks, and inspecting the condition of the project must be done at this time.

1. **Why is continued plan management important to ensure community safety?**

Without a current and effective EAP, any unplanned action may not succeed. Flash floods leave little time to wonder how to respond. A course of action is predetermined, documented, reviewed, and practiced in advance. Once the threat of flooding has been determined, response actions begin. As the flooding subsides, the post flood recovery and continued plan management begin. Response actions are reviewed and evaluated for continued plan management. Reactions and responses can improve based on the experience gained during an actual flood event.

1. **Where can I find additional information on developing an EAP?**

*For more information on how to develop a project specific Emergency Action, see the Plan* Guidelines for Developing an EMERGENCY ACTION PLAN for Flood Protection Projects.

For more information on the Flood Protection Program or technical assistance regarding specific projects, visit [Flood Protection](https://www.dep.pa.gov/Business/Water/Waterways/Flood-Protection/Pages/default.aspx) or [www.dep.pa.gov](http://www.dep.pa.gov) (select “Businesses,” then “Water,” then “Waterways Engineering and Wetlands,” then “Flood Protection”), or contact:

Department of Environmental Protection

Bureau of Waterways Engineering and Wetlands

Division of Project Inspection

P.O. Box 8460

Harrisburg, PA 17105-8460

Telephone: 717-783-1754

FAX: 717-772-0409