Floodplain Map Basics

Floodplain Management Staff
Arkansas Natural Resources Commission
2015

Floodplain Maps

- What do they show?
- What are they used for?
- As a community official, do you have copies of your floodplain maps?
- Do you know how to obtain or view flood maps?
- Does your community have digital maps?
- Do you know if your flood maps are current?
- Do you know how flood maps can be changed?

Flood Map Terminology - 1

- What is a **flood**?

A general and temporary condition of partial or complete inundation of normally dry land areas.

- What is a **floodplain**?

Any land area susceptible to being inundated by water form any source, such as inland or tidal waters.

- What is the **base flood**?

The flood having a one percent (**1%**) chance of being equaled or exceeded in any given year. Often referred to as the 100-year flood.

Flood Map Terminology - 2

- What is the **FEMA floodplain**?

Within the context of the National Flood Insurance Program (NFIP), the term "floodplain" is commonly used to mean the "**base floodplain**", the "**100-year floodplain**" (or **1% chance floodplain**) or the **Special Flood Hazard Area (SFHA)**. It is the floodplain to which communities participating in the NFIP must regulate at a minimum and which is used for determining mandatory purchase of flood insurance and rating flood insurance policies.

Astronaut photo – February 21, 2014

Flood Map Terminology - 3

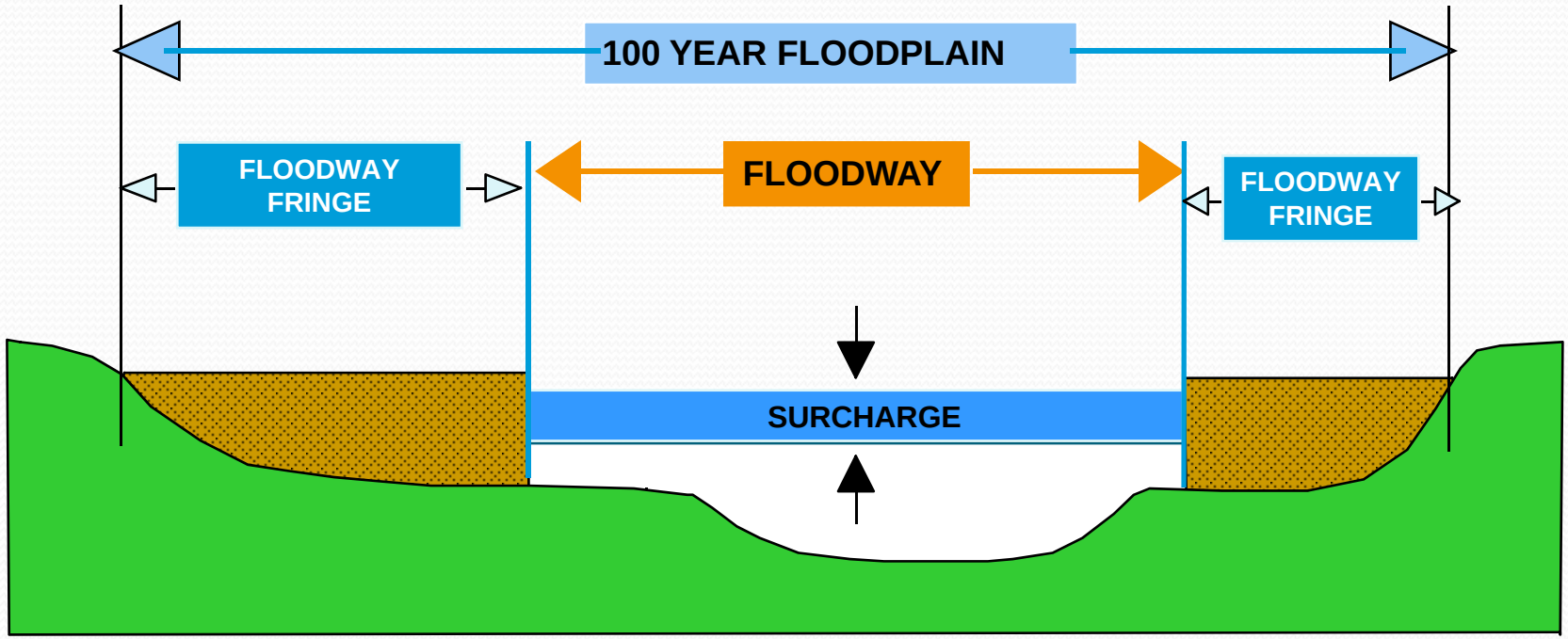
- What is the "**floodway**"?

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 a designated height. In the case with NFIP, maximum increase is one (1) foot.

- **Flood fringe**

The portion of the "floodplain" residing outside the floodway

FLOODWAY SCHEMATIC



FLOODWAY + FLOODWAY FRINGE = 100 YEAR FLOODPLAIN

SURCHARGE NOT TO EXCEED 1.0 FEET

What flood map show?

- Areal extent of the base flood plain
- Possibly also the extent of the 500-year (0.2%) floodplain
- Base flood elevations (**BFE**s)
- Survey cross sections
- Locations of survey bench marks or reference marks
- Flood zone designations and panel identification information
- And more…

Map Formats

- **Flood Hazard Boundary Map (FHBM)** – no BFEs or floodways – "plain Jane" – only shows area
- **Flood Insurance Rate Map (FIRM)**
  - Without BFEs – same as FHBM
  - With BFEs and no floodways - Caraway
  - With BFEs and separate floodway map - Waldron
  - With BFEs and floodways on map
  - Converted by letter
- **Floodway and Flood Boundary Map (FBFM)** - Waldron
- **Countywide FIRMS**
- **Digital FIRMs**

Z-fold
Ledger size
Digital

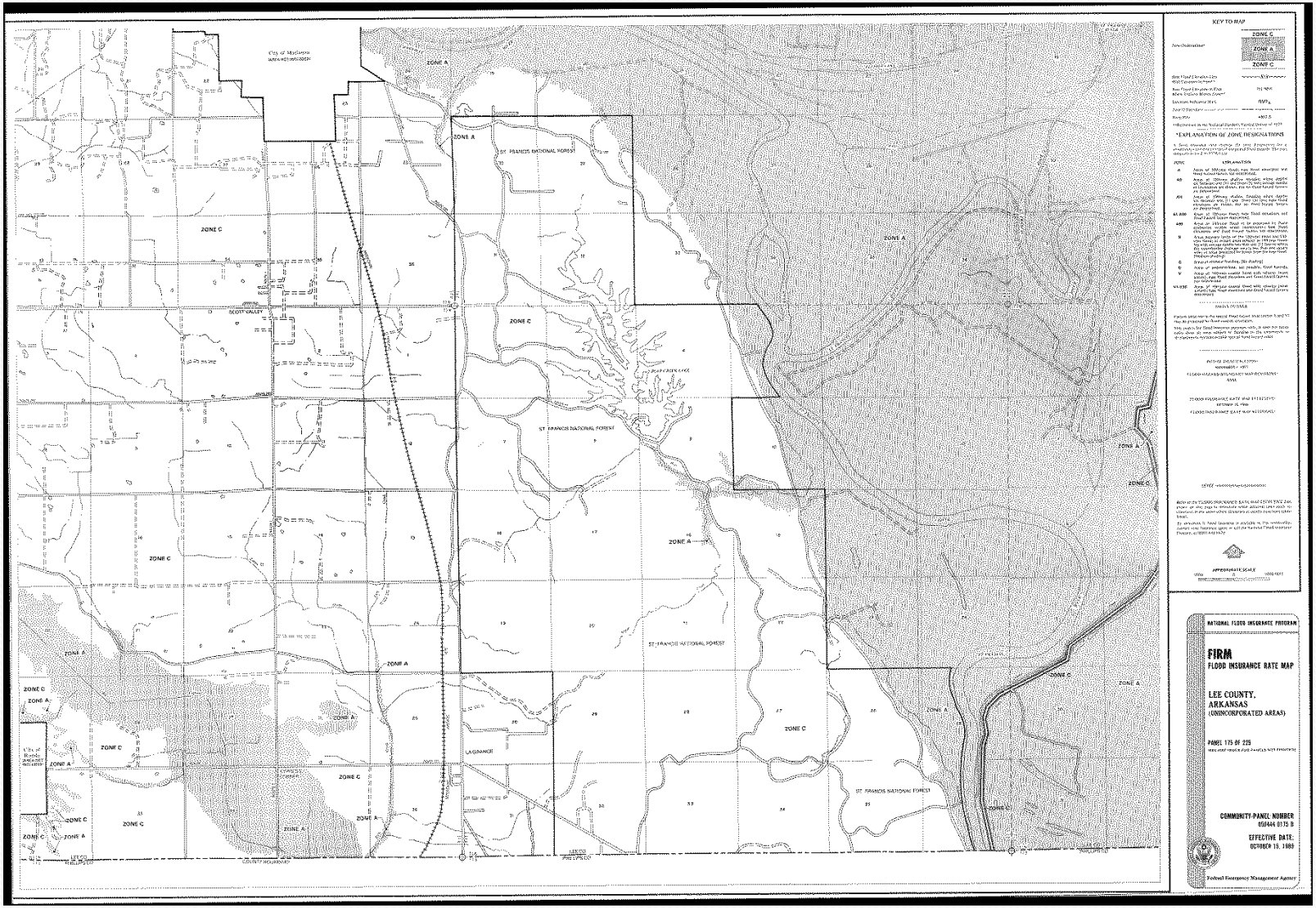
The “most basic” flood map

Flood Hazard Boundary Map (FHBM)

Flood Insurance Rate Map (FIRM) with no BFEs

- Maps characterized by “**Zone A**” areas…sometimes termed “**Approximate Zone A**” or “**Unnumbered Zone A**” areas

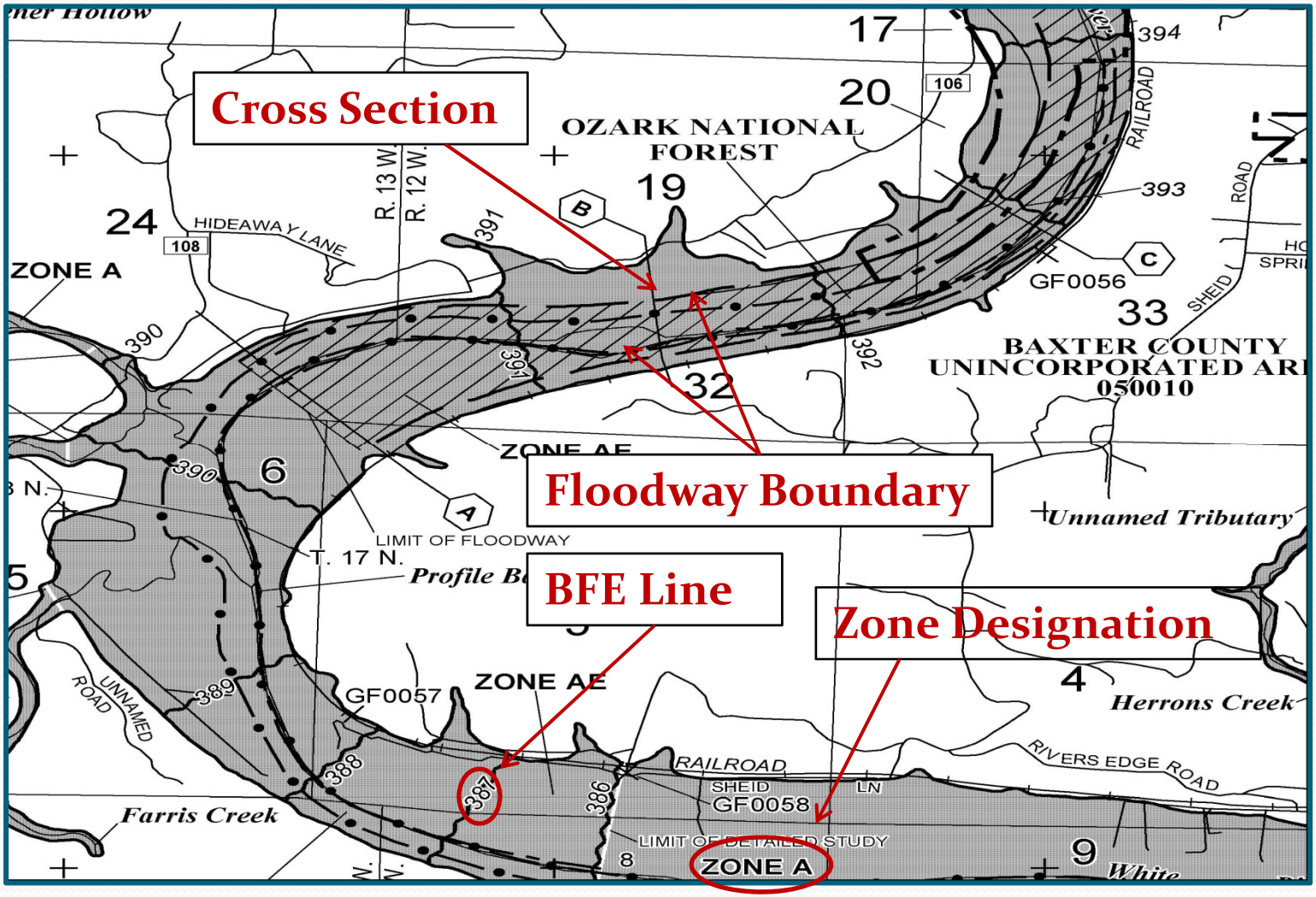
FIRM Panel 175 of 225 , Lee County, October 15, 1985



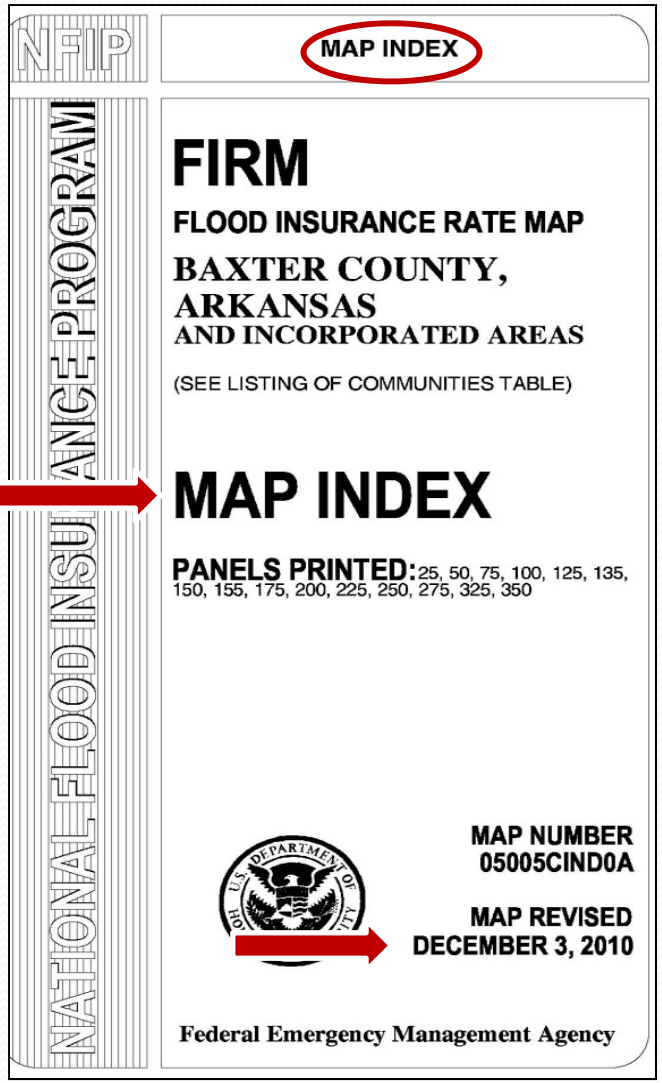
Fully Developed FIRM Map

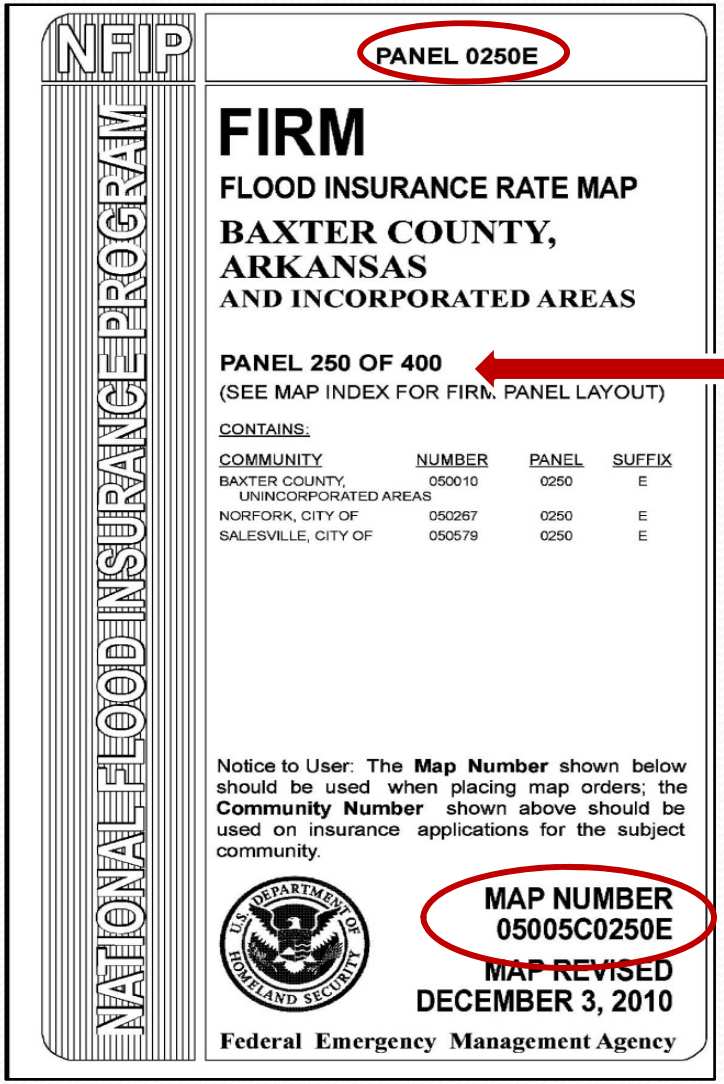
- Shows areal extent of SFHA through use of **Zones A, AE, AH, and AO**
- Shows **BFEs** using **wavy lines**, and backed by floodway data tables and profiles in the Flood Insurance Study (FIS)
- Shows "**floodways**"
- Is countywide – seamless joining incorporated and unincorporated areas of counties
- Has a digital counterpart that can be viewed on **Google Earth**, FEMA's **Geoplatform**, **ArcGIS**, other mapping software

Portion of FIRM for Norfork, Baxter County

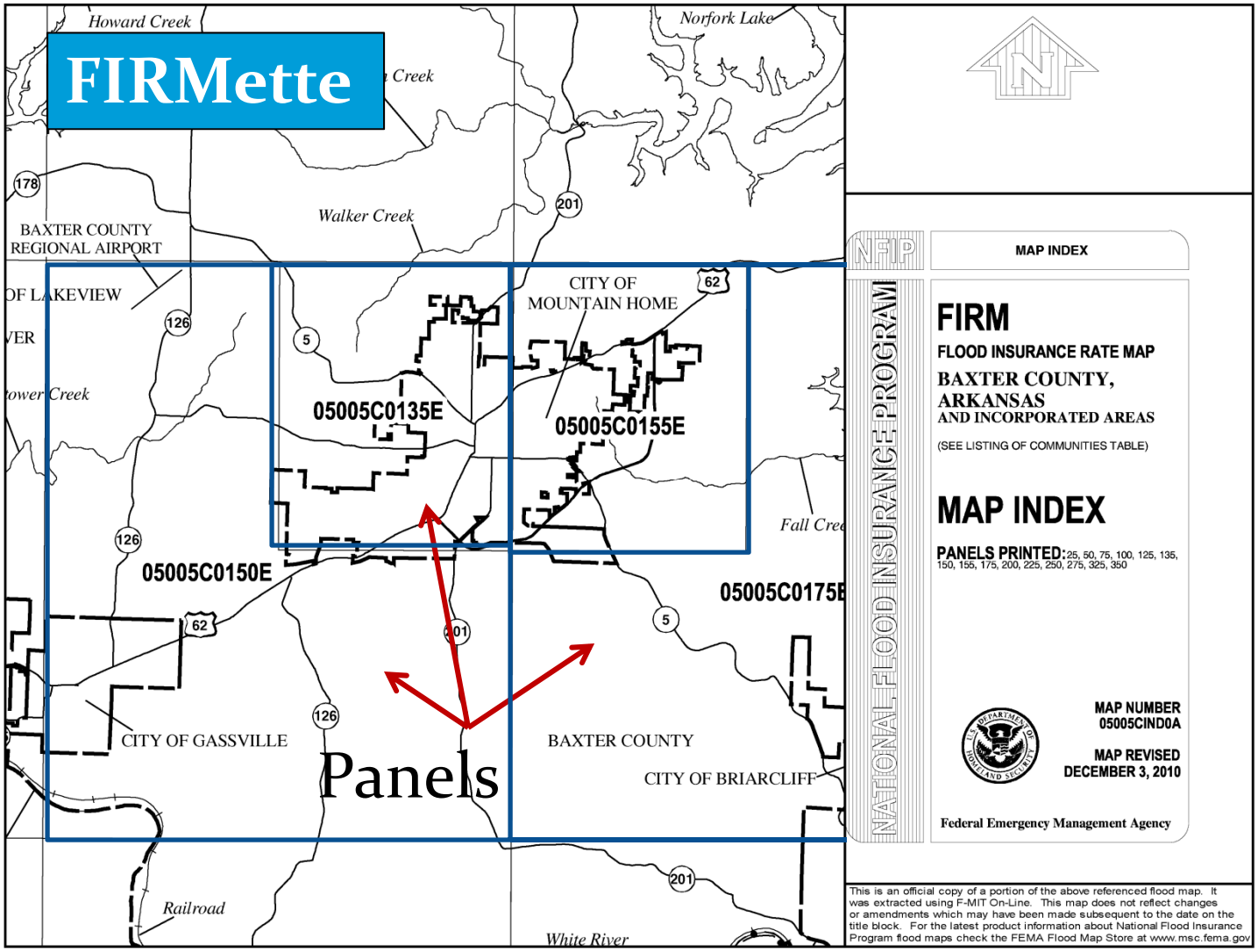


FIRM MAP PANEL TITLE BLOCK





Portion of FIRM Index for Baxter County



FIRM LEGEND

Flood zone definitions

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

Definition of symbols

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% Annual Chance Floodplain Boundary
	0.2% Annual Chance Floodplain Boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT	5000-foot ticks: Arkansas State Plane North Zone (FIPS Zone 0301), Lambert Conformal Conic projection
4489000m N	1000-meter Universal Transverse Mercator grid values, zone 15N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

Key Map Dates

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
April 16, 1990

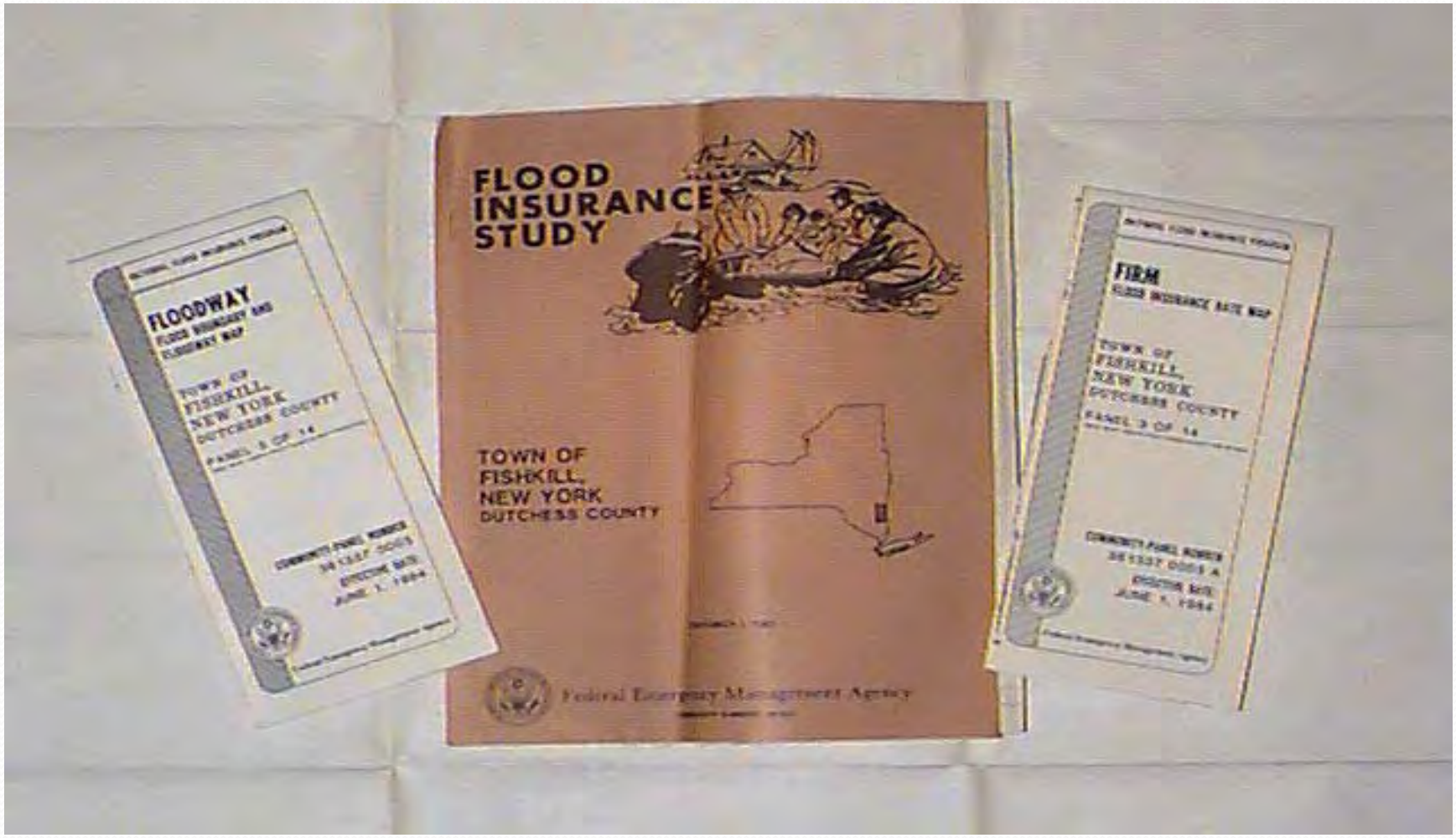
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

December 3, 1991 - To change Base Flood Elevations, Special Flood Hazard Areas and Zone Designations.
June 6, 2001 - To change Base Flood Elevations, Special Flood Hazard Areas and Zone Designations.
December 3, 2010 - To update corporate limits, roads and road names; to change Base Flood Elevations, Special Flood Hazard Areas and Zone Designations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

The Flood Insurance Study (FIS)



The FIS: Key Elements: Summary of Discharges

Table 1 - Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Arkansas River					
At Main Street in Little Rock (Pulaski County)	158,090	330,000	430,000	480,000	625,000
At Toad Suck Ferry Lock and Dam	156,403	*	*	485,000	*
Buffalo Branch					
At confluence with Tucker Creek Tributary	0.5	*	*	1,108	*
Centennial Creek					
At confluence with Tucker Creek Tributary	2.1	*	*	2,538	*
East Fork Cadron Creek					
At confluence with Cadron Creek	315	*	*	47,200	*
Gold Creek (East)					
At confluence with Little Creek	4.7	*	*	5,270	*
Upstream of Tributary No. 1	0.6	*	*	5,040	*
Upstream of Tributary No. 2	1.6	*	*	1,940	*

The FIS: Key Elements: Floodway Data Table

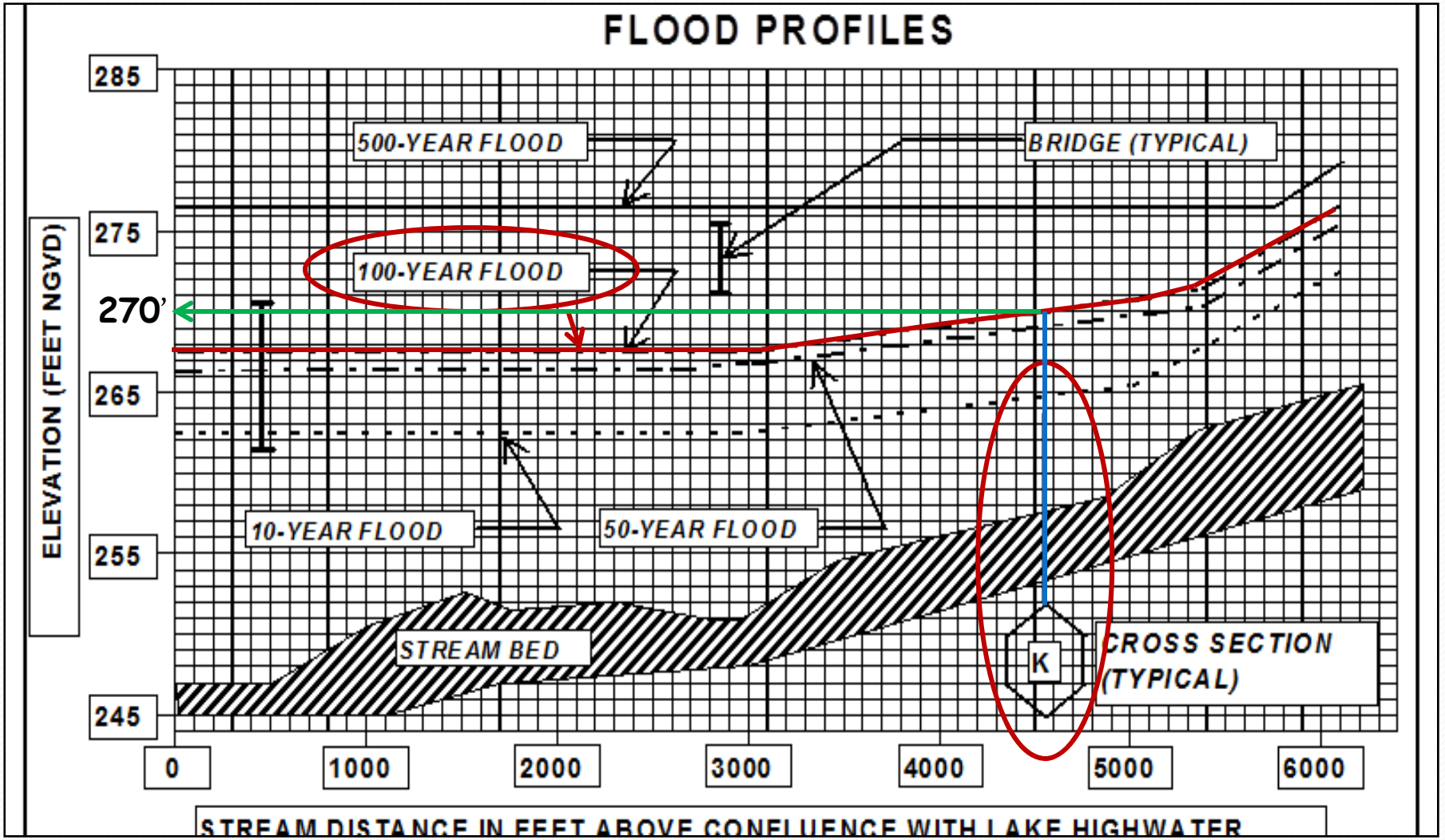
FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Buffalo CreekTributary A (Cont'd)								
O	12,370[4]	161	137	2.9	720.1	720.1	720.2	0.1
P	12,420[4]	200	540	0.7	720.2	720.2	720.2	0.0
Q	12,760[4]	290	332	1.2	720.8	720.8	720.8	0.0
R	12,850[4]	279	450	0.9	721.3	721.3	721.4	0.1
S	13,770[4]	209	239	1.3	722.7	722.7	722.8	0.1
T	13,900[4]	200	307	1.0	722.9	722.9	722.9	0.0
U	14,400[4]	44	82	3.9	724.5	724.5	724.6	0.1
V	14,590[4]	30	53	6.0	725.6	725.6	725.6	0.0
W	14,700[4]	20	79	3.7	726.7	726.7	726.7	0.0
X	15,110[4]	38	82	3.6	729.8	729.8	729.9	0.1
Y	15,210[4]	90	283	1.0	731.3	731.3	731.3	0.0
Z	18,050[4]	270	195	1.4	739.7	739.7	739.7	0.0
AA	18,552[4]	103	168	2.8	740.5	740.5	740.5	0.0
AB	19,195[4]	750	1,035	0.4	740.7	740.7	740.7	0.0
AC	19,350[4]	508	1,181	0.2	740.7	740.7	740.7	0.0
AD	20,559[4]	266	634	0.4	741.1	741.1	741.1	0.0
AE	20,854[4]	80	120	2.0	741.9	741.9	742.0	0.1
AF	20,931[4]	106	180	1.6	742.2	742.2	742.2	0.0
AG	21,544[4]	165	1,044	0.1	743.8	743.8	743.9	0.1
AH	21,949[4]	135	945	0.2	743.8	743.8	743.9	0.1
AI	22,548[4]	41	201	1.1	744.0	744.0	744.0	0.0

[4] Feet above mouth

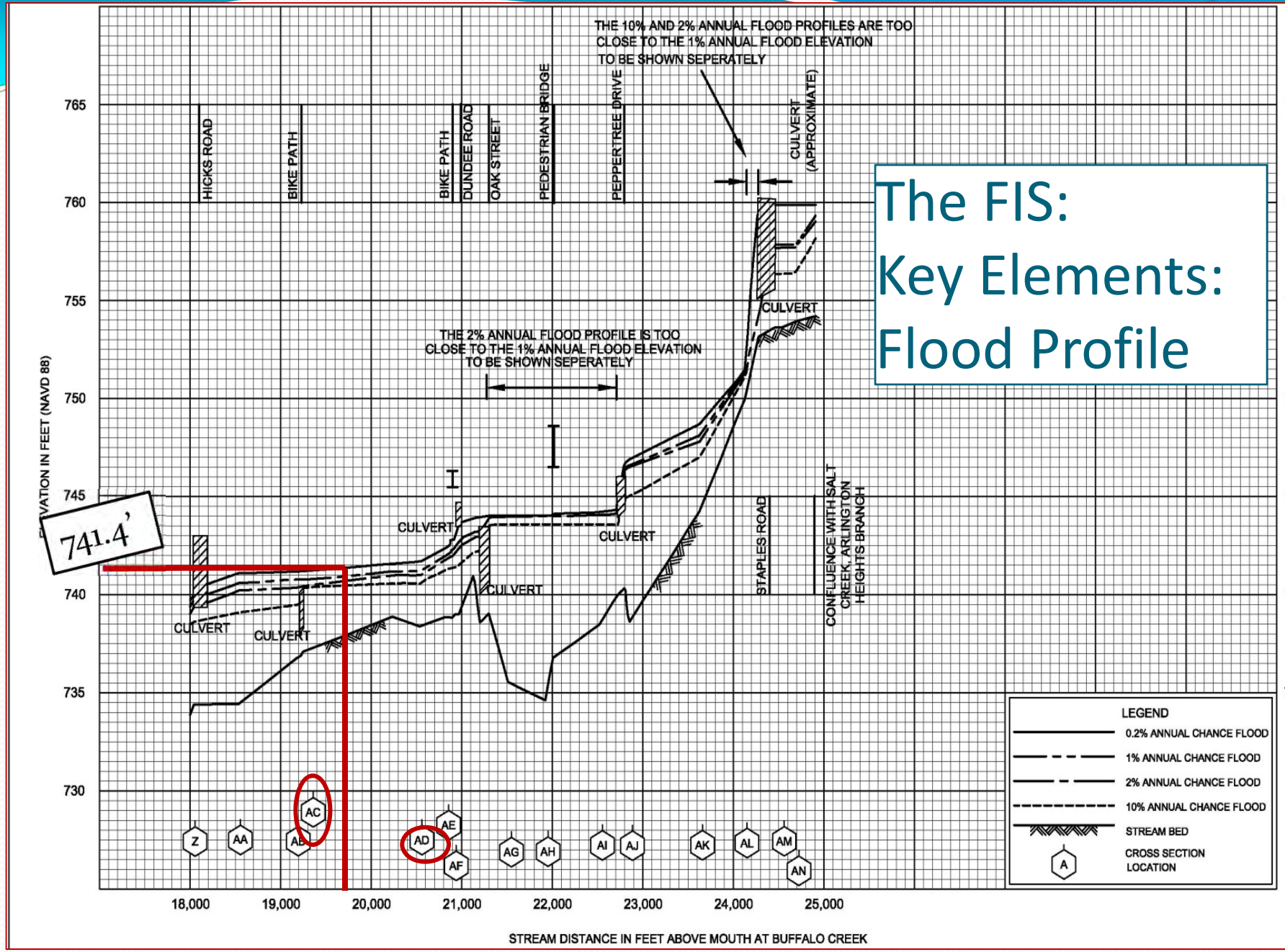
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOODWAY DATA

The FIS: Key Elements: Flood Profile



The FIS: Key Elements: Flood Profile



Conversion to a FIRM by Letter

Federal Emergency Management Agency

Washington, D.C. 20472

IA-RA-TO:198

THIS IS A SPECIAL NOTICE REGARDING THE CONVERSION FROM THE EMERGENCY TO THE REGULAR PROGRAM, WHICH SHOULD BE ATTACHED TO THE MAP FOR:

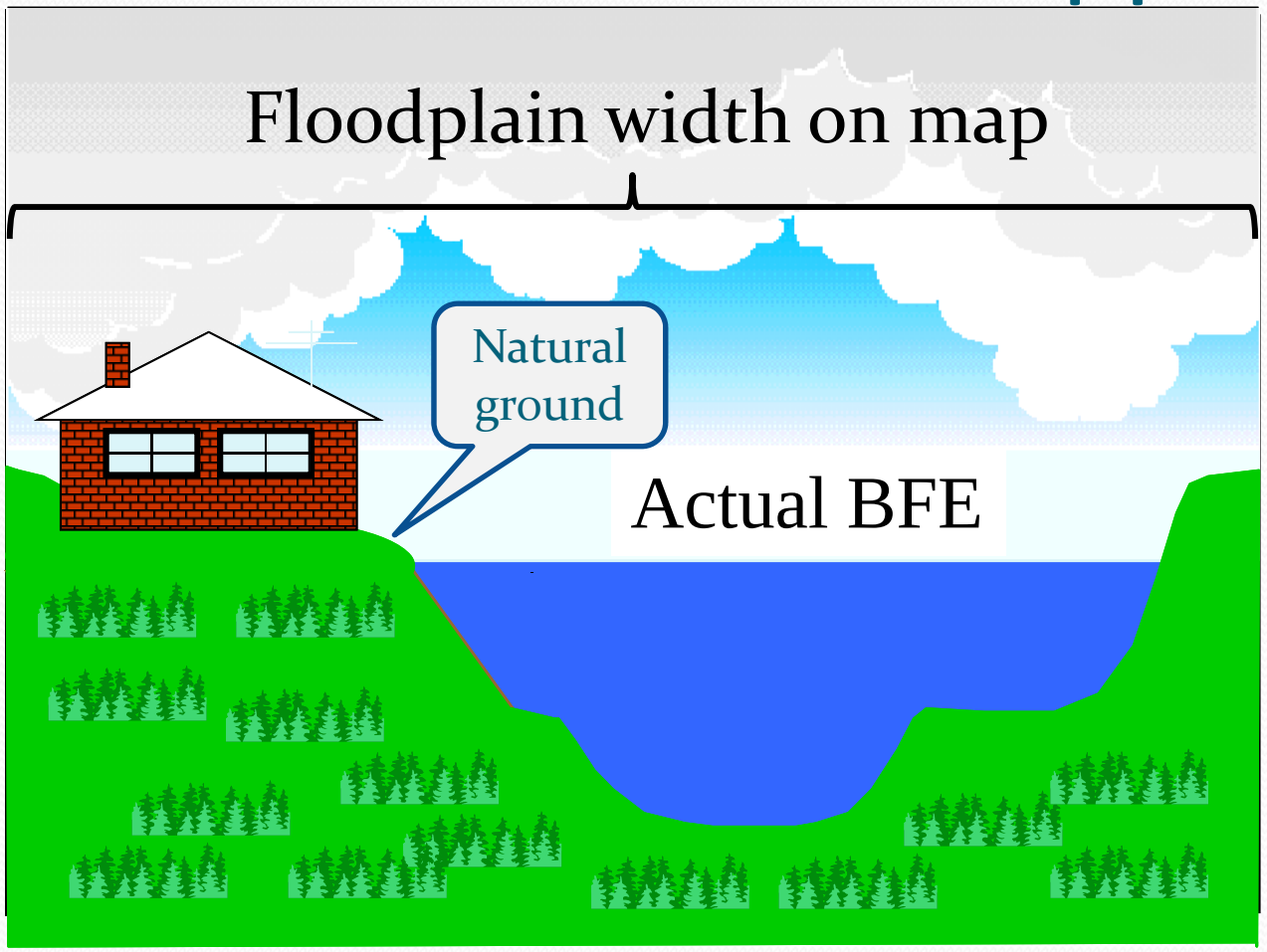
050226	Judsonia(city)	White	AR
Community Number	Community Name & Type	County Name	State

12-12-75	A	09-01-87	B
Flood Hazard Boundary Map Date	Old Suffix	Regular Program Entry and Initial Flood Insurance Rate Map Date	New Suffix

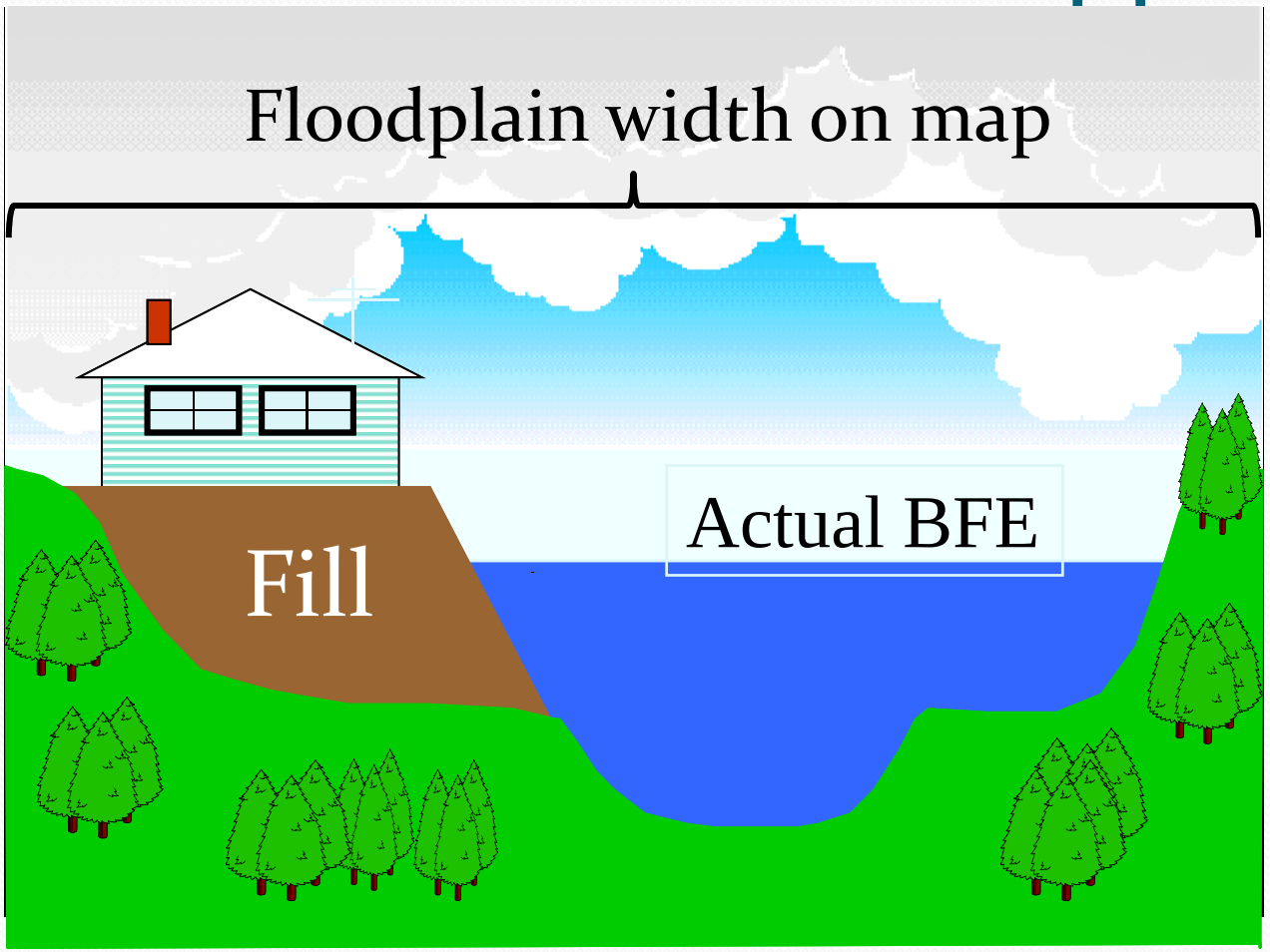
Letter of Map Change (LOMC)

- Letter of Map Amendment (LOMA)
- Letter of Map Revision Based on Fill (LOMR-F)
- Letter of Map Revision (LOMR)
- Conditional Letter of Map Revision (CLOMR)
- Letter of Map Amendment – Out As Shown (LOMA-OAS)

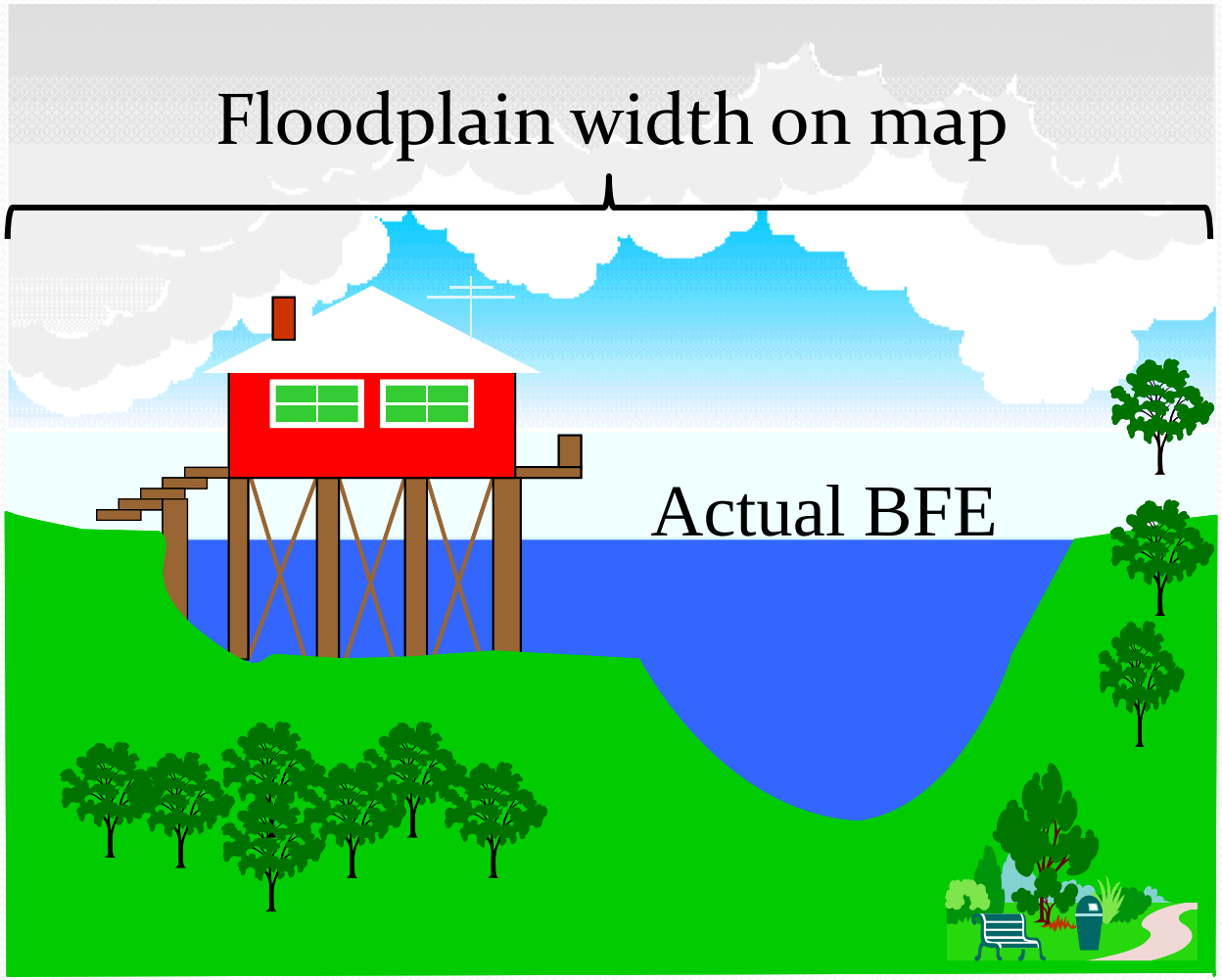
Situation 1: What LOMC Applies?



Situation 2: What LOMC Applies?



Situation 3: What LOMC Applies?

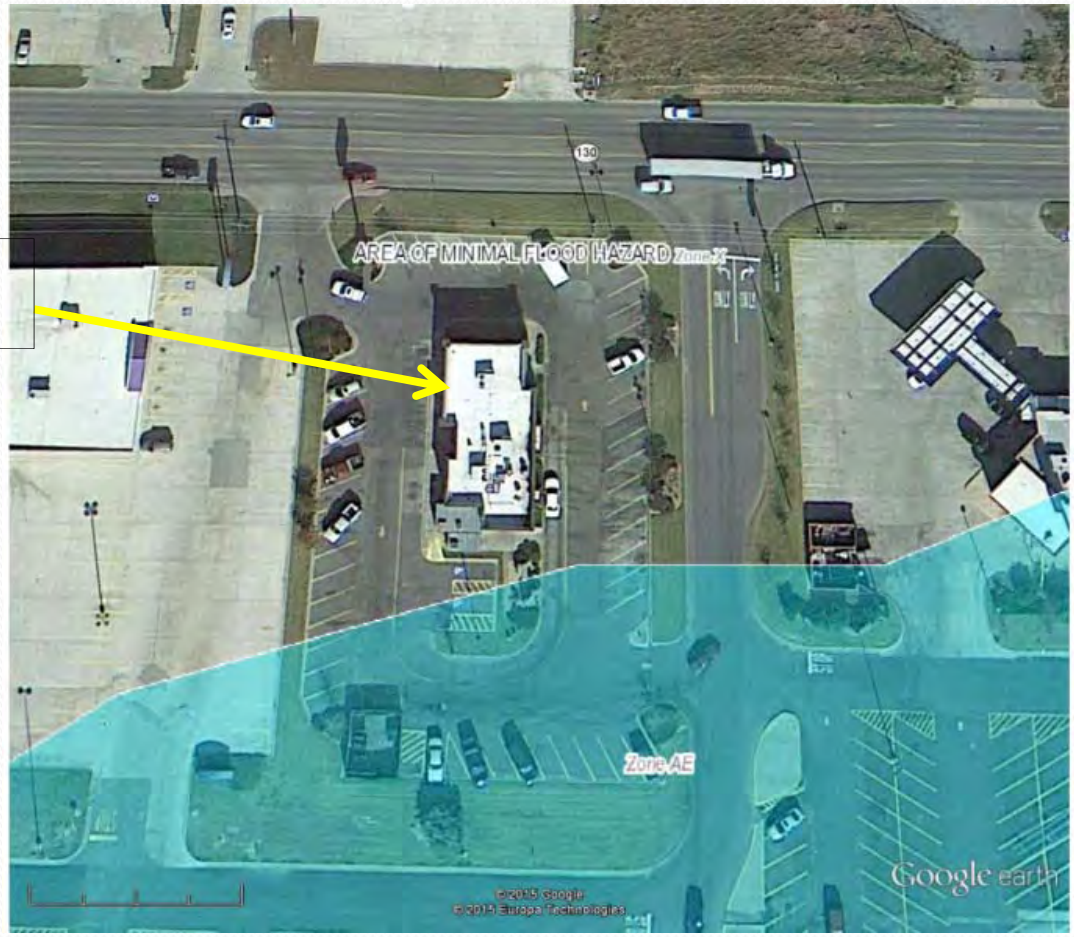


Situation 4: What LOMC Applies?

Channel realignment and substantial modification of floodway

Situation 5: What LOMC Applies?

Business



Structure is entirely Out of SFHA

More About Flood Maps

- What tools can you use to help locate property relative to the floodplain?
- If you suspect a house is not in the SFHA, but the map clearly shows it is, what can you do?
- What about a meandering stream?
- How can you determine the BFE for maps without them?

Stay Tuned

Questions?