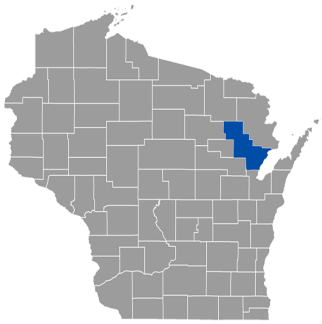
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 3



OCONTO COUNTY, WISCONSIN

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
GILLETT, CITY OF	550295
LENA, VILLAGE OF	550296
OCONTO, CITY OF	550297
OCONTO COUNTY, UNINCORPORATED AREAS	550294
OCONTO FALLS, CITY OF	550298
PULASKI, VILLAGE OF	550024
SURING, VILLAGE OF	550300

FEMA

REVISED:

March 21, 2023

FLOOD INSURANCE STUDY NUMBER
55083CV001B
Version Number 2.4.3.5

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FLOOD INSURANCE STUDY REPORT
OCONTO COUNTY, WISCONSIN

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal

Government. Congress also recognized that most of these floodprone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community’s regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Oconto County, Wisconsin.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC-8) sub-basins affecting each, are shown in Table 1. The FIRM panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

The location of flood hazard data for participating communities in multiple jurisdictions is also indicated in the table.

Jurisdictions that have no identified SFHAs as of the effective date of this study are indicated in the table. Changed conditions in these communities (such as urbanization or annexation) or the availability of new scientific or technical data about flood hazards could make it necessary to determine SFHAs in these jurisdictions in the future.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Gillett, City of	550295	04030104	55083C0539D, 55083C0543D	
Lena, Village of	550296	04030104	55083C0583D	
Oconto, City of	550297	04030104, 04030105, 04060200	55083C0616D[1], 55083C0617D, 55083C0618D, 55083C0619D, 55083C0636E, 55083C0638E, 55083C0639E	
Oconto County, Unincorporated Areas	550294	04030103, 04030104, 04030105	55083C0025D[1], 55083C0040D, 55083C0045D, 55083C0075D[1], 55083C0100D[1], 55083C0110D, 55083C0120D, 55083C0128D, 55083C0129D, 55083C0130D, 55083C0135D, 55083C0137D, 55083C0140D, 55083C0141D, 55083C0142D, 55083C0145D, 55083C0151D, 55083C0152D, 55083C0153D, 55083C0154D, 55083C0158D, 55083C0160D, 55083C0161D, 55083C0165D, 55083C0170D, 55083C0188D, 55083C0190D, 55083C0195D, 55083C0200D[1], 55083C0220D, 55083C0225D[1], 55083C0230D, 55083C0234D, 55083C0235D, 55083C0240D, 55083C0242D, 55083C0245D, 55083C0251D, 55083C0252D, 55083C0253D, 55083C0254D[1], 55083C0257D, 55083C0260D, 55083C0261D, 55083C0262D, 55083C0263D, 55083C0264D, 55083C0268D, 55083C0269D, 55083C0270D, 55083C0276D, 55083C0278D, 55083C0280D[1], 55083C0285D[1], 55083C0290D[1], 55083C0295D, 55083C0305D, 55083C0315D, 55083C0325D[1], 55083C0350D[1], 55083C0355D, 55083C0375D[1], 55083C0377D, 55083C0380D, 55083C0381D, 55083C0382D, 55083C0383D[1], 55083C0384D, 55083C0390D, 55083C0391D[1], 55083C0392D, 55083C0393D, 55083C0394D, 55083C0403D, 55083C0405D, 55083C0409D, 55083C0410D, 55083C0411D, 55083C0413D, 55083C0415D, 55083C0420D, 55083C0430D, 55083C0435D, 55083C0436D, 55083C0438D, 55083C0440D, 55083C0445D, 55083C0455D, 55083C0465D, 55083C0470D, 55083C0500D[1], 55083C0502D, 55083C0505D, 55083C0506D, 55083C0507D, 55083C0510D,	

[1] Panel Not Printed

Table 1: Listing of NFIP Jurisdictions (*continued)*

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Oconto County, Unincorporated Areas *(continued)*	550294	04030103, 04030104, 04030105	55083C0515D, 55083C0516D, 55083C0517D, 55083C0518D, 55083C0519D, 55083C0530D, 55083C0535D, 55083C0539D, 55083C0540D, 55083C0543D, 55083C0544D, 55083C0545D$_1$, 55083C0555D, 55083C0560D, 55083C0563D, 55083C0564D, 55083C0565D$_1$, 55083C0568D, 55083C0569D, 55083C0570D, 55083C0579D, 55083C0580D, 55083C0583D, 55083C0585D, 55083C0590D, 55083C0595D, 55083C0605D, 55083C0610D, 55083C0614D, 55083C0615D, 55083C0616D$_1$, 55083C0617D, 55083C0618D, 55083C0619D, 55083C0628E, 55083C0629E, 55083C0630D, 55083C0631E[1], 55083C0632E, 55083C0633E, 55083C0634E, 55083C0636E, 55083C0637E, 55083C0638E, 55083C0639E, 55083C0657D, 55083C0660D, 55083C0675D$_1$, 55083C0676D, 55083C0677D, 55083C0681D, 55083C0682D, 55083C0685D$_1$, 55083C0694D, 55083C0695D$_1$, 55083C0705D, 55083C0706D, 55083C0707D, 55083C0710D, 55083C0713D, 55083C0714D, 55083C0715D$_1$, 55083C0716D, 55083C0717D, 55083C0718D, 55083C0719D, 55083C0726D, 55083C0727D, 55083C0730D, 55083C0731D, 55083C0732D, 55083C0733D, 55083C0734D, 55083C0736D, 55083C0737D, 55083C0738D, 55083C0739D, 55083C0741D, 55083C0742D, 55083C0743D, 55083C0744D, 55083C0751D, 55083C0752D, 55083C0753D, 55083C0754D, 55083C0756D, 55083C0757E, 55083C0758E, 55083C0759E, 55083C0761D, 55083C0762D, 55083C0763D, 55083C0764E, 55083C0766E, 55083C0768E, 55083C0776E, 55083C0777E, 55083C0778E, 55083C0801D, 55083C0805D$_1$, 55083C0806D$_1$, 55083C0807D, 55083C0808D, 55083C0809D, 55083C0811D, 55083C0812D, 55083C0816D, 55083C0820D$_1$, 55083C0828D, 55083C0829D, 55083C0830D$_1$, 55083C0831D, 55083C0832D, 55083C0833D, 55083C0834E, 55083C0840D$_1$, 55083C0842E, 55083C0845D$_1$, 55083C0851E, 55083C0852E, 55083C0853E, 55083C0861E	
Oconto Falls, City of	550298	04030104	55083C0568D, 55083C0569D, 55083C0706D, 55083C0707D	

[1] Panel Not Printed

Table 1: Listing of NFIP Jurisdictions (*continued)*

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Pulaski, Village of	550024	04030103	55083C0811D, 55083C0812D	
Suring, Village of	550300	04030104	55083C0394D, 55083C0413D, 55083C0507D, 55083C0530D	

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1-percent annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1-percent annual chance and 0.2-percent annual chance floodplains; and 1-percent annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

  It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 30, "Map Repositories," within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

  The initial Countywide FIS Report for Oconto County became effective on October 6, 2010. Refer to Table 27 for information about subsequent revisions to the FIRMs.

- Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map (FBFM) panels. In addition, former flood hazard zone designations have been changed as follows:

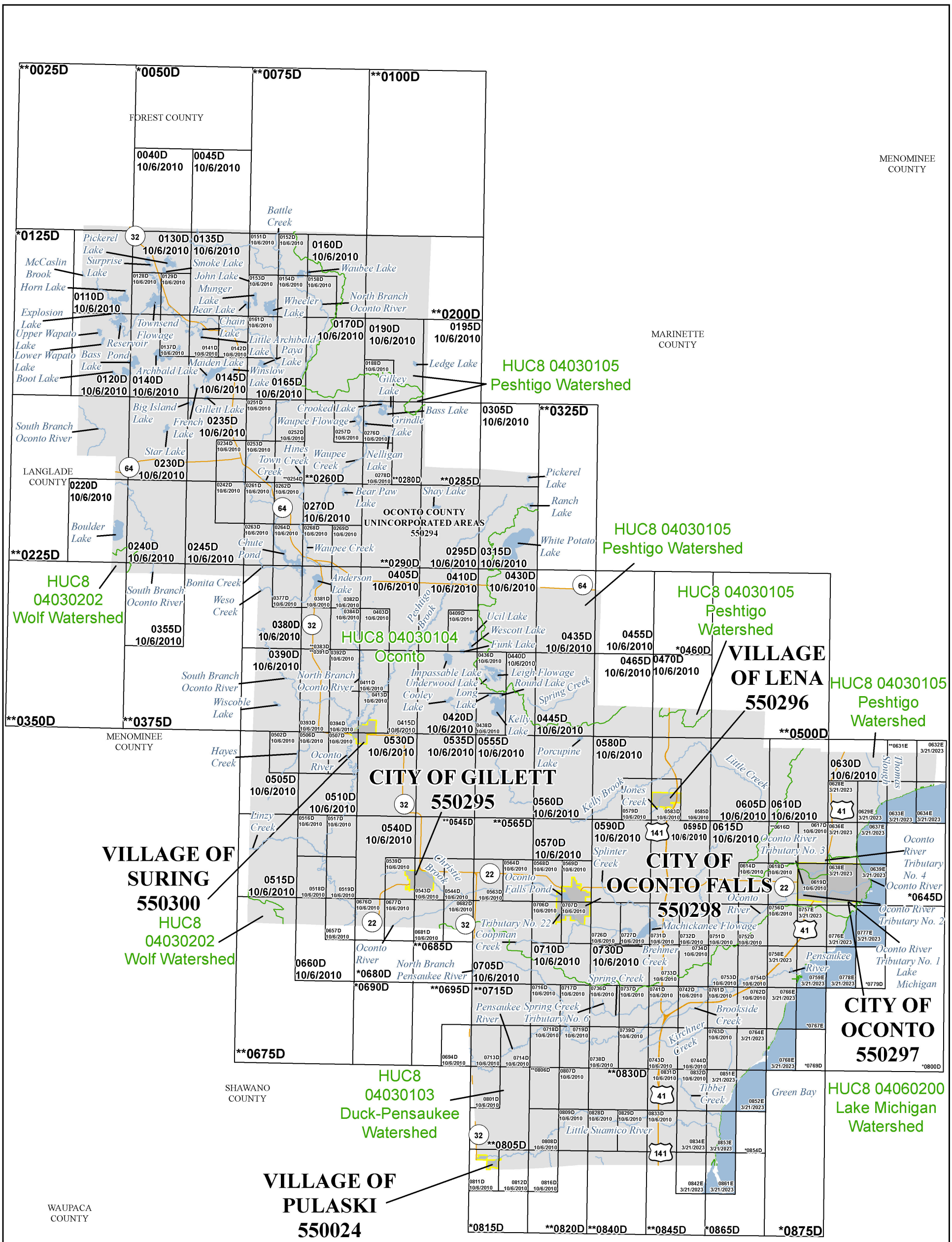
Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at www.fema.gov/national-flood-insurance-program-community-rating-system or contact your appropriate FEMA Regional Office for more information about this program.

- FEMA has developed a Guide to Flood Maps (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at https://www.fema.gov/online-tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Oconto County, and also displays the panel number and effective date for each FIRM panel in the county. Other information shown on the FIRM Index includes community boundaries, flooding sources, watershed boundaries, and USGS HUC-8 codes.

Figure 1: FIRM Index



ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before March 21, 2023.

1 inch = 26,000 feet 1:312,000

Miles 0 1.25 2.5 5 7.5 10

Map Projection:
Universal Transverse Mercator Zone 16 North;
North American Datum 1983

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY
** PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

OCONTO COUNTY, WISCONSIN and Incorporated Areas

PANELS PRINTED:

0040, 0045, 0110, 0120, 0128, 0129, 0130, 0135, 0137, 0140, 0141, 0142, 0145, 0151, 0152, 0153, 0154, 0158, 0160, 0161, 0165, 0170, 0188, 0190, 0195, 0220, 0230, 0234, 0235, 0240, 0242, 0245, 0251, 0252, 0253, 0257, 0261, 0262, 0263, 0264, 0268, 0269, 0270, 0276, 0278, 0295, 0305, 0315, 0355, 0377, 0380, 0381, 0382, 0384, 0390, 0392, 0393, 0394, 0403, 0405, 0409, 0410, 0411, 0413, 0415, 0420, 0430, 0435, 0436, 0438, 0440, 0445, 0455, 0465, 0470, 0502, 0505, 0506, 0507, 0510, 0515, 0516, 0517, 0518, 0519, 0530, 0535, 0539, 0540, 0543, 0544, 0555, 0560, 0563, 0564, 0568, 0569, 0570, 0579, 0580, 0583, 0585, 0590, 0595, 0605, 0610, 0614, 0615, 0617, 0618, 0619, 0628, 0629, 0630, 0632, 0633, 0634, 0636, 0637, 0638, 0639, 0657, 0660, 0676, 0677, 0681, 0682, 0694, 0705, 0706, 0707, 0710, 0713, 0714, 0716, 0717, 0718, 0719, 0726, 0727, 0730, 0731, 0732, 0733, 0734, 0736, 0737, 0738, 0739, 0741, 0742, 0743, 0744, 0751, 0752, 0753, 0754, 0756, 0757, 0758, 0759, 0761, 0762, 0763, 0764, 0766, 0768, 0776, 0777, 0778, 0801, 0807, 0808, 0809, 0811, 0812, 0816, 0828, 0829, 0831, 0832, 0833, 0834, 0842, 0851, 0852, 0853, 0861

FEMA

MAP NUMBER
55083CIND0B

MAP REVISED
MARCH 21, 2023

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1- 877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Mapping and Insurance eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 27 in this FIS Report.

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

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

Coastal Base Flood Elevations shown on the map apply only landward of the zero elevation referenced to Low Water Datum of Lake Michigan, administratively established by the National Oceanic and Atmospheric Administration at 176.0 meters (577.5 feet) above zero point International Great Lakes Datum of 1985. This lake-wide elevation is approximately equal to an elevation of 577.6 feet North American Vertical Datum of 1988 (NAVD88). Coastal flood elevations are also provided in the Coastal Transect Parameters table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Coastal Transect Parameters table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on the FIRM.

Figure 2. FIRM Notes to Users *continued)*

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator (UTM) Zone 16. The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 30 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by various sources. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Oconto County, Wisconsin, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 27 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Oconto County, Wisconsin, effective date March 21, 2023.

LIMIT OF MODERATE WAVE ACTION: Zone AE areas subject to overland wave propagation (refer to Table 25 for applicable transects) have been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between Zone VE and the LiMWA (or between the shoreline and the LiMWA for areas where Zone VE is not identified) will be similar to, but less severe than, those in Zone VE.

Figure 2. FIRM Notes to Users *continued)*

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Oconto County.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: *The 1-percent-annual-chance flood, also known as the base flood or 100-year flood, has a 1-percent chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1-percent-annual-chance flood. The Base Flood Elevation is the water surface elevation of the 1-percent-annual-chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a*

	Special Flood Hazard Areas subject to inundation by the 1-percent-annual-chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains. No base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1-percent-annual-chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1-percent-annual-chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1-percent-annual-chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

Figure 3: Map Legend for FIRM (*continued*)

OTHER AREAS OF FLOOD HAZARD

Shaded Zone X: Areas of 0.2-percent-annual-chance flood hazards and areas of 1-percent-annual-chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.

Future Conditions 1-Percent-Annual-Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.

Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1-percent-annual-chance flood. See Notes to Users for important information.

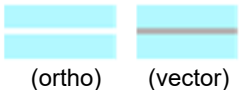
Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than the 1-percent-annual-chance flood.

OTHER AREAS

Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Unshaded Zone X: Areas of minimal flood hazard.

FLOOD HAZARD AND OTHER BOUNDARY LINES



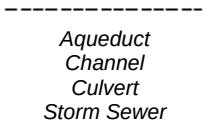
Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)

Limit of Study

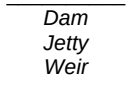
Jurisdiction Boundary

Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

GENERAL STRUCTURES



Channel, Culvert, Aqueduct, or Storm Sewer



Dam, Jetty, Weir

Figure 3: Map Legend for FIRM (*continued*)

	Levee, Dike, or Floodwall
Bridge	Bridge
REFERENCE MARKERS	
22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
513	Base Flood Elevation Line
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity
BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway

Figure 3: Map Legend for FIRM (*continued)*

234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16’ 52.5”	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Oconto County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1-percent-annual-chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent-annual-chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1-percent and 0.2-percent-annual-chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1-percent-annual-chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Oconto County, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 12. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1-percent-annual-chance floodplain corresponds to the SFHAs. The 0.2-percent-annual-chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Anderson Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.3	N	AE	2009
Archibald Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Bagley Creek	Oconto County, Unincorporated Areas	At confluence with Peshtigo Brook	At outlet of Impassable Lake	04030104			N	A	2009
Barney Spring	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Bass Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.2	N	AE	2009
Bear Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Bear Paw Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Big Island Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Boot Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.4	N	A	2009
Boulder Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.6	N	A	2009
Bowman Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Brehmer Creek	Oconto County, Unincorporated Areas	At confluence with Oconto River	At upstream limit of approximate study	04030104			N	A	2009
Brehmer Creek Tributary No. 2	Oconto County, Unincorporated Areas	At confluence with Brehmer Creek	At upstream limit of approximate study	04030104			N	A	2009
Brookside Creek	Oconto County, Unincorporated Areas	At confluence with Pensaukee River	Approximately 310 feet upstream of Cross Road	04030103	6.2		Y	AE	2009
Brooks Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Camp Five Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Chain Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Christie Brook	Gillett, City of; Oconto County, Unincorporated Areas	At confluence with Oconto River	Approximately 130 feet upstream of Chicago and Northwestern Railroad Bridge	04030104	5.6		Y	AE	2009
	Oconto County, Unincorporated Areas	Approximately 130 feet upstream of Chicago and Northwestern Railroad Bridge	At outlet of Christie Lake	04030104			N	A	2009
Christie Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
City of Oconto Tributary No. 1	Oconto, City of; Oconto County, Unincorporated Areas	At confluence with Lake Michigan	At upstream limit of detailed study	04030104	1.6		N	AE	1979
City of Oconto Tributary No. 4	Oconto, City of; Oconto County, Unincorporated Areas	Approximately 275 feet downstream of County Highway S	At Van Hecke Avenue	04030104	1.9		N	AE	2009
City of Oconto Tributary No. 4A	Oconto, City of	At confluence with City of Oconto Tributary No. 4	At Van Hecke Avenue	04030104	0.4		N	AE	2009
Chute Pond	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	AE	*
Cooley Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Coopman Creek	Oconto County, Unincorporated Areas	At confluence with Oconto River	At upstream limit of approximate study	04030104			N	A	2009
Crooked Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	AE	2009

*No data available

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Daly Creek	Oconto County, Unincorporated Areas	At confluence with Kelly Brook	At upstream limit of approximate study	04030104			N	A	2009
Daly Creek Tributary No. 1	Oconto County, Unincorporated Areas	At confluence with Daly Creek	At upstream limit of approximate study	04030104			N	A	2009
Daly Creek Tributary No. 7	Oconto County, Unincorporated Areas	At confluence with Daly Creek	At upstream limit of approximate study	04030104			N	A	2009
Daly Creek Tributary No. 8	Oconto County, Unincorporated Areas	At confluence with Daly Creek	At upstream limit of approximate study	04030104			N	A	2009
Deer Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Explosion Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Forbes Creek	Oconto County, Unincorporated Areas	At convergence with Hay Creek	At upstream limit of approximate study	04030105			N	A	2009
French Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Funk Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Gilkey Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	AE	2009
Gillett Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Glocke Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Grignon Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Grindle Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Hay Creek	Oconto County, Unincorporated Areas	At convergence with Forbes Creek	At upstream limit of approximate study	04030105			N	A	2009
Hay Creek Tributary No. 1	Oconto County, Unincorporated Areas	At confluence with Hay Creek	At upstream limit of approximate study	04030104			N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Hayes Creek	Oconto County, Unincorporated Areas	At confluence with Pecore Creek	Approximately 70 feet upstream of Hayes Road	04030104			N	A	2009
		Approximately 70 feet upstream of Hayes Road	Approximately 3.8 miles upstream of Hayes Road	04030104	3.8		Y	AE	2009
Hoerth Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Horn Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Impassable Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Jocko Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030105			N	A	2009
John Lake Tributary	Oconto County, Unincorporated Areas	At outlet to John Lake	At upstream limit of approximate study	04030104			N	A	2009
Jones Creek	Oconto County, Unincorporated Areas	At confluence with Little River	Approximately 0.8 mile downstream of North Rosera Street	04030104			N	A	2009
	Lena, Village of; Oconto County, Unincorporated Areas	Approximately 0.8 mile downstream of North Rosera Street	Approximately 0.8 mile upstream of Harley Street	04030104	2.3		Y	AE	2009
Jones Creek Tributary No. 1	Oconto County, Unincorporated Areas	At confluence with Jones Creek	At upstream limit of approximate study	04030104			N	A	2009
Jones Creek Tributary No. 2	Oconto County, Unincorporated Areas	At confluence with Jones Creek	At upstream limit of approximate study	04030104			N	A	2009
Kelly Brook	Oconto County, Unincorporated Areas	At convergence with North Branch Little River	At upstream limit of approximate study	04030104			N	A	2009
Kelly Brook Tributary No. 12	Oconto County, Unincorporated Areas	At confluence with Kelly Brook	At upstream limit of approximate study	04030104			N	A	2009
Kelly Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Kelly Lake Tributary	Oconto County, Unincorporated Areas	At outlet to Kelly Lake	At upstream limit of approximate study	04030104			N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Kirchner Creek	Oconto County, Unincorporated Areas	At outlet to Lake Michigan	Approximately 225 feet downstream of Sampson Road	04030103	1.9		N	A	2009
		Approximately 225 feet downstream of Sampson Road	Approximately 1.5 miles upstream of Oak Orchard Road	04030103	4.2		Y	AE	2009
Lake John	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.2	N	A	2009
Lake John Tributary	Oconto County, Unincorporated Areas	At outlet to Lake John	At upstream limit of approximate study	04030104			N	A	2009
Lake Michigan/Green Bay	Oconto, City of; Oconto County, Unincorporated Areas	Entire shoreline within Oconto County	Entire shoreline within Oconto County	04060200	25.2		N	AE	2017
Lake Michigan Tributary No. 5	Oconto County, Unincorporated Areas	At outlet to Lake Michigan	At upstream limit of approximate study	04030104			N	A	2009
Lauder Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Ledge Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030105			N	A	2009
Ledge Lake Tributary	Oconto County, Unincorporated Areas	At inlet to Ledge Lake	At outlet from Cedar Lake	04030105			N	A	2009
Leigh Flowage	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030105			N	A	2009
Linzy Creek	Oconto County, Unincorporated Areas	At confluence with Oconto River	At Menominee County/Oconto County Boundary	04030104			N	A	2009
Little Archbald Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Little Gillett Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Little Horn Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Little Pickerel Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Little River	Oconto County, Unincorporated Areas	At confluence with Oconto River	At convergence of Kelly Brook and North Branch Little River	04030104			N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Little River Tributary No. 2	Oconto County, Unincorporated Areas	At confluence with Little River	At upstream limit of approximate study	04030104			N	A	2009
Little River Tributary No. 4	Oconto County, Unincorporated Areas	At confluence with Little River	At upstream limit of approximate study	04030104			N	A	2009
Little River Tributary No. 15	Oconto County, Unincorporated Areas	At confluence with Little River	At upstream limit of approximate study	04030104			N	A	2009
Little River Tributary No. 18	Oconto County, Unincorporated Areas	At confluence with Little River	At upstream limit of approximate study	04030104			N	A	2009
Little Squaw Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Little Suamico River	Oconto County, Unincorporated Areas; Pulaski, Village of	At outlet to Lake Michigan	At the Oconto County/ Shawano County Boundary	04030103	19.2		Y	AE	2009
Little Wapato Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Long Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Lower Island Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Lower Wapato Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Maiden Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Makholm Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
McCaslin Brook	Oconto County, Unincorporated Areas	At confluence with North Branch Oconto River	Approximately 0.6 miles downstream of Sheridan Dam	04030104	3.7		N	A	2009
		Approximately 0.6 mile downstream of Sheridan Dam	At Wheeler Dam (Townsend Flowage)	04030104	9.9		Y	AE	2009
		At headwaters of Townsend Flowage	At Langlade County/Oconto County Boundary	04030104			N	A	2009
McCaslin Brook Tributary No. 3	Oconto County, Unincorporated Areas	At confluence with McCaslin Brook	At upstream limit of approximate study	04030104			N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
McCaslin Brook Tributary No. 3.1	Oconto County, Unincorporated Areas	At confluence with McCaslin Brook Tributary No. 3	At upstream limit of approximate study	04030104			N	A	2009
McCaslin Brook Tributary No. 6	Oconto County, Unincorporated Areas	At confluence with McCaslin Brook	At upstream limit of approximate study	04030104			N	A	2009
McCaslin Brook Tributary No. 6.2	Oconto County, Unincorporated Areas	At confluence with McCaslin Brook Tributary No. 6	At upstream limit of approximate study	04030104			N	A	2009
McCaslin Brook Tributary No. 7	Oconto County, Unincorporated Areas	At confluence with McCaslin Brook	At upstream limit of approximate study	04030104			N	A	2009
McCaslin Brook Tributary No. 7.2	Oconto County, Unincorporated Areas	At confluence with McCaslin Brook Tributary No. 7	At upstream limit of approximate study	04030104			N	A	2009
McComb Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
McComb Lake Tributary	Oconto County, Unincorporated Areas	At inlet to McComb Lake	At upstream limit of approximate study	04030104			N	A	2009
McDonald Creek	Oconto County, Unincorporated Areas	At Marinette County/Oconto County Boundary	At upstream limit of approximate study	04030105			N	A	2009
Messenger Creek	Oconto County, Unincorporated Areas	At Marinette County/Oconto County Boundary	At Jocko Lake Outlet	04030105			N	A	2009
Munger Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.2	N	A	2009
Munger Lake Tributary	Oconto County, Unincorporated Areas	At inlet to Munger Lake	At upstream limit of approximate study	04030104			N	A	2009
Nelligan Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
North Branch Little River	Oconto County, Unincorporated Areas	At convergence with Kelly Brook	At upstream limit of approximate study	04030104			N	A	2009
North Branch Little River Tributary No. 6	Oconto County, Unincorporated Areas	At confluence with North Branch Little River	At upstream limit of approximate study	04030104			N	A	2009
North Branch Oconto River	Oconto County, Unincorporated Areas	At convergence with South Branch Oconto River	At Chute Pond Dam	04030104	18.4		Y	AE	2009

***** No data available

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
North Branch Oconto River *(continued)*	Oconto County, Unincorporated Areas	At headwaters of Chute Pond	At Marinette County/Oconto County Boundary	04030104	22.2		Y	AE	2009
North Branch Pensaukee River	Oconto County, Unincorporated Areas	At confluence with Pensaukee River	At Oconto County/Shawano County Boundary	04030103			N	A	2009
Oconto River	Oconto, City of	At outlet to Lake Michigan	Approximately 0.1 mile downstream of County Highway S (Collins Avenue)	04030104			N	AE	1979
		Approximately 0.1 mile downstream of County Highway S (Collins Avenue)	Approximately 0.7 mile upstream of Brazeau Avenue	04030104			Y	AE	1979
		Approximately 0.7 mile upstream of Brazeau Avenue	Approximately 0.1 mile downstream of confluence of Oconto River Tributary No. 2	04030104	0.3		Y	AE	1999
		Approximately 0.1 mile downstream of confluence of Oconto River Tributary No. 2	At confluence of Oconto River Tributary No. 2	04030104	0.1		Y	AE	1979
	Oconto, City of; Oconto County, Unincorporated Areas	At confluence of Oconto River Tributary No. 2	Approximately 0.4 mile downstream of County Highway J	04030104			Y	AE	2009
	Oconto County, Unincorporated Areas	Approximately 0.4 mile downstream of County Highway J	At downstream City of Oconto Falls Boundary	04030104			Y	AE	1979
	Oconto Falls, City of	At downstream City of Oconto Falls Boundary	At upstream City of Oconto Falls corporate limits	04030104			Y	AE	1979
	Oconto County, Unincorporated Areas	At upstream City of Oconto Falls corporate limits	At Oconto County/Shawano County Downstream Boundary	04030104			Y	AE	1979

***** No data available

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Oconto River *(continued)*	Suring, City of; Oconto County, Unincorporated Areas	At Oconto County/Shawano County Upstream Boundary	At convergence of North Branch Oconto River and South Branch Oconto River	04030104			Y	AE	1979
Oconto River Tributary No. 2	Oconto, City of	At confluence with Oconto River	Approximately 0.6 mile upstream of confluence with Oconto River	04030104	0.6		Y	AE	2009
Oconto River Tributary No. 3	Oconto, City of	At confluence with Oconto River	Approximately 0.1 mile upstream of McDonald Street	04030104	0.2		Y	AE	1979
Oconto River Tributary No. 12	Oconto County, Unincorporated Areas	At confluence with Oconto River	At upstream limit of approximate study	04030104			N	A	2009
Oconto River Tributary No. 14	Oconto County, Unincorporated Areas	At confluence with Oconto River	At upstream limit of approximate study	04030104			N	A	2009
Oconto River Tributary No. 22	Oconto County, Unincorporated Areas; Oconto Falls, City of	At confluence with Oconto River	Approximately 0.5 mile upstream of South Flatley Street	04030104	1.2		Y	AE	2009
Paya Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Pecore Creek	Oconto County, Unincorporated Areas	At confluence with South Branch Oconto River	At Menominee County/Oconto County Boundary	04030104			N	A	2009
Pecore Creek Tributary No. 1 (includes Wiscobee Lake)	Oconto County, Unincorporated Areas	At confluence with Pecore Creek	At upstream limit of approximate study	04030104			N	A	2009
Pensaukee River	Oconto County, Unincorporated Areas	At outlet to Lake Michigan	Approximately 210 feet downstream of County Highway S	04030103			N	AE	1979
		Approximately 210 feet downstream of County Highway S	At Kuczynski Lane	04030103			N	AE	2009
		At Kuczynski Lane	At Safian Road	04030103			Y	AE	2008

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Pensaukee River *(continued)*	Oconto County, Unincorporated Areas	At Safian Road	At Oconto County/Shawano County Boundary (State Highway 32)	04030103			Y	AE	1979
Peshtigo Brook	Oconto County, Unincorporated Areas	At confluence with Oconto River	At upstream limit of approximate study	04030104			N	A	2009
Peterson Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Pickerel Lake (North Branch Oconto River Watershed)	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Pickerel Lake (Peshtigo Brook Watershed)	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Pickerel Lake Tributary	Oconto County, Unincorporated Areas	At outlet to Pickerel Lake (North Branch Oconto River Watershed)	At upstream limit of approximate study	04030104			N	A	2009
Plantation Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Porcupine Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Ranch Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Reservoir Pond	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Rost Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030105		0.1	N	A	2009
Round Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	AE	2009
Savage Lake	Gillett, City of	Entire shoreline	Entire shoreline	04030104			N	A	2009
Second South Branch Oconto River	Oconto County, Unincorporated Areas	At confluence with South Branch Oconto River	At upstream limit of approximate study	04030104			N	A	2009
Shadow Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Shay Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Smoke Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
South Branch Beaver Creek	Oconto County, Unincorporated Areas	At Marinette County/Oconto County Boundary	At upstream limit of approximate study	04030105			N	A	2009
South Branch Beaver Creek Tributary No. 1	Oconto County, Unincorporated Areas	At confluence with South Branch Beaver Creek	At upstream limit of approximate study	04030105			N	A	2009
South Branch Oconto River	Oconto County, Unincorporated Areas	At confluence with Oconto River	Approximately 1.1 miles upstream of confluence with Oconto River	04030104	1.1		Y	AE	1979
		Approximately 1.1 miles upstream of confluence with Oconto River	At Menominee County/Oconto County Downstream Boundary	04030104			N	A	2009
		At Menominee County/Oconto County Upstream Boundary	At upstream limit of approximate study	04030104			N	A	2009
South Branch Oconto River Tributary No. 7	Oconto County, Unincorporated Areas	At confluence with South Branch Oconto River	At upstream limit of approximate study	04030104			N	A	2009
South Branch Oconto River Tributary No. 18	Oconto County, Unincorporated Areas	At confluence with South Branch Oconto River	At upstream limit of approximate study	04030104			N	A	2009
South Fork Thunder River	Oconto County, Unincorporated Areas	At Marinette County/Oconto County Boundary	At convergence of Forbes Creek and Hay Creek	04030105			N	A	2009
South Fork Thunder River Tributary No. 2	Oconto County, Unincorporated Areas	At confluence with South Fork Thunder River	At upstream limit of approximate study	04030105			N	A	2009
Splinter Creek	Oconto County, Unincorporated Areas	At confluence with Machickanee Flowage	At upstream limit of approximate study	04030104			N	A	2009
Splinter Creek Tributary No. 1	Oconto County, Unincorporated Areas	At confluence with Splinter Creek	At upstream limit of approximate study	04030104			N	A	2009
Splinter Creek Tributary No. 2	Oconto County, Unincorporated Areas	At confluence with Splinter Creek	At upstream limit of approximate study	04030104			N	A	2009
Splinter Creek Tributary No. 3	Oconto County, Unincorporated Areas	At confluence with Splinter Creek	At upstream limit of approximate study	04030104			N	A	2009
Spring Creek	Oconto County, Unincorporated Areas	At confluence with Pensaukee River	At upstream limit of approximate study	04030103 04030104	6.5		Y	AE	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Spring Creek Tributary No. 6	Oconto County, Unincorporated Areas	At confluence with Spring Creek	Approximately 470 feet upstream of Burdosh Road	04030103	0.7		Y	AE	2009
Spring Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Squaw Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Star Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Surprise Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Thomas Slough	Oconto County, Unincorporated Areas	At outlet to Lake Michigan	At Marinette County/Oconto County Boundary	04030104			N	AE	2009
Tibbet Creek	Oconto County, Unincorporated Areas	Approximately 1.0 mile upstream of outlet to Green Bay	Approximately 1.6 miles upstream of Lade Beach Road	04030103	4.6		Y	AE	2009
Town Creek	Oconto County, Unincorporated Areas	At confluence with North Branch Oconto River	Approximately 0.4 mile upstream of Old 32 Road	04030104	2.2		Y	AE	2009
Townsend Flowage	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Ucil Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	A	2009
Underwood Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030105			N	A	2009
Upper Island Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Upper Wapato Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Wapato Lake Tributary	Oconto County, Unincorporated Areas	At outlet to Wapato Lake	At upstream limit of approximate study	04030104			N	A	2009

Table 2: Flooding Sources Included in this FIS Report *(continued)*

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Waubee Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Waupee Creek	Oconto County, Unincorporated Areas	At outlet to North Branch Oconto River	Approximately 0.1 mile upstream of Old State Highway 64	04030104	2.1		Y	AE	2009
		Approximately 0.1 mile upstream of Old State Highway 64	At upstream limit of approximate study	04030104			N	A	2009
		Approximately 1.6 miles downstream of County Highway W	At Waupee Dam	04030104	2.6		Y	AE	2009
Waupee Flowage	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Wescott Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104		0.1	N	AE	2009
Wheeler Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
White Potato Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030105		1.6	N	A	2009
Winslow Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009
Wiscoble Lake	Oconto County, Unincorporated Areas	Entire shoreline	Entire shoreline	04030104			N	A	2009

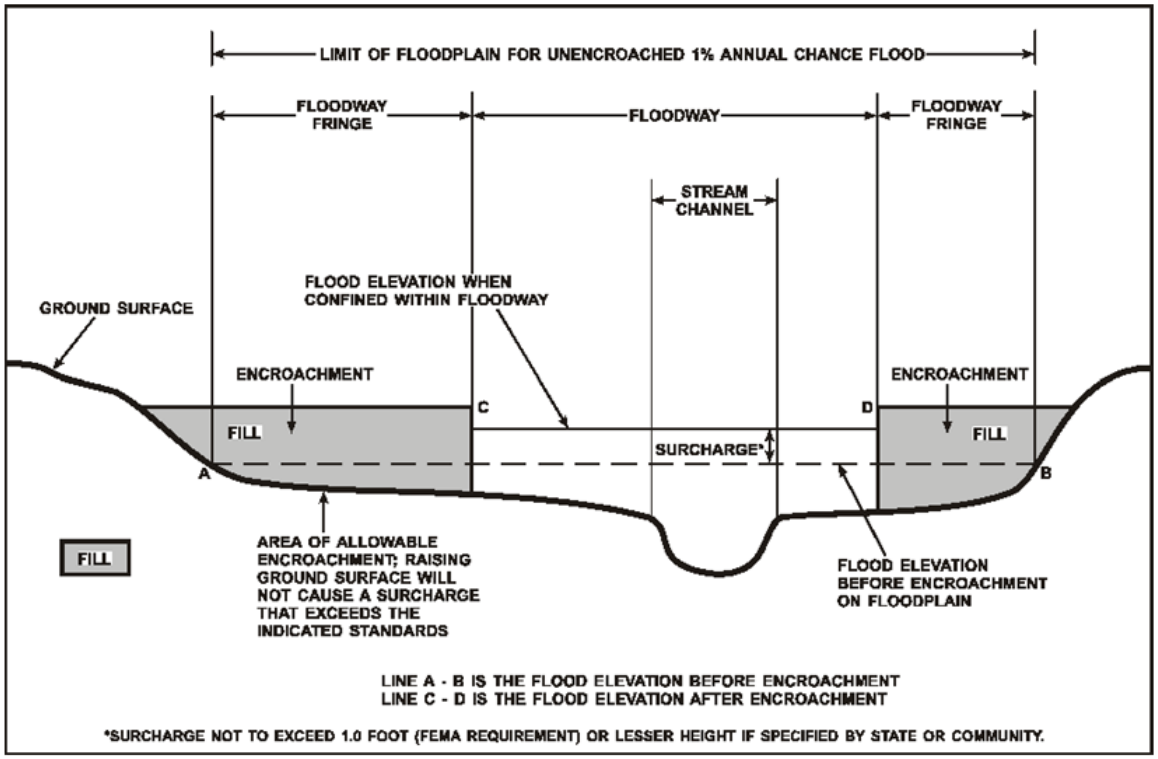
2.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1-percent-annual-chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1-percent-annual-chance flood. The floodway fringe is the area between the floodway and the 1-percent-annual-chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 23, "Floodway Data."

All floodways that were developed for this Flood Risk Project are shown on the FIRM using the symbology described in Figure 3. In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The BFE is the elevation of the 1-percent-annual-chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

BFEs are primarily intended for flood insurance rating purposes. Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. For example, the user may use the FIRM to determine the stream station of a location of interest and then use the profile to determine the 1-percent-annual-chance elevation at that location. Because only selected cross sections may be shown on the FIRM for riverine areas, the profile should be used to obtain the flood elevation between mapped cross sections. Additionally, for riverine areas, whole-foot elevations shown on the FIRM may not exactly reflect the elevations derived from the hydraulic analyses; therefore, elevations obtained from the profile may more accurately reflect the results of the hydraulic analysis.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Project.

2.5 Coastal Flood Hazard Areas

For most areas along rivers, streams, and small lakes, BFEs and floodplain boundaries are based on the amount of water expected to enter the area during a 1-percent-annual-chance flood and the geometry of the floodplain. Floods in these areas are typically caused by runoff from storm events. However, for areas on, or near, the Great Lakes, ocean coasts, large rivers, or other large bodies of water, the BFE and floodplain boundaries may be based on additional components that include storm surge and wave dynamics.

Coastal flooding sources that are included in this Flood Risk Project are shown in Table 2.

2.5.1 Water Elevations and the Effects of Waves

Specific terminology is used in coastal analyses to indicate which components have been included in evaluating flood hazards.

The stillwater elevation (SWEL or still water level) is the surface of the water resulting from astronomical tides, storm surge, and freshwater inputs, but excluding wave setup contribution or the effects of waves.

- Astronomical tides are periodic rises and falls in large bodies of water caused by the rotation of the earth and by the gravitational forces exerted by the earth, moon and sun. Tidal-induced fluctuations in the Great Lakes are small and their presence is masked by the normal fluctuations due to atmospheric forcing. The Great Lakes can be treated as if no tidal signal exists, and this contribution to water levels is neglected.
- Storm surge, inclusive of wind setup and seiche-induced fluctuation, is the additional water depth that occurs during large storm events. These events can bring air pressure changes and strong winds that force water up against the shore. The most common cause of a large seiche in the Great Lakes is the oscillating water level after a storm that moves over the lake, with the downwind portion of the lake subject to wind setup as water piles up against the coast and the upwind portion subject to a decrease in water levels.
- Freshwater inputs include rainfall that falls directly on the body of water, runoff from surfaces and overland flow, and inputs from rivers.

The 1-percent-annual-chance stillwater elevation is the stillwater elevation that has been calculated for a storm surge from a 1-percent-annual-chance storm. The 1-percent-annual-chance storm surge can be determined from analyses of water level station records, statistical study of regional historical storms, or other modeling approaches. Stillwater elevations for storms of other frequencies can be developed using similar approaches.

The total stillwater elevation (also referred to as the mean water level) is the stillwater elevation plus wave setup contribution but excluding the other effects of waves, such as wave runup and overland wave propagation.

- *Wave setup* is the increase in stillwater elevation at the shoreline caused by the reduction of waves in shallow water. It occurs as breaking wave momentum is transferred to the water column.

Like the stillwater elevation, the total stillwater elevation is based on a storm of a particular frequency, such as the 1-percent-annual-chance storm. Wave setup is typically estimated using standard engineering practices or calculated using models, since water level stations are often located in areas sheltered from wave action and do not capture wave height or wave setup information.

Coastal analyses may examine the effects of overland waves by analyzing storm-induced erosion, overland wave propagation, wave runup, and/or wave overtopping.

- Storm-induced erosion is the modification of existing topography by erosion caused by a specific storm event, as opposed to long-term erosion that occurs over time.
- *Overland wave propagation* describes the combined effects of variation in ground elevation, vegetation, and physical features on wave characteristics as waves move onshore.
- *Wave runup* is the uprush of water from wave action on a shore barrier. It is a function of the roughness and geometry of the shoreline at the point where the stillwater elevation intersects the land, as shown in Figure 5a.
- Wave overtopping refers to the flooding that occurs when wave runup passes over the crest of a barrier, as shown in Figure 5b.

Figure 5a: Wave Runup Transect Schematic

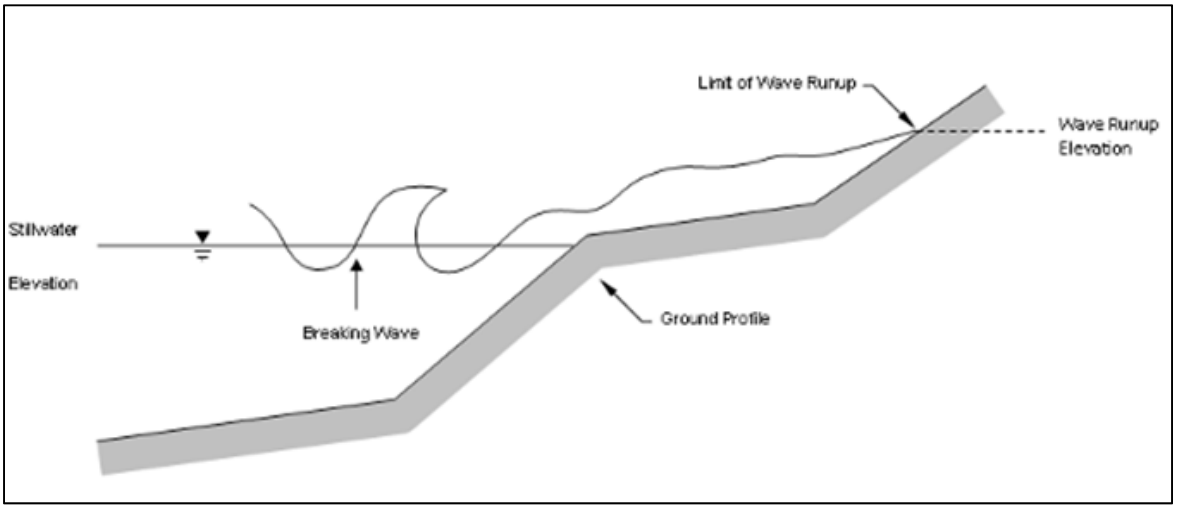
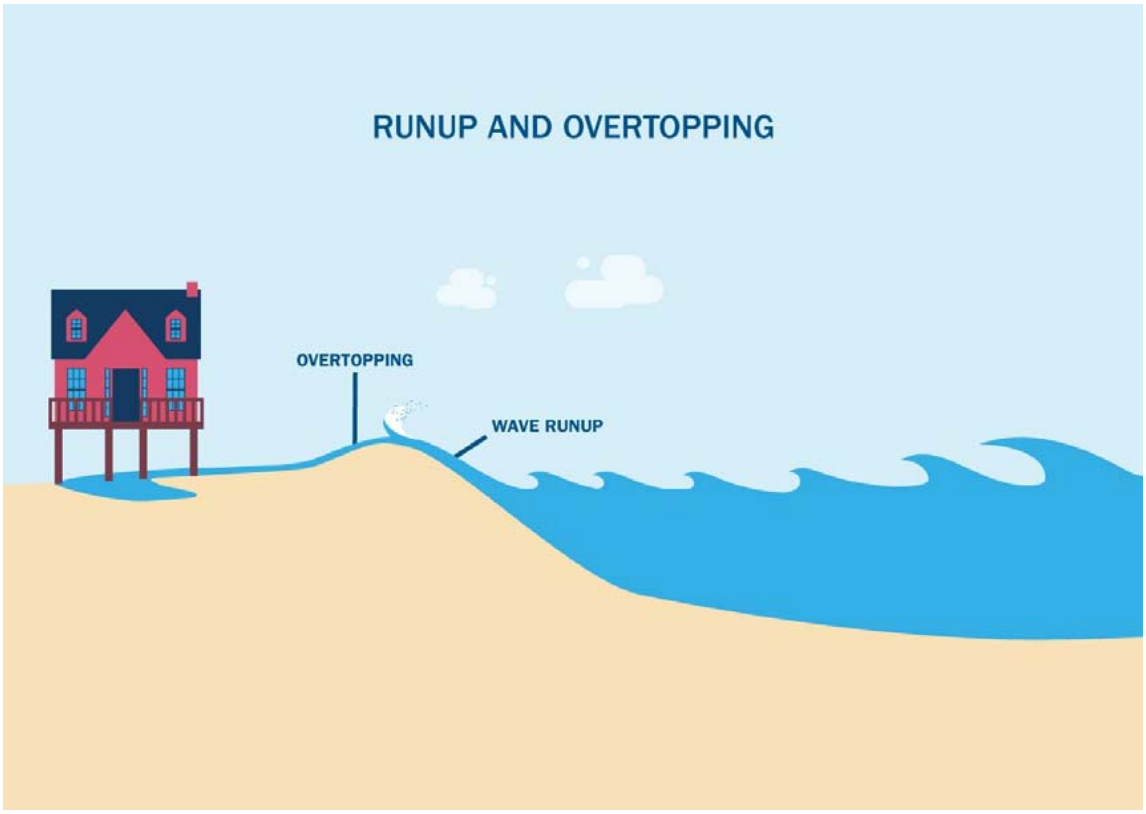


Figure 5b: Wave Overtopping Schematic



2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

For coastal communities along the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, and the Caribbean Sea, flood hazards must take into account how storm surges, waves, and in some cases extreme tides or lake level variations interact with factors such as topography, structures, and vegetation. Storm surge and waves must also be considered in assessing flood risk for certain communities on rivers or large inland bodies of water.

Beyond areas that are affected by storm surge and waves, coastal communities can also have riverine floodplains with designated floodways, as described in previous sections.

Floodplain Boundaries

In many coastal areas, storm surge is the principle component of flooding. The extent of the 1-percent-annual-chance floodplain in these areas is derived from the stillwater elevation for the 1-percent-annual-chance storm. The methods used for calculation of stillwater elevations for coastal areas are described in Section 5.3 of this FIS Report.

In areas dominated by overland wave propagation, the coastal BFEs represent the wave dissipation and generation as the wave propagates landward from the shoreline. The landward extent of the 1-percent-annual-chance floodplain is determined by the stillwater elevation with the addition of wave setup, where applicable. The methods used for calculation of wave setup and overland wave propagation are described in Section 5.3 of this FIS Report.

In some areas, the 1-percent-annual-chance floodplain is determined based on the limit of wave runup or wave overtopping for the 1-percent-annual-chance storm surge. The Special Flood Hazard Area (SFHA) extent is determined based on the elevation of the land in relation to the wave runup elevation or the amount of wave overtopping. For areas dominated by wave runup, the coastal BFE can vary from reach to reach. Where wave runup exceeds the crest of a coastal feature, the SFHA extent is determined by the limit of the overtopping zone. The methods that were used for calculation of wave runup and overtopping hazards are described in Section 5.3 of this FIS Report.

Table 25 presents the types of coastal analyses that were used in mapping the 1-percent-annual-chance floodplain in coastal areas.

Coastal BFEs

Coastal BFEs are calculated as the stillwater elevation for the 1-percent-annual-chance storm plus the additional flood hazard from wave effects (storm-induced erosion, wave setup, overland wave propagation, wave runup, and wave overtopping).

Where they apply, coastal BFEs are calculated along transects extending from offshore to the limit of coastal flooding onshore. Results of these analyses are accurate until local topography, vegetation, or development type and density within the community undergoes major changes.

Parameters that were included in calculating coastal BFEs for each transect included in this FIS Report are presented in Table 16, “Coastal Transect Parameters.” The locations of transects are shown in Figure 9, “Transect Location Map.” More detailed information about the methods used in coastal analyses and the results of intermediate steps in the coastal analyses are presented in Section 5.3 of this FIS Report. Additional information on specific mapping methods is provided in Section 6.4 of this FIS Report.

2.5.3 Coastal High Hazard Areas

Certain areas along the open coast and other areas may have higher risk of experiencing structural damage caused by wave action and/or high-velocity water during the 1-percent-annual-chance flood. These areas will be identified on the FIRM as Coastal High Hazard Areas.

- Coastal High Hazard Area (CHHA) is a SFHA extending from offshore to the inland limit of the primary frontal dune (PFD) or any other area subject to damages caused by wave action and/or high-velocity water during the 1-percent-annual-chance flood.
- *Primary Frontal Dune (PFD)* is a continuous or nearly continuous mound or ridge of sand with relatively steep slopes immediately landward and adjacent to the beach. The PFD is subject to erosion and overtopping from high tides and waves during major coastal storms.

The landward limit of the PFD occurs at a point where there is a distinct change from a relatively steep slope to a relatively mild slope; this point represents the landward extension of Zone VE.

No PFDs were identified within Oconto County.

CHHAs are designated as “VE” zones (for “velocity wave zones”) and are subject to more stringent regulatory requirements and a different flood insurance rate structure. BFEs are assigned to Zones VE on the FIRM. More detailed information about the identification and designation of Zone VE is presented in Section 6.4 of this FIS Report.

Areas that are not within the CHHA but are SFHAs may still be impacted by coastal flooding and damaging waves; these areas are shown as “AE” zones on the FIRM.

Figure 6a, “Coastal Transect Schematic (Wave Runup and Overtopping),” illustrates the relationship between the base flood elevation, the 1-percent-annual-chance stillwater elevation, and the ground profile as well as the location of the Zone VE and Zone AE/AO in areas subject to wave runup and overtopping.

Figure 6a: Coastal Transect Schematic (Wave Runup and Overtopping)

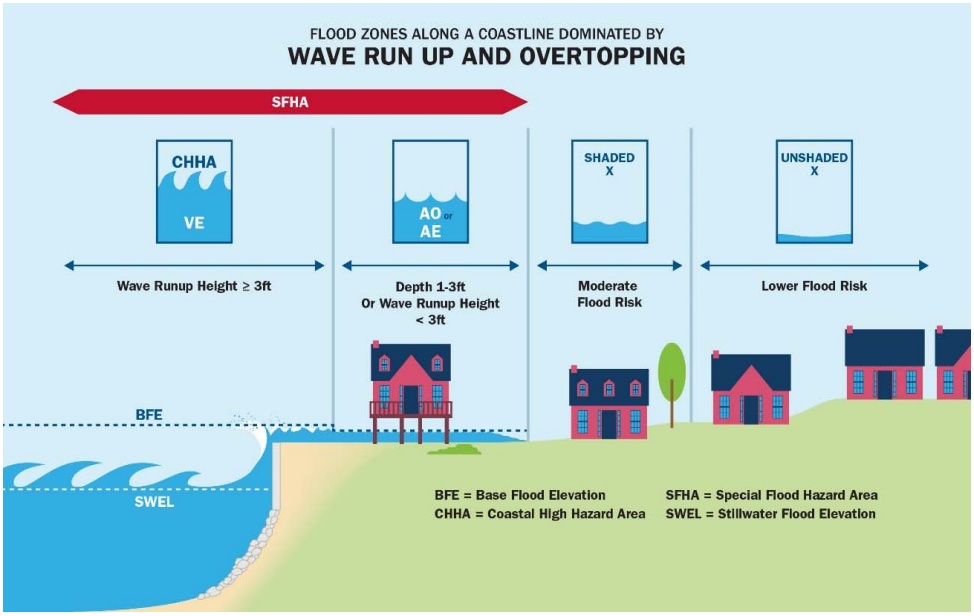
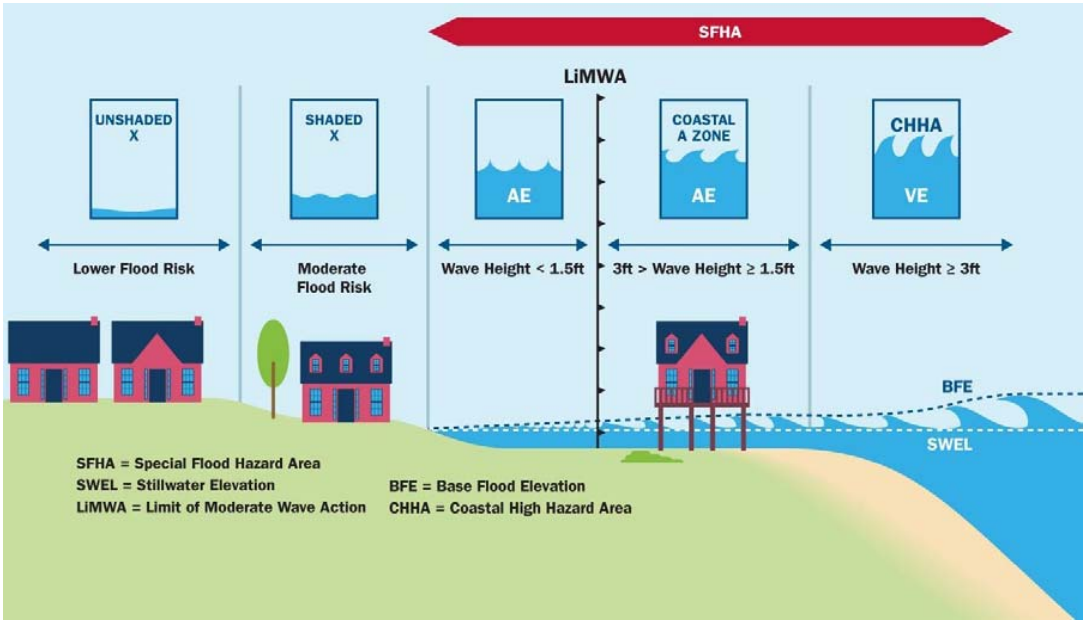


Figure 6b, “Coastal Transect Schematic (Overland Wave Propagation),” illustrates the relationship between the base flood elevation, the 1-percent annual chance stillwater elevation, and the ground profile as well as the location of the Zone VE and Zone AE in areas subject to overland wave propagation. This figure also illustrates energy dissipation and regeneration of a wave as it moves inland.

Figure 6b: Coastal Transect Schematic (Overland Wave Propagation)



Methods used in coastal analyses in this Flood Risk Project are presented in Section 5.3 and mapping methods are provided in Section 6.4 of this FIS Report.

Coastal floodplains are shown on the FIRM using the symbology described in Figure 3, "Map Legend for FIRM." The BFE mapped on the FIRM at the shoreline is determined by the 1-percent annual chance total water elevation, which includes the stillwater elevation plus wave effects. The 1-percent annual chance total water elevations are included in Table 16, along with the statistical stillwater elevations. If the BFE on the FIRM is higher than the stillwater elevations shown in Table 16 due to the presence of wave effects, the higher elevation should be used for construction and/or floodplain management purposes.

2.5.4 Limit of Moderate Wave Action

Laboratory tests and field investigations have shown that wave heights as little as 1.5 feet can cause damage to and failure of typical Zone AE building construction. Wood-frame, light gage steel, and masonry walls on shallow footings or slabs are subject to damage when exposed to waves less than 3 feet in height. Other flood hazards associated with coastal waves (floating debris, high velocity flow, erosion, and scour) can also damage Zone AE construction.

Therefore, a LiMWA boundary may be shown on the FIRM as an informational layer to assist coastal communities in safe rebuilding practices. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The location of the LiMWA relative to Zone VE and Zone AE is shown in Figure 6b.

The effects of wave hazards in Zone AE between Zone VE (or the shoreline where Zone VE is not identified) and the LiMWA boundary are similar to, but less severe than, those in Zone VE where 3-foot or greater breaking waves are projected to occur during the 1-percent-annual-chance flooding event. Communities are therefore encouraged to adopt and enforce more stringent floodplain management requirements than the minimum NFIP

requirements in areas lakeward of the LiMWA. The NFIP Community Rating System provides credits for these actions.

In areas where wave runup elevations dominate over wave crest elevations (Figure 6a), the LiMWA should not be shown on the FIRM. Examples of runup dominated areas include shorelines with steeply sloped beaches, bluffs, or flood protection structures that lie parallel to the shore. Similarly, in areas where the Zone VE designation is based on the presence of a PFD or wave overtopping, the LiMWA is not shown on the FIRM.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3, “Map Legend for FIRM.” Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of the areas of additional flood hazards.

Table 3 lists the flood insurance zones for Oconto County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Gillett, City of	A, AE, X
Lena, Village of	AE, X
Oconto, City of	AE, AH, VE, X
Oconto County (Unincorporated Areas)	A, AE, AH, VE, X
Oconto Falls, City of	A, AE, X
Pulaski, Village of	AE, X
Suring, Village of	A, AE, X

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 4 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 4: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Sources	Description of Affected Area	Drainage Area (square miles)
Duck-Pensaukee	04030103	Pensaukee River	Subbasin drains the southern part of the county and empties into Green Bay	333
Lake Michigan	04060200	Lake Michigan	Entire surface water area of Lake Michigan	22,457
Oconto	04030104	Oconto River	Subbasin drains the central part of the county and empties into Green Bay	960
Peshtigo	04030105	Peshtigo River	Subbasin drains the northeastern part of the county and empties into Green Bay	1,219
Wolf	04030202	None in Oconto County	Western Oconto County includes two small portions of this subbasin	3,728

4.2 Principal Flood Problems

Table 5 contains a description of the principal flood problems that have been noted for Oconto County by flooding source.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Lake Michigan	Flooding typically occurs along the shoreline of Lake Michigan and the mouths of its tributaries during high lake levels; the result of extended periods of above-normal precipitation combined with short-duration high winds from storm patterns. Some property damage and loss may occur during these events due to high water and erosion.
	Lake Michigan and the mouths of its tributaries can also be effected by seiches. Seiches are a weather phenomenon which are typically caused when strong winds and rapid changes in atmospheric pressure push water from one end of a body of water to the other. When the wind stops, the water rebounds to the other side of the enclosed area. The water then continues to oscillate back and forth for hours or even days. These sudden, extreme changes in water levels can cause severe flooding and damage to the lake shoreline and along tributary channels.
Oconto River (City of Gillett)	A number of floods have occurred along the Oconto River during the past 150 years, with largest flooding events near the City of Gillett occurring in 1907, 1908, 1922, 1939, 1952, 1965, and 1973. Ice may increase flood levels during some events, including the flooding that occurred in 1939 and 1953.
Oconto River (City of Oconto)	The largest flooding events near the City of Oconto have occurred in 1952, 1989, 1990, 1998, 2003, 2004, 2015, and 2017. During the flood of record in April of 1952, the USGS gage near the City of Oconto recorded a level of 14 feet, which is 5 feet above flood stage. At this level, homes and businesses adjacent to the river experience significant flood damage.

Table 6 contains information about historic flood elevations in the communities within Oconto County.

Table 6: Historic Flooding Elevations

Flooding Source	Location	Historic Peak Feet (NAVD88)	Event Date	Approximate Recurrence Interval (Years)	Source of Data[1]
Oconto River	Gaging Station near Gillett, WI	744.05	April 1922	*	USGS gage 04071000
	Gaging Station near Oconto, WI	596.34	April 1952	*	USGS gage 04071765

[1] USGS 2019
[*] No data available

4.3 Non-Levee Flood Protection Measures

This section is not applicable to this Flood Risk Project.

Table 7: Non-Levee Flood Protection Measures

[Not Applicable to this Flood Risk Project]

4.4 Levees

This section is not applicable to this Flood Risk Project.

Table 8: Levees

[Not applicable to this Flood Risk Project]

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 9. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 10. (Coastal stillwater elevations are discussed in Section 5.3 and shown in Table 16.) Stream gage information is provided in Table 11.

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
Brookside Creek	At confluence with Pensaukee River	6.1	380	*	660	740	*	1,060
	Just upstream of County Highway J	3.7	257	*	446	500	*	717
	Just upstream of Falk Road	2.5	187	*	325	365	*	522
	Just upstream of U.S. Highway 41/141	1.5	125	*	218	244	*	350
Christie Brook	At confluence with Oconto River	14.2	390	*	571	650	*	838
	Approximately 0.8 mile downstream of North Green Bay Avenue	8.3	263	*	383	435	*	578
	At Chicago and Northwestern Railroad	6.1	195	*	282	320	*	410
City of Oconto Tributary No. 1	At outlet to Green Bay	0.8	83	*	175	221	*	358
City of Oconto Tributary No. 4	Approximately 0.2 mile downstream of County Highway S	6.3	*	*	*	410	*	500
Hayes Creek	Just downstream of Hayes Road	11.5	328	*	473	535	*	687
	At County Highway R	6.8	212	*	305	345	*	443

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges *(continued)*

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
Jones Creek	At U.S. Highway 141	0.9	170	*	263	324	*	508
Kirchner Creek	At Sampson Road	6.1	409	*	727	860	*	1,227
Little Suamico River	At outlet to Green Bay	56.7	2,980	*	4,940	5,520	*	7,870
	At Cross Road	53.5	2,820	*	4,775	5,350	*	7,660
	Approximately 1.7 miles downstream of County Highway C	45.7	2,775	*	4,600	5,200	*	7,400
	Just upstream of County Highway C	37.8	2,500	*	4,200	4,850	*	6,800
	Just upstream of Schwartz Road	25.5	2,050	*	3,400	3,800	*	5,400
	At Jaworski Road	9.7	1,420	*	2,320	2,580	*	3,570
	At Water Treatment Plant Road	1.4	206	*	370	420	*	605
McCaslin Brook	At County Highway F	51.9	240	*	320	340	*	410
	Approximately 0.9 mile upstream of North Road	38.5	173	*	226	247	*	294
	At Old County Highway T	36.5	160	*	210	230	*	270
North Branch Oconto River	Just upstream of confluence with Oconto River	273.7	1,700	*	2,270	2,490	*	2,980

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges *(continued)*

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
North Branch Oconto River *(continued)*	Approximately 2.8 miles downstream of North Branch Road	270.8	1,700	*	2,260	2,480	*	2,960
	At Logan Road	261.5	1,660	*	2,200	2,410	*	2,870
	Approximately 1.6 miles downstream of State Highway 32	255.2	1,630	*	2,150	2,360	*	2,820
	At Kingston Road	188.3	1,260	*	1,650	1,800	*	2,150
	Approximately 0.6 mile upstream of Kingston Road	182.2	1,230	*	1,610	1,760	*	2,090
	At Chicago and Northwestern Railroad	177.4	1,200	*	1,570	1,720	*	2,050
	At State Highway 32/64	172.0	1,170	*	1,530	1,680	*	1,990
	At Tar Dam Road	167.4	1,140	*	1,500	1,640	*	1,950
	Approximately 1.1 miles downstream of County Highway F	101.0	890	*	1,140	1,230	*	1,460
	At County Highway F	89.6	790	*	1,010	1,100	*	1,310
Oconto River	At outlet to Green Bay	966.6	5,428	*	9,034	10,762	*	14,355
	Approximately 170 feet upstream of confluence of Oconto River Tributary No. 3	961.3	5,250	*	8,380	9,970	*	13,290

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges *(continued)*

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
Oconto River *(continued)*	At County Highway J	948.6	5,250	*	8,140	9,690	*	12,890
	Just upstream of confluence of Little River	764.2	4,680	*	6,070	6,620	*	7,850
	At Machickanee Dam	752.3	4,680	*	6,070	6,620	*	7,850
	At Oconto Falls Power Dam	720.4	4,680	*	6,070	6,620	*	7,850
	At County Highway K	714.3	4,690	*	6,080	6,630	*	7,860
	At State Highway 32	706.7	4,690	*	6,080	6,620	*	7,860
	At USGS Gage No. 04071000 at County Highway BB	679.4	4,700	*	6,090	6,640	*	7,870
	At County Highway V	633.5	4,580	*	5,940	6,480	*	7,680
	At County Highway H	614.1	4,320	*	5,600	6,110	*	7,250
	Approximately 1.0 mile downstream of convergence of North and South Branches of Oconto River	599.7	4,260	*	5,540	6,040	*	7,170
	Just downstream of convergence of North and South Branches of Oconto River	593.1	4,230	*	5,490	5,990	*	7,110
Oconto River Tributary No. 2	At confluence with Oconto River	1.0	18	*	28	32	*	45

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges *(continued)*

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
Oconto River Tributary No. 3	At confluence with Oconto River	0.2	13	*	32	37	*	58
Oconto River Tributary No. 22	At confluence with Oconto River	2.4	150	*	266	284	*	338
Pensaukee River	At outlet to Green Bay	147.0	4,400	*	7,420	8,330	*	11,890
	Just downstream of confluence of Spring Creek	126.7	4,360	*	7,250	8,095	*	11,400
	Approximately 2.0 miles upstream of Chicago, Milwaukee, St. Paul and Pacific Railroad	116.7	4,330	*	7,110	7,920	*	11,050
	At Safian Road	54.0	2,040	*	3,400	3,800	*	5,330
	At State Highway 32	46.7	1,810	*	3,030	3,390	*	4,780
South Branch Oconto River	Just upstream of convergence with North Branch Oconto River	214.8	1,730	*	2,210	2,400	*	2,820
	Approximately 1.1 miles upstream of confluence with Oconto River	214.2	1,720	*	2,210	2,400	*	2,810
Spring Creek	At confluence with Pensaukee River	8.4	136	*	320	380	*	650
	At Miller Road	2.4	74	*	160	190	*	320

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges *(continued)*

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
Spring Creek Tributary No. 6	At confluence with Spring Creek	1.7	16	*	32	38	*	64
Tibbet Creek	At outlet to Green Bay	12.9	818	*	1,349	1,565	*	2,152
	Approximately 1.4 miles upstream of Lade Beach Road	9.0	558	*	908	1,050	*	1,430
Town Creek	At confluence with North Branch Oconto River	1.9	66	*	140	172	*	267
Waupee Creek	At confluence with North Branch Oconto River	47.9	363	*	831	1,107	*	1,954
	Approximately 1.5 miles downstream of County Highway W	13.9	62	*	186	260	*	490

*Not calculated for this Flood Risk Project

Figure 7: Frequency Discharge-Drainage Area Curves

[Not applicable to this Flood Risk Project]

Table 10: Summary of Non-Coastal Stillwater Elevations

Flooding Source	Location	Elevations (feet NAVD88)				
		10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Anderson Lake	Oconto County, Unincorporated Areas	*	*	*	859.7	*
Crooked Lake	Oconto County, Unincorporated Areas	950.7	*	951.1	951.2	951.5
Round Lake	Oconto County, Unincorporated Areas	*	*	*	826.8	*
Westcott Lake	Oconto County, Unincorporated Areas	845.0	*	845.1	845.2	845.3

*Not calculated for this Flood Risk Project

Table 11: Stream Gage Information used to Determine Discharges

[Not applicable to this Flood Risk Project]

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 23, “Floodway Data.”

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 12. Roughness coefficients are provided in Table 13. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 12: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Anderson Lake	Entire shoreline	Entire shoreline	Water Resources Investigations Report 03-4250[1] (WRIR 03-4250)	HEC-RAS 3.1.3	01/02/2009	AE	
Archibald Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Bagley Creek	At confluence with Peshtigo Brook	At outlet of Impassable Lake	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Barney Spring	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Bass Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	AE	
Bear Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Bear Paw Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Big Island Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Boot Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Boulder Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Bowman Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Brehmer Creek	At confluence with Oconto River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Brehmer Creek Tributary No. 2	At confluence with Brehmer Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Brookside Creek	At confluence with Pensaukee River	Approximately 310 feet upstream of Cross Road	National Engineering Handbook Method (NEH, 1972)	WSP-2	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies
Brooks Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Camp Five Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Chain Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Christie Brook	At confluence with Oconto River	Approximately 130 feet upstream of Chicago and Northwestern Railroad Bridge	WIDNR Hydrology Tool/2003 USGS Flow Regression Equations	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies
	Approximately 130 feet upstream of Chicago and Northwestern Railroad Bridge	At outlet of Christie Lake	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Christie Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
City of Oconto Tributary No. 1	At confluence with Lake Michigan	At upstream limit of detailed study	National Engineering Handbook Method	WSP-2	03/01/1979	AE	
City of Oconto Tributary No. 4	Approximately 275 feet downstream of County Highway S	At Van Hecke Avenue	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE	
City of Oconto Tributary No. 4A	At confluence with City of Oconto Tributary No. 4	At Van Hecke Avenue	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE	
Chute Pond	Entire shoreline	Entire shoreline	*	WSP-2	*	AE	Impounded area of North Branch Oconto River. No floodway in this reach. Hydrologic method used was not listed in previous FIS texts.
Cooley Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Coopman Creek	At confluence with Oconto River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Crooked Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE	
Daly Creek	At confluence with Kelly Brook	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Daly Creek Tributary No. 1	At confluence with Daly Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Daly Creek Tributary No. 7	At confluence with Daly Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Daly Creek Tributary No. 8	At confluence with Daly Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Deer Lake	Entire shoreline	Entire shoreline	*	*	01/02/2009	A	
Explosion Lake	Entire shoreline	Entire shoreline	*	*	01/02/2009	A	
Forbes Creek	At convergence with Hay Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
French Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Funk Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Gilkey Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	AE	
Gillett Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Glocke Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Grignon Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	*	01/02/2009	A	
Grindle Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Hay Creek	At convergence with Forbes Creek	At upstream limit of approximate study, just downstream of County Highway R	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Hay Creek Tributary No. 1	At confluence with Hay Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Hayes Creek	At confluence with Pecore Creek	Approximately 70 feet upstream of Hayes Road	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
	Approximately 70 feet upstream of Hayes Road	Approximately 3.8 miles upstream of Hayes Road	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
Hoerth Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Horn Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Impassable Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Jocko Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
John Lake Tributary	At outlet to John Lake	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Jones Creek	At confluence with Little River	Approximately 0.8 mile downstream of North Rosera Street	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	A	
	Approximately 0.8 mile downstream of North Rosera Street	Approximately 0.8 mile upstream of Harley Street	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies
Jones Creek Tributary No. 1	At confluence with Jones Creek	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Jones Creek Tributary No. 2	At confluence with Jones Creek	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Kelly Brook	At convergence with North Branch Little River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Kelly Brook Tributary No. 12	At confluence with Kelly Brook	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Kelly Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Kelly Lake Tributary	At outlet to Kelly Lake	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Kirchner Creek	At outlet to Lake Michigan	Approximately 225 feet downstream of Sampson Road	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	Starting water surface elevations were based on normal depth
	Approximately 225 feet downstream of Sampson Road	Approximately 1.5 miles upstream of Oak Orchard Road	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
Lake John	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Lake John Tributary	At outlet to Lake John	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Lake Michigan Tributary No. 5	At outlet to Lake Michigan	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Lauder Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Ledge Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Ledge Lake Tributary	At inlet to Ledge Lake	At outlet from Cedar Lake	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Leigh Flowage	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Linzy Creek	At confluence with Oconto River	At Menominee County/Oconto County Boundary	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Little Archbald Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Little Gillett Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Little Horn Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Little Pickerel Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Little River	At confluence with Oconto River	At convergence of Kelly Brook and North Branch Little River	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Little River Tributary No. 2	At confluence with Little River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Little River Tributary No. 4	At confluence with Little River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Little River Tributary No. 15	At confluence with Little River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Little River Tributary No. 18	At confluence with Little River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Little Squaw Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Little Suamico River	At outlet to Lake Michigan	At Oconto County/Shawano County Boundary	National Engineering Handbook Method	WSP-2	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies
Little Wapato Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Long Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Lower Island Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Lower Wapato Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Maiden Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Makholm Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
McCaslin Brook	At confluence with North Branch Oconto River	Approximately 0.6 mile downstream of Sheridan Dam	*	WSP-2	01/02/2009	A	Hydrologic method used was not listed in previous FIS texts
	Approximately 0.6 mile downstream of Sheridan Dam	At Wheeler Dam (Townsend Flowage)	*	WSP-2	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies. Hydrologic method used was not listed in previous FIS texts.
	At headwaters of Townsend Flowage	At Langlade County/Oconto County Boundary	*	WSP-2	01/02/2009	A	Hydrologic method used was not listed in previous FIS texts
McCaslin Brook Tributary No. 3	At confluence with McCaslin Brook	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
McCaslin Brook Tributary No. 3.1	At confluence with McCaslin Brook Tributary No. 3	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McCaslin Brook Tributary No. 6	At confluence with McCaslin Brook	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McCaslin Brook Tributary No. 6.2	At confluence with McCaslin Brook Tributary No. 6	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McCaslin Brook Tributary No. 7	At confluence with McCaslin Brook	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McCaslin Brook Tributary No. 7.2	At confluence with McCaslin Brook Tributary No. 7	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McComb Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McComb Lake Tributary	At inlet to McComb Lake	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
McDonald Creek	At Marinette County/Oconto County Boundary	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Messenger Creek	At Marinette County/Oconto County Boundary	At Jocko Lake Outlet	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Munger Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Munger Lake Tributary	At inlet to Munger Lake	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Nelligan Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
North Branch Little River	At convergence with Kelly Brook	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
North Branch Little River Tributary No. 6	At confluence with North Branch Little River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
North Branch Oconto River	At convergence with South Branch Oconto River	At Chute Pond Dam	*	WSP-2	01/02/2009	AE with Floodway	Hydrologic method used was not listed in previous FIS texts
	At headwaters of Chute Pond	At Marinette County/Oconto County Boundary	*	WSP-2	01/02/2009	AE with Floodway	Hydrologic method used was not listed in previous FIS texts
North Branch Pensaukee River	At confluence with Pensaukee River	At Oconto County/Shawano County Boundary	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Oconto River	At outlet to Lake Michigan	Approximately 0.1 mile downstream of County Highway S (Collins Avenue)	National Engineering Handbook Method	WSP-2	09/01/1979	AE	
	Approximately 0.1 mile downstream of County Highway S (Collins Avenue)	Approximately 0.7 mile upstream of Brazeau Avenue	National Engineering Handbook Method	WSP-2	09/01/1979	AE with Floodway	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Oconto River *(continued)*	Approximately 0.7 mile upstream of Brazeau Avenue	Approximately 0.1 mile downstream of confluence of Oconto River Tributary No. 2	*	WSP-2	08/01/1999	AE with Floodway	Data from Letter of Map Revision (LOMR) 99-05-131P. Hydrologic model used was not listed in the LOMR.
	Approximately 0.1 mile downstream of confluence of Oconto River Tributary No. 2	At confluence of Oconto River Tributary No. 2	National Engineering Handbook Method	WSP-2	09/01/1979	AE with Floodway	
	At confluence of Oconto River Tributary No. 2	Approximately 0.4 mile downstream of County Highway J	National Engineering Handbook Method	WSP-2	01/02/2009	AE with Floodway	Hydraulics for this reach were revised in 2009
	Approximately 0.4 mile downstream of County Highway J	At downstream City of Oconto Falls Boundary	National Engineering Handbook Method	WSP-2	09/01/1979	AE with Floodway	
	At downstream City of Oconto Falls Boundary	At upstream City of Oconto Falls corporate limits	*	*	03/01/1979	AE with Floodway	Hydrologic and hyudraulic methods used were not listed in previous FIS texts
	At upstream City of Oconto Falls corporate limits	At Oconto County/Shawano County Downstream Boundary	National Engineering Handbook Method	WSP-2	09/01/1979	AE with Floodway	
	At Oconto County/Shawano County Upstream Boundary	At convergence of North Branch Oconto River and South Branch Oconto River	National Engineering Handbook Method	WSP-2	09/01/1979	AE with Floodway	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Oconto River Tributary No. 2	At confluence with Oconto River	Approximately 0.6 mile upstream of confluence with Oconto River	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
Oconto River Tributary No. 3	At confluence with Oconto River	Approximately 0.1 mile upstream of McDonald Street	National Engineering Handbook Method (NEH, 1972)	WSP-2	03/01/1979	AE with Floodway	
Oconto River Tributary No. 12	At confluence with Oconto River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Oconto River Tributary No. 14	At confluence with Oconto River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Oconto River Tributary No. 22	At confluence with Oconto River	Approximately 0.5 mile upstream of South Flatley Street	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
Paya Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Pecore Creek	At confluence with South Branch Oconto River	At Menominee County/Oconto County Boundary	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Pecore Creek Tributary No. 1 (includes Wiscobee Lake)	At confluence with Pecore Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Pensaukee River	At outlet to Lake Michigan	Approximately 210 feet downstream of County Highway S	National Engineering Handbook Method	WSP-2	09/01/1979	AE	
	Approximately 210 feet downstream of County Highway S	At Kuczynski Lane	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	
	At Kuczynski Lane	At Safian Road	*	*	09/01/2008	AE with Floodway	Hydrologic and hydraulic methods used were not listed in previous FIS text
	At Safian Road	At Oconto County/Shawano County Boundary (State Highway 32)	National Engineering Handbook Method	WSP-2	09/01/1979	AE with Floodway	
Peshtigo Brook	At confluence with Oconto River	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Peterson Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Pickerel Lake (North Branch Oconto River Watershed)	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Pickerel Lake (Peshtigo Brook Watershed)	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Pickerel Lake Tributary	At outlet to Pickerel Lake (North Branch Oconto River Watershed)	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	Flows into the Pickerel Lake located in the North branch Oconto River Watershed
Plantation Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Porcupine Lake	Entire shoreline	Entire shoreline	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Ranch Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Reservoir Pond	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Rost Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Round Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2/TR-55	TR-55 Flowpath Segment Method	01/02/2009	AE	
Savage Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Second South Branch Oconto River	At confluence with South Branch Oconto River	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Shadow Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Shay Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Smoke Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
South Branch Beaver Creek	At Marinette County/Oconto County Boundary	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
South Branch Beaver Creek Tributary No. 1	At confluence with South Branch Beaver Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
South Branch Oconto River	At confluence with Oconto River	Approximately 1.1 miles upstream of confluence with Oconto River	*	WSP-2	09/01/1979	AE with Floodway	Hydrologic method used was not listed in previous FIS texts
	Approximately 1.1 miles upstream of confluence with Oconto River	At Menominee County/Oconto County Downstream Boundary	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
	At Menominee County/Oconto County Upstream Boundary	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
South Branch Oconto River Tributary No. 7	At confluence with South Branch Oconto River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
South Branch Oconto River Tributary No. 18	At confluence with South Branch Oconto River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
South Fork Thunder River	At Marinette County/Oconto County Boundary	At convergence of Forbes Creek and Hay Creek	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
South Fork Thunder River Tributary No. 2	At confluence with South Fork Thunder River	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Splinter Creek	At confluence with Machickanee Flowage	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	

*No data available

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Splinter Creek Tributary No. 1	At confluence with Splinter Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Splinter Creek Tributary No. 2	At confluence with Splinter Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Splinter Creek Tributary No. 3	At confluence with Splinter Creek	At upstream limit of approximate study	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	A	
Spring Creek	At confluence with Pensaukee River	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies
Spring Creek Tributary No. 6	At confluence with Spring Creek	Approximately 470 feet upstream of Burdosh Road	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water elevations were based on known elevations from downstream studies
Spring Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Squaw Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Star Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Surprise Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Thomas Slough	At outlet to Lake Michigan	At Marinette County/Oconto County Boundary	WRIR 03-4250	HEC-RAS 3.1.3	01/02/2009	AE	
Tibbet Creek	Approximately 1.0 mile upstream of outlet to Green Bay	Approximately 1.6 miles upstream of Lade Beach Road	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Town Creek	At confluence with North Branch Oconto River	Approximately 0.4 mile upstream of Old 32 Road	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
Townsend Flowage	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Ucil Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Underwood Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Upper Island Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Upper Wapato Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Wapato Lake Tributary	At outlet to Wapato Lake	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Waubee Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Waupee Creek	At outlet to North Branch Oconto River	Approximately 0.1 mile upstream of Old State Highway 64	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
	Approximately 0.1 mile upstream of Old State Highway 64	At upstream limit of approximate study	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (*continued*)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Waupee Creek *(continued)*	Approximately 1.6 miles downstream of County Highway W	At Waupee Dam	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE with Floodway	Starting water surface elevations were based on normal depth
Waupee Flowage	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Wescott Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2/TR-55	HEC-RAS 3.1.3	01/02/2009	AE	
Wheeler Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
White Potato Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Winslow Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	
Wiscoble Lake	Entire shoreline	Entire shoreline	HEC-HMS 2.2.2	HEC-RAS 3.1.3	01/02/2009	A	

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Brookside Creek	0.040-0.050	0.060-0.120
Christie Brook	0.040	0.060-0.100
City of Oconto Tributary No. 1	0.045-0.100	0.055-0.100
City of Oconto Tributary No. 4	0.040-0.045	0.040-0.070
City of Oconto Tributary No. 4A	0.050	0.060
Hayes Creek	0.050	0.085
Jones Creek	0.040	0.060-0.100
Kirchner Creek	0.040	0.060-0.100
Little Suamico River	0.035-0.055	0.050-0.120
McCaslin Brook	0.030-0.050	0.050-0.120
North Branch Oconto River	0.030-0.060	0.040-0.100
Oconto River	0.030-0.060	0.040-0.100
Oconto River Tributary No. 2	0.050	0.070
Pensaukee River	0.035-0.050	0.080-0.120
South Branch Oconto River	0.040	0.120
Spring Creek	0.040-0.045	0.080-0.100
Spring Creek Tributary No. 6	0.045	0.100
Tibbet Creek	0.030-0.050	0.060-0.100
Town Creek	0.040	0.060-0.100
Tributary No. 22	0.050	0.100
Waupee Creek	0.040	0.060-0.100

5.3 Coastal Analyses

For the areas of Oconto County that are impacted by coastal flooding processes, coastal flood hazard analyses were performed to provide estimates of coastal BFEs. Coastal BFEs reflect the increase in water levels during a flood event due to storm surge and overland wave effects.

The following subsections provide summaries of how each coastal process was considered for this FIS Report. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation. Table 14 summarizes the methods and/or models used for the coastal analyses. Refer to Section 2.5.1 for descriptions of the terms used in this section.

Table 14: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Lake Michigan/ Green Bay	Entire shoreline of Oconto County from the Marinette County Line to the Brown County Line	Entire shoreline of Oconto County from the Marinette County Line to the Brown County Line	Erosion	CSHORE	06/30/2017
			Overland Wave Propagation	WHAFIS	06/30/2017
			Statistical Analyses	Q-Q Optimization	06/30/2017
			Storm Surge	ADCIRC	03/10/2017
			Wave Generation	SWAN	03/10/2017
			Wave Runup	Stockdon/van Gent/SPM[1]	06/30/2017
			Wave Setup	Direct Integration Method (DIM)	06/30/2017

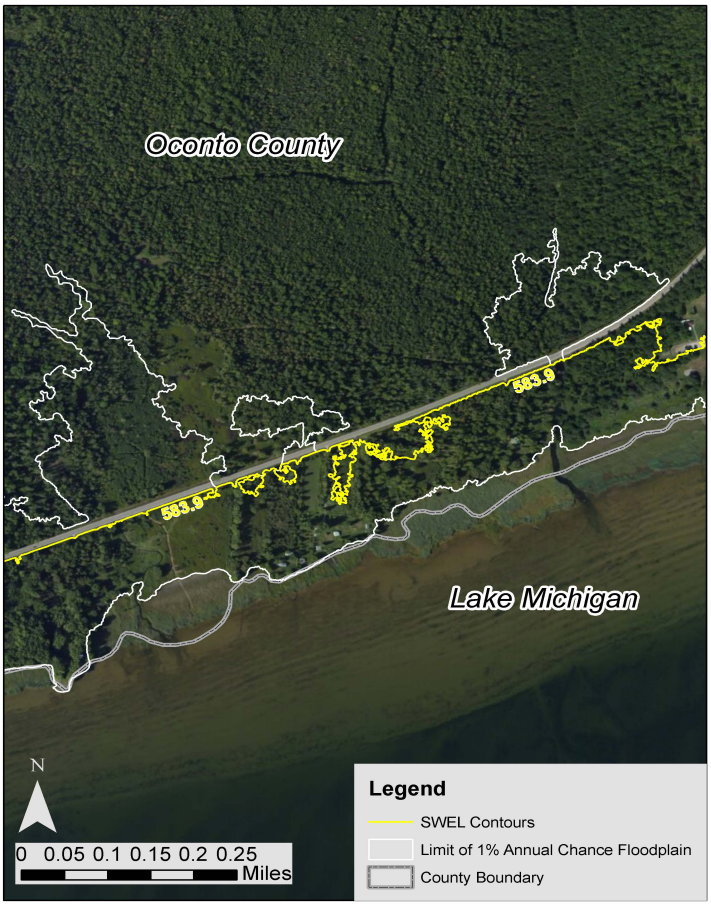
[1] U.S. Army Corps of Engineers (USACE) Shore Protection Manual (SPM) 1984

5.3.1 Total Stillwater Elevations

The stillwater elevations for the 1-percent-annual-chance flood were determined for areas subject to coastal flooding. The models and methods that were used to determine storm surge and wave setup are listed in Table 14. The stillwater elevation that was used for each transect in the coastal analyses is shown in Table 16, “Coastal Transect Parameters. Figure 8 shows an example of the stillwater elevations for the 1-percent-annual-chance flood that was determined for this coastal analysis; wave setup is computed at each transect location and added to the stillwater elevation to determine a total stillwater elevation.

Stillwater elevations and starting wave conditions for Oconto County were determined from the lake-wide wave and storm surge study conducted for Lake Michigan by FEMA and Strategic Alliance for Risk Reduction (STARR). The study was performed using the coupled SWAN + ADCIRC hydrodynamic and wave model on a mesh of 1,045,141 nodes and validated using water levels and waves for six historical storms. The model was then used to simulate 150 selected historic storms based on historic peak water levels and peak wave heights. When available, ice coverage was accounted for in validation and production events. The modeled data were used to create a history of water elevation and wave height records from which the 10-, 2-, 1-, and 0.2-percent annual chance of exceedance elevations were calculated.

Figure 8: 1-Percent-Annual-Chance Stillwater Elevations for Coastal Areas



Storm Surge Statistics

Storm surge is modeled based on characteristics of actual storms responsible for significant coastal flooding. The characteristics of these storms are typically determined by statistical study of the regional historical record of storms or by statistical study of water level stations.

When historic records are used to calculate storm surge, characteristics such as the strength, size, track, etc., of storms are identified by site. Storm data was used in conjunction with numerical hydrodynamic models to determine the corresponding storm surge levels. An extreme value analysis was performed on the storm surge modeling results to determine a stillwater elevation for the 1-percent-annual-chance event.

In an oceanic environment water level stations can be used instead of historic records of storms when the available station record for the area represents both the astronomical tide component and the storm surge component. Great Lakes studies rely on water level stations to identify the highest water level storm events from the historic record. The selected storms are then used to simulate storm surge and wave heights across the study area. Table 15 provides the water level station name, managing agency, station type, station identifier, start date, end date, and statistical methodology applied to each station to determine the stillwater elevations.

Table 15: Water Level Station Analysis Specifics

Station Name	Managing Agency of Station	Station Type	Start Date[1]	End Date[1]	Statistical Methodology
Calumet Harbor, IL (9087044)	National Oceanic and Atmospheric Administration (NOAA)	Water Level	1960	2009	N/A
Green Bay, WI (9087079)	NOAA	Water Level	1960	2009	
Holland, MI (9087031)	NOAA	Water Level	1960	2009	
Kewaunee, WI (9087068)	NOAA	Water Level	1973	2009	
Ludington, MI (9087023)	NOAA	Water Level	1960	2009	
Mackinaw City, MI (9075080)	NOAA	Water Level	1960	2009	
Milwaukee, WI (9087057)	NOAA	Water Level	1960	2009	
Port Inland, MI (9087096)	NOAA	Water Level	1964	2009	
Sturgeon Bay, WI (9087072)	NOAA	Water Level	1960	2009	

[1] Available data within study period of record (1960-2009)

5.3.2 Waves

Starting wave heights and wave periods for Oconto County were determined from the lake-wide wave and storm surge study conducted for Lake Michigan by FEMA and STARR as described in Section 5.3.1. The modeled data were used to create a history of wave height and wave period records which was used to determine starting wave conditions for the transect analysis.

Wave Setup Analysis

Wave setup was computed based on the wave and water level modeling results through the methods and models listed in Table 14. To adequately capture the complex hydrodynamics of wave-breaking across the surf zone, wave setup was calculated at each transect using the Direct Integration Method (DIM).

5.3.3 Coastal Erosion

A single storm episode can cause extensive erosion in coastal areas. Storm-induced erosion was evaluated using the methods listed in Table 14 to determine the modification to existing topography that is expected to be associated with coastal flooding events. The post-event eroded profile was used for the subsequent transect-based onshore wave hazard analyses.

5.3.4 Wave Hazard Analyses

Overland wave hazards were evaluated to determine the combined effects of ground elevation, vegetation, and physical features on overland wave propagation and wave runup. These analyses were performed at representative transects where waves are expected to be present during the floods of the selected recurrence intervals. The results of these analyses were used to determine elevations for the 1-percent annual chance flood. The transect analysis was performed with elevations in the vertical datum of IGLD85 and ultimately converted to NAVD88 for mapping.

Transect locations were chosen with consideration given to the physical land characteristics as well as development type and density so that they would closely represent conditions in their locality. Additional consideration was given to changes in the total stillwater elevation. Transects were spaced close together in areas of complex topography and dense development or where total stillwater elevations varied. In areas having more uniform characteristics, transects were spaced at larger intervals. Transects shown in Figure 9, “Transect Location Map,” are also depicted on the FIRM. Table 16 provides the location, stillwater elevations, and total water elevations for all coastal analysis transects. Starting wave conditions are also provided for each transect evaluated for overland wave hazards. In this table, “starting” indicates the parameter value at the beginning of the transect.

Wave Height Analysis

Wave height analyses were performed to determine wave heights and corresponding wave crest elevations for the areas inundated by coastal flooding and subject to overland wave propagation hazards. Refer to Figure 6b for a schematic of a coastal transect evaluated for overland wave propagation hazards.

The methodology for analyzing the effects of wave heights associated with coastal storm surge flooding is described in a report prepared by the National Academy of Sciences (NAS). This method is based on three major concepts. First, depth-limited waves in shallow water reach maximum breaking height that is equal to 0.78 times the stillwater depth. The wave crest is 70 percent of the total wave height above the stillwater level. The second major concept is that wave height may be diminished by dissipation of energy due to the presence of obstructions, such as sand dunes, dikes and seawalls, buildings and vegetation. The amount of energy dissipation is a function of the physical characteristics of the obstruction and is determined by procedures prescribed in the NAS Report. The third major concept is that wave height can be regenerated in open fetch areas due to the transfer of wind energy to the water. This added energy is related to fetch length and depth.

Along each transect, wave heights and wave crest elevations were computed considering the combined effects of changes in ground elevation, vegetation, and physical features. The joint probability method (JPM) is used to compute five theoretical combinations of wave and water level conditions that have a joint 1-percent annual chance probability of occurrence. These theoretical combinations were simulated to determine the water levels, which include wave setup, and wave conditions at the shoreline. Wave heights and wave crest elevations were modeled using the methods and models listed in Table 14.

There were no overland wave propagation transects within Oconto County.

Wave Runup and Overtopping Analysis

Wave runup is the uprush of water caused by wave action on a shore barrier exceeding the total stillwater level. As part of the coastal study, an evaluation of wave runup is conducted to determine the total water elevation due to storm surge, wave setup, and wave runup, and whether that total water elevation is the dominant coastal flood hazard for an area. Wave runup is evaluated for areas having dune barrier systems, coastal bluffs, as well as sloped and vertical structures.

Wave runup elevations were calculated for each coastal transect using the methods and models listed in Table 14, which follow the FEMA Guidelines and Specifications. For gently sloping shorelines (slopes less than 1:10), the Stockdon equations were applied. For steeper (but non-vertical) sloping shorelines, the van Gent method was performed. For vertical structures, runup elevations were determined using the guidance in Figure D-14 of the FEMA Guidelines and Specifications obtained from the SPM. The SPM results in a mean wave runup value, which was multiplied by 2.2 to obtain the 2-percent runup height.

Wave overtopping occurs when the potential wave runup elevation is greater than the topographic feature crest elevation. The overtopping rate will depend on the incident water level and wave conditions, the barrier geometry and roughness characteristics, and the upland slope. Overtopping rates were calculated using the methods and models listed in Table 14, which follow the FEMA Guidelines and Specifications.

Wave overtopping behavior is determined based on the slope landward of the barrier crest. Where the shoreline geometry is characterized by a low-crested bluff or structure backed by a positively-sloping, nearly level upland, the Plateau Method was applied to calculate an adjusted runup elevation and the inland extent of runup. Where the shoreline geometry is characterized by a negative slope landward of the barrier crest, the overtopping water will result in sheet flow on the negative slope and may propagate until it reaches another flooding source or ponding area.

Table 16: Coastal Transect Parameters

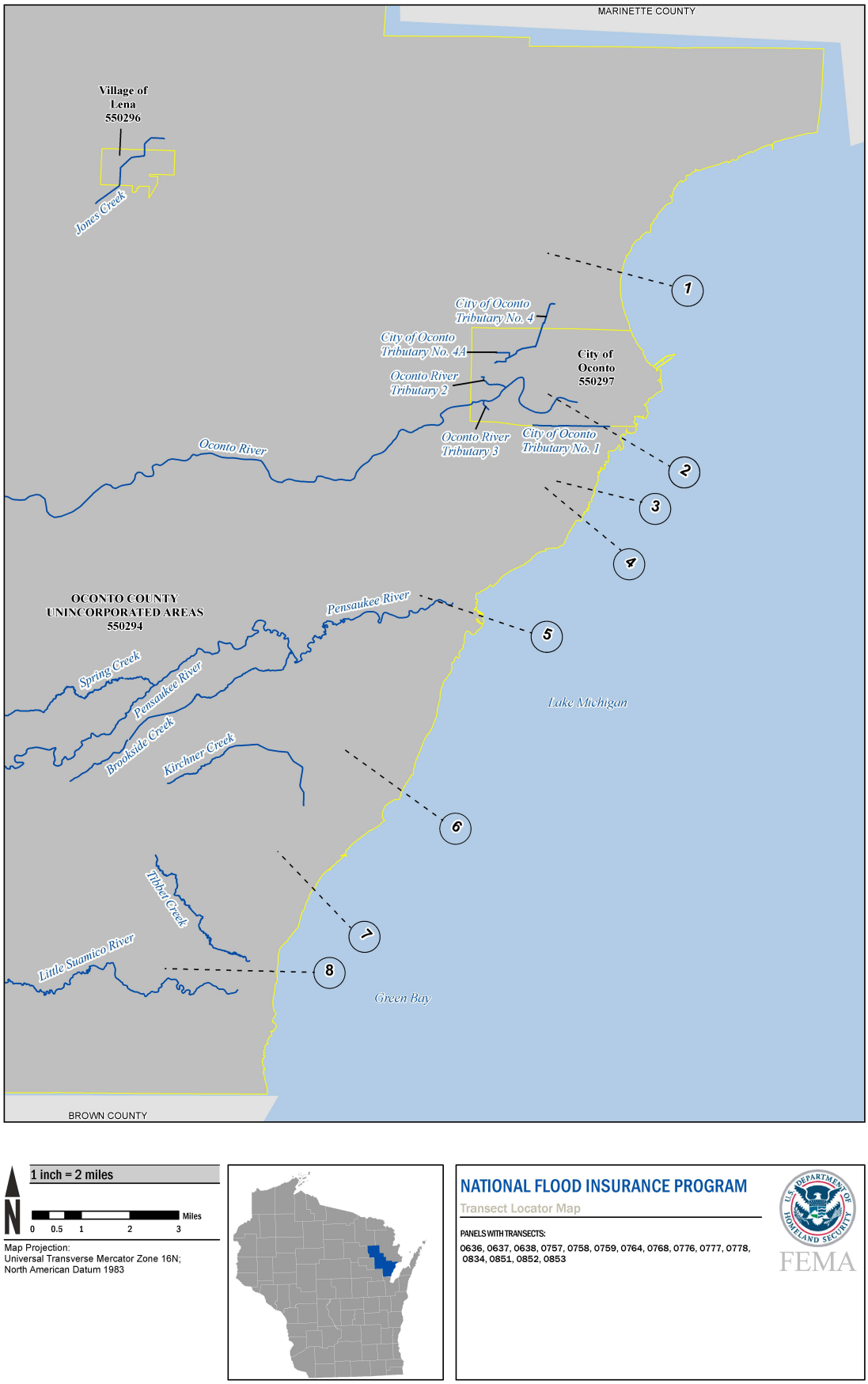
Flooding Source	Coastal Transect	Starting Wave Conditions for the 1-Percent-Annual-Chance[1]		Starting Stillwater Elevations (feet NAVD88)					1-Percent-Annual-Chance Total Water Elevation[2] (ft NAVD88)
		Significant Wave Height H_s (feet)	Peak Wave Period T_p (second)	10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance	
Lake Michigan/Green Bay	1	2.4	7.2	583.0	*	583.7	583.9	584.1	586.8
	2	2.3	6.5	582.9	*	583.6	583.8	584.1	587.1
	3	1.9	6.8	583.1	*	583.6	583.7	583.8	587.1
	4	3.1	6.5	583.0	*	583.7	583.8	584.1	587.2
	5	2.4	6.8	583.1	*	583.8	583.9	584.2	587.2
	6	3.2	6.7	583.1	*	583.8	583.9	584.2	587.1
	7	3.7	6.2	583.2	*	583.9	584.1	584.4	587.5
	8	2.6	6.8	583.3	*	583.9	584.1	584.3	587.6

* Not calculated for this Flood Risk Project

[1] Wave data provided for WHAFIS-dominant transects only. The 1-percent starting wave parameters are not applicable for runup transects since a response-based approach is utilized.

[2] Includes wave action representative of 1-Percent Total Water Level (for wave runup and overtopping) or 1-Percent Wave Crest Elevation (for overland wave propagation).

Figure 9: Transect Location Map



5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Project.

Table 17: Summary of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

Table 18: Results of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please visit the NGS website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Oconto County are provided in Table 19.

Table 19: Countywide Vertical Datum Conversion

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88
Abrams	SE	44.750	-88.000	0.052
Berry Lake	SE	44.875	-88.375	-0.026
Breed	SE	45.000	-88.375	-0.026
Coleman	SE	45.000	-88.000	-0.098
Fredenberg Lake	SE	45.000	-88.500	-0.016
Gillett	SE	44.875	-88.250	-0.013
Hickory Corners	SE	45.000	-88.250	-0.023
Kelly Lake	SE	45.000	-88.125	-0.052
Krakow	SE	44.750	-88.250	-0.016
Langlade	SE	45.125	-88.625	0.003
Legend Lake	SE	44.875	-88.500	-0.052
Lena	SE	44.875	-88.000	-0.075
Marinette West	SE	45.000	-87.750	-0.092
McCaslin Mountain	SE	45.375	-88.375	0.007
Mountain	SE	45.125	-88.375	-0.030
Oconto Falls North	SE	44.875	-88.125	-0.046
Oconto Falls South	SE	44.750	-88.125	-0.007
Oconto West	SE	44.875	-87.875	-0.069
Otter Lake	SE	45.375	-88.500	0.023
Porterfield SW	SE	45.000	-87.875	-0.089
Reservoir Pond	SE	45.250	-88.625	0.026
Shadow Lake	SE	45.125	-88.500	0.043
Shay Lake	SE	45.125	-88.250	-0.33
Townsend	SE	45.250	-88.500	0.010
Wabeno	SE	45.375	-88.625	0.049
Wheeler Lake	SE	45.250	-88.375	-0.030
White Pond Lake	SE	45.125	-88.125	-0.062
Average Conversion from NGVD29 to NAVD88 = -0.024 feet				

[1] NGS 2008

Table 20: Stream-Based Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM Database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping.

Base map information shown on the FIRM was derived from the sources described in Table 21.

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Green Bay Shoreline	Wisconsin DNR	2018	1:6,000	Spatial and attribute information for Green Bay shoreline
Oconto County Effective Political Boundary	FEMA	2010	1:6,000	Spatial and attribute information for Oconto County political boundaries
Oconto County Transportation	US Census Bureau, Geography Division	2018	1:6,000	Spatial and attribute information for local roads, airports and railroads
PLSS Lines and Area for Oconto Countywide Study	Wisconsin DNR	1996	1:24,000	Spatial and attribute information for PLSS areas and boundaries
Roads for Oconto Countywide Study	Wisconsin DNR	2007	1:100,000	Spatial and attribute information for local roads, airports and railroads
USACE Structures	US Army Corps of Engineers, Chicago District	2012	1:6,000	Spatial and attribute information for general structures
USDA-FSA-APFO Digital Ortho Mosaic	USDA NAIP	2017	1:24,000	Basemap imagery and spatial and attribute information for Base Index
Watershed Boundary Dataset (WBD), HUC8 Boundaries, gages	USGS and USDA - NRCS	2017	1:12,000	Spatial and attribute information for subbasins and gages
Wisconsin Rivers and Shorelines	Wisconsin DNR	2007	1:24,000	Spatial and attribute information for water areas and lines

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22. For each coastal flooding source studied as part of this FIS Report, the mapped floodplain boundaries on the FIRM have been delineated using the flood and wave elevations determined at each transect; between transects, boundaries were delineated using land use and land cover data, the topographic elevation data described in Table 22, and knowledge of coastal flood processes. In ponding areas, flood elevations were determined at each junction of the model; between junctions, boundaries were interpolated using the topographic elevation data described in Table 22.

In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 23, “Floodway Data.”

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Oconto, City of; Oconto County, Unincorporated Areas	Entire Lake Michigan/ Green Bay Shoreline	Light Detection and Ranging data (LiDAR)	+/- 15 cm $RMSE_Z$	+/- 1.5 m $RMSE_Z$	JALBTCX 2013
Gillett, Oconto, and Oconto Falls, Cities of; Lena, and Suring, Villages of; Oconto County, Unincorporated Areas	All within HUCs 04030103, 04030104, 04030105	LiDAR data	*	*	WIDNR 2019
		2-Foot Interval Contours	*	*	Oconto County 2005

* Data unavailable

BFEs shown at cross sections on the FIRM represent the 1-percent-annual-chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations.

Table 23: Floodway Data

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BROOKSIDE CREEK									
A	647	117	903	0.8	0	607.3	605.6[2]	605.7	0.1
B	1,518	372	2,386	0.3	0	607.3	605.6[2]	605.7	0.1
C	2,592	1,362	7,561	0.1	0	607.3	605.9[2]	606.0	0.1
D	3,956	563	2,009	0.3	46	607.3	606.1[2]	606.2	0.1
E	5,524	190	995	0.6	0	608.9	608.9	609.0	0.1
F	7,163	223	1,258	0.5	0	612.6	612.6	612.7	0.1
G	7,729	352	2,063	0.3	0	612.6	612.6	612.7	0.1
H	9,028	777	3,519	0.1	0	614.1	614.1	614.2	0.1
I	10,140	665	1,558	0.3	0	614.1	614.1	614.1	0.0
J	12,525	284	443	1.1	0	618.9	618.9	618.9	0.0
K	14,158	337	694	0.9	0	628.9	628.9	628.9	0.0
L	15,707	80	406	1.7	0	634.1	634.1	634.1	0.0
M	17,919	516	700	0.5	0	638.4	638.4	638.4	0.0
N	20,400	276	420	1.3	0	640.3	640.3	640.3	0.0
O	25,496	124	202	1.2	0	652.8	652.8	652.8	0.0
P	27,516	244	740	0.3	0	665.0	665.0	665.0	0.0
Q	30,779	84	114	2.2	0	671.4	671.4	671.4	0.0
R	32,493	253	1,004	0.4	0	680.5	680.5	680.5	0.0

[1]Feet above confluence with Pensaukee River

[2]Elevation computed without consideration of backwater effects from Pensaukee River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

BROOKSIDE CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CHRISTIE BROOK								
A	1,441	182	481	1.4	739.5	737.8[2]	737.8	0.0
B	2,455	238	426	1.5	739.5	738.4[2]	738.4	0.0
C	3,702	287	614	1.1	739.6	739.6	739.6	0.0
D	5,753	324	483	1.4	741.0	741.0	741.0	0.0
E	7,547	430	476	1.4	743.0	743.0	743.0	0.0
F	9,438	266	452	1.4	746.6	746.6	746.6	0.0
G	10,460	181	294	2.2	748.8	748.8	748.8	0.0
H	11,605	170	379	1.7	751.6	751.6	751.6	0.0
I	12,758	286	433	1.5	753.1	753.1	753.1	0.0
J	13,757	150	270	2.4	756.2	756.2	756.2	0.0
K	15,064	182	368	1.8	760.8	760.8	760.8	0.0
L	16,138	248	331	1.3	763.0	763.0	763.0	0.0
M	17,224	184	328	1.3	766.2	766.2	766.2	0.0
N	18,305	46	92	4.7	773.3	773.3	773.3	0.0
O	21,388	131	191	2.3	788.5	788.5	788.5	0.0
P	22,452	95	162	2.7	793.6	793.6	793.6	0.0
Q	24,415	481	810	0.4	802.0	802.0	802.0	0.0
R	25,522	155	195	1.6	803.1	803.1	803.1	0.0
S	26,508	205	281	1.1	805.6	805.6	805.6	0.0
T	27,518	250	193	1.7	808.2	808.2	808.2	0.0

[1]Feet above outlet to Oconto River

[2]Elevation computed without consideration of backwater effects from Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

CHRISTIE BROOK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CHRISTIE BROOK (CONTINUED)								
U	28,089	111	176	1.8	811.4	811.4	811.4	0.0
V	28,275	232	1151	0.3	818.1	818.1	818.1	0.0
W	28,894	102	277	1.2	818.3	818.3	818.3	0.0
X	29,300	61	186	1.7	819.1	819.1	819.1	0.0
Y	29,482	92	181	1.8	819.2	819.2	819.2	0.0

[1]Feet above outlet to Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

CHRISTIE BROOK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
HAYES CREEK								
A	1,994	171	392	1.4	835.0	835.0	835.0	0.0
B	3,029	233	447	1.2	836.0	836.0	836.0	0.0
C	4,182	226	454	1.2	836.9	836.9	836.9	0.0
D	5,266	257	534	1.0	838.4	838.4	838.4	0.0
E	6,237	239	532	1.0	839.6	839.6	839.6	0.0
F	7,243	295	478	1.1	840.4	840.4	840.4	0.0
G	8,311	371	803	0.4	840.8	840.8	840.8	0.0
H	9,341	363	533	0.7	841.0	841.0	841.0	0.0
I	10,410	1,020	1,300	0.3	841.1	841.1	841.1	0.0
J	11,749	1,092	1,638	0.2	841.2	841.2	841.2	0.0
K	12,893	1,288	1,700	0.2	841.3	841.3	841.3	0.0
L	13,879	1,919	3,184	0.1	841.3	841.3	841.3	0.0
M	15,134	1,766	2,069	0.2	841.4	841.4	841.4	0.0
N	16,415	1,286	1,526	0.2	841.4	841.4	841.4	0.0
O	17,707	958	658	0.5	842.0	842.0	842.0	0.0
P	18,946	752	888	0.5	842.9	842.9	842.9	0.0

[1]Feet above Hayes Road

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

HAYES CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
JONES CREEK								
A	2,692	1,034	227	0.9	694.2	694.2	694.2	0.0
B	4,648	33	55	3.6	695.8	695.8	695.8	0.0
C	5,975	397	413	0.5	699.3	699.3	699.3	0.0
D	7,099	68	153	0.7	702.7	702.7	702.7	0.0
E	8,690	1,384	1,698	0.1	705.6	705.6	705.6	0.0
F	10,034	576	510	0.2	705.6	705.6	705.6	0.0
G	11,372	316	201	0.5	706.7	706.7	706.7	0.0

[1] Feet above U.S. Highway 141

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

JONES CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
KIRCHNER CREEK								
A	10,038	520	675	1.3	599.1	599.1	599.1	0.0
B	11,190	3,027	1,930	0.4	600.6	600.6	600.6	0.0
C	13,779	1,625	1,459	0.6	602.9	602.9	602.9	0.0
D	17,078	406	745	1.0	605.2	605.2	605.2	0.0
E	18,477	78	264	2.8	606.1	606.1	606.1	0.0
F	21,342	348	293	2.5	608.8	608.8	608.8	0.0
G	21,965	355	478	1.5	611.5	611.5	611.5	0.0
H	23,151	307	419	1.8	613.3	613.3	613.3	0.0
I	24,880	515	662	0.7	616.1	616.1	616.1	0.0
J	26,810	240	366	1.2	620.8	620.8	620.8	0.0
K	28,072	300	385	1.2	625.1	625.1	625.1	0.0
L	29,942	412	400	1.1	629.7	629.7	629.7	0.0
M	31,662	430	429	1.0	633.1	633.1	633.1	0.0

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

KIRCHNER CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
LITTLE SUAMICO RIVER									
A	5,909	151	1,917	2.9	721	585.7	585.7	585.8	0.1
B	7,091	166	1,234	4.5	0	586.7	586.7	586.8	0.1
C	8,229	188	1,311	4.3	0	587.7	587.7	587.8	0.1
D	8,654	292	2,735	2.0	368	589.5	589.5	589.6	0.1
E	9,896	738	5,262	1.1	0	590.8	590.8	590.9	0.1
F	13,662	629	2,344	2.4	0	593.3	593.3	593.4	0.1
G	17,941	352	1,959	2.9	62	598.6	598.6	598.7	0.1
H	19,087	443	1,968	2.9	0	600.4	600.4	600.5	0.1
I	24,990	137	1,312	4.3	104	617.4	617.4	617.5	0.1
J	25,368	934	4,928	1.1	0	619.4	619.4	619.5	0.1
K	29,638	729	1,959	2.8	0	630.3	630.3	630.4	0.1
L	32,846	665	2,652	2.0	85	636.6	636.6	636.7	0.1
M	33,146	808	5,621	1.0	0	640.3	640.3	640.4	0.1
N	35,119	354	1,835	2.9	0	643.1	643.1	643.2	0.1
O	35,692	597	1,753	3.0	0	644.7	644.7	644.7	0.0
P	39,335	737	3,274	1.6	0	648.6	648.6	648.6	0.0
Q	42,989	528	2,608	2.0	0	654.2	654.2	654.2	0.0
R	47,586	467	1,552	3.4	0	663.1	663.1	663.1	0.0
S	52,513	525	2,185	2.4	0	672.1	672.1	672.1	0.0
T	57,059	306	1,028	5.1	0	688.5	688.5	688.5	0.0

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE SUAMICO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
LITTLE SUAMICO RIVER (CONTINUED)									
U	59,132	703	2,498	2.1	0	694.8	694.8	694.8	0.0
V	65,124	273	1,819	2.7	0	714.3	714.3	714.3	0.0
W	68,166	417	1,294	3.8	0	720.0	720.0	720.0	0.0
X	69,347	450	2,694	1.4	0	726.9	726.9	726.9	0.0
Y	71,558	508	2,736	1.4	0	727.9	727.9	727.9	0.0
Z	76,992	552	2,647	1.4	0	732.4	732.4	732.4	0.0
AA	80,571	459	2,592	1.5	0	736.4	736.4	736.4	0.0
AB	82,946	546	1,737	2.2	0	737.7	737.7	737.7	0.0
AC	85,086	385	1,414	2.7	0	741.4	741.4	741.4	0.0
AD	86,624	413	2,298	1.1	0	746.7	746.7	746.7	0.0
AE	89,333	253	706	3.7	0	755.1	755.1	755.1	0.0
AF	91,723	238	573	4.5	0	762.1	762.1	762.1	0.0
AG	93,201	204	1,821	2.1	0	769.4	769.4	769.5	0.1
AH	95,225	230	1,892	2.9	223	771.4	771.4	771.5	0.1
AI	97,526	201	773	4.1	0	782.2	782.2	782.3	0.1
AJ	100,583	624	1,425	2.0	0	788.9	788.9	789.0	0.1
AK	101,038	442	1,763	1.4	0	789.9	789.9	790.0	0.1
AL	102,155	489	1,495	1.2	191	790.9	790.9	791.0	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE SUAMICO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
LITTLE SUAMICO RIVER (CONTINUED)									
AM	103,448	196	1,964	0.6	609	793.1	793.1	793.2	0.1
AN	104,073	391	631	0.7	0	793.4	793.4	793.5	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE SUAMICO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MCCASLIN BROOK								
A	19,802	184	265	1.3	1,174.4	1,174.4	1,174.4	0.0
B	20,886	61	77	4.4	1,181.3	1,181.3	1,181.3	0.0
C	21,124	69	80	4.2	1,184.7	1,184.7	1,184.7	0.0
D	21,793	52	57	6.0	1,191.5	1,191.5	1,191.5	0.0
E	22,213	91	85	4.0	1,198.2	1,198.2	1,198.2	0.0
F	22,906	226	339	1.0	1,205.4	1,205.4	1,205.4	0.0
G	23,435	283	236	1.4	1,206.7	1,206.7	1,206.7	0.0
H	24,270	149	215	1.6	1,208.1	1,208.1	1,208.1	0.0
I	25,739	360	409	0.8	1,209.1	1,209.1	1,209.1	0.0
J	26,401	194	249	1.4	1,210.1	1,210.1	1,210.1	0.0
K	27,185	163	228	1.5	1,211.0	1,211.0	1,211.0	0.0
L	27,853	33	58	5.9	1,214.0	1,214.0	1,214.0	0.0
M	28,283	47	65	5.2	1,216.0	1,216.0	1,216.0	0.0
N	28,620	28	79	4.3	1,217.8	1,217.8	1,217.8	0.0
O	29,021	39	109	3.1	1,218.8	1,218.8	1,218.8	0.0
P	29,239	57	81	4.2	1,219.2	1,219.2	1,219.2	0.0
Q	30,033	85	145	2.4	1,219.8	1,219.8	1,219.8	0.0
R	30,922	59	117	2.9	1,222.3	1,222.3	1,222.3	0.0
S	31,824	60	135	2.5	1,224.0	1,224.0	1,224.0	0.0
T	32,566	75	129	2.6	1,226.0	1,226.0	1,226.0	0.0
U	33,334	121	173	2.0	1,228.4	1,228.4	1,228.4	0.0

[1]Feet above confluence with North Branch Oconto River

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MCCASLIN BROOK (CONTINUED)								
V	34,175	153	245	1.4	1,230.5	1,230.5	1,230.5	0.0
W	35,245	74	142	2.4	1,231.9	1,231.9	1,231.9	0.0
X	35,860	118	202	1.7	1,232.6	1,232.6	1,232.6	0.0
Y	36,524	126	208	1.6	1,233.5	1,233.5	1,233.5	0.0
Z	37,369	204	322	1.1	1,234.3	1,234.3	1,234.3	0.0
AA	38,678	95	161	2.1	1,235.4	1,235.4	1,235.4	0.0
AB	39,045	70	317	1.1	1,237.4	1,237.4	1,237.4	0.0
AC	43,770	192	500	0.6	1,238.6	1,238.6	1,238.7	0.1
AD	47,703	158	297	0.8	1,245.8	1,245.8	1,245.8	0.0
AE	48,437	89	250	1.0	1,247.1	1,247.1	1,247.1	0.0
AF	49,366	20	89	2.8	1,248.1	1,248.1	1,248.1	0.0
AG	50,508	55	100	2.5	1,249.7	1,249.7	1,249.7	0.0
AH	50,977	48	76	3.3	1,252.3	1,252.3	1,252.3	0.0
AI	51,918	84	146	1.7	1,255.6	1,255.6	1,255.6	0.0
AJ	52,672	39	69	3.6	1,260.8	1,260.8	1,260.8	0.0
AK	54,323	159	182	1.4	1,265.1	1,265.1	1,265.1	0.0
AL	55,746	135	185	1.3	1,267.6	1,267.6	1,267.6	0.0
AM	57,127	71	78	3.2	1,269.8	1,269.8	1,269.8	0.0
AN	58,540	159	180	1.4	1,273.5	1,273.5	1,273.5	0.0
AO	60,371	68	55	4.5	1,278.2	1,278.2	1,278.2	0.0

[1]Feet above confluence with North Branch Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

MCCASLIN BROOK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MCCASLIN BROOK (CONTINUED)								
AP	61,900	106	111	2.2	1,282.8	1,282.8	1,282.8	0.0
AQ	64,210	87	149	1.7	1,288.1	1,288.1	1,288.1	0.0
AR	66,587	311	221	1.1	1,294.6	1,294.6	1,294.6	0.0
AS	68,338	246	118	2.1	1,300.4	1,300.4	1,300.4	0.0
AT	69,723	165	195	1.3	1,305.7	1,305.7	1,305.7	0.0
AU	70,762	67	54	4.6	1,308.4	1,308.4	1,308.4	0.0
AV	71,115	166	364	0.7	1,309.4	1,309.4	1,309.4	0.0

[1]Feet above confluence with North Branch Oconto River

Table 23: Floodway Data *(continued)*

LOCATION		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (Feet NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE
OCONTO RIVER									
A	10,988	188	2,079	5.2	0	585.2	584.7[2]	584.8	0.1
B	12,133	211	2,308	4.7	30	585.3	585.3	585.4	0.1
C	12,355	241	2,499	4.3	0	586.1	586.1	586.2	0.1
D	13,342	400	3,100	3.5	0	586.4	586.4	586.5	0.1
E	15,279	400	3,100	3.5	0	586.9	586.9	587.0	0.1
F	16,354	244	2,420	4.5	39	587.6	587.6	587.7	0.1
G	16,513	246	2,420	4.5	37	587.8	587.8	587.9	0.1
H	17,019	189	1,670	6.5	31	587.8	587.8	587.9	0.1
I	17,209	198	2,170	4.9	42	587.9	587.9	588.0	0.1
J	17,915	341	3,200	3.4	59	588.2	588.2	588.3	0.1
K	20,533	1,811	10,800	1.0	0	588.7	588.7	588.8	0.1
L	23,007	700	5,120	2.1	0	589.5	589.5	589.6	0.1
M	25,379	527	4,220	2.6	0	590.1	590.1	590.2	0.1
N	25,779	428	2,960	5.5	0	590.1	590.1	590.2	0.1
O	26,366	640	4,120	4.4	0	590.5	590.5	590.6	0.1
P	27,111	289	2,914	4.5	254	590.8	590.8	590.9	0.1
Q	27,634	282	2,649	4.4	56	591.0	591.0	591.1	0.1
R	28,355	259	2,535	4.9	213	591.2	591.2	591.3	0.1
S	28,945	254	2,569	4.7	76	591.5	591.5	591.6	0.1
T	29,410	286	2,509	4.8	0	591.7	591.7	591.8	0.1
U	29,958	411	2,985	4.4	0	592.0	592.0	592.1	0.1

[1]Feet above outlet to Green Bay

[2]Elevation computed without consideration of backwater effects from Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WISCONSIN

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER *(CONTINUED)*									
V	32,384	1,276	5,019	2.2	0	592.8	592.8	592.9	0.1
W	34,388	1,232	4,957	2.2	0	593.1	593.1	593.2	0.1
X	35,989	2,586	10,870	1.0	0	593.5	593.5	593.6	0.1
Y	37,975	644	4,803	2.2	187	593.8	593.8	593.9	0.1
Z	40,164	490	4,111	2.6	0	594.3	594.3	594.4	0.1
AA	42,530	584	4,349	2.5	0	595.0	595.0	595.1	0.1
AB	44,500	847	5,288	2.0	0	595.5	595.5	595.6	0.1
AC	46,524	432	3,616	3.0	0	596.1	596.1	596.2	0.1
AD	48,178	356	3,038	3.6	0	596.7	596.7	596.8	0.1
AE	50,333	812	5,284	2.0	0	597.3	597.3	597.4	0.1
AF	52,441	206	4,652	2.3	317	598.6	598.6	598.7	0.1
AG	55,603	434	4,490	2.4	0	599.2	599.2	599.3	0.1
AH	58,290	314	3,168	2.1	0	599.6	599.6	599.7	0.1
AI	59,989	301	2,852	2.3	137	599.9	599.9	600.0	0.1
AJ	62,268	305	2,612	2.5	0	600.4	600.4	600.5	0.1
AK	65,675	199	1,835	3.6	0	601.4	601.4	601.5	0.1
AL	68,619	386	2,051	3.2	0	603.2	603.2	603.3	0.1
AM	73,118	233	1,533	4.3	0	605.9	605.9	606.0	0.1
AN	73,571	241	2,431	2.7	24	608.5	608.5	608.6	0.1
AO	74,661	74	822	8.0	62	623.2	623.2	623.3	0.1
AP	82,362	735	6,482	1.0	0	624.4	624.4	624.5	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER *(CONTINUED)*									
AQ	85,472	1,095	7,874	0.8	0	624.5	624.5	624.6	0.1
AR	88,897	712	3,048	2.2	188	625.0	625.0	625.1	0.1
AS	91,455	602	2,720	2.4	84	626.8	626.8	626.9	0.1
AT	93,989	291	1,631	4.0	0	628.9	628.9	629.0	0.1
AU	96,860	290	1,881	3.5	108	631.2	631.2	631.3	0.1
AV	99,713	204	1,436	4.6	0	633.5	633.5	633.6	0.1
AW	103,007	1,704	3,212	2.1	134	639.3	639.3	639.4	0.1
AX	105,109	128	636	10.4	36	664.0	664.0	664.1	0.1
AY	105,510	30	407	16.2	40	673.3	673.3	673.3	0.0
AZ	106,056	367	3,451	1.6	41	706.6	706.6	706.6	0.0
BA	106,179	248	2,361	2.4	27	706.7	706.7	706.7	0.0
BB	106,263	275	2,363	2.4	0	706.7	706.7	706.7	0.0
BC	107,584	310	2,080	2.7	29	707.1	707.1	707.1	0.0
BD	111,184	498	5,813	1.1	89	733.2	733.2	733.3	0.1
BE	113,024	528	6,325	1.0	0	733.2	733.2	733.3	0.1
BF	115,716	587	5,813	1.1	0	733.2	733.2	733.3	0.1
BG	118,512	432	3,549	1.9	0	733.5	733.5	733.6	0.1
BH	120,956	321	2,514	2.6	0	734.2	734.2	734.3	0.1
BI	123,923	499	3,268	2.0	0	734.9	734.9	735.0	0.1
BJ	125,950	327	4,094	1.6	357	736.3	736.3	736.4	0.1
BK	128,470	650	4,406	1.5	0	736.6	736.6	736.7	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER *(CONTINUED)*									
BL	131,506	728	4,627	1.4	244	737.3	737.3	737.4	0.1
BM	134,299	580	3,206	2.1	45	738.0	738.0	738.1	0.1
BN	136,562	338	4,670	1.4	246	738.4	738.4	738.5	0.1
BO	136,717	419	6,020	1.1	361	739.0	739.0	739.1	0.1
BP	139,976	1,083	7,282	0.9	75	739.3	739.3	739.4	0.1
BQ	142,580	448	3,522	1.9	0	739.8	739.8	739.9	0.1
BR	145,104	408	3,480	1.9	0	740.2	740.2	740.3	0.1
BS	147,030	403	2,696	2.4	0	740.6	740.6	740.7	0.1
BT	150,016	352	2,642	2.5	0	741.5	741.5	741.6	0.1
BU	151,942	152	2,845	2.3	252	743.5	743.5	743.6	0.1
BV	154,470	296	2,502	2.6	0	744.2	744.2	744.3	0.1
BW	158,679	209	1,347	4.9	0	750.0	750.0	750.1	0.1
BX	162,093	135	1,057	6.2	0	755.1	755.1	755.2	0.1
BY	189,902	581	3,737	1.8	0	774.1	774.1	774.2	0.1
BZ	194,165	520	3,393	1.9	0	775.2	775.2	775.3	0.1
CA	196,602	522	3,188	2.0	28	775.9	775.9	776.0	0.1
CB	198,693	259	3,281	2.0	181	776.5	776.5	776.6	0.1
CC	199,522	181	3,076	2.1	346	777.3	777.3	777.4	0.1
CD	201,987	679	3,272	2.0	60	778.2	778.2	778.3	0.1
CE	205,193	841	4,556	1.4	0	778.9	778.9	779.0	0.1
CF	214,011	1,929	10,240	0.6	0	779.7	779.7	779.8	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER *(CONTINUED)*									
CG	222,197	1,764	8,403	0.8	0	780.7	780.7	780.8	0.1
CH	228,141	605	3,825	1.6	0	781.8	781.8	781.9	0.1
CI	230,118	195	3,548	1.7	241	783.0	783.0	783.1	0.1
CJ	233,139	510	5,753	1.1	883	783.5	783.5	783.6	0.1
CK	284,962	1,700	6,242	1.0	0	794.2	794.2	794.3	0.1
CL	294,267	394	9,187	0.6	1,102	796.1	796.1	796.2	0.1
CM	295,053	1,413	7,685	0.8	168	796.5	796.5	796.6	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH BRANCH OCONTO RIVER									
CN	307,101	1,165	3,362	0.7	0	798.0	798.0	798.0	0.0
CO	329,153	1,420	3,341	0.7	0	802.2	802.2	802.3	0.1
CP	340,664	265	1,146	2.2	0	806.5	806.5	806.6	0.1
CQ	344,413	407	3,755	0.6	43	810.4	810.4	810.5	0.1
CR	353,258	88	743	3.3	0	813.5	813.5	813.6	0.1
CS	361,637	130	1,102	2.2	153	817.0	817.0	817.1	0.1
CT	378,733	74	503	4.8	0	834.8	834.8	834.9	0.1
CU	382,949	143	542	3.5	0	841.6	841.6	841.7	0.1
CV	387,029	121	612	3.2	0	850.0	850.0	850.1	0.1
CW	390,405	130	639	2.8	0	854.2	854.2	854.3	0.1
CX	395,934	87	1,016	1.7	153	857.1	857.1	857.2	0.1
CY	407,377	81	1,317	1.3	159	873.8	873.8	873.9	0.1
CZ	410,701	118	412	4.2	0	886.4	886.4	886.5	0.1
DA	414,073	58	303	5.7	36	912.7	912.7	912.8	0.1
DB	418,103	402	929	1.8	0	918.7	918.7	918.8	0.1
DC	422,735	76	873	2.0	210	924.2	924.2	924.3	0.1
DD	426,709	290	1,302	1.3	52	925.4	925.4	925.5	0.1
DE	431,911	79	299	5.7	0	948.7	948.7	948.8	0.1
DF	438,309	92	332	5.0	0	1,027.0	1,027.0	1,027.1	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH BRANCH OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH BRANCH OCONTO RIVER (*CONTINUED*)									
DG	442,472	106	453	3.7	0	1,043.3	1,043.3	1,043.4	0.1
DH	450,188	192	586	2.8	0	1,062.4	1,062.4	1,062.5	0.1
DI	454,815	164	675	2.4	0	1,073.0	1,073.0	1,073.1	0.1
DJ	458,160	575	1,383	1.2	0	1,075.2	1,075.2	1,075.3	0.1
DK	460,880	76	319	5.2	0	1,083.9	1,083.9	1,084.0	0.1
DL	461,050	233	1,304	1.2	0	1,087.1	1,087.1	1,087.2	0.1
DM	510,280	147	468	2.6	29	1,144.6	1,144.6	1,144.7	0.1
DN	513,671	128	505	2.4	0	1,148.6	1,148.6	1,148.7	0.1
DO	516,401	128	707	1.6	96	1,150.2	1,150.2	1,150.3	0.1
DP	516,917	220	1,675	0.7	68	1,152.1	1,152.1	1,152.2	0.1
DQ	517,372	98	554	2.0	0	1,152.2	1,152.2	1,152.3	0.1
DR	521,674	111	278	4.0	0	1,164.7	1,164.7	1,164.7	0.0
DS	524,080	194	468	2.4	0	1,184.0	1,184.0	1,184.0	0.0

[1]Feet above outlet to Green Bay

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER TRIBUTARY NO. 2								
A	2,203	289	28	1.2	596.0	596.0	596.0	0.0
B	2,828	639	632	0.1	598.1	598.1	598.1	0.0
C	3,402	432	107	0.3	598.2	598.2	598.2	0.0

[1]Feet above confluence with Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER TRIBUTARY NO. 2

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER TRIBUTARY NO. 3									
A	550	37	4,220	2.6	0	590.2	590.0[2]	590.1	0.1
B	680	139	550	0.1	142	593.0	593.0	593.1	0.1
C	1,198	229	872	0.0	238	593.0	593.0	593.1	0.1

[1]Feet above confluence with Oconto River

[2]Elevation computed without consideration of backwater effects from Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER TRIBUTARY NO. 3

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OCONTO RIVER TRIBUTARY NO. 22								
A	674	31	48	5.9	641.0	641.0	641.0	0.0
B	1,244	35	98	2.9	652.1	652.1	652.1	0.0
C	2,161	62	127	2.2	657.9	657.9	657.9	0.0
D	3,270	132	86	3.3	664.5	664.5	664.5	0.0
E	4,000	29	44	6.5	685.7	685.7	685.7	0.0
F	4,343	39	72	3.9	696.6	696.6	696.6	0.0
G	4,782	42	59	4.8	709.8	709.8	709.8	0.0
H	5,067	30	48	5.9	718.5	718.5	718.5	0.0
I	5,549	32	52	5.5	729.8	729.8	729.8	0.0
J	5,996	23	43	6.6	737.7	737.7	737.7	0.0
K	6,402	64	120	2.4	741.5	741.5	741.5	0.0

[1] Feet above confluence with Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

OCONTO RIVER TRIBUTARY NO. 22

Table 23: Floodway Data *(continued)*

LOCATION		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (Feet NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE
PENSAUKEE RIVER									
A	5,781	795	6,362	1.3	0	588.5	588.5	588.6	0.1
B	6,517	756	5,449	1.0	0	588.7	588.7	588.8	0.1
C	7,153	418	3,825	2.2	662	589.4	589.4	589.5	0.1
D	7,376	694	5,595	1.5	214	591.8	591.8	591.9	0.1
E	7,922	1,173	6,995	1.2	28	592.1	592.1	592.2	0.1
F	8,920	757	3,893	2.2	0	592.9	592.9	593.0	0.1
G	13,450	215	1,921	4.4	0	595.5	595.5	595.6	0.1
H	13,785	500	3,675	2.3	0	596.4	596.4	596.4	0.0
I	19,896	840	4,503	1.3	0	600.2	600.2	600.2	0.0
J	33,365	315	4,470	1.4	0	605.7	605.7	605.7	0.0
K	46,502	246	1,128	7.4	0	615.2	615.2	615.2	0.0
L	48,247	895	3,013	2.7	0	619.9	619.9	619.9	0.0
M	51,060	774	3,168	2.6	0	624.4	624.4	624.4	0.0
N	53,092	1,795	3,765	2.2	0	626.8	626.8	626.8	0.0
O	55,078	441	1,621	5.0	0	631.8	631.8	631.8	0.0
P	56,399	314	1,757	4.6	0	635.0	635.0	635.0	0.0
Q	58,542	512	1,978	4.1	0	638.9	638.9	638.9	0.0
R	60,505	616	2,627	3.0	0	643.4	643.4	643.4	0.0
S	65,181	193	1,304	6.0	0	652.1	652.1	652.1	0.0
T	65,774	182	1,474	5.3	0	655.0	655.0	655.0	0.0

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WISCONSIN

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: PENSAUKEE RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
PENSAUKEE RIVER (CONTINUED)									
U	67,462	521	2,288	3.4	0	656.8	656.8	656.8	0.0
V	69,696	674	1,830	4.3	0	662.2	662.2	662.2	0.0
W	70,255	156	1,071	7.3	0	663.7	663.7	663.7	0.0
X	70,556	287	2,203	3.6	0	668.8	668.8	668.8	0.0
Y	72,259	663	3,616	2.2	0	669.7	669.7	669.7	0.0
Z	74,177	616	3,436	2.3	0	671.2	671.2	671.2	0.0
AA	76,455	703	2,614	3.0	0	672.7	672.7	672.7	0.0
AB	77,961	788	1,534	5.1	0	674.1	674.1	674.1	0.0
AC	80,857	551	2,120	3.7	0	678.4	678.4	678.4	0.0
AD	83,823	991	4,696	1.7	0	683.9	683.9	683.9	0.0
AE	84,296	468	3,303	2.4	0	684.7	684.7	684.7	0.0
AF	89,559	795	5,034	1.6	0	687.8	687.8	687.8	0.0
AG	91,496	388	2,606	3.0	0	689.1	689.1	689.1	0.0
AH	95,095	562	2,872	2.8	0	691.5	691.5	691.5	0.0
AI	98,945	863	3,703	2.1	0	696.2	696.2	696.2	0.0
AJ	102,933	498	3,185	2.5	0	698.5	698.5	698.5	0.0
AK	104,070	315	2,536	3.1	0	699.5	699.5	699.5	0.0
AL	104,954	567	2,791	2.8	0	701.4	701.4	701.4	0.0

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

PENSAUKEE RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
PENSAUKEE RIVER (CONTINUED)									
AM	109,595	900	6,596	1.2	0	704.4	704.4	704.4	0.0
AN	113,148	523	4,237	1.9	0	705.9	705.9	705.9	0.0
AO	115,709	465	2,225	1.7	0	706.2	706.2	706.2	0.0
AP	118,355	515	2,999	1.3	0	707.4	707.4	707.4	0.0
AQ	119,844	405	1,951	2.0	0	707.9	707.9	707.9	0.0
AR	121,154	250	930	4.1	0	708.9	708.9	708.9	0.0
AS	124,018	277	1,455	2.6	0	713.1	713.1	713.1	0.0
AT	126,965	448	1,816	2.1	0	715.2	715.2	715.2	0.0
AU	128,515	129	574	6.6	0	720.5	720.5	720.5	0.0
AV	129,471	104	554	6.9	0	724.1	724.1	724.1	0.0
AW	130,401	291	978	3.9	0	726.9	726.9	726.9	0.0
AX	132,484	270	947	4.0	0	730.5	730.5	730.5	0.0
AY	134,357	197	1,210	3.1	0	733.4	733.4	733.4	0.0
AZ	135,164	570	2,680	1.4	0	734.3	734.3	734.3	0.0
BA	135,781	892	4,910	0.8	0	734.5	734.5	734.5	0.0
BB	142,137	1,349	5,246	0.7	0	735.1	735.1	735.1	0.0
BC	144,664	604	1,229	3.1	0	736.7	736.7	736.7	0.0
BD	147,092	646	2,211	1.7	0	740.3	740.3	740.3	0.0

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

PENSAUKEE RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
PENSAUKEE RIVER (CONTINUED)									
BE	149,377	341	1,365	2.8	0	743.8	743.8	743.8	0.0
BF	150,942	230	908	4.2	0	746.0	746.0	746.0	0.0
BG	151,742	329	1,477	2.6	0	748.1	748.1	748.1	0.0
BH	153,442	191	933	4.1	0	751.8	751.8	751.8	0.0
BI	154,946	322	1,100	3.5	0	754.9	754.9	754.9	0.0
BJ	156,589	379	1,376	2.8	0	758.7	758.7	758.7	0.0
BK	157,430	160	1,062	3.4	42	759.7	759.7	759.8	0.1
BL	157,706	174	2,400	1.5	98	762.3	762.3	762.4	0.1
BM	169,622	231	1,522	2.2	49	772.4	772.4	772.5	0.1

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

PENSAUKEE RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SOUTH BRANCH OCONTO RIVER								
A	666	150	904	2.1	796.9	796.9	797.0	0.1
B	6,053	510	1,536	1.1	798.8	798.8	798.9	0.1

[1]Feet above confluence with Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH BRANCH OCONTO RIVER

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SPRING CREEK								
A	1,082	147	173	2.2	644.4	644.4	644.4	0.0
B	2,280	88	86	4.4	648.3	648.3	648.3	0.0
C	3,386	215	274	1.4	651.3	651.3	651.3	0.0
D	5,303	242	310	1.2	655.8	655.8	655.8	0.0
E	6,695	234	228	1.7	657.9	657.9	657.9	0.0
F	7,854	159	206	1.8	661.2	661.2	661.2	0.0
G	9,450	272	260	1.5	666.8	666.8	666.8	0.0
H	10,644	233	338	1.1	669.3	669.3	669.3	0.0
I	11,694	197	294	1.3	670.4	670.4	670.4	0.0
J	12,764	339	327	1.2	671.9	671.9	671.9	0.0
K	15,188	226	251	1.5	677.0	677.0	677.0	0.0
L	16,458	142	188	2.0	681.2	681.2	681.2	0.0
M	17,738	169	280	1.4	683.6	683.6	683.6	0.0
N	20,859	652	1,114	0.3	690.1	690.1	690.1	0.0
O	22,096	606	586	0.7	691.3	691.3	691.3	0.0
P	24,333	361	413	0.9	695.4	695.4	695.4	0.0
Q	25,766	409	328	1.2	698.3	698.3	698.3	0.0
R	27,733	108	199	1.9	703.4	703.4	703.4	0.0
S	28,767	274	471	0.8	705.8	705.8	705.8	0.0
T	29,807	488	389	0.5	706.8	706.8	706.8	0.0
U	31,774	107	104	1.8	711.8	711.8	711.8	0.0
V	33,221	28	44	4.3	713.9	713.9	713.9	0.0

[1]Feet above confluence with Pensaukee River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SPRING CREEK (CONTINUED)								
W	34,136	549	1,346	0.1	717.1	717.1	717.1	0.0

[1]Feet above confluence with Pensaukee River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SPRING CREEK TRIBUTARY NO. 6								
A	1,117	92	54	0.7	706.9	706.9	706.9	0.0
B	2,167	263	79	0.5	711.3	711.3	711.3	0.0
C	3,341	52	27	1.4	715.1	715.1	715.1	0.0
D	3,481	29	25	1.5	715.9	715.9	715.9	0.0
E	3,862	32	27	1.4	717.2	717.2	717.2	0.0

[1]Feet above confluence with Spring Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK TRIBUTARY NO. 6

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TIBBET CREEK								
A	7,146	336	941	1.7	588.3	588.3	588.3	0.0
B	8,490	451	1,043	1.5	589.3	589.3	589.3	0.0
C	11,032	1,272	3,563	0.4	593.6	593.6	593.6	0.0
D	13,925	366	628	2.5	596.2	596.2	596.2	0.0
E	15,339	416	1,066	1.5	597.2	597.2	597.2	0.0
F	16,503	160	475	3.3	600.4	600.4	600.4	0.0
G	17,851	437	1,097	1.4	602.8	602.8	602.8	0.0
H	19,036	158	368	4.3	608.9	608.9	608.9	0.0
I	20,205	210	796	2.0	613.4	613.4	613.4	0.0
J	21,181	209	595	2.6	615.1	615.1	615.1	0.0
K	23,079	240	641	2.4	618.5	618.5	618.5	0.0
L	24,262	228	821	1.9	621.5	621.5	621.5	0.0
M	25,828	780	2,041	0.5	623.8	623.8	623.8	0.0
N	28,170	1,108	1,895	0.6	624.3	624.3	624.3	0.0
O	30,621	864	1,349	0.8	627.1	627.1	627.1	0.0

[1]Feet above outlet to Green Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

TIBBET CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TOWN CREEK								
A	1,799	29	35	4.9	925.8	925.8	925.8	0.0
B	2,091	142	87	2.0	936.3	936.3	936.3	0.0
C	2,531	65	123	1.4	940.8	940.8	940.8	0.0
D	3,102	57	52	3.3	942.2	942.2	942.2	0.0
E	3,750	30	33	5.2	949.7	949.7	949.7	0.0
F	4,214	154	126	1.4	954.4	954.4	954.4	0.0
G	4,670	145	117	1.5	955.0	955.0	955.0	0.0
H	5,217	49	86	1.5	956.8	956.8	956.8	0.0
I	5,426	89	343	0.4	961.4	961.4	961.4	0.0
J	5,925	370	984	0.1	961.8	961.8	961.8	0.0
K	6,990	423	766	0.2	962.4	962.4	962.4	0.0
L	7,787	204	416	0.3	963.4	963.4	963.4	0.0
M	8,495	150	198	0.3	963.4	963.4	963.4	0.0
N	8,833	38	19	3.3	963.6	963.6	963.6	0.0
O	9,420	91	130	0.5	967.9	967.9	967.9	0.0
P	9,901	212	407	0.2	973.4	973.4	973.4	0.0
Q	10,465	133	184	0.3	973.4	973.4	973.4	0.0
R	11,389	100	186	0.3	980.4	980.4	980.4	0.0

[1]Feet above confluence with North Branch Oconto River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

OCONTO COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

TOWN CREEK

Table 23: Floodway Data *(continued)*

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
WAUPEE CREEK								
A	1,589	175	603	1.8	860.3	860.3	860.3	0.0
B	3,263	202	518	2.1	861.7	861.7	861.7	0.0
C	4,142	181	650	1.7	862.7	862.7	862.7	0.0
D	5,042	350	1,291	0.9	863.2	863.2	863.2	0.0
E	8,602	393	1,019	1.1	864.7	864.7	864.7	0.0
F	9,981	304	985	0.8	865.3	865.3	865.3	0.0
G	11,282	314	794	1.0	866.3	866.3	866.3	0.0
H	47,817	69	90	2.9	918.3	918.3	918.3	0.0
I	48,026	102	127	2.0	919.3	919.3	919.3	0.0
J	48,202	24	42	3.7	920.7	920.7	920.7	0.0
K	48,721	73	58	2.7	922.4	922.4	922.4	0.0
L	50,269	48	54	2.9	924.3	924.3	924.3	0.0
M	51,544	45	66	2.3	926.4	926.4	926.4	0.0
N	52,588	125	127	1.2	927.9	927.9	927.9	0.0
O	53,569	83	95	1.6	928.6	928.6	928.6	0.0
P	54,791	116	108	1.4	930.7	930.7	930.7	0.0
Q	55,883	142	156	1.0	931.3	931.3	931.3	0.0
R	56,987	261	191	0.8	932.3	932.3	932.3	0.0
S	58,378	125	168	0.9	933.0	933.0	933.0	0.0
T	59,436	60	78	2.0	933.4	933.4	933.4	0.0
U	60,928	71	105	1.5	935.0	935.0	935.0	0.0
V	61,495	149	334	0.5	937.1	937.1	937.1	0.0

[1]Feet above outlet to North Branch Oconto River