# U.S. House of Representatives
## Committee on Transportation and Infrastructure
### Washington, DC 20515

James L. Oberstar
Chairman

David Heymsfeld, Chief of Staff
Ward W. McCarragher, Chief Counsel

John L. Mica
Ranking Republican Member

James W. Coon II, Republican Chief of Staff

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**SUMMARY OF SUBJECT MATTER**

**TO:** Members of the Subcommittee on Water Resources and Environment and Members of the Subcommittee on Economic Development, Public Buildings, and Emergency Management

**FROM:** Subcommittees on Water Resources and Environment and Economic Development, Public Buildings, and Emergency Management Staff

**SUBJECT:** Hearing on "National Levee Safety and Dam Safety Programs"

## PURPOSE

The Subcommittees on Water Resources and Environment and Economic Development, Public Buildings, and Emergency Management are scheduled to meet on Tuesday, May 8, 2007, at 10:00 a.m., in Room 2167 of the Rayburn House Office Building, to jointly receive testimony regarding the state of our nation's levee and dam safety programs. Witnesses will include representatives from the United States Army Corps of Engineers ("Corps"), the Federal Emergency Management Agency ("FEMA"), the American Society of Civil Engineers, the Association of State Dam Safety Officials, the National Association of Flood and Stormwater Management Agencies, and the Association of State Floodplain Managers.

## LEVEE SAFETY BACKGROUND

The Corps has constructed nearly 9,000 miles of the nation's estimated 15,000 miles of levees. On the federal level, new levee construction requires complex engineering and its capacity is based on a level of protection that is justified by an analysis of the risks, costs, and benefits of constructing the project. There are strict engineering standards required when a federal levee is designed and built.

FEMA has defined a levee in the National Flood Insurance Program regulations as "a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding." Its primary function is flood protection.

There are undoubtedly thousands of miles of other levees built by other Federal agencies, states, towns, farmers, and landowners. Some of these levees are well built and well maintained; others are not. What we know about the existence and condition of these other levees we often learn when one fails or is overwhelmed by a flood event.

Levees must be maintained. Planting grass on a levee helps to prevent erosion, however trees and shrubs have root systems that can form a conduit for water and weaken the structure. Except for the mainline levees of the lower Mississippi River, maintenance of levees constructed by the Corps is a non-federal responsibility. Little is known about the current condition of Federal or non-federal levees, including whether these levees were designed to meet current conditions, or whether they have been properly maintained by the non-federal interest.

Although rare, failure of flood damage reduction infrastructure does occur, and has become more frequent in recent years. Unlike dams, levees are not designed to be overtopped by floodwaters for an extended period of time. Levees are also not designed to abut a waterbody for longer than a storm event or seasonal water level. If this occurs, it can cause erosion of the soils in, under, and around the levee. In addition, some levees fail due to inadequate maintenance, inappropriate materials, poor design, or poor construction methods. In some cases, levees are subject to the variable subsidence of a region resulting in the levees being lower than when built.

Levees are typically built in a certain location and to a specified height to provide a certain level of flood protection. The level of protection provided by a levee may change with time due to natural or man-made changes. Natural changes may include land subsidence, sedimentation, and vegetative growth in the floodway. Land use changes in an area such as upstream development can induce hydrologic changes including faster runoff that will reduce the level of protection provided by a levee.

Levees provide flood damage reduction benefits as well as economic development opportunities. However, structurally deficient or antiquated levees present a risk to public safety and economic infrastructure. While statutory authorities like Section 10 of the Rivers and Harbors Act of 1899, the Clean Water Act, and the National Flood Insurance Program may influence control over federal and non-federal levees, there is no minimum standard to regulate the design, placement, construction, or maintenance of non-federal levees built by private individuals or public entities.

People and property behind a levee are always subject to some level of risk. However, people living and working behind levees are often unaware of the risk. That risk may have to do with the height or the condition of the levee or the risk that a flood event will occur that is greater than the design of the levee.

For urban areas, the Federal Government typically designs levees and flood damage reduction projects around a one percent annual probability of such an event, more commonly referred to as a "100-year flood", as the minimum standard for identifying, mapping, and managing flood hazards. Often in urban areas, a greater level of protection is warranted and larger levees are constructed. Levees that protect agricultural lands typically are designed to protect against smaller floods that are more likely to occur in a given year, such as a flood with an annual probability of 20 percent, more commonly referred to as a "five-year flood".

FEMA operates the National Flood Insurance Program as a way to manage flood risk without having to rely on Federal disaster assistance. In the United States, there is only a small private insurance market for flood insurance. Participating communities are expected to adopt building codes and other types of activities that will reduce losses posed by a 100-year flood. However, structures built behind the protection of 100-year levees are not designated as being within the floodplain, and therefore occupants within these areas are not required to participate in the National Flood Insurance Program. FEMA does require levees protecting flood-prone areas to be certified for structural soundness, proper maintenance, and provide protection against a 100-year flood. The Army Corps of Engineers performs a majority of these certifications; however, this process is currently not designed to assess the geotechnical conditions of the levees or the hydrological conditions of the areas to be protected. While levee structures may be sound, the underlying geology or hydrology may impact the structure. Performing this type of assessment will represent a significant cost for the Army Corps of Engineers, communities, and levee districts. The Corps estimates that to perform these types of assessments for the 1,600 miles of levees in California's Central Valley will cost $100 million, or $60,000 per mile of levee. For Fiscal Year 2006, the Corps had $30 million to begin an inventory and conduct some assessments of federally-constructed levees nationwide. The Administration requested $20 million to continue this inventory and assessment process in Fiscal Year 2007 and $10 million for fiscal 2008.

While some States have programs to regulate levees constructed by non-federal entities, the majority of States do not have such programs. Those States that have programs are in response to the National Flood Insurance Program or regulatory programs that require localities to control land use or implement other floodplain management measures. Under the National Flood Insurance Program, FEMA can exempt communities from certain requirements of the program if the communities can show that the levees protecting them are designed, constructed, located, and maintained according to certain criteria. The accuracy of maps used by FEMA to define flood hazard areas are currently under review, as more than 75 percent of the maps are more than 10 years old, raising concerns that hydrologic data has changed since the maps were last reviewed.

A 2004 analysis by the Army Corps of Engineers found some locations along the Missouri River where the 100-year flood elevation is four feet higher than what was shown on previous flood maps. As FEMA updates its maps through its Map Modernization Initiative, some communities that were once thought to be protected from the 100-year flood event may find themselves with less protection and subjected to different flood insurance requirements.

## RECENT ISSUES

In recent years, there has been much activity and concern about the condition and safety of levees around the country. The hurricane season of 2005 dramatically demonstrated the consequences of levee overtopping and failure when New Orleans flooded after levees failed during Hurricane Katrina. In addition, the Corps completed an initial review of levees and identified 122 levees that are determined to have unacceptable maintenance. *See attached list.* The State of California has also conducted a review of its levees and identified 29 critical sites. In the fall of 2006, California passed a $4.09 billion general obligation bond dedicated to levee repair work.

A "Flood Risk Policy Summit of 2006"was convened in December 2006 that brought together more than 60 professionals from Federal and state governments, flood risk managers,

engineering professionals, natural resource specialists, and others. There are a number of recommendations that resulted from this meeting.

In April 2007, the Association of State Floodplain Managers and the National Association of Flood and Stormwater Management Agencies issued joint recommendations for a national levee policy that resulted from the 2006 Summit. A few of the recommendations include:

- establishing a National Levee Inventory and National Levee Safety Program – beyond just a federally funded assessment of levees, a safety program needs to be developed that takes into account the role of States, regional flood management authorities, and non-federal sponsors;
- providing incentives and disincentives based on effective local, regional, and state actions;
- considering public safety and other issues on equal footing determinations of national economic benefits in Corps project formulation and analysis; and
- require better operation and maintenance of flood risk reduction structures -- developing incentives to properly maintain and disincentives for improper maintenance of flood damage reduction projects.

In addition to the wide-ranging condition of levees, it is prudent to also consider the impact from changing natural conditions such as sea level rise and climate change. Both of these changes have dramatic implications for new and existing flood- and storm-damage reduction infrastructure, such as levees. For example, according to National Oceanic and Atmospheric Administration ("NOAA") estimates, a potential storm surge from a category 3 hurricane (estimated 12-15 feet without waves) at the end of the century combined with a mean sea level rise and land subsidence in New Orleans could result in a storm surge of 12 to 15 feet above the city's present altitude. Predicted increases in storm severity in the eastern United States and faster snow melt in the mountains of the western United States will increase burdens on existing and planned flood damage reduction systems.

## PRIOR LEGISLATIVE AND OVERSIGHT ACTIVITY

In the 109th Congress, the Subcommittee on Water Resources and Environment held a hearing on April 6, 2006, to oversee levee safety issues and the need for legislative action. On July 28, 2006, the Committee on Transportation and Infrastructure reported H.R. 4650, the Levee Safety Program Act of 2005, to the House. No further action was taken.

In the 110th Congress, Representative Schmidt introduced H.R. 1587, the National Levee Safety Program Act of 2007. This legislation is modeled on H.R. 4650 from the 109th Congress.

## DAM SAFETY BACKGROUND

In 1972, Congress directed the Secretary of the Army to undertake a national program on the inspection of dams (P.L. 92-367). The Water Resources Development Act of 1996 (P.L. 104-303) amended that Act to establish the National Dam Safety Program as a partnership of States, Federal agencies, and other stakeholders to encourage individual and community responsibility for dam safety. The National Dam Safety Program Act has as its mission to "...reduce the risks to life

and property from dam failure in the United States through the establishment and maintenance of an effective national dam safety program to bring together the expertise and resources of the federal and non-federal communities in achieving national dam safety hazard reduction."

Since its creation, the National Dam Safety Program has helped to mitigate the risk of dam failure by providing technical and financial assistance to state dam safety officials. There are approximately 80,000 dams in the United States; of these, approximately 10,000 dams are considered to have high-hazard potential, meaning their failure could result in loss of life or severe property damage. Private individuals, corporations, and state and local governments own more than 95 percent of the dams in the United States, making state dam safety officials our first line of defense in preventing dam failures and mitigating the effects through the development of Emergency Action Plans. A primary function of the National Dam Safety Program is to increase the level of knowledge and preparedness to prevent and mitigate the effects of dam failures.

The Act includes:
1) a National Dam Inventory to provide to the public periodically updated information on the inventory of dams in the United States;
2) an Interagency Committee on Dam Safety to encourage the establishment and maintenance of effective federal and state programs, policies and guidelines intended to enhance dam safety;
3) a National Dam Safety Program, including a strategic plan, a National Dam Safety Review Board and grant assistance to the states to provide vital support for the improvement of the state dam safety programs that regulate most of the dams in the United States;
4) a dam safety research effort for technical and archival research; and
5) dam safety training for state dam safety staff and inspectors.

## PRIOR LEGISLATIVE AND OVERSIGHT ACTIVITY

In the 109th Congress, the Subcommittee on Economic Development, Public Buildings, and Emergency Management held a hearing on the National Dam Safety Program on July 26, 2006.

On September 14, 2006, the Subcommittee recommended H.R. 4981, a bill to reauthorize the National Dam Safety Program, favorably to the full Committee. On September 20, 2006, the Committee on Transportation and Infrastructure reported the bill to the House. On September 27, the House passed H.R. 4981. On December 9, 2006, the House passed a similar Senate bill, S. 2735, which became Public Law 109-460.