

SKAGIT COUNTY FIS UPDATE



**BURLINGTON CHAMBER OF
COMMERCE PRESENTATION
MAY 24, 2007**

PROCESS & SCHEDULE

Flood Insurance Study Phase 1 Overview

- **New maps cover Sedro Woolley downstream to bay**
- **Study uses an unsteady-state, 2-D hydraulic model**
- **The hydrologic data for the study:**
 - 100-year discharge of 226,400 cfs (at Concrete)
 - 50-year discharge of 185,000 cfs (at Concrete)
- **There are no 100-year flood protective levees**
- **Vertical datum changes from NGVD 29 to NAVD 88**
- **New maps will not contain a floodway (at this time)**

PROCESS & SCHEDULE

Flood Insurance Study Phase 1 Overview

- Follows a USGS Quad layout – countywide coverage with no city “cut-outs”
- Currently working with the County GIS staffs to ensure that quality LiDAR-topo data is used
- Contains 100 & 500 year floodplains (AE/X zones)
- 10, 50, 100, 500 year flood elevations published
- Not the same results as the USACE is using for their Flood Damage Reduction Study

PROCESS & SCHEDULE

Flood Insurance Study Phase 2 Overview

- **Finish mapping upper Skagit from Sedro Woolley to Concrete (including portions of the Sauk)**
 - Will include updated topo/floodway/new BFEs
- **Meet with communities to start to discuss a floodway downstream of Sedro Woolley**
- **Work with the communities to outreach study results and homeowner implications**
- **Issue revised maps**

U.S. GEOLOGICAL SURVEY

Water Resources Division (WRD) Mission

- To provide reliable, impartial, timely information that is needed to understand the Nation's water resources. WRD actively promotes the use of this information by decision makers to:
- Minimize the loss of life and property as a result of water-related natural hazards, such as floods, droughts, and land movement
- Effectively manage ground-water and surface-water resources for domestic, agricultural, commercial, industrial, recreational, and ecological uses
- Protect and enhance water resources for human health, aquatic health, and environmental quality
- Contribute to wise physical and economic development of the Nation's resources for the benefit of present and future generation

U.S. ARMY CORPS OF ENGINEERS

Hydrologic Engineering Center (HEC) Mission

- The designated Center of Expertise for the [US Army Corps of Engineers](#) in the technical areas of surface and groundwater hydrology, river hydraulics and sediment transport, hydrologic statistics and risk analysis, reservoir system analysis, planning analysis, real-time water control management and a number of other closely associated technical subjects.
- HEC supports Corps field offices, headquarters, and laboratories by providing technical methods and guidance, water resources models and associated utilities, training and workshops, accomplishing research and development, and performing technical assistance and special projects.

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency Mission

- **Reduce the loss of life and property and protect the Nation from all hazards, including natural disasters, acts of terrorism, and other man-made disasters, by leading and supporting the Nation in a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation.**

FEMA

National Flood Insurance Program (NFIA 1968)

- **Section 1360** of the Act requires that flood risk zones be established in all flood-prone areas, and that estimates be made with respect to the rates of probable flood-caused loss for the various flood-risk zones for each of these areas..
- *HUD (subsequently transferred to FEMA) is charged by Congress with mapping the nation's floodplains and creating maps to regulate risk.*
- A meeting of scientists and other experts recommended that the **1% (100-year) flood** be the standard for the NFIP. This initiated the first **FIS**.
 - OMB reaffirmed the use of the **1% flood** as the basis for floodplain management in **1983**

RE STUDY PROCESS

Timeline of events

- USACE GI initiated and request for map revision was made by county – **July, 1997 (part of USACE GI)**
- *FEMA conducts scoping meetings* – **Jan, 2001**
- USACE hydrologic model reviewed internally - **2002**
- USACE hydraulic model undergoes independent technical review (ITR) by West Consultants - **2002**
- FEMA reviews (and approves) USACE hydrology – **June, 2003**
- HEC Davis performs ITR of the hydrology and hydraulics - **2004**
- PSE pays Tetra Tech to perform ITR of USACE work – **2004**
- USGS (William Kirby) reviews USACE hydrology – **2004**
- FEMA halts FIS process at the County's request pending the results of multiple ITR and additional studies – **Feb, 2005**
- HEC performs ITR of PIE's H&H model – **2005**
(conclusion: model is deficient due to inadequate input of historic flows)

RE STUDY PROCESS

Timeline of events

- USGS verified 1921 flows by calibrating them to 2003 flood - **2005**
- USGS further reviews the historic floods and confirmed the (USGS) verification study; also reviewed PIE data - **2005**
- USGS reviews the “Larry Kunzler White Paper” - **2005**
- FEMA mails “data request letter” to all communities – **March, 2005**
- FEMA holds meetings to discuss “Map Mod product” – **July, 2005**
- FEMA reviews PIE alternate hydrology – **Dec, 2005**
- FEMA concludes that the USGS/USACE figures are still accurate – **Feb, 2006**
- FEMA resumes FIS process - **2006**
- ***Intermediate “CCO” meeting – June 28, 2006***
- *Draft study & maps released to public – March, 2007*
- *FEMA conducts multiple FIS briefings to communities – May, 2007*

RE STUDY PROCESS

Timeline of events

- Preliminary maps issued – **est. July, 2007**
- Hold Final CCO meeting – **est. Sept, 2007**
- 90 day appeal period begins after 2nd public notice in local newspaper – **est. Sept, 2007**
- 90-day appeal period ends – **est. Dec, 2007**
 - FEMA reviews submitted technical appeals and modifies or maintains maps as appropriate
- FEMA issues “Letter of Final Determination (LFD)” to communities and publishes the BFEs in the Federal Register – **est. Jan/Feb, 2008**
 - Communities have 6 months to adopt the study before the data becomes “effective”. *Failure to adopt results in suspension from NFIP*
- Effective date – **est. July, 2008**

90 DAY APPEAL PERIOD

Appeals

- *“requests for changes to proposed BFEs”*
- *Must be based on scientific evidence demonstrating error*
- *FEMA will not accept anecdotal information as the basis of a BFE change*

Protests

- *“requests that do not involve BFEs”*
- *hydrology*
- *floodplain boundaries*
- *corporate limits*
- *road locations*
- *road names*
- *etc.*

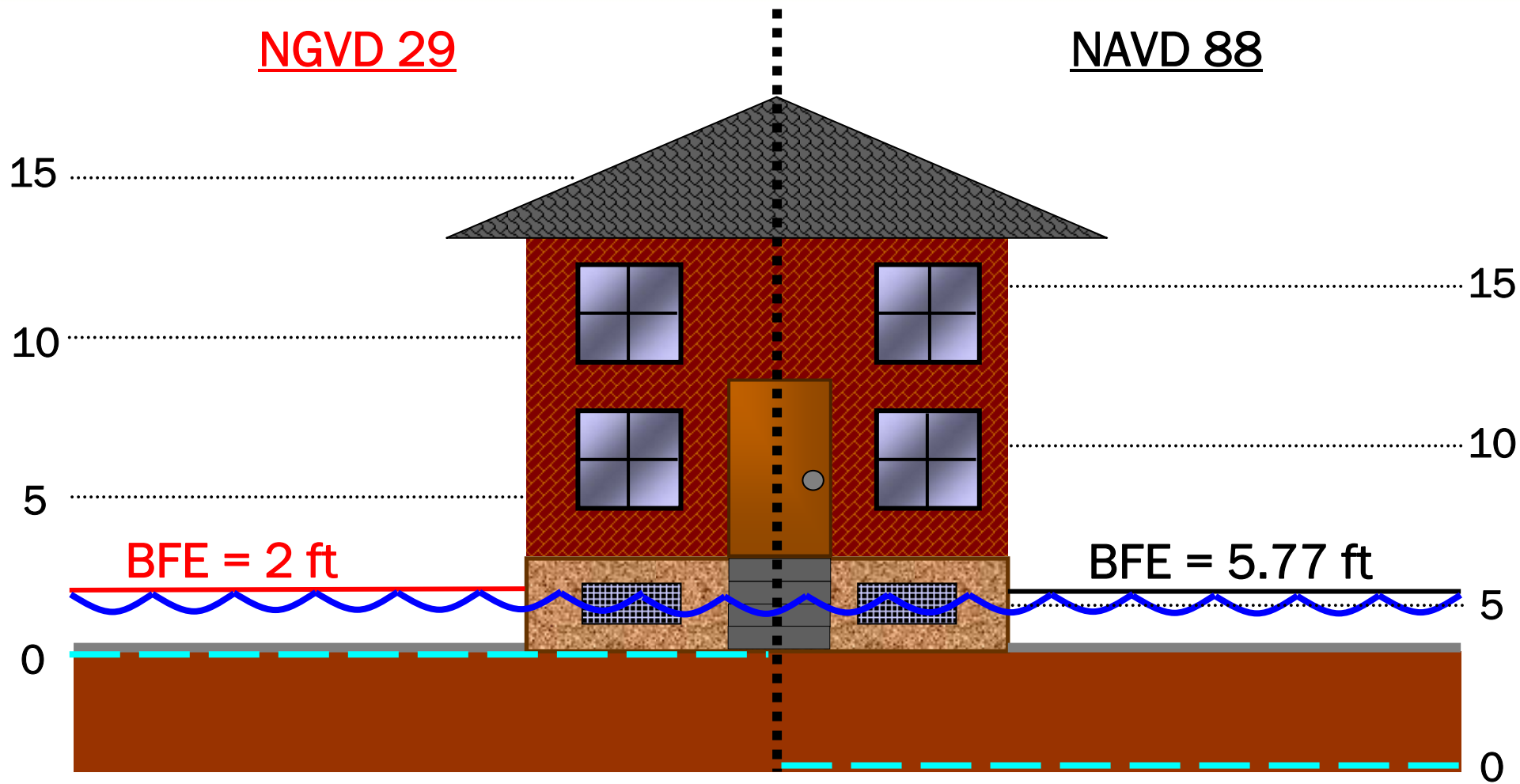
DIGITAL FLOOD INSURANCE RATE MAPS

Vertical Datum Change

- **NGVD 29**
 - Based on a mean sea level from 21 tidal stations in the US & 5 stations in Canada
- **NAVD 88**
 - Based on the density of the Earth instead of varying values of sea heights
 - More accurate
- **Conversion in Skagit County is 3.77'**
 - $\text{NGVD} + (3.77') = \text{NAVD}$
 - Ex: 20' (on current map) = 23.77' on new map

DIGITAL FLOOD INSURANCE RATE MAPS

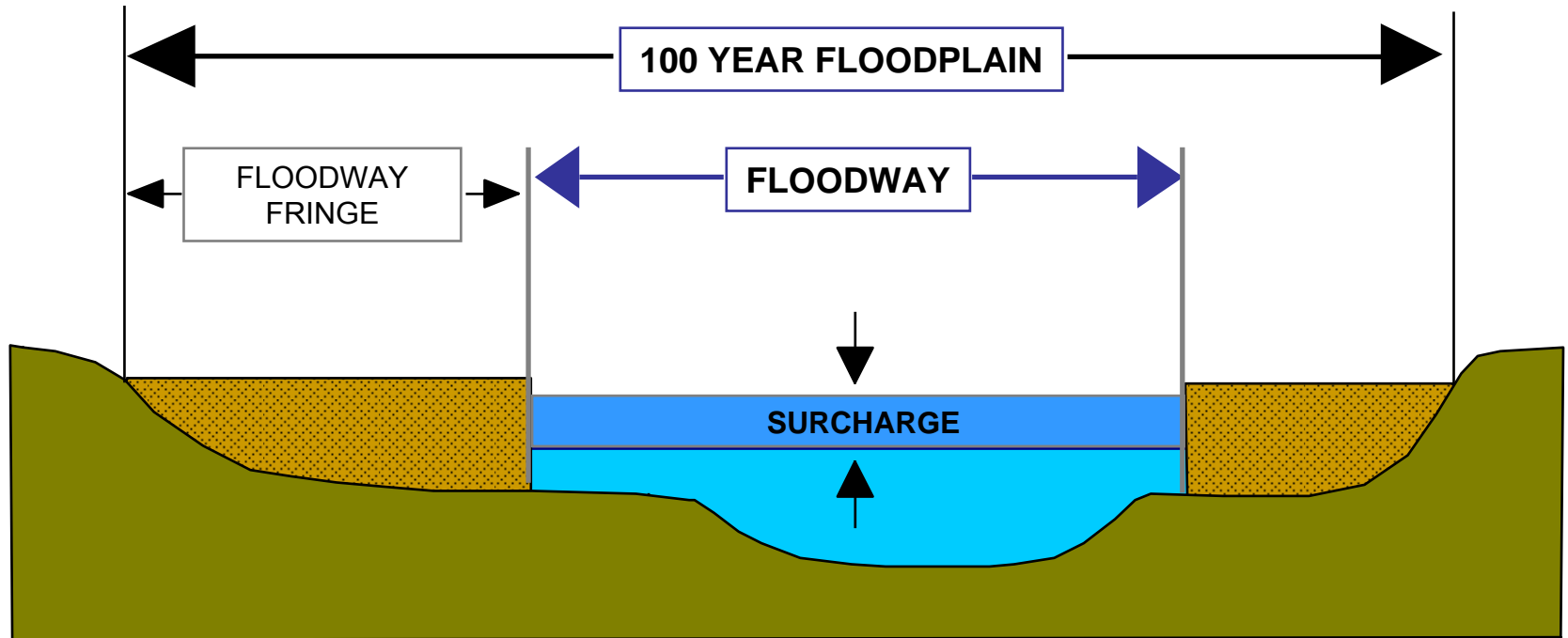
Vertical Datum and FIRMs (ex uses 3.77' conversion)



FLOODWAY

- **Historically, Skagit County, Burlington, and Mount Vernon have all adopted their own version of a conveyance preservation tool pursuant to 60.3(C)(10) of the 44 Code of Federal Regulations.**
- **RCW 86.16 applies to a “floodway” as shown on a FEMA map**
- **A floodway is a standardized approach to preserving open space to convey the 100-year flood without causing greater than a 1’ rise.**
- **Floodways are used upstream of Sedro Woolley**

Floodway Schematic



FLOODWAY + FLOODWAY FRINGE = 100 YEAR FLOODPLAIN
SURCHARGE NOT TO EXCEED 1.0 FEET

RUMORS VS. FACTS

- **Myth:** *“BFEs would be lower if we removed the four controversial “Stewart” floods!”*
- **Fact:** FEMA evaluated a 50-year flood event with a lower discharge than would occur with the 4 floods removed and verified that the BFE would only decrease by about 1-2’

226,400 cfs vs 185,000 cfs – 100 vs 50 year flood

All Elevations shown in NAVD 88

Draft 50 year SWL: ~38.9'
Draft 100 year SWL: ~39.8'
Effective BFE: ~34.2' ($\Delta 5.6'$)

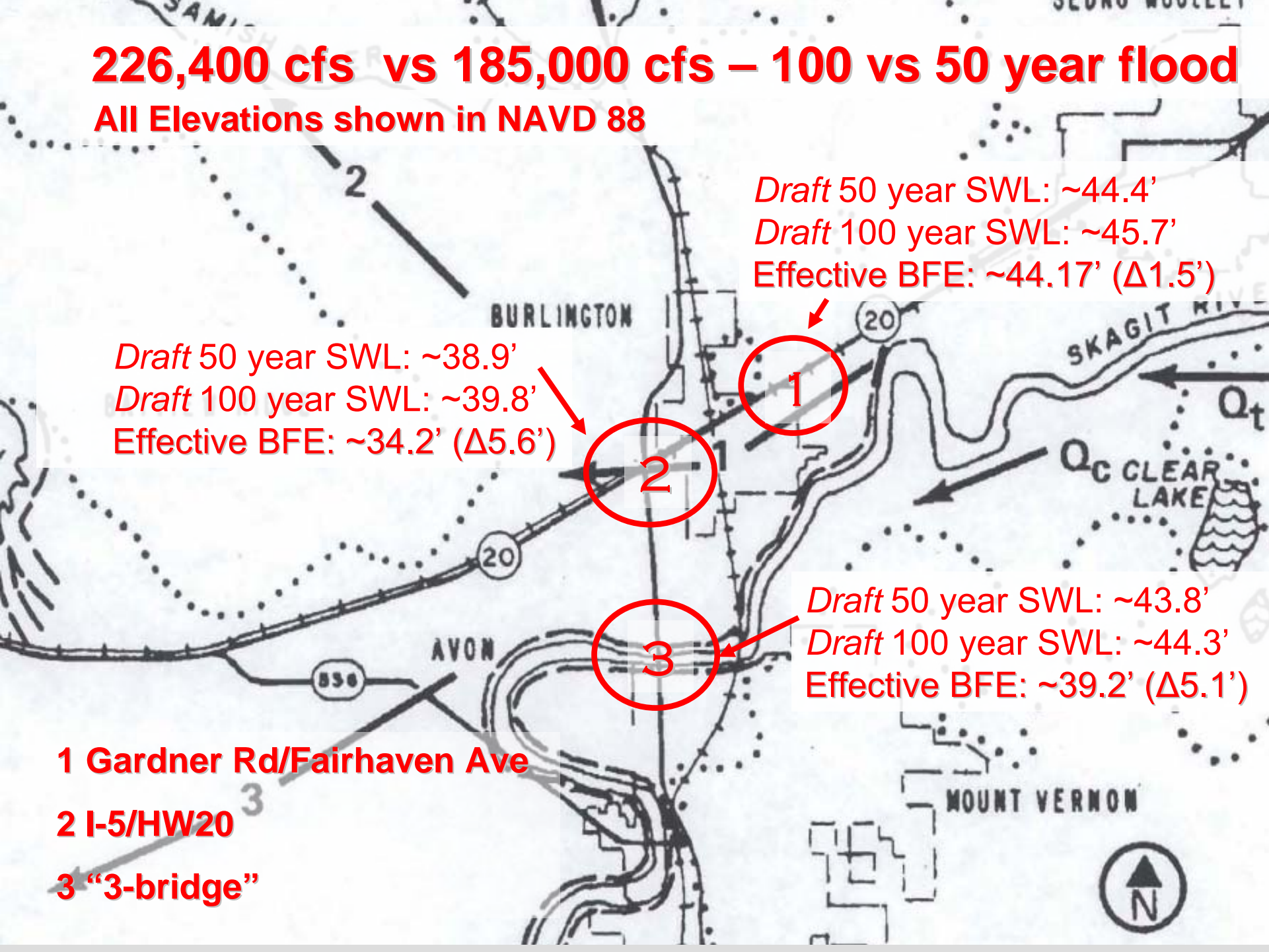
Draft 50 year SWL: ~44.4'
Draft 100 year SWL: ~45.7'
Effective BFE: ~44.17' ($\Delta 1.5'$)

Draft 50 year SWL: ~43.8'
Draft 100 year SWL: ~44.3'
Effective BFE: ~39.2' ($\Delta 5.1'$)

1 Gardner Rd/Fairhaven Ave

2 I-5/HW20

3 "3-bridge"



BASE FLOOD ELEVATIONS

What accounts for the change from 1984 – 2007?

- **Previous model**

- Assumed 3 “Flow Paths” each carrying a limited amount of water
 - Flow Path 1: 130k CFS Flow Path 2: 86k CFS Flow Path 3: 44k CFS
- Used a single est. of 240,000 cfs entering the river (steady-state) and routed it in a uniform direction downstream (1-dimension)
- Did not factor levee failures
 - Flooding in Fir Island: effective BFE is 12.7’ (NAVD88), but levee failure resulted in observed depths of 10’ above the ground (exceeding BFE’s by 3-9’)

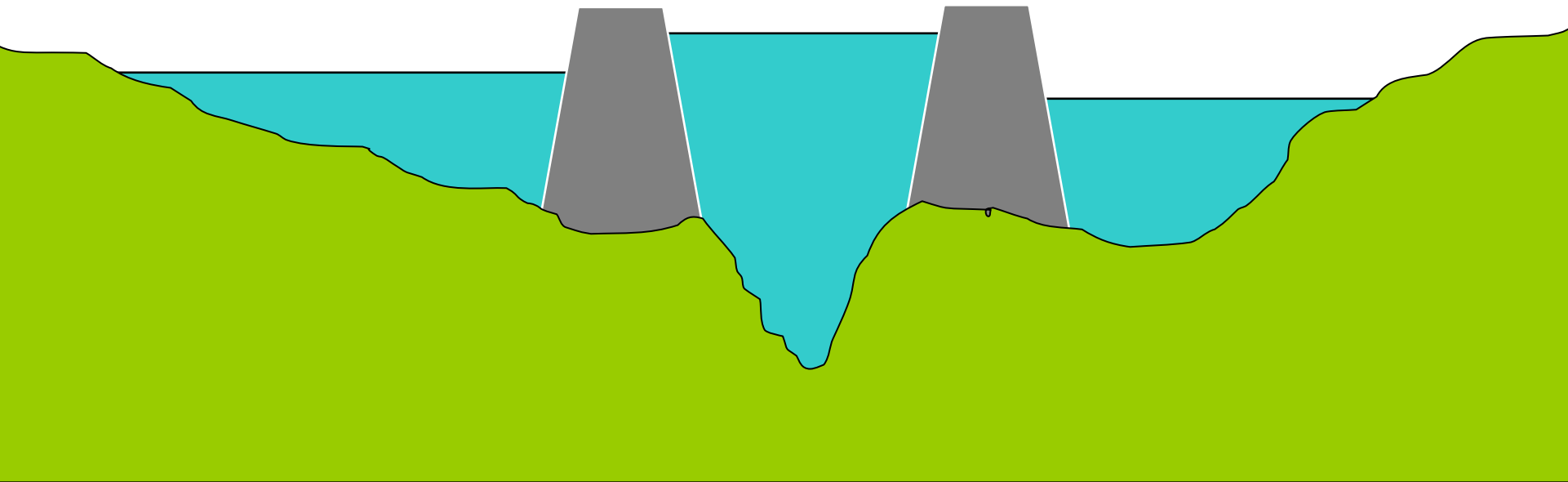
BASE FLOOD ELEVATIONS

What accounts for the change from 1984 – 2007?

- **New model factors conditions such as:**
 - Water *entering or exiting* the river system (2-dimensions) as the river rises, crests, and falls over time (unsteady-state)
 - Water freely moving/interacting throughout the entire delta (as opposed to assumed separate “flow paths” with their own assumed 100-year discharge)
 - levee failure scenarios



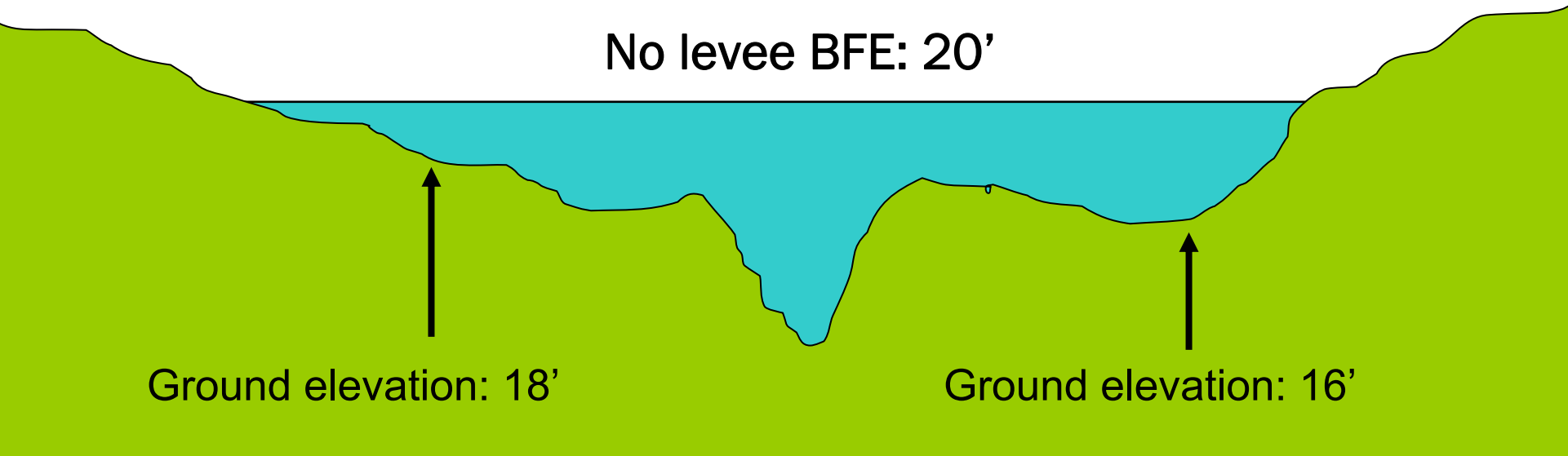
HOW DOES FEMA MODEL LEVEES?



SCENARIO 1:

ASSUME NO LEVEES EXIST

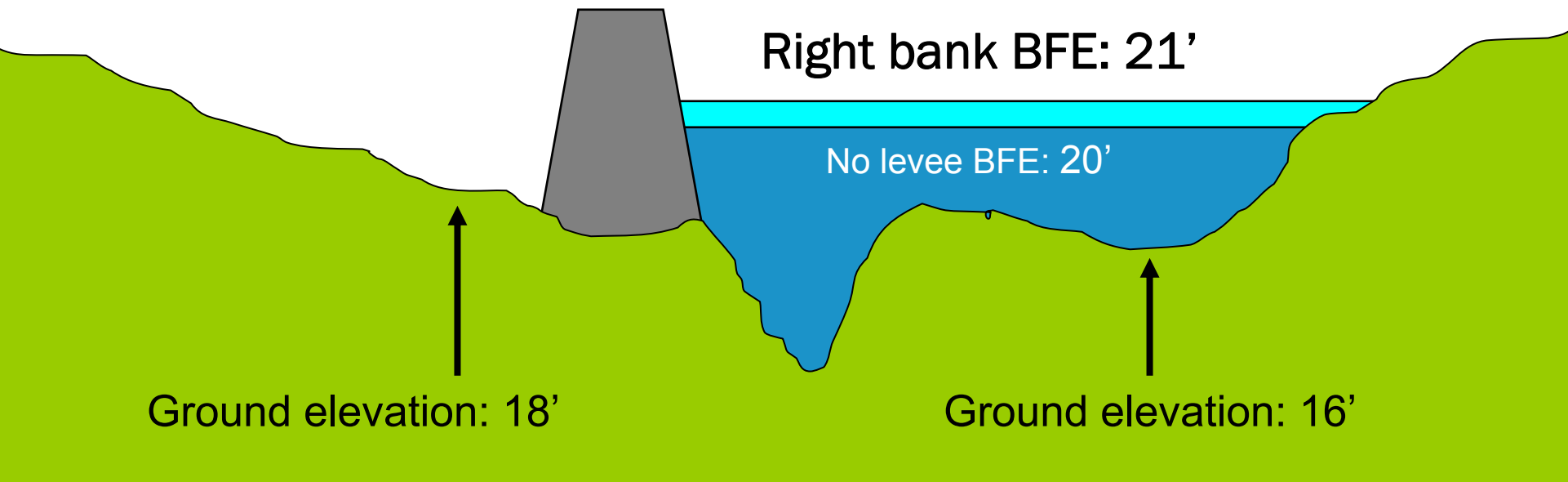
- Establishes a baseline for comparison
- Used for calculating the Floodway
- Provides lowest BFEs



SCENARIO 2:

SIMULATE RIGHT BANK LEVEE FAILURE

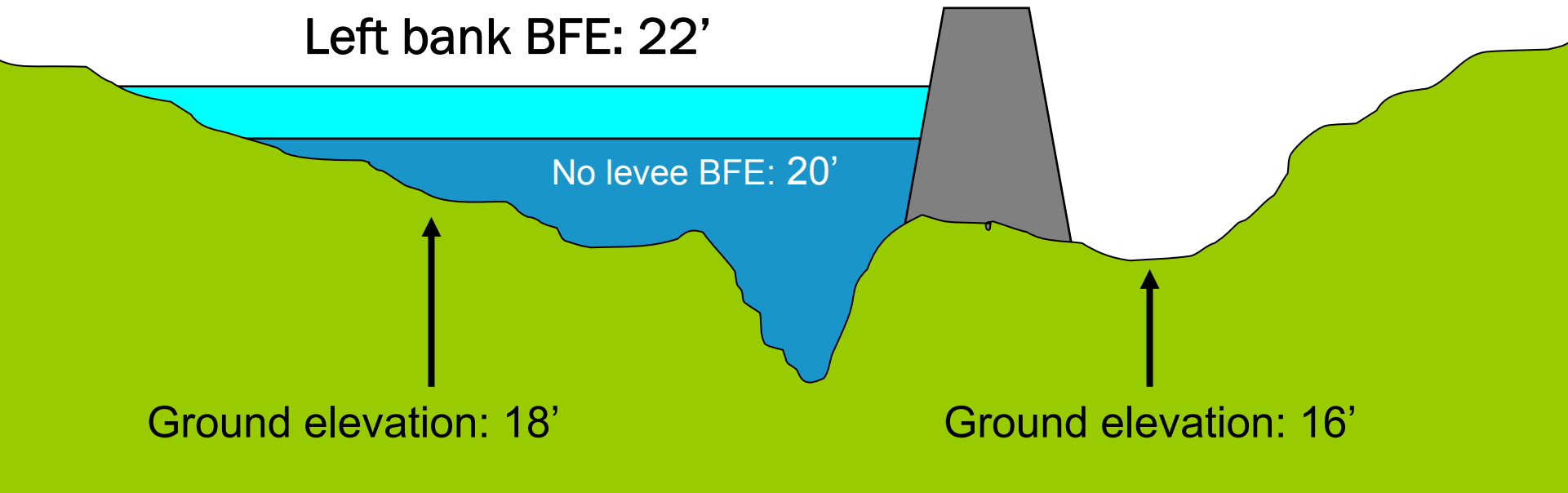
This determines the BFE on the right bank (behind levee)



SCENARIO 3:

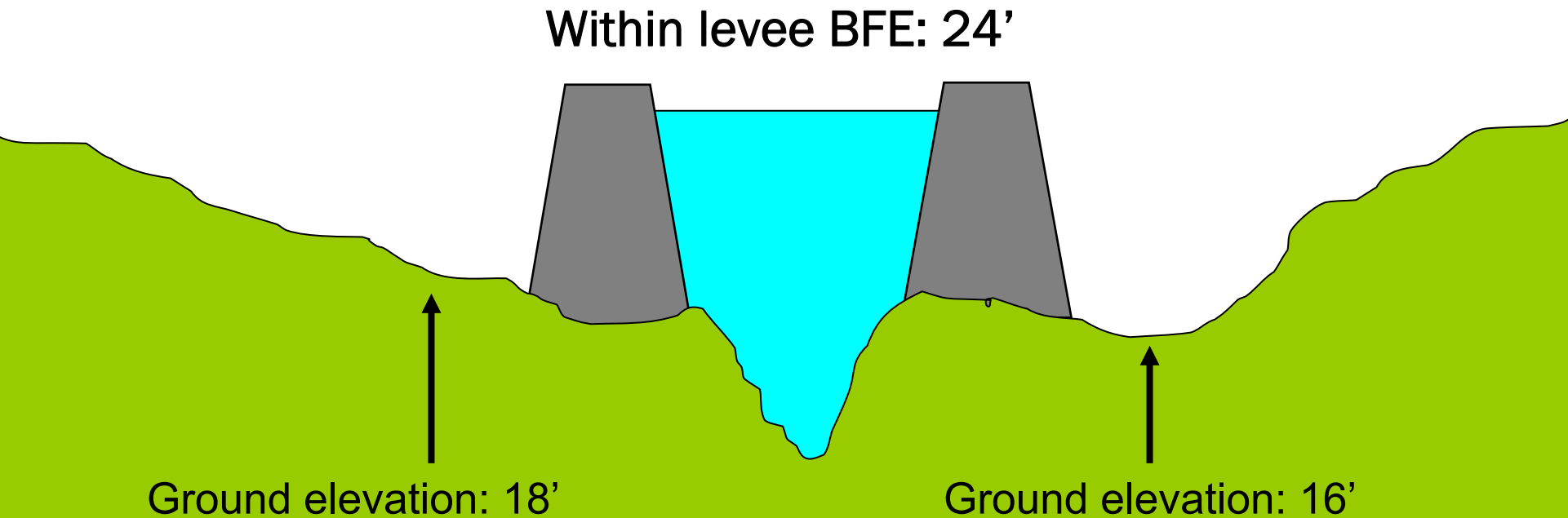
SIMULATE LEFT BANK LEVEE FAILURE

- This determines the BFE on the left bank (behind levee)



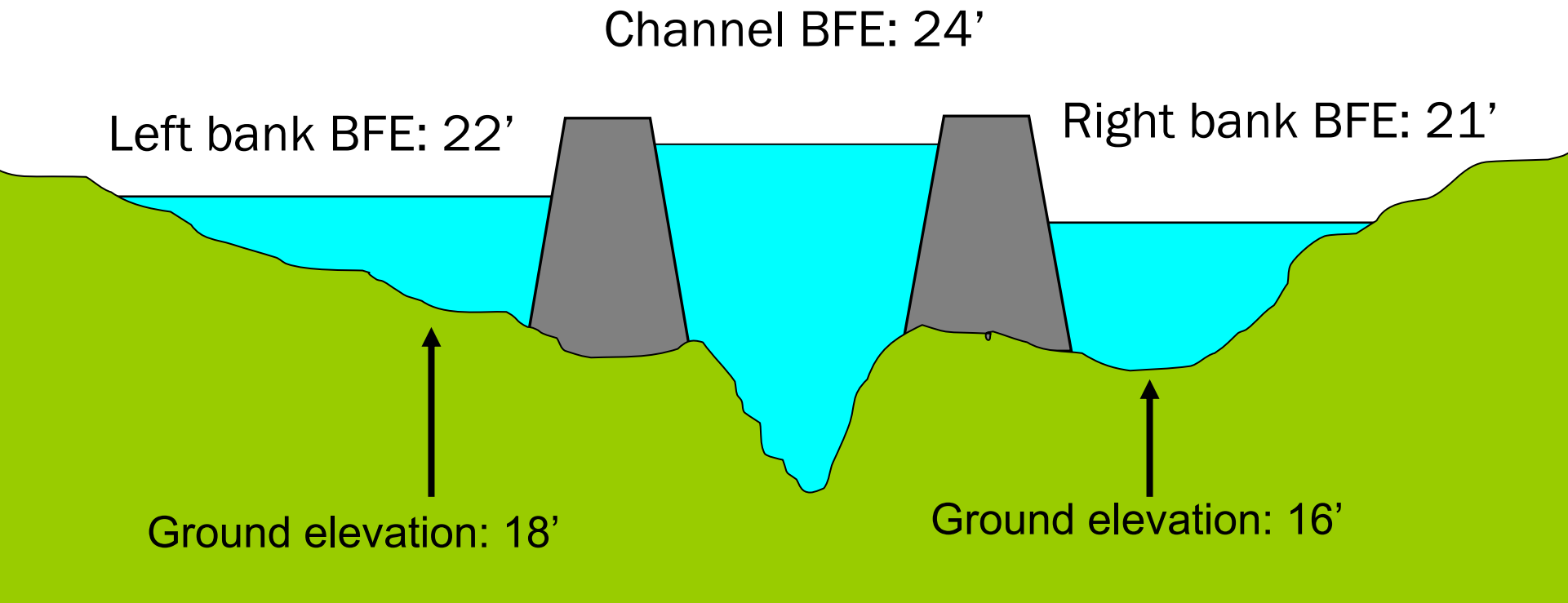
SCENARIO 4: SIMULATE NO LEVEE FAILURES

- Determines the BFE within the levee
- Indicates insufficient freeboard?



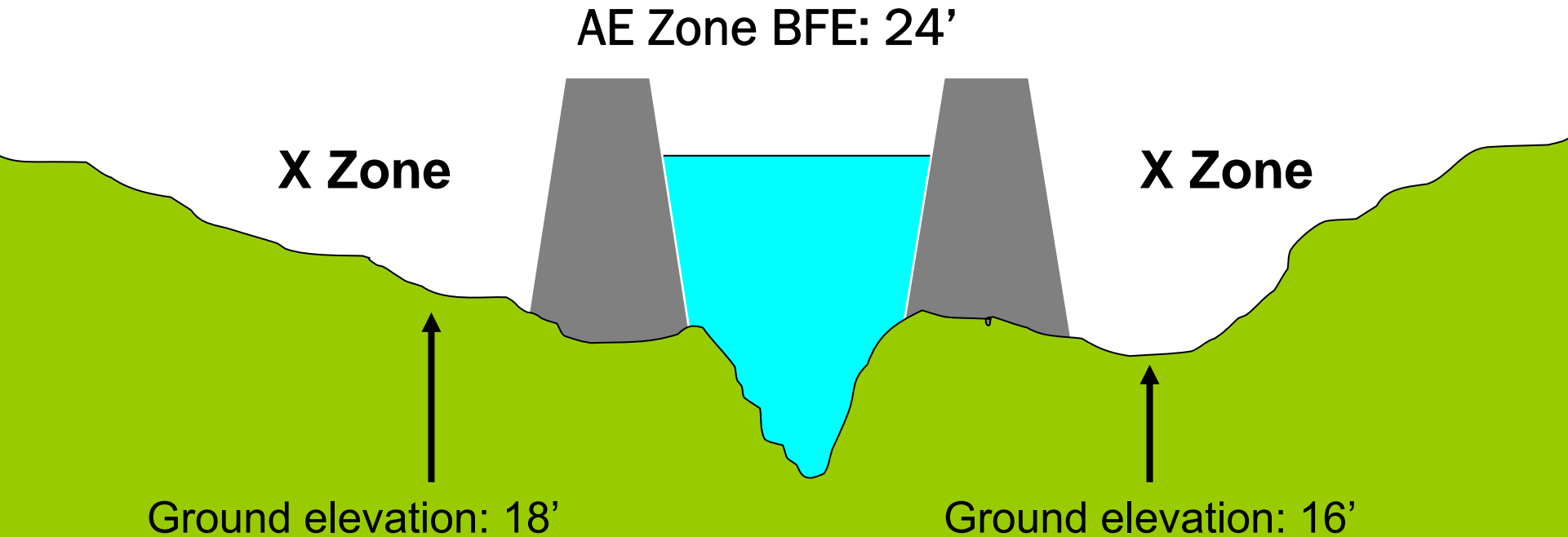
MAPPING: COMBINE THE RESULTS — ASSIGN RISK ZONE & ASSIGN BFE

- Final BFE shown reflects what would occur when a levee fails by factoring in the unknown of where the levee will fail



IS THE LEVEE CERTIFIED BY USACE?

- Levees must meet standards identified at 44 CFR 65.10
- Based on FEMA Guidelines and Specifications for mapping
- Original interim levee policy: May 15, 1981



FLOOD INSURANCE STATISTICS

City of Burlington Facts

- **Total number of policies: 1,305**
- **Premiums Collected: \$779,000**
- **Insurance in force: \$261 million**
- **Average premium: \$597**
- **Total losses since 1978: 15**
- **\$45,000 million claims paid**
- **Policy holders in the SFHA save 20% on premiums**
- **SFHA buildings save \$146 annually**
 - This equals ~\$191,000 saved each year!

FLOOD INSURANCE STATISTICS

City of Mount Vernon Facts

- **Total number of policies: 1,006**
- **Premiums Collected: \$786,000**
- **Insurance in force: \$192 million**
- **Average premium: \$597**
- **Total losses since 1978: 60**
- **\$556,000 million claims paid**
- **Policy holders in the SFHA save 20% on premiums**
- **SFHA buildings save \$193 annually**
 - This equals ~\$194,000 saved each year!

FLOOD INSURANCE STATISTICS

Skagit County Facts

- **Total number of policies: 2,737 (highest in State)**
- **Premiums Collected: \$1.77 million**
- **Insurance in force: \$489 million**
- **Average premium: \$650**
- **Total losses since 1978: 532**
- **\$6.7 million claims paid**
- **Policy holders in the SFHA save 20% on premiums**
- **SFHA buildings save \$227 annually**
 - This equals ~\$561,000 saved each year!

FLOOD INSURANCE STATISTICS

Skagit compared to WA and RX Facts

- **Total WA Policies: 80,812**
 - Skagit accounts for 7% or 5,376
 - Skagit has highest number of policies in Region X (counties & cities)
- **Total WA Coverage: \$16 billion**
 - Skagit is 2nd in Region X (\$1 billion)
- **Total WA Annual Premiums Collected: \$85 million**
 - Skagit accounts for 4% or \$3.6 million
- **Total WA Claims Since 1978: 15,140**
 - Skagit accounts for 7% or 1,045
- **Total WA Claims Paid Since 1978: \$218 million**
 - Skagit received 6% or \$12 million

FLOOD INSURANCE RATES

2007 Post FIRM Residential Rates (\$100k)

3 ft above BFE = \$196

2 ft above BFE = \$261

1 ft above BFE = \$411

0 ft at BFE = \$741

-1 ft below BFE = \$2,296

-2 ft below BFE = \$2,535

-3 ft below BFE = \$2,825

-5 ft below BFE = \$5,500

FLOOD INSURANCE RATES

2007 Post FIRM Non-residential Rates (\$150k)

+4 ft above BFE *= \$888

1 ft above BFE = \$726

0 ft at BFE = \$1,806

-1 ft below BFE = \$7,041

*\$500k building, \$500k contents w/ Class 5 CRS discount
(See example from handouts)

FLOOD INSURANCE

Grandfathering Rate Require Documentation

- To recognize policy holders who have built in compliance and have maintained a continuous and current flood insurance policy, FEMA will allow the policy holder to continue to benefit from the original rating of that building.
- Policies are transferable from one owner to another (e.g. due sale of property)
- Owner has the option of using the updated maps as the rating criteria for that property or continuing to use the rate established based on the original (old) maps.

Or...

FLOOD INSURANCE

Grandfathering Rate Require Documentation

A policy holder can provide sufficient documentation

- The date of the FIRM in effect when building was constructed
- The flood zone from that FIRM in which the property is located
- The Base Flood Elevation (BFE) for that zone (if applicable)
- A copy of the map panel showing the location of the building
- The rating element that is to be grandfathered (rate or zone).
 - Evidence supporting the rating element includes documents such as Elevation Certificates.
 - A letter from the community official verifying this information also is acceptable, as long as the above information is provided.

FLOOD INSURANCE

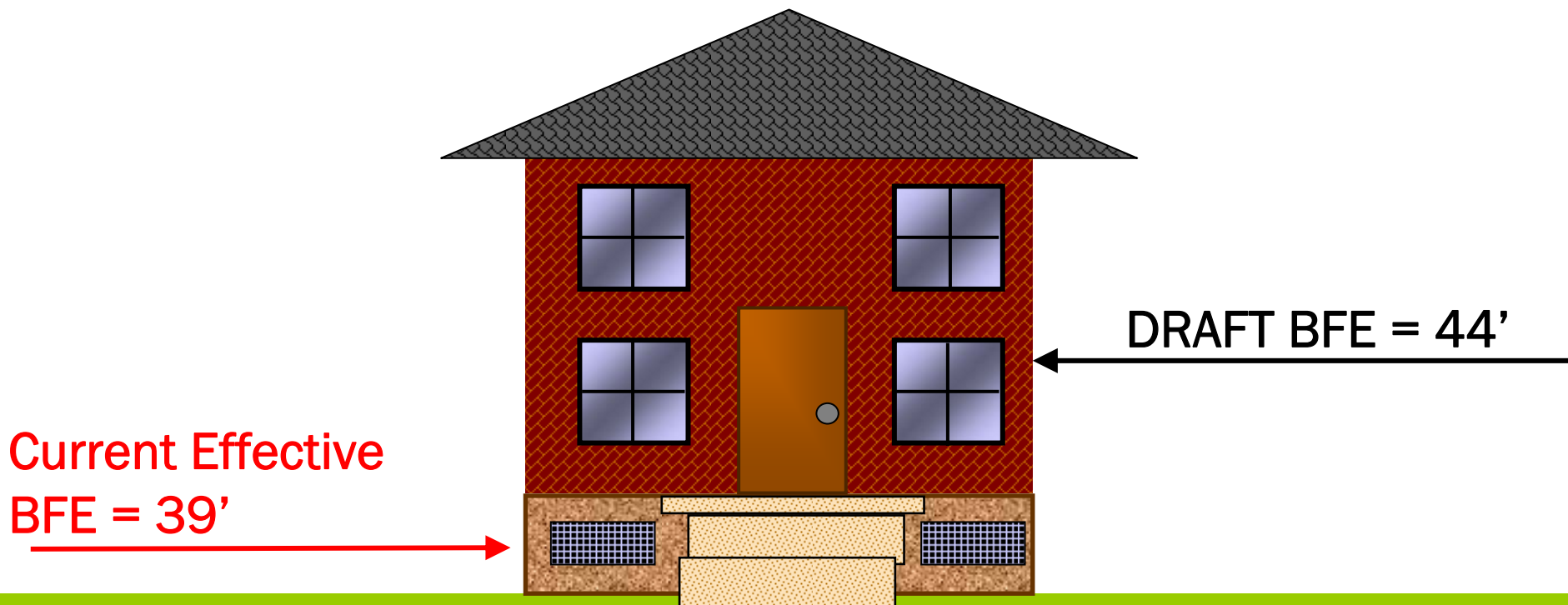
Grandfathering Rates

Why use the draft maps for permitting?

- If a building is voluntarily elevated today using the draft BFEs, when the maps become effective, that owner will still be able to pay rates reflecting the additional freeboard!
- **The key to rating buildings built in compliance with old maps is to retain copies of the old maps!**

GRANDFATHERING

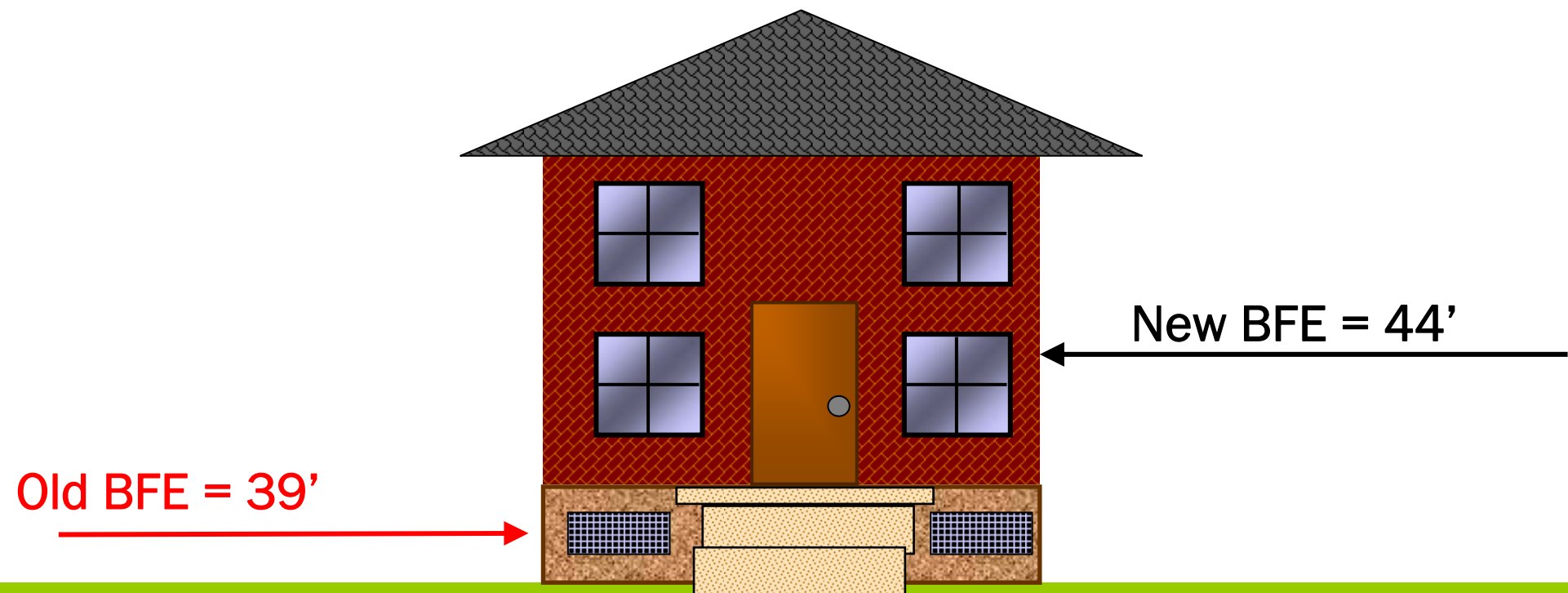
2007 – Existing, Compliant, Post-FIRM Structure



Annual premium: ~\$411 (BFE +1' rate)
for \$100,000 insurance

GRANDFATHERING

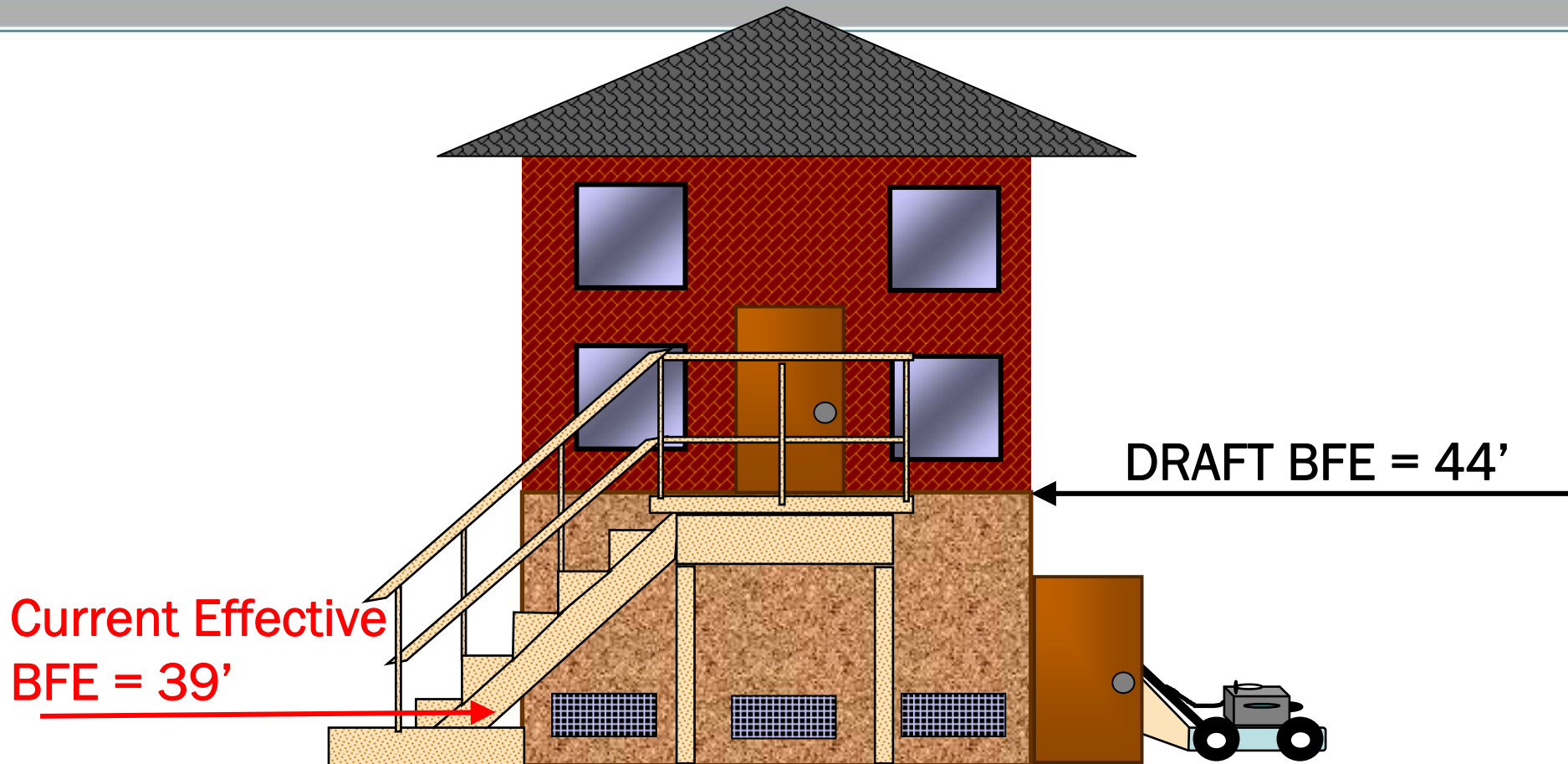
2007 – Existing, Compliant, Post-FIRM Structure: no changes



Grandfathered annual premium: ~\$411 (retains BFE +1' rate)
for \$100,000 insurance (unless substantially improved)

GRANDFATHERING

2007 – New construction or substantial improvement



Grandfathered annual premium: ~\$196 (retains BFE + 5' rate)
for \$100,000 insurance

QUESTIONS & COMMENTS

FEMA Region X

Ryan Ike, CFM (425) 487-4767

Ecology, NWRO Bellevue

Chuck Steele (425) 649-7139

NFIP Insurance Questions

Leslie Melville (425) 482-0316

FEMA Map Services Center: www.msc.fema.gov

Access *current* maps for your location

Letter of Map Amendment (LOMA) Hotline - **1-877-FEMA-MAP**