

## **Chapter 5**

### **Flood Plain Issues**

#### **Introduction**

For regulatory purposes, a floodplain is divided into two components: the floodway and the flood fringe. The floodway is the portion of the floodplain that generally must be preserved for the movement of floodwater. It conveys the deeper, higher velocity flood flow. The flood fringe is the portion of the floodplain outside the limits of the floodway. Flood fringe areas are “storage” areas, characterized by generally shallow, slower moving floodwaters.

Any development in a floodplain, such as aggregate operations, are regulated by the federal government through our counties or zoning regulations. Floodplain Development Permits are required. The regulations and permits are discussed further in this chapter.

A complete list of forms, documents and software can be found at:

[http://www.fema.gov/fhm/frm\\_main.shtm](http://www.fema.gov/fhm/frm_main.shtm)

#### **Floods and Floodplains in Ohio**

Floodplains are low, flat areas bordering watercourses that serve as storage and flow areas for excess water. In the case of riverine flooding, “normal” daily flows remain in the stream channel. However, when rapid snowmelt, severe thunderstorms or prolonged rainfall occurs, the flow of water exceeds the channel and extends across the floodplain. This “runoff” is carried south into the Ohio River and north into Lake Erie. Flooding is therefore a natural component of the hydrologic cycle.

Ohio’s river systems and coastal areas, including the corresponding floodplain areas, have played a major role in the state’s economic progress and growth. Throughout Ohio’s history, floodplains have attracted development. Fertile soil, flat terrain and an abundance of water have encouraged agriculture, commerce and industry along Lake Erie, the Ohio River, and major tributaries throughout the state.

Negative aspects of development in floodplains areas have been the exposure of properties to flood damage and risk to human life. In fact, Ohio has a tragic flood history. In March 1913, known as Ohio’s largest flood disaster, approximately 100 cities and communities were devastated by floodwaters, and 467 people died. In 1990, the Shadyside Flood killed 26 people. Other major flood events occurred in 1936, 1937, 1959, 1982, 1987, 1989, 1990, 1992, 1995, 1996, 1997, and 1998. Flooding is Ohio’s primary natural hazard.

#### **Floodplain Management**

Since its inception in 1968, the National Flood Insurance Program (NFIP) has provided federally backed flood insurance to encourage communities to enact and enforce floodplain management regulations. The NFIP is a voluntary program based upon an agreement between local communities and the federal government. This agreement states that if the community

implements and enforces a floodplain management program to reduce future flood risks to new development in special flood hazard areas, the federal government will make flood insurance available within the community. Flood insurance provides financial protection to safeguard property owners against potential flood losses.

To be covered by a flood insurance policy, a property must be in a community that participates in the NFIP. To qualify for the program, a community adopts and enforces floodplain management regulations for development in flood hazard areas. The two basic objectives of the regulations are to ensure that development will not aggravate existing flooding conditions and that new buildings will be protected from flood damage. Today more than 19,000 communities participate in the NFIP.

### **Authority for Ohio communities to Regulate Floodplains**

The enabling authority for counties to participate in the NFIP is found in Section 307.37 of the ORC, which states:

*A county building code may include regulations for participation in the national flood insurance program established in the “Flood Disaster Protection Act of 1973,” . . . and regulations adopted for the purposes of section 1506.04 or 1506.07 of the Revised Code governing the prohibition, location, erection, construction, redevelopment, or flood proofing of new buildings or structures, substantial improvements to existing buildings or structures, and other development in unincorporated territory within flood hazard areas.*

Under Ohio law, townships do not have enough home rule authority delegated to them to qualify for participation in the NFIP independently; rather townships are included under the county’s NFIP participation. However, several townships in Ohio with zoning regulations have adopted a zoning overlay district or similar language for floodplain areas.

### **National Flood Insurance Program Summary**

The NFIP is administered by the Federal Emergency Management Agency (FEMA), and coordinated in the State of Ohio by the Ohio Department of Natural Resources, Division of Water. FEMA has been given the responsibility to identify and map the flood hazard areas of all communities. Local communities have the responsibility to regulate all development within identified flood hazard areas in compliance with minimum flood damage reduction criteria if they wish to participate in the NFIP. Minimum requirements are as follows:

- ! Permits must be obtained for all proposed construction or development.
- ! Structures must be anchored to prevent flotation and lateral movement.
- ! All new residential structures and substantial improvements in flood hazard areas must have the lowest floor (including basement) elevated to or above the 100-year flood elevation.
- ! All new nonresidential structures and substantial improvements in flood hazard areas must be elevated or flood proofed to or above the 100-year flood elevation.
- ! Development in floodways that will cause any increase in the 100-year flood elevation must be prohibited.

The communities must agree to review all structural or nonstructural development proposed in a federally identified special flood hazard area (SFHA). The SFHA is that area subject to inundation in the event of a 100-year flood.

The federal government initially identifies community flood hazard areas through the issuance of Flood Hazard Boundary Maps. These maps identify the flood areas without providing flood elevation data. Flood hazard areas on these maps are identified as “Zone A”. Further study by the government or its agents results in the Flood Boundary and Floodway Maps (FBFM). These maps give 100 year flood elevations, the 100 year floodplain boundary, the 500-year floodplain boundary, and delineate the “floodway”. Another type of map, entitled the Flood Insurance Rate Map (FIRM) includes the 100-year flood elevations and designated insurance rate zones. Since 1985, the two types of maps have been combined into a new FIRM map.

These maps are available from the Ohio Department of Natural Resources, Division of Water, Floodplain Management Program located in Building E, Fountain Square, and Columbus, Ohio. The phone number is 614.265.6750.

### **Evaluation of the Proposed Development**

The base flood elevation, or 100-year profile, is considered the basis for the limits of the floodplain. The location in the floodplain of the proposed development has a significant effect on the development requirements. Development outside the floodway fringe areas is not governed by the NFIP floodplain regulations. Within the floodway fringe, new development or substantial improvements to existing structures is allowed, provided that all residential developments are elevated to or above the base flood level, and nonresidential development is elevated or flood proofed to or above the base flood elevation. Development within the regulatory floodway is allowed only if there is no resulting increase in flood elevations.

An initial step for a proposed development is to determine its location with respect to the floodplain fringe and floodway delineated areas. The developer should obtain the appropriate FBFM or FIRM map for showing the delineated areas. Then, if needed, a field survey can be conducted to determine whether the site actually lies outside the floodplain or within the floodplain fringe or floodway. A survey is more accurate than relying strictly on the maps. If the flood maps show the property to be within the floodway fringe, but the field surveys show otherwise, the owner may request a Letter of Map Amendment from FEMA.

Under certain circumstances, an engineering analysis is required to establish the floodway. Examples requiring an analysis are:

- ! when the site is in an unnumbered “A Zone” where no flood elevation data is available and the proposed development involves 5 acres or more;
- ! when the site is in an area where base flood data is available but no floodway has been computed.

In these circumstances a hydraulic analysis must be performed to establish the floodway. This analysis is performed through a backwater analysis using a surface profile software, such as the Corps of Engineers' HEC-2 software.

Floodways are determined in the software by simulating encroachments or loss of conveyance on each side of the floodplain. That is, portions of the floodplain are assumed in the computer model to be "filled in", or otherwise obstructed on each side, resulting in equal reductions in conveyance of floodwaters. This procedure assures that property owners on each side of the watercourse will have the same development rights. The computer model simulates the encroachment; reducing the width of the flood, flow path. The discharge that formerly flowed through the filled over bank area is now contained in the narrower flow path (floodway); consequently the water surface elevation increases. Under NFJP minimum standards, the allowable degree of encroachment is "limited" by a maximum increase in water surface elevation of one-foot at any point along the watercourse. Some communities have chosen a NFIP study based on a one-half (0.5) foot rise in flood elevation. Generally, the smaller the allowable rise, the greater the portion of the total 100-year floodplain that is reserved as floodway.

### **Summary**

An operator can build plants, excavate, construct levees, etc. within the floodway fringe that has been established through a FIRM map. If the fringe and floodway have not been delineated as in "Zone A" areas, an engineer familiar with the HEC-2 program needs to be hired to demonstrate through hydrologic and hydraulic analysis, that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not result in any more than a one foot increase, at any point, to the water surface elevation of the 100 year flood elevation. A Development Permit is required in both cases.

If an operator wishes to propose an activity in a delineated floodway, such as construction of a levee, then again an engineered study needs to be performed to show no increase in the 100-year flood elevation as a result of the activity.

### **Administration of Local Floodplain Management Regulations**

Participation in the NFIP requires that a community have an administrative system to issue permits for all proposed construction and other developments, nonstructural included, within flood hazard areas. It is important to understand that "development" refers to any manmade change to the floodplain. This definition is expanded beyond the scope of the building permit to address any alterations of the landscape, such as excavation or fill, which may affect drainage patterns and the flow of water during a flood. Any development that can result in an increase or change to an identified flood hazard area requires a permit.

NFIP regulations require that the local community designate an official to be responsible for implementation and enforcement of the local floodplain management regulations. Anyone proposing development within the 100-year floodplain area must obtain and complete an application for the development prior to beginning the activity. The application for permit should be submitted to the local floodplain administrator for review and approval.