

# Attachment 3

Excerpts from Local, State and Federal  
Floodplain Management Regulations

Ordinance No. 188

**FLOOD DAMAGE PREVENTION ORDINANCE  
OF THE TOWN OF HAMILTON**

Whereas, the Legislature of the State of Washington has delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

Whereas, the flood hazard areas of Hamilton are subject to periodic inundation which results in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare; and

Whereas, These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to the flood loss; and

Whereas, this ordinance is prepared in codified form to facilitate the codification of ordinances at a later date;

NOW THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF HAMILTON AS FOLLOWS:

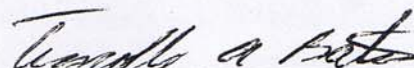
**SECTION 1.** The document attached as Exhibit A, incorporated by reference as though set forth in full, is hereby enacted, and shall be known as the "Flood Damage Prevention Ordinance of the Town of Hamilton," and shall be referred to by titles and section numbers used therein.

**SECTION 2.** Ordinance No. 135, dated July 13, 1987, shall have no application to development governed by this ordinance. However, it shall apply to any development occurring prior to the effective date of this ordinance.

**SECTION 3.** The provisions of this ordinance are declared to be separate and severable. The validity of any clause, sentence, paragraph, subdivision, section or portion of this ordinance, or the validity of the application thereof to any person, owner, or circumstance shall not effect the validity of the remainder of the ordinance, or the validity of this application to other persons, owners, or circumstances.

**SECTION 4.** This ordinance shall be effective after passage and publication as provided by law.

PASSED AND APPROVED this 11 day of October, 1994.

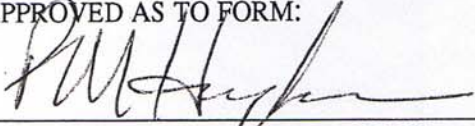
  
\_\_\_\_\_  
MAYOR TIMOTHY A. BATES

ATTEST:



TOWN CLERK, DELILAH SUTTON

APPROVED AS TO FORM:



TOWN ATTORNEY, PATRICK M. HAYDEN



## Exhibit A

### FLOOD DAMAGE PREVENTION ORDINANCE

#### SECTION 1.0 STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE, AND OBJECTIVES

##### 1.1 STATUTORY AUTHORIZATION

The Legislature of the State of Washington has delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry.

##### 1.2 FINDINGS OF FACT

- (1) The flood hazard areas of Hamilton are subject to periodic inundation which results in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
- (2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to the flood loss.

##### 1.3 STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- (1) To protect human life and health;
- (2) To minimize expenditure of public money and costly flood control projects;
- (3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (4) To minimize prolonged business interruptions;
- (5) To minimize damage to public facilities and utilities such as water and gas mains, electric telephone and sewer lines, streets, and bridges located in areas of special flood hazard;
- (6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- (7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and
- (8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

##### 1.4 METHODS OF REDUCING FLOOD LOSSES

In order to accomplish its purposes, this ordinance includes methods and provisions for:

- (1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;



- (2) Requiring that uses vulnerable to flood, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- (3) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- (4) Controlling filling, grading, and other development which may increase flood damage; and
- (5) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or may increase flood hazards in other areas.

## SECTION 2.0 DEFINITIONS

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application.

“ADMINISTRATOR” means the Mayor or his designee appointed for purposes of administering the requirements of this Ordinance.

“APPEAL” means a request for a review of the Town of Hamilton’s interpretation of any provision of this ordinance or a request for a variance.

“AREA OF SHALLOW FLOODING” means a designated AO or AH Zone on the flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; ca clearly defined channel does not exist; The path of flooding is unpredictable and indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.

“AREA OF SPECIAL FLOOD HAZARD” means the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. Designation on maps always included the letters A or V.

“BREAKAWAY WALL” means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

“CRITICAL FACILITY” means a facility for which even a slight chance of flooding might be too great. Critical facilities include, but are not limited to schools, nursing homes, hospitals, police, fire and emergency response installations, installations which produce, use, or store hazardous materials or hazardous waste.

“DEVELOPMENT” means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations located within the area of special flood hazard.

“FLOOD” or “FLOODING” means a general and temporary condition of partial or complete inundation of normally dry land areas from:

- (1) The overflow of inland or tidal waters and/or
- (2) The unusual and rapid accumulation of runoff of surface waters from any source.

“FLOOD INSURANCE RATE MAP (FIRM)” means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.



“FLOOD INSURANCE STUDY” means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map, and the water surface elevation of the base flood.

“FLOODWAY” means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

“LOWEST FLOOR” means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building’s lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements, of this ordinance found at Section 5.2-1(2).

“MANUFACTURED HOME” means a structure, including mobile homes, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For flood plain management purposes the term “manufactured home” also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes the term “manufactured home” does not include part trailers, travel trailers, and other similar vehicles.

“MANUFACTURED HOME PARK OR SUBDIVISION” means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

“NEW CONSTRUCTION” means structures for which the “start of construction” commenced on or after the effective date of this ordinance.

“START OF CONSTRUCTION” includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundation or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

“STRUCTURE” means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

“SUBSTANTIAL IMPROVEMENT” means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either:

- (1) before the improvement or repair is started, or
- (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:



- (1) any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or
- (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

“VARIANCE” means a grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance.

“WATER DEPENDENT” means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

### SECTION 3.0 GENERAL PROVISIONS

#### 3.1 LANDS TO WHICH THIS ORDINANCE APPLIES

This ordinance shall apply to all areas of special flood hazards within the jurisdiction of the Town of Hamilton.

#### 3.2 BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD

The areas of special flood hazard identified in the Federal Insurance Administration in a scientific and engineering report entitled “The Flood Insurance Study for the local unit dated November 27, 1981, with accompanying Flood Insurance Maps, and any subsequent changes, amendments, and additions thereto, is hereby adopted by reference and declared to be a part of this ordinance. The Flood Insurance Study is on file at Hamilton Town Hall.

*pre firm  
before  
1981  
or  
1984?*

#### 3.3 PENALTIES FOR NONCOMPLIANCE

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this ordinance and other applicable regulation. Violation of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall upon conviction thereof be fined not more than One Thousand Dollars (\$1,000.00) or imprisoned for not more than ninety (90) days, or both, for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the Town of Hamilton from taking such other lawful action, including injunctive relief, as is necessary to prevent or remedy any violation.

#### 3.4 ABROGATION AND GREATER RESTRICTIONS

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

#### 3.5 INTERPRETATION

In the interpretation and application of this ordinance, all provisions shall be:

- (1) Considered as minimum requirements;
- (2) Liberally construed in favor of the governing body; and
- (3) Deemed neither to limit nor repeal any other powers granted under State statutes.



### 3.6 WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of the Town of Hamilton, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

## SECTION 4.0 ADMINISTRATION

### 4.1 ESTABLISHMENT OF DEVELOPMENT PERMIT

#### 4.1-1 Development Permit Required

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 3.2. The permit shall be for all structures including manufactured homes, as set forth in the "DEFINITIONS", and for all development including fill and other activities, also as set forth in the "DEFINITIONS".

#### 4.1-2 Application for Development Permit

Application for a development permit shall be made on forms furnished by the administrator and may include but not be limited to; plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

- (1) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;
- (2) Elevation in relation to mean sea level to which any structure has been floodproofed;
- (3) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Section 5.2-2; and
- (4) Description of the extent to which a watercourse will be altered or relocated as a result of proposed development.

### 4.2 DESIGNATION OF THE ADMINISTRATOR

The Mayor is hereby appointed to administer and implement this ordinance by granting or denying development permit applications in accordance with its provisions. The Mayor is authorized to designate and appoint additional persons to assist in enforcing the ordinance.

### 4.3 DUTIES AND RESPONSIBILITIES OF THE ADMINISTRATOR

Duties of the administrator shall include, but not be limited to:

#### 4.3-1 Permit Review



- (1) Review all development permits to determine that the permit requirements of this ordinance have been satisfied.
- (2) Review all development permits to determine that all necessary permits have been obtained from those Federal, State, or local governmental agencies from which prior approval is required.
- (3) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the provisions of Section 5.3 are met.

#### 4.3-2 Use of Other Base Flood Data

When base flood elevation data has not been provided in accordance with Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD, the administrator shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, State or other source, in order to administer Section 5.2, SPECIFIC STANDARDS, and 5.3 FLOODWAYS.

#### 4.3-3 Information to be Obtained and Maintained

- (1) Where base flood elevation data is provided through the Flood Insurance Study or required as in Section 4.3-2, obtain and record the actual (as-built) elevation (in relation to mean sea level) of the lowest floor, including basement, of all new or substantially improved structures, and whether or not the structure contains a basement.
- (2) For all new or substantially improved floodproofed structures:
  - (i) verify and record the actual elevation (in relation to mean sea level), and
  - (ii) maintain the floodproofing certifications required in Section 4.1(3).
- (3) Maintain for public inspection all record pertaining to the provisions of this ordinance.

#### 4.3-4 Alteration of Watercourses

- (1) Notify adjacent communities and the Washington State Department of Ecology prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.
- (2) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

#### 4.3-5 Interpretation of FIRM Boundaries

Make interpretations where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 4.4.

### 4.4 VARIANCE PROCEDURE

#### 4.4-1 Appeal Board

- (1) The Town Council of Hamilton shall hear and decide appeals and requests for variances from the requirements of this ordinance.
- (2) The Town Council shall hear and decide appeals when it is alleged that there is an error in any requirement, decision, or determination made by the administrator in the enforcement or administration of this ordinance.



- (3) Those aggrieved by the decision of the Town Council, or any taxpayer, may appeal such decision to the Superior Court of Skagit County, Washington, as provided by law.
- (4) In passing upon such applications, the Town Council shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and:
  - (i) the danger that materials may be swept onto other lands to the injury of others;
  - (ii) the danger to life and property due to flooding or erosion damage;
  - (iii) the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
  - (iv) the importance of the services provide by the proposed facility to the community;
  - (v) the necessity to the facility of a waterfront location, where applicable;
  - (vi) the availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
  - (vii) the compatibility of the proposed use with existing and anticipated development;
  - (viii) the relationship of the proposed use to the comprehensive plan and flood plain management program for that area;
  - (ix) the safety of access to the property in times of flood for ordinary and emergency vehicles;
  - (x) the expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and
  - (xi) the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.
- (5) Upon consideration of the factors of Section 4.4-1(4) and the purposes of this ordinance, the Town Council may attach such conditions to the granting of variances as it deems necessary to further the purposes of this ordinance.
- (6) The administrator shall maintain the records of all appeal actions and report any variances to the Federal Insurance Administration upon request.

#### 4.4-2 Conditions for Variances

- (1) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (i - xi) in Section 4.4-1 (4) have been fully considered. As the lot size increases the technical
- (2) Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in this section.
- (3) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.
- (4) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- (5) Variances shall only be issued upon:
  - (i) A showing of good and sufficient cause;



- (ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
  - (iii) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public as identified in Section 4.1-4 (4), or conflict with existing local laws or ordinances.
- (6) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.
- (7) Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except 4.4-2(1), and otherwise complies with Sections 4.1-1 and 5.1-2 of the GENERAL STANDARDS.
- (8) Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

## SECTION 5.0 PROVISIONS FOR FLOOD HAZARD REDUCTION

### 5.1 GENERAL STANDARDS

In all areas of special flood hazards, the following standards are required:

#### 5.1-1 Anchoring

- (1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.
- (2) All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).

#### 5.1-2 Construction Materials and Methods

- (1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
- (2) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
- (3) Electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities shall be designed and / or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

#### 5.1-3 Utilities



- (1) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
- (2) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters; and,
- (3) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

#### 5.1-4 Subdivision Proposals

- (1) All subdivision proposals shall be consistent with the need to minimize flood damage;
- (2) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage;
- (3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and,
- (4) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or 5 acres (whichever is less).

#### 5.1-5 Review of Building Permits

Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (Section 4.3-2), applications for building permits shall be reviewed to assure that proposed construction will be reasonable safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

### 5.2 SPECIFIC STANDARDS

In all areas of special flood hazards where base flood elevation data has been provided as set forth in Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD or Section Use of Other Base Flood Data, the following provisions are required:

#### 5.2-1 Residential Construction

- (1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot or more above base flood elevation.
- (2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
  - (i) A minimum of two openings have a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
  - (ii) The bottom of all openings shall be no higher than one foot above grade.



- (iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry or exit of floodwaters.

#### 5.2-2 Nonresidential Construction

New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated one foot or more above the level of the base flood elevation; or together with attendant utility and sanitary facilities, shall:

- (1) be floodproofed so that below one foot above the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
- (2) have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
- (3) be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 4.3-3(2);
- (4) nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 5.2-1(2).
- (5) applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to one foot above the base flood level will be rated as at the base flood level).

#### 5.2-3 Critical Facility

Construction of new critical facilities shall be, to the extent possible, located outside the limits of the base flood plain. Construction of new critical facilities shall be permissible within the base flood plain if no feasible alternative site is available. Critical facilities constructed within the base flood plain shall have the lowest floor elevated to three feet or more above the level of the base flood elevation at the site. Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into flood waters. Access routes elevated to or above the level of the base flood plain shall be provided to all critical facilities to the extent possible.

#### 5.2-4 Manufactured Homes

All manufactured homes to be placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is one foot or more above the Base Flood Elevation; and be securely anchored to an adequately anchored foundation system in accordance with the provisions of section 5.1-1(2).

### 5.3 FLOODWAYS

Located within areas of special flood hazard established in Section 3.2 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provisions apply:



- (1) Prohibit encroachments, including fill, new construction, substantial improvements, and other development unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
- (2) Construction or reconstruction of residential structures is prohibited within designated floodways, except for (i) repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (ii) repairs, reconstruction or improvements to a structure, the cost of which does not exceed 50 percent of the market value of the structure either, (A) before the repair, reconstruction, or repair is started, or (B) if the structure has been damaged, and is being restored, before the damage occurred. Work done on structures to comply with existing health, sanitary, or safety codes or to structures identified as historic places shall not be included in the 50 percent.
- (3) If Section 5.3(1) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Section 5.0, PROVISIONS FOR FLOOD HAZARD REDUCTION.

#### 5.4 WETLANDS MANAGEMENT

To the maximum extent possible, avoid the short and long term adverse impacts associated with the destruction of modification of wetlands, especially those activities which limit or disrupt the ability of the wetland to alleviate flooding impacts. The following process should be implemented:

- (1) Review proposals for development within base flood plains for their possible impacts on wetlands located within the flood plain.
- (2) Ensure that development activities in or around wetlands do not negatively affect public safety, health, and welfare by disrupting the wetlands' ability to reduce flood and storm drainage.
- (3) Request technical assistance from the Department of Ecology in identifying wetland areas. Existing wetland map information from the National Wetlands Inventory (NWI) can be used in conjunction with the community's FIRM to prepare an overlay zone indicating critical wetland areas deserving special attention.

#### 5.5 STANDARDS FOR SHALLOW FLOODING AREAS (AO ZONES)

Shallow flooding areas appear on FIRM's as AO zones with depth designations. The base flood depths in these zones range from 1 to 3 feet above ground where a clearly defined channel does not exist, or where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is usually characterized as sheet flow. In these areas, the following provisions apply:

- (1) New construction and substantial improvements of residential structures within AO zones shall have the lowest floor (including basement) elevated above the highest grade adjacent to the building, one foot or more above the depth number specified on the FIRM (at least two feet if no depth number is specified).
- (2) New Construction and substantial improvements of nonresidential structures within AO zones shall either:
  - (i) have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, one foot or more above the depth number specified on the FIRM (at least two feet if no depth number is specified); or



- (ii) together with attendant utility and sanitary facilities, be completely flood proofed to or above that level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effect of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect as in section 5.2-2(3).
  - (3) Require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.
-



## Chapter 173-158 WAC

### FLOOD PLAIN MANAGEMENT

Last Update: 7/16/02

#### WAC

173-158-010	Authority.
173-158-020	Purpose.
173-158-030	Definitions.
173-158-040	Regulatory area.
173-158-045	Technical assistance.
173-158-050	Criteria for land management and use.
173-158-064	Additional state requirements.
173-158-070	Additional floodway requirements.
173-158-075	Existing farmhouse standards.
173-158-076	Substantially damaged residential dwellings other than farmhouses.
173-158-080	Wetlands management.
173-158-084	Submittal of local ordinances.
173-158-086	Local option to exceed minimum requirements.
173-158-090	Penalties and enforcement.
173-158-120	Variances.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

173-158-060	Additional state requirements. [Statutory Authority: RCW 86.16.061. 89-07-022 and 90-06-059 (Order 88-57 and 88-57A), § 173-158-060, filed 3/7/89 and 3/6/90, effective 4/6/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-060, filed 5/4/88.] Repealed by 90-21-089, filed 10/19/90, effective 11/19/90. Statutory Authority: RCW 86.16.061.
173-158-100	Local compliance schedule. [Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-100, filed 5/4/88.] Repealed by 90-21-089, filed 10/19/90, effective 11/19/90. Statutory Authority: RCW 86.16.061.
173-158-110	State assumption of regulatory authority. [Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-110, filed 5/4/88.] Repealed by 90-21-089, filed 10/19/90, effective 11/19/90. Statutory Authority: RCW 86.16.061.

**WAC 173-158-010 Authority.** This chapter is adopted pursuant to chapter 86.16 RCW as amended during the 1989 legislative session.

Note: Copies of all statutes, regulations, and other documents cited or referred to in this chapter may be viewed at the Department of Ecology, Mailstop PV-11, Olympia, Washington 98504.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-010, filed 10/19/90, effective 11/19/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-010, filed 5/4/88.]

**WAC 173-158-020 Purpose.** Chapter 86.16 RCW establishes statewide authority for flood plain management through the adoption and administration by local governments of regulatory programs which are compliant with the minimum standards of the National Flood Insurance Program (NFIP). Chapter 86.16 RCW also directs the department of ecology to establish minimum state

WAC (9/5/02 3:28 PM)[ 1 ]



requirements for flood plain management which equal the NFIP minimum standards; to provide technical assistance and information to local governments related to administration of their flood plain management ordinances and the NFIP; to provide assistance to local governments in identifying the location of the one hundred year (base) flood plain; and allows for the issuance of regulatory orders.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-020, filed 10/19/90, effective 11/19/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-020, filed 5/4/88.]

**WAC 173-158-030 Definitions.** For the purposes of this chapter the following definitions shall apply:

"Base flood" means the flood having a one percent chance of being equalled or exceeded in any given year. Also referred to as the "one hundred year flood."

"Best available information" means in the absence of official flood insurance rate map data, communities can use data from other federal, state, or other sources provided this data has either been generated using technically defensible methods or is based on reasonable historical analysis and experience.

"Designated floodway" means the regulatory floodway which has been delineated on the flood insurance rate map (FIRM) or the flood boundary/floodway map (FBFM) of a community's flood insurance study and is included in the community's flood damage prevention ordinance.

"Development" means any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, extraction or drilling operations or storage of equipment or materials.

" Dwelling " means one or more rooms designed for occupancy by a person or family for living and sleeping purposes, containing kitchen facilities and rooms with internal accessibility, for use solely by the dwelling's occupants.

"Encroachment" means any alteration or development within the regulatory floodway that would result in any increase in flood levels during the occurrence of the base flood discharge.

"Existing farmhouse" means a farmhouse which was built prior to the adoption of the local flood insurance rate map and local ordinances implementing the NFIP.

"Farmhouse" means a single family dwelling located on a farm site where resulting agricultural products are not produced for the primary consumption or use by the occupants and the farm



owner.

"Flood or flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters; and/or
- The unusual and rapid accumulation of runoff of surface waters from any source.

"Flood insurance rate map (FIRM)" means the official map on which the federal insurance administration has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

"Floodway" means the channel of a river or other water-course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

"New construction" means structures for which the "start of construction" commenced on or after the effective date of the local ordinance.

"Person" means an individual, partnership, corporation, association, organization, cooperative, public or municipal corporation, or any agency of the state or local governmental unit however designated.

"Replacement residential structure" means a residential structure built as a substitute for a previously existing residential structure of equivalent use and size.

"Residential structure" means a place in which one lives: Dwelling.

"Special flood hazard area" means an area subject to a base or one hundred year flood; areas of special flood hazard are shown on a flood hazard boundary map or flood insurance rate map as Zone A, AO, A1-30, AE, A99, AH, VO, V1-30, VE, or V.

"Structure" means a walled and roofed building, including a gas or liquid storage tank that is principally above ground. Manufactured homes are considered structures.

"Start of construction" includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement, or other improvement was within one hundred eighty days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, or filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or

foundation or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

"Substantial damage" means damage of any origin sustained by a structure where the cost of restoring the structure to its before damage condition would equal or exceed fifty percent of the market value of the structure before the damage occurred.

"Substantial improvement" means any repair, reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either:

- Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement or building official and are the minimum necessary to assure safe living conditions; or
- Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.

"Variance" means a grant of relief from the requirements of this chapter which permits construction in a manner that would otherwise be prohibited by this chapter.

"Wetlands" means lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands have one or more of the following three attributes: At least periodically, the land supports predominantly hydrophytes; the substrate is predominantly undrained hydric soil; and the substrate is nonsoils and is saturated with water or covered by shallow water at some time during the growing season of each year.

[Statutory Authority: Chapter 86.16 RCW. 02-15-093 (Order 00-26), § 173-158-030, filed 7/16/02, effective 8/16/02. Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-030, filed 10/19/90, effective 11/19/90; 89-07-022 and 90-06-059 (Order 88-57 and 88-57A), § 173-158-030, filed 3/7/89 and 3/6/90, effective 4/6/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-030, filed 5/4/88.]

**WAC 173-158-040 Regulatory area.** The minimum regulatory area for state and local flood plain management regulations  
WAC (9/5/02 3:28 PM)[ 4 ]



shall be those areas subject to a base (one hundred year) flood and designated as special flood hazard areas on the most recent maps provided by the Federal Emergency Management Agency (FEMA) for the National Flood Insurance Program (NFIP). Best available information shall be used if these maps are not available or sufficient as determined by the Federal Emergency Management Agency.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-040, filed 10/19/90, effective 11/19/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-040, filed 5/4/88.]

**WAC 173-158-045 Technical assistance.** The department of ecology shall provide technical assistance to local governments in the administration of their flood plain management ordinances. The department shall also assist counties, cities, and towns in identifying the location of the one hundred year flood plain, and petitioning the federal government to alter its designations of where the one hundred year flood plain is located if the federally recognized location of the one hundred year flood plain is found to be inaccurate.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-045, filed 10/19/90, effective 11/19/90.]

**WAC 173-158-050 Criteria for land management and use.** The standards and definitions contained in 44 CFR, Parts 59 and 60 for the National Flood Insurance Program are adopted as the minimum state standards by reference.

[Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-050, filed 5/4/88.]

**WAC 173-158-064 Additional state requirements.** State requirements may be established for specific flood plains that exceed the minimum federal requirements of the NFIP, in accordance with RCW 86.16.031(8) and the following:

(1) A written request must be submitted to the department of ecology by the affected county, city, or town to initiate the process.

(2) The location of the one hundred year flood plain must be reexamined by the affected community and the department of ecology, and has been certified by the department as being

accurate for the affected areas.

(3) The department of ecology shall negotiate with the affected community to determine the content of proposed additional requirements.

(4) The department of ecology shall notify the public of related public meetings and public hearings.

(5) The department of ecology must find that the proposed increased requirements are necessary due to local circumstances and general public safety.

(6) The area where the additional requirements apply is to be clearly identified.

(7) Additional state requirements shall be established as needed in accordance with the required state rule-making procedures.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-064, filed 10/19/90, effective 11/19/90.]

**WAC 173-158-070 Additional floodway requirements.** The following additional state requirements are established in accordance with RCW 86.16.041.

(1) Special flood hazard areas with designated floodways. In addition to those NFIP requirements for designated floodways, communities with designated floodways shall restrict land uses within such areas to include the prohibition of construction or reconstruction of residential structures except for: (a) Repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (b) repairs, reconstruction, or improvements to a structure the cost of which does not exceed fifty percent of the market value of the structure either (i) before the repair, reconstruction, or improvement is started, or (ii) if the structure has been damaged, and is being restored, before the damage occurred. Work done on structures to comply with existing health, sanitary, or safety codes which have been identified by the local code enforcement or building official and are the minimum necessary to assure safe living conditions shall not be included in the fifty percent determination in (b) of this subsection. A residential dwelling located partially within a designated floodway will be considered as totally within a designated floodway and must comply with this chapter. However, the floodway prohibition in this subsection does not apply to existing farmhouses in designated floodways that meet the provisions of WAC 173-158-075, or to residential dwellings other than farmhouses that meet the depth and velocity and erosion analysis provisions of WAC 173-158-076, or to structures



identified as historical places.

(2) Special flood hazard areas without designated floodways. When a regulatory floodway for a stream has not been designated, the community may require that applicants for new construction and substantial improvements reasonably utilize the best available information from a federal, state, or other source to consider the cumulative effect of existing, proposed, and anticipated future development and determine that the increase in the water surface elevation of the base flood will not be more than one foot at any point in the community. Building and development near streams without a designated floodway shall comply with the requirements of 44 CFR 60.3 (b)(3) and (4), and (c)(10) of the NFIP regulations.

[Statutory Authority: Chapter 86.16 RCW. 02-15-093 (Order 00-26), § 173-158-070, filed 7/16/02, effective 8/16/02. Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-070, filed 10/19/90, effective 11/19/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-070, filed 5/4/88.]

**WAC 173-158-075 Existing farmhouse standards.** Repairs, reconstruction, replacement, or improvements to existing farmhouse structures located in designated floodways and which are located on lands designated as agricultural lands of long-term commercial significance under RCW 36.70A.170 shall be permitted subject to the following:

(1) The new farmhouse is a replacement for an existing farmhouse on the same farm site;

(2) There is no potential safe building site for a replacement farmhouse on the same farm site outside the designated floodway or the location requires close proximity to other structures in the farm operation in order to maintain the integrity and operational viability of the farm; in no case shall a replacement be located into an area with higher flood hazards in terms of depths, velocities and erosion;

(3) Repairs, reconstruction, or improvements to a farmhouse shall not increase the total square footage of encroachment of the existing farmhouse;

(4) A replacement farmhouse shall not exceed the total square footage of encroachment of the structure it is replacing;

(5) A farmhouse being replaced shall be removed, in its entirety, including foundation, from the floodway within ninety days after occupancy of a new farmhouse;

(6) For substantial improvements, and replacement farmhouses, the elevation of the lowest floor of the improvement

and farmhouse respectively, including basement, is a minimum one foot higher than the base flood elevation;

(7) New and replacement water supply systems are designed to eliminate or minimize infiltration of flood waters into the system;

(8) New and replacement sanitary sewerage systems are designed and located to eliminate or minimize infiltration of flood water into the system and discharge from the system into the flood waters; and

(9) All other utilities and connections to public utilities are designed, constructed, and located to eliminate or minimize flood damage.

[Statutory Authority: Chapter 86.16 RCW. 02-15-093 (Order 00-26), § 173-158-075, filed 7/16/02, effective 8/16/02.]

**WAC 173-158-076 Substantially damaged residential dwellings other than farmhouses.** For all substantially damaged residential structures, other than farmhouses, located in a designated floodway, the department, at the request of the local government, is authorized to assess the risk of harm to life and property posed by the specific conditions of the floodway. Based upon scientific analysis of depth, velocity, flood-related erosion and debris load potential, the department may exercise best professional judgment in recommending to the local permitting authority repair, replacement or relocation of a substantially damaged structure. The property owner shall be responsible for submitting to local government any information necessary to complete the assessment required by this section when such information is not otherwise available.

(1) Recommendation to repair or replace a substantially damaged residential structure located in the regulatory floodway shall be based on the flood characteristics at the site. In areas of the floodway that are subject to shallow and low velocity flooding, low flood-related erosion potential, and adequate flood warning time to ensure evacuation, the department may recommend the replacement or repair of the damaged structure. Any substantially damaged residential structure located in the regulatory floodway in a high risk zone based on the flood characteristics will not be recommended to be repaired or replaced. Flood warning times must be twelve hours or greater, except if the local government demonstrates that it has a flood warning system and/or emergency plan in operation. For purposes of this paragraph flood characteristics must include:

(a) Flood depths can not exceed more than three feet; flood velocities cannot exceed more than three feet per second.



(b) No evidence of flood-related erosion. Flood erosion will be determined by location of the project site in relationship to channel migration boundaries adopted by the local government. Absent channel migration boundaries, flood erosion will be determined by evidence of existing overflow channels and bank erosion.

At the request of local government, the department will prepare a report of findings and recommendations for local government concurrence on repair or replacement of substantially damaged residential structures located in the regulatory floodway.

Without a recommendation from the department for the repair or replacement of a substantially damaged residential structure located in the regulatory floodway, no repair or replacement is allowed per WAC 173-158-070(1).

(2) Before the repair, replacement, or reconstruction is started, all requirements of the National Flood Insurance Program, the state requirements adopted pursuant to RCW 86.16.031(8), and all applicable local regulations must be satisfied. In addition the following conditions must be met:

(a) There is no potential safe building location for the replacement residential structure on the same property outside the regulatory floodway.

(b) A replacement residential structure is a residential structure built as a substitute for a previously existing residential structure of equivalent use and size.

(c) Repairs or reconstruction or replacement of a residential structure shall not increase the total square footage of floodway encroachment.

(d) The elevation of the lowest floor of the substantially damaged or replacement residential structure is a minimum of one foot higher than the base flood elevation.

(e) New and replacement water supply systems are designed to eliminate or minimize infiltration of flood water into the system.

(f) New and replacement sanitary sewerage systems are designed and located to eliminate or minimize infiltration of flood water into the system and discharge from the system into the flood waters.

(g) All other utilities and connections to public utilities are designed, constructed, and located to eliminate or minimize flood damage.

[Statutory Authority: Chapter 86.16 RCW. 02-15-093 (Order 00-26), § 173-158-076, filed 7/16/02, effective 8/16/02.]

**WAC 173-158-080 Wetlands management.** Wetlands are areas of great natural productivity and hydrological utility, providing natural flood control, flood desynchronization, and flow stabilization of rivers and streams. The unrestricted use and development of wetlands will destroy many of these beneficial qualities which directly affect human health and safety during flood events. The piecemeal alteration and destruction of wetlands through draining, dredging, filling and other means has an adverse cumulative impact on their ability to reduce flood damages.

Communities should, to the maximum extent possible, seek to avoid the short and long term adverse impacts associated with the destruction or modification of wetlands, especially those activities which limit or disrupt the ability of the wetland to ameliorate flooding impacts. Proposals for development within special flood hazard areas (base floodplains) should be reviewed for their possible impacts on wetlands located within the floodplain. Communities should ensure that development activities in or around wetlands do not negatively affect public safety, health, and welfare by disrupting the wetlands' ability to reduce flood and storm hazards.

Communities may request technical assistance from the department of ecology in identifying wetland areas. Existing wetland map information from the National Wetlands Inventory (NWI) can be used in conjunction with the community's FIRM to prepare an overlay zone indicating critical wetland areas deserving special attention. Local wetlands management strategies can also be developed which will preserve these valuable areas.

[Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-080, filed 5/4/88.]

**WAC 173-158-084 Submittal of local ordinances.**

Communities shall submit to the department of ecology and to the federal Emergency Management Agency (FEMA) regional office newly adopted or amended flood damage prevention ordinances to incorporate the requirements of chapter 86.16 RCW and this chapter. Such ordinances or amendments shall take effect thirty days from filing with the department unless the department disapproves such ordinance or amendment, in writing, within that time period. The department may disapprove any ordinance or amendment which does not comply with the requirements of the NFIP, or WAC 173-158-040, 173-158-064, or 173-158-070. The department will provide guidance and assistance to communities in preparation and review of draft ordinances upon request by



the community.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-084, filed 10/19/90, effective 11/19/90.]

**WAC 173-158-086 Local option to exceed minimum requirements.** In accordance with RCW 86.16.045 a county, city, or town may adopt flood plain management ordinances or requirements that exceed the minimum federal requirements of the National Flood Insurance Program and the state requirements of this chapter without following the procedures provided in RCW 86.16.031(8) and WAC 173-158-064.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-086, filed 10/19/90, effective 11/19/90.]

**WAC 173-158-090 Penalties and enforcement.** (1) The attorney general or the attorney for the local government shall bring such injunctive, declaratory, or other actions as are necessary to ensure compliance with this chapter.

(2) Any person who fails to comply with this chapter shall also be subject to a civil penalty not to exceed one thousand dollars for each violation. Each violation or each day of noncompliance shall constitute a separate violation.

(3) The penalty provided for in this section shall be imposed by a notice in writing, either by certified mail with return receipt requested or by personal service, to the person incurring the same from the department or local government, describing the violation with reasonable particularity and ordering the act or acts constituting the violation or violations to cease and desist or, in appropriate cases, requiring necessary corrective action to be taken within a specific and reasonable time.

(4) Any penalty imposed pursuant to this section by the department shall be subject to review by the pollution control hearings board. Any penalty imposed pursuant to this section by local government shall be subject to review by the local government legislative authority. Any penalty jointly imposed by the department and local government shall be appealed to the pollution control hearings board.

[Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-090, filed 5/4/88.]

**WAC 173-158-120 Variances.** The variance procedure contained in 44 CFR, Part 60.6 and the local flood damage prevention ordinance shall apply to this chapter unless an activity or use is expressly prohibited therein.

[Statutory Authority: RCW 86.16.061. 90-21-089, § 173-158-120, filed 10/19/90, effective 11/19/90. Statutory Authority: Chapter 86.16 RCW. 88-10-058 (Order 88-6), § 173-158-120, filed 5/4/88.]



CHAPTER 13

FLOOD DAMAGE REDUCTION

13-1. The Federal Interest. Congress, in the Flood Control Act of 1936, established as a nationwide policy that flood control (i.e., flood damage reduction) on navigable waters or their tributaries is in the interest of the general public welfare and is therefore a proper activity of the Federal Government in cooperation with the states and local entities. The 1936 Act, as amended, and more recently the Water Resources Development Act (WRDA) of 1986, specify the details of Federal participation. They have established the scope of the Federal interest to include consideration of all alternatives in controlling flood waters, reducing the susceptibility of property to flood damage, and relieving human and financial losses.

13-2. Flood Plain Management. Flood plain management (FPM) is a continuing process, involving both Federal and non-Federal action, that seeks a balance between use and environmental quality in the management of the inland and coastal flood plains as components of the larger human communities. The flood damage reduction aspects of flood plain management involve modifying floods and modifying the susceptibility of property to flood damages. The former embraces the physical measures commonly called "flood control;" the latter includes regulatory and other measures intended to reduce damages by means other than modifying flood waters. By guiding flood plain land use and development, flood plain regulations seek to reduce future susceptibility to flood hazards and damages consistent with the risk involved and serve in many cases to preserve and protect natural flood plain values.

a. Flood Plain Management Services. The Corps is authorized by Section 206 of the Flood Control Act of 1960, as amended, to provide information, technical planning assistance, and guidance to aid states, local governments, and Indian Tribes in identifying the magnitude and extent of the flood hazard and in planning wise use of the flood plains. Direct response and assistance of this kind are provided upon request through the Flood Plain Management Services Program. The Corps also provides support for the National Flood Insurance Program to the Federal Emergency Management Agency on a reimbursable basis under interagency agreement. (ER 1105-2-100)

b. Executive Order (EO) 11988. This EO requires the Corps to provide leadership and take action to: (1) avoid development in the base (100-year) flood plain unless it is the only practicable alternative; (2) reduce the hazards and risk associated with floods; (3) minimize the impact of floods on human safety, health and welfare; and (4) restore and preserve the natural and beneficial values of the base flood plain. In this regard, the policy of the Corps is to formulate projects which, to the extent possible, avoid or minimize adverse impacts associated with use of the base flood plain and avoid inducing development in the base flood plain unless there is no practicable alternative for the development. (ER 1165-2-26)

c. Modification of Federal Facilities. In planning or modifying Federal facilities on flood plains and in disposing of Federal lands and property, the Corps will follow the Flood Plain Management Guidelines (43 FR 6030), 10 February 1978, issued by the Water Resources Council pursuant to EO 11988.

13-3. Flood Related Planning Policy. It is the policy of the Corps of Engineers to consider in the planning process all practicable and relevant alternatives applicable to flood damage reduction. No one alternative will be pre-judged superior to any other. Consideration will be given both to measures intended to modify flood behavior (structural measures) and those intended to modify damage susceptibility by altering the ways in which people would otherwise occupy and use flood plain lands and waters (nonstructural measures). The fundamental goal is to develop, define and recommend a robust solution that has public and institutional support (having appropriately determined how well an economical plan can be made to function, how capable are the responsible interests to operate and maintain it, and how safe will be the people who will depend on it). (ER 1105-2-100)

a. Structural Measures. These include dams and reservoirs, levees, walls, diversion channels, bridge modifications, channel alterations, pumping, and land treatment. All such measures reduce the frequency of damaging overflows.

b. Nonstructural Measures. These include flood warning and preparedness; temporary or permanent evacuation and relocation; land use regulations including floodway delineation, flood plain zoning, subdivision regulations and building codes; flood proofing; area renewal policies; and conversion to open space.

13-4. Design Flood Criteria. The Corps policy in design of flood damage reduction projects is to provide an optimum degree of protection consistent with safety of life and property. The Corps seeks an economically efficient degree of protection and land use in agricultural areas, and acceptable reduction of risks and preservation of environmental values in protecting other rural and urban areas. Definitions for certain significant storms and floods, and for terms that relate flood magnitude to project performance, have been adopted as follows:

a. Standard Project Storm (SPS). The SPS is a hypothetical storm having the most severe flood-producing rainfall depth-area-duration relationship and areal distribution pattern that is considered reasonably characteristic of the region in which the drainage area is located. It is developed by studying the major storm events in the region, excluding the most extreme. Development of the SPS may involve transposition and adjustment of a large storm from its observed location to the locality of concern (EM 1110-2-1411). When that is the case, studies are to be coordinated through CECW-EH for review by the Hydrometeorological Section of NWS.

b. Standard Project Flood (SPF). The SPF is the discharge hydrograph resulting from the SPS. SPF for projects east of the 105th meridian may be developed using EM 1110-2-1411. For projects located west of the 105th meridian, use 50 percent of the Probable Maximum Flood (PMF) for SPF.

c. Probable Maximum Precipitation (PMP). Theoretically, the PMP is the greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographical location during a certain time of the year. Development of the PMP considers all storms of record and the observed precipitation is increased by maximizing the moisture inflows to the storm system. Generalized depth-area-duration and seasonal



30 Jul 99

relationships for the continental U.S. are published by the National Weather Service in a series of hydrometeorological reports .

d. Probable Maximum Flood (PMF). The PMF is the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the drainage basin under study. A PMF is developed from PMP. Assumptions concerning rainfall losses, snowmelt runoff, channel efficiency, etc. are adjusted to produce the largest flood reasonably possible. The PMF is used to design high hazard structures (top of dam, outlet and spillway capacities) where failure cannot be tolerated.

e. Inflow Design Flood (IDF). The IDF for a dam is the flood hydrograph used in the design or evaluation of a dam and its appurtenant works (ER 1110-8-2(FR)). In some older documents, this may be referred to as the spillway design flood. The upper limit of the IDF is the PMF.

f. Project Performance. The analysis will quantify the project reliability and performance by explicitly incorporating the uncertainties associated with key hydrologic, hydraulic, and other engineering variables. This reliability and performance will be reported as the protection for a target percent chance exceedance flood with a specified reliability. For example, the proposed project is expected to contain the one-half percent (0.5 percent) chance exceedance flood, should it occur, with a ninety percent (90%) reliability. This performance may also be described in terms of the percent chance of containing a specific historic flood should it occur. To fully define how a project is expected to function requires describing project impacts at several flood levels and locations. There is no minimum level of performance or reliability required for Corps projects; therefore, any project increments beyond the NED plan represents explicit risk management options. It is, therefore, vital that all participants understand the performance, reliability and costs of the NED plan, as well as, increments and decrements of the plan, in order to fully participate in an informed decision-making process.

13-5. Risk-Based Analysis. The risk-based analysis framework is defined as an approach to evaluation and decision making that explicitly, and to the extent practical, analytically, incorporates considerations of risk and uncertainty. These risks and uncertainties arise from measurement errors, short data records, and from the innate variability of complex physical, social, and economic situations, particularly those dealing with future occurrences. Because it captures and quantifies the extent of the risk and uncertainty in the various planning and design components of an investment project, this approach has been found very useful. Each of the components can be examined and conscious decisions made reflecting an explicit tradeoff between risk and costs. Risk-based analysis can identify which plans are more robust and can be used to compare plans in terms of their likely physical performance and economic success.

13-6. Structural Measures. Different types of structural flood damage reduction measures have different primary and secondary impacts on flooding. Plan formulation and impact assessment should take into account all impacts, and residual flooding from all sources. (The dominant flooding may be from a different source under without and with project conditions.) In project planning, both the primary beneficial effects and the secondary effects of the alternatives must be borne in mind and appropriately accommodated.

a. Reservoirs. Reservoirs regulate floods downstream from the dam by temporarily storing some part of the flood volume and releasing it later. The impact downstream is to lower flood stages, increase the duration of flooding, and shift the flood to a later time. It is normal for dam and reservoir projects to effect some control on, and lower flood stages for, all magnitudes of floods. This is especially true of dams with ungated spillways. The amount of control and effectiveness will, however, decrease when flood volumes exceed the storage reserved for flood control. For the large flood, dams with gated spillways may exert lesser control on downstream flood stages than comparable ungated dams. Reservoir releases downstream can raise groundwater levels in fields adjacent (and even more distant) to the river and rapid change in stages can exacerbate bank caving. Downstream of dams, uncontrolled tributaries will continue to contribute to flooding, causing stage reductions to become less and less farther downstream. (Tributary flooding may then assume increased significance.) Channel capacities downstream of dams may increase over time; however, farther downstream, especially below a tributary carrying heavy sediment loads, channel capacity may be reduced. (Reservoir regulation tends to shift channel rating curves upward--less flow at a given stage--especially upstream of tributaries.) Upstream of a dam, sediment deposition can be expected to occur mostly in upper pool areas, decreasing the flood control effectiveness over time and raising flood stages and ground water levels around the pool.

b. Channel Enlargements. Channel enlargement will act like a negative reservoir, raising flood stages downstream, shortening flood durations and shifting the flood to an earlier time. Flood stages will be lower in the enlarged channel reach for all floods including those exceeding the channel capacity, if the channel is not excessively long. (Long, oversize channels may have increased flood stages in the lower part of the channel.) With main stem flooding reduced, direct overbank flooding from tributaries may assume increased significance. How flows from upstream and from tributaries are collected, controlled, and transitioned into the enlarged channel can greatly influence the project's beneficial impacts. Some control is generally required to direct overbank flow into the channel. Erosion and considerable attendant damage may occur upstream of the enlarged channel unless there is appropriate hydraulic control; the same applies where tributaries enter. All artificially enlarged channels will tend toward a new equilibrium state where sediment inflow and carrying capacity are in balance; the trend may be to a smaller or larger channel than the one constructed. Whatever the trend, it may be so slow as to be hardly noticeable, may occur at some intermediate rate, or may take place suddenly with one dramatic large flood.

c. Levees and Floodwalls. Levees and floodwalls are constructed to exclude flood waters from the protected area, up to a certain magnitude of flood. Unlike reservoirs and channel enlargements, the flood control effectiveness of a levee or floodwall will cease abruptly if a flood should overtop it. Interior runoff impeded by the structure may cause interior flooding if there are not proper provisions for interim storage behind it or discharge past the barrier. Potential effects outside a levee, upstream and downstream, are too complex and too site dependent to generalize otherwise, but generally the constriction of flow area caused by the structure will raise flood stages upstream. Within the levee reach, flood stages may be increased or decreased depending on whether the structure forms a hydraulically long or short constriction. A levee may reduce valley

storage enough to cause the same impacts downstream as a channel.

13-7. Nonstructural Measures. Section 73 of Public Law 93-251 expresses Congressional policy and, in effect, endorses Corps practice that consideration shall be given to nonstructural measures in the planning and formulation of all flood damage reduction plans. Nonstructural measures are defined as those which reduce or avoid flood damages, without significantly altering the nature or extent of flooding, by changing the use made of flood plains or accommodating existing uses to the flood hazard. Examples of nonstructural measures are flood proofing, flood warning/preparedness, temporary or permanent evacuation, and regulation of flood plains. These measures are considered separately, in combination and as incremental elements of plans which may include structural measures also. Economic justification can be based on combined flood damage reduction and other (e.g., recreational) benefits. Nonstructural plans should be formulated without preconception as to what would constitute an acceptable minimum level of protection. The level of protection may vary in order to achieve a more coherent and cohesive plan. The level of protection is a Corps decision; individual owners may decide whether to participate. Plans that would leave occupied buildings inaccessible during a flood are normally not recommended. The separable costs allocated to recreation and fish and wildlife shall not exceed the costs for flood damage reduction.

13-8. Definition of the Flood Control Plan. The Federal flood control project is comprised of two obvious elements: the physical aspects of improvement recommended and the associated requirements of local cooperation. The intended flood control plan (i.e., the outputs from the Federal project) may, however, be dependent upon other elements as well. The assumptions made about how the Federal project improvements will function may depend upon other assumptions about the continued effectiveness of already existing non-Federal developments that shape or control flows (whether specifically intended for flood control, or not). They may reflect the assumed existence of other non-Federal developments planned but not yet in place. It is critical that the non-Federal sponsor, responsible for operation and maintenance (O&M) of the Federal project, understand the importance of all the elements that go together to make the plan function. A complete description of a plan includes all structural, nonstructural, legal, and institutional features, both proposed and existing, that contribute to the intended flood control outputs. The outputs of the plan, and of individual elements if they have separable outputs, should be quantified in understandable physical, economic and environmental terms. The operating requirements should be developed for each element requiring operation (e.g., statement of the trigger that will say it is time to close a gate and the amount of time it will take to close it). Finally, there should be explication of the overall resources required to operate and maintain the plan, i.e., manpower, equipment, cost. The requirement for definition of the plan in these terms begins in the preauthorization feasibility phase and ends with preparation of the O&M manual furnished to the non-Federal sponsor when the project is turned over (See paragraphs 10-12, 11-2.c).

13-9. Drainage. Section 2 of the Flood Control Act of 1944 redefined flood control to include "channel and major drainage improvements." Section 403 of WRDA 1986 modified this by inserting after "drainage improvements" the following: "and flood prevention improvements for protection from groundwater-induced damages."



a. Major Outlets. Legislative recognition that the provision of major drainage outlets is an essential part of and complement to flood damage reduction improvements, is interpreted to permit major drainage improvements of natural waterways and their tributaries, and of existing artificial waterways. Major outlets are designated as those for the drainage from an organized or contemplated drainage district; groups of drainage districts, or local governmental unit such as county, town, or city. Normally, the Federal project for an outlet drainage channel will consist of works in a natural stream or existing artificial waterway. However, new artificial drainage channels may be constructed under the Federal program wherever that procedure would be technically more effective, environmentally sound, and would be more economical than improvement of existing drainage courses. (The costs of major drainage outlets are included with costs for other project flood control elements and cost shared accordingly.)

b. Agricultural. In agricultural areas, collection of drainage water is considered a local responsibility. This includes such work as ditching, diking, and grading on farms and within local drainage districts or governmental units. Federal outlets works may "tie" into such local works.

c. Urban. Flood damage reduction works in urban areas are the adjustments in land use and the facilities designed to reduce flood damages in urban areas from overflow or backwater due to major storms and snowmelt. They include structural and other engineering modifications to natural streams or to previously modified natural waterways. In urban or urbanizing areas, provision of a basic drainage system to collect and convey the local runoff to a stream is a non-Federal responsibility. Water damage problems may be addressed under the flood control authorities downstream from the point where the flood discharge is greater than 800 cubic feet per second for the 10 percent flood (one chance in ten of being exceeded in any given year) under conditions expected to prevail during the period of analysis. Drainage areas of less than 1.5 square miles shall be assumed to lack adequate discharge to meet the above criterion. Exceptions may be granted in areas of hydrologic disparity producing limited discharges for the 10 percent flood but in excess of 1800 cfs for the one percent flood. (ER 1165-2-21)

d. Groundwater. Section 403 of WRDA 1986 defines flood control to include measures for the prevention of groundwater-induced damages. Study and analysis of this expanded definition of flood control has not produced a satisfactory classification system for defining Corps interest in a groundwater-induced damage prevention program. Accordingly, budget and authorization support is not available at this time for a generic program of groundwater-induced damage prevention. Individual cases involving urban groundwater-induced flooding believed to have merit within the general context of traditional flood damage reduction should be referred to CECW-P prior to implying any Corps interest to potential sponsors.

13-10. Project Cooperation and Cost Sharing. WRDA 1986, superseding previous legislative provisions, and as amended by WRDA 1996, established the basic requirements for non-Federal participation in Federal flood damage reduction projects. Separable costs of recreation features included in structural and nonstructural flood damage reduction projects are cost shared 50-percent Federal/50-percent non-Federal.

a. Structural Measures. For structural projects (or structural components of a project combining both structural and nonstructural elements) non-Federal interests must:

- (1) Provide a cash contribution equal to 5 percent of total project costs;
- (2) Provide all lands, easements, rights-of-way, relocations (except alterations to railroad bridges and approaches thereto including constructing new railroad bridges over flood control channels constructed in fast lands or new channel alignments which are assigned as construction costs), and dredged material disposal areas (referred to as LERRD);
- (3) Provide an additional cash payment when the sum of items (1) and (2) is less than 25 percent of total project costs (35 percent for projects authorized, or reauthorized after formal deauthorization, after 12 October 1996) (if the sum of items (1) and (2) should exceed 50 percent of total project costs, local contributions in excess of 50 percent will be reimbursed by the Federal Government);
- (4) Operate, maintain, repair, replace, and rehabilitate the project after completion (referred to as OMRR&R);
- (5) Hold and save the United States free from damages due to the construction or subsequent maintenance of the project, except any damages due to the fault or negligence of the United States or its contractors;
- (6) Prevent future encroachments which might interfere with proper functioning of the project;
- (7) For any project for local flood protection, participate in and comply with applicable Federal flood plain management and flood insurance programs (i.e., the National Flood Insurance Program), pursuant to Section 402, Public Law 99-662, as amended, (Note: Item (7) is applicable to projects designed for the primary benefit of specific localities; for projects such as large reservoirs designed to provide widespread benefits of varying significance to disparate jurisdictions throughout an extended area or region, it may be omitted) and, prepare a flood plain management plan designed to reduce the impacts of future flood events in the project area within one year of signing a project cooperation agreement (PCA), and implement such plan not later than one year after completion of construction of the project; and,
- (8) Provide guidance and leadership to prevent unwise future development in the flood plain.

b. Nonstructural Measures. The non-Federal costs for nonstructural measures (as complete projects or as components of a project combining both structural and nonstructural elements) will be limited to 25 percent of total project costs (35 percent for features/projects authorized, or reauthorized after formal deauthorization, after 12 October 1996) for such measures. Non-Federal interests are required to provide all LERRD. If the cost of LERRD should be less than 25 percent of total costs (35 percent for features/projects authorized, or reauthorized after formal deauthorization, after 12 October 1996) for the nonstructural measures, non-Federal interests shall pay the difference in cash. If

implement such FPMP not later than one year after completion of construction of the project. To promote prudent flood plain management at the non-Federal level, it is Corps policy to encourage a non-Federal sponsor to develop its FPMP during the preparation of the feasibility study. A non-Federal sponsor's FPMP should implement measures, public expenditures, and policies to reduce loss of life, injuries, damages to property and facilities, public expenditures, and other adverse impacts associated with flooding, and to preserve and enhance natural flood plain values and should address measures which will help preserve levels of protection provided by the Corps flood damage reduction or hurricane or storm damage reduction project. Also, local interests may be required to adopt and enforce other, special regulations if they are necessary to protect the Federal investment or to achieve expected project benefits (e.g., preservation of channel capacity by adoption of regulations controlling channel encroachments, preservation and reservation of ponding areas, etc.). In general, the local sponsor should adopt flood plain management programs necessary to ensure wise use of flood plains in, as well as adjacent to, the project area. (ER 1105-2-100).

13-11. Single Owner Properties. The Corps will not recommend adoption of a Federal project, or include as a separable element in a recommended structural project plan, flood control improvements which would solely benefit the private property of a single owner. (See Table 12-3 and paragraph 12-7.a) The Corps may recommend Federal cost participation in the construction of a flood control project where the project would serve/benefit property owned publicly by a single state (including the District of Columbia and territories and possessions of the United States), county, municipality, or other duly appointed public entity. (ER 1165-2-123)

13-12. Credit for Compatible Non-Federal Works. The non-Federal sponsor of a Corps flood control project may, pursuant to Section 104 of WRDA 1986 (Public Law 99-662), receive credit toward the sponsor's costs for required local cooperation for compatible flood control works constructed in advance by non-Federal interests. Basically this is limited to such works undertaken by non-Federal sponsors while Federal preauthorization studies for the Federal project are in progress. (ER 1165-2-29)

a. Work accomplished prior to completion of the reconnaissance phase of the preauthorization studies is not eligible.

b. Thereafter, credit may be afforded if, before the work is undertaken, the non-Federal sponsor applies for and receives conditional assurance from the Corps that the work can reasonably be expected to be recommended for credit. (This procedure must be completed prior to project authorization.)

c. The work must subsequently be completed by the non-Federal sponsor; a Federal project must ultimately be authorized by Congress; the completed non-Federal work must still be a relevant element of whatever final plan for the Federal project is adopted; and the Federal project must actually be undertaken.

d. In completion of the feasibility phase of preauthorization studies, the non-Federal works for which credit applications have been favorably acted upon will be included as elements of at least one of



the alternative plans under consideration for recommendation as a Federal project; in evaluation of the alternatives, such non-Federal works, whether completed or not, will not be assumed part of the "without" project condition.

e. Proposed crediting will be addressed in feasibility report recommendations.

f. Credit for completed compatible work may be given after the PCA is approved against all requirements of local cooperation for the Federal project, except against the basic 5 percent cash contribution; the creditable work will be valued as the lesser of the actual non-Federal costs or the estimated cost for the work if accomplished as part of Federal project construction; if such value exceeds the final value of the local cooperation requirements against which credit can be given, non-Federal sponsor is not entitled to reimbursement for any such excess.

13-13. Flood Insurance. The National Flood Insurance Program (NFIP) is available to protect the individual in participating communities from extreme financial loss in the event of a disastrous flood. Under the NFIP (Public Law 90-448, as amended) insurance is subsidized, up to an amount specified, on properties in areas designated as hazardous by the Federal Emergency Management Agency (FEMA). The land use control measures required of communities to gain and maintain eligibility for flood insurance are complementary to other flood plain management efforts. Section 202 of Public Law 93-234 states that no Federal officer or agency shall approve any financial assistance for acquisition or construction purposes after July 1, 1975, for use in any area identified by FEMA as an area having special flood hazards unless the community in which such area is situated is then participating in the NFIP. Section 402 of WRDA 1986 expands the prohibition against Federal participation in flood hazard areas by including "Federal participation in construction of local flood control projects"; and Section 14 of WRDA 1988 amended Section 402 to extend prohibition to "hurricane and storm damage reduction projects." Throughout the planning, engineering, and construction process, coordination, investigations and responsibilities of the parties involved must be identified to ensure that the necessary technical data is developed and available for the community to maintain active participation in the NFIP.

13-14. Evaluation of Economic Benefits for Flood Damage Reduction. Flood plain management, including flood control and prevention, can contribute to the NED objective by improving the net productivity of flood prone land resources. This occurs either by an increase in output of goods and services and/or by reducing the cost of using the land resources (improvement in economic efficiency). The benefit standard is the willingness of users (benefiting activities) to pay for each increment of output from a plan. (P&G, Chapter II)

a. Evaluation Procedure. Each flood plain management plan under consideration is evaluated on a with and without basis. The without condition is that most likely to occur without the specific plan and gives proper recognition of the effect of existing and authorized plans, laws, policies and the flood hazard on the probable course of development. The adoption and enforcement of appropriate land use regulations pursuant to the Flood Disaster Protection Act of 1973 (Public Law 93-234) and compliance with EO 11988 and EO 11990 are assumed, both with and without a Corps plan. For purposes of evaluating structural components of a plan, rational economic use of the flood plain is assumed. Economic rationality assumes that users

of the flood plain will attempt to maximize returns, and take actions with full knowledge of the flood hazard unless constrained by laws or policies as mentioned above. Benefits and costs are evaluated under prices existing at the time of submission of the report to HQUSACE.

b. Flood Damage Reduction Benefits. NED benefits are categorized according to their effect as inundation reduction benefits, intensification benefits, or location benefits. Inundation reduction benefit is the value of reducing or modifying the flood losses to the economic activity using the flood plain without any plan. Inundation reduction benefits are usually measured as the reduction in the amount of flood damages or related costs (those which would be voluntarily undertaken by economically rational individuals to reduce damages). Intensification benefit is the value of more intensive use of the land (e.g., a shift from lower to higher value crops or higher crop yields). Location benefit is the value of making flood plain land available for a new economic use (e.g., where a shift from agricultural to industrial use occurs).

New use  
Rec Rec 1/1/99

\* c. Benefits from Evacuation or Relocation. NED benefits resulting from evacuation and relocation plans consist of: benefits from the new use of the flood plain; reduction of externalized flood damages (damages absorbed by non-flood plain occupants); and benefits accruing to off-flood-plain properties adjacent to open space. In addition, non-monetary values such as increases in significant environmental outputs on the evacuated flood-prone lands may be considered in establishing justification for evacuation and relocation plans.

Fish habitat  
Flood water storage

d. Land Development Benefits. Land development, as used here for policy purposes, is defined as the conversion of primarily vacant land (land without significant structural improvements) to more valuable (economically defined) use as a result of a flood damage reduction project. Benefits for land development are usually categorized as "location" benefits and are equivalent to the net change in land value. An example would be the conversion of farmland to residential land as a result of provision of flood protection. Land development does not include cases where land use is the same with or without the flood damage reduction project but would be used more intensively (intensification). It also does not include cases where land use would change without the project and project benefits are achieved through savings in future flood proofing costs or prevention of damages to future development. The following general policy principles apply to the consideration of land development benefits at structural flood damage reduction projects.

(1) Project or separable increments of projects that achieve only land development (location) benefits do not address the priority purpose of flood damage reduction and, therefore, have a low budget priority. Federal participation in these projects or separable increments will not be recommended.

(2) The NED plan will be formulated to protect existing development and vacant property that is interspersed with existing development. All project benefits, including land development benefits for interspersed vacant property, will be included for project formulation and justification. The NED plan may also provide protection of vacant property that is not interspersed with existing development if it can be demonstrated that the vacant property would

be developed without the project and benefits are based on savings in future flood proofing costs or reduction in damages to future development.

(3) If no project or separable project increment can be economically justified to protect existing development, interspersed vacant property and/or property that would be developed without the project, there is ordinarily no budgetary interest in expanding the area of protection to achieve land development (location) benefits even if net benefits are increased and economic justification can be achieved.

(4) A limited exception to policy principles (1) through (3) above can be considered in the case where the cost of protecting existing development can be substantially reduced if some vacant property that is not interspersed with existing development is included in the protected area. This situation typically exists where an existing levee or floodwall is being raised to provide a higher degree of protection. These exceptions will be considered on a case-by-case basis. Compatibility with EO 11988 still must be demonstrated. It also must be clear that the primary objective of the project is not land development but the minimization of the cost of protecting existing development.

e. Benefit Determination Involving Existing Levees. Problems have often arisen in the benefit evaluation of flood damage reduction studies when there are existing levees of uncertain reliability. Specifically, the problem is one of engineering judgment but has implications for benefit evaluation: engineering opinion may differ or be uncertain on the ability of the levees to contain flows with water surface elevations of given heights. This may lead to difficulty in arriving at a clear, reasonable and agreed upon without project condition.

(1) General. Investigations for flood damage prevention involving the evaluation of the physical effectiveness of existing levees and the related effect on the economic analysis shall use a systematic approach to resolving indeterminate, or arguable, degrees of reliability. Reasonable technical investigations shall be pursued to establish the minimum and, to the extent possible, the maximum estimated levels of physical effectiveness. Necessary information and summary of analyses shall be included in report presentations of plan formulation and shall be documented in appropriate supporting materials.

(2) Sources of Uncertainty. Studies involving existing levees will focus on the sources of uncertainty (likely causes of failure). Other than overtopping, levees principally fail due to one or a combination of four causes: surface erosion, internal erosion (piping), underseepage, and slides within the levee embankment or foundation soils. Reasonable investigations, commensurate with the level of detail suitable to the planning activity underway, shall determine the condition of existing levees with respect to the factors that can lead to failure, if this information does not already exist.

(3) Performance Record. Existing levees either have or have not failed during previous flood events or have shown evidence of distress such as various degrees of piping, underseepage and sloughing. Information regarding their performance is relevant and vitally important in forming judgments regarding future performance. However, it should not be assumed that because a levee has passed a



30 Jul 99

flood of a given frequency it will always do so in the future or vice versa, assuming the levee has been repaired.

(4) Reliability.

(a) Reliability judgments should be based solely on physical phenomena. The question to be answered is: what percent of the time will a given levee withstand water at height "x"? This means that considerations such as degree of protection, induced damages, induced flood heights, potential for increased risk of loss of life due to false sense of security, etc., are not included. These considerations will be dealt with separately during the plan formulation process.

(b) The purpose of reliability determination is to be able to estimate the without-project damages. Its purpose is not to make statements about the degree of protection afforded by the existing levees. Major subordinate commands (MSC) and district commands (DC) making reliability determinations should gather information to enable them to identify two points on the existing levees. The first point is the highest vertical elevation on the levee such that it is highly likely that the levee would not fail if the water surface elevation were to reach this level. This point shall be referred to as the Probable Non-failure Point (PNP). The second point is the lowest vertical elevation on the levee such that it is highly likely that the levee would fail. This point shall be referred to as the Probable Failure Point (PFP). As used here, "highly likely" means 85+ percent confidence. As defined, the PNP will be at a lower elevation than the PFP. When there are unresolved uncertainties or differences of opinion, consideration should be given to having the range of uncertainty extend from the lower of arguable PNPs to the higher of the PFPs. Because of lack of information or other reasons, if the PFP cannot be determined then the PFP shall be the low point in the levee where the levee is first overtopped. When determining the low point in the levee, MSC and DC shall assume that closure actions have taken place.

(5) Benefit Evaluation Procedure. Even if no degree of protection is claimed for an existing levee, it does, most likely, provide some benefits. Assessment of these benefits must be in some degree arbitrary in the absence of illuminating engineering or statistical analyses. The function of identifying the probable failure and non-failure points is to create a range of water surface elevations on the levee over which it may be presumed that the probability of levee failure increases as water height increases. The requirement that as the water surface height increases the probability of failure increases, incorporates the reasonable assumption that as the levee becomes more and more stressed it is more and more likely to fail. If the form of the probability distribution is not known, a linear relationship is an acceptable approach for calculating the benefits associated with the existing levees. For benefit evaluation, assume all flood damages will be prevented below the PNP; and no damages will be prevented above the PFP.

f. Restoration of Market Values. Valid estimates of restored market value are difficult and costly to make in typical flood control project evaluations. Therefore, no resources should be used in efforts to quantify restoration of market values for flood control projects.

13-15. Flood Emergency Operations and Disaster Assistance.

a. Corps of Engineers Authority. Emergency activities pursuant to Section 5 of Public Law 77-288, as amended by Public Law 99, 84th Congress, Section 206 of the Flood Control Act of 1962 and Section 302 of WRDA 1990, and others, includes the following work whenever and wherever required: preparation for emergency response to any natural disaster; flood fighting and rescue operations; post flood response; emergency repair and restoration of flood damaged or destroyed flood control works such as levees; emergency protection of Federally authorized hurricane and shore protection works being threatened; and the repair or restoration of Federal hurricane or shore protection structures damaged or destroyed by wind, wave, or water action of other than an ordinary nature. The authority under Section 5, as amended, was expanded by Section 82 of Public Law 93-251, which authorized providing emergency supplies of clean water to any locality confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the inhabitants of the locality. Public Law 95-51 further amended Section 5 to provide the Secretary of the Army authority to provide emergency water supplies in areas determined to be drought distressed. Authorized emergency activities are financed from an Emergency Fund authorized by Section 5, to be replenished on an annual basis. (ER 11-1-320, ER 500-1-1)

(1) The provision of advance flood damage reduction measures by the Corps is supplemental to state and local community efforts, rather than replacements for them. Corps protective and preventive measures will generally be of a temporary nature designed to meet an imminent flood threat. Permanent rehabilitation work to protect against the threat of future disasters will be considered separately from advance measures. A declaration of a state of emergency or written request by the governor of a state is a prerequisite to furnishing advance measures. Local interests are required to remove temporary works provided as advanced measures.

(2) It is Corps policy that local assurances and appropriate requests for assistance will be obtained. Local cooperation for accomplishment of advance measures and rehabilitation works require local assurances to (a) provide without cost to the United States all lands, easements and rights-of-way necessary for the authorized emergency work; (b) hold and save the United States free from damage due to the authorized emergency work; and (c) maintain and operate all the rehabilitation work after its completion. Additional features of local participation should also be considered, as appropriate, and included in the assurance agreement; e.g., the removal of emergency flood damage reduction measures, after their purpose has been served, is a local responsibility.

(3) Requests for providing emergency supplies of clean water due to contamination or drought are considered separately from the flood and coastal storm emergency activities. Requests for assistance due to a contaminated source must be made in writing by the governor of the state affected. Assistance for contaminated source situations is limited to 30 days. Applications from drought distressed areas may be presented by individuals or political subdivisions who must agree to the terms deemed necessary by the Secretary of the Army. Assistance is limited to Federally owned equipment and Federal manpower for implementation.

(4) Under Section 5, as amended, emergency funds may be expended directly by the Corps for authorized purposes. However,

there is no authority under Section 5 whereby local interests may be reimbursed for any of their costs for emergency operations accomplished on their own behalf. Also, Section 5 authority and funds are not used in lieu of other appropriate Corps continuing authorities.

(5) After a flood event, the Corps may perform emergency work on public and private lands and waters for a period of 10 days following a governor's request for assistance. This work must be essential for the preservation of life and property, including, but not limited to, channel clearance, emergency shore protection, clearance and removal of debris and wreckage endangering health and safety, and temporary restoration of essential public facilities and services.

b. Other Disaster Assistance. Disaster assistance beyond Corps statutory authority will conform to the provisions of AR 500-60 which pertains primarily to military assistance. In the event of Presidential declaration of a major disaster, or emergency declared by the Director, Federal Emergency Management Agency (FEMA), assistance to state and local governments is provided in essential response and recovery operations when and as directed by the President through FEMA under the provisions of The Robert T. Stafford Disaster Relief Act (42 U.S.C. 5121 et seq). The Corps fully responds to all requests from the FEMA Director or Regional Director. (ER 11-1-320, ER 500-1-1)

13-16. Use of Storage Allocated for Flood Damage Reduction and Navigation at Non-Corps Projects. Section 7 of the Flood Control Act of 1944 requires the Secretary to prescribe regulations for the use of storage allocated for flood control or navigation at all reservoirs constructed wholly or in part with Federal funds. During the planning and design phases, project owners consult with the Corps regarding the quantity and value of space to reserve in the reservoir for flood damage reduction and/or navigation. (ER 1110-2-241, EM 1110-2-3600)

13-17. Provision of Flood Protection at Urban Renewal Projects. The inclusion of flood protection at urban renewal projects must be in accordance with the WRC Principles and Guidelines (P&G).

13-18. Construction of Flood Control Projects by Non-Federal Interests. Section 211 of WRDA 1996 provides authority for non-Federal sponsors to undertake the design and construction of federally authorized flood control projects without Federal funding, and to be eligible to be reimbursed an amount equal to the estimate of the Federal share, without interest (or inflation), of the design and construction cost of the project or separable element thereof. The Energy and Water Development Appropriations Act of 1998 provides additional guidance on Section 211 of WRDA 1996 regarding notification of the Committees on Appropriations of the House and Senate on scheduling of reimbursements.

a. General. Reimbursement for the construction of any authorized flood control project undertaken by a non-Federal sponsor pursuant to Section 211 of WRDA 1996 is contingent upon approval by the Secretary of the Army of the plans for construction and the Secretary's determination, after a review of studies and design documents, that the project or separable element thereof, is economically justified and environmentally acceptable. This approval must be obtained prior to the initiation of construction of the work for which the reimbursement request will be made. Further, prior to initiating negotiations for a reimbursement agreement for the



construction of any project pursuant to Section 211 of WRDA 1996, the Secretary of the Army must notify the Committees on Appropriations of the House and the Senate. This notification must include the total commitment and the reimbursement requirements that the Administration intends to support in future budget submissions. Budgetary and programmatic priorities will be taken into account when reviewing plans submitted by non-Federal sponsors. Only projects or separable elements of projects which have been specifically authorized by Congress will be considered eligible for reimbursement under this provision. Reimbursement of non-Federal sponsor work under Section 211(e) of WRDA 1996 will not be considered for the Continuing Authorities Program projects.

b. Non-Federal Requirements. All projects pursued under the authority of Section 211 must be planned, designed and constructed in accordance with appropriate Federal criteria, standards and policies, including the appropriate National Environmental Policy Act (NEPA) documentation, and construction must comply with all applicable Federal and state laws and regulations. The non-Federal sponsor will normally be required to develop the design, engineering plans and specifications for the construction it proposes to undertake. In addition, the non-Federal sponsor must conduct NEPA investigations, prepare appropriate NEPA documents, conduct all public and agency coordination, and obtain all necessary Federal and state permits. The Corps may undertake these efforts if funds are provided by the non-Federal sponsor and if such work does not delay the completion of other Corps assignments. Further, funds for activities undertaken by the Corps district offices which are necessary for the successful completion of a Section 211 project or separable element thereof, and construction of the sponsor proposed work including, but not limited to, design, review of project economics, environmental assessments, determination of LERRDs requirements, auditing, permit evaluations, and inspections, must also be provided by the non-Federal sponsor. The non-Federal sponsor must provide all LERRDs and shall perform or ensure performance of all relocations that the Corps determines are required for the construction, operation and maintenance of the project. The value of LERRDs provided by the non-Federal sponsor that are required for the project will be determined in accordance with standard valuation procedures as contained in the model PCA for structural flood control projects. In addition, the non-Federal sponsor will be responsible for the operation, maintenance, repair, replacement and rehabilitation of the project in accordance with regulations or directions prescribed by the Corps and shall perform all other items of sponsor cooperation required by the project authorization.

c. Section 211 Agreement. In the development of a Section 211 agreement, the normal procedures for processing and reviewing a PCA will be used. The decision document approved by the Secretary must be included as support for the Section 211 agreement. Negotiations for proceeding with a project under Section 211 are to be accomplished at the district level once approval to initiate the negotiations has been received.

d. Reimbursement. Reimbursements pursuant to Section 211(e)(1) of WRDA 1996 cannot occur until the flood control project, or separable element thereof, has been constructed. Reimbursements are subject to appropriations Acts. Any eligible reimbursable Federal share of costs associated with studies or design efforts conducted by non-Federal sponsors after authorization and prior to construction will be included in the final auditing of the total project costs upon completion of the construction of a project or separable element

thereof. Any reimbursement desired by a non-Federal sponsor for studies or design it accomplished prior to authorization must be specifically identified and requested in the authorizing document.

TITLE 42--THE PUBLIC HEALTH AND WELFARE

CHAPTER 50--NATIONAL FLOOD INSURANCE

SUBCHAPTER III--COORDINATION OF FLOOD INSURANCE WITH LAND-MANAGEMENT  
PROGRAMS IN FLOOD-PRONE AREAS

Sec. 4104a. Notice requirements

(a) Notification of special flood hazards

(1) Regulated lending institutions

Each Federal entity for lending regulation (after consultation and coordination with the Financial Institutions Examination Council) shall by regulation require regulated lending institutions, as a condition of making, increasing, extending, or renewing any loan secured by improved real estate or a mobile home that the regulated lending institution determines is located or is to be located in an area that has been identified by the Director under this chapter or the Flood Disaster Protection Act of 1973 as an area having special flood hazards, to notify the purchaser or lessee (or obtain satisfactory assurances that the seller or lessor has notified the purchaser or lessee) and the servicer of the loan of such special flood hazards, in writing, a reasonable period in advance of the signing of the purchase agreement, lease, or other documents involved in the transaction. The regulations shall also require that the regulated lending institution retain a record of the receipt of the notices by the purchaser or lessee and the servicer.

(2) Federal agency lenders

Each Federal agency lender shall by regulation require notification in the manner provided under paragraph (1) with respect to any loan that is made by the Federal agency lender and secured by improved real estate or a mobile home located or to be located in an area that has been identified by the Director under this chapter or the Flood Disaster Protection Act of 1973 as an area having special flood hazards. Any regulations issued under this paragraph shall be consistent with and substantially identical to the regulations issued under paragraph (1).

(3) Contents of notice

Written notification required under this subsection shall include--

(A) a warning, in a form to be established by the Director, stating that the building on the improved real estate securing the loan is located, or the mobile home securing the loan is or is to be located, in an area having special flood hazards;

(B) a description of the flood insurance purchase requirements under section 102(b) of the Flood Disaster

Protection Act of 1973 [42 U.S.C. 4012a(b)];

(C) a statement that flood insurance coverage may be purchased under the national flood insurance program and is

also

available from private insurers; and

(D) any other information that the Director considers necessary to carry out the purposes of the national flood insurance program.

(b) Notification of change of servicer

(1) Lending institutions

Each Federal entity for lending regulation (after consultation and coordination with the Financial Institutions Examination Council) shall by regulation require regulated lending institutions,

in connection with the making, increasing, extending, renewing, selling, or transferring any loan described in subsection (a)(1) of this section, to notify the Director (or the designee of the Director) in writing during the term of the loan of the servicer of the loan. Such institutions shall also notify the Director (or such designee) of any change in the servicer of the loan, not later than 60 days after the effective date of such change. The regulations under this subsection shall provide that upon any change in the servicing of a loan, the duty to provide notification under this subsection shall transfer to the transferee servicer of the loan.

(2) Federal agency lenders

Each Federal agency lender shall by regulation provide for notification in the manner provided under paragraph (1) with respect

to any loan described in subsection (a)(1) of this section that is made by the Federal agency lender. Any regulations issued under this

paragraph shall be consistent with and substantially identical to the regulations issued under paragraph (1) of this subsection.

(c) Notification of expiration of insurance

The Director (or the designee of the Director) shall, not less than 45 days before the expiration of any contract for flood insurance under this chapter, issue notice of such expiration by first class mail to the owner of the property covered by the contract, the servicer of any loan secured by the property covered by the contract, and (if known to the Director) the owner of the loan.

(Pub. L. 90-448, title XIII, Sec. 1364, as added Pub. L. 93-383, title VIII, Sec. 816(a), Aug. 22, 1974, 88 Stat. 739; amended Pub. L. 98-181, title IV, Sec. 451(d)(1), Nov. 30, 1983, 97 Stat. 1229; Pub. L. 103-325, title V, Sec. 527, Sept. 23, 1994, 108 Stat. 2263.)

References in Text



The Flood Disaster Protection Act of 1973, referred to in subsec. (a) (1), (2), is Pub. L. 93-234, Dec. 31, 1973, 87 Stat. 975, as amended, which enacted sections 4002, 4003, 4012a, 4104, 4104a, 4105 to 4107, and 4128 of this title, amended sections 4001, 4013 to 4016, 4026, 4054, 4056, 4101, and 4121 of this title and sections 24 and 1709-1 of Title 12, Banks and Banking, repealed section 4021 of this title, and enacted provision set out as a note under section 4001 of this title. For complete classification of this Act to the Code, see Short Title of 1973 Amendment note set out under section 4001 of this title and Tables.

#### Amendments

1994--Pub. L. 103-325 amended section generally. Prior to amendment, section read as follows: ``Each Federal instrumentality responsible for the supervision, approval, regulation, or insuring of banks, savings and loan associations, or similar institutions shall by regulation require such institutions, as a condition of making, increasing, extending, or renewing (after the expiration of thirty days following August 22, 1974) any loan secured by improved real estate or a mobile home located or to be located in an area that has been identified by the Director under this chapter or Public Law 93-234 as an area having special flood hazards, to notify the purchaser or lessee (or obtain satisfactory assurances that the seller or lessor has notified the purchaser or lessee) of such special flood hazards, in writing, a reasonable period in advance of the signing of the purchase agreement, lease, or other documents involved in the transaction.''

1983--Pub. L. 98-181 substituted ``Director'' for ``Secretary''.

#### Transfer of Functions

For transfer of functions, personnel, assets, and liabilities of the Federal Emergency Management Agency, including the functions of the Director of the Federal Emergency Management Agency relating thereto, to the Secretary of Homeland Security, and for treatment of related references, see sections 313(1), 551(d), 552(d), and 557 of Title 6, Domestic Security, and the Department of Homeland Security Reorganization Plan of November 25, 2002, as modified, set out as a note under section 542 of Title 6.

#### Section Referred to in Other Sections

This section is referred to in sections 4012a, 4106 of this title.