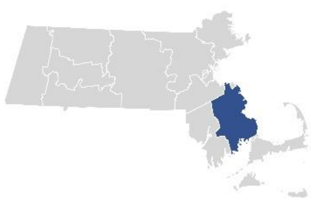
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 2 OF 5



PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
ABINGTON, TOWN OF	250259	MARSHFIELD, TOWN OF	250273
BRIDGEWATER, TOWN OF	250260	MATTAPOISETT, TOWN OF	255214
BROCKTON, CITY OF	250261	MIDDLEBOROUGH, TOWN OF	250275
CARVER, TOWN OF	250262	NORWELL, TOWN OF	250276
DUXBURY, TOWN OF	250263	PEMBROKE, TOWN OF	250277
EAST BRIDGEWATER, TOWN OF	250264	PLYMOUTH, TOWN OF	250278
HALIFAX, TOWN OF	250265	PLYMPTON, TOWN OF	250279
HANOVER, TOWN OF	250266	ROCHESTER, TOWN OF	250280
HANSON, TOWN OF	250267	ROCKLAND, TOWN OF	250281
HINGHAM, TOWN OF	250268	SCITUATE, TOWN OF	250282
HULL, TOWN OF	250269	WAREHAM, TOWN OF	255223
KINGSTON, TOWN OF	250270	WEST BRIDGEWATER, TOWN OF	250284
LAKEVILLE, TOWN OF	250271	WHITMAN, TOWN OF	250285
MARION, TOWN OF	255213		

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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
Indian Head Brook	Outlet of Wampatuck Pond	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Indian Head Brook	Confluence with Indian Head River	Approximately 45 feet upstream of Liberty Street	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	6/1/1985	AE w/Floodway	Starting water-surface elevations were from Indian Head River profiles assuming coincident peaks.
Indian Head River	Confluence with North River	Hanson/ Hanover corporate limits	Log-Pearson type III flood frequency analysis (WRC 1977)	HEC-2 (USACE 1974)	1/1/1978	AE w/Floodway	Data for analysis were from USGS streamgage 01105730 (Indian Head River in Hanover) (USGS 1976). Discharges agree closely with adjacent studies. Upstream and downstream of streamgage, discharges were transposed based on drainage-area ratios. Starting water-surface elevations for upper reach were from profiles for lower reach.

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
Iron Mine Brook	Confluence with North River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Island Creek and Zone A tributaries	Mouth at Kingston Bay	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Jones River	Limit of coastal flooding below Elm Street	Grove Street	Log-Pearson type III flood frequency analysis (IACWD 1982)	HEC-RAS 5.0	2/1/2017	AE w/Floodway	Flood frequency analysis used USGS streamgage 01105870 (Jones River at Kingston) (Zarriello 2017). At-site estimates were weighted by expected moments algorithm (Cohn et al. 1997, 2001; Griffis et al. 2004), considering regression equations and inverse variance. Computations were performed in PeakFQ (Veilleux et al. 2014). Peakflows were transferred upstream of the gage using drainage-area ratios (Johnstone and Cross 1949). The most upstream flow-change location used drainage-area-ratio estimates despite being outside the range of the equations because alternative methods (i.e., regression equations) weren't applicable. Drainage areas calculated for this method included the Silver Lake watershed. This watershed is not usually considered to contribute to Jones River, but Silver Lake water level data from 1996 to 2016 (MADER 2016) indicated that Silver Lake overtopped Forge Pond Dam on 12 of 19 annual peakflow dates. Starting water-surface elevations were from normal depth. Structures and underwater portions of cross sections were surveyed. Overbank portions of cross sections were obtained from lidar topography (USGS 2011, 2014a). Ineffective flow was designated at structures. Hydraulic model assumed steady, subcritical flow; expansion (0.3 to 0.8) and contraction (0.1 to 0.5) coefficients; and no minor losses. Structures were modeled using the same methods for all profiles. Roughness values were selected based on field notes, photographs, and aerial imagery.
Jones River	Grove Street	Silver Lake Dam	HEC-1 (USACE 1973)	HEC-2 (USACE 1974)	5/1/1983	AE w/Floodway	HEC-1 model was calibrated to March 1968 flood, slightly greater than a 10-percent-annual-chance event at USGS streamgage 01105870. Rainfall hydrographs were from USWB (1961).

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
Jones River and Zone A tributaries	Outlet of Silver Lake	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Jones River Brook	Confluence with Jones River	Kingston corporate limits	HEC-1 (USACE 1973)	HEC-2 (USACE 1974)	5/1/1983	AE w/Floodway	HEC-1 model was calibrated to March 1968 flood, slightly greater than a 10-percent-annual-chance event at USGS streamgage 01105870. Rainfall hydrographs were from USWB (1961). Starting water-surface elevations were from the slope-area method.
Jones River Brook and Zone A tributaries	Kingston corporate limits on Jones River Brook	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Jones River Tributary A	Confluence with Jones River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Jones River Tributary B	Confluence with Jones River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Kings Pond	Entire shoreline	Entire shoreline	Rainfall hydrograph	Storage rating curve	6/1/1983	AE	

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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 Pudding Brook	Limit of coastal flooding	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Littles Creek	Confluence with South River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Long Pond	Entire shoreline	Entire shoreline	Regression equations (Zarriello et al. 2012)	HEC-RAS 4.1.0 (Brunner 2010)	7/1/2014	AE	Assawompset and Long Ponds were modeled as a continuous river system with Nemasket River. Regression equations were used to calculate peakflows at the outlet of Long Pond, the outlet of Assawompset Pond, and along Nemasket River to the mouth. Water-surface elevations for Long Pond were computed using a step-backwater model for the reach between Assawompset and Long Ponds and using high-water data collected at both ponds to verify the close hydraulic connection between them.
Longwater Brook	Confluence with Drinkwater River	Unnamed dam approximately 5,200 feet upstream of confluence with Drinkwater River	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	7/1/1980	AE w/Floodway	Starting water-surface elevations were from Drinkwater River profiles.
Longwater Brook and Zone A tributaries	Outlet of Hackett Pond	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Maple Springs Brook and Zone A tributaries	Confluence of Maple Springs Brook with Agawam River	Points of one square mile of drainage area	Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Matfield River	Confluence with Taunton River	275 feet upstream of Bridge Street	Drainage-area ratio	HEC-2 (USACE 1974)	11/1/1996	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Starting water-surface elevations were from Taunton River profiles.
Mattapoisett River	100 feet downstream of Wolf Island Road	Approximately 6,062 feet upstream of Snipatuit Road	Regression equations	HEC-2 (USACE 1974)	5/1/1980	AE w/Floodway	Rating curve was developed for outlet of Snipatuit Pond. Rainfall runoff for 10-, 2-, and 1-percent-annual-chance floods was added to base water-surface elevation, and corresponding outlet floods were determined from rating curve. 0.2-percent-annual-chance flood was extrapolated. Peakflows for remainder of watershed were calculated from regression equations. 1-percent-annual-chance flow from Snipatuit Pond was added to all flows from remainder of watershed to determine final flows. Starting water-surface elevations were from the slope-are method. Cross section data were obtained from field survey and photogrammetric maps.

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
Mattapoisett River and Zone A tributaries	Limit of coastal flooding on Mattapoisett River	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Meadow Brook (East Bridgewater)	Central Street	East Bridgewater corporate limits	Drainage-area ratio	HEC-2 (USACE 1974)	11/1/1977	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7.
Meadow Brook (Whitman)	Whitman corporate limits	Approximately 2,658 feet upstream of Auburn Street	Regression equations	HEC-2 (USACE 1974)	1/1/1980	AE w/Floodway	Starting water-surface elevations were from adjacent studies.
Meadow Brook Tributary	Confluence with Meadow Brook	4,124 feet upstream of Auburn Street	Regression equations	HEC-2 (USACE 1974)	1/1/1980	AE w/Floodway	Starting water-surface elevations were from Meadow Brook profiles.

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
Mile Brook	Approximately 150 feet south of Kingston corporate limits	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Mile Brook	Confluence with Halls Brook	Approximately 150 feet south of Kingston corporate limits	HEC-1 (USACE 1973)	HEC-2 (USACE 1974)	5/1/1983	AE w/Floodway	HEC-1 model was calibrated to March 1968 flood, slightly greater than a 10-percent-annual-chance event at USGS streamgage 01105870. Rainfall hydrographs were from USWB (1961). Starting water-surface elevations were from the slope-area method.
Nemasket River	Confluence with Taunton River	Assawompset Pond Dam	Regression equations (Zarriello et al. 2012)	HEC-RAS 4.1.0 (Brunner 2010)	7/1/2014	AE w/Floodway	Regression equations were used to calculate peakflows at the outlet of Long Pond, the outlet of Assawompset Pond, and along Nemasket River to the mouth. Most underwater cross-section data and structure elevations were from field surveys in November and December 2012 and April 2013. Underwater cross-section data for selected cross sections were obtained from survey data collected for the previous effective study. Overbank cross-section data were from lidar topography (FEMA 2011, USGS 2011). Starting water-surface elevations were from normal depth, using a slope of 0.00015.

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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
North River Tributary A	Confluence with North River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
North Tributary to Shumatuscacant River	Confluence with Shumatuscacant River	Approximately 1,600 feet upstream of Wales Street	Regression equations (Johnson and Tasker 1974)	HEC-2 (USACE 1974)	9/1/1977	AE	0.2-percent-annual-chance peakflows (not available from regression equations) were extrapolated.
Northern Branch of Ben Mann Brook	Hingham Street	Approximately 950 feet upstream of Hingham Street	unknown	unknown	6/16/2008	AE	
Oldham Pond	Entire shoreline	Entire shoreline	Reservoir routing	unknown	1/1/1978	AE	10-, 2-, and 1-percent-annual-chance peakflows into Oldham and Furnace Ponds (CDM 1964) were routed through the ponds. 0.2-percent-annual-chance peakflows were extrapolated.
Palmer Mill Brook	Confluence with Winnetuxet River	Approximately 1,660 feet upstream of Hayward Street	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	3/1/1980	AE w/Floodway	Starting water-surface elevations were from Winnetuxet River profiles.

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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
Pine Brook and Zone A tributaries	Confluence of Pine Brook with Jones River	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Plymouth River	Cushing Pond Dam	Approximately 2,068 feet upstream of Old Ward Street	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	7/1/1983	AE w/Floodway	Overbank portions of cross sections and interpolated cross sections were taken from topographic maps (Avis 1979). Structures were field-surveyed. Starting water-surface elevations were from hydraulic analysis of Foundry Pond Dam. Hydraulic model was calibrated to information from local residents and Hingham Flood Plain Maps (Perkins 1975). Recent modifications were taken into account when using historical high-water marks.
Pocksha Pond	Entire shoreline	Entire shoreline	Regression equations (Zarriello et al. 2012)	HEC-RAS 4.1.0 (Brunner 2010)	7/1/2014	AE	Pocksha Pond was not directly modeled. Elevations were taken from adjacent Assawompset Pond given information on the hydraulic connectivity between the two waterbodies.
Poor Meadow Brook	Approximately 8,700 feet downstream of Main Street	Approximately 4,675 feet upstream of West Washington Street	Regression equations (Wandle 1983)	HEC-2 (USACE 1974)	6/1/1985	AE w/Floodway	Starting water-surface elevations were from the slope-area method with 0.0006 energy grade line slope.

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Pudding Brook and Zone A tributaries	Limit of coastal flooding on Pudding Brook	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Red Brook and Zone A tributaries	Mouth of Red Brook at Buttermilk Bay	Points of one square mile of drainage area	Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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Robinson Creek	Limit of coastal flooding	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Rocky Meadow Brook	Confluence with Weweantic River	Approximately 2,868 feet upstream of France Street	Drainage-area-CFSM curve	HEC-2 (USACE 1974)	7/1/1980	AE w/Floodway	Log-Pearson type III flood frequency analysis was performed on all streamgages in vicinity. All results were plotted for drainage area versus CSFM. Envelope curves were drawn around plotted data. Final curve selected by engineering judgment was on the low side of plotted data since characteristics of study reach are different than those of gages used to develop curve.
Rose Brook	Confluence with Wankinco River	Point of one square mile of drainage area	Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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Salisbury Brook	Confluence with Salisbury Plain River	Approximately 450 feet upstream of Prospect Street	Flow routing (SCS 1972)	HEC-2 (USACE 1974)	8/1/1977	AE w/Floodway	Rainfall runoff method (SCS 1972) was used to determine peakflows for Lovett Brook. Lovett Brook peakflows were routed through Brockton Reservoir, Waldo Lake, ponds in D.W. Field Park (CDM 1968), and Cross Pond, the headwaters for Salisbury Brook. Peakflows downstream were calculated using drainage-area ratios (SCS 1972). Cross sections were field-surveyed.
Salisbury Plain River (Brockton)	Brockton corporate limits	Confluence with Salisbury Brook	Flow routing (SCS 1972)	HEC-2 (USACE 1974)	8/1/1977	AE w/Floodway	Peakflows were determined by graphically adding peakflows from Salisbury Brook and Trout Brook at confluence. Downstream, peakflows were determined using drainage-area ratios (SCS 1972). Cross sections were field-surveyed. Starting water-surface elevations were from the slope-area method.
Salisbury Plain River (West Bridgewater)	West Bridgewater corporate limits	West Bridgewater corporate limits	Drainage-area ratio	HEC-2 (USACE 1974)	3/1/1979	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Cross sections were field-surveyed.
Satucket River	700 feet downstream of Plymouth Street	80 feet upstream of Pond Street	Drainage-area ratio	HEC-2 (USACE 1974)	11/1/1977	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7.
Satuit Brook	500 feet upstream of Front Street	Approximately 100 feet upstream of abandoned railroad	Rational method	HEC-2 (USACE 1974)	8/1/1983	AE w/Floodway	Rational Method computation used assumed hydrograph distributions. Water-surface elevations at road crossings were calculated using the Francis Formula with adopted “C” values for roads and weirs being 3.09 and 3.33, respectively. Starting water-surface elevations were from normal depth.

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
Sawmill Brook	Confluence with Taunton River	Approximately 4,826 feet upstream of Bedford Street	Regression equations (Jennings et al. 1993)	HEC-2 (USACE 1974)	11/1/1996	AE w/Floodway	Starting water-surface elevations were from Taunton River profiles effective at the time.
Second Brook	Confluence with Jones River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Second Herring Brook	Confluence with Black Pond Brook	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Second Herring Brook	Confluence with North River	Confluence with Black Pond Brook	Log-Pearson type III flood frequency analysis, drainage-area ratio, and regression equations (Wandle 1977)	HEC-2 (USACE 1974)	7/1/1980	AE w/Floodway	Log-Pearson type III analysis was performed on USGS streamgage 01105870 (Jones River in Kingston). Drainage-area ratios were used to transpose results to study reach. Final peakflows were average of transposed LPIII results and results from regression equations. Cross section data were obtained from field survey and photogrammetric maps (Moore 1974). Starting water-surface elevations were from mean high tide.
Shinglemill Brook	Confluence with Longwater Brook	Limit of detailed study	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Shinglemill Brook	Webster Street	Whiting Street	unknown	unknown	12/26/2007	AE	
Shumatuscacant River (Abington)	Abington corporate limits	Approximately 2,300 feet upstream of Summit Road	Regression equations (Johnson and Tasker 1974)	HEC-2 (USACE 1974)	9/1/1977	AE w/Floodway	0.2-percent-annual-chance peakflows (not available from regression equations) were extrapolated. Because watershed is small, six flow-change locations were used. Cross sections were field-surveyed. Starting water-surface elevations were from hydraulic analysis at the downstream end.

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
Shumatuscacant River (Whitman)	Confluence with Shumatuscacant Tributary	Whitman corporate limits	Regression equations	HEC-2 (USACE 1974)	1/1/1980	AE w/Floodway	Cross sections were field-surveyed. Starting water-surface elevations were from the slope-area method.
Shumatuscacant Tributary	Confluence with Shumatuscacant River	820 feet upstream of Franklin Street	Regression equations	HEC-2 (USACE 1974)	1/1/1980	AE w/Floodway	Starting water-surface elevations were from the slope-area method.
Sippican River and Zone A tributaries	Limit of coastal flooding on Sippican River	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Sippican River Tributary A	Confluence with Sippican River	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Smelt Brook	State Route 3	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Smelt Brook	State Route 3A	60 feet upstream of Cranberry Road	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	5/1/1983	AE w/Floodway	Starting water-surface elevations were from the slope-area method.
Snows Brook	Confluence with Taunton River	50 feet upstream of Forest Street	Drainage-area ratio	HEC-2 (USACE 1974)	3/1/1978	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7.
South Brook	Confluence with Town River	25 feet upstream of Bedford Street	Drainage-area ratio	HEC-2 (USACE 1974)	3/1/1978	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7.

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
South Meadow Brook	Confluence with Weweantic River	Approximately 1,145 feet upstream of Pond Street	Drainage-area-CFSM curve	HEC-2 (USACE 1974)	7/1/1980	AE w/Floodway	Log-Pearson type III flood frequency analysis was performed on all streamgages in vicinity. All results were plotted for drainage area versus CSFM. Envelope curves were drawn around plotted data. Final curve selected by engineering judgment was on the low side of plotted data since characteristics of study reach are different than those of gages used to develop curve. Starting water-surface elevations were from Weweantic River profiles.
South River and Zone A tributaries	Limit of coastal flooding on South River	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Stream Channel to Unnamed Tributary to Third Herring Brook	Confluence with Unnamed Tributary to Third Herring Brook	Confluence of Tributaries 1 and 2 to Stream Channel to Unnamed Tributary to Third Herring Brook	unknown	unknown	9/7/2005	AE	

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
Stream River	Whitman/Abington corporate limits	Approximately 100 feet upstream of Ashland Street	Regression equations (Wandle 1983)	HEC-2 (USACE 1974)	12/1/1990	AE w/Floodway	0.2-percent-annual-chance peakflows (not available from regression equations) were extrapolated. Cross sections were field-surveyed. Starting water-surface elevations were from the slope-are method.
Taunton River	County limits	Cherry Street	Regression-weighted log-Pearson type III flood frequency analysis (Cohn et al. 2012)	HEC-RAS 4.1.0 (Brunner 2010)	7/1/2014	AE w/Floodway	Log-Pearson type III discharges from USGS streamgage 01108000 (Taunton River near Bridgewater) were from Zariello et al. (2012). Flows were transferred upstream and downstream using a weighted hybrid method (Guimaraes and Bohman 1992). At split-flow reach between County Street and Owen Parkway, flow optimization in HEC-RAS was used to calculate amount of discharge in main channel and side channel. The hydraulic model was calibrated to the high-water marks from the March and April 2010 flood event. Most underwater cross-section data and structure elevations were from field surveys in March and April, 2012. Underwater cross-section data for cross sections in Bridgewater and Middleborough were obtained from survey data collected for the previous effective study. Overbank cross-section data were from lidar topography (FEMA 2011, USGS 2011). Starting water-surface elevations were from normal depth, using a slope of 0.00033.

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
Third Herring Brook and Zone A tributaries	Confluence of Third Herring Brook with North River	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Torrey Brook and Zone A tributaries	Confluence of Torrey Brook with Drinkwater River	Points of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Town Brook (Hingham)	Hingham Harbor	Approximately 1,100 feet upstream of South Street	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	7/1/1983	AE w/Floodway	Overbank portions of cross sections and interpolated cross sections were taken from topographic maps (Avis 1979). Survey data were obtained from Hingham Highway Department and a previous study (MADPW 1970). Elevations were spot-checked, and some additional sections were surveyed. Starting water-surface elevations were from normal depth. Hydraulic model was calibrated to information from local residents and Hingham Flood Plain Maps (Perkins 1975). Recent modifications were taken into account when using historical high-water marks.
Town Brook (Plymouth)	Limit of coastal flooding below Water Street	Headwaters at Billington Sea	Maintenance of Variance Extension, type 1 (Hirsch 1982)	HEC-RAS 5.0	2/1/2017	AE w/Floodway	MOVE.1 record extension was performed on USGS streamgage 01105874 (Town Brook at Plymouth) using index USGS streamgage 01105876 (Eel River at Rt. 3A near Plymouth). Derived peakflow record was analyzed using log-Pearson type III flood-frequency analysis (IACWD 1982) with expected moments algorithm (Cohn et al. 1997, 2001; Griffis et al. 2004) in PeakFQ (Veilluex et al. 2014). Starting water-surface elevations were from mean higher high tide at nearby tide gage. Structures and underwater portions of cross sections were surveyed. Overbank portions of cross sections were obtained from lidar topography (USGS 2011, 2014a). Ineffective flow was designated at structures. Hydraulic model assumed steady, subcritical flow; expansion (0.3 to 0.8) and contraction (0.1 to 0.5) coefficients; and no minor losses. Structures were modeled using the same methods for all profiles. Roughness values were selected based on field notes, photographs, and aerial imagery.

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
Town River	Confluence with Taunton River	Confluence with Lake Nippenicket Tributary	Drainage-area ratio	HEC-2 (USACE 1974)	3/1/1979	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Starting water-surface elevations were from Taunton River profiles.
Tributary 1 to Stream Channel to Unnamed Tributary to Third Herring Brook	Confluence with Stream Channel to Unnamed Tributary to Third Herring Brook	Approximately 300 feet upstream of confluence with Stream Channel to Unnamed Tributary to Third Herring Brook	unknown	unknown	9/7/2005	AE	
Tributary 1 to Unnamed Tributary to Iron Mine Brook	Confluence with Unnamed Tributary to Iron Mine Brook	Ponding Area 1	unknown	unknown	9/7/2005	AE	
Tributary 2 to Stream Channel to Unnamed Tributary to Third Herring Brook	Confluence with Stream Channel to Unnamed Tributary to Third Herring Brook	Approximately 370 feet upstream of confluence with Stream Channel to Unnamed Tributary to Third Herring Brook	unknown	unknown	9/7/2005	AE	

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
Tributary 2 to Unnamed Tributary to Iron Mine Brook	Confluence with Unnamed Tributary to Iron Mine Brook	Ponding Area 2	unknown	unknown	9/7/2005	AE	
Tributary A	Confluence with French Stream	Levin Road	Rational method	HEC-2 (USACE 1974)	3/1/1980	AE w/Floodway	In conjunction with Rational Method, flows were routed through Summer Street culvert (Gray 1973). Peakflows at confluence are lower than at Levin Road because Summer Street culvert causes upstream storage. Starting water-surface elevations were from the slope-are method.
Tributary A to Sawmill Brook	Confluence with Sawmill Brook	Approximately 80 feet upstream of Colonial Drive	Regression equations (Jennings et al. 1993)	HEC-2 (USACE 1974)	11/1/1996	AE	Starting water-surface elevations were from Sawmill Brook profiles.
Tributary to Meadow Brook	Confluence with Meadow Brook	1,340 feet upstream of Whitman/East Bridgewater corporate limits	Drainage-area ratio	HEC-2 (USACE 1974)	11/1/1977	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Starting water-surface elevations were based on coincident flow with Meadow Brook.
Trout Brook	Confluence with Salisbury Brook	Approximately 415 feet upstream of Ames Street	Flow routing (SCS 1972)	HEC-2 (USACE 1974)	8/1/1977	AE w/Floodway	Rainfall runoff method (SCS 1972) was used to determine peakflows for Trout Brook. Peakflows downstream were routed through the reach. Cross sections were field-surveyed. Starting water-surface elevations were from Salisbury Plain River profiles.
Turkey Hill Run	Confluence with Weir River	Approximately 160 feet upstream of East Street	Regression equations	HEC-2 (USACE 1974)	8/1/1983	AE w/Floodway	

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
Unnamed Tributary 2 to Shinglemill Brook	Confluence with Shinglemill Brook	Approximately 1,300 feet upstream of confluence with Shinglemill Brook	unknown	unknown	12/26/2007	AE	
Unnamed Tributary 3 to Shinglemill Brook	Confluence with Shinglemill Brook	Approximately 1,600 feet upstream of confluence with Shinglemill Brook	unknown	unknown	12/26/2007	AE	
Wankinco River and Zone A tributaries	Limit of coastal flooding on Wankinco River	Points of one square mile of drainage area	Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.

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
Weir River	Foundry Pond Dam	Free Street	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	7/1/1983	AE w/Floodway	Overbank portions of cross sections and interpolated cross sections were taken from topographic maps (Avis 1979). Structures were field-surveyed. Starting water-surface elevations were from hydraulic analysis of Foundry Pond Dam. Hydraulic model was calibrated to information from local residents and Hingham Flood Plain Maps (Perkins 1975). Recent modifications were taken into account when using historical high-water marks.
West Brook	Limit of coastal flooding	Point of one square mile of drainage area	2017 state regression equations (Zarriello 2017)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
West Meadow Brook	Confluence with Town River	West Bridgewater corporate limits	Drainage-area ratio	HEC-2 (USACE 1974)	3/1/1979	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7.

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
Weweantic River	Wareham/Carver corporate limits	Confluence of Rocky Meadow Brook and South Meadow Brook	Drainage-area-CFSM curve	HEC-2 (USACE 1974)	7/1/1980	AE w/Floodway	Log-Pearson type III flood frequency analysis was performed on all streamgages in vicinity. All results were plotted for drainage area versus CSFM. Envelope curves were drawn around plotted data. Final curve selected by engineering judgment was on the low side of plotted data since characteristics of study reach are different than those of gages used to develop curve. Starting water-surface elevations were from the slope-are method.
Weweantic River and Zone A tributaries	Limit of coastal flooding on Weweantic River	Points of one square mile of drainage area	Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA)	HEC-RAS 4.1.0 (Brunner 2010)	5/31/2017	A	Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable.
Willow Brook	Confluence with Town River	Approximately 950 feet upstream of Main Street	Drainage-area ratio	HEC-2 (USACE 1974)	3/1/1979	AE w/Floodway	Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7.

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
Winnetuxet River	Confluence with Taunton River	Approximately 4,888 feet upstream of Main Street	Regression equations (Wandle 1977)	HEC-2 (USACE 1974)	3/1/1980	AE w/Floodway	Starting water-surface elevations for lower reach were from Taunton River profiles effective at the time. Coincident flow was chosen for these two rivers because topographic and soil characteristics indicate it is probable. Cross section data were obtained from field survey and photogrammetric maps (Col-East various). Starting water-surface elevations for upper reach were from lower reach profiles.

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Aaron River and Zone A tributaries	0.055-0.057	0.099-0.106
Accord Brook	0.010-0.050	0.050-0.100
Agawam River and Zone A tributaries	0.051-0.057	0.090-0.105
Agawam River Tributary A	0.057	0.105
Ashley Brook	0.057	0.104-0.106
Aucoot Creek	0.057	0.104
Bares Brook	0.057	0.105-0.106
Beaver Brook	0.030-0.050	0.016-0.080
Beaver Dam Brook (detailed)	0.025-0.070	0.090-0.100
Beaver Dam Brook and Zone A tributaries	0.057	0.104-0.106
Beaver Dam Brook Tributary A	0.057	0.104-0.105
Benson Brook	0.056-0.057	0.102-0.106
Billington Sea Zone A tributaries	0.056-0.057	0.101-0.106
Black Betty Brook	0.030-0.060	0.050-0.100
Black Brook	0.013-0.050	0.016-0.080
Black Pond Brook (approximate)	0.057	0.104-0.105
Black Pond Brook (detailed)	0.04	0.060-0.110
Bluefish River Tributary A	0.057	0.104-0.106
Bound Brook	0.030-0.065	0.050-0.095
Branch of Eel River (detailed)	0.015-0.060	0.090-0.100
Branch of Eel River and Zone A tributaries	0.055-0.057	0.098-0.106
Branch of Eel River Tributary A	0.057	0.104-0.105
Coastal Tributary A and Zone A tributaries	0.057	0.103-0.106
Coastal Tributary C	0.057	0.106
Coastal Tributary D	0.057	0.104
Coastal Tributary E	0.057	0.104-0.106
Coastal Tributary F	0.057	0.103-0.104
Coastal Tributary G	0.057	0.104
Coastal Tributary H	0.057	0.104-0.105
Coastal Tributary I	0.057	0.104-0.105
Coastal Tributary J	0.057	0.103-0.106
Crane Brook	0.04	0.080-0.120

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Crooked Meadow River	0.014-0.050	0.080-0.120
Cushing Brook and Zone A tributaries	0.055-0.057	0.100-0.106
Doggett Brook and Zone A tributaries	0.053-0.057	0.094-0.106
Drinkwater River (approximate)	0.057	0.105-0.106
Drinkwater River (detailed)	0.035	0.060-0.090
Drinkwater River Tributary	0.035	0.08
Drinkwater River Tributary A and Zone A tributaries	0.056-0.057	0.103-0.106
Eel River (Hingham)	0.015-0.050	0.090-0.120
Eel River (Plymouth)	0.024-0.060	0.09
Eel River and Zone A tributaries	0.054-0.057	0.096-0.106
First Herring Brook (approximate)	0.057	0.104-0.105
First Herring Brook (detailed)	0.023-0.060	0.090-0.100
First Herring Brook Tributary A	0.057	0.105
French Stream (Hanover)	0.035	0.08
French Stream (Rockland)	0.030-0.045	0.050-0.100
French Stream Zone A tributaries	0.056-0.057	0.103-0.106
Furnace Brook No. 2	0.056-0.057	0.102-0.104
Green Harbor Brook and Zone A tributaries	0.057	0.104-0.106
Halls Brook (approximate)	0.057	0.105-0.106
Halls Brook (detailed)	0.015-0.040	0.080-0.100
Harlow Brook No. 2 and Zone A tributaries	0.55-0.057	0.099-0.104
Herring Brook (approximate)	0.057	0.104-0.106
Herring Brook (detailed)	0.025-0.030	0.075-0.080
Herring River	0.053-0.057	0.094-0.104
Hockomock River	0.030-0.060	0.050-0.100
Indian Brook (detailed)	0.020-0.065	0.020-0.100
Indian Brook and Zone A tributaries	0.055-0.057	0.098-0.106
Indian Head Brook (approximate)	0.057	0.104-0.105
Indian Head Brook (detailed)	0.035-0.040	0.070-0.090
Indian Head River (Hanover)	0.035	0.060-0.100
Indian Head River (Hanson)	0.035	0.060-0.100
Iron Mine Brook	0.057	0.104-0.106

Table 13: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
Island Creek and Zone A tributaries	0.056-0.057	0.103-0.106
Jones River (detailed)	0.04-0.055	0.08-0.11
Jones River and Zone A tributaries	0.055-0.057	0.100-0.106
Jones River Brook (detailed)	0.030-0.040	0.100-0.110
Jones River Brook and Zone A tributaries	0.055-0.057	0.100-0.106
Jones River Tributary A	0.057	0.106
Jones River Tributary B	0.057	0.105-0.106
Little Pudding Brook	0.057	0.104-0.106
Littles Creek	0.056-0.057	0.103-0.105
Longwater Brook	0.035	0.08
Maple Springs Brook and Zone A tributaries	0.056-0.057	0.101-0.105
Matfield River	0.035	0.100-0.120
Mattapoisett River (detailed)	0.035-0.040	0.060-0.090
Mattapoisett River Zone A tributaries	0.046-0.057	0.077-0.106
Meadow Brook (East Bridgewater)	0.023-0.030	0.016-0.030
Meadow Brook (Whitman)	0.035	0.060-0.080
Meadow Brook Tributary	0.040-0.045	0.060-0.100
Mile Brook (approximate)	0.057	0.105-0.106
Mile Brook (detailed)	0.015-0.040	0.080-0.100
Nemasket River	0.025-0.065	0.06-0.13
North River	0.025-0.030	0.075-0.080
North River Tributary A	0.057	0.103-0.106
Palmer Mill Brook	0.045	0.08
Pine Brook and Zone A tributaries	0.055-0.057	0.100-0.106
Plymouth River	0.014-0.050	0.080-0.120
Poor Meadow Brook	0.035-0.045	0.065-0.105
Pudding Brook and Zone A tributaries	0.055-0.057	0.100-0.106
Red Brook and Zone A tributaries	0.052-0.057	0.093-0.106
Robinson Creek	0.057	0.104-0.106
Rocky Meadow Brook	0.030-0.035	0.060-0.090
Rose Brook	0.057	0.104
Salisbury Brook	0.025-0.040	0.060-0.080

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Salisbury Plain River (Brockton)	0.025-0.040	0.060-0.080
Salisbury Plain River (West Bridgewater)	0.030-0.060	0.050-0.100
Satucket River	0.031-0.050	0.016-0.080
Satuit Brook	0.013-0.060	0.1
Sawmill Brook	0.04	0.100-.0120
Second Brook	0.057	0.105
Second Herring Brook	0.057	0.104-0.106
Shinglemill Brook	0.057	0.105
Shumatuscacant River	0.035-0.040	0.080-0.100
Shumatuscacant River – North Tributary	0.012-0.040	0.080-0.100
Shumatuscacant Tributary	0.030-0.045	0.090-0.100
Sippican River and Zone A tributaries	0.050-0.057	0.087-0.106
Sippican River Tributary A	0.057	0.105-0.106
Smelt Brook (approximate)	0.057	0.104-0.106
Smelt Brook (detailed)	0.015-0.040	0.070-0.100
Snows Brook	0.013-0.060	0.016-0.070
South Brook	0.013-0.060	0.016-0.090
South Meadow Brook	0.033-0.037	0.060-0.080
South River and Zone A tributaries	0.052-0.057	0.091-0.106
Stream River	0.013-0.060	0.060-0.180
Taunton River	0.035-0.060	0.080-0.10
Third Herring Brook and Zone A tributaries	0.052-0.057	0.091-0.106
Torrey Brook and Zone A tributaries	0.057	0.104-0.106
Town Brook (Hingham)	0.017-0.050	0.070-0.100
Town Brook (Plymouth)	0.03-0.05	0.07-0.1
Town River	0.03-0.06	0.050-0.100
Tributary A	0.035-0.040	0.08
Tributary A to Sawmill Brook	0.04	0.12
Tributary to Meadow Brook	0.05	0.08
Trout Brook	0.025-0.040	0.060-0.080
Turkey Hill Brook	0.015-0.070	0.090-0.110
Wankinco River and Zone A tributaries	0.052-0.057	0.093-0.106

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Weir River	0.014-0.050	0.080-0.120
West Brook	0.057	0.104-0.106
West Meadow Brook	0.030-0.060	0.050-0.100
Weweantic River (detailed)	0.025-0.037	0.060-0.090
Weweantic River and Zone A tributaries	0.035-0.057	0.052-0.106
Willow Brook	0.030-0.060	0.050-0.100
Winnetuxet River (Halifax)	0.035-0.045	0.050-0.100
Winnetuxet River (Plympton)	0.030-0.050	0.080-0.100

5.3 Coastal Analyses

For the areas of Plymouth 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 extreme tides and storm surge as well as 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
Bourne Wharf River, Eel River, Little Wood Island River, North River, Pine Point River	Tidal portions in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Tidal portions in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Stillwater elevation and storm surge	RIVSRG (HTA 1977)	3/1/2002
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Extremal analysis	Peaks Over Threshold (POT)	3/28/2008

Table 14: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Stillwater elevation and storm surge	USACE Tidal Flood Profiles (USACE 1988) with extrapolation	3/28/2008
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Wave height	WHAFIS 3.0 (FEMA 1988)	3/28/2008
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Wave runup for sloped structures with slope gentler than 1:8	RUNUP 2.0 (FEMA 2007b)	3/28/2008
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Wave runup for sloped structures with slope steeper than 1:8	TAW	3/28/2008
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Wave runup for vertical structures	SPM (USACE 1984)	3/28/2008
Buzzards Bay	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Entire coastline in Towns of Marion, Mattapoisett, and Wareham	Wave setup	DIM (FEMA 2007a)	3/28/2008

Table 14: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Overland wave height	WHAFIS 4.0 (FEMA undated)	5/1/2013
Cape Cod Bay	Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate	Primary frontal dune	Analysis of dune dimensions	5/1/2013
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Town of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Stillwater elevation and storm surge	USACE Tidal Flood Profiles (USACE 1988) with extrapolation	3/1/2002
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate	Wave height	STWAVE (USACE 2001)	5/1/2013
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate	Wave runup for sloped structures with slope steeper than 1:8	TAW	5/1/2013

Table 14: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate	Wave runup for sloped structures with slope gentler than 1:8	RUNUP 2.0 (FEMA 2007b)	5/1/2013
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate	Wave runup for vertical structures	SPM (USACE 1984)	5/1/2013
Cape Cod Bay	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate	Wave setup	DIM (FEMA 2007a)	5/1/2013
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Extremal analysis	Peaks Over Threshold (POT)	3/28/2008
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Stillwater elevation and storm surge	USACE Tidal Flood Profiles (USACE 1988) with extrapolation	3/28/2008
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Wave height	WHAFIS 3.0 (FEMA 1988)	3/28/2008

Table 14: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Wave runup for sloped structures with slope gentler than 1:8	RUNUP 2.0 (FEMA 2007b)	3/28/2008
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Wave runup for sloped structures with slope steeper than 1:8	TAW	3/28/2008
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Wave runup for vertical structures	SPM (USACE 1984)	3/28/2008
Hingham Bay and Massachusetts Bay	Entire coastline in Towns of Hingham and Hull	Entire coastline in Towns of Hingham and Hull	Wave setup	DIM (FEMA 2007a)	3/28/2008

5.3.1 Total Stillwater Elevations

The total stillwater elevations (stillwater including storm surge plus wave setup) for the 1% 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 coastal analyses is shown in Table 16, “Coastal Transect Parameters.” Figure 8 shows the total stillwater elevations for the 1% annual chance flood that was determined for this coastal analysis.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas

[Not Applicable to this Flood Risk Report]

Astronomical Tide

Astronomical tidal statistics were generated directly from local tidal constituents by sampling the predicted tide at random times throughout the tidal epoch.

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 tidal gages.

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% annual chance event.

Tidal gages can be used instead of historic records of storms when the available tidal gage record for the area represents both the astronomical tide component and the storm surge component. Table 15 provides the gage name, managing agency, gage type, gage identifier, start date, end date, and statistical methodology applied to each gage used to determine the stillwater elevations. For areas between gages, peak stillwater elevations for selected recurrence intervals were estimated by combining interpolation between gages and observed high water marks during major storms. A regionalized statistical approach was applied to the gage data so that stillwater elevations in areas between gages could be identified.

Table 15: Tide Gage Analysis Specifics

Gage Name	Managing Agency of Tide Gage Record	Gage Type	Start Date	End Date	Statistical Methodology
WIS Station 53	*	Tide	1980	1999	POT

Combined Riverine and Tidal Effects
Riverine and surge rates for the lower reaches of the Inundation River were combined by developing curves for rate of occurrence vs. flood level for each flood source.

Wave Setup Analysis
Wave setup was computed during the storm surge modeling through the methods and models listed in Table 14 and included in the frequency analysis for the determination of the total stillwater elevations. The oscillating component of wave setup, *dynamic wave setup*, was calculated for areas subject to wave runup hazards.

5.3.2 Waves

A coastal wave model was used to calculate the nearshore wave fields required for the addition of wave setup effects. Three nested grids were used to obtain sufficient nearshore resolution to represent the radiation stress gradients required as ADCIRC inputs. Radiation stress fields output from the inner grids are used by ADCIRC to estimate the contribution of breaking waves (wave setup effects) to the total stillwater elevation.

5.3.3 Coastal Erosion

A single storm episode can cause extensive erosion in coastal areas. Storm-induced erosion was evaluated to determine the modification to existing topography that is expected to be associated with flooding events. Erosion was evaluated using the methods listed in Table 14. 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 along all shorelines for which waves were 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% annual chance flood.

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 starting wave conditions 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 6 for a schematic of a coastal transect evaluated for overland wave propagation hazards.

Wave heights and wave crest elevations were modeled using the methods and models listed in Table 14, “Summary of Coastal Analyses”.

Wave Runup Analysis

Wave runup analyses were performed to determine the height and extent of runup beyond the limit of stillwater inundation for the 1% annual chance flood. Wave runup elevations were modeled using the methods and models listed in Table 14.

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Weymouth Back River	1	13.76	*	8.4	*	9.3	9.7	10.6
Weymouth Back River	2	15.01	*	8.4	*	9.3	9.7	10.6
Hingham Bay	3	15.01	*	8.4	*	9.3	9.7	10.6
Hingham Bay	4	16.25	*	8.4	*	9.3	9.7	10.6
Hingham Bay	5	16.16	*	8.4	*	9.3	9.7	10.6
Hingham Harbor	6	14.66	*	8.4	*	9.3	9.7	10.6
Hingham Harbor	7	15.29	*	8.4	*	9.3	9.7	10.6
Hingham Harbor	8	14.28	*	8.4	*	9.3	9.7	10.6
Hingham Harbor	9	16.84	*	8.4	*	9.3	9.7	10.6
Hingham Harbor	10	15.22	*	8.4	*	9.3	9.7	10.6
Hingham Harbor	11	15.01	*	8.4	*	9.3	9.7	10.6
Weir River	12	16.5	*	8.4	*	9.3	9.7	10.6
Hull Bay	13	15.49/15.00	*	8.4	*	9.3	9.7	10.6
Hull Bay	14	15.55	*	8.4	*	9.3	9.7	10.6
Hull Bay	15	16.39	*	8.4	*	9.3	9.7	10.6

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Hull Bay	16	16.22	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	17	16.95/15.96	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	18	15.39	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	19	16.87/14.66	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	20	17.57	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	21	23.28	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	22	21.91/16.7	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	23	21.61/14.7	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	24	22.06	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	25	23.43	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	26	22.37	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	27	26.01	*	8.4	*	9.3	9.7	10.6
Massachusetts Bay	28	23.73	*	8.1	*	9.3	9.7	10.6
Massachusetts Bay	29	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	30	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Massachusetts Bay	31	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	32	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	33	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	34	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	35	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	36	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	37	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	38	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	39	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	40	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	41	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	42	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	43	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	44	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	45	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Massachusetts Bay	46	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	47	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	48	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	49	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	50	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	51	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	52	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	53	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	54	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	55	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	56	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	57	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	58	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	59	*	*	8.3	*	9.1	9.5	10.3
Massachusetts Bay	60	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Massachusetts Bay	61	*	*	8.3	*	9.1	9.5	10.6
Massachusetts Bay	62	*	*	8.3	*	9.1	9.5	10.6
Massachusetts Bay	63	*	*	8.3	*	9.1	9.5	10.6
Massachusetts Bay	64	*	*	8.3	*	9.1	9.5	10.6
Massachusetts Bay	65	*	*	8.3	*	9.1	9.5	10.6
Massachusetts Bay	66	*	*	8.3	*	9.1	9.5	10.6
Duxbury Bay	67	*	*	8.3	*	9.1	9.5	10.6
Duxbury Bay	68	*	*	8.3	*	9.1	9.5	10.6
Duxbury Bay	69	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	70	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	71	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	72	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	73	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	74	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	75	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Duxbury Bay	76	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	77	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	78	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	79	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	80	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	81	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	82	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	83	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	84	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	85	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	86	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	87	*	*	8.3	*	9.1	9.5	10.3
Duxbury Bay	88	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	89	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	90	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Kingston Bay	91	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	92	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	93	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	94	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	95	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	96	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	97	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	98	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	99	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	100	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	101	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	102	*	*	8.3	*	9.1	9.5	10.3
Kingston Bay	103	*	*	8.3	*	9.1	9.8	10.7
Plymouth Harbor	104	*	*	8.6	*	9.5	9.8	10.7
Plymouth Harbor	105	*	*	8.6	*	9.5	9.8	10.7

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Plymouth Harbor	106	*	*	8.6	*	9.5	9.8	10.7
Massachusetts Bay	107	*	*	8.6	*	9.5	9.8	10.7
Plymouth Harbor	108	*	*	8.6	*	9.5	9.8	10.7
Plymouth Harbor	109	*	*	8.6	*	9.5	9.8	10.7
Plymouth Harbor	110	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	111	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	112	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	113	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	114	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	115	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	116	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	117	*	*	8.3	*	9.1	9.5	10.3
Plymouth Harbor	118	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	119	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	120	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Cape Cod Bay	121	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	122	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	123	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	124	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	125	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	126	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	127	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	128	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	129	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	130	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	131	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	132	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	133	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	134	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	135	*	*	8.3	*	9.1	9.5	10.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Cape Cod Bay	136	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	137	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	138	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	139	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	140	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	141	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	142	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	143	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	144	*	*	8.3	*	9.1	9.5	10.3
Cape Cod Bay	145	*	*	8.3	*	9.1	9.5	10.3
Buzzards Bay	146	18.7	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	147	21.89	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	148	21.04	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	149	18.97	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	150	20.44	*	7.8	*	11.8	13.7	17.7

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Buzzards Bay	151	17.7	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	152	17.34	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	153	18.11	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	154	19.08	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	155	21.64	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	156	20.24	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	157	22.3	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	158	21.51	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	159	22.3	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	160	22.21	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	161	19.13	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	162	24.93	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	163	21.96	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	164	21.37	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	165	21.37	*	7.8	*	11.8	13.7	17.7

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Buzzards Bay	166	21.37	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	167	20.57	*	7.8	*	11.8	13.7	17.7
Buzzards Bay	168	20.98	*	7.8	*	11.7	13.6	17.6
Buzzards Bay	169	21.34	*	7.6	*	11.6	13.5	17.6
Buzzards Bay	170	20.79	*	7.6	*	11.6	13.5	17.6
Buzzards Bay	171	20.91	*	7.6	*	11.6	13.5	17.6
Buzzards Bay	172	21.06	*	7.6	*	11.6	13.5	17.6
Buzzards Bay	173	22.1	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	174	23.41	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	175	21.53	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	176	22.67	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	177	21.82	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	178	21.09	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	179	21.09	*	7.6	*	11.5	13.3	17.3
Buzzards Bay	180	20.72	*	7.6	*	11.5	13.3	17.3

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Buzzards Bay	181	21.3	*	7.6	*	11.7	13.2	17.1
Buzzards Bay	182	21.07	*	7.6	*	11.7	13.2	17.1
Buzzards Bay	183	21.05	*	7.6	*	11.4	13.21	17.1
Buzzards Bay	184	20.7	*	7.6	*	11.4	13.21	17.1
Buzzards Bay	185	20.67	*	7.6	*	11.4	13.21	17.1
Buzzards Bay	186	21.79	*	7.6	*	11.4	13.21	17.1
Buzzards Bay	187	20.77	*	7.5	*	11.3	13.2	17.1
Buzzards Bay	188	20.81	*	7.5	*	11.3	13.2	17.1
Buzzards Bay	189	20.95	*	7.5	*	11.3	13.2	17.1
Buzzards Bay	190	20.03	*	7.4	*	11.1	12.9	16.7
Buzzards Bay	191	20.96	*	7.4	*	11.1	12.9	16.7
Buzzards Bay	192	20.79	*	7.4	*	11.1	12.9	16.7
Buzzards Bay	193	20.67	*	7.4	*	11.1	12.9	16.7
Buzzards Bay	194	20.96	*	7.3	*	11.1	12.8	16.7
Buzzards Bay	195	20.39	*	7.3	*	11.1	12.8	16.7

*Not calculated for this Flood Risk Project

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
		Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Buzzards Bay	196	20.17	*	7.1	*	10.7	12.5	16.2
Buzzards Bay	197	20.1	*	7.1	*	10.7	12.5	16.2
Buzzards Bay	198	20.1	*	7.1	*	10.7	12.5	16.2
Buzzards Bay	199	20.45	*	7.1	*	10.7	12.5	16.2
Buzzards Bay	200	18.98	*	7.1	*	10.7	12.5	16.2

*Not calculated for this Flood Risk Project

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 Plymouth County in the 2012 FIS are provided in Table 19.

Table 19: Countywide Vertical Datum Conversion

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
All in Plymouth County	-	-	-	-0.8
Average Conversion from NGVD29 to NAVD88 = -0.8 feet				

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*, 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
Digital orthophoto	MassGIS	2005	1:5,000	Orthoimagery for all FIRMs dated July 17, 2012 (MassGIS 2005)
Digital orthophoto	USGS	2013	1:2,400	Orthoimagery for all FIRMs dated July 16, 2015
Digital orthophoto	MassGIS	2008	30-cm resolution	Orthoimagery for all FIRMs dated November 4, 2016
Digital orthophoto	USGS	2014	0.3-m resolution	Orthoimagery for certain FIRMs dated July 6, 2021 in the southern portion of Plymouth County (USGS 2014b)

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital orthophoto	USGS	2013	0.3-m resolution	Orthoimagery for certain FIRMs dated July 6, 2021 in the northern portion of Plymouth County (USGS 2013)
Political boundaries	MassGIS	-	-	Municipal and county boundaries
Transportation features	MassGIS	-	-	Roads and railroads derived from orthophotography for all FIRMs dated July 17, 2012; July 16, 2015; or November 4, 2016
Transportation features	USCB	2016	-	Roads and railroads for all FIRMs dated July 6, 2021 (USCB 2016)
Surface water features	MassGIS	-	-	Streams, rivers, and lakes derived from orthophotography for all FIRMs dated July 17, 2012; July 16, 2015; or November 4, 2016

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% and 0.2% annual chance floodplain boundaries are close together, only the 1% 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
Duxbury, Town of; Kingston, Town of; Marion, Town of; Marshfield, Town of; Mattapoisett, Town of; Norwell, Town of; Plymouth, Town of; Rochester, Town of; Scituate, Town of; Wareham, Town of	All sources in lidar project area (mostly near the coast) studied or redelineated in 2021 Cape Cod Watershed revision	Lidar	5.0 cm	N/A	USGS 2014a
Abington, Town of; Carver, Town of; Duxbury, Town of; Halifax, Town of; Hanover, Town of; Hanson, Town of; Hingham, Town of; Marion, Town of; Marshfield, Town of; Mattapoisett, Town of; Middleborough, Town of; Norwell, Town of; Pembroke, Town of; Plymouth, Town of; Plympton, Town of; Rochester, Town of; Rockland, Town of; Scituate, Town of; Wareham, Town of	All sources in lidar project area (mostly inland) studied or redelineated in 2021 Cape Cod Watershed revision	Lidar	8.5 cm	N/A	USGS 2011
Bridgewater, Town of; Halifax, Town of; Lakeville, Town of; Middleborough, Town of	Assawompset Pond, Great Quitticas Pond, Long Pond, Nemasket River, Pocksha Pond, Taunton River, and all reaches in lidar project area redelineated in 2015 Narragansett Watershed revision	Lidar	7.1 cm	N/A	USGS 2011

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Duxbury, Town of; Kingston, Town of; Marshfield, Town of; Plymouth, Town of; Scituate, Town of	All coastal flooding sources	Lidar	2 ft	N/A	Photo Science 2010
Hingham, Town of; Hull, Town of; Marion, Town of; Mattapoisett, Town of; Wareham, Town of	All coastal flooding sources	Lidar	2 ft	N/A	Sanborn 2006
Hanson, Town of	Certain flooding sources not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:4,800	Sewall 1984
Hingham, Town of; Kingston, Town of	Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study	Topographic maps	5 ft	1:4,800	Avis 1979
Whitman, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Previous studies	*	*	FEMA 1978
West Bridgewater, Town of	Certain flooding sources not revised or redelineated since pre-countywide study	Previous studies	*	*	FEMA 1976
Whitman, Town of	Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study	Topographic maps	5 ft	1:4,800	Teledyne 1976
Abington, Town of	Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study	Topographic maps	5 ft	1:2,400	CDM 1975

*Data not available

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Hingham, Town of	Certain flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:7,200	Perkins 1975
Norwell, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Previous studies	*	*	FEMA 1975
Halifax, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Previous studies	*	*	FEMA 1974a
Rockland, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Previous studies	*	*	FEMA 1974b
Abington, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:24,000	USGS various
Bridgewater, Town of	Certain flooding sources not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:25,000	USGS various
Bridgewater, Town of; West Bridgewater, Town of	Certain flooding sources not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:24,000	USGS various
Brockton, City of	Flooding sources not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:24,000	USGS various

*Data not available

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Carver, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:25,000	USGS various
East Bridgewater, Town of; Lakeville, Town of; Middleborough, Town of	Flooding sources not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:24,000	USGS various
Halifax, Town of; Plympton, Town of	Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study	Topographic maps	5 ft	1:4,800	Col-East various
Hanson, Town of	Certain flooding sources not revised or redelineated since pre-countywide study	Topographic maps	5 ft	1:4,800	Col-East various
Hingham, Town of	Certain flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:24,000	*
Plympton, Town of	Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study	Topographic maps	10 ft	1:24,000	USGS various

*Data not available

BFEs shown at cross sections on the FIRM represent the 1% 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

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	16,178	128	437	0.6	107.5	107.5	108.4	0.9
B	16,284	100	428	0.6	107.5	107.5	108.5	1.0
C	17,234	188	929	0.3	107.5	107.5	108.5	1.0
D	18,290	9	48	5.3	112.6	112.6	112.6	0.0
E	18,396	87	334	0.8	113.1	113.1	113.1	0.0
F	19,314	128	541	0.5	113.2	113.2	113.3	0.1
G	20,164	405	1,733	0.1	113.2	113.2	113.4	0.2
H	21,738	206	703	0.4	113.2	113.2	113.4	0.2
I	22,857	39	56	4.5	113.7	113.7	114.6	0.9
J	23,681	128	338	0.8	116.0	116.0	117.0	1.0
K	24,980	16	39	6.6	118.6	118.6	118.9	0.3
L	26,337	92	382	0.7	124.4	124.4	124.5	0.1
M	26,437	56	185	1.4	124.4	124.4	124.5	0.1

[1]Feet above confluence with Plymouth River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: ACCORD BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	38	326	2.4	63.9	63.9	64.9	1.0
B	800	33	174	5.8	68.9	68.9	69.9	1.0
C	3,520	200	912	1.1	73.2	73.2	47.2	1.0
D	4,800	34	288	3.1	77.6	77.6	78.6	1.0
E	6,320	40	67	7.3	88.4	88.4	88.7	0.3
F	8,080	71	704	2.1	93.6	93.6	94.6	1.0

[1]Feet above Elm Street

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BEAVER BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,950	240	901	1.5	*	9.9	10.9	1.0
B	4,250	37	185	7.2	13.4	13.4	13.4	0.0
C	4,350	250	1,620	0.8	15.0	15.0	15.9	0.9
D	5,000	490	3,127	0.4	15.1	15.1	16.0	0.9
E	5,900	21	230	4.6	18.0	18.0	18.4	0.4
F	6,000	72	695	1.5	18.6	18.6	19.1	0.5
G	7,100	162	1,328	0.8	18.9	18.9	19.5	0.6
H	8,600	384	3,578	0.3	18.9	18.9	19.5	0.6

[1]Feet above confluence with Cape Cod Bay
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BEAVER DAM BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,400	108	221	0.5	90.4	88.3[2]	89.3	1.0
B	2,040	38	17	2.9	90.4	90.0[2]	90.1	0.1
C	3,580	10	25	2.0	97.8	97.8	98.0	0.2
D	4,620	13	22	2.3	100.5	100.5	100.6	0.1

[1]Feet above confluence with West Meadow Brook
[2]Elevation computed without consideration of backwater effects from West Meadow Brook

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BLACK BETTY BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	-510	20	119	2.3	53.6	53.6	54.6	1.0
B	-502	18	64	3.3	55.5	55.5	56.2	0.7
C	1,150	70	181	1.6	57.8	57.8	58.8	1.0

[1]Feet above Central Street

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BLACK BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	50	19	64	4.1	37.6	37.6	38.4	0.8
B	600	20	48	5.5	41.2	41.2	41.2	0.0
C	1,090	20	55	4.7	43.8	43.8	44.4	0.6
D	1,440	15	38	6.9	48.2	48.2	48.6	0.4
E	1,650	60	128	2.0	50.9	50.9	51.9	1.0
F	1,960	25	57	4.6	52.7	52.7	52.8	0.1
G	2,100	15	37	5.7	52.9	52.9	53.2	0.3
H	2,800	27	67	3.1	56.3	56.3	56.7	0.4
I	3,370	15	39	5.3	58.3	58.3	58.9	0.6
J	3,440	15	27	7.7	59.9	59.9	60.1	0.2
K	4,270	16	55	3.8	65.4	65.4	66.3	0.9
L	4,720	16	49	4.3	67.1	67.1	67.9	0.8
M	5,200	16	59	3.6	68.6	68.6	69.6	1.0
N	6,000	40	80	1.9	72.1	72.1	72.5	0.4
O	6,310	23	28	5.3	75.3	75.3	75.3	0.0

[1]Feet above confluence with Second Herring Brook

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BLACK POND BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	10	95	617	1.4	14.2	14.2	15.2	1.0
B	110	200	1,557	0.6	14.3	14.3	15.3	1.0
C	710	100	550	1.6	14.4	14.4	15.4	1.0
D	1,410	140	534	1.6	16.7	16.7	17.1	0.4
E	1,500	147	565	1.6	18.3	18.3	18.7	0.4
F	1,850	77	510	1.7	18.3	18.3	18.8	0.5
G	1,950	242	1,788	0.5	19.2	19.2	19.4	0.2
H	2,850	90	145	6.1	23.0	23.0	23.0	0.0
I	4,450	273	1,436	0.5	29.4	29.4	30.1	0.7
J	5,450	349	898	0.7	30.2	30.2	30.2	0.0
K	6,000	180	347	1.9	30.6	30.6	30.8	0.2

[1]Feet above Mordecai Lincoln Road

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BOUND BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	600	116	396	2.7	*	9.2[2]	10.2	1.0
B	1,265	101	298	3.6	16.7	16.7	16.7	0.0
C	1,380	340	2,495	0.4	17.9	17.9	18.4	0.5
D	1,980	506	4,642	0.2	17.9	17.9	18.4	0.5
E	2,695	16	134	7.9	18.5	18.5	19.4	0.9
F	2,810	223	1,868	0.6	19.8	19.8	20.4	0.6

[1]Feet above confluence with Eel River
[2]Elevation computed without consideration of backwater effects from Eel River
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: BRANCH OF EEL RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,515	100	116	4.4	66.6	64.1[2]	64.1	0.0
B	4,275	40	181	2.8	67.2	67.2	67.6	0.4
C	6,078	85	297	1.7	67.7	67.7	68.3	0.6

[1]Feet above confluence with Weweantic River
[2]Elevation computed without consideration of backwater effects from Weweantic River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: CRANE BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	34	235	1.9	28.4	28.4	28.8	0.4
B	100	44	351	1.3	28.5	28.5	28.9	0.4
C	1,500	35	224	1.6	28.5	28.5	29.0	0.5
D	2,640	9	60	6.0	31.2	31.2	31.2	0.0
E	2,777	16	124	2.9	31.8	31.8	31.8	0.0
F	3,775	13	118	3.1	31.9	31.9	32.7	0.8

[1]Feet above Free Street

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: CROOKED MEADOW BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	5,600	38	233	6.6	50.3	50.3	50.6	0.3
B	6,780	155	686	2.1	52.1	52.1	53.1	1.0
C	7,200	40	154	7.5	52.5	52.5	53.3	0.8
D	8,080	35	167	6.9	67.0	67.0	67.1	0.1
E	8,435	200	2,169	0.7	67.7	67.7	68.4	0.7
F	10,870	58	358	3.8	68.1	68.1	68.4	0.3
G	12,585	40	354	2.5	75.1	75.1	75.6	0.5
H	13,660	50	464	1.9	75.1	75.1	75.8	0.7
I	14,880	30	248	2.3	76.2	76.2	76.3	0.1
J	15,570	40	284	2.3	76.2	76.2	76.5	0.3
K	17,030	200	783	0.7	76.2	76.2	76.9	0.7
L	18,430	250	1,014	0.6	76.4	76.4	77.1	0.7
M	19,430	55	146	2.3	76.4	76.4	77.1	0.7
N	20,540	160	620	0.5	79.7	79.7	80.4	0.7

[1]Feet above confluence with Indian Head River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: DRINKWATER RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	100	27	125	2.5	52.5	52.5	53.5	1.0
B	430	27	115	2.7	53.1	53.1	53.8	0.7
C	535	27	119	2.7	53.2	53.2	54.0	0.8
D	1,150	45	260	1.2	53.6	53.6	54.3	0.7
E	1,252	30	112	2.8	54.2	54.2	54.6	0.4
F	1,950	45	277	1.1	54.3	54.3	54.7	0.4
G	2,064	32	210	1.5	54.4	54.4	54.8	0.4
H	3,130	150	118	2.7	54.5	54.5	55.2	0.7
I	3,200	200	214	1.5	54.7	54.7	55.3	0.6
J	3,670	20	123	2.6	55.2	55.2	56.0	0.8
K	4,220	6	26	12.3	60.0	60.0	60.0	0.0
L	4,291	16	112	2.8	67.7	67.6	67.6	0.0

[1]Feet above confluence with Drinkwater River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: DRINKWATER RIVER TRIBUTARY

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	201	28	99	1.1	48.8	48.8	49.8	1.0
B	919	5	14	7.8	49.8	49.8	50.0	0.2
C	966	49	137	0.8	51.1	51.1	51.2	0.1
D	1,668	78	229	0.5	51.2	51.2	51.4	0.2
E	2,988	5	16	7.2	55.1	55.1	55.1	0.0
F	3,105	26	104	1.1	56.0	56.0	56.0	0.0
G	3,844	76	160	0.7	56.1	56.1	56.2	0.1
H	4,784	6	22	5.2	74.4	74.4	74.4	0.0
I	4,932	9	15	7.4	75.1	75.1	75.1	0.0
J	5,349	49	255	0.4	98.8	98.8	98.8	0.0
K	5,475	23	101	1.1	98.8	98.8	98.8	0.0
L	5,993	77	239	0.5	98.9	98.9	99.0	0.1

[1]Feet above confluence with Plymouth River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: EEL RIVER (TOWN OF HINGHAM)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	9,700	47	160	2.9	*	8.0[2]	9.0	1.0
B	9,960	30	102	4.5	*	9.6[2]	10.0	0.4
C	10,060	12	43	10.8	10.3	10.3	10.3	0.0
D	10,160	96	487	1.0	12.3	12.3	12.3	0.0
E	10,400	53	239	1.9	12.4	12.4	12.5	0.1
F	10,700	49	187	2.5	12.6	12.6	12.8	0.2
G	10,830	190	332	1.4	24.8	24.8	24.8	0.0
H	10,940	316	1,579	0.3	25.0	25.0	25.0	0.0
I	11,800	330	1,631	0.3	25.0	25.0	25.0	0.0
J	12,700	234	492	0.9	25.0	25.0	25.0	0.0
K	12,810	20	82	5.7	25.0	25.0	25.1	0.1
L	12,950	19	96	4.8	25.8	25.8	25.9	0.1
M	13,200	104	377	1.2	26.4	26.4	26.6	0.2
N	13,800	37	62	7.5	26.9	26.9	27.2	0.3
O	13,920	10	41	11.4	29.2	29.2	29.2	0.0
P	14,000	29	57	8.1	33.6	33.6	33.6	0.0
Q	14,110	7	57	8.2	56.7	56.7	56.7	0.0
R	14,220	366	2,061	0.2	57.4	57.4	57.4	0.0

[1]Feet above confluence with Plymouth Harbor
[2]Elevation computed without consideration of backwater effects from Plymouth Harbor
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: EEL RIVER (TOWN OF PLYMOUTH)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	575	232	871	0.7	17.2	17.2	17.3	0.1
B	1,420	370	1,163	0.5	17.5	17.5	17.6	0.1
C	2,420	123	445	1.4	17.6	17.6	17.8	0.2
D	3,420	50	88	6.9	24.3	24.3	24.3	0.0
E	4,430	41	639	0.7	41.8	41.8	41.8	0.0
F	5,530	770	7,845	0.1	41.8	41.8	41.8	0.0
G	6,730	10	80	4.5	41.8	41.8	41.8	0.0
H	7,920	280	821	0.4	44.0	44.0	44.0	0.0
I	8,920	30	49	7.3	44.0	44.0	44.5	0.5
J	9,920	120	311	1.2	48.8	48.8	49.5	0.7
K	10,920	197	409	0.9	50.0	50.0	50.8	0.8
L	12,020	33	126	1.9	57.3	57.3	57.9	0.6
M	12,890	14	57	4.3	62.7	62.7	63.6	0.9
N	14,000	164	470	0.5	65.2	65.2	65.8	0.6
O	15,000	145	407	0.6	65.4	65.4	66.2	0.8
P	15,800	94	261	0.9	65.7	65.7	66.7	1.0

[1]Feet above New Driftway

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: FIRST HERRING BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	640	80	240	2.9	68.4	68.4	68.9	0.5
B	1,800	90	282	2.5	69.4	69.4	69.9	0.5
C	2,550	90	286	2.4	70.1	70.1	70.9	0.8
D	4,400	430	1,370	0.5	70.8	70.8	71.8	1.0
E	5,310	401	1,199	0.5	70.9	70.9	71.9	1.0
F	6,750	230	698	0.7	71.1	71.1	72.1	1.0
G	8,420	*	137	3.8	72.8	72.8	73.4	0.6
H	10,425	*	124	3.5	79.5	79.5	80.0	0.5
I	12,540	*	122	3.5	84.4	84.4	84.8	0.4
J	13,760	*	101	4.3	86.2	86.2	86.9	0.7
K	14,800	*	94	4.6	89.5	89.5	89.5	0.0
L	17,690	*	191	1.9	101.5	101.5	101.5	0.0
M	18,420	*	212	1.7	102.5	102.5	102.6	0.1
N	18,880	50	154	2.3	102.5	102.5	102.7	0.2
O	19,300	*	78	4.6	103.4	103.4	103.5	0.1
P	21,630	*	40	9.0	108.3	108.3	108.3	0.0
Q	22,740	*	87	4.2	115.2	115.2	115.4	0.2
R	23,480	100	411	0.9	118.5	118.5	118.5	0.0

[1]Feet above confluence with Drinkwater River
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: FRENCH STREAM

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	16	*	32	8.3	18.8	18.8	18.8	0.0
B	100	149	1,084	0.2	20.0	20.0	20.0	0.0
C	301	26	122	2.2	21.5	21.5	21.5	0.0
D	760	22	101	2.6	21.7	21.7	21.9	0.2
E	1,214	22	75	3.5	21.9	21.9	22.5	0.6
F	1,404	*	44	6.0	23.5	23.5	23.5	0.0
G	1,637	*	108	2.4	24.0	24.0	24.3	0.3
H	1,837	28	197	1.3	24.1	24.1	24.4	0.3
I	2,397	26	170	1.6	24.1	24.1	24.5	0.4
J	3,918	22	193	1.4	24.2	24.2	24.8	0.6
K	5,776	336	3,261	0.1	24.2	24.2	25.0	0.8
L	7,476	80	382	0.6	24.2	24.2	25.1	0.9
M	8,596	184	697	0.2	24.2	24.2	25.1	0.9
N	9,858	50	131	1.1	24.2	24.2	25.2	1.0
O	10,639	50	108	1.4	24.8	24.8	25.8	1.0
P	11,357	22	27	5.4	27.9	27.9	27.9	0.0
Q	11,558	*	19	7.8	31.5	31.5	31.5	0.0
R	11,648	*	28	5.1	32.9	32.9	33.2	0.3
S	12,038	400	1,695	0.1	41.4	41.4	41.4	0.0
T	14,277	120	145	0.9	41.4	41.4	41.4	0.0
U	15,159	80	119	1.1	42.6	42.6	43.6	1.0

[1]Feet above dam
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: HALLS BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	15,660	40	50	2.2	45.0	45.0	45.0	0.0
W	15,808	23	154	0.7	52.7	52.7	52.7	0.0
X	16,220	*	51	2.1	52.9	52.9	53.5	0.6
Y	16,421	435	1,530	0.1	52.9	52.9	53.6	0.7

[1]Feet above dam
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: HALLS BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	4,230	*	35	6.0	46.8	46.8	47.3	0.5

[1]Feet above Damons Point Road
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: HANNAH EAMES BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	11,440	111	64	4.3	20.8	20.8	20.8	0.0
B	11,755	65	272	1.0	25.1	25.1	25.1	0.0
C	13,635	58	51	5.4	25.7	25.7	25.7	0.0
D	16,545	80	130	1.7	31.9	31.9	31.9	0.0
E	17,291	9	38	5.7	35.6	35.6	35.6	0.0
F	18,251	175	479	0.5	36.3	36.3	36.3	0.0
G	19,812	35	37	5.9	39.4	39.4	39.4	0.0

[1]Feet above confluence with North River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: HERRING BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	-3,115	1,643	9,444	0.1	62.6	62.6	63.6	1.0
B	-1,765	1,383	6,072	0.2	62.6	62.6	63.6	1.0
C	-90	1,590	5,685	0.2	62.6	62.6	63.6	1.0
D	1,490	1,500	4,804	0.2	63.3	63.3	63.7	0.4
E	2,910	1,200	3,096	0.3	63.4	63.4	63.7	0.3
F	4,350	900	2,389	0.4	63.5	63.5	63.8	0.3
G	5,880	600	1,641	0.6	63.5	63.5	63.9	0.4
H	7,306	567	781	1.2	63.7	63.7	64.5	0.8
I	8,170	300	1,081	0.9	66.7	66.7	66.8	0.1
J	10,144	100	456	2.1	66.8	66.8	67.3	0.5
K	11,480	100	407	2.3	68.1	68.1	68.9	0.8
L	15,015	100	367	2.6	70.8	70.8	71.8	1.0
M	17,520	100	471	1.9	74.2	74.2	74.6	0.4
N	19,233	100	471	1.9	74.3	74.3	75.3	1.0
O	22,271	100	395	2.2	75.8	75.8	76.7	0.9
P	24,000	100	384	2.3	77.0	77.0	78.0	1.0
Q	24,732	100	404	2.2	78.9	78.9	79.5	0.6

[1]Feet above Maple Street in West Bridgewater

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: HOCKOMOCK RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	250	78	252	2.5	21.2	21.2	22.0	0.8
B	850	75	463	1.4	26.6	26.6	26.6	0.0
C	950	170	643	1.0	26.6	26.6	26.6	0.0
D	1,310	80	221	2.9	26.6	26.6	26.6	0.0
E	1,870	111	496	1.3	28.1	28.1	28.5	0.4
F	2,430	15	82	7.7	28.3	28.3	28.3	0.0

[1]Feet above confluence with Cape Cod Bay

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: INDIAN BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	250	27	111	2.8	39.9	38.9[2]	39.8	0.9
B	1,180	36	157	2.0	40.1	39.6[2]	40.5	0.9
C	2,180	35	48	6.6	41.9	41.9	42.0	0.1
D	2,400	125	372	0.8	46.4	46.4	46.4	0.0
E	3,200	100	408	0.8	46.5	46.5	46.5	0.0
F	4,160	26	45	7.0	46.7	46.7	46.9	0.2
G	5,340	60	217	1.3	53.3	53.3	53.6	0.3
H	6,750	25	127	2.2	53.5	53.5	54.1	0.6
I	7,980	130	273	0.7	53.8	53.8	54.7	0.9
J	8,910	50	102	1.9	54.2	54.2	55.2	1.0
K	10,010	18	68	2.9	57.7	57.7	58.0	0.3
L	11,550	125	274	0.7	58.0	58.0	58.9	0.9
M	12,400	18	43	4.5	59.3	59.3	59.3	0.0

[1]Feet above confluence with Indian Head River
[2]Elevation computed without consideration of backwater effects from Indian Head River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: INDIAN HEAD BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	5,830	100	467	3.9	25.6	25.6	26.6	1.0
B	6,280	60	222	8.2	27.0	27.0	27.5	0.5
C	7,130	50	283	6.4	31.3	31.3	31.6	0.3
D	7,700	179	1,002	1.8	38.5	38.5	38.5	0.0
E	8,690	261	1,120	1.6	38.7	38.7	38.7	0.0
F	9,800	119	634	2.9	39.0	39.0	39.0	0.0
G	11,100	72	465	3.9	39.6	39.6	39.8	0.2
H	12,650	150	752	2.1	40.5	40.5	41.3	0.8
I	13,660	330	1,202	1.3	41.5	41.5	42.5	1.0
J	14,450	50	326	4.8	44.4	44.4	44.9	0.5

[1]Feet above Elm Street Dam

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: INDIAN HEAD RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	132	55	192	3.0	*	7.0[2]	7.0	0.0
B	192	55	198	2.9	*	7.2[2]	7.2	0.0
C	670	94	269	2.2	*	8.0[2]	8.2	0.2
D	1,555	45	133	4.4	*	9.9	10.9	1.0
E	1,619	70	237	2.5	12.2	12.2	12.3	0.1
F	1,655	44	269	2.2	19.1	19.1	19.1	0.0
G	1,794	290	1,870	0.3	19.2	19.2	19.2	0.0
H	2,587	114	553	1.0	19.2	19.2	19.2	0.0
I	3,544	64	332	1.7	19.3	19.3	19.3	0.0
J	5,493	63	260	2.0	19.5	19.5	20.0	0.5
K	6,429	122	376	1.4	19.6	19.6	20.5	0.9
L	7,268	27	61	8.6	20.8	20.8	20.8	0.0
M	7,473	53	100	5.2	23.0	23.0	23.1	0.1
N	8,272	39	175	3.0	25.1	25.1	25.5	0.4
O	9,446	26	139	3.8	26.3	26.3	26.9	0.6
P	10,363	83	301	1.7	27.0	27.0	27.9	0.9
Q	11,857	60	228	2.3	27.9	27.9	28.8	0.9
R	12,495	32	134	3.9	28.7	28.7	29.5	0.8
S	14,032	34	179	2.9	30.6	30.6	31.5	0.9
T	15,561	91	300	1.7	31.7	31.7	32.7	1.0
U	16,458	154	496	1.1	32.2	32.2	33.2	1.0

[1]Feet above confluence with Second Brook
[2]Elevation computed without consideration of backwater effects from Kingston Bay
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: JONES RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	16,521	38	179	2.9	32.2	32.2	33.2	1.0
W	17,564	281	829	0.6	32.7	32.7	33.7	1.0
X	18,870	80	284	1.8	33.1	33.1	34.0	0.9
Y	19,576	130	394	0.5	33.2	33.2	34.2	1.0
Z	20,558	33	138	1.4	33.4	33.4	34.4	1.0
AA	21,902	51	143	1.4	33.9	33.9	34.8	0.9
AB	22,720	39	77	2.5	34.7	34.7	35.4	0.7
AC	22,821	33	151	1.3	36.5	36.5	36.9	0.4
AD	22,993	49	245	0.8	38.2	38.2	38.6	0.4
AE	23,241	45	206	0.9	38.2	38.2	38.7	0.5
AF	23,798	30	75	0.9	38.2	35.7[2]	36.0	0.3
AG	25,358	61	122	0.6	38.2	35.9[2]	36.3	0.4
AH	26,658	*	12	5.8	39.7	39.7	39.9	0.2
AI	26,898	49	40	0.6	40.5	40.5	40.9	0.4
AJ	27,178	83	310	0.1	47.1	47.1	47.1	0.0

[1]Feet above confluence with Second Brook
[2]Elevation computed without consideration of backwater effects from downstream Jones River model
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: JONES RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	53	155	1.9	33.2	32.5[2]	33.5	1.0
B	1,162	90	309	1.0	33.7	33.7	34.6	0.9
C	2,360	79	245	1.2	34.5	34.5	35.3	0.8
D	3,041	*	74	4.0	35.1	35.1	36.0	0.9
E	3,268	40	206	1.5	38.7	38.7	38.9	0.2
F	4,150	61	333	0.9	38.7	38.7	39.0	0.3

[1]Feet above confluence with Jones River
[2]Elevation computed without consideration of backwater effects from Jones River
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: JONES RIVER BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	800	60	315	0.9	79.8	79.8	80.5	0.7
B	1,790	65	320	0.8	79.8	79.8	80.8	1.0
C	2,700	40	112	2.4	83.2	83.2	83.8	0.6
D	2,875	19	69	3.9	83.7	83.7	84.2	0.5
E	3,880	18	58	4.7	85.2	85.2	85.7	0.5
F	5,120	6	33	8.2	92.9	92.9	93.2	0.3

[1]Feet above confluence with Drinkwater River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: LONGWATER BROOK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,560	129	1,412	1.7	29.4	29.4	30.3	0.9
B	6,670	190	1,240	2.0	31.4	31.4	32.1	0.7
C	7,200	268	2,316	1.1	33.2	33.2	33.9	0.7

[1]Feet above confluence with Taunton River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: MATFIELD RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	-95	*	125	3.9	21.2	21.2	22.2	1.0
B	95	23	111	4.4	22.0	22.0	22.9	0.9
C	1,895	130	334	1.4	23.7	23.7	24.6	0.9
D	3,345	25	70	7.0	25.2	25.2	25.4	0.2
E	5,445	30	162	3.0	26.9	26.9	27.8	0.9
F	6,705	80	321	1.5	27.6	27.6	28.6	1.0
G	8,515	50	220	2.2	28.5	28.5	29.4	0.9
H	10,655	120	468	1.0	29.2	29.2	30.1	0.9
I	11,685	30	123	3.9	30.6	30.6	31.0	0.4
J	13,025	90	434	1.1	32.6	32.6	33.3	0.7
K	15,005	115	544	0.9	32.8	32.8	33.7	0.9
L	16,195	150	549	0.9	32.9	32.9	33.8	0.9
M	17,445	130	427	1.1	33.0	33.0	34.0	1.0
N	19,035	160	413	1.2	33.5	33.5	34.5	1.0
O	20,195	*	120	4.0	34.5	34.5	35.1	0.6
P	22,025	150	416	1.2	38.3	38.3	39.1	0.8
Q	22,895	135	314	1.5	38.8	38.8	39.8	1.0
R	24,065	30	71	1.9	41.5	41.5	42.4	0.9
S	25,055	36	57	2.4	44.6	44.6	44.6	0.0
T	28,105	*	662	0.2	51.8	51.8	51.8	0.0
U	28,995	*	31	4.3	51.8	51.8	51.8	0.0

[1]Feet above Wolf Island Road
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: MATTAPOISETT RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	29,985	*	58	2.3	53.1	53.1	53.8	0.7
W	30,805	*	99	0.7	53.4	53.4	54.2	0.8
X	32,645	*	39	1.6	53.7	53.7	54.5	0.8
Y	33,735	*	29	2.2	54.5	54.5	55.0	0.5

[1]Feet above Wolf Island Road bridge in Rochester

*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: MATTAPOISETT RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	28	141	3.4	39.8	39.8	40.8	1.0
B	1,040	56	161	3.0	42.2	42.2	42.6	0.4
C	2,160	41	127	3.7	47.5	47.5	47.5	0.0
D	2,812	15	239	2.7	49.0	49.0	49.1	0.1
E	3,229	26	389	2.2	50.4	50.4	50.6	0.2
F	4,509	56	203	3.7	55.9	55.9	56.9	1.0
G	6,389	64	209	2.6	59.4	59.4	59.9	0.5
H	8,069	19	182	4.1	66.8	66.8	67.5	0.7
I	9,269	87	360	2.0	69.5	69.5	70.5	1.0
J	10,789	50	350	2.2	70.6	70.6	71.6	1.0
K	12,269	12	160	3.0	72.6	72.6	73.4	0.8
L	13,989	57	1,848	0.4	74.6	74.6	75.5	0.9
M	15,069	345	1,715	0.4	74.6	74.6	75.6	1.0
N	16,429	50	234	1.2	77.7	77.7	77.8	0.1
O	17,489	25	117	2.3	77.8	77.8	78.0	0.2
P	17,939	25	118	2.3	77.8	77.8	78.2	0.4
Q	18,189	30	113	1.9	77.9	77.9	78.4	0.5
R	19,279	50	152	1.4	78.7	78.7	79.6	0.9
S	20,029	20	51	4.4	80.0	80.0	80.5	0.5
T	20,560	50	182	1.2	84.4	84.4	84.4	0.0
U	21,269	45	100	2.2	86.1	86.1	87.0	0.9

[1]Feet above Central Street

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: MEADOW BROOK