

U.S. DEPARTMENT OF THE ARMY

COMPLETE STATEMENT

OF

**COLONEL DAVID. E. ANDERSON
COMMANDER AND DISTRICT ENGINEER
U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT**

BEFORE

**THE COMMITTEE ON HOMELAND SECURITY
SUBCOMMITTEE ON EMERGENCY PREPAREDNESS, RESPONSE,
AND COMMUNICATIONS**

UNITED STATES HOUSE OF REPRESENTATIVES

ON

**ENSURING EFFECTIVE PREPAREDNESS AND RESPONSE:
LESSONS LEARNED FROM HURRICANE IRENE AND
TROPICAL STORM LEE**

NOVEMBER 29, 2011

Mr. Chairman and members of the Subcommittee, I am Colonel David Anderson, Commander of the Baltimore District, U.S. Army Corps of Engineers (Corps). Thank you for the opportunity to testify before you about our how our organization plans, responds to, and recovers from high water events, and with specific regard to the recent Hurricane Irene and Tropical Storm Lee events.

OVERVIEW

The Corps is a unique organization, with a diverse military and civil works mission. The Baltimore District is 1,200 employees strong and executes its Civil Works mission primarily in flood risk management, ecosystem restoration, and navigation throughout the Chesapeake Bay watershed, from its headwaters in New York through Pennsylvania to the shorelines of Maryland and Virginia and to the Atlantic coastline.

The Corps owns or operates 692 dams that provide hydropower, water supply and crucial flood damage reduction throughout the United States, including 17 dams in the Susquehanna River and Potomac River Basins, 11 of which are in the Commonwealth of Pennsylvania.

The Corps is also responsible for executing an important regulatory program that helps protect tens of thousands of acres of aquatic resources per year, and we work with the Federal Emergency Management Agency (FEMA) to provide valuable engineering expertise during times of National emergencies.

We are the Army's engineers, focusing our expertise on building training facilities, hospitals, barracks and other assets across the Department of Defense that help improve the lives of our service members and increase our military's ability to protect and defend our Nation.

Included in our diverse missions, and related to the topic here, is our role and responsibility in flood risk management and emergency response.

Responsibility for flood risk management in the United States is a shared responsibility among multiple Federal, State, and local government agencies with a complex set of programs and authorities. The authority to determine how land is used in floodplains and to enforce flood-wise requirements is entirely the responsibility of state and local governments. Floodplain management choices made by state and local officials, in turn, impact the effectiveness of federal programs to mitigate flood risk and the performance of federal flood risk management infrastructure. Importantly, we must ensure the public is educated both as to the risks they face and actions they can take to reduce their risks.

AUGUST-SEPTEMBER 2011 FLOODING

The Baltimore District, which has responsibility for the Susquehanna River Basin, exercised its full range of flood risk management programs in response to Hurricane

Irene in August 2011 and Tropical Storm Lee in September 2011. These two events produced significant precipitation in the Susquehanna River Basin and caused flooding throughout the East Coast. First, Hurricane Irene passed through the northeast corridor, making landfall on August 26-28, 2011. Then, only a week and a half later, Tropical Storm Lee moved up from the Gulf of Mexico and stalled over the northeast, creating moderate to major flooding along the Upper Susquehanna and mainstem Susquehanna Rivers. In some locations, the flood stage was exceeded by more than 15 feet, with numerous river gages exceeding previous records set mostly during Tropical Storm Agnes in June 1972 and during the storm of June 2006.

Rainfall totals ranged from 6-15 inches, mostly from Tropical Storm Lee, during the period of September 6-9, 2011. The heaviest rain fell over the mainstem Susquehanna and Upper Susquehanna River Basins, generally in a north-south band running from Binghamton, New York to Harrisburg, Pennsylvania. Some of these areas had already been affected by heavy rains associated with Hurricane Irene.

EMERGENCY MANAGEMENT AND PREPAREDNESS

The Corps' emergency response authorities derive from the Stafford Act, the authority of 33 U.S.C. 701n (referred to as Public Law 84-99 or PL 84-99) and our regulatory statutes. The Corps also provides reimbursable emergency response and recovery support to the Federal Emergency Management Agency (FEMA) under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288, as amended), and in emergencies the Corps can expedite permitting through its own regulatory program.

Under PL84-99, the Corps is authorized to undertake activities that include disaster preparedness, advance measures, emergency operations and rehabilitation of eligible flood damage reduction projects damaged by flood or rehabilitation of Federally authorized shore protection projects.

Disaster preparedness consists of functions required to ensure that the Corps is ready to respond to a broad range of disasters and emergencies. Corps flood preparedness includes coordination, planning, training, and conducting response exercises with key local, state, and tribal stakeholders/partners. Establishing and maintaining good working relationships benefits both the Corps and its partner and improves communications during a flood response. Also, confirming points of contact for both state and local partners and the Corps on a periodic basis allows for an exchange of information and updating on key areas of interest. Being aware of state and local authorities, requirements, capabilities and expectations helps the Corps determine how it can best supplement state and local needs. Conversely, educating state and local entities about Corps authorities, requirements and expectations eliminates potential gaps and overlaps. These activities ensure Corps personnel assigned emergency assistance responsibilities are trained and equipped to accomplish their missions.

The Rehabilitation and Inspection Program (RIP) provides for the inspection and rehabilitation of federal and non-federal flood risk management projects damaged or destroyed by floods, and the rehabilitation of federally authorized and constructed hurricane and storm damage reduction projects damaged or destroyed by wind, wave or water action other than that of an ordinary nature. A project in the program remains eligible for acceptance into the program for future rehabilitation as long as it is properly operated and maintained as determined by a Corps inspection, which is conducted annually.

In accordance with the Department of Homeland Security's National Response Framework, the Corps is the executing agency under Emergency Support Function #3 (Public Works and Engineering), on behalf of the Department of Defense. Typical mission assignments include Emergency Temporary Power, Debris Removal, Commodities/Water, Temporary Housing/Roofing, Infrastructure Assessments, Urban Search and Rescue, among others. As a result of Hurricane Irene and Tropical Storm Lee, the Baltimore District supported FEMA by deploying 45 experts for various timeframes for assistance.

The Corps responded to the high water event by immediately dispatching engineers, construction experts and public affairs officials to area levees and dams, monitoring water levels, activating emergency operations procedures in preparation for potential flooding, and helping to communicate important life-saving information to the public. For example, during the height of the storm, we deployed a 10-person team of engineers to central Pennsylvania to assist in evaluating the condition of levees and floodwalls, providing technical assistance, and supporting the flood fight.

One example of the measures taken occurred in Wilkes-Barre, where the river gage recorded 42.66 feet of water at its peak, a full 1.75 feet higher than Tropical Storm Agnes in 1972, which reached 40.91 feet. The Wyoming Valley Levee System, originally constructed in 1936, consists of three levee systems at Plymouth, Kingston-Exeter, and Wilkes-Barre-Hanover Township. The levees extend for approximately 15 miles with 13 storm water pump stations. Tropical Storm Lee tested this system with tremendous flows and water pressure placed on the structure.

On-site patrols identified two locations in Forty-Fort that required interim solutions in order to reduce the risk of damage to the levee system. The first incident occurred late in the day Thursday, September 8, where rising waters caused cracks to develop on the system's floodwall. In order to stabilize the wall and maintain flood protection, we provided on-site expertise and made recommendations to the local flood authority to add ballast – or weight – to the land side of the wall. By building up additional material on the land side, a flood wall is stabilized against the pressure of the rising water. A local contractor provided the necessary equipment, staff and truckloads of material to perform the repairs, and they, along with the flood authority and the Corps, worked throughout the night and finished the repairs around 2 a.m.

A few hours after repairing the floodwall, the Corps was called to a second location in Forty-Fort that needed repairs. A large boil, an area where differential pressure allows seepage and the possible transport of fine grained material, measuring 50 feet in diameter was occurring on the landside toe of the levee. Boils are typical during a high water event, and if not properly monitored, they can destabilize the levee. Our engineers again recommended covering the area with a specialized material and loading it with additional fill to prevent further degradation of the levee. By adding additional fill, weight is added to the land side of the levee, increasing its stability. The repair was completed and further damage was avoided.

As described in Wilkes-Barre, teams of engineers perform 24-hour levee patrols at the Federal projects, walking the levees and examining the flood walls and pump stations to ensure proper performance during significant flow events. Typically, our engineers look for cracking, tilting and soft foundation conditions around the floodwall. They also look for boils and properly working closure structures, drainage structures and pump stations. They work in partnership with state and local officials to provide technical assistance and support for levees that are not operated by the Corps. This intensive effort is conducted so that issues can be identified and resolved early, reducing the risk of a more serious problem to structures or people.

Although flood damages in the entire Northeast region were devastating, in many areas where Corps projects exist, their operation by the Corps effectively reduced an additional estimated \$6 billion of damages to the residents in the Northeast.

PL 84-99 – FLOOD CONTROL AND COASTAL EMERGENCIES

Following a significant event, the Corps has the authority to rehabilitate flood risk management projects as authorized by Public Law 84-99, which is funded by the Flood Control and Coastal Emergencies (FCCE) Appropriation. It includes responsibility for disaster preparedness, emergency operations, rehabilitation of flood damage reduction projects, provision of emergency water, advance measures when the threat of flooding is imminent, and participation in FEMA-led hazard mitigation teams. The Corps has the ability to execute emergency response operations and specific activities under this authority; a Presidential declaration is not required. Following an event, the Corps releases a public notice to federal and non-federal sponsors, who can submit a formal/written request for assistance.

Rehabilitation is limited to those projects that have been previously and regularly inspected (called “active” projects) and determined to be in acceptable condition. In most cases, these projects are maintained by local jurisdictions. In accordance with Corps’ regulations, assistance for “active” projects is limited to repair to pre-disaster condition and level of protection, must be beyond normal operation and maintenance, must have construction repair costs greater than \$15,000, and must have a benefit-to-cost ratio of 1.0 or greater. Channel restoration, within the project limits, to pre-flood hydraulic capacity may be eligible when the channel capacity has been decreased to 75 percent or less of pre-event capacity.

Post-storm, the Corps deployed teams to the affected areas to conduct initial assessments of damages to our flood risk management projects. The results from these assessments will be combined with a sponsors' written request for assistance, and projects will be considered for eligibility under the PL 84-99 Program. Many projects sustained varying levels of damage, some more critical than others.

Funding for repair of eligible damages is 100% federal cost for federal projects and 80% federal, 20 percent local sponsor for non-federal projects. Funding is provided through the Corps' FCCE appropriations account.

Following Hurricane Irene and Tropical Storm Lee, a Public Notice was issued on September 16, 2011 to federal and non-federal sponsors whereby sponsors could submit a formal/written request for assistance per the previously described criteria. The Public Notice was posted on the Baltimore District website and the 30-day window ended October 16, 2011.

Due to the damages caused by the record flooding in 2011, the Corps is using a prioritization process to differentiate the level of need and to facilitate prioritized funding requirements. These are based primarily on those projects that pose the greatest risk to life safety and other factors.

Requirements for funding as a result of September 2011 flooding are being evaluated by Corps Headquarters, along with requirements for damages resulting from other major natural disasters which occurred in 2011, namely flooding in the Mississippi River and Missouri River Basins.

FLOOD RISK MANAGEMENT

The Corps shares with FEMA, both the expertise and mandate under its respective authorities and missions to address the nation's vulnerabilities to flood related disasters and damages. Since passage of the Flood Control Act of 1936 established a federal role in flood management, the Corps authorized responsibilities have expanded to include developing structural and nonstructural solutions to managing flood risks, inspecting the condition of existing flood management infrastructure, providing technical and planning support to states and communities, conducting advance emergency measures to alleviate impending flooding, providing emergency flood fight support, and rehabilitating levees and other flood management infrastructure damaged by flooding. In May 2006, the Corps established the National Flood Risk Management Program to take the first step of bringing together other federal agencies, state and local governments and agencies, and the private sector to develop and implement a unified national flood risk management strategy that eliminates conflicts between different flood risk management programs and takes advantage of all opportunities for collaboration. In recent years, the Corps has placed an increasing emphasis on nonstructural approaches to flood risk management. Nonstructural alternatives focus on efforts and measures to reduce flood damages in an area by addressing the development in the

floodplain, such as: floodplain zoning, participating in FEMA's National Flood Insurance Program (NFIP), developing and implementing flood warning systems (coordinated with the National Oceanic and Atmospheric Administration's flood warning program) and emergency evacuation plans, and flood proofing individual structures as well as removing structures from the extreme flood hazard areas. Other measures, such as setback levees, are also being utilized by the Corps, as they typically offer greater natural use of the floodplain while still providing structural protection from floodwaters if completely non-structural alternatives are not viable.

Traditionally, Corps efforts to address flooding hazards have been through civil works projects to reduce the probability of flooding through the construction of levees or other flood management infrastructure. As projects are formulated, we now focus on the most effective combination of tools available that citizens may use to lower" their flood risk, not only reducing the probability of flooding, but also reducing the consequences should a flood occur. Furthermore, the decision on which tools to implement involves all stakeholders.

LEVEE SAFETY PROGRAM

The Corps has had a long history of planning, designing, constructing, and inspecting a multitude of levee systems and conducting flood fighting throughout the Nation. The Corps established its Levee Safety Program in 2007 with the mission to assess the integrity and viability of levees and recommend courses of action to make sure that levee systems do not present unacceptable risks to the public, property and environment. The Levee Safety Program activities focus on public safety as its top priority. Some specific Levee Safety Program activities involve:

- Populating and maintaining the National Levee Database to serve as a living, dynamic record of information relative to the status and safety of the nation's levee systems. The National Levee Database was opened to public access on October 27, 2011 and can be found at (<http://nld.usace.army.mil>).
- Applying a levee screening tool that combines inspection data with a preliminary engineering assessment and maximizing the use of existing information (inspection rates and consequence data) and local knowledge of levee performance. Results will be used to rank levees based on relative risk to help inform decisions about future actions to improve public safety associated with the levees.
- Incorporating changes and improvements associated with the state-of-the-art professional engineering practice into levee safety policy and procedures.
- Conducting both routine (every year) and periodic (every 5 years) inspections for the levees in the Corps' Levee Safety Program –
 - To ensure that the levee system will perform as expected.
 - To identify deficiencies or areas which need monitoring or immediate repair.
 - To assess the integrity of the levee system in order to identify any changes over time.

- To collect information in order to be able to make informed decisions about future actions.
- To determine eligibility for federal rehabilitation funding for the levee in accordance with PL 84-99.
- To determine if the levee is being properly operated and maintained.

Levees within the Corps Levee Safety Program include those which are 1) federally authorized and Corps operated and maintained; 2) Corps constructed and locally operated and maintained; and 3) locally constructed and locally maintained, but have been accepted in to the Corps Rehabilitation and Inspection Program (RIP). Levees within the Corps program consist of approximately 14,600 miles or 2,000 levee systems. The Corps will communicate the condition and associated risk of these levee systems and recommend actions that may include immediate repair of certain deficiencies and/or interim risk reduction measures. The Corps will assist the local sponsor and other stakeholders to develop the best path forward. Levees do not and cannot eliminate risk and are not the only available flood risk reduction tool.

FLOODPLAIN MANAGEMENT SERVICES PROGRAM

Under the Floodplain Management Services Program, the Corps can provide technical assistance with flood-related issues. Technical assistance takes the form of hydrologic and hydraulic modeling, inundation mapping, geographic information system analyses, assessing structural and non-structural alternatives (including floodproofing and stormwater management measures), determining potential benefits and costs, assessing flood hazards and mitigation, comprehensive planning and risk management, and other related analyses and assessments. This program can provide concept plans for alternative solutions to flooding problems but cannot result in design or construction of projects.

STUDY—DESIGN—CONSTRUCTION

The Corps also has a range of study, design and construction authorities for flood risk management. There are the “large” project authorities such as that used for the Wyoming Valley and Lackawanna River Flood Risk Management projects and “small” project authorities, for projects generally less than \$7 million total.

The traditional and most common way for the Corps to help a community solve a water resource problem is through individually authorized studies and projects. The Corps jointly conducts a cost-shared study with a non-federal sponsor and, if shown by the study to be feasible, constructs the project. This approach requires that Congress provide the Corps with authority and funds to first accomplish a reconnaissance and feasibility study and, then, to design and construct the project. Local sponsors share the study and construction costs with the Corps and usually pay for all operation and maintenance costs. This approach may be used to address any one of a variety of water resource problems, including navigation, flood risk management and ecosystem restoration.

PARTNERING WITH FEMA ON FLOODPLAIN MAPPING

Both the Corps and FEMA have a long history of partnering on floodplain mapping as part of the NFIP. Over the past 30 years, the Corps has completed more than 3,000 studies for FEMA related to identifying the flood potential of various areas across the country. These studies involved activities such as flood plain delineations and detailed flood insurance studies. In August 2005, both agencies signed an agreement that further streamlined the process for the Corps to provide flood plain mapping and other related services to FEMA.

The Corps cooperates with FEMA and other federal, state and local agencies through numerous avenues in support of FEMA's floodplain mapping efforts. Currently, the Corps and FEMA partnership is the strongest it has ever been. The Corps and FEMA will continue this partnership as FEMA transitions into their Risk Mapping, Analysis, and Planning (RiskMAP) program.

SILVER JACKETS PROGRAM - AGENCY COLLABORATION

The Silver Jackets program is an interagency team with members that have some aspect of flood risk management/reduction as part of their mission. Traditionally, different agencies wear different colored jackets when responding to emergencies. The name Silver Jackets is used to underscore the common mission of the diverse agencies involved.

Silver Jackets includes more than 12 active federal, state, regional and professional agencies and organizations. Their focus over the past year has been on flood risk management outreach and learning others' programs. The team developed an interagency flood risk management program guide that lists all Federal, State and regional flood related programs. Most recently, the team met to discuss the recent flooding and the actions each agency took during and after the event. Flood related issues and how our programs can be used continue to be discussed among the various agencies.

The Pennsylvania Silver Jackets team recently submitted a proposal for a flood inundation mapping project for the City of Harrisburg and several adjacent communities. The proposed project leverages resources from the Corps, Susquehanna River Basin Commission, U.S. Geologic Survey, National Weather Service, Pennsylvania Emergency Management Agency, Federal Emergency Management Agency and The Harrisburg Authority. The project will provide a graphical extension to river forecasts issued by the National Weather Service in partnership with the Susquehanna River Flood Forecast and Warning System. The Harrisburg pilot project was selected to move forward.

CONCLUSION

Thank you for the opportunity to provide a comprehensive review of our role and programs for flood risk management, and an understanding of Corps programs for flood risk management. The Corps uses its authorities, programs and role in flood risk management to the optimum and maximum extent in order to reduce the risk to life, structures and property. We are all responsible for our safety.

This concludes my testimony and I would be happy to answer any questions you or other members of the Subcommittee may have.