Levee Analysis and Mapping Plan
Cayuga Creek Levees

Villages of Depew and Lancaster,
Erie County, New York

October 2016

FEMA

RiskMAP
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Acronyms

BFE	Base Flood Elevation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
LAMP	Levee Analysis and Mapping Procedures
LLPT	Local Levee Partnership Team
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
NAVD 88	North American Vertical Datum of 1988
NYSDEC	New York State Department of Environmental Conservation
USACE	U.S. Army Corps of Engineers

Definitions

The terms below have been used in this document. Additional terms are provided in FEMA's *Analysis and Mapping Procedures for Non-Accredited Levee Systems* (July 2013) in the Glossary of Levee Terms. This document is available from the FEMA Library at https://www.fema.gov/media-library-data/20130726-1922-25045-4455/20130703_approachdocument_508.pdf.

Base Flood Elevation (BFE) – The elevation of a flood having a 1-percent chance of being equaled or exceeded in any given year.

Levee Analysis and Mapping Procedure (LAMP) Approach* – LAMP approaches include Sound Reach, Freeboard Deficient Procedure, Overtopping Analysis, Structural Based Inundation, and Natural Valley. Details on these approaches can be found in FEMA's *Analysis and Mapping Procedures for Non-Accredited Levee Systems* (July 2013).

Levee Reach – Any continuous section of a levee system to which a single analysis and mapping procedure may be applied.

Levee System – A flood hazard-reduction system that consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices**.**

Local Levee Partnership Team (LLPT) – A work group that can be facilitated by FEMA when a non-accredited levee system in a community or project area will be analyzed and the areas landward of the levee system will be mapped. The primary function of this group is to share information/data and identify options based on stakeholder roles and knowledge.

Non-Accredited Levee System – A levee system that does not meet the requirements spelled out in the National Flood Insurance Program (NFIP) regulations at Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44CFR§65.10), *Mapping of Areas Protected by Levee Systems*, and is not shown on a FIRM as reducing the flood hazards posed by a 1-percent-annual-chance or greater flood.

Zone D – Area of undetermined but possible flood hazard.

*All definitions on this page except for this one are from FEMA's Analysis and Mapping Procedures for Non-Accredited Levee Systems (July 2013)

0 Executive Summary

The Federal Emergency Management Agency's (FEMA's) Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for the villages of Depew and Lancaster in Erie County, New York must be revised to reasonably account for the hazard reduction impacts of non-accredited levees. FEMA's guidance was revised in 2013 to incorporate a new Levee Analysis and Mapping Procedure (LAMP) which provides a suite of flexible procedures to perform flood hazard analysis and mapping (see Section 1). The Village of Lancaster has a flood management system where the Cayuga Creek levee system is being studied using the LAMP process (see Section 2). One reach of that project is shared with the Village of Depew.

In December 2015 and February 2016, FEMA Region II partnered with stakeholders in the villages of Depew and Lancaster to form a collaborative Local Levee Partnership Team (LLPT) and worked to determine potential LAMP approaches for the Cayuga Creek levee system in the villages of Depew and Lancaster (see Sections 3 and 4 respectively). The process involved the collection and group evaluation of available data, creation and evaluation of analysis and mapping, and detailed discussions on mapping needs.

The information gained through the extensive coordination of the LLPT is now supplemented by a recently completed "first pass" LAMP analysis (see Section 5). The information collected and the analysis performed allows for the development of this document—a plan outlining potential reach procedures. This document informs the path forward (See section 6). FEMA met with the LLPTs in May and June 2016 to present the first pass LAMP analyses and discuss the options for moving forward. The Village of Lancaster elected to move forward with the Freeboard Deficient Approach. The Village Depew has also elected to move forward with the Freeboard Deficient Approach.

This Levee Analysis and Mapping Plan summarizes the discussions and decisions by FEMA and project stakeholders on how best to map the flood hazards landward of the Cayuga Creek levee system at the villages of Depew and Lancaster. First Pass Analyses were assessed for three LAMP approaches: Natural Valley, Freeboard Deficient, and Structural Based Inundation. After reviewing draft results from the three LAMP approaches, both villages chose the Freeboard Deficient approach for their future mapping, although Lancaster hopes to pursue accreditation in the future if funding becomes available.

1 Introduction

Under FEMA's prior levee approach, a levee system that did not meet the National Flood Insurance Program (NFIP) requirements was analyzed and mapped as if it provided no protection during a base (1-percent-annual-chance) flood. This was known as the "without levee" approach.

Some stakeholders expressed concern about the "without levee" approach. Members of both the U.S. House of Representatives and the U.S. Senate echoed this concern and asked FEMA to consider discontinuing the "without levee" approach. Accordingly, FEMA drew on current modeling techniques to refine the identification of flood hazard reduction that non-accredited levee systems provide. This process recognizes that such modeling is never precise.

FEMA and its Production and Technical Services contractor (STARR II) initiated the LAMP process for the levees in the villages of Depew and Lancaster. Recent technological advances in data collection methods and hydrologic and hydraulic modeling were leveraged as part of this process. LAMP is a more refined approach to mapping flood hazards in areas landward of levee systems than the former approach.

The LAMP process also:

- Leverages local knowledge and data, with proactive stakeholder engagement in LLPTs;
- Aligns available resources for engineering analyses and mapping commensurate with the level of risk in the areas impacted by the levee; and
- Considers the unique characteristics of each levee system from an engineering perspective.

The Cayuga Creek levee system in the villages of Depew and Lancaster is not accredited. FEMA is using the LAMP process to develop refined flood hazard mapping in areas landward of the levees. This will provide a more realistic representation of levee-related flood hazards in the villages of Depew and Lancaster.

The LAMP process is conducted in four phases:

- **Phase 0: Flood Structure Identification and Review:** Levee systems are identified and verified as being constructed, operated, and maintained as flood control structures. An LLPT is established during this phase.
- **Phase 1: Analysis and Mapping Plan Preparation:** LLPT meetings are held periodically to review available data and documentation. Discussions assist in the preparation of an Analysis and Mapping Plan based on the available information.
- **Phase 2: Analysis Preparation and Results Review (if applicable):** Analysis is performed by FEMA and shared with the LLPT to validate results against available data and documentation. Results are compared to effective FISs to update the scope of work, if necessary.
- **Phase 3: FIRM Update, Due Process and Effective FIRM Issuance:** FIRM panels are updated with Phase 2 results. Communities and FEMA follow all NFIP regulatory due process procedures, and updated FIRM panels are adopted for local floodplain management purposes.

This report describes the Levee Analysis and Mapping Plan for the Cayuga Creek levee system, a result of the collaboration between FEMA, the villages of Depew and Lancaster, Erie County, New York State Department of Environmental Conservation (NYSDEC), U.S. Army Corps of Engineers (USACE), and other local stakeholders. This report documents the progress through Phase 1, including the first pass analysis results and data evaluation, as well as the community's selection of the preferred LAMP scenario.

2 Levee System Description

2.1 Flood Protection Measures in the villages of Depew and Lancaster

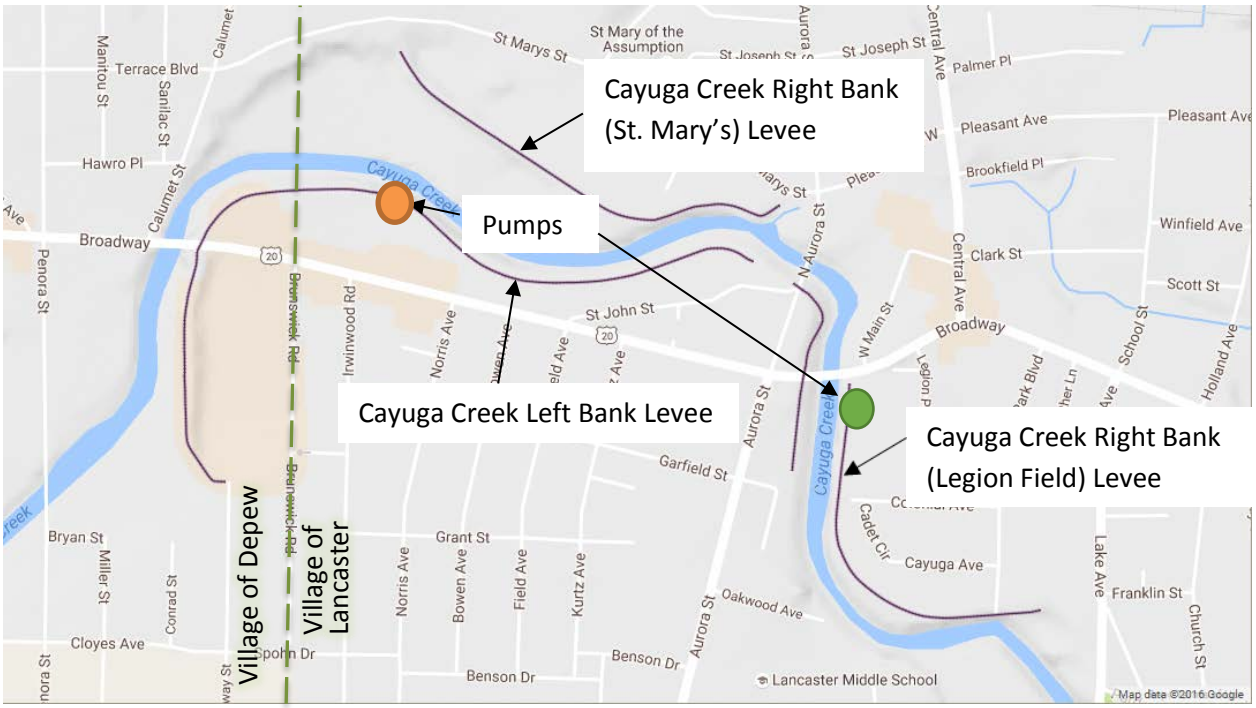
The Cayuga Creek levee system (see Figure 1) is comprised of a series of riverine levees designed to reduce the flood risk from Cayuga Creek (see Figures 2 and 3) in the villages of Depew and Lancaster, Erie County, New York. Pertinent data is summarized in Table 1.

Table 1: Cayuga Creek Levee Data

Owner	villages of Depew and Lancaster
Maintained by	Jointly by villages of Depew and Lancaster along with NYSDEC
Built	1949, War Department, Corps of Engineers, Office of the District Engineer, Buffalo 7, New York
Flooding Source	Cayuga Creek
Length	Approximately 9,700 feet
Pump Stations	2

	Coordinates		Elevation (NAVD88)	
Levee End-Point	**Longitude**	**Latitude**	**Levee Crest**	**LAMP BFE**
Cayuga Creek (Lancaster), Legion Field, Upstream Right Bank	-78.6689	42.8964	668.8	660.0
Cayuga Creek (Lancaster), Legion Field, Downstream Right Bank	-78.6725	42.8995	664.2	656.0
Cayuga Creek (Lancaster-Depew), Upstream Left Bank	-78.6735	42.8983	663.7	656.0
Cayuga Creek (Lancaster-Depew), Downstream Left Bank	-78.6841	42.8982	651.2	649.0
Cayuga Creek (Lancaster), St. Mary's, Upstream Right Bank	-78.6738	42.9020	659.2	654.0
Cayuga Creek (Lancaster), St. Mary's, Downstream Right Bank	-78.6808	42.9041	656.2	651.5

Figure 1: General Location Map



2.2 Pump Stations and Floodgates

Two pump stations were identified for the Cayuga Creek levees. No flood gates were identified for the Cayuga Creek levees. The first pump station is in the middle of the south bank levee. The second pump station is at the downstream end of the eastern levee on the north bank.

2.3 LAMP Flood Risk Project

Tables 2 and 3 summarize the communities' NFIP and FIRM history.

Table 2: Summary of Communities in Project Area

County	Community	Participating in the NFIP?	Approximate Number of Structures Impacted by Levee System
Erie County	Village of Depew	Yes	5
Erie County	Village of Lancaster	Yes	150

Table 3: Community Map History

Community Name	Initial Identification	Flood Hazard Boundary Map Revision Date(s)	FIRM Effective Date	FIRM Revision Date(s)
Village of Depew	February 22, 1974	July 30, 1976	August 3, 1981	Pending
Village of Lancaster	April 12, 1974	May 14, 1976 March 4, 1977	July 2, 1979	Pending

The effective FIRM for the Village of Lancaster depicts the Cayuga Creek levee as providing protection. The effective FIS for the Village of Depew describes the flood protection project, but references buildings subject to 10- to 100-year flooding and plans to floodproof these structures. Both current effective studies pre-date LAMP levee accreditation procedures.

A countywide FIRM and FIS were issued in preliminary form for Erie County, New York on December 31, 2009, with a revised preliminary issued February 19, 2016. The preliminary maps use FEMA's levee "seclusion" mapping practice, meaning that information from the current effective FIRMs for the villages of Lancaster and Depew is shown on the maps in areas impacted by the Cayuga Creek levees.

2.4 LAMP Process Tasks

The LAMP process is divided into six distinct tasks: LLPT Compilation, Field Reconnaissance, Perform Initial Levee Analysis, Flood Risk Outreach, Complete Levee Analysis and Mapping Plan, and Produce Preliminary Products/Issue Preliminary (see Table 4).

Table 4: Project Tasks

Task	Details	Tentative Start/End Dates*
LLPT Compilation (Phase 0)	Identification and outreach to individuals to serve on the LLPT.	12/2/2015 – 12/10/2015

Task	Details	Tentative Start/End Dates*
Field Reconnaissance (Phase 1)	LLPT to determine levee reaches to study and potential analysis of those reaches. Perform field reconnaissance of these reaches.	12/10/2015
Perform Initial Levee Analysis and develop Levee Analysis and Mapping Plan (Phase 1)	FEMA to collaborate with the LLPT to develop analysis based on Field Reconnaissance findings and Levee Analysis and Mapping Plan.	12/2/2015 – 2/9/2016
Flood Risk Outreach (Phase 2)	LLPT to assess results of the Field Reconnaissance and Perform Levee Analysis tasks. LLPT to work at the local level to disseminate findings that could impact local communities.	TBD
Complete Levee Analysis and Mapping Plan; Finalize LAMP mapping (Phase 2)	FEMA to complete detailed analysis based on chosen approach, develop mapping, and finalize Levee Analysis and Mapping Plan; develop final analysis and mapping.	TBD
Produce Preliminary Products / Issue Preliminary (Phase 3)	FEMA to develop Preliminary Products (including FIRM database) from revised analysis above if that is the direction from FEMA and LLPT.	TBD

*All schedules are tentative and will be adjusted at the pace of the LLPT.

3 Local Levee Partnership Team

Based on the community meeting associated with the 2009 preliminary FIRM issuance, several stakeholders were identified as members of the LLPT. The LLPT was formed to provide FEMA with data and input, including feedback on the procedures to be used for analyzing and mapping the levee reach, based on local levee conditions. The stakeholders who participated in the LLPT for this project are listed in Table 5.

Table 5: Local Levee Partnership Team Participants

LLPT Member	Contact Information
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Srikanth Koka*	STARR II, Project Manager 8401 Arlington Blvd., Fairfax, VA 22031 703.849.0584; skoka@dewberry.com
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* Project Engineer lead transferred from Vikram Srivastava to Srikanth Koka in July 2016.

4 Stakeholder Engagement

4.1 Stakeholder Engagement Meeting #1 (LLPT1)

A FEMA-led project team engaged with the affected communities, levee owners/operators, and other stakeholders during LLPT Meeting #1 on December 10, 2015. The overall intent of the meeting was to establish contact, explain the LAMP process, and discuss the application of the LAMP process to the Cayuga Creek levees.

At the first LLPT meeting, FEMA discussed the LAMP process and explained the LAMP procedures to be considered for the non-accredited levees. The LLPT discussed each of the LAMP procedures (Sound Reach, Freeboard Deficient Reach, Overtopping Reach, Structural Inundation, and Natural Valley) and determined which were applicable to the Cayuga Creek levees.

During this discussion the USACE representative informed the group that the levees may meet the requirements of 44 CFR§65.10 and therefore could be accredited. However, the associated cost for demonstrating these requirements were met would be substantial (approximately $50,000 - $200,000). Neither the villages, USACE, nor NYSDEC had budget set aside for this purpose. It was suggested that the 125 properties in the levee protection area may form a levee district and raise the funds for accreditation.

The meeting notes, materials, and attendee list for the 1st LLPT meeting are provided in Appendix A.

Vikram Shrivastava and Seth Lawler of FEMA's Production and Technical Services contractor team, STARR II, carried out field reconnaissance on December 11, 2015 to examine the levee features. The intent of the field reconnaissance was to provide a context to the LLPT discussions. Photographs taken during the site visit are included in Appendix E.

4.2 Stakeholder Engagement Meeting #2 (LLPT2)

At the second LLPT meetings on February 9, 2016, the LLPT members reviewed the first pass analysis information (see Section 5). The LLPT was given an opportunity to review the results and determine if an alternate approach or alternate data should be used.

During the discussions further information on the interior drainage pump stations was provided. There are two pump stations in this levee system (see Figure 1). The first pump station is in the middle of the south bank levee. The second pump station is at the downstream end of the eastern levee on the north bank.

The LLPT agreed that the Overtopping LAMP procedure did not apply to any levee reach as the levee was not designed to be overtopped. Similarly, the Sound Reach LAMP procedure did not apply to any levee reach, as then it could be accredited. Therefore, the possible LAMP procedures for the levee reaches were Natural Valley, Structural Inundation, and Freeboard Deficient.

The LLPT members recommended that the LAMP first pass analyses be presented to the Mayors and Village Councils for the villages' input on the LAMP methods for the Phase 2 analysis.

The timeline of the upcoming revised preliminary FIRM was discussed, along with potential accreditation of the levees by the villages of Depew and Lancaster. The information from the First Pass Analyses can be leveraged as part of the accreditation analysis.

FEMA explained that the project information would be captured in a Levee Analysis and Mapping Plan (this document). A draft of this plan is to be distributed to all the LLPT members Winter 2016/2017.

The meeting notes, materials, and attendee list for the 2nd LLPT meeting are provided in Appendix B.

5 First Pass Analysis

FEMA developed a First Pass Analysis, which is a quick analysis with a low level of detail, to approximate the floodplain boundary for each LAMP approach. This informed the discussions in LLPT Meeting 2, during which the LLPT finalized the LAMP procedures to be recommended for refinement in a future LAMP Phase 2 study.

5.1 Natural Valley Procedure

The Natural Valley LAMP Procedure flood hazard mapping allows flow to be conveyed on both sides of a non-accredited levee.

Figure 2 illustrates the results of the Natural Valley First Pass Analysis using HEC-RAS 5.0 (2 dimensional flow).

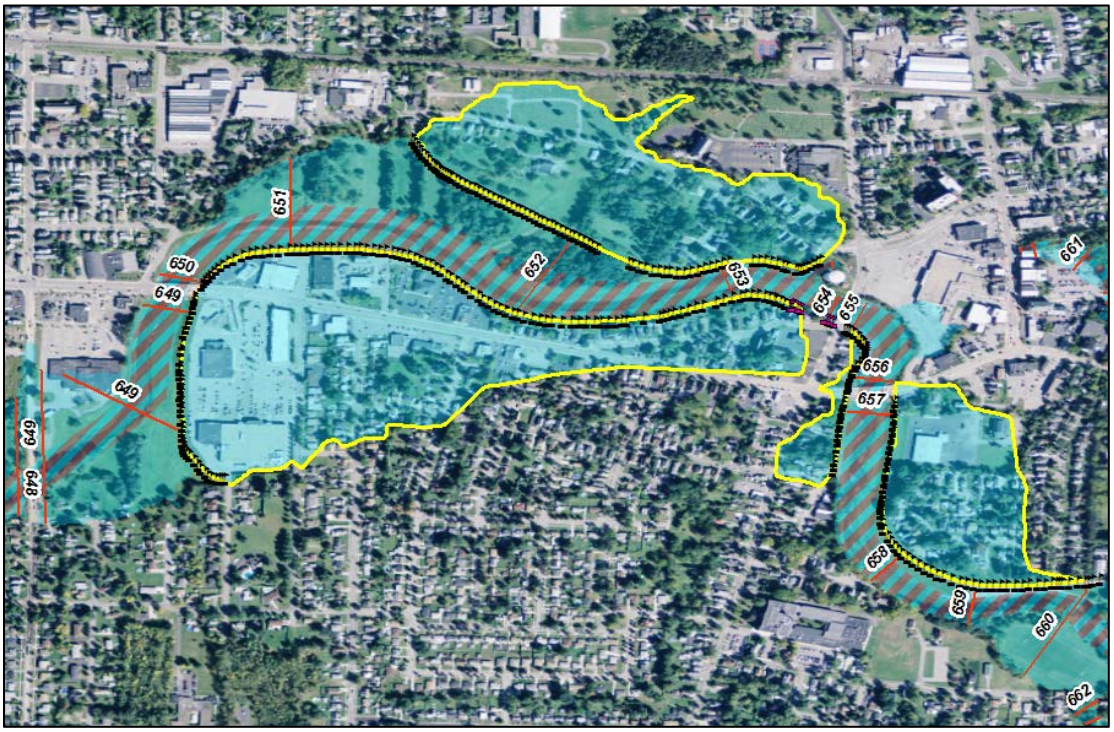

Figure 2: Natural Valley Procedure Mapping

5.2 Freeboard Deficient Procedures

The top of levee profile was compared to the required freeboard profile and the Cayuga Creek Levee System was found to be freeboard deficient on the Right Levee (looking downstream) downstream of Aurora Street. While the levee is higher than the Base Flood Elevation (BFE), it does not meet the freeboard requirement as set forth in 44 CFR§65.10; therefore the Freeboard Deficient LAMP Procedure is applicable. For this situation, the flood hazards behind the levee reach are mapped with two components: Zone AE for the 1-percent-annual-chance floodplain due to interior drainage and Zone D for the balance of the Natural Valley Floodplain (described in Section 5.1). For the purposes of the first pass analysis, pumps were not taken into consideration.

The results of the Freeboard Deficient Analysis using HEC-RAS 5.0 (2 dimensional flow) can be seen in Figure 3.

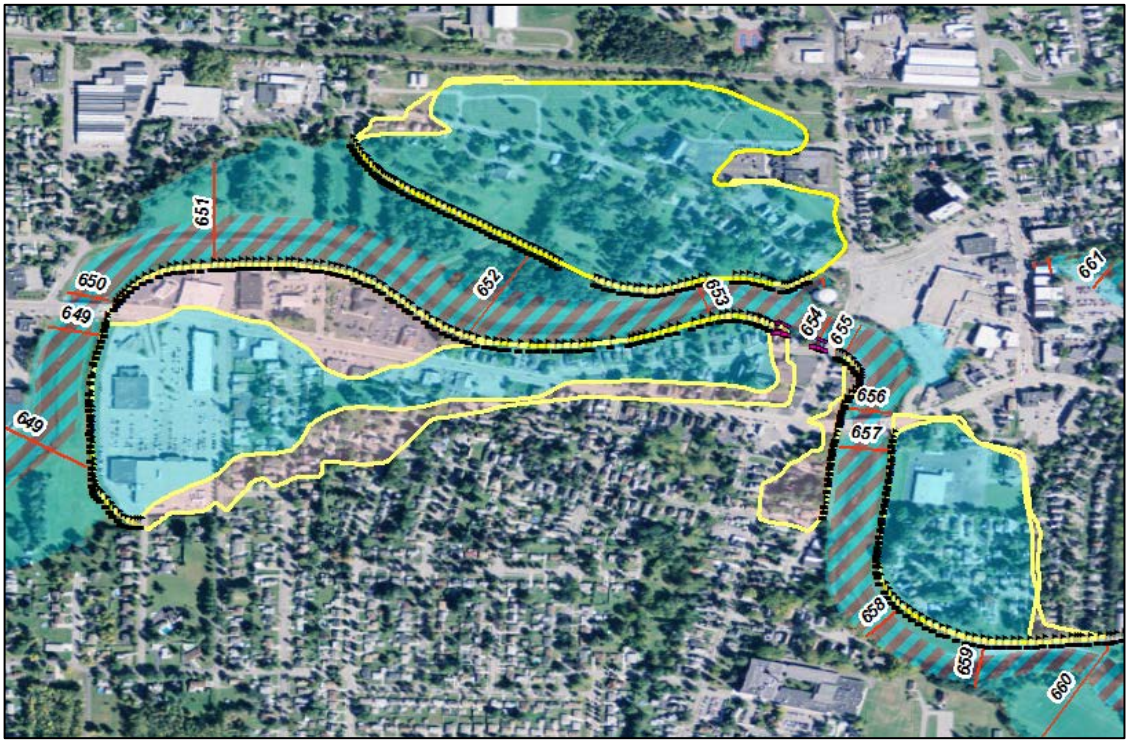

Figure 3: Freeboard Deficient Procedure Mapping

5.3 Structural Based Inundation First Pass Analysis

First Pass Analyses (2 dimensional flow) were developed for three levee breaching scenarios using HEC-RAS 5.0.

The results of these analyses are mapped in Figure 4.

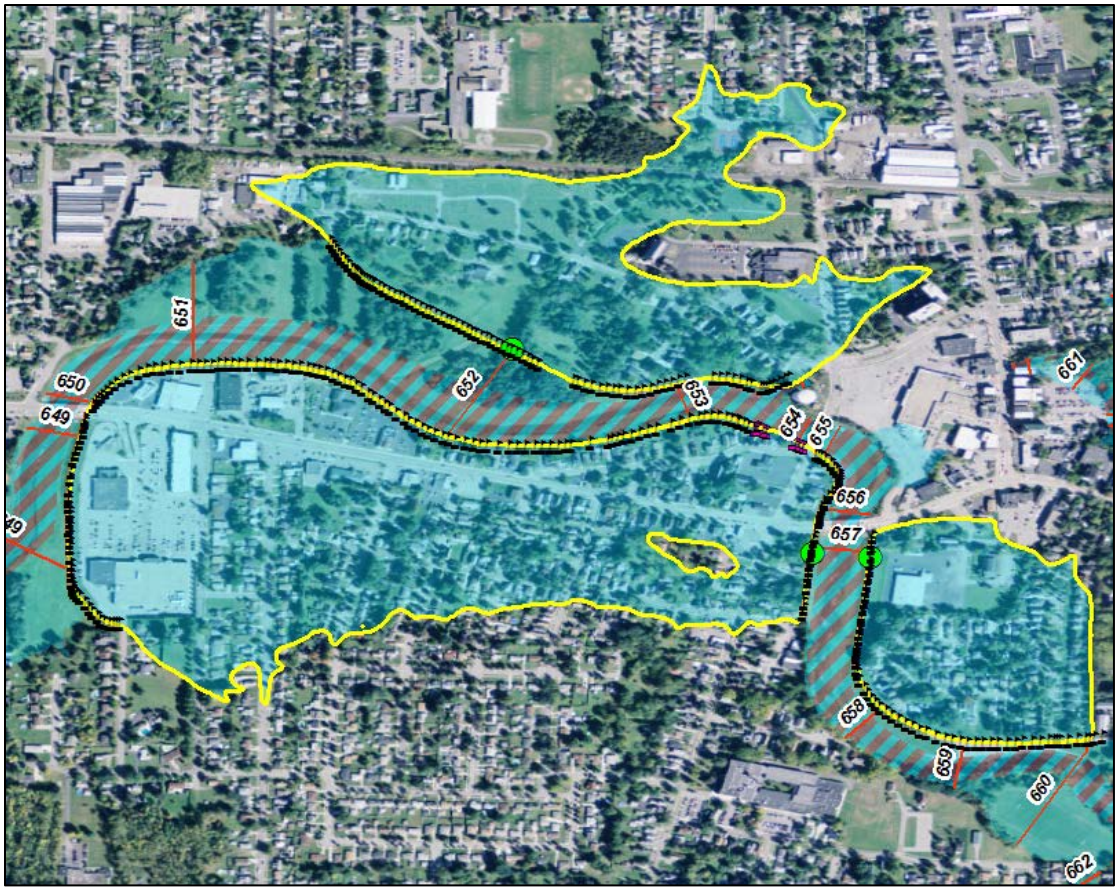

Figure 4: Structural Inundation Procedure Mapping

5.4 Review of First Pass Analyses

After reviewing the results of the First Pass Analyses, the Village of Lancaster requested that FEMA move forward with the Freeboard Deficient Analysis (Appendix C). The Village of Depew indicated via email and mail that they favored following the Village of Lancaster's lead.

6 Path Forward

6.1 LAMP Phase 2 Analysis

As insufficient data is available to accredit the Cayuga Creek levees at this time, FEMA will undertake a LAMP Phase 2 and LAMP Phase 3 study to take into account the hazard reduction impacts of the non-accredited levees. One way to address freeboard, would be for the levee to be found to have a minimum of at least two feet and then for a federal agency tasked with the design and construction of levees to perform a risk analysis that showed the structure to provide sufficient levels of protection.

The LAMP Phase 2 analysis will focus on refining the Freeboard Deficient analysis. The models and source data will be reviewed and refined with any updated information (e.g. updated discharges, recent surveyed cross sections, updated land cover data, and topographic data).

The subsequent LAMP Phase 3 study will incorporate the LAMP Phase 2 results into the regulatory NFIP products, namely the FIS and FIRM.

6.2 Levee Accreditation

The Village of Lancaster has indicated an interest in pursuing accreditation for the Cayuga Creek levees if funding can be obtained to perform the physical improvements and engineering review required. If the system can be brought into compliance with 44 CFR§65.10 of the NFIP regulations, the levees can be shown as accredited in the Erie County (All Jurisdictions) FIS and on the FIRM. Should this occur, FEMA will cease work on the LAMP Phase 2 and 3 efforts. If the FIRM and FIS have already been updated by the time of accreditation, FEMA will revise the maps via a Letter of Map Revision or Physical Map Revision.

FEMA's Levee Accreditation Checklist has been included in Appendix F for reference.

7 References

FEMA: Non-Accredited Levee Analysis and Mapping Guidance, September 2013

USACE, National Levee Database (GeoDatabase Version 3.0 dated 07-28-2015), 2015.

Appendix A
Stakeholder Engagement - LLPT Meeting #1 Information

FEMA

Levee Analysis and Mapping Procedures (LAMP) for Non-accredited Levees

Villages of Lancaster and Depew, Erie County, NY
December 10, 2015

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Agenda

- Introductions
- Review of the area impacted by the local levee system
- Overview of the Levee Analysis and Mapping Procedure (LAMP) process
- Outline the initial LAMP study methods for the local levee system
- Review of the information for the local levee system
  - Applicability of LAMP Procedures based on levee data
  - Data needed for LAMP Procedures
- LAMP Path Forward

Introductions & Contact Information

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- Project Manager
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  - Thomas Song
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    Thomas.Song@mbakerintl.com

Risk Communications

KNOW YOUR RISK

Do your residents know about their flood risk?

KNOW YOUR ROLE

Do your residents know what mitigation actions they should/can take?

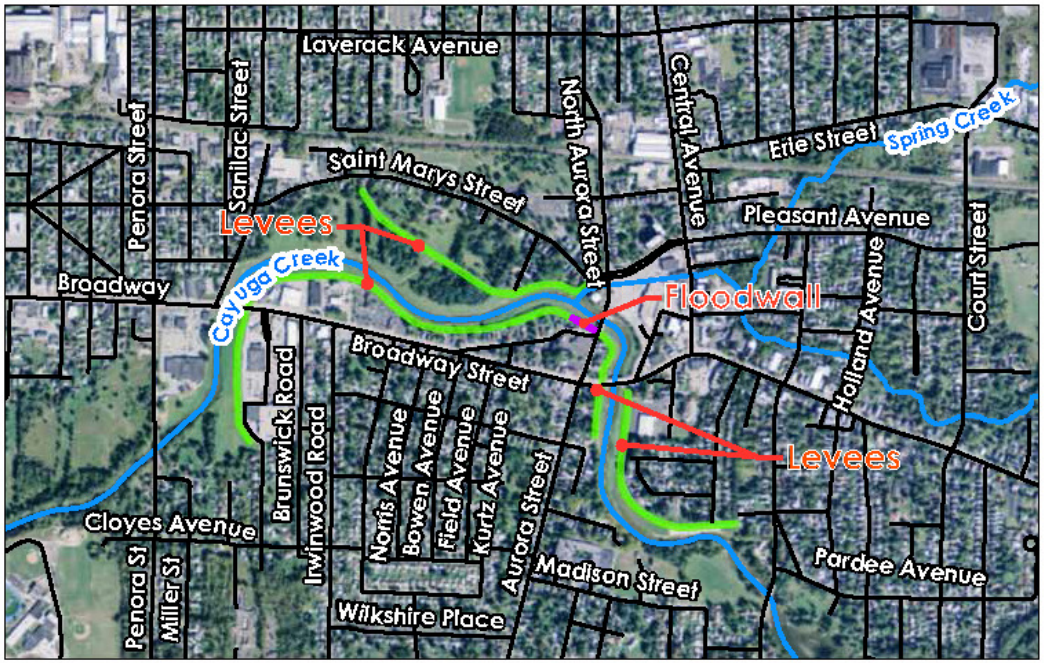
TAKE ACTION

Encourage your residents to take the actions that can build their resiliency to flooding.

Review of the area impacted by the local levee system

Review of the Local Levee System

- Multiple levee systems were constructed in the late 1940's along Cayuga Creek in Villages of Lancaster and Depew
- The flood risks landward of the non-accredited levee systems will be studied with FEMA's new approach to levee mapping, LAMP.



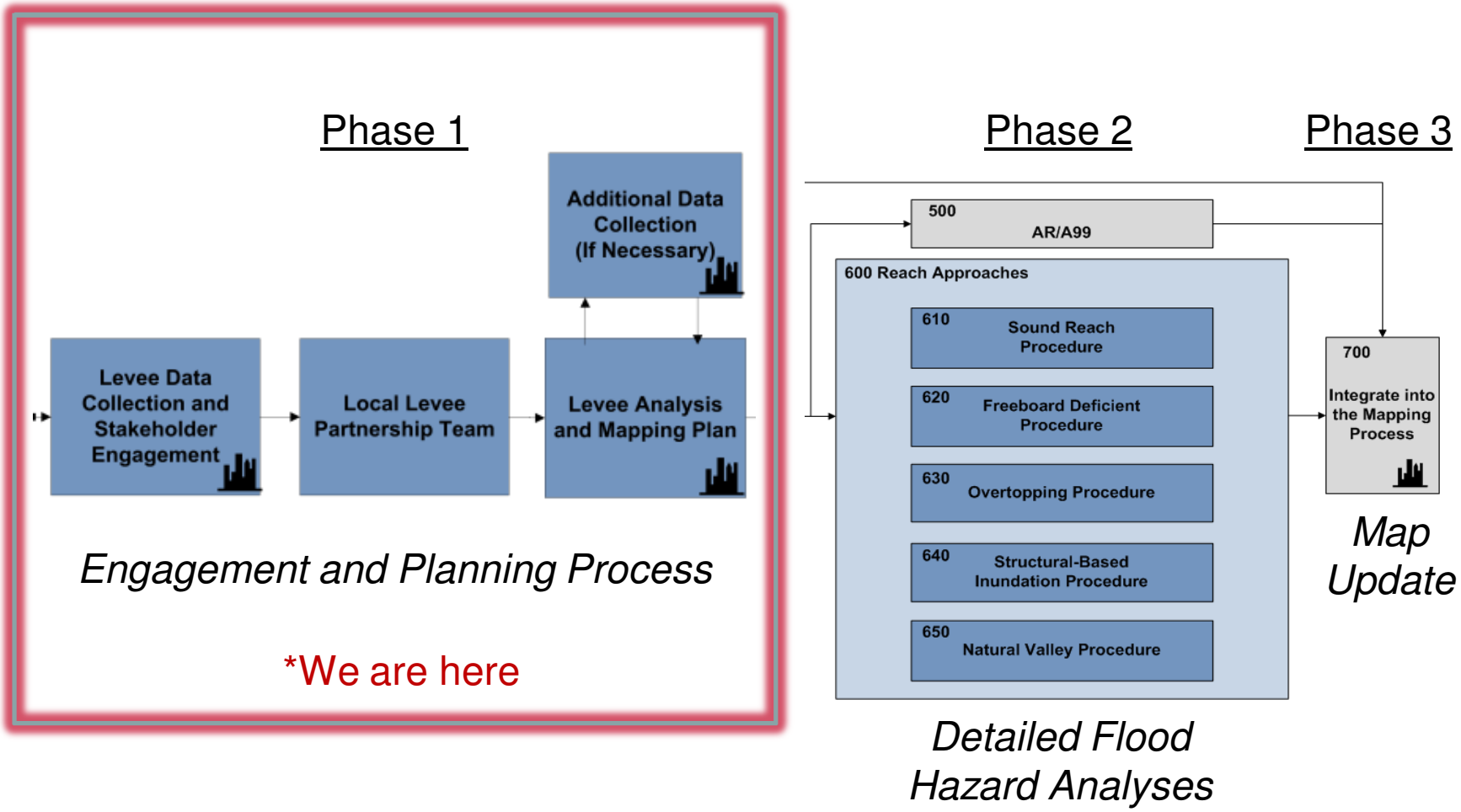
Overview of the Levee Analysis and Mapping Procedure (LAMP) process

Levee Analysis and Mapping Process (LAMP) Approach

LAMP is

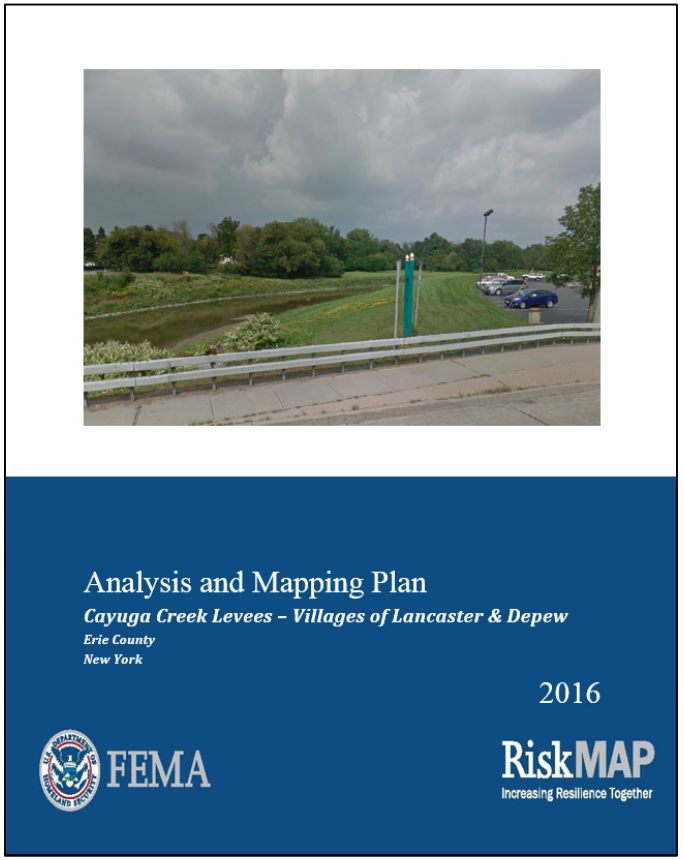
- FEMA's new approach to identifying the flood risk landward of non-accredited levee systems.
- A collaborative levee evaluation process that works with interactive stakeholder engagement.
- A levee-specific study to analyze and determine updated Special Flood Hazard Areas landward of the non-accredited levee.

Levee Analysis and Mapping Process (LAMP) Process



Levee Analysis and Mapping Process (LAMP) – Phase 1

- LAMP Phase 1 Objectives
  - Establish a Local Levee Partnership Team (LLPT) to collect local levee data and related levee system information
  - Perform an approximate-level flooding analysis (First Pass Analysis)
  - Prepare the Levee Analysis and Mapping Plan



Local Levee Partnership Team *(LLPT)*

- Meeting-Specific Objectives:
  - Important information and data related to how the levee system will be analyzed and mapped is obtained and considered.
  - LLPT members have an opportunity to explain the unique conditions related to their levee system that will impact the analysis and mapping.
  - LLPT members comment on methods for levee system reaches, analyses, and mapping within the allowable guidelines.
  - A reasonable schedule is developed for obtaining input or additional data.

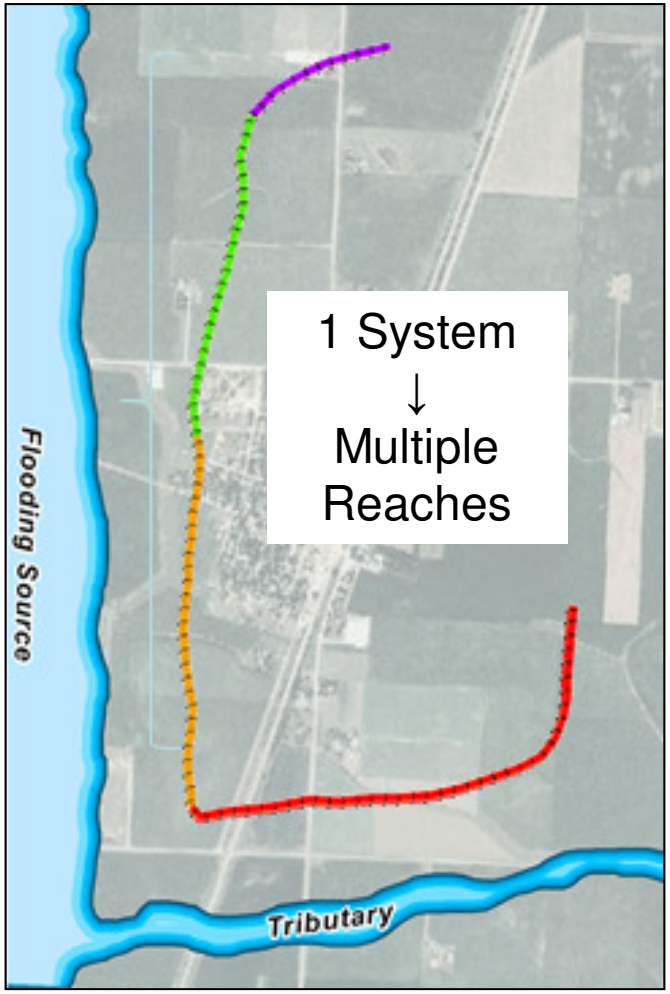
Outline the initial LAMP study methods for the local levee system

LAMP Analyses & Methodology

There are five procedures detailed in the LAMP Final Approach Document.

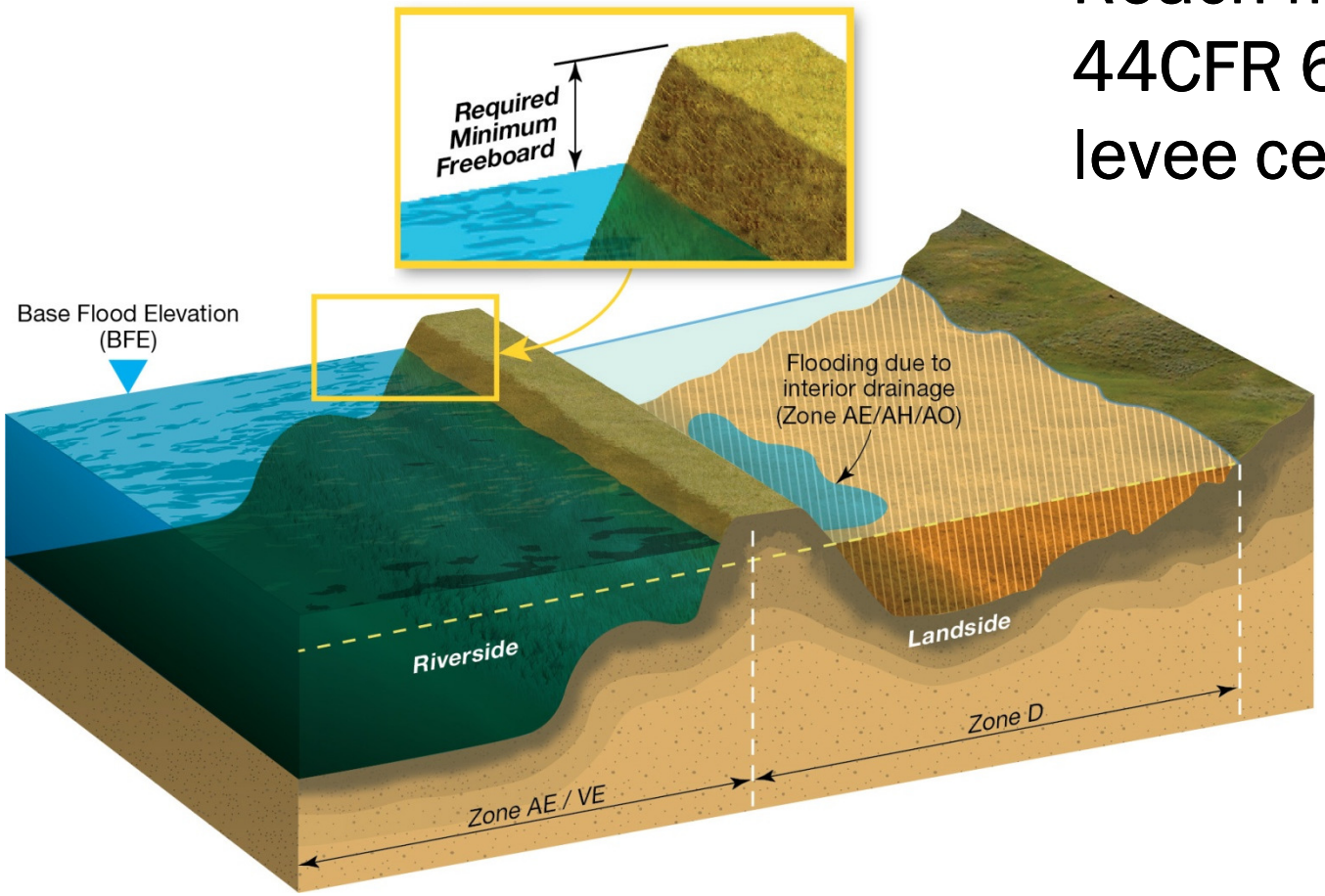
- Sound Reach
- Freeboard Deficient
- Overtopping
- Structural-Based Inundation
- Natural Valley

A levee system can be broken up into multiple reaches in order to analyze the flood risk in its vicinity.

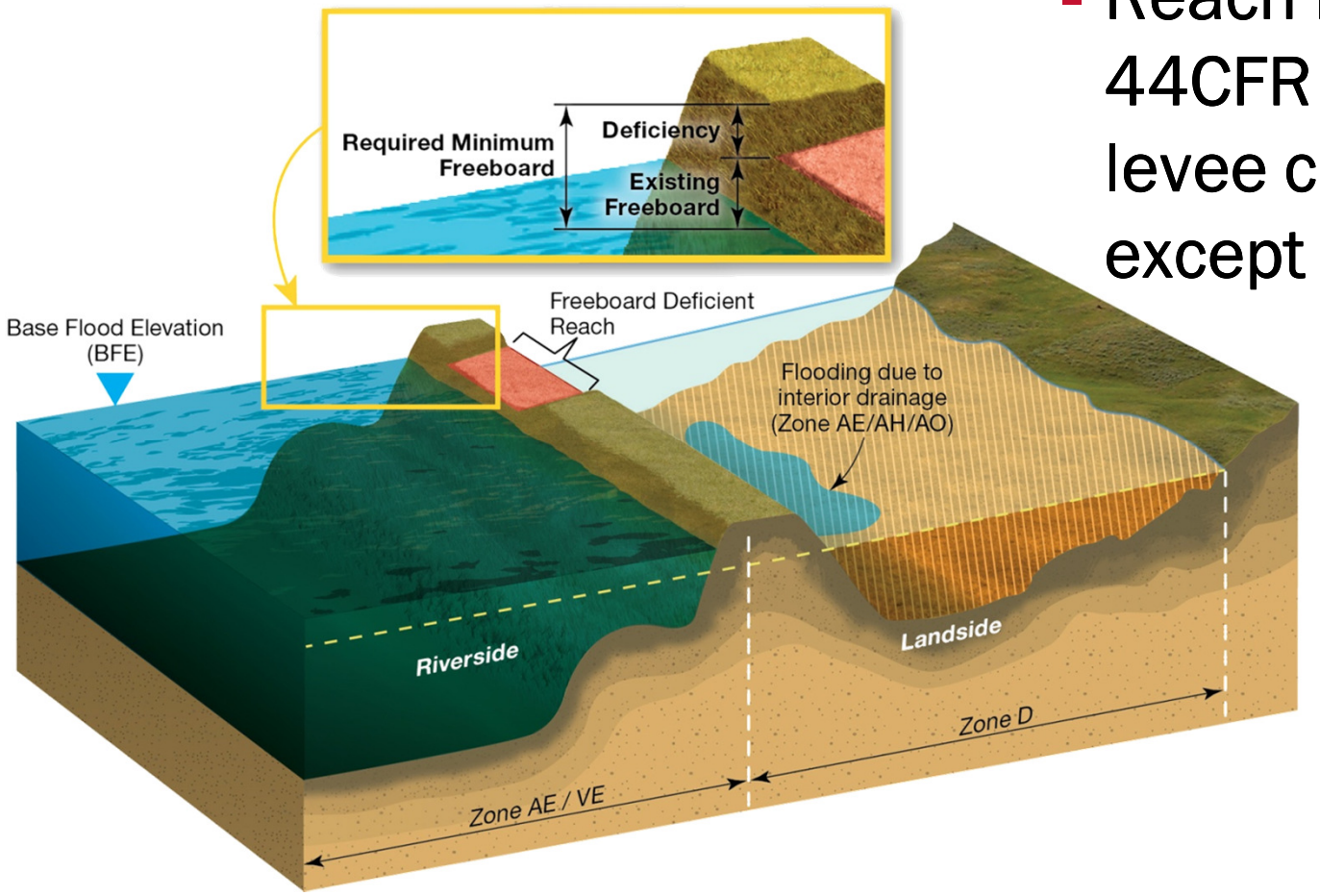


Sound Reach Procedure

- Reach meets 44CFR 65.10 levee certification

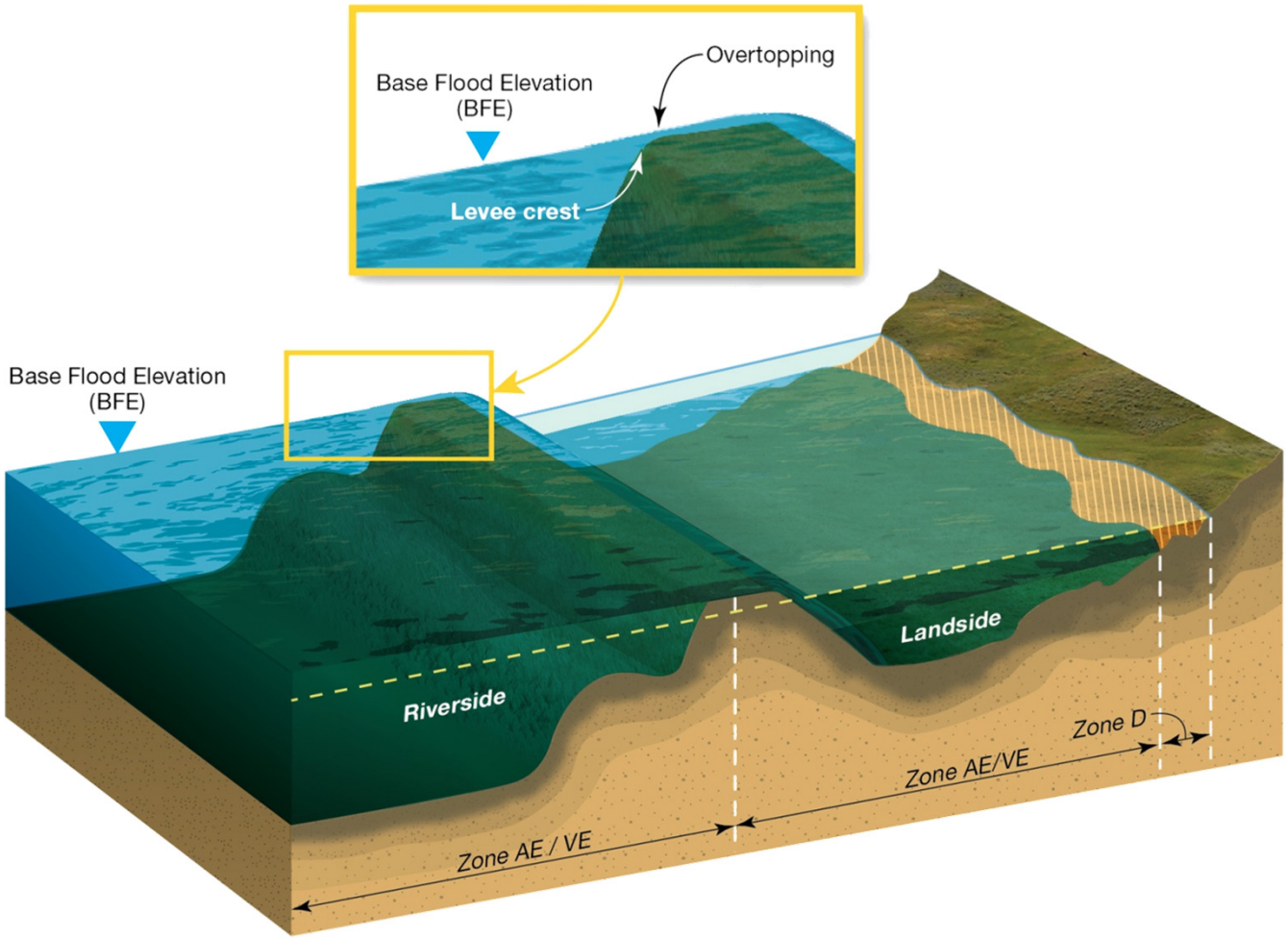


Freeboard Deficient Procedure



- Reach meets 44CFR 65.10 levee certification except freeboard

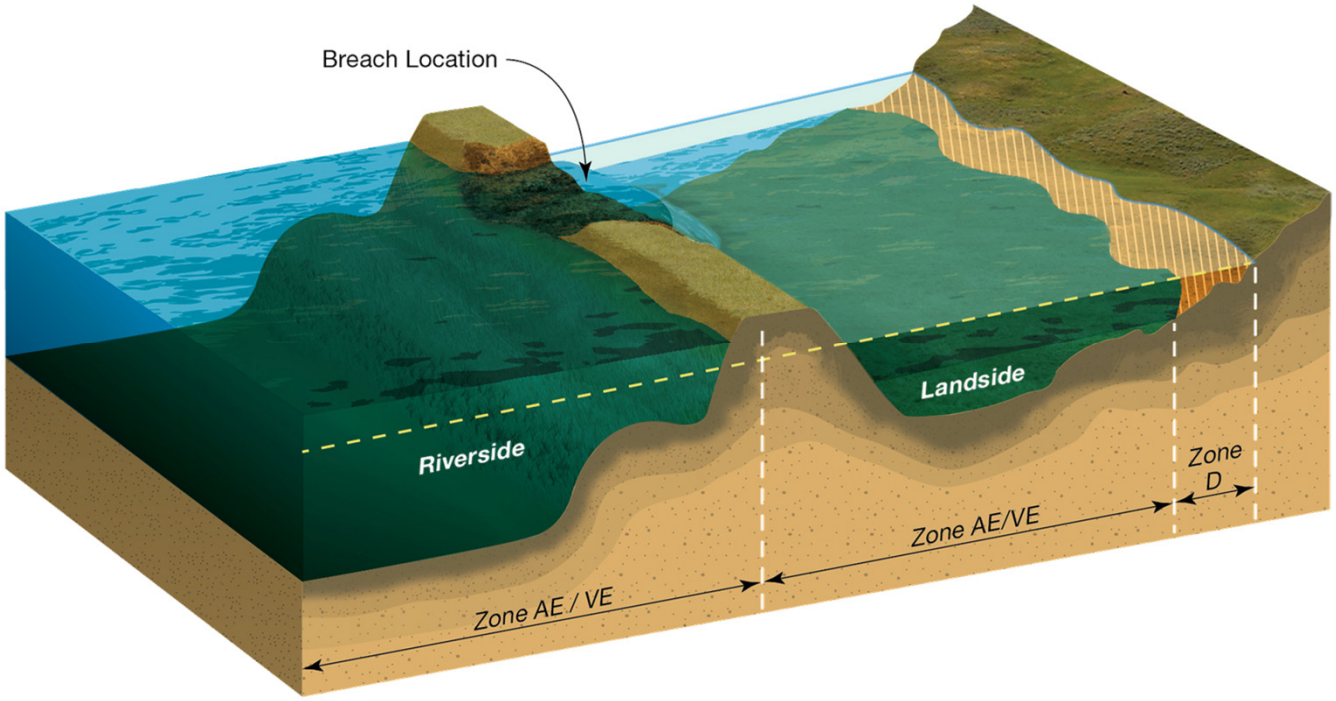
Overtopping Procedure



- Reach meets 44CFR 65.10 levee certification except freeboard
- Levee designed to be overtopped in 1% storm with no erosion

Structural-Based Inundation Procedure

- Levee has history or potential for breaches



Natural Valley Procedure

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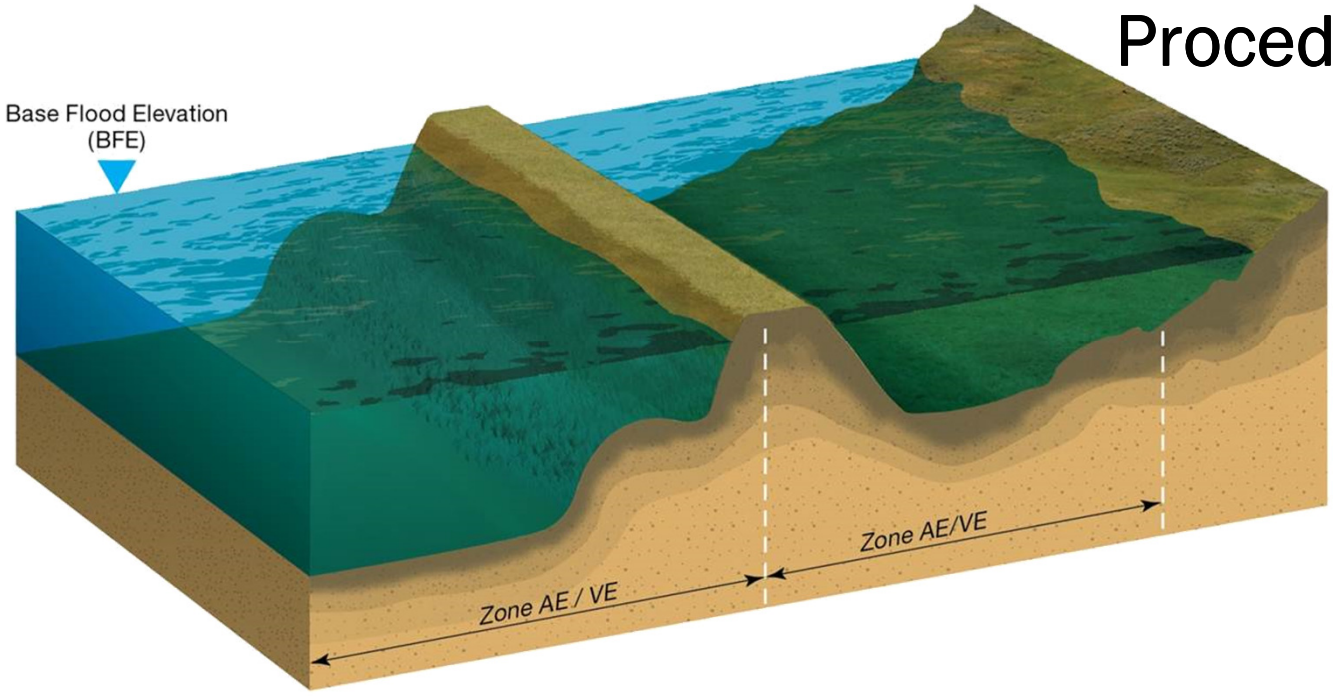
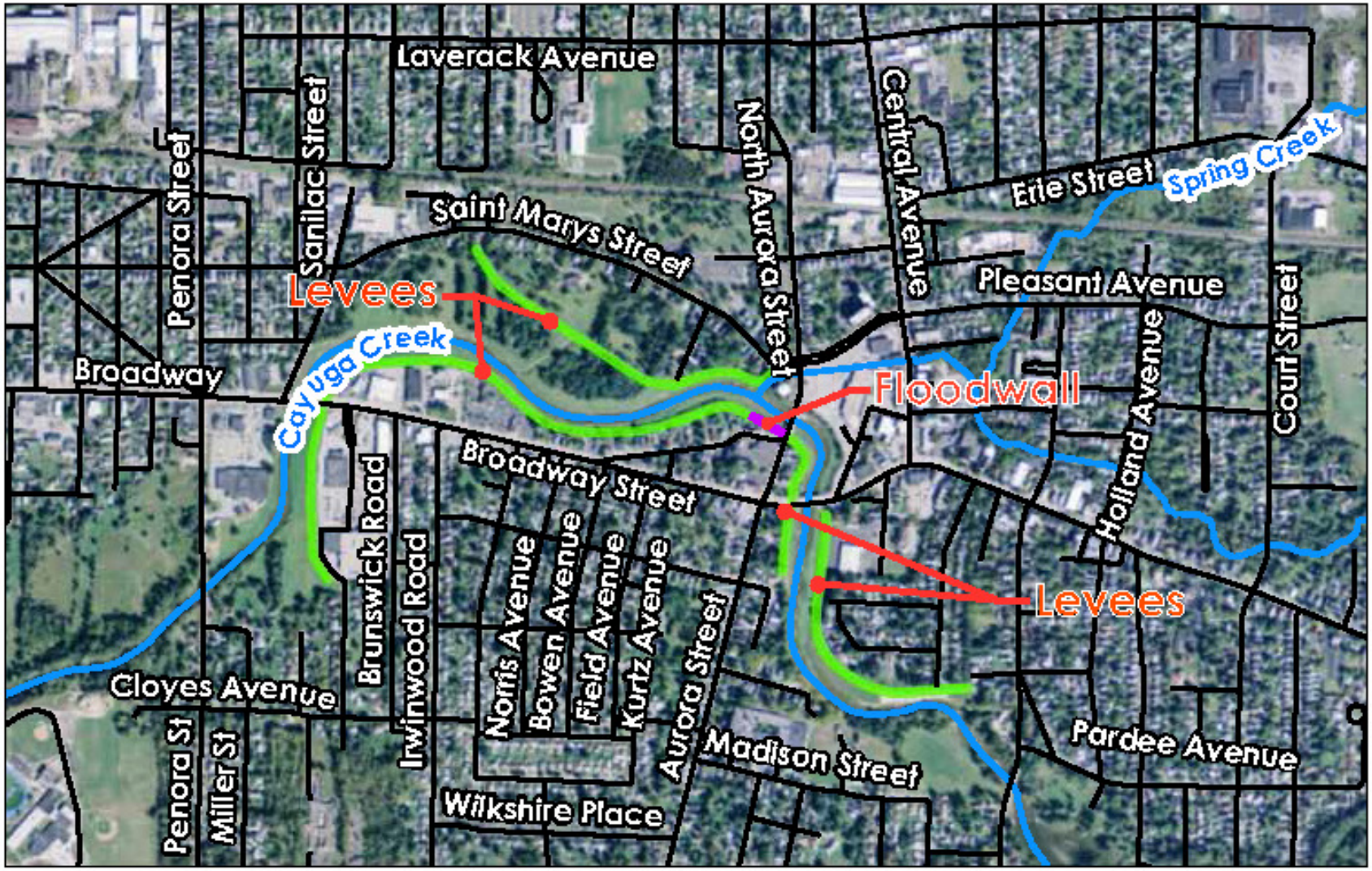


Review of the information for the local levee system

Application of LAMP to Levees in Lancaster & Depew



Application of LAMP to Levees in Lancaster & Depew

- LLPT discussions on applicable LAMP Procedure
  - Sound Reach Procedure
    - Does any "reach" of the levee system meet all 44CFR 65.10 levee certification requirements except that it is attached to "reaches" that cannot be certified
  - Freeboard Deficient Procedure
    - Does any "reach" of the levee system meet all 44CFR 65.10 levee certification requirements except freeboard
  - Overtopping Procedure
    - Is any "reach" a floodwall or levee designed to be overtopped in 1% storm?
  - Structural Based Inundation Procedure
    - Is there historical evidence that this levee has been breached in the past?
    - Is there evidence that finds this levee system vulnerable to breaching?
  - Natural Valley Procedure
    - Mapping landward of the levee without taking the levee into consideration

Application of LAMP to Levees in Lancaster & Depew

- Additional data needs for applicable LAMP Procedures
  - Sound Reach Procedure
    - If applicable, data needs are …
  - Freeboard Deficient Procedure
    - If applicable, data needs are …
  - Overtopping Procedure
    - If applicable, data needs are …
  - Structural Based Inundation Procedure
    - If applicable, data needs are …
  - Natural Valley Procedure
    - FEMA has sufficient information for this procedure

LAMP Path Forward

LAMP Path Forward

- LAMP - Phase 1

1st LLPT Meeting

(We are here)

Apply initial LAMP Procedures and develop First Pass Analyses

2nd LLPT Meeting

Review First Pass Analysis and finalize which Procedure(s) will be applied in future Phase 2 Detailed Analysis (if applicable)

Prepare a LAMP Plan document that summarizes LLPT discussions; First Pass Analyses; and recommended LAMP Procedure to be applied in Phase 2

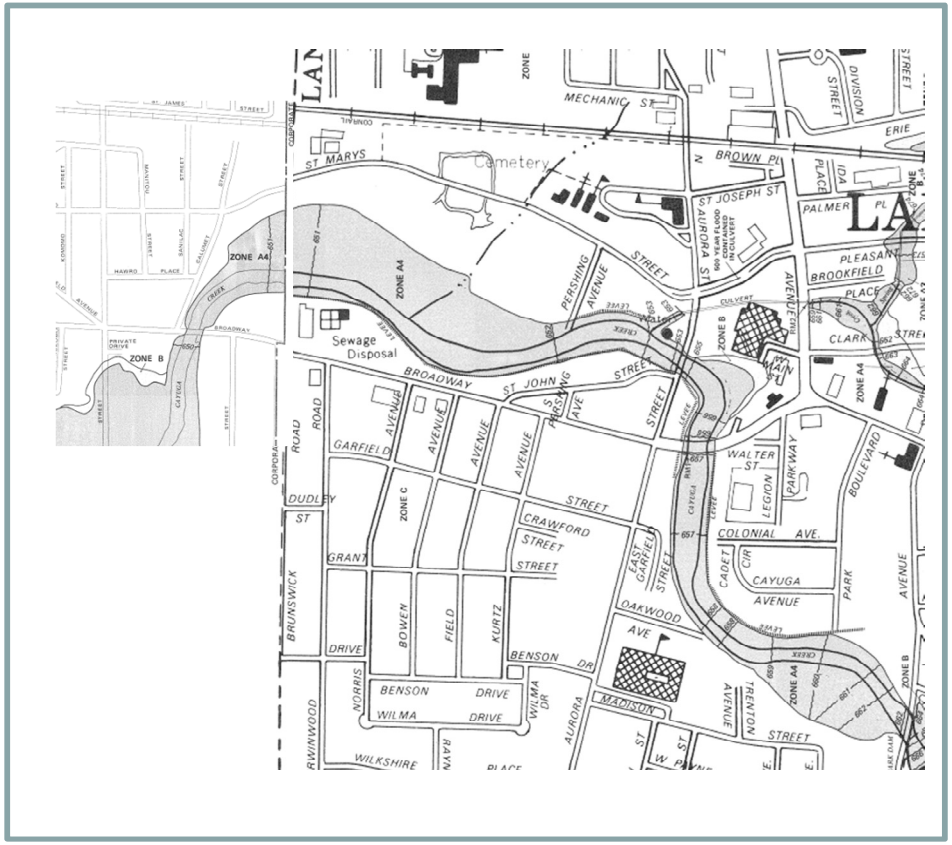
3rd LLPT Meeting (virtual)

Draft LAMP Plan will be shared with all LLPT members

Dec 2015 → Feb 2016

Concurrent Map Revision

- LAMP Study focuses on determining flood risk related to the Cayuga Creek levee.
- Concurrent Flood Insurance Rate Map (FIRM) update underway



FEMA

Know, plan for, mitigate against and communicate about the risks in your community.

Key Considerations for Selecting Technical Procedures

- Levee system characteristics
- Data availability
- Reasons 44CFR65.10 cannot be met
- Length/size of the levee system and/or reach
- Levee profile vs. BFEs
- Levee Reach discussions
- Levee performance history
- Accreditation status of levee system on current NFIP maps
- Flooding characteristics
- Contributing drainage area
- Duration of flooding
- Terrain of protected area
- Level of risk in leveed area
- Community/levee owner willingness to contribute data or analyses
- Original design and as-built plans
- O&M report, inspections, tests
- Current models
- Current survey data
- Geotechnical analyses

LAMP Kick Off Meeting for the Villages of Lancaster and Depew, NY

Meeting Date/Place:

December 10, 2015 (2:00 – 4:00 PM) at the Municipal Building, 5423 Broadway, Lancaster, NY 14086 (POC: Bill Cansdale)

Purpose:

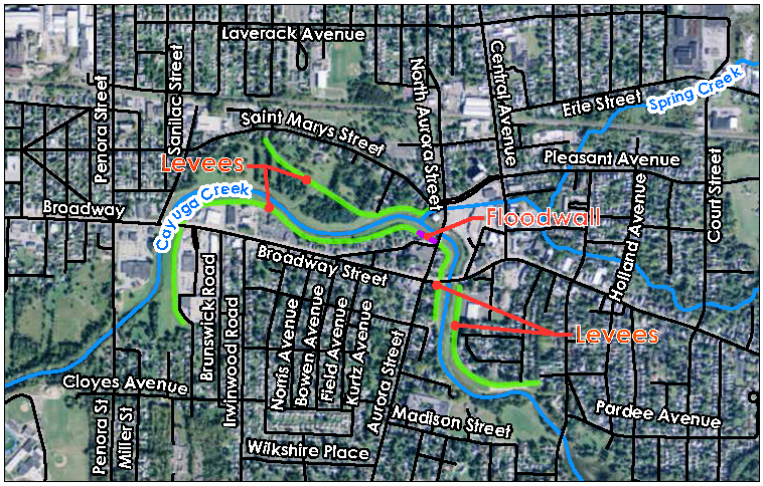
FEMA Region II conducted the first in a series of meetings to discuss Levee Analysis and Mapping Procedures (LAMP) for the levee system in the Villages of Lancaster and Depew. This meeting served to identify local and county officials along with stakeholder that would form a Local Levee Partnership Team (LLPT). This meeting also served to have the newly formed LLPT meet one another and learn about the LAMP process that included the available methods for analysis, existing information about the about the local levee system, and the next steps.

Attendees:

A total of 25 people participated in the meeting (see attached sign in sheet for specifics). There were representatives from the villages of Lancaster and Depew, Erie county, various field offices/departments of NYSDEC, the USACE Buffalo District, staffers from elected officials, a private citizen/local organizer, and FEMA (with their PTS and CERC contractors).

Summary:

The levee system undergoing LAMP consists of 3 reaches that cannot be further divided – 2 on north bank and 1 on south bank (see image below). The system is operated and maintained by the NYSDEC. The number of structures in the levee impact area was approximated at 125. It was the opinion of the USACE that the levee system could be certified but NYSDEC made it known that they did not have a budget to do it. An interesting notion was raised on the possibility of an alternative source of funding for certification from a rough assessment of taking the total costs for policies in the levee impact area and weighing it against the cost of certification. There were concerns about the flood insurance implications that would arise from the results of the viable LAMP approaches that the Region will be better prepared to address at the next meeting. FEMA and the PTS will continue to do data collection and follow up on the items from the meeting. FEMA and CERC will continue to work on messaging and ensure that the LLPT members are engaged.



Discussion Items:

- Mr. Song opened the meeting and welcomed all participants. Mr. Song explained that the meeting was to discuss the levees in the Villages of Lancaster and Depew along Cayuga Creek.
- Mr. Thomas then introduced the project team from FEMA's side:
  - FEMA Project Monitor
    - Alan Springett, Engineer, (212) 680-8557, Alan.Springett@fema.dhs.gov
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  - People around the room introduced themselves and their involvement in this project.
- Mr. Thomas provided a brief overview of Risk Communications
  - Know Your Risk - Do your residents know about their flood risk?
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- Mr. Springett reviewed the Cayuga Creek levees in Lancaster and Depew:
  - Multiple levee systems were constructed in the late 1940's along Cayuga Creek in Villages of Lancaster and Depew
  - The flood risks landward of the non-accredited levee systems will be studied with FEMA's new approach to levee mapping, LAMP.
- Mr. Springett then proceeded to provide FEMA's transition from its previous analysis for levees that are not accredited to the new method – LAMP:
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  - A levee-specific study to analyze and determine updated Special Flood Hazard Areas landward of the non-accredited levee.
- Mr. Springett next explained that LAMP is a 3 phase process:
  - Phase 1 – Engagement and Planning Process (we are here)
  - Phase 2 – Detailed Flood Hazard Analyses
  - Phase 3 - *Map Update*
- The objectives for LAMP Phase 1 are:

- Establish a Local Levee Partnership Team (LLPT) to collect local levee data and related levee system information
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o Mr. Shrivastava stressed that the major distinction of LAMP with the earlier levee analysis method was the analysis taking into account a levee system being broken up into multiple reaches in order to analyze the flood risk in the vicinity of each reach.

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o Mr. Shrivastava led a discussion on the applicability of the various procedures to the levees:
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o Mr. Song provided an overview of the timeline of the project.

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    - Properties impacted and Previous Community Study on Levees: The Village of Lancaster representatives explained that approximately 125 structures were affected. The Village had done a previous study to consolidate all the available information on the levees.
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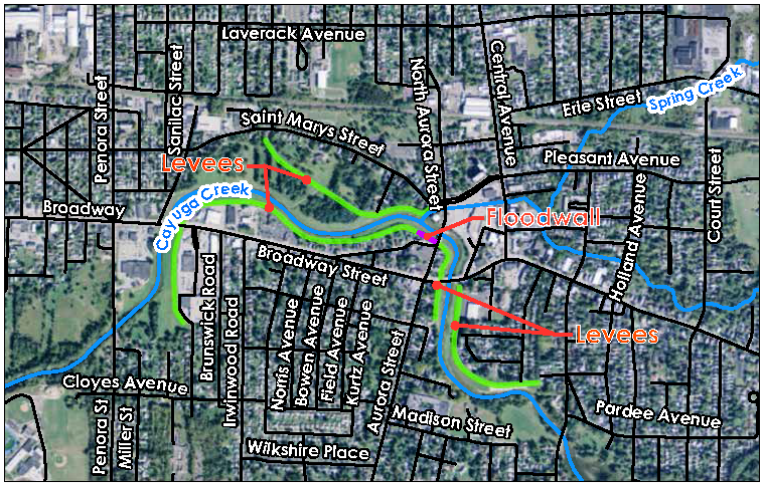

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LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Local Levee Partnership Team Meeting

Date: 12/10/15 **Time:** 2:00 PM

Location: Lancaster Municipal Building
5423 Broadway
Lancaster, NY 14086

Name	Community/Firm	Address	Phone	Fax	Email
Bryan Piliga	Congressman Chris Collins	128 Main St. Geneseo, NY 14454	585-519-4002 5		bryan.pilga@mail.house.gov
Scott M Kuhlmey	V/Lancaster Office of Emerg Mgmt	5423 Broadway Lancaster	861-7933	601-1099	SKuhlmey@lancastervillage.org
Michael Moskal	V/Depew Office of Emerg Management	85 Manitou St. Depew, NY 14043	310-9984		mmoskal@villageofdepew.org
RJ Mieman	/	/	444-5034		RMieman@villageofdepew.org

PRIVACY ACT STATEMENT **(5 U.S.C. 552(a) Privacy Act)**

a. **AUTHORITY:** 5 U.S.C. 301 Departmental Regulations;14 U.S.C.2; 14 U.S.C.5 (88); National Environmental Protection Act (NEPA), 42 U.S.C. 4321; 44U.S.C.3101
b. **PURPOSE:** To obtain personal Information for the purpose of compiling mailing lists and to document public comments as required by the NEPA. NEPA requires public involvement in agency decision-making processes. Decisional documents as well as comment mechanisms must be made available to the public.
c. **ROUTINE USES:** To the Department of Homeland Security, U. S. Coast Guard, President of the Council on Environmental Quality, Environmental Protection Agency, and other authorized federal, state, or local governments who are authorized to develop and enforce environmental standards.
d. **DISCLOSURE:** Disclosure of your name, street address, or other contact information is voluntary; however, if information is not provided, we may not be able to provide copies of decisional documents and to retrieve additional comments related to environmental impact actions or decisions.
e. **PHOTOGRAPHS:** In the event that photographs are taken, you acknowledge that FEMA and RAMPP have permission to use that photograph.

LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Name	Community/Firm	Address	Phone	Fax	Email
Michelle Czech	Planning commission	15 St. John St Lancaster	983-2557		Kenrazi@Aol.com
Jen Dougherty	DEC-DHC	270 Michigan Ave Buffalo, NY	851-7194		jennifer.dougherty@dec.ny.gov
Tim Walsh	NYSDEC Western Flood Hub	6274 East Avon-Lima Rd. Avon, NY 14414	585 226 5437		Tim.walsh@Dec.ny.gov
Bill Mechanic	NYSDEC	625 Broadway Albany, 12233-3504	518 402-8146		William.Mechanic@dec.ny.gov
Tony Fischione	Village of Depew CEO	85 Manitou St Depew, N.Y. 14043	683-1400 EXT 143		AFischione@VillageofDepew.org

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MEETING
SIGN-IN SHEET

FEMA

Name	Community/Firm	Address	Phone	Fax	Email
Mitch Martin	Senator Gallivan		656-8594		mitch@senatorgallivan.com
Bill Cansdale	Village of Lancaster		716-683-2800		wcansdale@lancasterny.org
Kerrie OKeeffe	NYS DEC		585 226 5465		kerrie.okeeffe@dec.ny.gov
Ted Myers	NYSDEC R9 - Buffalo		716-851-7088		Theodore.Myers@dec.ny.gov
Paul Cocca	USACE Buffalo		716-879 4372		paul.a.cocca@usace.army.mil
Jesse Nikonowicz	Village of Depew		716 683 1400		JNikonowicz@Vod.org
Vikram Shrivastava	STANTEC - TI		703-849 -0213		vshrivastava@dewberry.com

PRIVACY ACT STATEMENT **(5 U.S.C. 552(a) Privacy Act)**

f. **AUTHORITY:** 5 U.S.C. 301 Departmental Regulations;14 U.S.C.2; 14 U.S.C.5 (88); National Environmental Protection Act (NEPA), 42 U.S.C. 4321; 44U.S.C.3101

g. **PURPOSE:** To obtain personal Information for the purpose of compiling mailing lists and to document public comments as required by the NEPA. NEPA requires public involvement in agency decision-making processes. Decisional documents as well as comment mechanisms must be made available to the public.

h. **ROUTINE USES:** To the Department of Homeland Security, U. S. Coast Guard, President of the Council on Environmental Quality, Environmental Protection Agency, and other authorized federal, state, or local governments who are authorized to develop and enforce environmental standards.

i. **DISCLOSURE:** Disclosure of your name, street address, or other contact information is voluntary; however, if information is not provided, we may not be able to provide copies of decisional documents and to retrieve additional comments related to environmental impact actions or decisions.

j. **PHOTOGRAPHS:** In the event that photographs are taken, you acknowledge that FEMA and RAMPP have permission to use that photograph.

LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Name	Community/Firm	Address	Phone	Fax	Email
Laura Ortiz	USACE	1776 Niagara Buffalo NY 14207	716-879-4402		laura.v.ortiz@usace.army.mil
Bob Remmers	USACE	1776 Niagara St Buffalo, NY	716-879-4277		robert.w.remmers@usace.army.mil
Marely Ortiz	Erie County DEP	95 Franklin St Buffalo NY 14202	716-858-1916		~~marietg.ortiz~~ marely.ortiz@erie.gov
SHAWN M. MARSHALL	Village of LANCASTER	5423 BROADWAY LANCASTER, NY 14086	716-836-3697		SMARSHALL@LANCASTERVILLAGE.ORG
THOMAS SONG	CERC				THOMAS.SONG@MBAICERINTL.
Alan Springett	FEMA	26 Federal Plaza New York, NY 10278	212-680-8557		Alan.Springett@fema.dhs.gov
Seth Lawler	Dewberry	Fairfax VA	703-549-0213		Slawler@dewberry.com

PRIVACY ACT STATEMENT (5 U.S.C. 552(a) Privacy Act)

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LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Name	Community/Firm	Address	Phone	Fax	Email
George Miller	Village of Lanc.	5500 Broadway	683-1028	683-1029	gmiller@lancaster village.org
Gerald DiPaola	USACE	1776 Niagara St.	879-4228		gerald.a.dipaola @usace.army.mil
Dan King	Thill-Demerly Agency	5329 Broadway Lancaster NY	716 683-4491	683-4497	dan king @ thilldemerly.com
Phil Fleck	Vill. of Depew	200 Rutherford Pl.	716 683-5700	683-9278	pfleck @ village of depew .org

PRIVACY ACT STATEMENT **(5 U.S.C. 552(a) Privacy Act)**

f. **AUTHORITY:** 5 U.S.C. 301 Departmental Regulations;14 U.S.C.2; 14 U.S.C.5 (88); National Environmental Protection Act (NEPA), 42 U.S.C. 4321; 44U.S.C.3101

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j. **PHOTOGRAPHS:** In the event that photographs are taken, you acknowledge that FEMA and RAMPP have permission to use that photograph.

Appendix B
Stakeholder Engagement - LLPT Meeting #2 Information

LAMP LLPT Meeting, Village of Depew, NY

Meeting Date:

June 27, 2016 (6:00 PM) at the Municipal Building, 85 Manitou St, Depew, NY, 14086

Purpose:

FEMA Region II conducted the third in a series of meetings to discuss Levee Analysis and Mapping Procedures (LAMP) for the levee system in the Town of Depew. This meeting served to inform the Local Levee Partnership Team (LLPT) that a decision was required for the initiation of Phase 2 of the LAMP process, to outline the path forward and to answer any outstanding questions and concerns of the communities.

Attendees:

A total of 25 people participated in the meeting (see attached sign in sheet for specifics). There were representatives from the Village of Depew, NYSDEC, the USACE Buffalo District, a private citizens, the media, and FEMA, and its contractors.

Meeting Items:

- Alan presented the ppt (see attached)
- Ted Myers -DEC owns and operates the levees
- Alan noted that FEMA is only permitted to provide names of communities that have had levees. Bob Remer - USACE can provide names of firms that have done levee accreditations, but this is not an endorsement.
- questions from audience:
    - What is the benefit of accreditation for Depew? Lifting of mandatory insurance requirement for 3 commercial structures
    - Who is responsible for upgrades/maintenance of the systems? Ted said DEC would need to discuss, DEC will not pay for accreditation
    - What is freeboard, sound reach, etc.? Alan explained
    - When built? 1949 by DEC
    - Has it ever overtopped/failed? No
- Alan strongly encouraged Depew to coordinate with the Village of Lancaster. He explained that in the absence of accreditation, a LAMP scenario will need to be selected and that Lancaster has

requested Freeboard Deficient. FEMA will pay for this analysis and the data will be useful toward accreditation if the communities decide to pursue it. It would be good if both communities chose the same LAMP scenario.

	Name	Agency	Email
✓1	Karl Bukowiecki	Village of Depew Trustee	Kbukowiecki@Village of Depew.org
✓2	Maureen Jeracka's	Village Administrator	mjeracka's@villageof
✓3	Jesse Nikonowicz	Mayor	jnikonowicz@depew.org
✓4	Bob Kocewicz	trustee	Bkocewicz@
✓	Kevin Peterson	trustee	Kpetersen@
	TED MYERS	NYSDEC Region 9	theodore.myers@dec.ny.gov
	Kim Dunn	Dewberry	kdunn@dewberry.com
	JOAN PRIEBE	Depew Homeowner	
	DANIEL BEUTLER	DEPEW TAXPAYER	
Retired	KEVEN PETERSON	VILLAGE OF DEPEW TRUSTEE	KPETERSON@VILLAGEOFDEPEW.ORG
	BOB KOCEWICZ	" " "	RKOCEWICZ@RIADVOCATE.COM
	Bob Remmers	USACE Buffalo District	robert.w.remmers@usace.army.mil
X	DON JAKE JAKUBOWSKI	TRUSTEE	DJAKUBOWSKI@VILLAGEOFDEPEW.ORG
	Jim Ramsey	Rec Director Depew	Rammerj35@Gmail
	Julie Halm	Bee Group Newspapers	julieh@beenews.com
	SCOTT WEGST	DEPEW FIRE DEPT	SCOTT.WEGST@DEPEWFIRE.ORG
	Ryan Paolella	Depew Fire Dept	Ryan paolella@depewfire.org
	JAMES S. NUSALL	DEPEW FIRE DEPT	JAMIE.NUSALL@DEPEWFIRE.ORG
	TONY FISCHIONE	DEPEW CODE ENFORCEMENT	AFISCHIONE@VILLAGEOFDEPEW.ORG
	Thomas Brown	USACE Buffalo District	tbrown328@gmail.com
	James Rogers	USACE Buffalo District	
	Timothy Rogacki	DEPEW FIRE DEPT	
	RICHARD KROPP	Depew fire Dept	
	TRACY SUNDBERG	DEPEW FIRE DEPT	
	DAVE Strohmenger	Depew Fire Dept	
	RONALD D. MROZOWSKI	DEPEW FIRE DEPT	
	JIM NUSALL	" " "	

FEMA

Levee Analysis and Mapping Procedures (LAMP) for Non-accredited Levees

Villages of Lancaster and Depew, Erie County, NY

February 9, 2016

RiskMAP
Increasing Resilience Together

Agenda

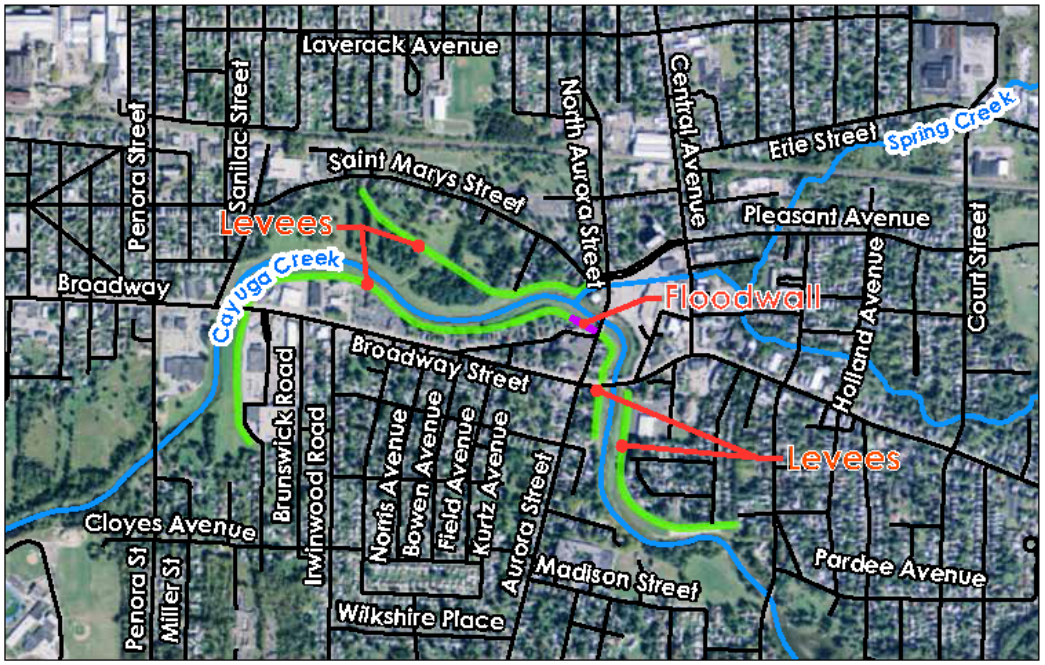
- Introductions
- Review of LLPT Meeting #1
- First Pass Analysis Results
- Finalize LAMP study methods for Phase 2 Analysis
- LAMP Path Forward
- Review of First Pass Analysis

Introductions & Contact Information

- **FEMA Project Monitor**
  - Alan Springett, Engineer
    (212) 680-8557
    Alan.Springett@fema.dhs.gov
- **Project Manager**
  - Vikram Shrivastava (STARR II)
    (703) 849-0253
    VShrivastava@dewberry.com
- **Outreach Lead**
  - Thomas Song
    914-343-6696, 646-682-5531
    Thomas.Song@mbakerintl.com

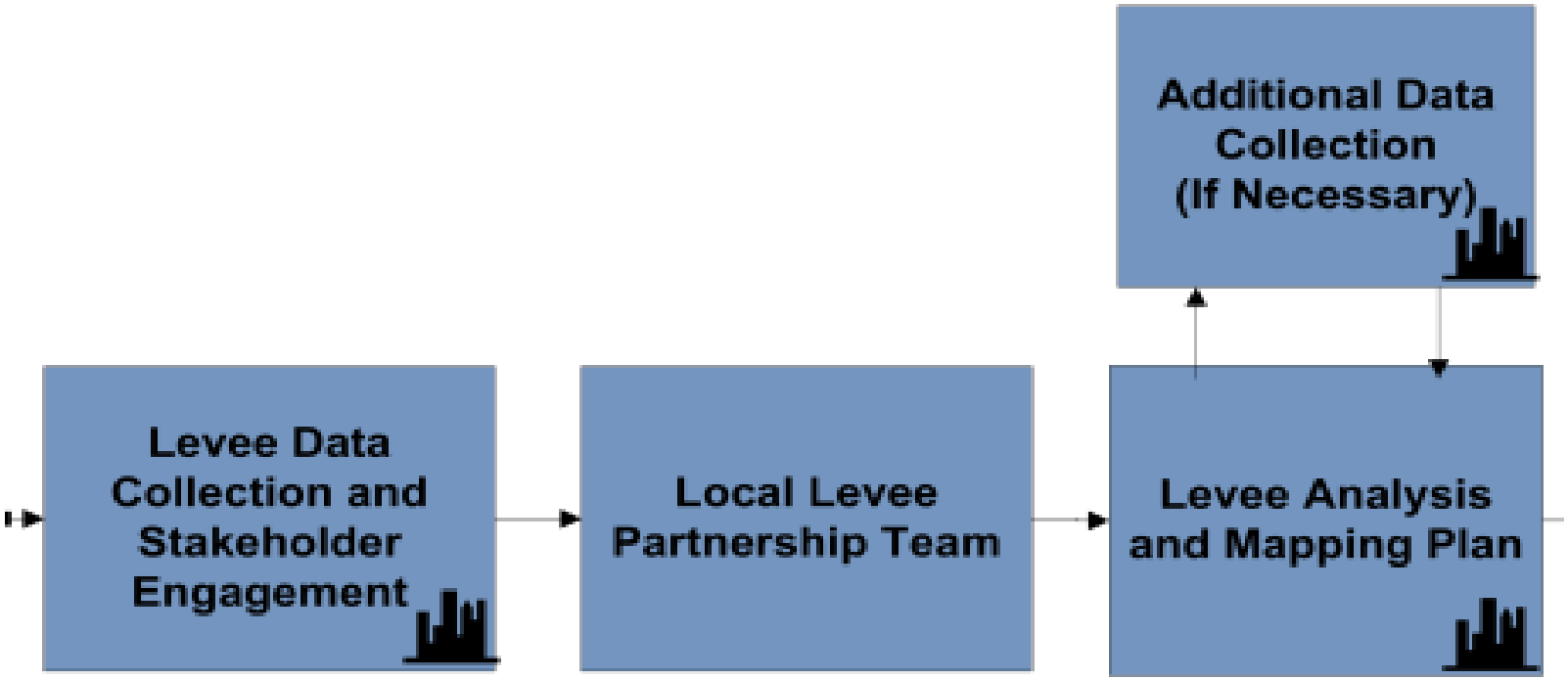
Review of the Local Levee System

- Multiple levee systems were constructed in the late 1940's along Cayuga Creek in Villages of Lancaster and Depew
- The flood risks landward of the non-accredited levee systems will be studied with FEMA's new approach to levee mapping, LAMP.



Levee Analysis and Mapping Process (LAMP) Process

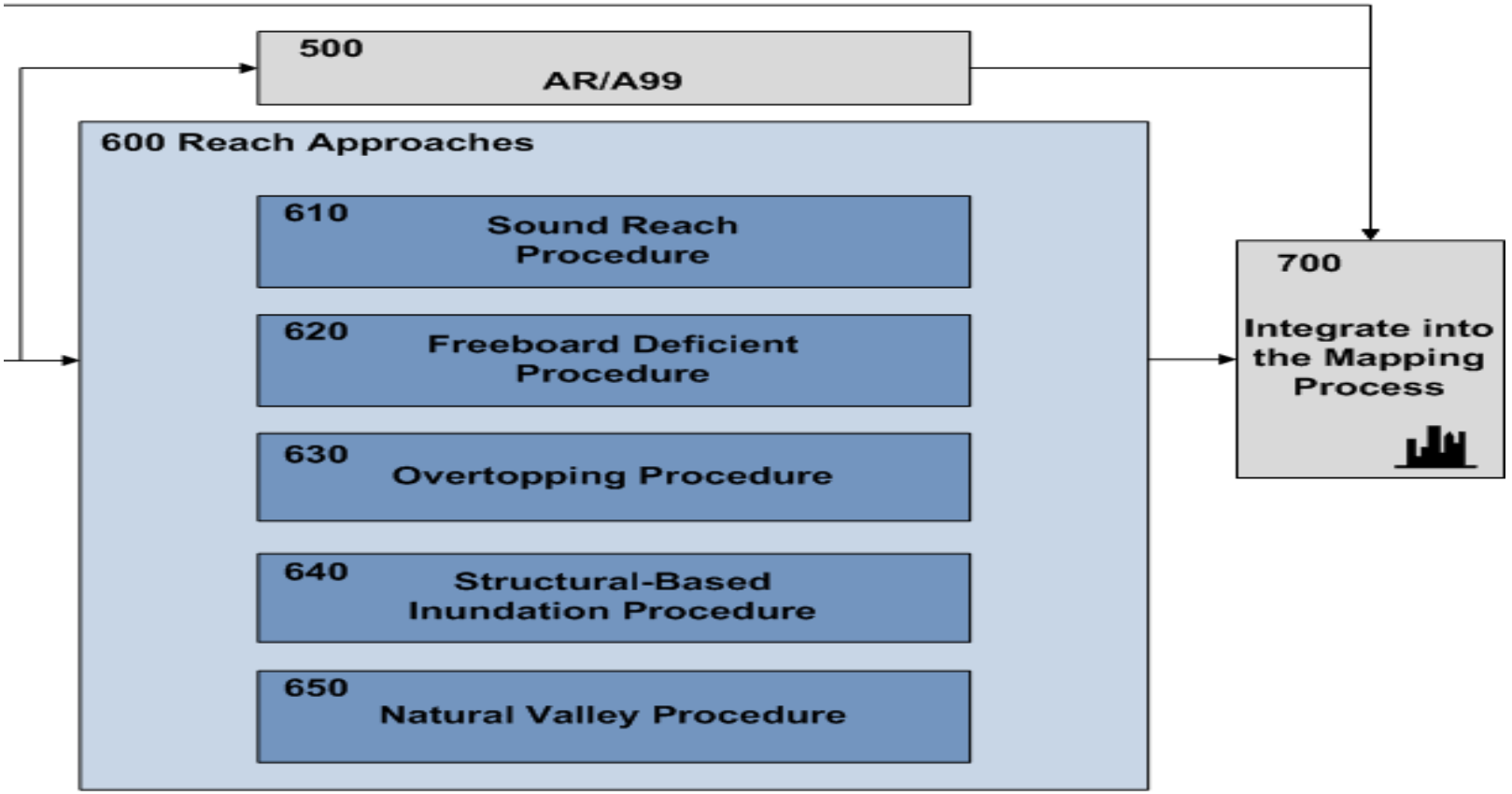
PHASE I: Engagement and Planning Process



Current phase

Levee Analysis and Mapping Process (LAMP) Process

Phase 2: Detailed Flood Hazard Analyses
Phase 3: Map Update

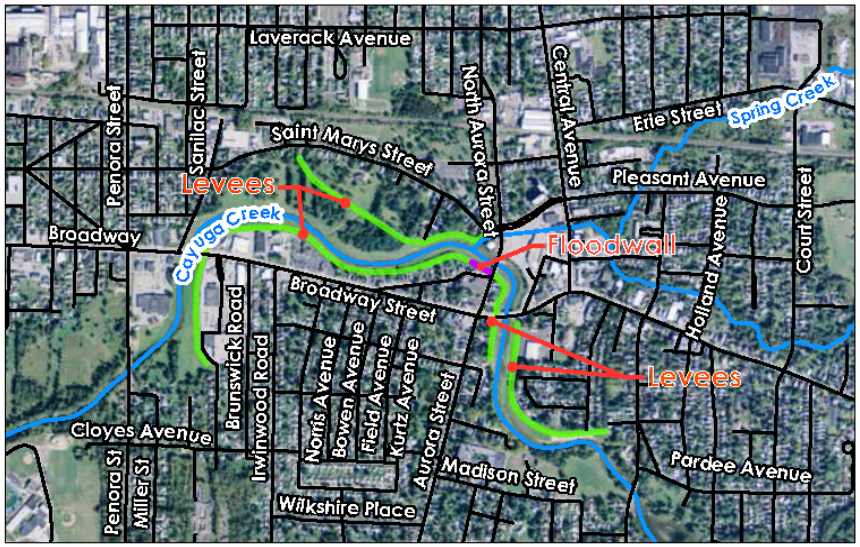


LAMP Analyses & Methodology

There are five procedures detailed in the LAMP Final Approach Document.

- Natural Valley
- Structural-Based Inundation
- Overtopping
- Freeboard Deficient
- Sound Reach

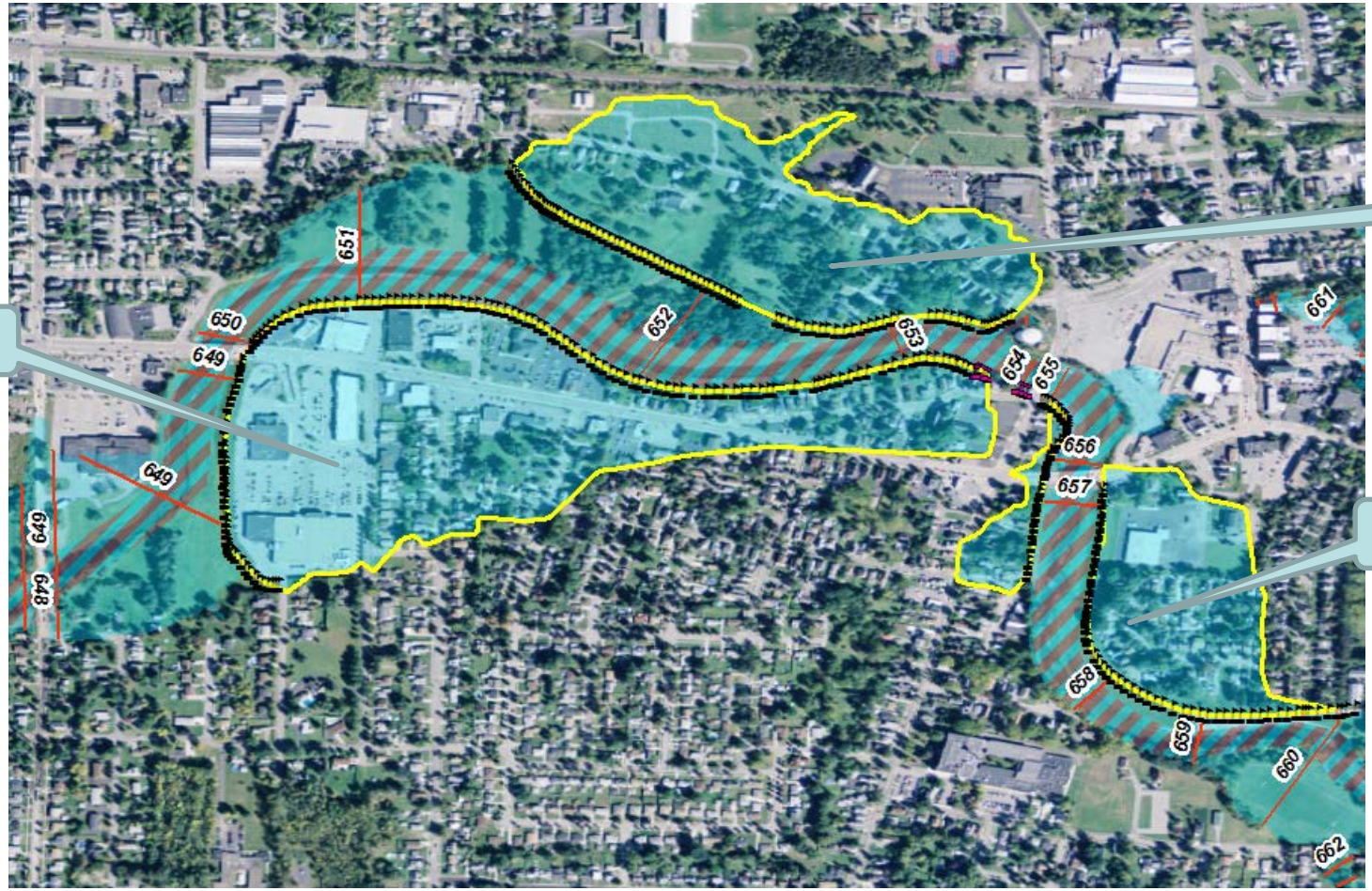
Some levee systems can be broken up into multiple reaches in order to analyze the flood risk in their vicinity.



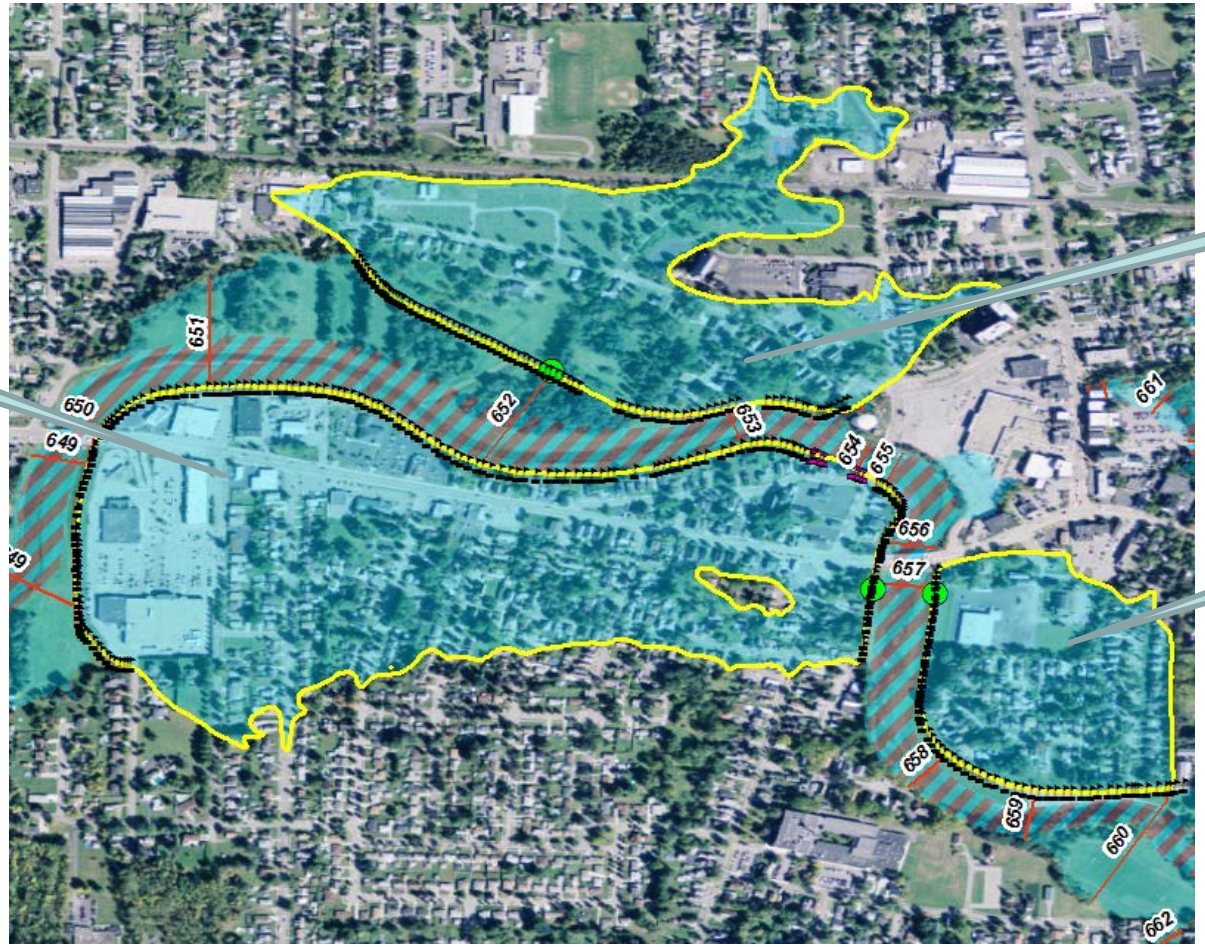
Application of LAMP to Levees in Lancaster & Depew

- **LAMP Procedures are**
  - Natural Valley Procedure (Applicable)
  - Structural Based Inundation Procedure (Potentially Applicable)
    - Levee does not have known vulnerabilities or history of breaching
  - Overtopping Procedure (Not Applicable)
    - BFEs are lower than top of levee / floodwall
  - Freeboard Deficient Procedure (Potentially Applicable)
    - Will require documentation that levee meets 44CFR65.10 except for freeboard
  - Sound Reach Procedure (Potentially Applicable)
    - Will require documentation that levee meets 44CFR65.10 except for freeboard

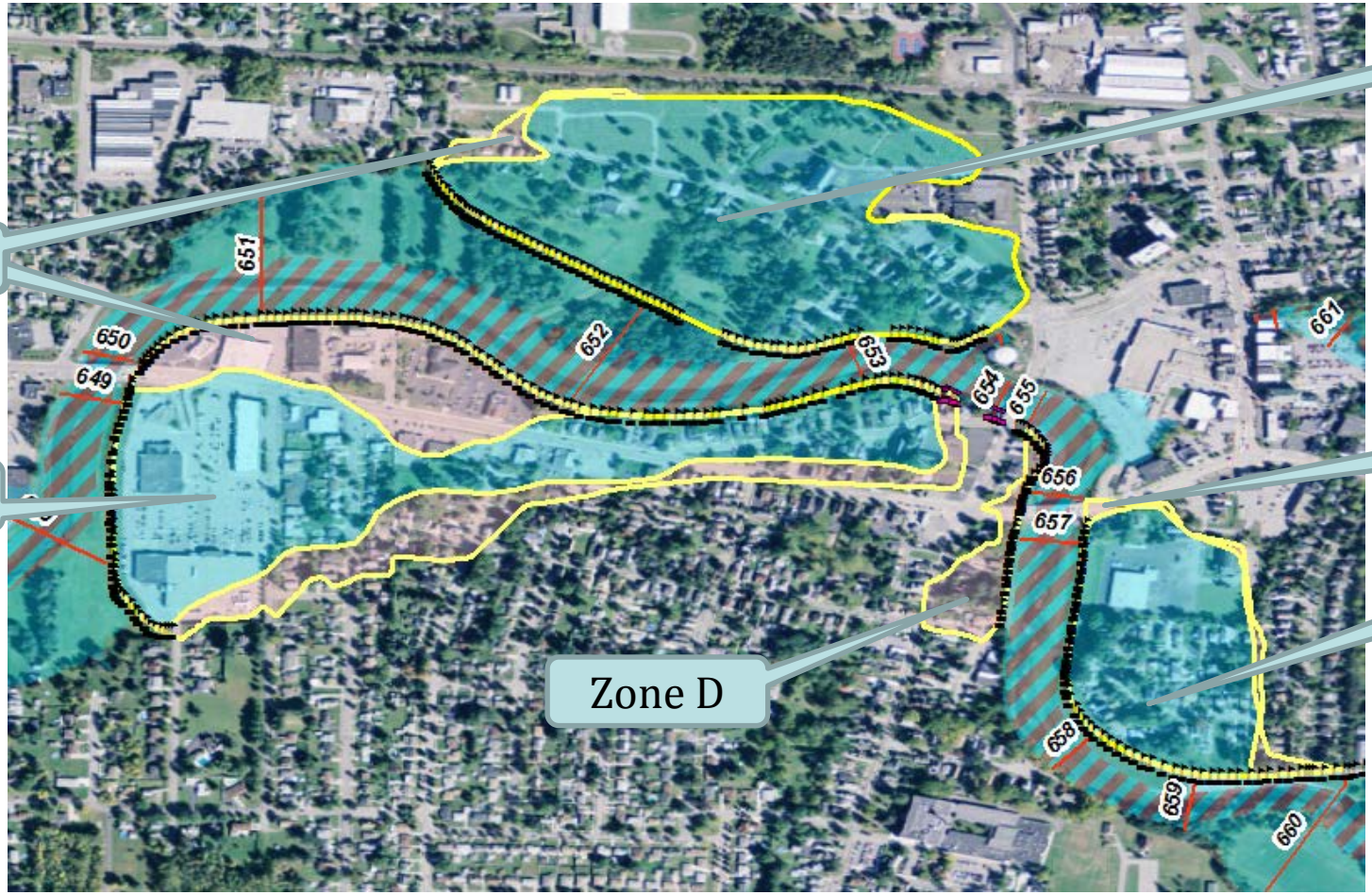
First Pass Analysis
Natural Valley Procedure



First Pass Analysis
Structural Based Inundation

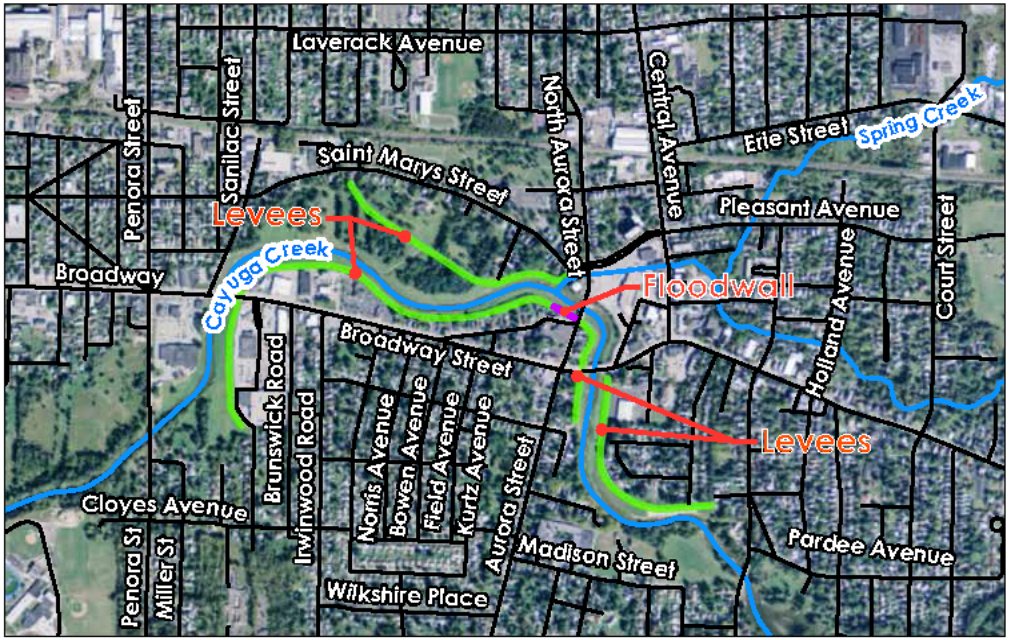


First Pass Analysis
Sound Reach & Freeboard Deficient



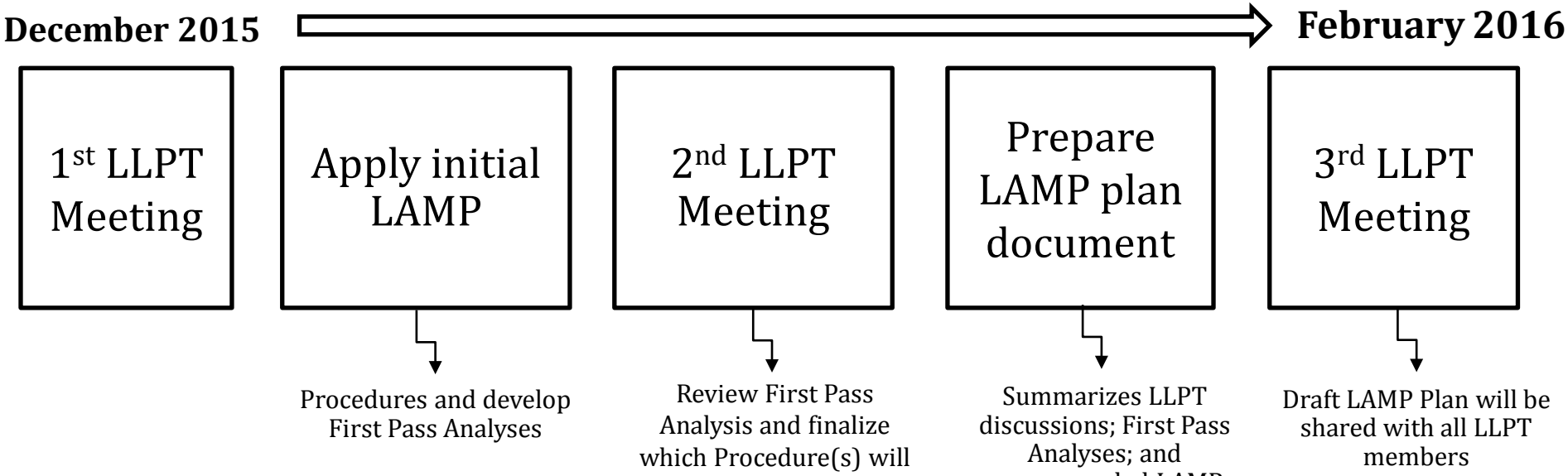
Finalize LAMP study methods for Phase 2 Analysis

- **LAMP Procedures are**
  - Natural Valley Procedure
  - Structural Based Inundation Procedure
  - Overtopping Procedure
  - Freeboard Deficient Procedure
  - Sound Reach Procedure



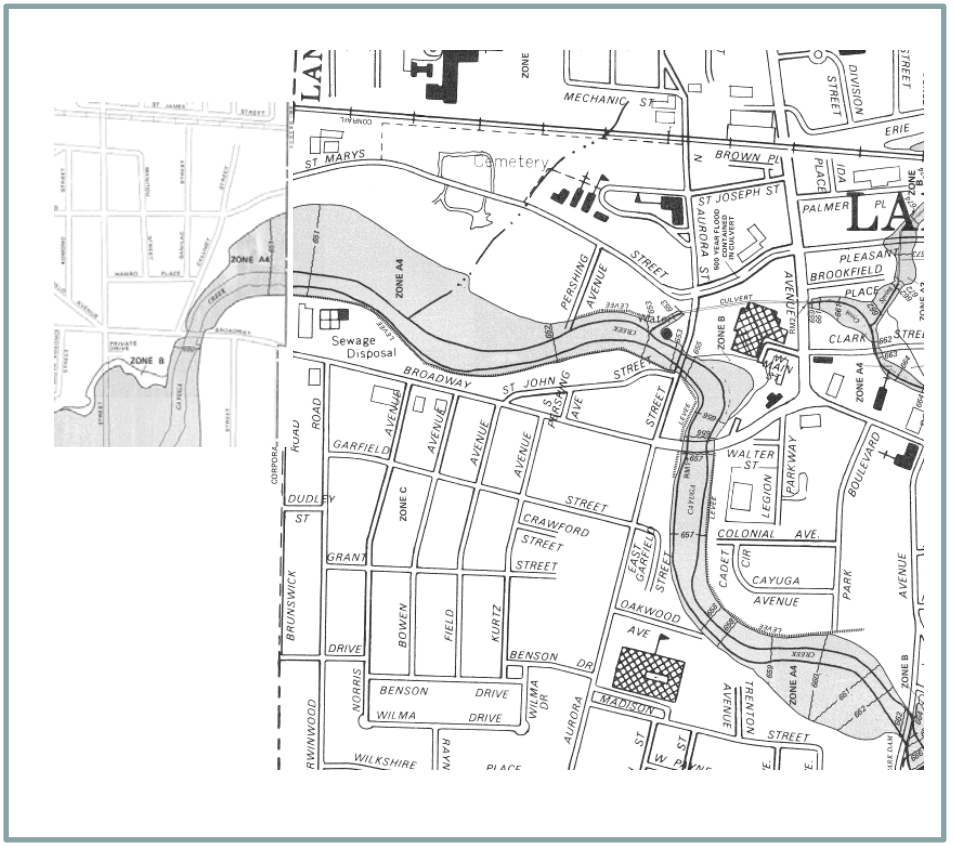
LAMP Path Forward

- **LAMP PHASE 1**



Concurrent Map Revision

- LAMP Study focuses on determining flood risk related to the Cayuga Creek levee.
- Concurrent Flood Insurance Rate Map (FIRM) update underway with “seclusion”



Review of First Pass

FEMA

Know, plan for, mitigate against and communicate about the risks in your community.

LAMP LLPT Meeting III, Village of Lancaster, NY

Meeting Date:

June 2, 2016 (6:00 AM- 9:00 PM) at the Municipal Building, 5423 Broadway, Lancaster, NY, 14086 (POC: Michael Stegmeier)

Purpose:

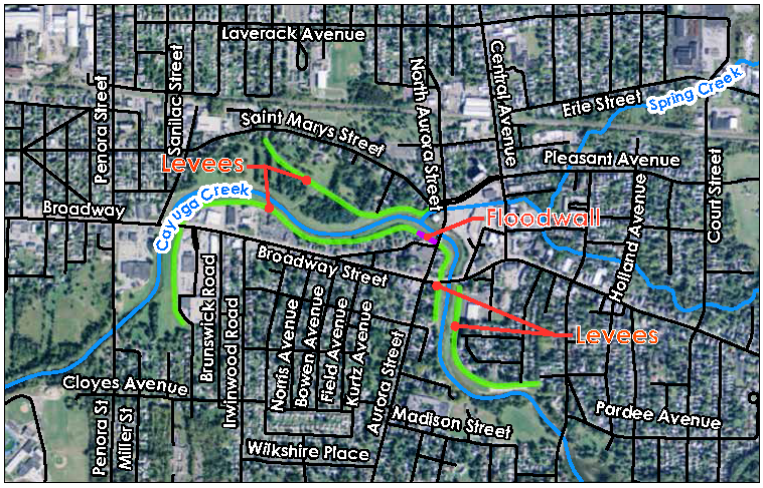
FEMA Region II conducted the third in a series of meetings to discuss Levee Analysis and Mapping Procedures (LAMP) for the levee system in the Town of Depew and the Village of Lancaster. This meeting served to inform the Local Levee Partnership Team (LLPT) that a decision was required for the initiation of Phase 2 of the LAMP process, to outline the path forward and to answer any outstanding questions and concerns of the communities.

Attendees:

A total of 20 people participated in the meeting (see attached sign in sheet for specifics). There were representatives from the villages of Lancaster and Depew, Erie county, various field offices/departments of NYSDEC, the USACE Buffalo District, staffers from elected officials, a private citizen/local organizer, and FEMA.

Summary:

The levee system undergoing LAMP consists of 3 reaches that cannot be further divided – 2 on north



Meeting Items:

- Mr. Springett opened the meeting at 6:15 pm (delayed due to IT issues, projection system down) by opening the floor to questions. Summary of Questions/Responses:
  - Question (Dan): DEC plans to continue maintaining the property, which was recently cleaned. Has the recent dredging and cleaning activity been considered in the current modeling.

Response (Alan): The recent cleaning would likely restore the channel to the condition it was in during the latest round of modeling in the 80's, which was also conducted just after a cleaning.

- Question (Deputy Mayor): Why is the cost of the accreditation on the village since it was constructed by the USACE and wasn't maintained by DEC?

  Response (Alan): USACE does not build with the standards of FEMA in mind, so the original standards the USACE may not meet the FEMA criteria.

  Response (Bob): The USACE designs according to a Maximum Benefit criteria which is different from the 1% chance occurrence used by FEMA.

- Question (Dan): Why can't the USACE pay for the accreditation, as they did in Pennsylvania?

  Response (Bob): I am not familiar with that case, however that may have been under different circumstances. The USACE will not and does not do this on a regular basis.

  Discussion: A general discussion ensued, including clarification of terminology used by FEMA, USACE, Risk, Risk analysis methodology and criteria established by FEMA in the NFIP.

  - Recurring themes in this discussion (prompted largely by the Deputy Mayor), were
    1. The 100yr flood has not occurred in this area in recent memory.
    2. The houses impacted have not been required to carry insurance in the past.
    3. FEMA is attempting to pay for/subsidize disasters in other areas by requiring places such as Lancaster to pay flood insurance premiums.
    4. It has been acknowledged by FEMA and congress recently that the NFIP and FEMA in general have been mismanaged.

- At this point, the Mayor suggested we move to the presentation. The presentation was conducted by:
  - FEMA Project Monitor
    - Alan Springett, Engineer, (212) 680-8557, Alan.Springett@fema.dhs.gov
  - Project Engineer
    - Seth Lawler (STARR II), (703) 849-0213, slawler@dewberry.com

  Presentation Topics (see pdf of Presentation)

  - Review of the Local Levee System
  - Review of LLPT Meeting #1
  - First Pass Analysis Results
    - Natural Valley
    - Structural Based Inundation
    - Sound Reach & Freeboard Deficient

- Finalize LAMP study methods for Phase 2 Analysis
- LAMP Path Forward
- Review of First Pass Analysis

- This ended the format presentation part of the meeting. The following items were discussed:
  - The village needs to decide which methods of modeling they would like FEMA to pursue during the second phase of analysis.
  - Different methods can be used for different sections of the levee system.
  - The option for seeking accreditation is available to them through a funding mechanism of their choosing. Levee districts are common in the west, and if the village were inclined to do something similar, they may do so.

Community Follow up:

The community would like to receive an email including the following:

1. A PDF of the presentation so that the board members can meet and discuss the options, choose a methodology for the phase 2 modeling and notify FEMA of their decision.
2. A link with the procedure for individual homeowners interested in challenging the BFE for their property (initiating a LOMA)
3. An updated timeline for the LAMP process.
4. Clarification on the consequences/repercussions for the communities if they opt not to participate in the NFIP.
5. Preliminary Mapping info:
   a. Link to available preliminary mapping.
   b. An estimate on when they may be available/effective.
6. The town will contact Vikram next week to discuss their decisions.

Internal Follow up:

1. If the levee is accredited, will there be a freeboard deficient floodplain?
2. What is the process for mapping if the town moves to accredit the levee?

LAMP LLPT Meeting #2 for the Villages of Lancaster and Depew, NY

Meeting Date/Place:

February 9, 2016 (2:00 – 4:00 PM) at the Municipal Building, 5423 Broadway, Lancaster, NY 14086 (POC: Bill Cansdale)

Purpose:

FEMA Region II conducted the second in a series of meetings to discuss Levee Analysis and Mapping Procedures (LAMP) for the levee system in the Villages of Lancaster and Depew. This meeting served to present first pass analyses for the various LAMP Procedures and discuss the appropriate LAMP Procedure for refinement in a future LAMP Phase 2 study.

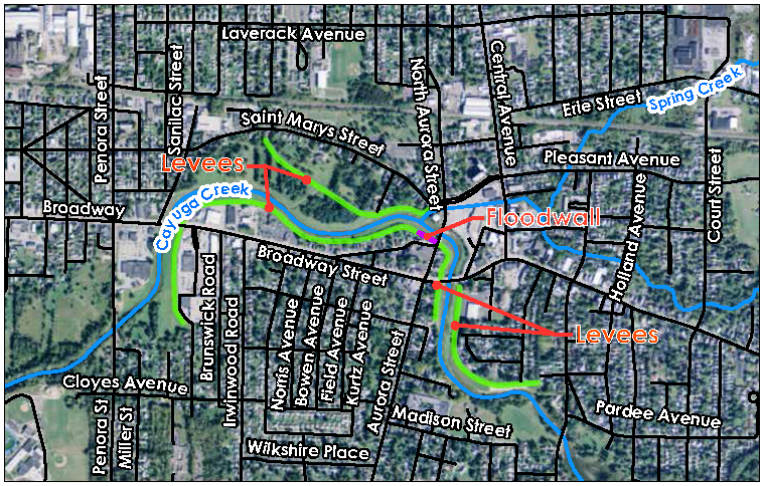
Attendees:

A total of 15 people participated in the meeting (see attached sign in sheet for specifics). There were representatives from the villages of Lancaster and Depew, Erie County, various field offices/departments of NYSDEC, the USACE Buffalo District, a private citizen/local organizer, and FEMA (with the PTS contractor).

Summary:

The levee system undergoing LAMP consists of 3 reaches that cannot be further divided – 2 on north bank and 1 on south bank (see image below). The system is operated and maintained by the NYSDEC. The number of structures in the levee impact area was approximated at 125. A quick review was provided on the LAMP process and procedures used to map the flood hazards behind unaccredited levees. Based on the available information the applicable LAMP procedures were identified. The LLPT reviewed the resulting flood hazards from the first pass analyses for the applicable LAMP Procedures.

The LLPT felt it best to brief the Village Councils at the council meetings in March on the LAMP process and results from the first pass analyses. This was considered prudent as approximately 125 structures could potentially be mapped in the Special Flood Hazard Area and require flood insurance. With input from the Village Councils the LLPT can then recommend the LAMP Procedures for refinement in a future LAMP Phase 2 study.



Discussion Items:

- Mr. Springett opened the meeting and welcomed all participants. Mr. Springett explained that the meeting was to discuss the levees in the Villages of Lancaster and Depew along Cayuga Creek.
- Mr. Springett then introduced the project team from FEMA's side:
  - FEMA Project Monitor
    - Alan Springett, Engineer, (212) 680-8557, Alan.Springett@fema.dhs.gov
  - Project Manager (FEMA Production Contractor)
    - Vikram Shrivastava (STARR II), (703) 849-0253, VShrivastava@dewberry.com
  - Outreach Lead
    - Thomas Song, 914-343-6696, 646-682-5531, Thomas.Song@mbakerintl.com
  - People around the room introduced themselves and their involvement in this project.
- Mr. Springett reviewed the Cayuga Creek levees in Lancaster and Depew:
  - Multiple levee systems were constructed in the late 1940's along Cayuga Creek in Villages of Lancaster and Depew
  - The flood risks landward of the non-accredited levee systems are being studied with FEMA's new approach to levee mapping, LAMP.
- Mr. Springett provided an high level overview of the LAMP Process
  - Phase 1: Engagement and Planning which includes
    - Levee Data Collection and Stakeholder Engagement
    - Local levee Partnership Team
    - Additional Data Collection (if necessary)
    - Levee Analysis and Mapping Plan
  - Phase 2: Detailed Flood Hazard Analysis which includes
    - AR/A99 Analyses for levees under construction which will be accredited (which do not apply to the levees in Lancaster and Depew)
    - LAMP Procedures for non-accredited levees
  - Phase 3: Map Update
- Mr. Springett then provided an high level overview of the five LAMP Procedures:
  - Natural Valley
  - Structural-Based Inundation
  - Overtopping
  - Freeboard Deficient
  - Sound Reach
- Mr. Springett further explained that some levee systems can be broken up into multiple reaches in order to analyze the flood risk in their vicinity. This is the case with the levees in Lancaster and Depew where there are two reaches on the north bank and one reach on the south bank.
- Mr. Shrivastava then reviewed the various LAMP Procedures and their applicability to the levees in Lancaster and Depew:
  - Natural Valley Procedure (Applicable)
  - Structural Based Inundation Procedure (Potentially Applicable). However, levees does not have known vulnerabilities or history of breaching
  - Overtopping Procedure (Not Applicable). As the top of the levees are above the Base Flood Elevations (BFEs)
  - Freeboard Deficient Procedure (Potentially Applicable). Will require documentation that levee meets 44CFR65.10 except for freeboard

- Sound Reach Procedure (Potentially Applicable). Will require documentation that levee meets 44CFR65.10 except for freeboard

- During the above discussion exhibits with the results of the first pass analyses were presented.
  - Natural Valley Procedure where the 2D hydraulic analysis allows flow conveyance behind the levee. The resulting flood hazards if this procedure were chosen would be Zone AEs with BFEs.
  - Structural Inundation Procedure where 2D hydraulic analyses were used to model a single breach in each of the three levee reaches. The levee breaches were chosen to model the worst case scenario with the breach location chosen where there was a maximum difference in the levee toe and the BFE. The first pass analysis found that the structural breaching resulted in a floodplain that was larger than the Natural Valley floodplain.
  - Freeboard Deficient / Sound Reach Procedure where the runoff (interior drainage) from the area draining to the levee was computed and modeled using 2D hydraulic analysis. For the first pass analysis no pumps were modeled. During discussions of this method, the USACE representatives informed FEMA that there were pumps on the south bank levees and the east north bank levee. The results found that the flood hazards for the north bank levees were very similar (but not exactly) to the Natural Valley Procedure results. For the south bank levees the results indicated flood plains narrower than the Natural Valley Procedure results. The Freeboard Deficient / Sound Reach flood hazards would be mapped as Zone AEs with BFEs. Where the Natural Valley flood hazards were wider than the Freeboard Deficient / Sound Reach flood hazards the area would be mapped as a Zone D. Mr. Springett stated he was working with FEMA HQ to allow Letter of Map Amendments (LOMAs) for the Zone D areas based on the Natural Valley Procedure 2D first pass analyses.
- The LLPT then compared the differences in flood hazards from the LAMP first pass analyses.
- Mr. Shrivastava asked if the information presented so far allowed the LLPT members to shortlist one or more of the LAMP Procedures to be recommended for refinement in a future LAMP Phase 2 study. The LLPT members asked that the task of shortlisting the LAMP Procedures be postponed until FEMA can present the first pass analyses to the Village Councils and the councils provide input. As the agenda for the February 22nd Village Councils meetings is already finalized, this is better done in March.
- Mr. Shrivastava then provided an update on the upcoming Erie County (All Jurisdictions) revised preliminary FIRMs and FIS issuance. He explained that the revised preliminary was scheduled for issuance in late February. This revised preliminary would not update the flood hazards behind the Lancaster and Depew levees. The flood hazards behind these levees would be mapped as they are on the current effective FIRM (i.e. with no Special Flood Hazard Areas).
- Action Items
  - Vikram (PTS Contractor):
    - Send exhibits with the first pass analyses results to all LLPT members which will facilitate LAMP Procedure recommendations for a future LAMP Phase 2 study.
    - Work with Thomas (CERC Contractor) for FEMA presentations at the March Village Councils meetings.
    - Coordinate with Village Engineers and provide background on LAMP Procedures and First Pass Analyses so that the Village Engineers can advise the Village Councils.
  - Thomas (CERC Contractor):
    - Work with Vikram (PTS Contractor) for FEMA presentations at the March Village Councils meetings.

LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Local Levee Partnership Team Meeting

Date: 2/9/16 **Time:** 2:00 PM

Location: Lancaster Municipal Building
5423 Broadway
Lancaster, NY 14086

Name	Community/Firm	Address	Phone	Fax	Email
Alan Springett	FEMA	26 Federal Plaza New York, NY 10278	212-680-8557		Alan.Springett@fema.dhs.gov
Bob Remmers	USACE	1776 Niagara St Buffalo, NY 14207	(716) 879-4277		robert.w.remmers@usace.army.mil
Greg Olma	EC PARKS	95 Franklin St.	858-8350		gregory.olma@erie.gov
Manely Ann Ortiz	EC DEP	95 Franklin St	858-1916		manely.ortiz@erie.gov

PRIVACY ACT STATEMENT **(5 U.S.C. 552(a) Privacy Act)**

a. **AUTHORITY:** 5 U.S.C. 301 Departmental Regulations;14 U.S.C.2; 14 U.S.C.5 (88); National Environmental Protection Act (NEPA), 42 U.S.C. 4321; 44U.S.C.3101
b. **PURPOSE:** To obtain personal Information for the purpose of compiling mailing lists and to document public comments as required by the NEPA. NEPA requires public involvement in agency decision-making processes. Decisional documents as well as comment mechanisms must be made available to the public.
c. **ROUTINE USES:** To the Department of Homeland Security, U. S. Coast Guard, President of the Council on Environmental Quality, Environmental Protection Agency, and other authorized federal, state, or local governments who are authorized to develop and enforce environmental standards.
d. **DISCLOSURE:** Disclosure of your name, street address, or other contact information is voluntary; however, if information is not provided, we may not be able to provide copies of decisional documents and to retrieve additional comments related to environmental impact actions or decisions.
e. **PHOTOGRAPHS:** In the event that photographs are taken, you acknowledge that FEMA and RAMPP have permission to use that photograph.

LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Name	Community/Firm	Address	Phone	Fax	Email
MATT FISCHIONE	TOWN/VILLAGE LANCASTER				MFISCHIONE@LANCASTERNY.GOV
Phil Fleck	Village of DePew				PFleck@villageofdepew.com
TED MORTON	EC LEG.	92 Franklin St BUFFALO NY 14202	716-864-4482		tmorton@aol.com
Dan King	Thill-Demerly Agency Inc.	5329 Broadway Lancaster NY 14086	(716) 683-4491		danking@thilldemerly.com.
Kerrie O'Keeffe	NYS DEC Flood Hub	6274 East Avon Lima Rd, Avon NY	585 226-5465		Kerrie.OKeeffe@dec.ny.gov

PRIVACY ACT STATEMENT (**5 U.S.C. 552(a) Privacy Act**)

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LANCASTER / DEPEW, ERIE CO.
LEVEE PARTNERSHIP
MEETING
SIGN-IN SHEET

FEMA

Name	Community/Firm	Address	Phone	Fax	Email
Seth Lawler	Dewberry	8401 Arlington Blvd Fairfax VA	703-849-0213		slawler@dewberry.com
Kristen C. Guadagno	Erie County DEP	95 Franklin St. Rm 1008 Buffalo, NY 14202	716-462-8952		kristen.guadagno@erie.gov
Laura Ortiz	USACE	1776 Niagara Buffalo	716-879-4402		laura.v.ortiz@usace.army.mil
Gerald DiPaola	USACE	1776 NIAGARA ST, BUFFALO, NY 14207	(716) 879-4228		gerald.a.dipaola@usace.army.mil
Tim WALSH	Flood Hub NYSDEC	6274 E AVON-LIMA RD AVON, NY 14414	585 226 5437		tim.walsh@dec.ny.gov
Tony Fischione	Village of Depew	85 MANITOU ST Depew N.Y. 14043	683-1400 x143		AFischione@villageofdepew.ORG

PRIVACY ACT STATEMENT (**5 U.S.C. 552(a) Privacy Act**)

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e. **PHOTOGRAPHS:** In the event that photographs are taken, you acknowledge that FEMA and RAMPP have permission to use that photograph.

Appendix C
Approach Agreement

Mayor
Jesse Nikonowicz
716-681-4396

Trustees
Karl Bukowiecki
Don Jakubowski
Bob Kucewicz
Kevin Peterson

Village Administrator
Maureen Jerackas
716-683-7451 x127
716-683-1398 (fax)

Village Attorney
Kathleen McDonald

RECEIVED 8/30/16

Village of Depew

August 25, 2016

Alan Springett, Senior Engineer
FEMA Region II, Mitigation
Risk Analysis, Risk Assessment Lead
26 Federal Plaza, Ste 1337
New York, NY 10278

Dear Mr. Springett,

I am writing you in regards to the Cayuga Creek in the Village of Depew and Village of Lancaster. As you are aware, the Cayuga Creek has deficiencies which prevent it from meeting the accreditation requirements of the National Flood Insurance Program.

It was explained to us that FEMA has finalized new levee analysis methods to model the flood hazard risks in areas affected by non-accredited levees on FIRMs in order to more accurately portray the level of protection that non-accredited structures may offer. These analyses were described to us, along with draft floodplain boundaries for each scenario. We have reviewed these scenarios and are requesting that FEMA move forward with the Freeboard Deficient Procedure as the mapping approach for the Cayuga Creek in Village of Depew and Village of Lancaster.

Sincerely,

Jesse Nikonowicz

Jesse Nikonowicz
Mayor, Village of Depew

Village of Lancaster

Municipal Building
5423 Broadway
Lancaster, NY 14086
Telephone: (716) 683-2105
Facsimile: (716) 684-4830
www.lancastervillage.org

June 21, 2016

Alan Springett, Senior Engineer
FEMA Region II, Mitigation
Risk Analysis, Risk Assessment Lead
26 Federal Plaza, Ste 1337
New York, NY 10278

RE: FEMA Mapping Approach

Dear Mr. Springett:

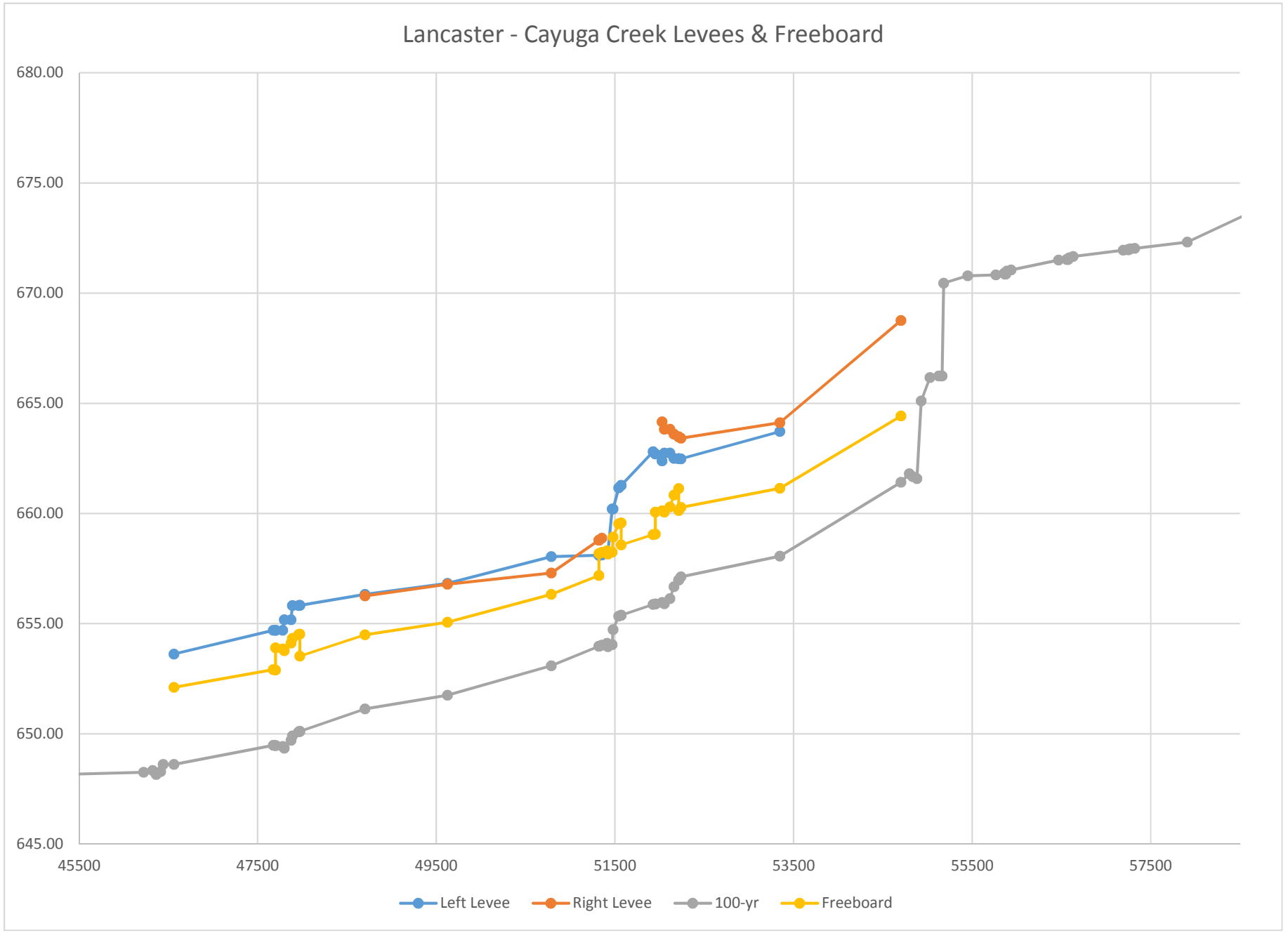
On behalf of the Board of Trustees of the Village of Lancaster, I hereby authorize FEMA to move forward with the Freeboard Deficient Procedure as the mapping approach for all reaches along Cayuga Creek in the Village of Lancaster.

Please do not hesitate to contact me with any questions.

Very truly yours,

Paul M. Maute
Mayor

Appendix D
Freeboard Profile Comparison


Lancaster - Cayuga Creek Levees & Freeboard
680.00
675.00
670.00
665.00
660.00
655.00
650.00
645.00
45500
47500
49500
51500
53500
55500
57500
Left Levee
Right Levee
100-yr
Freeboard

Appendix E
Site Photographs

Appendix F
Levee Accreditation Checklist

Meeting the Criteria for Accrediting Levee Systems on Flood Insurance Rate Maps:
How-To Guide for Floodplain Managers and Engineers

The National Flood Insurance Program (NFIP) defines a levee system in Title 44, Chapter 1,Section 59.1 of the Code of Federal Regulations (44 CFR 59.1) as a flood risk reduction system that consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices to protect a hydraulically distinct area. Within the NFIP, a levee is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

As part of the flood mapping process, the Federal Emergency Management Agency (FEMA), and its State and local mapping partners, review and evaluate levee system data and documentation. Any community and/or other party seeking recognition or continued recognition of a levee system on a Flood Insurance Rate Map (FIRM) must provide FEMA with data and documentation, certified by a registered professional engineer, showing that the levee system is expected to provide 1-percent-annual-chance (base) flood risk reduction.

To be mapped on a FIRM as providing base flood risk reduction, levee systems must meet and continue to meet the NFIP minimum design, operation, and maintenance requirements described in Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR 65.10). FEMA has posted several guidance documents related to levee accreditation, mapping, and other topics. Please access the Levee Resources Library for updated guidance documents. To help clarify the responsibilities of community officials, levee owners, or other parties seeking recognition of a levee system identified during a study/mapping project, FEMA has posted several guidance documents related to levee accreditation, mapping, and other related topics. This document provides information regarding how FEMA maps levee systems, a checklist of the types of data and documentation that must be submitted for levee systems to be accredited on FIRMs, and an index of further resources.

A NOTE ABOUT FLOOD RISK AND FLOOD INSURANCE

Levee systems are designed to provide a specific level of protection. They can be overtopped or fail during flood events larger than those for which the system was designed. Levee systems also decay over time, which may increase the likelihood of failure. They require regular maintenance and periodic upgrades to retain their level of protection. When levees do fail, the resulting damage, including loss of life, may be much greater than if the levee system had not been built.

For all these reasons, FEMA strongly encourages people in levee-impacted areas to understand their flood risk, know and follow evacuation procedures, and protect their property by purchasing flood insurance, floodproofing their structure, or taking other precautionary measures. For more information on flood insurance, please visit FloodSmart.gov.

RISK MAPPING, ASSESSMENT, AND PLANNING PROGRAM (RISK MAP)

The Federal Emergency Management Agency's Risk MAP Program delivers quality data that increases public awareness and leads to action to reduce risk to life and property. Risk MAP is a nationwide program that works in collaboration with States, Tribes, and Local communities using best available science, rigorously vetted standards, and expert analysis to identify risk and promote mitigation action, resulting in safer, more resilient communities.

RiskMAP
Increasing Resilience Together

FEMA

HOW FEMA MAPS LEVEE SYSTEMS

FEMA mapping requirements are designed to provide accurate, up-to-date flood hazard and risk information to people living and working landward of levee systems so that they may make wise decisions to minimize loss of life and damage to property due to flooding. FEMA does not evaluate the performance of a levee system—this is the responsibility of the levee owner. FEMA is responsible for establishing levee system evaluation and mapping standards, determining flood insurance risk zones, and reflecting these determinations on FIRMs.

Figure 1. Accredited Levee System

Accredited Levee System

An accredited levee system is a system that FEMA has determined to meet the design, data, and documentation requirements of 44 CFR 65.10; it therefore can be shown on a FIRM as reducing the base flood hazard. This determination is based on a submittal, by or on behalf of a community, which includes 44 CFR 65.10—compliant data and documentation, certified by a registered professional engineer. The area landward of an accredited levee system is shown on the FIRM as a moderate-hazard area, labeled Zone X (shaded), except for areas of interior drainage flooding such as ponding areas, which will be shown as high-hazard areas, called Special Flood Hazard Areas (SFHAs). Flood insurance is not mandatory in Zone X (shaded) areas, but it is mandatory in SFHAs. FEMA strongly encourages flood insurance for all structures in floodplains and especially in areas landward of levees.

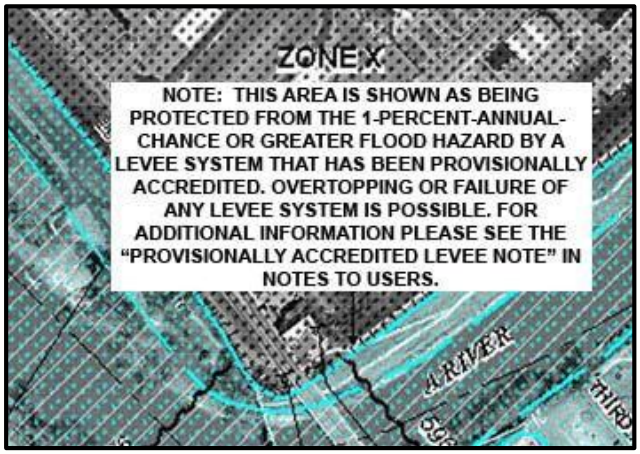


Figure 2. Provisionally Accredited Levee System

Provisionally Accredited Levee (PAL) System

The Provisionally Accredited Levee (PAL) designation may be used for a levee system that FEMA has previously accredited as providing base flood hazard reduction on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee system is compliant with 44 CFR 65.10. Before FEMA will apply the PAL designation to a levee system, the community or levee owner needs to sign and return an agreement indicating that the data and documentation required for compliance with 44 CFR 65.10 will be provided within a specified timeframe. Where PAL requirements are met, the impacted area landward of a PAL system on the updated FIRM is shown as a moderate-hazard area, labeled Zone X (shaded) and a PAL note is added. Therefore, flood insurance is not mandatory for

insurable structures in the area landward of a levee system with a PAL designation; however, flood insurance and other protective measures are strongly encouraged by FEMA. A community is eligible to receive a PAL designation for a levee system only once.

Levee System: Non-Accredited or De-accredited

If the levee system is not shown as providing base flood hazard reduction on an effective FIRM, the system is considered to be non-accredited and the levee-impacted area is mapped as Zone AE or Zone A on a FIRM following implementation of analysis and mapping procedures depending on approaches and type of study performed for the area. If the levee system was previously shown as providing base flood protection on an effective FIRM but does not meet PAL requirements, FEMA will perform analysis procedures to effectively remove accreditation or "de-accredit" the levee system and will re-map the affected area landward of the levee as an SFHA, labeled Zone AE or Zone A depending on the type of study performed. Flood insurance is required for insurable structures in SFHAs, if they have with federally backed mortgages.

Figure 3. Levee System: Non-Accredited or De-accredited

The checklist provided on the following pages is meant to assist local community officials and levee owners in gathering the 44 CFR 65.10—compliant data and documentation required for FEMA to recognize a levee system with 1-percent-annual-chance flood hazard reduction on the community's FIRM (accreditation). Where possible, text from the actual NFIP regulations (44 CFR 65.10) was used in the following table.

The checklist is set up according to the appropriate paragraph of 44 CFR 65.10. For example, Design Criteria can be found in Paragraph 65.10(b):

Design Criteria*	Section of the NFIP Regulations: 65.10(b)
	Description: For levee systems to be recognized (i.e., accredited) by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided.

Design Criteria	Section of the NFIP Regulations: 65.10(b)
Description: For levee systems to be accredited by FEMA, communities and/or levee owners must submit data and documentation to show that adequate design and operations and maintenance systems are in place to provide reasonable assurance that the levee has, and will continue to have, base flood risk reduction capability.	
Checklist for Design Criteria:	
☐	**Freeboard.** The minimum freeboard required is 3 feet above the Base Flood Elevation (BFE) all along the length of the levee, with an additional 1 foot within 100 feet of structures (such as bridges) or wherever the flow is restricted, and an additional 0.5 foot at the upstream end of a levee. Levees impacted by coastal flooding have special freeboard requirements (see Paragraphs 65.10(b)(1)(iii) and (iv)).
☐	**Closures.** All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.
☐	**Embankment Protection**. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.
☐	**Embankment and Foundation Stability Analyses.** Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided must evaluate expected seepage during loading conditions associated with the base flood and must demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (USACE) Engineer Manual 1110–2–1913, *Design and Construction of Levees*, (Chapter 6, Section II), may be used.
☐	**Settlement Analyses.** Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in USACE Engineer Manual 1110–1–1904, *Soil Mechanics Design— Settlement Analysis*, must be submitted.

☐	**Interior Drainage.** An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters, as described in USACE Engineer Manual 1110-2-1914, *Hydrologic Analysis of Interior Areas.*
Operation Plan	**Paragraph 65.10(c)(1) of the NFIP Regulations**
Description: For a levee system to be accredited, the operational criteria described below must be provided. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.	
Checklist for Operation Plan:	
☐	**Flood Warning System.** Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.
☐	**Plan of Operation**. A formal plan of operation including specific actions and assignments of responsibility by individual name or title.
☐	**Periodic Operation of Closures.** Provisions for periodic operation, at not less than 1-year intervals, of the closure structure for testing and training purposes.
Interior Drainage Plan	**Paragraph 65.10(c)(2) of the NFIP Regulations**
Description: Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood risk reduction purposes only if the following minimum criteria are included in the operation plan.	
Checklist for Interior Drainage Plan:	

☐	**Flood Warning System.** Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.
☐	**Plan of Operation.** A formal plan of operation including specific actions and assignments of responsibility by individual name or title.
☐	**Manual Backup.** Provision for manual backup for the activation of automatic systems.
☐	**Periodic Inspection.** Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than 1 year shall elapse between either the inspections or the operations.
Maintenance Plan	**Paragraph 65.10(d) of the NFIP Regulations**
Description: For levee systems to be recognized as accredited by FEMA, the maintenance criteria must be as described herein.	
Checklist for Maintenance Plan:	
☐	Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is sought or when the plan for a previously recognized system is revised in any manner.
☐	All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP which must assume ultimate responsibility for maintenance.
☐	This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, the plan shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.
Certification	**Paragraph 65.10(e) of the NFIP Regulations**

Description: Data submitted to support that a given levee system complies with the structural requirements set forth in "Design Criteria" (Paragraphs 65.10(b)(1) through (7) of the regulations) must be certified by a Registered Professional Engineer. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection from the base flood.

Checklist for Certification Requirement:	
☐	All data submitted is certified by a Professional Engineer or by a Federal agency**.**
☐	Certified as-built levee plans are included in the submittal.