

## Natural Valley Procedure Modeling and Mapping Non-Accredited Levees

### LEVEE ANALYSIS AND MAPPING PROCEDURES OVERVIEW

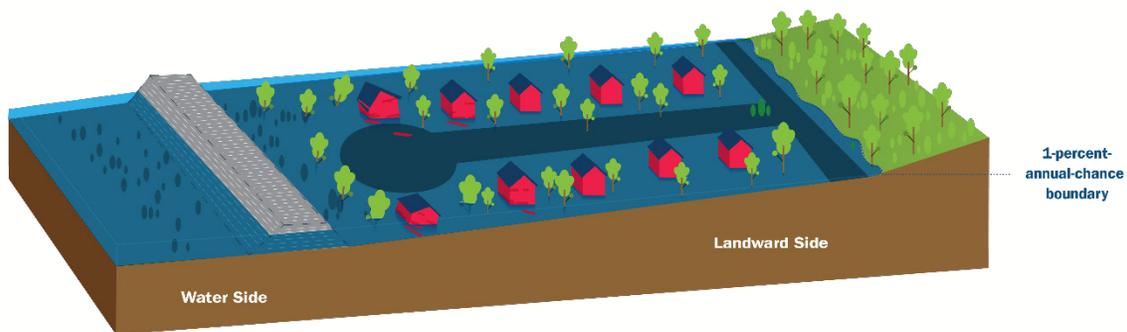
The Federal Emergency Management Agency’s (FEMA) responsibilities include educating and helping a community understand their flood risk. One of the ways FEMA does this is by creating maps to help communities understand their flood risk and define this as high, moderate, or low risk of flooding. When FEMA conducts a flood mapping project and a non-accredited levee system is involved, there are specific considerations to take into account. FEMA created a set of procedures for non-accredited levees to more accurately analyze and depict the flood hazard in an area impacted by a levee system. These procedures, known as the “levee analysis and mapping procedures,” offer five different ways to analyze a levee reach (or, section of levee). By applying one of these procedures, the community can more accurately understand their risk and take steps to reduce that risk. The Code of Federal Regulations (CFR) Section 65.10, is the procedure guidance followed and will be referenced throughout this document.

### PROCEDURE OVERVIEW

FEMA begins analysis of all non-accredited levee systems using the **Natural Valley** procedure to establish areas that may be flooded if the levee system were to breach, overtop, or fail completely. The **Natural Valley** procedure can be applied to the entire levee system, or a specific reach or reaches of the levee system.

**Natural Valley** refers to the channel and floodplain of a river or coastal area before the addition of flood control structures like levees.

*In its simplest terms, the Natural Valley procedure treats the levee as if it does not exist.*



*Image 1: The dashed lines depict where the levee would be – this procedure treats the levee as if it does not exist.*

### RESULTING ZONE DESIGNATION

When the **Natural Valley procedure** is first used to identify the levee-impacted area (the area that would be flooded if the levee system failed to perform), it is designated as a Special Flood Hazard Area (SFHA).

Once the levee-impacted area has been found by the system-wide Natural Valley procedure, a community may choose to move forward with the levee analysis and mapping procedures for a specific levee reach. If the Natural Valley procedure is applied to selected reaches, the flood hazard area for each reach will usually be designated as Zone A or AE, an SFHA. These zone designations determined in each reach may be impacted by flooding from adjacent or other reaches, and localized interior drainage flooding.

### INSURANCE CONSIDERATIONS

The **Natural Valley** procedure is the least complex means of levee analysis and requires the least amount of data of all established procedures for analyzing flood hazards associated with non-accredited levee systems. For communities with limited resources and data, this could be the most reasonable path forward.

Because Zone A/AE is a high-hazard area, property owners are encouraged to take proactive steps to reduce their risk, including the purchase of flood insurance. In fact, while flood insurance is strongly recommended for all structures, the Zone A/AE designation carries a flood insurance requirement. It is **mandatory** for structures with mortgages from federally regulated or insured lenders.

Given the mandatory insurance requirement, there are several options to help keep insurance costs low:

- **Newly Mapped Procedure:** This cost-saving rating option helps reduce the financial impact of a map change for properties newly mapped as high-risk.
- **Grandfathering:** This rating option may provide a lower cost by locking in the insurance rate associated with the current moderate- or low-risk flood zone or Base Flood Elevation when the policy renews in the future. The easiest way to take advantage of grandfathering is to buy a policy before the new flood maps take effect.
- **Community Rating System (CRS) credits:** This program recognizes communities for their additional efforts beyond the minimum standards to reduce flood damage to insurable property. Under the CRS, communities that choose to participate may reduce the flood insurance premium rates for property owners in the community by taking these additional actions.

To purchase flood insurance, individuals need to contact their insurance agent. Property owners with questions about flood insurance can call the National Flood Insurance Program, toll free, at 1-888-FLOOD29 (356-6329) or visit [floodsmart.gov](http://floodsmart.gov). See the [Levees and Flood Insurance Fact Sheet](#) for more information.

### Natural Valley can be used in two ways:

1. In any levee mapping project, it is used system-wide to determine the area that will be impacted if the levee system were to not impede flooding.
2. Additionally, it can be applied to a single levee reach if the levee analysis and mapping procedures are applied.

### Natural Valley Procedure Documentation

The **Natural Valley** procedure can be applied to one or more non-accredited levee reaches. It would make sense for a community to choose Natural Valley if:

1. The levee reach does not meet the requirements of 44 CFR 65.10;
2. Data necessary for more complex methods is not and will not be available in the near term; or
3. The community provides feedback that they would like to use this procedure at the start of a mapping project.

### **OTHER CONSIDERATIONS**

An “interior drainage” analysis must be conducted for all levee systems. Interior drainage represents all water runoff, seepage (water going under the levee), and water collection on the landward side of the levee system. The analysis must identify and demonstrate the potential runoff paths from the impacted drainage area. Any areas of residual risk and interior drainage flooding that fall within these areas are mapped as a SFHA, regardless of whether the levee system is accredited or not. This is a critical analysis because it shows that risk can still exist, even if the levee meets certain 65.10 requirements.

Levees are designed to manage a certain amount of floodwater and can be overtopped or fail during flood events exceeding the design level. When this occurs, the result can be devastating to the homes and businesses nearby, and in some cases even worse than if the levee had not been there in the first place. There is always more a community can do to reduce their risk, especially when it comes to floodplain management, building codes, and zoning. See the [Levee Risk and Mitigation Fact Sheet](#) for more information.

***For more information on other procedures for analyzing and mapping hazards associated with non-accredited levees, visit:  
<https://www.fema.gov/media-library/assets/documents/33587>***

***The Code of Federal Regulations can be accessed at: <https://www.govinfo.gov/help/cfr>***