



Levee Analysis and Mapping Plan

Champlain Canal & Wood Creek Levee

Town and Village of Whitehall

June 2019



FEMA

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Acronyms

BFE	Base Flood Elevation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
LLPT	Local Levee Partnership Team
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 Approach* – Levee Analysis and Mapping Procedures 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).

Leveed Area – All land areas that would be subject to inundation by the one percent annual chance flood if the levee system was not present.

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

Levee Segment - A discrete portion of a levee system that is operated and maintained by a single entity.

Levee System – A flood hazard-reduction system that consists of one or more levee segments and other features such as floodwalls and pump stations, which are interconnected and necessary to ensure exclusion of the design flood from the associated leveed area, and which are constructed and operated in accordance with sound engineering practices.

Local Levee Partnership Team (LLPT) – A work group that is 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 in the NFIP regulations at Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR § 65.10) and is not shown on a FIRM as reducing the base flood hazards.

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) report and Flood Insurance Rate Map (FIRM) for the Town and Village of Whitehall, Washington County, New York are to be revised to reasonably account for the hazard reduction impacts of a non-accredited levee system in the community. FEMA revised its approach in 2013 by incorporating a new Levee Analysis and Mapping Procedure process, allowing for a suite of analysis techniques to perform flood hazard identification and mapping (see Section 1). The Town and Village of Whitehall have a flood management project where the levee systems are being studied using the Levee Analysis and Mapping Procedures (see Section 2).

In September of 2018, FEMA Region II partnered with stakeholders in the Town and Village of Whitehall to form a collaborative Local Levee Partnership Team (LLPT) and worked to determine potential Levee Analysis and Mapping Procedures for the Town and Village of Whitehall levee system (see Sections 3, 4 and 5 respectively). The process involved the collection and evaluation of available data, development of initial analysis and mapping, and detailed discussions on mapping needs.

Based on the lack of development behind the levee system and, therefore, limited impact from inundation mapping, the Town and Village of Whitehall have elected the Natural Valley procedure (see Section 5).

This Levee Analysis and Mapping Plan summarizes the data collection and analysis process, discussions among the LLPT, and potential path forward on how best to map the flood hazards landward of the Town and Village of Whitehall levee system.

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 to reflect the scenario where the (1-percent-annual-chance) flood is not impeded by the levee embankment; in many cases, when reflecting the floodplain ground geometry in the hydraulic model, the high grounds associated with the levee are removed. This was known as the “without levee” approach.

Stakeholders expressed concern about the “without levee” approach. Members of Congress 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 the uncertainty associated with hazard identification of levee-impacted areas by providing additional options to better depict the flood hazard. Known as the Levee Analysis and Mapping Procedures for non-accredited levees, this process offers a more refined approach to mapping flood hazards in leveed areas.

The FEMA Region II levee team (FEMA levee team), its Production and Technical Services provider (STARR II), the Community Engagement and Risk Communication provider (CERC), the U.S. Army Corps of Engineers (USACE), the New York State Department of Environmental Conservation (NYSDEC), and the New York State Canal Corporation (NYSCanalCorp) are working with the Town and Village of Whitehall officials to identify flood hazards for non-accredited levees as they relate to the Champlain Canal and Wood Creek Levee system. Recent technological advances in data collection methods and hydrologic and hydraulic modeling were leveraged as part of this process. Levee Analysis and Mapping Procedures is a more refined approach to mapping flood hazards in areas landward of levee systems than the former approach.

The Levee Analysis and Mapping Procedures 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 levee system in the Town and Village of Whitehall is not currently accredited. FEMA is using the Levee Analysis and Mapping Procedures process to develop refined flood hazard mapping in areas landward of the levees. Updated regulatory flood hazard mapping is not anticipated in this community for a number of years, so this effort is intended to provide a more realistic representation of levee-related flood hazards in the Town and Village of Whitehall for community officials and emergency managers to use in development and preparedness planning.

The Levee Analysis and Mapping Procedures 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 risk reduction 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 LAMP Plan, if necessary. Draft maps prepared at this stage may be used as best available data for floodplain management.
- **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 as the regulatory basis for local floodplain management.

This report documents the progress through Phase 1. This effort is a result of the collaboration between FEMA, the Town and Village of Whitehall, Washington County, NYSDEC, NYSCanalCorp, USACE, and other local stakeholders.

2 Levee System Description

2.1 Flood Protection Measures in the Town and Village of Whitehall

The Champlain Canal & Wood Creek Levee System (see Figure 1) is a crucial part of the Whitehall flood damage reduction project. It was designed to reduce the flood risk from the Champlain Canal and Wood Creek in the Town and Village of Whitehall, specifically to EB Metals Inc., after overtopping and causing widespread damage. EB Metals Inc. used to be located within the levee protected area as shown in Figure 1. As of today, the facility does not exist and the levee protected area is a vacant lot.

The levee system was originally built in 1935. After the floods of 1974 and 1986 the levee was improved. Table 1 presents a summary of the Champlain Canal & Wood Creek Levee System flood control characteristics.

Table 1. Town and Village of Whitehall Flood Control Systems Data.

Owner	Non-USACE
Maintained by	Town and Village of Whitehall
Built	Locally Constructed (1935) and Operated
Flooding Source	Champlain Canal & Wood Creek
Length	0.71 miles (3,749 ft.)
Pump Stations	0
Closure Structures	0
NLD System ID	1205000258
USACE Division	North Atlantic
USACE District	New York
FEMA Region	2
County	Washington County, NY

A field visit confirmed that the levee system only includes levees on the banks of Champlain Canal and Woods Creek and there are no levees on the north and south side of the levee protected area. This levee configuration is incorrectly depicted in USACE's National Levee Database (NLD) which shows levees not only along the banks but also along both sides of Route 4 (Poultney St.) and railroad embankments (see Figure 2). FEMA will coordinate with USACE to update the NLD accordingly.

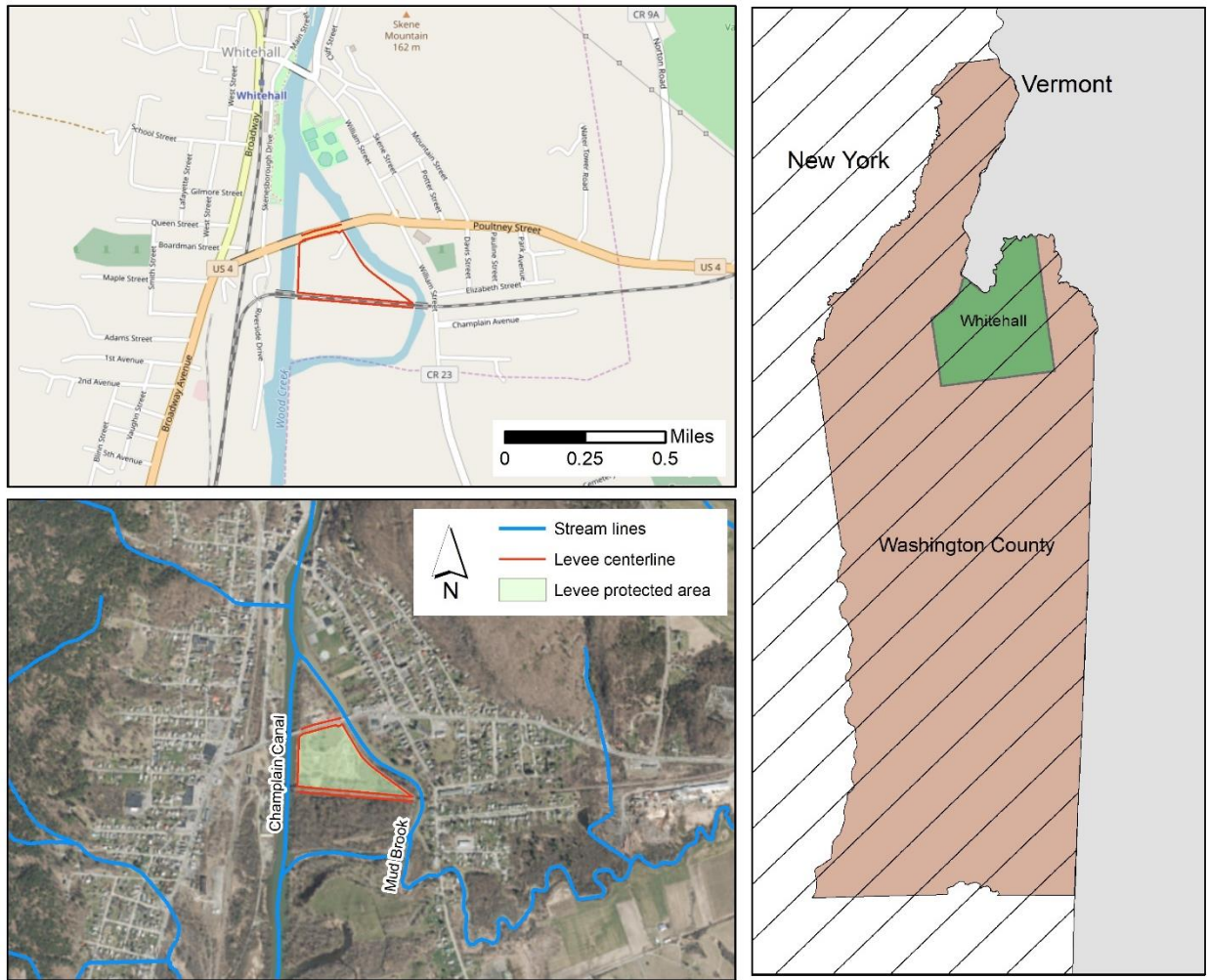


Figure 1: General Location Map (using NLD data to depict levee line)



Figure 2: Correct levee centerline

2.2 Levee Analysis and Mapping Procedures Flood Risk Project

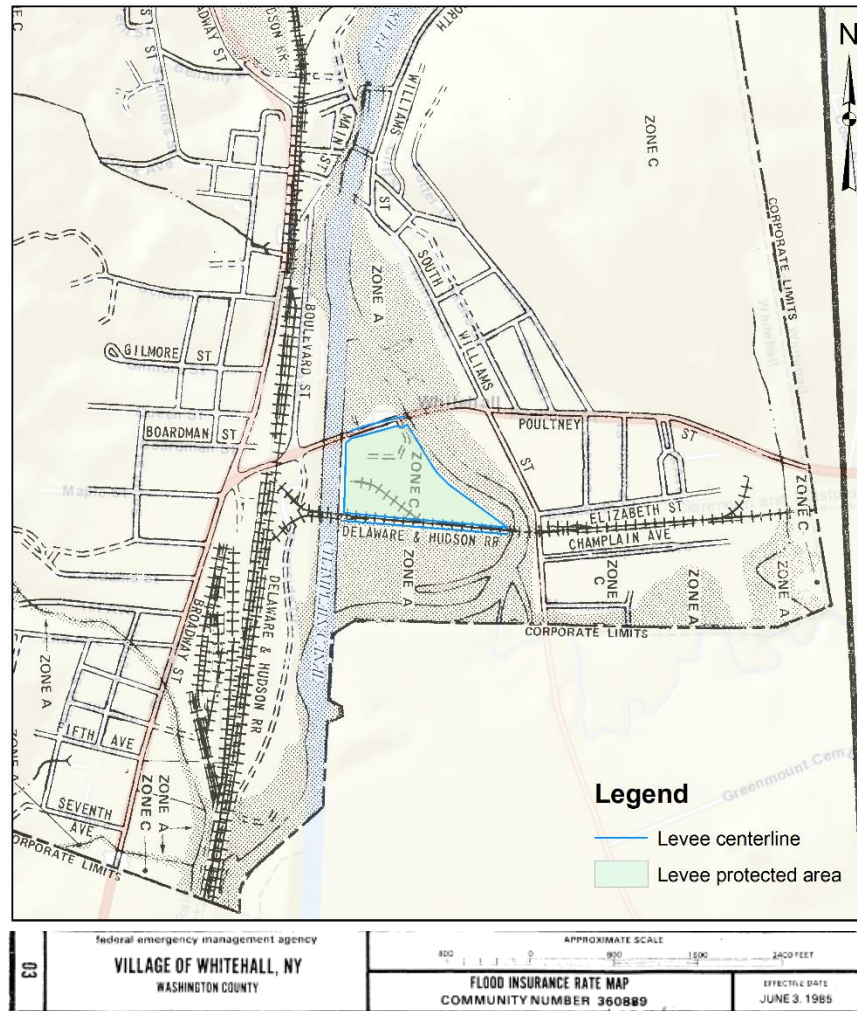
Table 2 and Table 3 summarize the communities' NFIP and FIRM history.

Table 2. Summary of Communities in Project Area

County	Community	Participating in the NFIP?	Approximate Number of Structures Impacted by Levee Systems
Washington County	Whitehall Village	Yes	0

Table 3. Community Map History

Community Name	Initial Identification	Flood Hazard Boundary Map Revision Date(s)	FIRM Effective Date	FIRM Revision Date(s)
Whitehall Village	May 3, 1974	June 25, 1976	June 3, 1985	-



**Figure 3: FIRM Map for the Village of Whitehall, NY
(Modified for the purpose of this report)**

Currently, the levee is shown on the 1985 Flood Insurance Rate Map (FIRM) (see Figure 3) as reducing flood risk (providing protection) on the land side of the levee system. However, currently FEMA does not have any data to show that the levee continues to meet the minimum FEMA requirements to provide such protection.

The NLD currently depicts the levee system with an outdated accreditation. At the time of the effective mapping development, FEMA did not heavily scrutinize levee system characteristics with regard to flood risk. However, FEMA does not have certified engineering data to show that the levee system meets the minimum requirements of Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR 65.10) to be recognized on the FIRM as reducing the flood hazards posed by a 1-percent-annual-chance or greater flood. Therefore, this system is considered non-accredited.

3 Local Levee Partnership Team

Based on the community meeting LLPT #1 held on September 25, 2018 in Whitehall, NY, several stakeholders were identified as members of the LLPT (See Table 4). 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 4.

Table 4. Local Levee Partnership Team Participants

LLPT Member	Contact Information
John Rozell	Supervisor - Town of Whitehall (518) 499-1535; townofwhitehall@live.com
Teresa Austin	Deputy Mayor - Village of Whitehall (518) 538-4481; teresaastin47@hotmail.com
Louis Pratt	Highway Superintendent - Town of Whitehall (518) 499-1535; highwayii@live.com
Glen Gosnell	Director - Washington County Department of Public Safety (518) 747-7520; publicsafety@co.washington.ny.us
Tim Hardy	Washington County Department of Public Safety thardy@co.washington.ny.us
Corinna Aldrich	District Manager - Washington County Soil and Water Conservation District (518) 692-9940; corrina.aldrich@ny.nacdnet.net
Laura Chadwick	Washington County Real Property Tax Services (518) 746-2130; lchadwick@co.washington.ny.us
Pamela Landi	Washington County Planning (518) 746-2290; plandi@co.washington.ny.us
Arvind Goswami	NYS Department of Environmental Conservation (518) 402-8186; arvind.goswami@dec.ny.gov
Brad Wenskoski	NYS Department of Environmental Conservation (518) 402-8280; brad.wenskoski@dec.ny.gov
Thomas Mcdonald	NYS Canal Corporation (518) 237-6373; thomas.mcdonald@canals.ny.gov
Shudipto (Shu) Rahman	FEMA Region II Project Monitor – Regional Engineer (202) 702-4273; shudipto.rahman@fema.dhs.gov
Srikanth Koka	Project Manager – STARR II (703) 849-0584; skoka@dewberry.com
Matt Kroneberger	CERC - Outreach support (212) 237-6373; matt.kroneberger@ogilvy.com

4 Stakeholder Engagement

4.1 Stakeholder Engagement Meeting #1 (General Meeting, LLPT 1)

A FEMA-led project team engaged with the Whitehall community, levee owners/operators, and other stakeholders during the LLPT Meeting #1 (LLPT 1.0) on September 25, 2018 in Whitehall, NY. The overall intent of the meeting was to establish contact, explain the Levee Analysis and Mapping Procedures process, and discuss the application of the Levee Analysis and Mapping Procedures to the levee systems in Washington County.

At the initial LLPT 1.0 meeting, representatives from FEMA provided an overview to the invited Levee Analysis and Mapping Procedures communities, answered questions concerning FEMA products, terminology, and procedures, and provided a timeline for the Levee Analysis and Mapping Procedures projects. FEMA explained in detail the five procedures outlined in the Levee Analysis and Mapping Procedures Final Approach Document and the major distinctions of Levee Analysis and Mapping Procedures in comparison with earlier levee analyses. FEMA and their contractor led a discussion about the applicability of each procedure to the levees.

As mentioned, based on discussions and provided documentation, the levee system was privately built in 1935. According to records, the construction permit was issued to the Champlain Spinners, Inc. of Whitehall. Currently, the levee system is operated and maintained by the Town of Whitehall; maintenance is not done periodically. However the lack of development landward of the levee systems means there is little impact here. If future development were to be considered, environmental remediation would need to be taken into consideration.

Representatives from NYSDEC believe that the levee system is under local ownership, and that attempts have been made to inspect the levee system, though no inspection has been performed. Following the presentation, questions and follow-up items were discussed. (See Appendix A for the LLPT 1.0 presentation and Appendix B for minutes)

5 Natural Valley Procedure

FEMA developed a First Pass Analysis (refer to Figure 4), which is an approximate analysis to estimate the floodplain boundary for each relevant Levee Analysis and Mapping Procedures approach. The Natural Valley Procedure which is the method of choice to analyze this particular levee system, allows flow to be conveyed on both sides of a non-accredited levee.

5.1 Natural Valley Letter

During the Whitehall LLPT1 meeting held on September 25, 2018, and subsequent discussions between the Whitehall community and FEMA, it was decided that the levee analysis procedure will be based on the Natural Valley approach. A letter of acceptance was sent to the community on January 17, 2019. The letter of acceptance for use of the Natural Valley Levee Analysis and Mapping Procedure can be found in Appendix C.



Figure 4: First Pass Analysis

6 Path Forward

6.1 Levee Analysis and Mapping Procedures

The Champlain Canal & Wood Creek Levee System is shown as reducing flood hazard on the effective FIRM. As no data in support of the 44CFR§65.10 requirements has been received by FEMA in support of the levee project, the levee systems would be considered non-accredited in a future remapping effort.

FEMA engaged the Town and Village of Whitehall through the Levee Analysis and Mapping Procedures for non-accredited levees process to help identify potential options to evaluate the flood hazard for the levee impacted areas. So far there has been no indication that the community is considering levee certification and accreditation, due to the lack of development in this area and, therefore, lack of impact.

FEMA is currently in the process of updating the flood hazard mapping for levee as part of the ongoing countywide study. It is recommended that the community coordinate with FEMA Region II in advance of any anticipated changes to development to keep the Region apprised of the levee status. FEMA's Levee Accreditation Checklist has been included in Appendix D for reference.

7 References

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