Former Mt. Tom Station Power Plant
200 Northampton Street
Holyoke, Massachusetts

Inflow Design Flood Control System Plan – Bottom Ash Basin A

Mt. Tom Generating Company LLC
Houston, Texas

May 2026

Certification Statement

CCR Unit: Mt. Tom Generating Company LLC; former Mt. Tom Power Plant; Bottom Ash Basin A

I hereby certify that, to the best of my knowledge, information, and belief, the information contained in this CCR Rule Report, including all underlying data, has been prepared in accordance with accepted engineering practices. I further certify that, with respect to the above-referenced CCR Unit, the Inflow Design Flood Control System Plan dated May 7, 2026, has been prepared to meet the applicable requirements and provisions of Title 40 of the Code of Federal Regulations § 257.82 (40 CFR 257.82)

David Azinheira, PE, CFM
Printed Name

May 7, 2026
Date

COMMONWEALTH OF MASSACHUSETTS
DAVID L. AZINHEIRA
CIVIL
No. 53723
REGISTERED
PROFESSIONAL ENGINEER

Table of Contents

SECTION 1 | Introduction **1-1**
1.1 Background 1-1
1.2 Purpose 1-1
1.3 Regulations 1-1

SECTION 2 | Flood Control System **2-1**
2.1 Internal Flood Potential 2-1
2.2 External Floodwater Potential 2-2
2.3 Flood Control System Performance 2-3

SECTION 3 | Evaluation of Extreme Connecticut River Flood Conditions **3-1**
3.1 Connecticut River Water Levels 3-1
3.2 Connecticut River Water Level Behavior 3-1
3.2.1 USGS Stream Gage Data Review 3-1
3.2.2 Development of Water Level-Time Relationship 3-3
3.3 Summary of Connecticut River Water Level Evaluation 3-4

SECTION 4 | Plan Revision and Record Keeping **4-1**

Figures

FIGURE 1 Site Location Map .... Full Page Figures
FIGURE 2 Site Plan .... Full Page Figures
FIGURE 3-1 Stream Gage Rising Limb Slope Graphical Summary 3-2
FIGURE 3-2 Stream Gage Falling Limb Slope Graphical Summary 3-34

Tables

TABLE 2-1 Precipitation Depths for Hydrologic Modeling 2-2
TABLE 2-2 Hydrologic Modeling Results 2-2
TABLE 3-1 Falling Limb Slopes from Evaluated Storm Events 3-2
TABLE 3-2 Connecticut River Elevation Flow Relationship at Bottom Ash Basin A 3-4
TABLE 3-3 Connecticut River Water Level-Time Estimate Adjacent to Bottom Ash Basin 3-4

Appendices

Appendix A: Rainfall Data
Appendix B: Hydrologic Model Output
Appendix C: FEMA Data for Connecticut River
Appendix D: Stream Gauge Data
Appendix E: Predicted Connecticut River Water Levels

\\tighebond.com\data\data\projects\G\G0682 GDF Mt. Tom\037 - Post Closure Compliance & CCR\06 - CCR\Initial Inflow Design - Flood Control Plan\Report\Final\Bottom Ash Basin A\Inflow Design Flood Control System Plan - Bottom Ash Basin A.docx

SECTION 1 | Introduction

1.1 Background

On behalf of Mt. Tom Generating Company LLC ("MTGC"), a wholly owned indirect subsidiary of ENGIE North America, Inc., Tighe & Bond, Inc. ("Tighe & Bond") has prepared this Inflow Design Flood Control System Plan ("Plan") associated with the Environmental Protection Agency ("EPA") Coal Combustion Residuals ("CCR") Final Rule for Legacy CCR Surface Impoundments ("LSI") and CCR Management Units ("CCRMU"), for the former MTGC facility (the "site"), located at 200 Northampton Street in Holyoke, Massachusetts. A Site Location Map and Site Plan are provided as Figure 1 and Figure 2, respectively.

The Basin known as "Bottom Ash Basin A" is shown in Figure 2 and is an LSI as defined by 40 CFR 257.82.

The width (east to west) of Bottom Ash Basin A varies from 300 feet to 360 feet, and it is approximately 360 feet long (north to south) with a maximum depth of approximately 15 feet, and a maximum structural height (compared to the elevation at the downstream toe) of approximately 12.5 feet. The maximum storage of the basin is approximately 29.3 acre-feet. The northern side of the impoundment is partially incised, sharing an embankment with the historical Coal Pile Sump Area and the Special Basin. There is currently no inflow to the basin other than direct precipitation over the basin surface area and immediately adjacent edges of the embankment crest, and the basin is generally dry other than immediately following rainfall events until rainwater infiltrates into the basin. There are no valves or diversions that could contribute flow to the basin other than direct precipitation, nor valves or diversions that would remove water from the basin.

1.2 Purpose

The CCR Rules require that an inflow design flood control system plan be prepared for LSIs. The plan must document how the inflow design flood control system has been designed, including appropriate engineering calculations. The purpose of this Plan is to meet the requirements of 40 CFR 257.82.

1.3 Regulations

The requirements of 40 CFR 257.82 "Hydrologic and hydraulic capacity requirements for CCR surface impoundments" are:

(a) *The owner or operator of an existing or new CCR surface impoundment, legacy CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.*

  (1) *The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.*

  (2) *The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.*

  (3) *The inflow design flood is:*

    (i) *For a high hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the probable maximum flood;*

(ii) For a significant hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood;
(iii) For a ***low hazard potential*** *CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the* ***100-year flood****; or*
(iv) For an incised CCR surface impoundment, the 25-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under § 257.3-3.

(c) Inflow design flood control system plan –

(1) Content of the plan. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(2) Amendment of the plan. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

(3) Timeframes for preparing the initial plan –

(i) Existing CCR surface impoundments. The owner or operator of the CCR unit must prepare the initial inflow design flood control system plan no later than October 17, 2016.

(ii) New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

(4) Frequency for revising the plan. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(5) The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(g), the notification requirements specified in § 257.106(g), and the internet requirements specified in § 257.107(g).

SECTION 2 | Flood Control System

Bottom Ash Basin A is a low hazard potential CCR surface impoundment, as defined by 40 CFR 257.53. Therefore, in accordance with 40 CFR 257.82(a)(3)(iii), the Inflow Design Flood ("IDF") is the 100-year flood.

2.1 Internal Flood Potential

A rainfall runoff hydrologic analysis for Bottom Ash Basin A was performed using HydroCAD, a modeling software based on USDA-SCS Technical Release No. 20 (TR-20). The only runoff draining toward Bottom Ash Basin A is rainfall directly falling over the basin and the interior of the berm.

Principal hydrology input values for the modeling program include rainfall depth, the total contributing watershed area, land use, soil properties, and the time of concentration. The Bottom Ash Basin A watershed has a drainage area of approximately 3.0 acres (130,000 square feet). For the purposes of evaluating the internal flood control, the soils are assumed to have standing water during the majority of the storm event so a runoff curve number of 98 (the maximum runoff curve number possible following the TR-20 methodology) is conservatively assumed. Rainfall is assumed to enter the pond nearly instantaneously so direct rainfall (time of concentration of 0) is assumed.

Water is only able to exit the basins through exfiltration, and an exfiltration rate of $3x10^{-4}$ cm/s (0.425 inches/hour) was determined based on lab permeability tests calculated using ASTM D 2434-68(1974) Permeability of Granular Soils (Constant Head) presented in an Appendix (Laboratory Geotechnical Analysis) from *Mt. Tom Generating Station Coal Reconversion Hydrogeologic Study Preconversion Report*, prepared by Gibbs & Hill, Inc., dated June 9, 1981. Borings were also performed as part of the *Former Mt. Tom Station Power Plant 200 Northampton St., Holyoke, MA RTN 1-20229, ACO 00002589 Phase II Comprehensive Site Assessment & Phase III Remedial Action Plan*, prepared by Tighe & Bond, dated September 2018 and found groundwater levels were greater than 25 feet below the embankment levels in the vicinity of Bottom Ash Basin A. Groundwater levels were conservatively assumed to be at elevation 100 feet NAVD88, less than 25 feet below the embankment crest.

Bottom Ash Basin A was input into HydroCAD as a pond, with storage volumes estimated usings 2024 USGS LiDAR data for Western Massachusetts with 0.5 meter resolution flown in Spring of 2024[1].

The 24-hour precipitation for the 4%, 2%, 1%, 0.5%, 0.2%, and 0.1% annual exceedance probability storm events (the 25-, 50-, 100-, 500-and 1,000-year storms) were estimated using the National Oceanic and Atmospheric Administration ("NOAA") Atlas 14 precipitation depth estimates. **Table 2-1** provides the precipitation amounts used for the various storms analyzed and the NOAA Atlas 14 Point Precipitation Frequency Estimates are available in **Appendix A**. A 24-hour probable maximum precipitation ("PMP") was estimated using the methodology outlined in Hydrometeorological Report No. 51 and represents the "worst case" rainfall anticipated. A 24-hour Soil Conservation Service Type III rainfall distribution was conservatively assumed for all rainfall events.

Table 2-2 provides a summary of computed water level depth, computed water surface elevations, and freeboard to the low point of the embankment. For the IDF, the 1% annual exceedance probability (100-year)

[1] https://www.fisheries.noaa.gov/inport/item/78679

storm, the anticipated water level is 109.6 feet NAVD88, providing 11.7 feet to the low point in the embankment (121.3 feet NAVD88). **Appendix B** provides a summary of HydroCAD output data for the study.

TABLE 2-1 Precipitation Depths for Hydrologic Modeling

Annual Exceedance Probability	24-Hour Precipitation Depth (inches)
4% (25-year)	6.14
2% (50-year)	7.00
1% (100-year)*	**7.96**
0.2% (500-year)	11.3
0.1% (1000-year)	13.1
PMP	31.3

*The 100-year storm event is the IDF.

TABLE 2-2 Hydrologic Modeling Results

Annual Exceedance Probability	Depth of Water (feet)	Water Surface Elevation (feet, NAVD88)	Freeboard (feet)
4% (25-year)	2.4	109.4	11.9
2% (50-year)	2.5	109.5	11.8
1% (100-year)*	**2.6**	**109.6**	**11.7**
0.2% (500-year)	3.1	110.1	11.2
0.1% (1000-year)	3.3	110.3	11
24-hour PMP	5.4	112.4	8.9

*The 100-year storm event is the IDF.

Based on the evaluation, overtopping is not expected during the IDF, and Bottom Ash Basin A meets the requirements of CFR 257.82. Bottom Ash Basin A will not overtop during the 1,000-year storm event or the 24-hour PMP, significantly exceeding the minimum freeboard requirements. Additionally, water is not expected to remain impounded in Bottom Ash Basin A for long. Given the infiltration rates, the basin is expected to empty from its peak 100-year storm elevation in approximately 6 days.

2.2 External Floodwater Potential

Bottom Ash Basin A is surrounded by a perimeter berm that provides external flood water protection. Besides rainfall, one potential external inflow source to Bottom Ash Basin A was identified, the Connecticut River, located immediately east of the basin. The Connecticut River has the potential to only contribute to the Bottom Ash Basin A's flood risk under extremely rare circumstances, but it has been considered for completeness purposes.

The Connecticut River 1% annual exceedance probability (100-year) storm event water elevation data is available from the Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") number 25013C0088E effective July 16, 2013, and from the Flood Insurance Study ("FIS") for Hampden

County, Massachusetts number 25013CV001C effective June 7, 2013. **Appendix C** shows the portion of the FIRM (National Flood Hazard Layer FIRMette, exported on December 3, 2025) at the site and a summary of relevant pages from the FIS report.

The effective FEMA mapping was developed using topographic data that predates the published FIRM. Accordingly, site-specific survey data and more recent LiDAR provide a more current representation of existing ground elevations than the generalized floodplain polygons shown on the FIRM.

Bottom Ash Basin A overlaps with Cross Section BD of the Connecticut River. The Floodway Data Table from the FIS indicates the FEMA 100-year water level is 120.8 feet NAVD88 at cross section BD. The minimum embankment crest of the Bottom Ash Basin A is 121.3 feet NAVD88, so Bottom Ash Basin A is anticipated to have at minimum 0.5-foot of freeboard during the 100-year frequency storm event, and at least 1.0-foot of freeboard for the majority for Bottom Ash Basin A.

Based on these elevations, the Connecticut River is not anticipated to overtop the embankment and should not be an inflow source to Bottom Ash Basin A during the 1% annual exceedance probability event. If river elevations were to exceed the published 100-year level, causing Bottom Ash Basin A to completely fill with flood water, the resulting ponded water within the basin is anticipated to dissipate through infiltration within approximately 14 days.

2.3 Flood Control System Performance

Based on the evaluations presented in Sections 2.1 and 2.2, the Bottom Ash Basin A is considered hydraulically adequate to manage both internal and external flood conditions without the need for operational controls under the evaluated design conditions.

The long-term performance of the flood control system is dependent on routine maintenance of the basin, including maintaining embankment integrity and preserving infiltration capacity at the basin bottom.

SECTION 3 | Evaluation of Extreme Connecticut River Flood Conditions

3.1 Connecticut River Water Levels

Although overtopping is not anticipated during the IDF event at Bottom Ash Basin A, the slope stability can still be impacted by the difference in water levels outside and inside of the basin. Specifically, the analyses require an understanding of the relative rates at which exterior Connecticut River floodwaters would rise and recede compared to an assumed empty Bottom Ash Basin A.

This section documents the methodology used to estimate Connecticut River water level recession rates. The results of this evaluation are intended to support the development of conservative and technically defensible slope stability loading conditions. While note required to include in the IDF, Tighe & Bond decided to incorporate instead of writing a separate report.

3.2 Connecticut River Water Level Behavior

3.2.1 USGS Stream Gage Data Review

Tighe & Bond evaluated discharge data for the Connecticut River from U.S. Geological Survey ("USGS") Gage No. 01172003 (Connecticut River Below Power Dam at Holyoke, Massachusetts) and USGS Gage No. 01172010 (Connecticut River at I-391 Bridge at Holyoke, Massachusetts). From a slope-stability standpoint, the primary concern is whether Connecticut River water levels drop significantly faster than water levels within Bottom Ash Basin A.

Typically water levels rise faster than they recede and water levels following a peak flow decrease relatively rapidly initially, and then decline more slowly as groundwater influences dominate. Therefore, the initial falling-limb slopes were conservatively used for this analysis, as they represent the fastest likely rate of river-stage decline. **Appendix D** presents the measured annual peak flows for each gage, as well as discharge data for the three largest storm events that did not appear to be influenced by snow and/or snowmelt. Snowmelt-influenced events were excluded because they typically result in slower recession rates due to prolonged melting.

Table 3-1 summarizes the peak flow rates and estimated rising-limb and falling-limb slopes for the evaluated storm events. **Figure 3-1** illustrates the points used to calculate the falling-limb hydrographs. The average falling-limb slope used for this study is 33,100 cfs/day. Due to the complex shape of the rising hydrograph rounding toward the peak, the October 2005 hydrograph shape was used and adjusted for the peak flow.

TABLE 3-1 Falling Limb Slopes from Evaluated Storm Events

Date	Gage Number	Peak Flow (cfs)	Rising Limb Slope (cfs/day)	Falling Limb Slope (cfs/day)
June 1984	01172883	153,000	72,400	25,000
October 2005	01172010	101,000	117,200	33,867
August 2011	01172010	107,000	136,637	40,433
		Average =	**108,800**	**33,100**

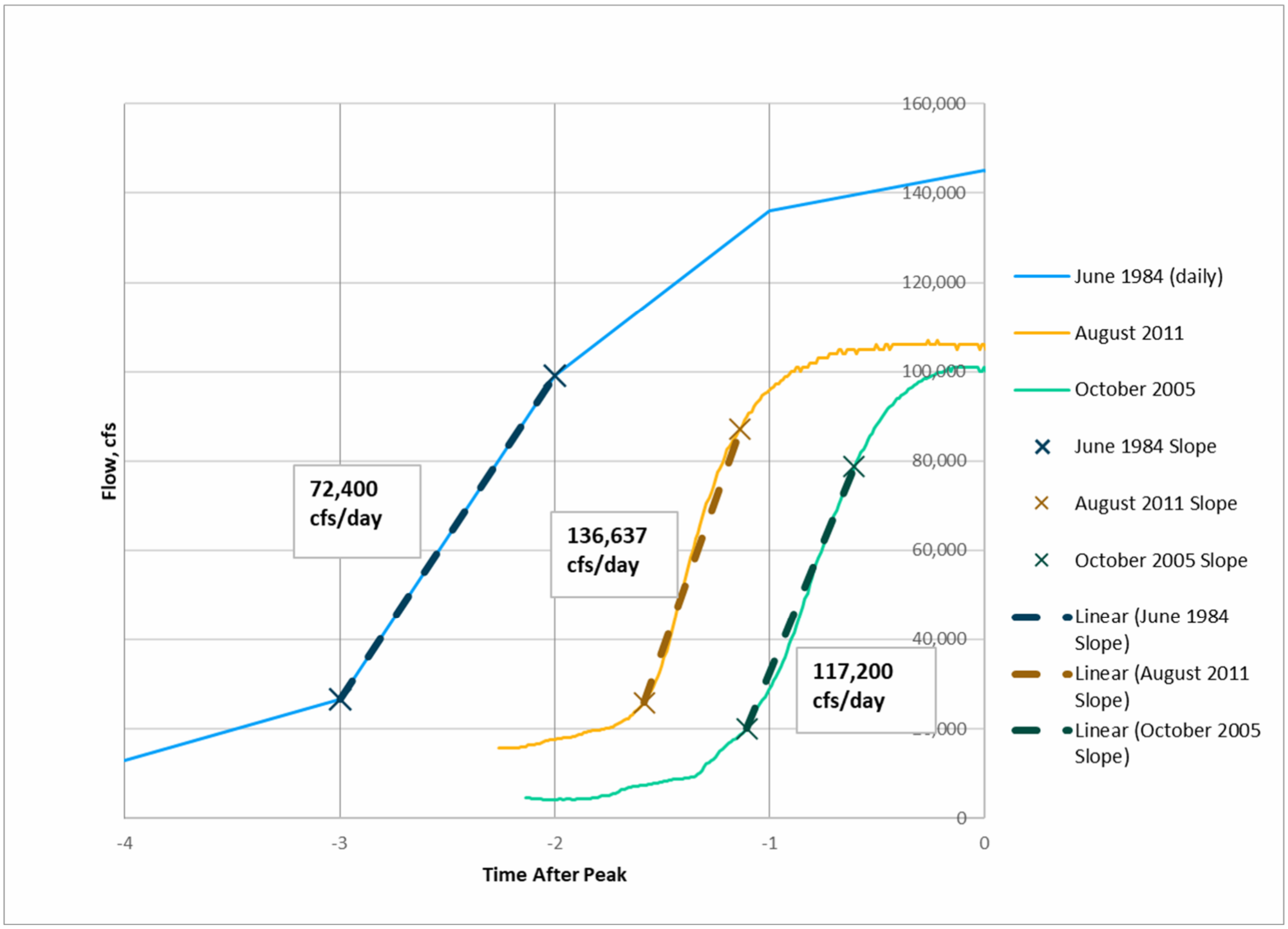


FIGURE 3-1 Stream Gage Rising Limb Slope Graphical Summary

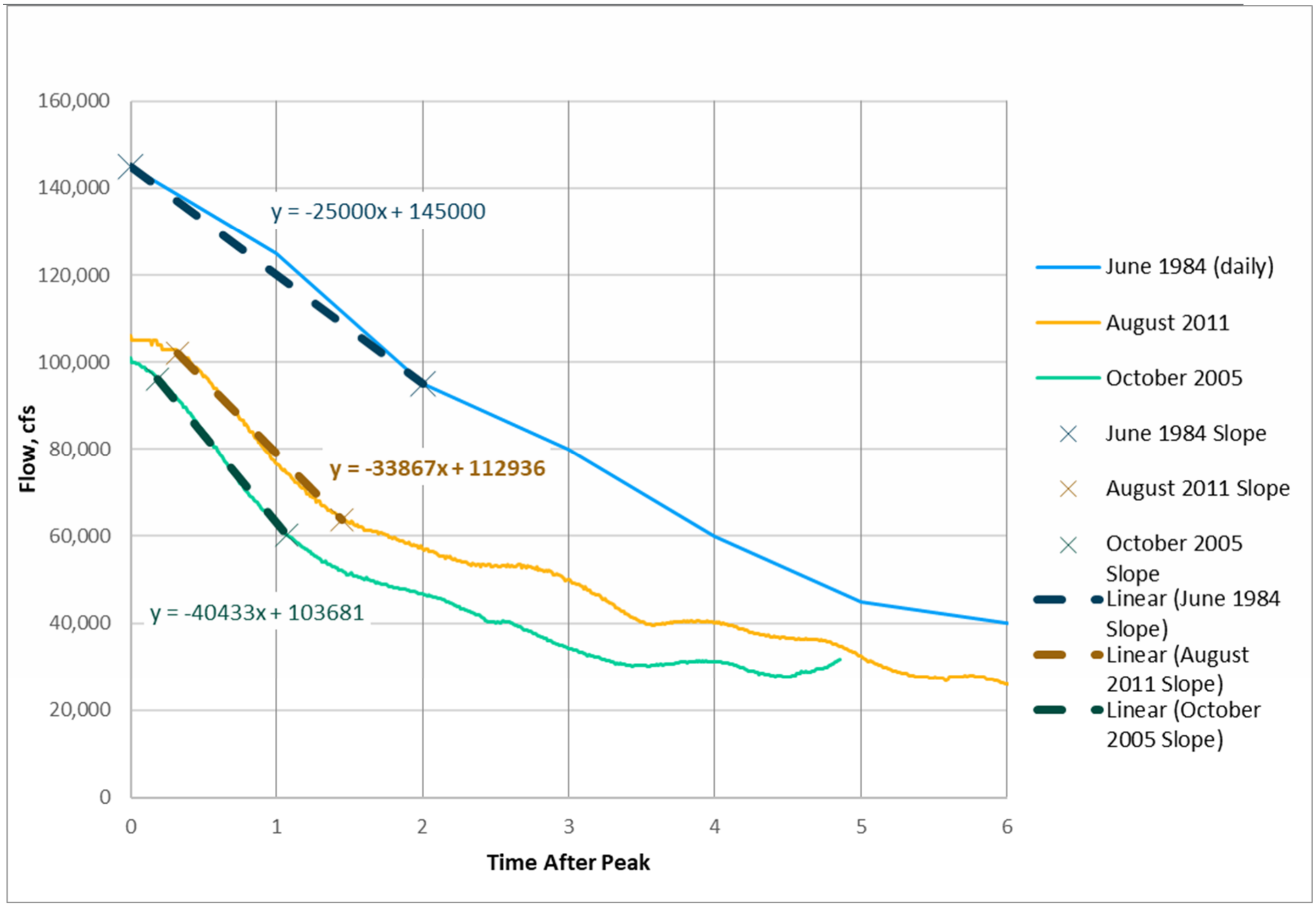


FIGURE 3-2 Stream Gage Falling Limb Slope Graphical Summary

3.2.2 Development of Water Level-Time Relationship

For the purposes of this overtopping analysis, it is assumed that the Connecticut River water level at the site will rise to approximately 120.8 feet NAVD88 for evaluating Bottom Ash Basin A, below the minimum embankment elevation of 121.3 feet NAVD88.

The Connecticut River 10%, 2%, 1%, and 0.2% annual exceedance probability (10-, 50-, 100-, and 500-year) flood water elevation data is available from the FEMA FIRM No. 25013C0088E, effective July 16, 2013, and the Flood Insurance Study (FIS) for Hampden County, Massachusetts (No. 25013CV001C) effective June 7, 2023. **Appendix C** includes a segment of the applicable FIRM panel and relevant excerpts from the FIS.

The FIS provided Connecticut River discharges for elevations ranging from 116.2 feet NAVD88 to 124 feet NAVD88 at cross section BE, and 116.1 feet NAVD88 to 123.7 feet NAVD88 at cross section BD, with corresponding flows of 132,000 cfs to 226,000 cfs. The April 2019 *Mt. Tom Facility Hydrologic and Hydraulic Analysis* determined that a flow of 27,000 cfs resulted in a water level of approximately 103.5 feet NAVD88, which was used as a reasonable lower limit for this analysis.

Table 3-2 shows the computed relationship between Connecticut River water level and flow at Bottom Ash Basin A. This relationship was used to compute elevations for a given flow rate by assuming a logarithmic trend for the flows from FEMA, and a linear trend between the 10-Year FEMA flow and the low flow estimate.

Table 3-3 shows the estimated water-level over time for the Connecticut River adjacent to Bottom Ash Basin A, conservatively assuming the basin remains empty. During the rising limb a curved shape based on the October 2005 storm event to appropriately "round off" the storm event toward the peak flow.

TABLE 3-2 Connecticut River Elevation Flow Relationship at Bottom Ash Basin A

Name	Elevation (feet, NAVD88)	Flow (cfs)	Notes
500-Year	123.7	226,000	FIS Cross Section BD
100-Year	120.8	187,000	FIS Cross Section BD
50-Year	119.5	170,000	FIS Cross Section BD
10-Year	116.1	132,000	FIS Cross Section BD
Between Normal Flow and Bank	103.5	27,000	From April 2019 "Mt. Tom Facility Hydrologic and Hydraulic Analysis" at former Fire Dock Elevation.

TABLE 3-3 Connecticut River Water Level-Time Estimate Adjacent to Bottom Ash Basin

Time (days)	Time (hours)	Flow (cfs)	Estimated Elevation (feet, NAVD88)	Notes
-1.8	43.2	27,000	103.5	Assumed starting "typical" water level
-0.9	-21.6	133,500	116.2	Switch from linear to curved rise in water level
-0.5	-12	179,900	120.4	
0	0	187,000	120.8	FEMA 100-year water level
0.5	12	176,450	120.1	Assume 33,100 cfs/day decrease
1	24	159,900	118.7	
1.5	36	143,350	117.2	
2	48	126,800	115.5	
2.5	60	110,250	113.5	
3	72	93,700	111.5	
3.5	84	77,150	109.5	Below minimum toe elevation
5.0	99.1	56,300	107.0	Below reservoir bottom elevations

3.3 Summary of Connecticut River Water Level Evaluation

Based on evaluation of FEMA flood data and U.S. Geological Survey stream gage records, Tighe & Bond estimated the relative rates of Connecticut River floodwater recession following a 100-year frequency storm event conservatively assuming Bottom Ash Basin A is empty.

These conditions represent conservative loading scenarios for slope stability analyses and were therefore used to define post-overtopping stability evaluation cases.

In accordance with 40 CFR 257.82, the owner or operator is required to maintain an up-to-date inflow design flood control system plan for the Special Basin LSI. This includes preparing the initial plan on the schedule specified for the applicable unit type and updating it at least every five years thereafter, or more frequently if site conditions change in a manner that could materially affect the plan.

Any revision or newly completed plan must be placed in the facility's operating record as required by 40 CFR 257.105(g)(4), and each version must be supported by appropriate engineering documentation. The regulation also requires that both initial and periodic plans receive certification by a qualified professional engineer (or approval by the appropriate permitting authority) to confirm that the design and documentation meet the performance standards of 40 CFR 257.82.

SECTION 4 | Plan Revision and Record Keeping

In accordance with 40 CFR 257.82, the owner or operator is required to maintain an up-to-date inflow design flood control system plan for the Bottom Ash Basin A LSI. This includes preparing the initial plan on the schedule specified for the applicable unit type, and updating it at least every five years thereafter, or more frequently if site conditions change in a manner that could materially affect the plan.

Any revision or newly completed plan must be placed in the facility's operating record as required by 40 CFR 257.105(g)(4), and each version must be supported by appropriate engineering documentation. The regulation also requires that both initial and periodic plans receive certification by a qualified professional engineer (or approval by the appropriate permitting authority) to confirm that the design and documentation meet the performance standards of 40 CFR 257.82.

County, Massachusetts number 25013CV001C effective June 7, 2013. **Appendix C** shows the portion of the FIRM (National Flood Hazard Layer FIRMette, exported on December 3, 2025) at the site and a summary of relevant pages from the FIS report.

The effective FEMA mapping was developed using topographic data that predates the published FIRM. Accordingly, site-specific survey data and more recent LiDAR provide a more current representation of existing ground elevations than the generalized floodplain polygons shown on the FIRM.

Bottom Ash Basin A overlaps with Cross Section BD of the Connecticut River. The Floodway Data Table from the FIS indicates the FEMA 100-year water level is 120.8 feet NAVD88 at cross section BD. The minimum embankment crest of the Bottom Ash Basin A is 121.3 feet NAVD88, so Bottom Ash Basin A is anticipated to have at minimum 0.5-foot of freeboard during the 100-year frequency storm event, and at least 1.0-foot of freeboard for the majority for Bottom Ash Basin A.

Based on these elevations, the Connecticut River is not anticipated to overtop the embankment and should not be an inflow source to Bottom Ash Basin A during the 1% annual exceedance probability event. If river elevations were to exceed the published 100-year level, causing Bottom Ash Basin A to completely fill with flood water, the resulting ponded water within the basin is anticipated to dissipate through infiltration within approximately 14 days.

2.3 Flood Control System Performance

Based on the evaluations presented in Sections 2.1 and 2.2, the Bottom Ash Basin A is considered hydraulically adequate to manage both internal and external flood conditions without the need for operational controls under the evaluated design conditions.

The long-term performance of the flood control system is dependent on routine maintenance of the basin, including maintaining embankment integrity and preserving infiltration capacity at the basin bottom.

SECTION 3 | Evaluation of Extreme Connecticut River Flood Conditions

3.1 Connecticut River Water Levels

Although overtopping is not anticipated during the IDF event at Bottom Ash Basin A, the slope stability can still be impacted by the difference in water levels outside and inside of the basin. Specifically, the analyses require an understanding of the relative rates at which exterior Connecticut River floodwaters would rise and recede compared to an assumed empty Bottom Ash Basin A.

This section documents the methodology used to estimate Connecticut River water level recession rates. The results of this evaluation are intended to support the development of conservative and technically defensible slope stability loading conditions. While note required to include in the IDF, Tighe & Bond decided to incorporate instead of writing a separate report.

3.2 Connecticut River Water Level Behavior

3.2.1 USGS Stream Gage Data Review

Tighe & Bond evaluated discharge data for the Connecticut River from U.S. Geological Survey ("USGS") Gage No. 01172003 (Connecticut River Below Power Dam at Holyoke, Massachusetts) and USGS Gage No. 01172010 (Connecticut River at I-391 Bridge at Holyoke, Massachusetts). From a slope-stability standpoint, the primary concern is whether Connecticut River water levels drop significantly faster than water levels within Bottom Ash Basin A.

Typically water levels rise faster than they recede and water levels following a peak flow decrease relatively rapidly initially, and then decline more slowly as groundwater influences dominate. Therefore, the initial falling-limb slopes were conservatively used for this analysis, as they represent the fastest likely rate of river-stage decline. **Appendix D** presents the measured annual peak flows for each gage, as well as discharge data for the three largest storm events that did not appear to be influenced by snow and/or snowmelt. Snowmelt-influenced events were excluded because they typically result in slower recession rates due to prolonged melting.

Table 3-1 summarizes the peak flow rates and estimated rising-limb and falling-limb slopes for the evaluated storm events. **Figure 3-1** illustrates the points used to calculate the falling-limb hydrographs. The average falling-limb slope used for this study is 33,100 cfs/day. Due to the complex shape of the rising hydrograph rounding toward the peak, the October 2005 hydrograph shape was used and adjusted for the peak flow.

TABLE 3-1 Falling Limb Slopes from Evaluated Storm Events

Date	Gage Number	Peak Flow (cfs)	Rising Limb Slope (cfs/day)	Falling Limb Slope (cfs/day)
June 1984	01172883	153,000	72,400	25,000
October 2005	01172010	101,000	117,200	33,867
August 2011	01172010	107,000	136,637	40,433
		Average =	**108,800**	**33,100**

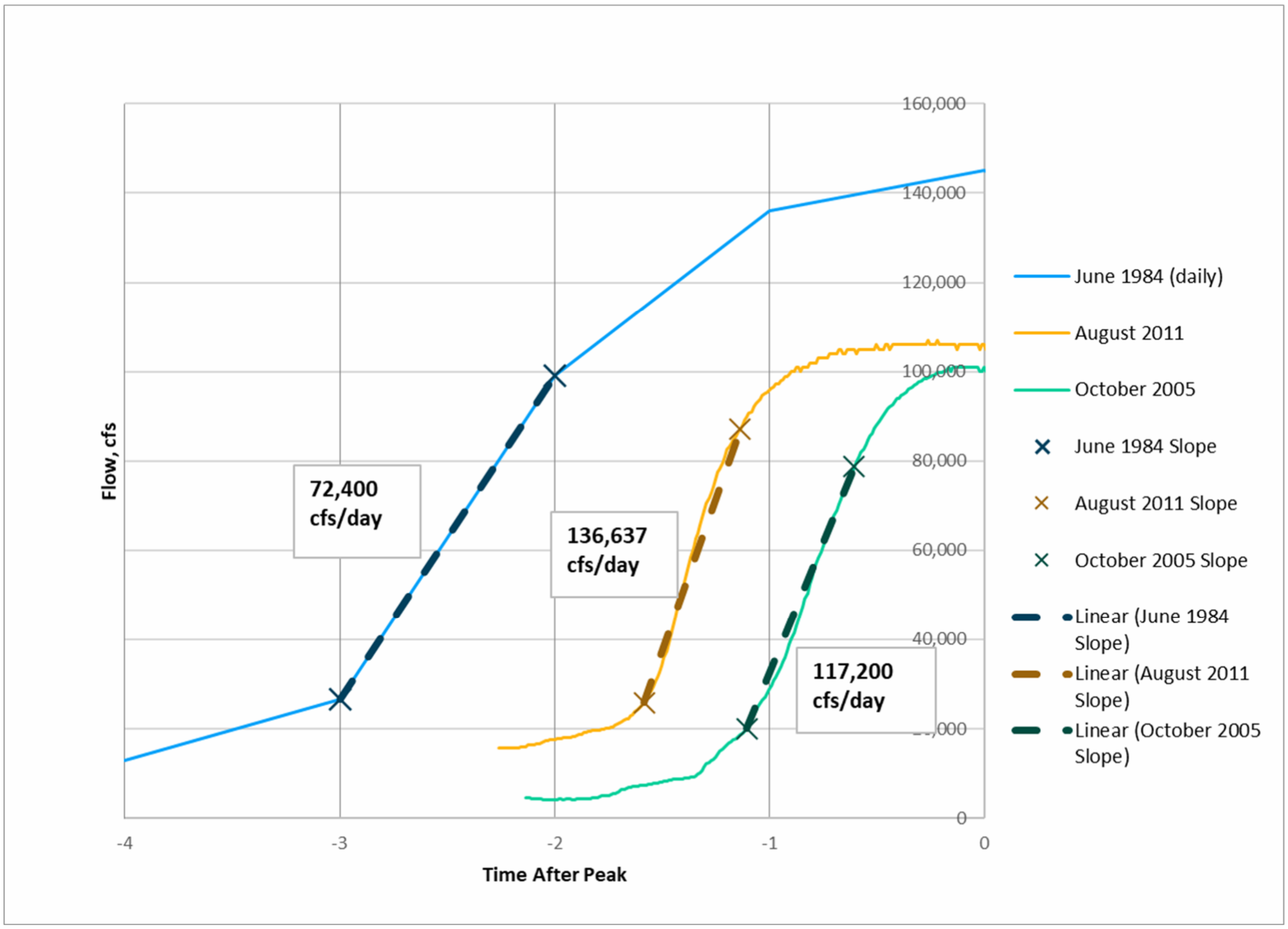


FIGURE 3-1 Stream Gage Rising Limb Slope Graphical Summary

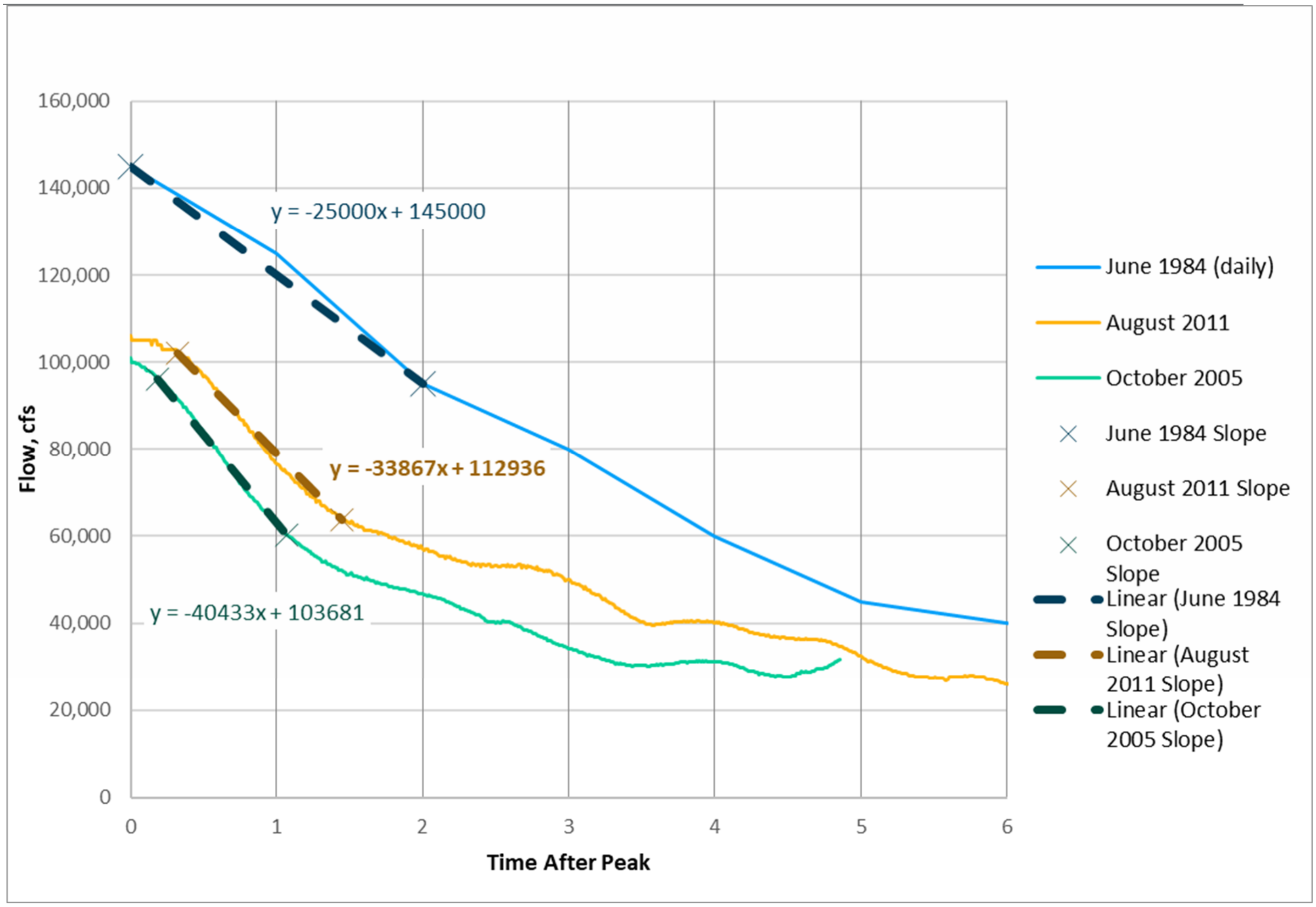


FIGURE 3-2 Stream Gage Falling Limb Slope Graphical Summary

3.2.2 Development of Water Level-Time Relationship

For the purposes of this overtopping analysis, it is assumed that the Connecticut River water level at the site will rise to approximately 120.8 feet NAVD88 for evaluating Bottom Ash Basin A, below the minimum embankment elevation of 121.3 feet NAVD88.

The Connecticut River 10%, 2%, 1%, and 0.2% annual exceedance probability (10-, 50-, 100-, and 500-year) flood water elevation data is available from the FEMA FIRM No. 25013C0088E, effective July 16, 2013, and the Flood Insurance Study (FIS) for Hampden County, Massachusetts (No. 25013CV001C) effective June 7, 2023. **Appendix C** includes a segment of the applicable FIRM panel and relevant excerpts from the FIS.

The FIS provided Connecticut River discharges for elevations ranging from 116.2 feet NAVD88 to 124 feet NAVD88 at cross section BE, and 116.1 feet NAVD88 to 123.7 feet NAVD88 at cross section BD, with corresponding flows of 132,000 cfs to 226,000 cfs. The April 2019 *Mt. Tom Facility Hydrologic and Hydraulic Analysis* determined that a flow of 27,000 cfs resulted in a water level of approximately 103.5 feet NAVD88, which was used as a reasonable lower limit for this analysis.

Table 3-2 shows the computed relationship between Connecticut River water level and flow at Bottom Ash Basin A. This relationship was used to compute elevations for a given flow rate by assuming a logarithmic trend for the flows from FEMA, and a linear trend between the 10-Year FEMA flow and the low flow estimate.

Table 3-3 shows the estimated water-level over time for the Connecticut River adjacent to Bottom Ash Basin A, conservatively assuming the basin remains empty. During the rising limb a curved shape based on the October 2005 storm event to appropriately "round off" the storm event toward the peak flow.

TABLE 3-2 Connecticut River Elevation Flow Relationship at Bottom Ash Basin A

Name	Elevation (feet, NAVD88)	Flow (cfs)	Notes
500-Year	123.7	226,000	FIS Cross Section BD
100-Year	120.8	187,000	FIS Cross Section BD
50-Year	119.5	170,000	FIS Cross Section BD
10-Year	116.1	132,000	FIS Cross Section BD
Between Normal Flow and Bank	103.5	27,000	From April 2019 "Mt. Tom Facility Hydrologic and Hydraulic Analysis" at former Fire Dock Elevation.

TABLE 3-3 Connecticut River Water Level-Time Estimate Adjacent to Bottom Ash Basin

Time (days)	Time (hours)	Flow (cfs)	Estimated Elevation (feet, NAVD88)	Notes
-1.8	43.2	27,000	103.5	Assumed starting "typical" water level
-0.9	-21.6	133,500	116.2	Switch from linear to curved rise in water level
-0.5	-12	179,900	120.4	
0	0	187,000	120.8	FEMA 100-year water level
0.5	12	176,450	120.1	Assume 33,100 cfs/day decrease
1	24	159,900	118.7	
1.5	36	143,350	117.2	
2	48	126,800	115.5	
2.5	60	110,250	113.5	
3	72	93,700	111.5	
3.5	84	77,150	109.5	Below minimum toe elevation
5.0	99.1	56,300	107.0	Below reservoir bottom elevations

3.3 Summary of Connecticut River Water Level Evaluation

Based on evaluation of FEMA flood data and U.S. Geological Survey stream gage records, Tighe & Bond estimated the relative rates of Connecticut River floodwater recession following a 100-year frequency storm event conservatively assuming Bottom Ash Basin A is empty.

These conditions represent conservative loading scenarios for slope stability analyses and were therefore used to define post-overtopping stability evaluation cases.

In accordance with 40 CFR 257.82, the owner or operator is required to maintain an up-to-date inflow design flood control system plan for the Special Basin LSI. This includes preparing the initial plan on the schedule specified for the applicable unit type and updating it at least every five years thereafter, or more frequently if site conditions change in a manner that could materially affect the plan.

Any revision or newly completed plan must be placed in the facility's operating record as required by 40 CFR 257.105(g)(4), and each version must be supported by appropriate engineering documentation. The regulation also requires that both initial and periodic plans receive certification by a qualified professional engineer (or approval by the appropriate permitting authority) to confirm that the design and documentation meet the performance standards of 40 CFR 257.82.

SECTION 4 | Plan Revision and Record Keeping

In accordance with 40 CFR 257.82, the owner or operator is required to maintain an up-to-date inflow design flood control system plan for the Bottom Ash Basin A LSI. This includes preparing the initial plan on the schedule specified for the applicable unit type, and updating it at least every five years thereafter, or more frequently if site conditions change in a manner that could materially affect the plan.

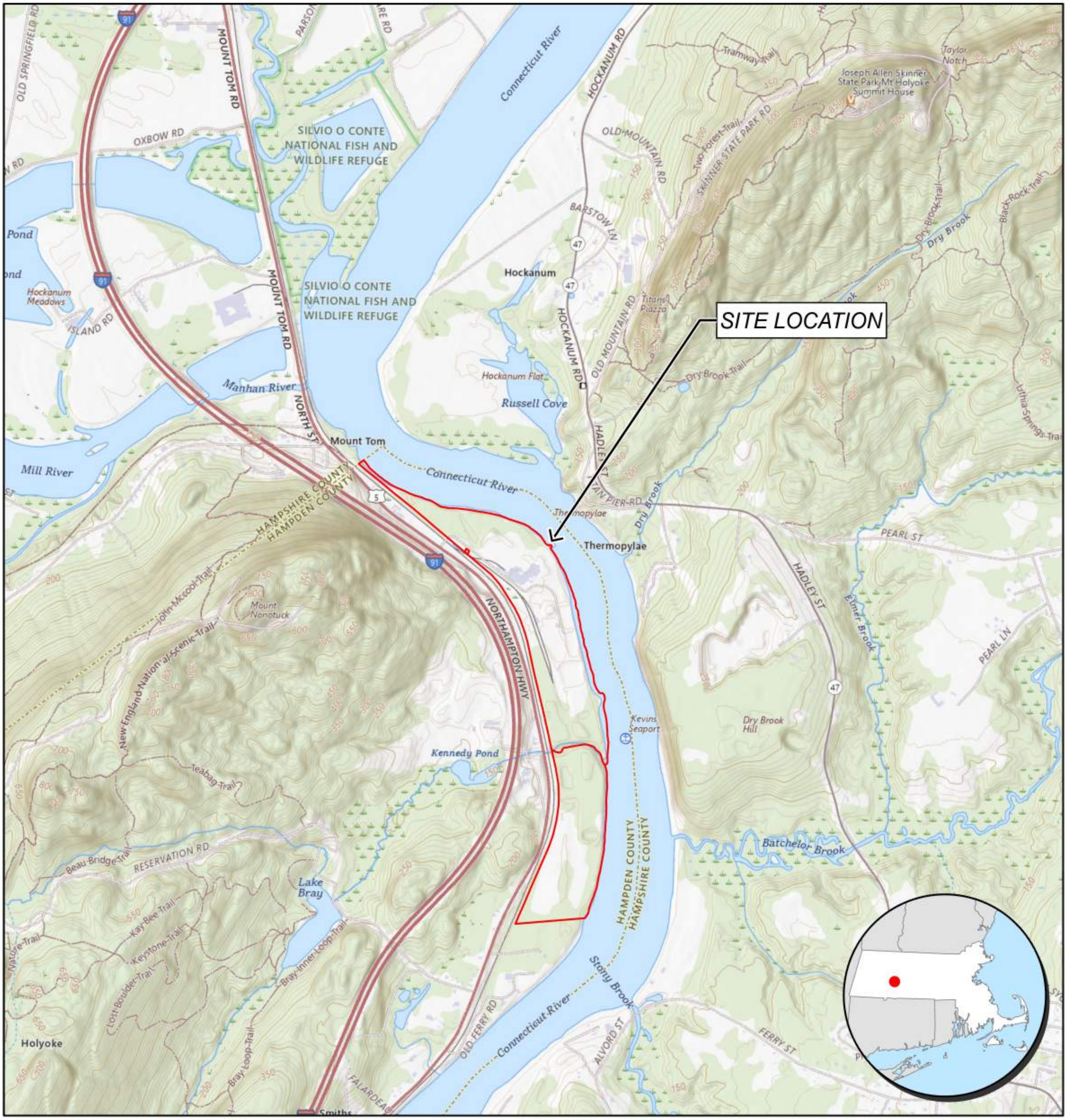
Any revision or newly completed plan must be placed in the facility's operating record as required by 40 CFR 257.105(g)(4), and each version must be supported by appropriate engineering documentation. The regulation also requires that both initial and periodic plans receive certification by a qualified professional engineer (or approval by the appropriate permitting authority) to confirm that the design and documentation meet the performance standards of 40 CFR 257.82.

Tighe & Bond

Full Page Figures

Former Mt. Tom Station Power Plant
200 Northampton Street
Holyoke, Massachusetts

FIGURE 1
SITE LOCATION
January 2026



Property Boundary

1:24,000

0 1,000 2,000

Feet

N

Based on USGS The National Map Topo Basemap.
Contour Interval Equals 10 Feet.
Circles indicate 500-foot and half-mile radii.

Tighe & Bond

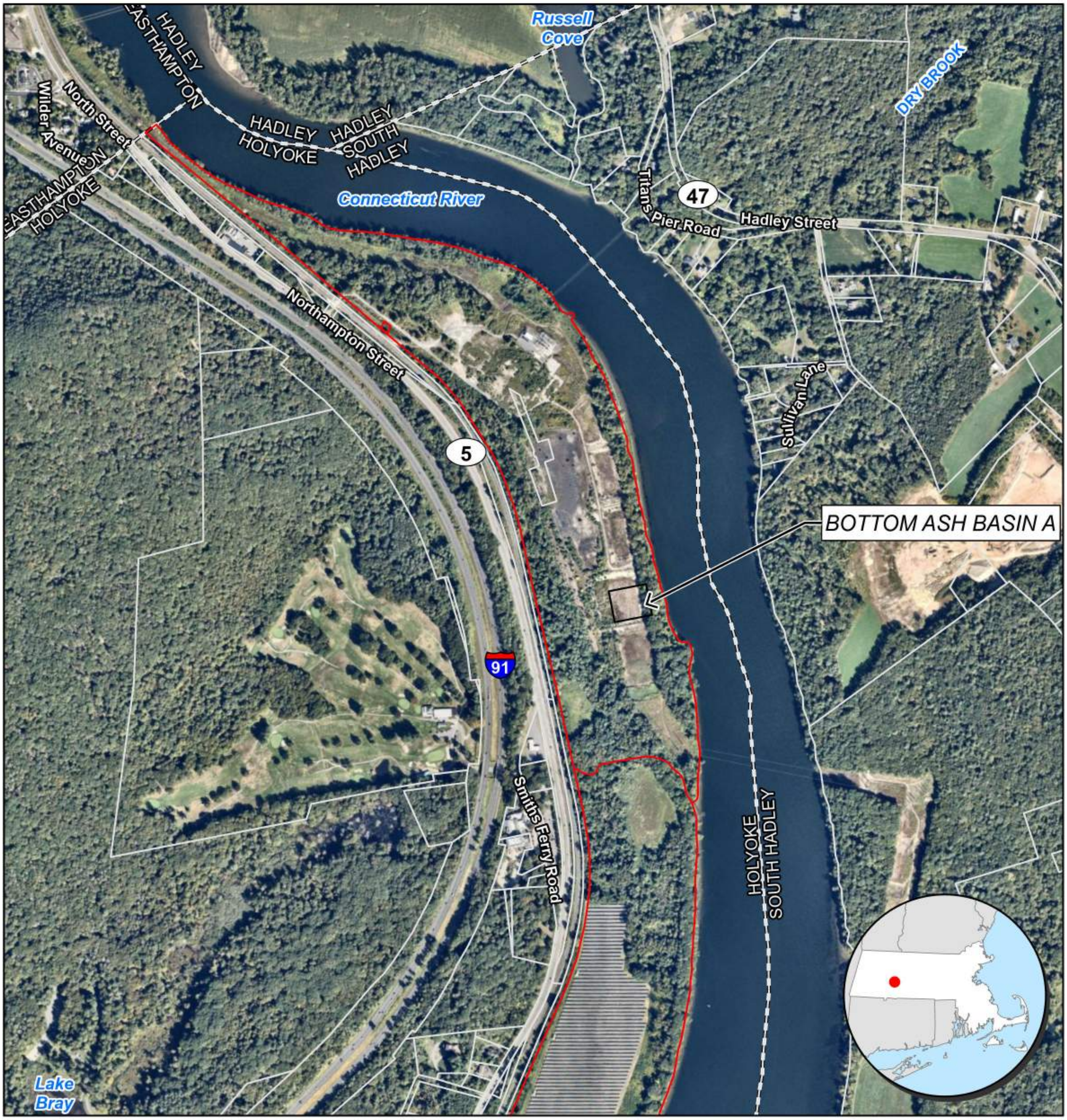
J:\G\G0682 GDF Mt. Tom\037 - Post Closure Compliance & CCR\06 - CCR\Figures\GIS\Figure 1 - Site Location\Figure 1 - Site Location.aprx\Fig1_Topo [Exported By: ZLepore, 1/26/2026, 11:36 AM]

G-0682

FIGURE 2

SITE PLAN

March 2026



Property Boundary

Parcel Boundary

Municipal Boundary

N

1:10,800

0 450 900

Feet

Based on latest Nearmap Imagery.

Tighe & Bond

Appendix A: Rainfall Data

NOAA Atlas 14, Volume 10, Version 3
Location name: Holyoke, Massachusetts, USA*
Latitude: 42.2777°, Longitude: -72.6025°
Elevation: 122 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.329 (0.253-0.420)	0.393 (0.302-0.502)	0.497 (0.381-0.638)	0.583 (0.444-0.753)	0.702 (0.519-0.950)	0.792 (0.574-1.10)	0.885 (0.623-1.28)	0.987 (0.662-1.46)	1.13 (0.733-1.74)	1.25 (0.789-1.97)
10-min	0.466 (0.359-0.596)	0.557 (0.428-0.712)	0.704 (0.539-0.905)	0.826 (0.629-1.07)	0.994 (0.735-1.35)	1.12 (0.812-1.55)	1.25 (0.883-1.81)	1.40 (0.939-2.08)	1.60 (1.04-2.47)	1.77 (1.12-2.79)
15-min	0.549 (0.422-0.701)	0.655 (0.503-0.837)	0.828 (0.634-1.06)	0.972 (0.741-1.26)	1.17 (0.864-1.58)	1.32 (0.956-1.83)	1.48 (1.04-2.12)	1.64 (1.10-2.44)	1.88 (1.22-2.91)	2.08 (1.32-3.28)
30-min	0.748 (0.576-0.956)	0.894 (0.687-1.14)	1.13 (0.868-1.45)	1.33 (1.01-1.72)	1.60 (1.18-2.17)	1.80 (1.31-2.50)	2.02 (1.42-2.91)	2.25 (1.51-3.34)	2.58 (1.67-3.98)	2.84 (1.80-4.49)
60-min	0.948 (0.729-1.21)	1.13 (0.870-1.45)	1.44 (1.10-1.84)	1.68 (1.28-2.18)	2.03 (1.50-2.75)	2.29 (1.66-3.17)	2.56 (1.80-3.69)	2.86 (1.92-4.24)	3.27 (2.12-5.05)	3.61 (2.28-5.69)
2-hr	1.21 (0.937-1.53)	1.44 (1.12-1.82)	1.82 (1.40-2.31)	2.13 (1.64-2.72)	2.56 (1.91-3.45)	2.88 (2.11-3.98)	3.23 (2.30-4.65)	3.62 (2.44-5.34)	4.20 (2.73-6.45)	4.69 (2.98-7.35)
3-hr	1.38 (1.08-1.73)	1.65 (1.28-2.08)	2.09 (1.62-2.64)	2.45 (1.90-3.12)	2.95 (2.22-3.97)	3.33 (2.45-4.59)	3.73 (2.68-5.38)	4.21 (2.84-6.19)	4.93 (3.21-7.54)	5.54 (3.53-8.66)
6-hr	1.71 (1.35-2.13)	2.07 (1.63-2.59)	2.66 (2.09-3.34)	3.16 (2.47-3.99)	3.84 (2.91-5.13)	4.33 (3.23-5.96)	4.88 (3.56-7.05)	5.56 (3.78-8.13)	6.63 (4.33-10.1)	7.56 (4.82-11.8)
12-hr	2.08 (1.66-2.57)	2.58 (2.05-3.19)	3.39 (2.69-4.21)	4.06 (3.20-5.08)	4.99 (3.83-6.64)	5.67 (4.27-7.76)	6.42 (4.73-9.26)	7.39 (5.03-10.7)	8.94 (5.85-13.5)	10.3 (6.59-15.9)
24-hr	2.45 (1.98-3.00)	3.08 (2.48-3.78)	4.11 (3.30-5.06)	4.97 (3.96-6.16)	6.14 (4.76-8.12)	7.00 (5.33-9.54)	7.96 (5.92-11.5)	9.21 (6.31-13.3)	11.3 (7.39-16.9)	13.1 (8.38-20.1)
2-day	2.82 (2.29-3.41)	3.55 (2.88-4.31)	4.75 (3.84-5.79)	5.74 (4.62-7.05)	7.11 (5.56-9.33)	8.10 (6.22-11.0)	9.22 (6.92-13.2)	10.7 (7.36-15.4)	13.1 (8.66-19.6)	15.3 (9.86-23.4)
3-day	3.08 (2.52-3.71)	3.87 (3.17-4.67)	5.17 (4.21-6.27)	6.24 (5.06-7.63)	7.72 (6.07-10.1)	8.80 (6.79-11.9)	10.0 (7.55-14.3)	11.6 (8.02-16.6)	14.3 (9.43-21.2)	16.6 (10.7-25.3)
4-day	3.31 (2.72-3.97)	4.14 (3.41-4.99)	5.52 (4.52-6.66)	6.66 (5.41-8.10)	8.22 (6.48-10.7)	9.36 (7.24-12.6)	10.6 (8.04-15.1)	12.3 (8.53-17.6)	15.1 (10.0-22.5)	17.6 (11.4-26.7)
7-day	3.94 (3.27-4.70)	4.87 (4.04-5.81)	6.39 (5.27-7.66)	7.65 (6.27-9.24)	9.38 (7.45-12.1)	10.6 (8.28-14.2)	12.1 (9.13-17.0)	13.9 (9.66-19.7)	16.9 (11.2-24.9)	19.5 (12.7-29.5)
10-day	4.58 (3.82-5.43)	5.55 (4.63-6.60)	7.15 (5.93-8.53)	8.48 (6.99-10.2)	10.3 (8.20-13.2)	11.6 (9.06-15.4)	13.1 (9.92-18.3)	15.0 (10.5-21.1)	18.0 (12.0-26.4)	20.6 (13.4-31.0)
20-day	6.58 (5.55-7.73)	7.62 (6.41-8.96)	9.31 (7.81-11.0)	10.7 (8.92-12.7)	12.6 (10.1-15.9)	14.1 (11.0-18.2)	15.6 (11.8-21.2)	17.4 (12.3-24.3)	20.2 (13.5-29.4)	22.4 (14.6-33.5)
30-day	8.26 (7.01-9.64)	9.33 (7.91-10.9)	11.1 (9.35-13.0)	12.5 (10.5-14.8)	14.5 (11.7-18.1)	16.0 (12.5-20.5)	17.6 (13.2-23.5)	19.3 (13.6-26.8)	21.8 (14.6-31.6)	23.7 (15.5-35.4)
45-day	10.3 (8.83-12.0)	11.5 (9.77-13.3)	13.3 (11.3-15.5)	14.8 (12.5-17.4)	16.9 (13.6-20.9)	18.5 (14.5-23.4)	20.1 (15.1-26.6)	21.8 (15.5-30.1)	24.0 (16.2-34.6)	25.6 (16.7-38.0)
60-day	12.0 (10.3-13.9)	13.2 (11.3-15.3)	15.2 (12.9-17.6)	16.8 (14.2-19.6)	19.0 (15.4-23.2)	20.7 (16.2-26.0)	22.4 (16.7-29.2)	24.0 (17.1-32.9)	26.0 (17.6-37.4)	27.5 (18.0-40.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

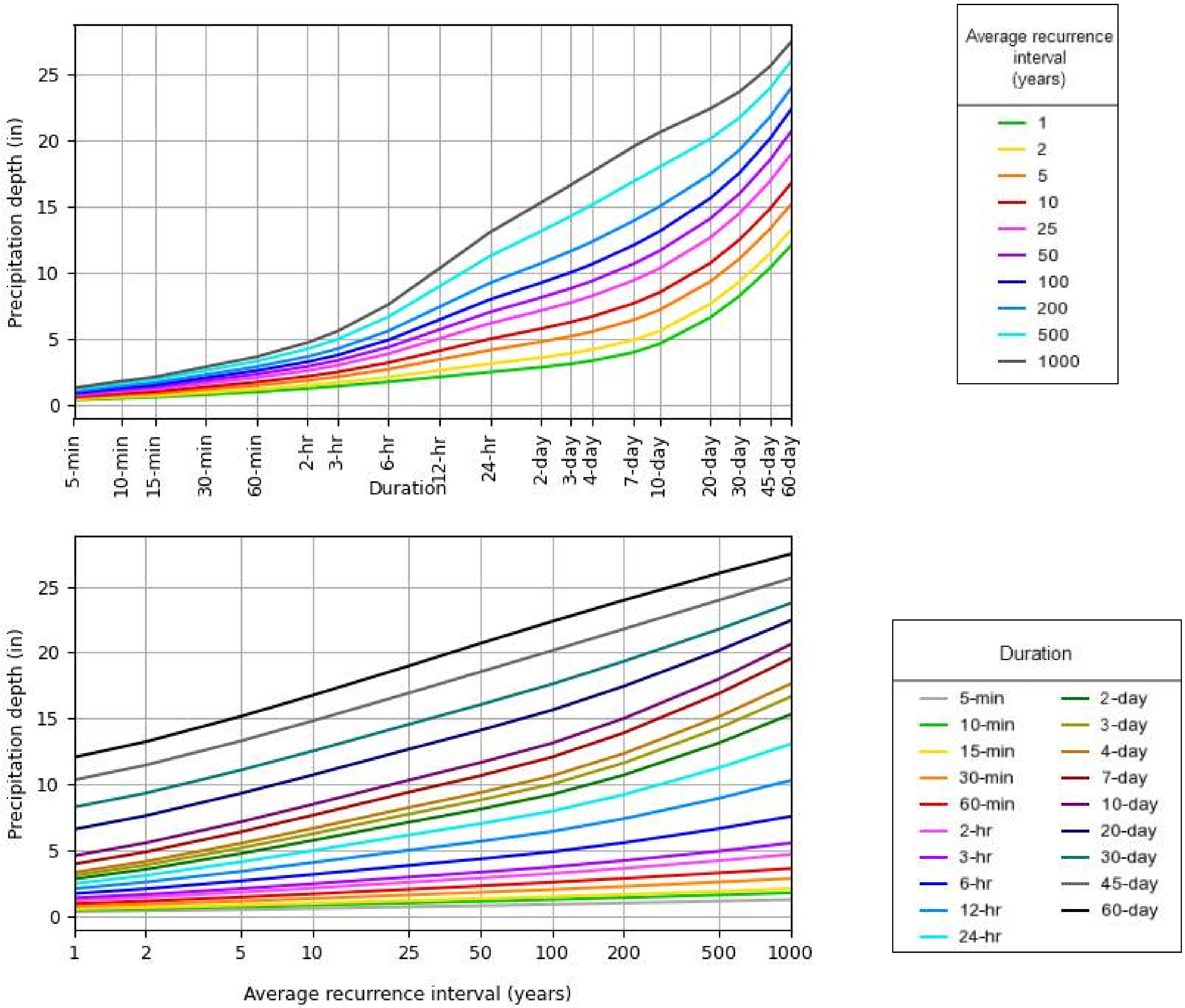
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 42.2777°, Longitude: -72.6025°



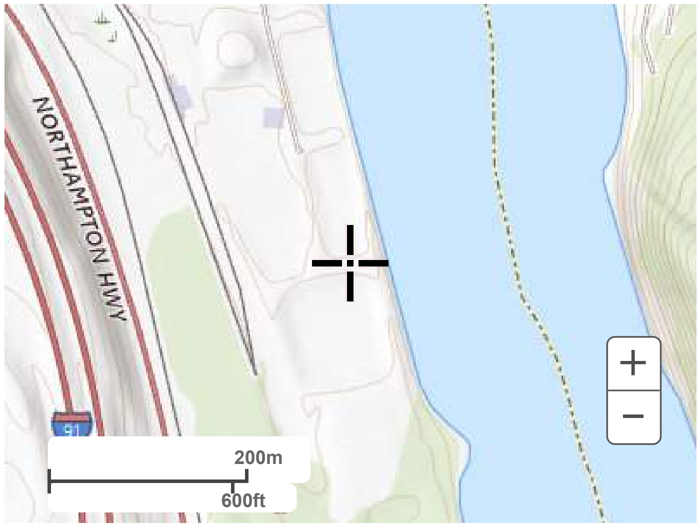
NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Tue Dec 2 14:49:31 2025

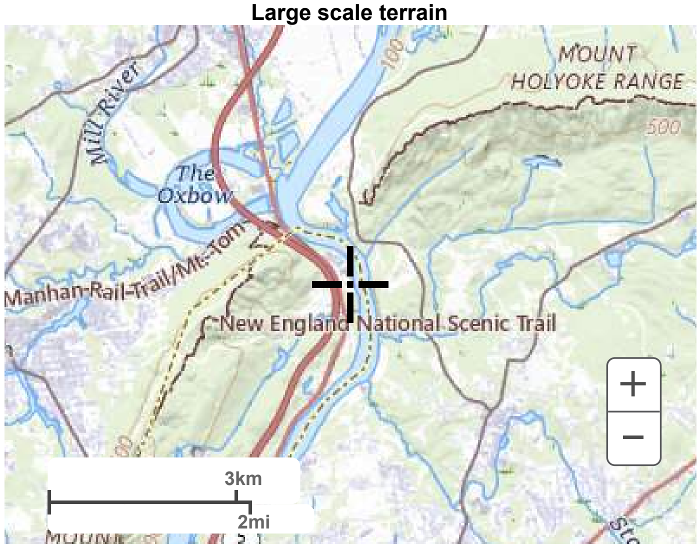
Back to Top

Maps & aerials

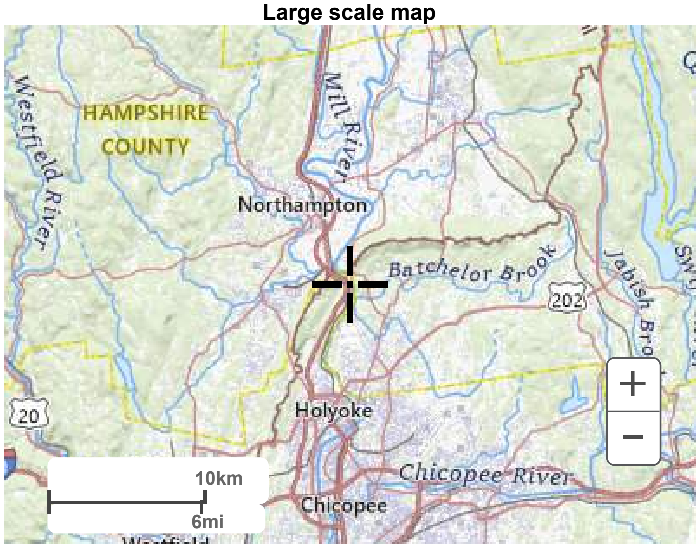
Small scale terrain



Large scale terrain



Large scale map



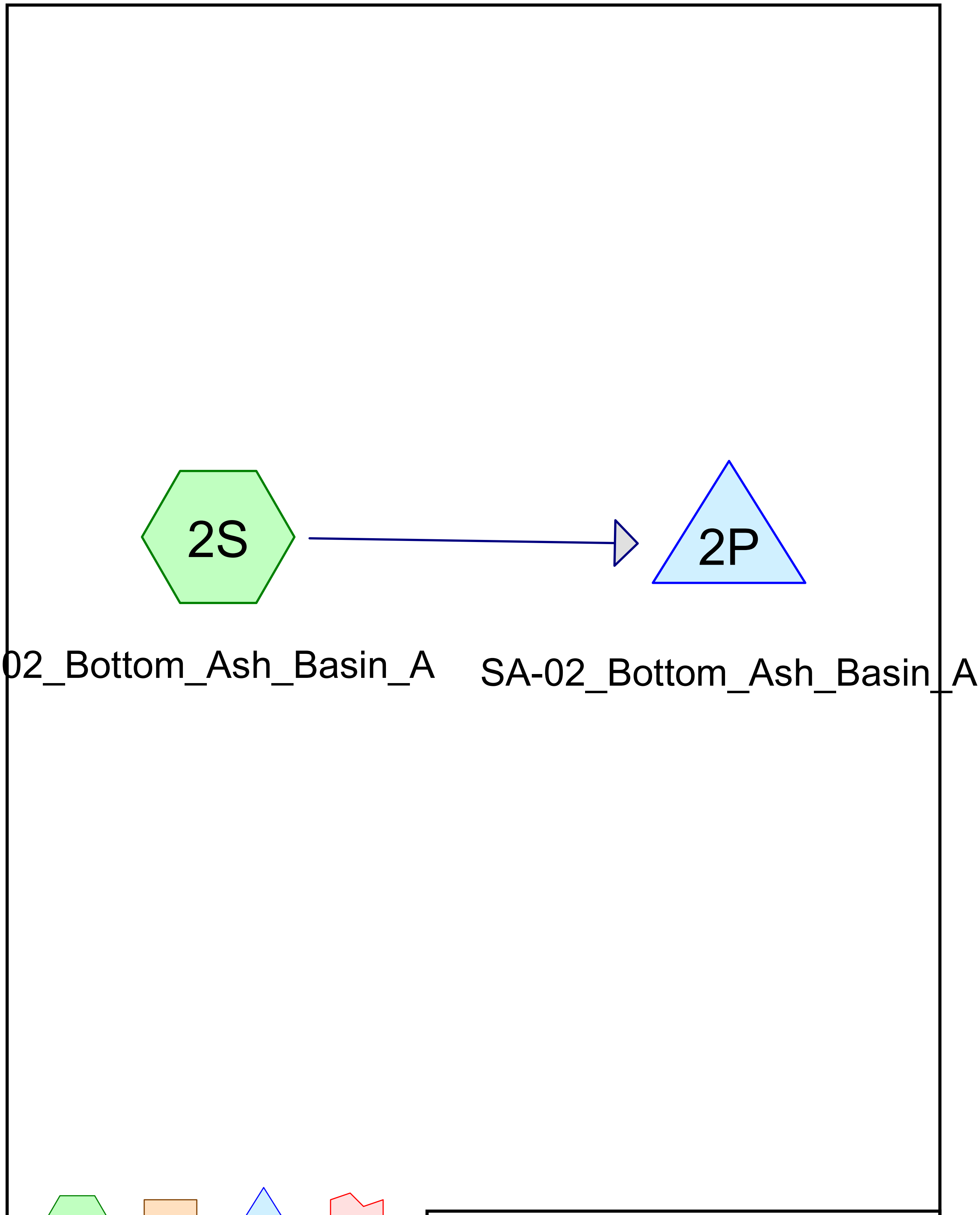
Large scale aerial

[Back to Top](#)

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix B: IDF Hydrologic Model Output



Routing Diagram for MtTomHydrology
Prepared by Tighe & Bond, Printed 3/5/2026
HydroCAD® 10.20-4c s/n 01453 © 2024 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-Year	Type III 24-hr		Default	24.00	1	7.96	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.953	98	(2S)
2.953	**98**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
2.953	Other	2S
2.953		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	2.953	2.953		2S
0.000	**0.000**	**0.000**	**0.000**	**2.953**	**2.953**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 2S: Runoff Area=2.953 ac 100.00% Impervious Runoff Depth=7.72"
Tc=0.0 min CN=98 Runoff=28.15 cfs 1.900 af

Pond 2P: SA-02_Bottom_Ash_Basin_A Peak Elev=109.63' Storage=1.378 af Inflow=28.15 cfs 1.900 af
Outflow=0.63 cfs 1.548 af

Total Runoff Area = 2.953 ac Runoff Volume = 1.900 af Average Runoff Depth = 7.72"
0.00% Pervious = 0.000 ac 100.00% Impervious = 2.953 ac

Summary for Subcatchment 2S: 02_Bottom_Ash_Basin_A

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

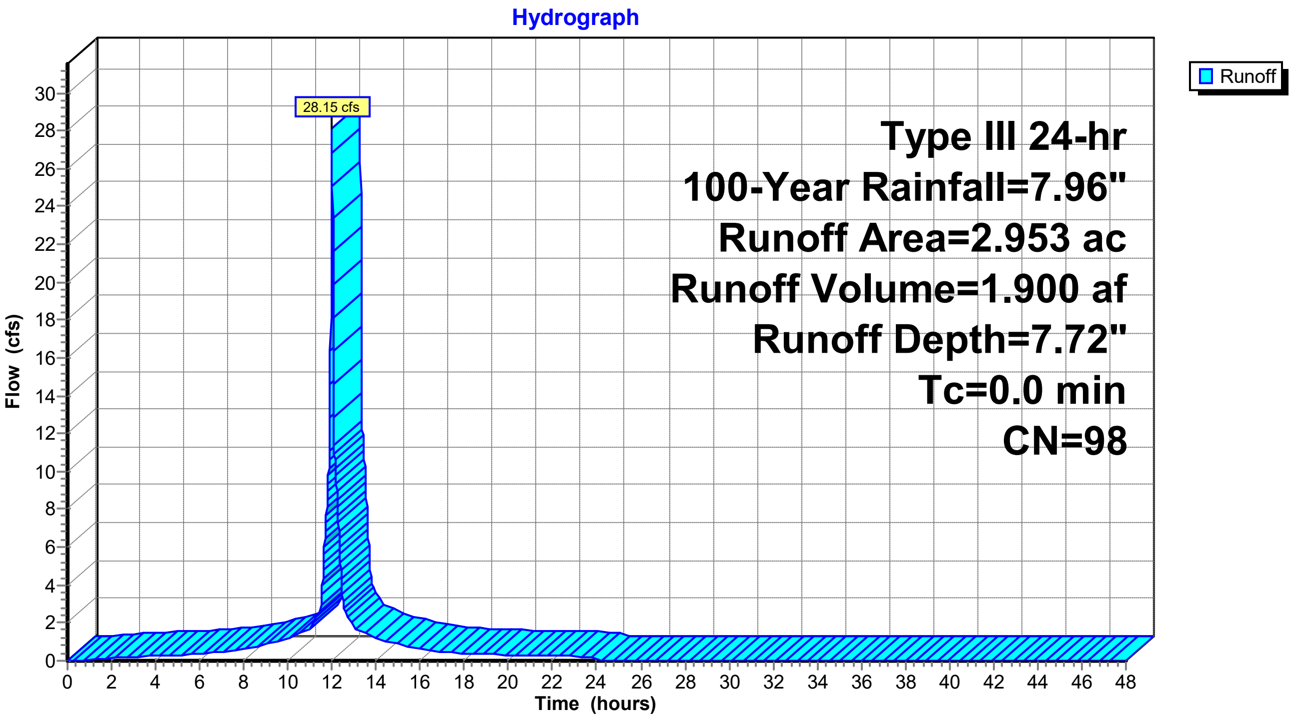
Runoff = 28.15 cfs @ 12.00 hrs, Volume= 1.900 af, Depth= 7.72"
Routed to Pond 2P : SA-02_Bottom_Ash_Basin_A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.96"

	Area (ac)	CN	Description
*	2.953	98	
	2.953		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					**Direct Entry,**

Subcatchment 2S: 02_Bottom_Ash_Basin_A



Summary for Pond 2P: SA-02_Bottom_Ash_Basin_A

Inflow Area = 2.953 ac,100.00% Impervious, Inflow Depth = 7.72" for 100-Year event
Inflow = 28.15 cfs @ 12.00 hrs, Volume= 1.900 af
Outflow = 0.63 cfs @ 15.95 hrs, Volume= 1.548 af, Atten= 98%, Lag= 236.7 min
Discarded = 0.63 cfs @ 15.95 hrs, Volume= 1.548 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 109.63' @ 15.95 hrs Surf.Area= 1.330 ac Storage= 1.378 af

Plug-Flow detention time= 924.4 min calculated for 1.548 af (81% of inflow)
Center-of-Mass det. time= 850.1 min (1,585.8 - 735.7)

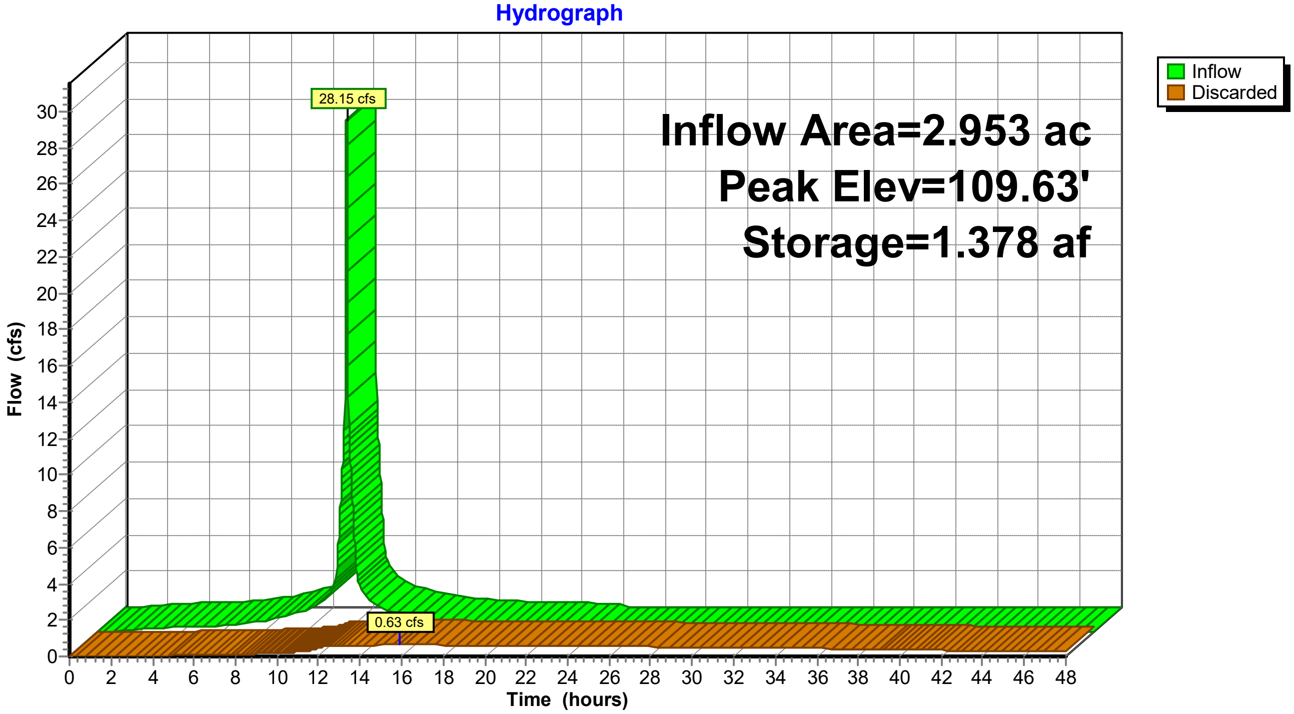
Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	31.298 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
107.00	0.000	0.000	0.000
108.00	0.149	0.074	0.074
109.00	0.902	0.526	0.600
110.00	1.586	1.244	1.844
111.00	1.851	1.718	3.562
112.00	1.938	1.894	5.457
113.00	2.019	1.979	7.435
114.00	2.100	2.060	9.495
115.00	2.184	2.142	11.637
116.00	2.274	2.229	13.866
117.00	2.366	2.320	16.186
118.00	2.466	2.416	18.602
119.00	2.569	2.517	21.120
120.00	2.676	2.623	23.742
121.00	2.775	2.725	26.468
122.00	2.903	2.839	29.307
122.68	2.953	1.991	31.298

Device	Routing	Invert	Outlet Devices
#1	Discarded	107.00'	**0.425 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 100.00'

Discarded OutFlow Max=0.63 cfs @ 15.95 hrs HW=109.63' (Free Discharge)
└─**1=Exfiltration** (Controls 0.63 cfs)

Pond 2P: SA-02_Bottom_Ash_Basin_A

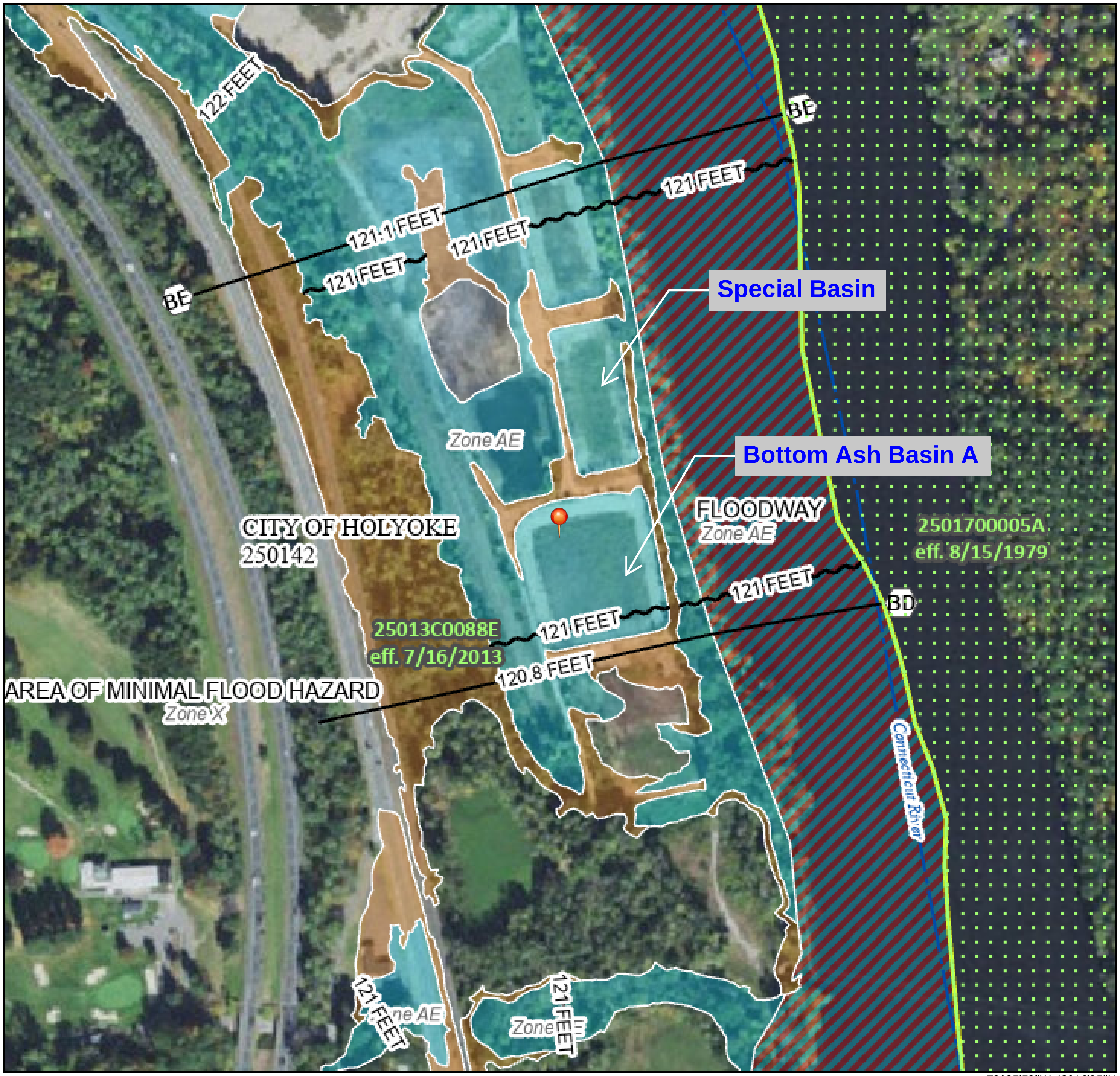


Appendix C: FEMA Data for Connecticut River

National Flood Hazard Layer FIRMette

FEMA

72°36'29"W 42°16'52"N



72°35'52"W 42°16'25"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

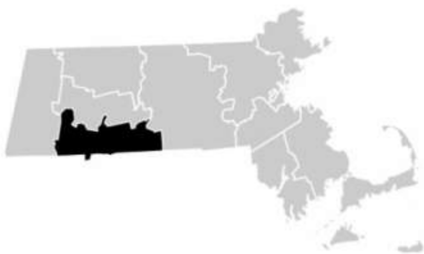
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/3/2025 at 6:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 5



HAMPDEN COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
AGAWAM, TOWN OF	250133	MONSON, TOWN OF	250145
BLANDFORD, TOWN OF	250134	MONTGOMERY, TOWN OF	250146
BRIMFIELD, TOWN OF	250135	PALMER, TOWN OF	250147
CHESTER, TOWN OF	250136	RUSSELL, TOWN OF	250148
CHICOPEE, CITY OF	250137	SOUTHWICK, TOWN OF	250149
EAST LONGMEADOW, TOWN OF	250138	SPRINGFIELD, CITY OF	250150
GRANVILLE, TOWN OF	250139	TOLLAND, TOWN OF	250151
HAMPDEN, TOWN OF	250140	WALES, TOWN OF	250152
HOLLAND, TOWN OF	250141	WEST SPRINGFIELD, TOWN OF	250155
HOLYOKE, CITY OF	250142	WESTFIELD, CITY OF	250153
LONGMEADOW, TOWN OF	250143	WILBRAHAM, TOWN OF	250154
LUDLOW, TOWN OF	250144		

REVISED:

June 7, 2023

FLOOD INSURANCE STUDY NUMBER
25013CV001C
Version Number 2.6.3.6

FEMA

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% + Annual Chance	0.2% Annual Chance
Austin Brook	At confluence with Walker Brook	1.4	180	*	350	470	*	860
Bradley Brook	At mouth	10.8	2,800	*	5,100	6,400	*	10,200
Broad Brook	At confluence with Chicopee River	14.3	410	*	700	860	*	1,370
Broad Brook (Lower)	At Holyoke-Southampton corporate limits	3.3	170	*	250	300	*	400
Broad Brook (Lower)	Upstream of Keys Road	2.3	130	*	190	220	*	300
Broad Brook (Upper)	Upstream of Cherry Street Extension	1.0	70	*	100	115	*	150
Chicopee Brook	At confluence with Quaboag River	23.7	1,370	*	3,000	4,120	*	8,420
Chicopee Brook	At Ellis Mill No.1	15.1	450	*	980	1,430	*	3,200
Chicopee River	At mouth	721.0	11,000	*	23,800	32,500	*	63,000
Chicopee River	At USGS gage no. 01177000	688.0	10,800	*	23,400	32,000	*	62,100
Chicopee River	At USGS gage at Indian Orchard	688.0	10,795	*	23,400	32,000	*	62,000
Chicopee River	At Springfield- Wilbraham corporate limits	684.9	10,760	*	23,320	31,890	*	61,890
Chicopee River	At Collins Company Dam	678.0	10,680	*	23,140	31,650	*	61,420
Chicopee River	At Red Bridge Dam	659.2	10,460	*	22,260	30,990	*	60,140
Connecticut River	At confluence of Westfield River	9575.0	137,000	*	179,000	197,000	*	241,000
Connecticut River	At confluence of Chicopee River	9046.0	135,000	*	175,000	193,000	*	235,000
Connecticut River	At Holyoke's upstream corporate limits	8275.0	132,000	*	170,000	187,000	*	226,000
Foskett Mill Stream	At confluence with the Quaboag River	10.1	614	*	1,030	1,255	*	1,944

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BC	107,050	1,104	33,033	6.0	120.5	120.5	120.6	0.1
BD	109,100	776	28,207	7.0	120.8	120.8	120.8	0.0
BE	110,360	940	31,606	6.0	121.1	121.1	121.2	0.1
BF	113,010	807	24,858	8.0	121.8	121.8	121.8	0.0

[1]Stream distance in feet above Agawam/Enfield corporate limit
[2]Width extends beyond county boundary

TABLE 23

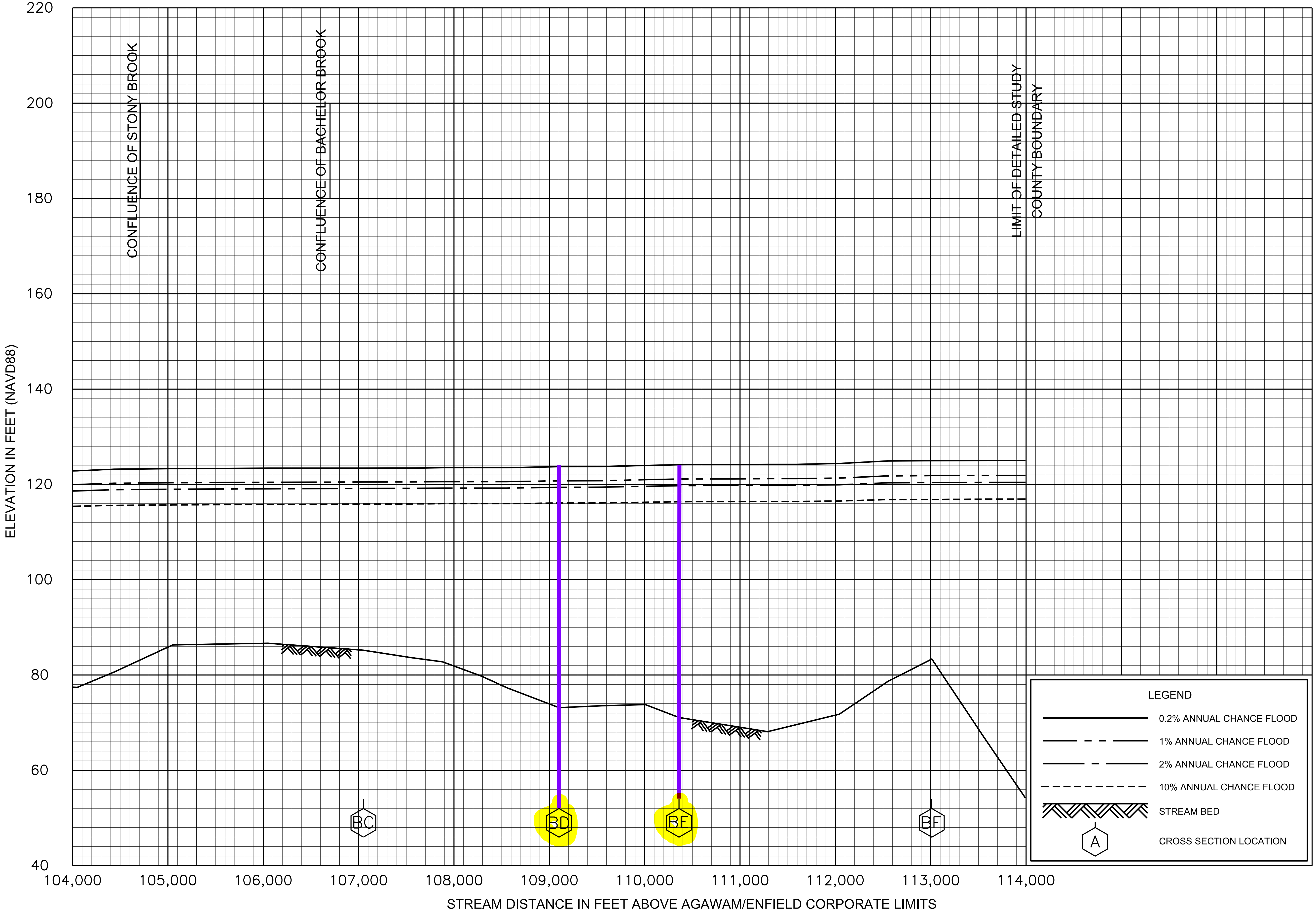
FEDERAL EMERGENCY MANAGEMENT AGENCY

HAMPDEN COUNTY, MA

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: CONNECTICUT RIVER



FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HAMPDEN COUNTY, MA

ALL JURISDICTIONS

Tighe & Bond

Appendix D: Stream Gauge Data

USGS 01172003

Name: Connecticut River Below Power Dam at Holyoke, MA

Summary: June 1984 flood event used for 2025 study.

Links:

General: https://waterdata.usgs.gov/ma/nwis/uv/?site_no=01172003

Peak Stream Flow: https://nwis.waterdata.usgs.gov/usa/nwis/peak/?site_no=01172003

Available Annual Peak Flow Data

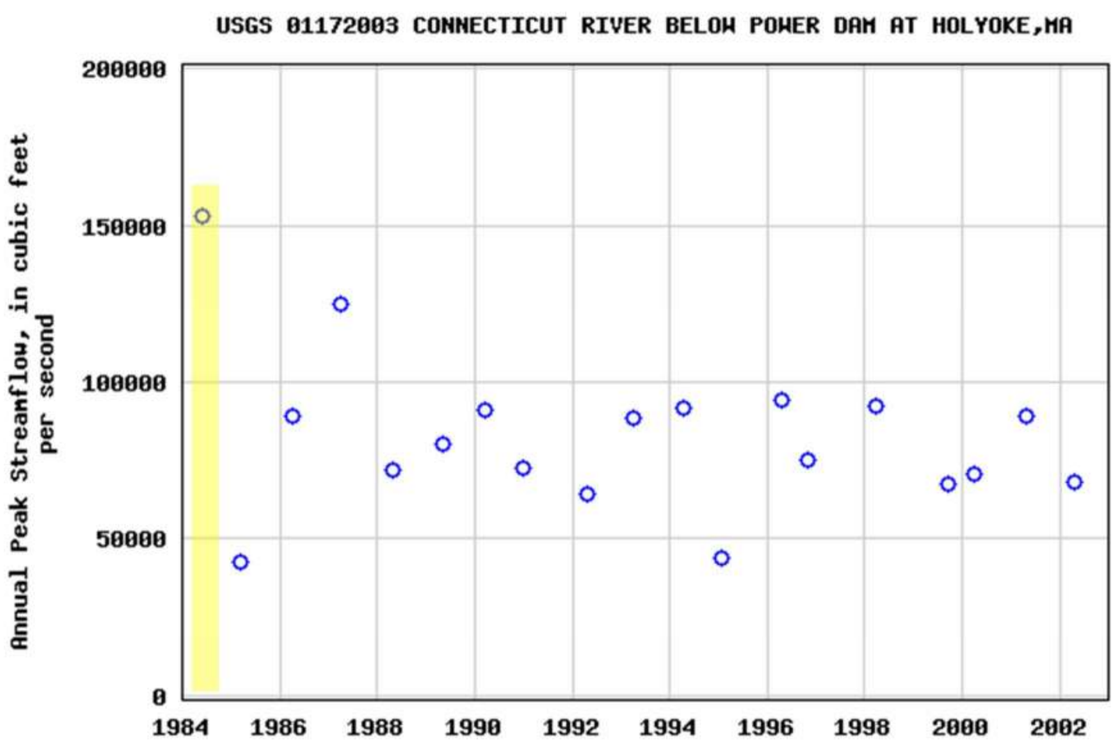


Figure A-1

Connecticut River Annual Peak Stream Flow Data for USGS 01172003 *Connecticut River Below Power Dam at Holyoke, MA* Screen Capture with Flood Event Used in Falling Limb Analysis Highlighted

June 1984 (USGS 01172003)

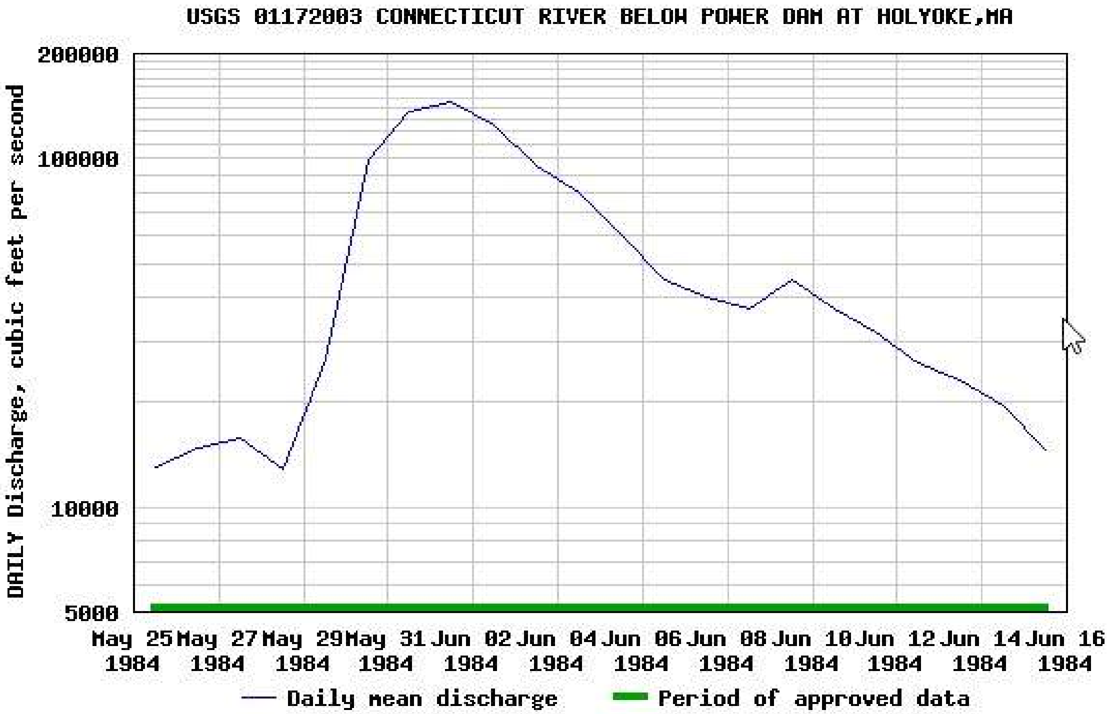


Figure A-2
June 1984 Connecticut River Flood Event Screen Capture from USGS Website

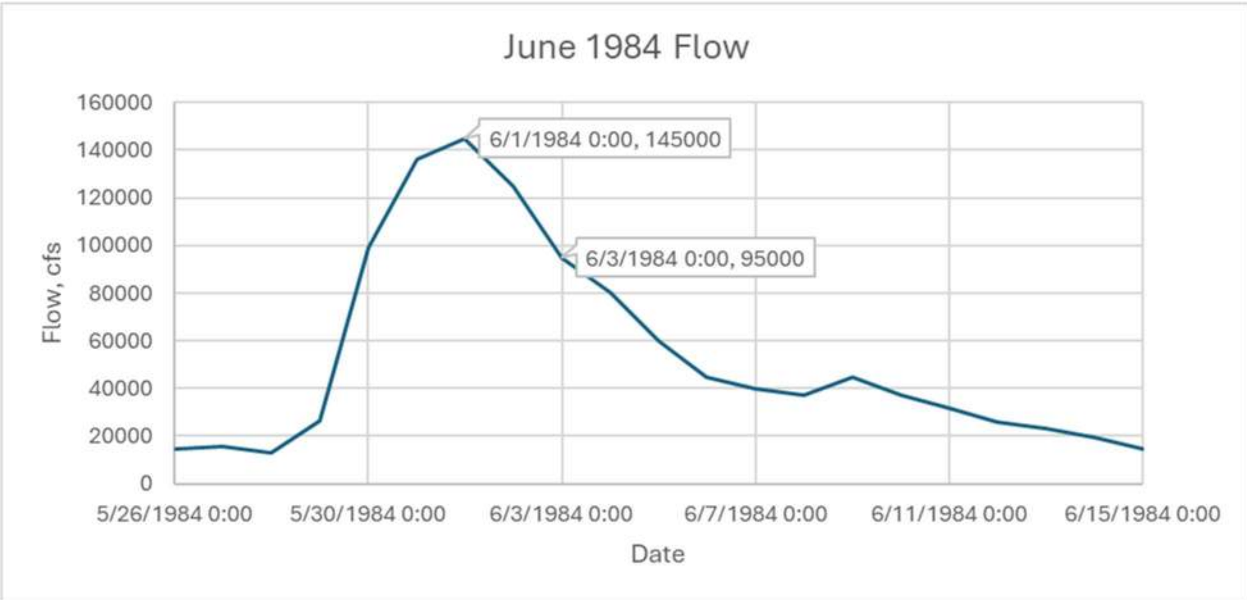


Figure A-3
June 1984 Flood Event Plot With Data Points Used for Falling Limb Analysis

USGS 01172010

Name: Connecticut River at I-391 Bridge at Holyoke, MA

Summary: October 2005 and August 2011 flood events used for 2025 study.

Links:

General: https://waterdata.usgs.gov/ma/nwis/uv/?site_no=01172010

Peak Stream Flow: https://nwis.waterdata.usgs.gov/usa/nwis/peak/?site_no=01172010

Available Annual Peak Flow Data

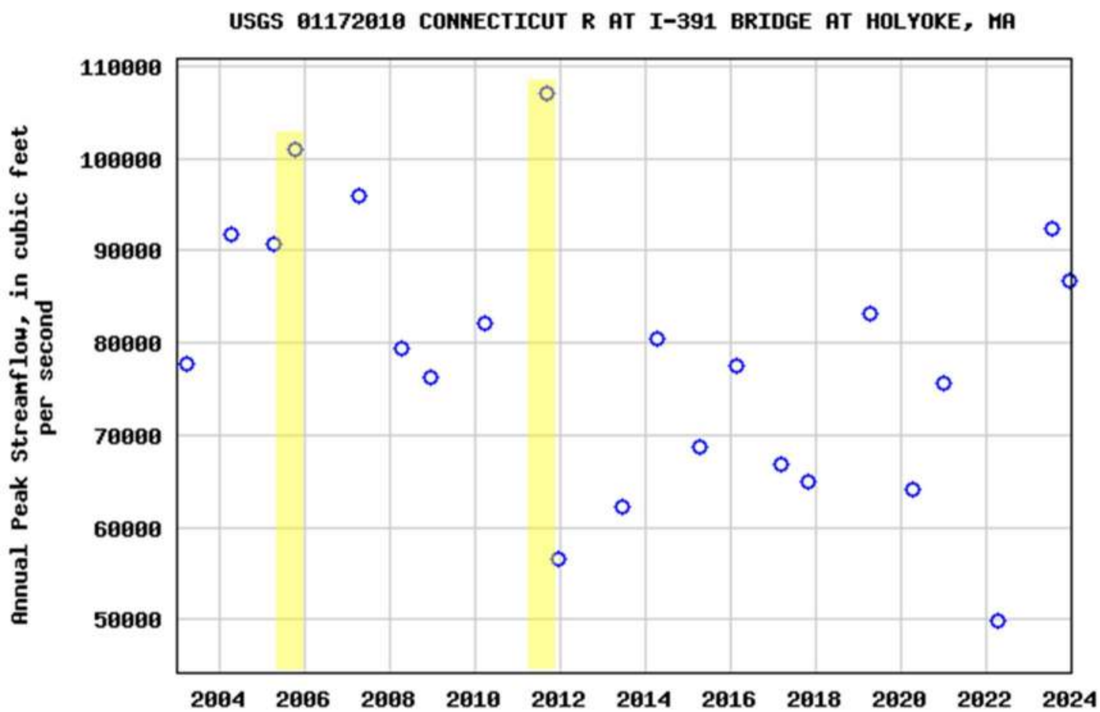


Figure A-4
Connecticut River Annual Peak Stream Flow Data for USGS *Connecticut River at I-391 Bridge at Holyoke, MA* Screen Capture with Flood Events Used in Falling Limb Analysis Highlighted

October 2005 (USGS 01172010)

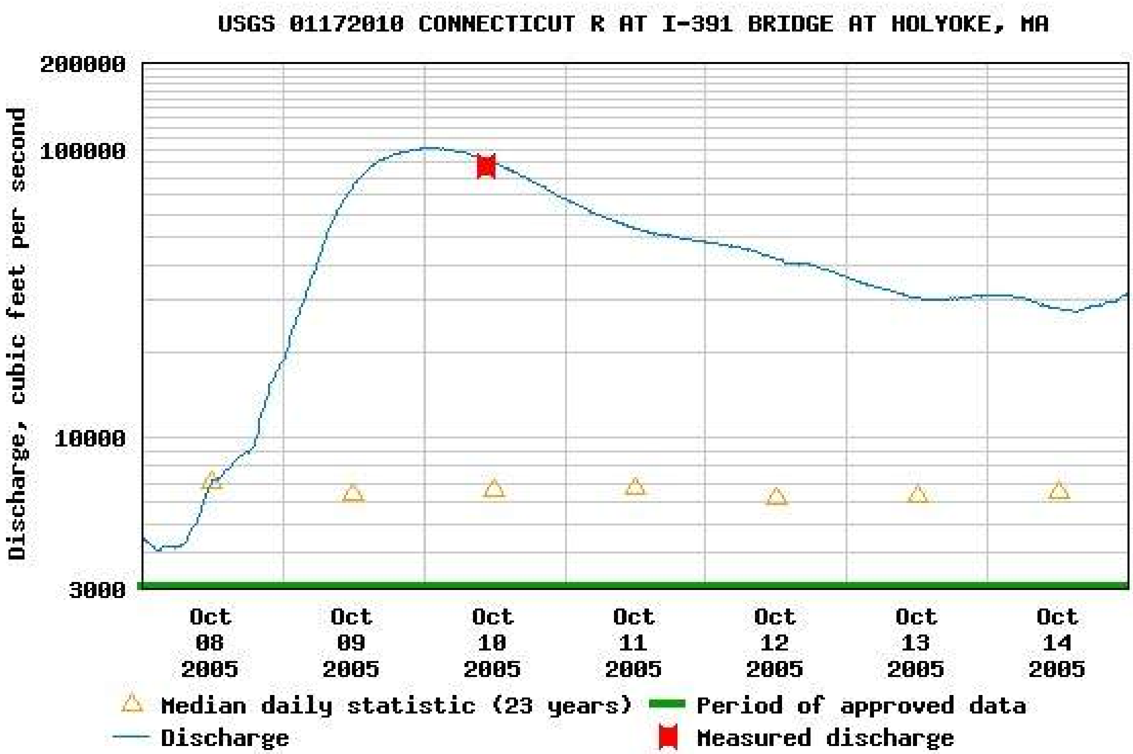


Figure A-5
October 2005 Connecticut River Flood Event Screen Capture from USGS Website

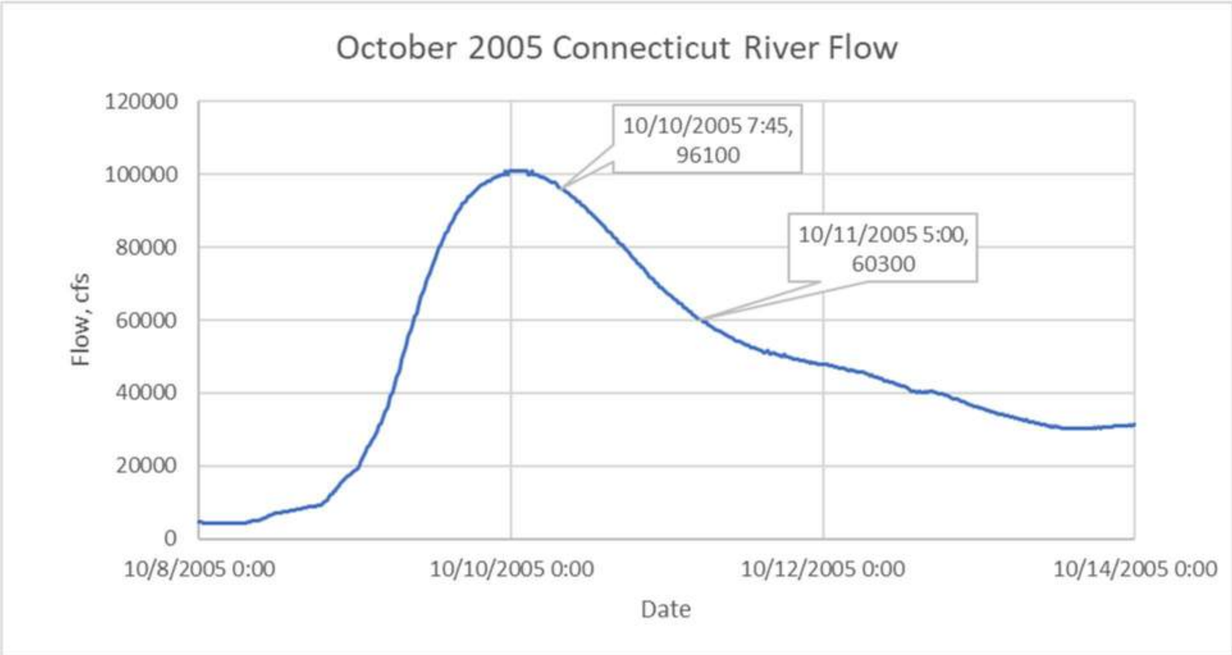


Figure A-6
October 2005 Flood Event Plot With Data Points Used for Falling Limb Analysis

August 2011 (USGS 01172010)

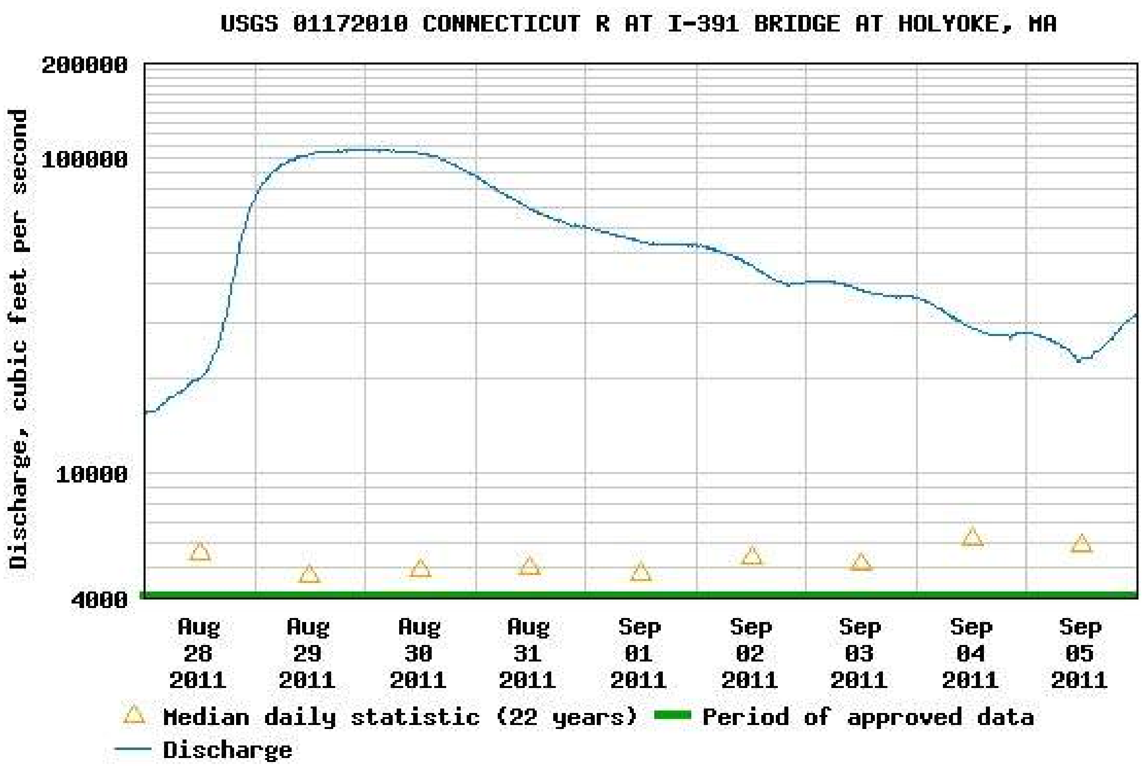


Figure A-7
August 2011 Connecticut River Flood Event Screen Capture from USGS Website

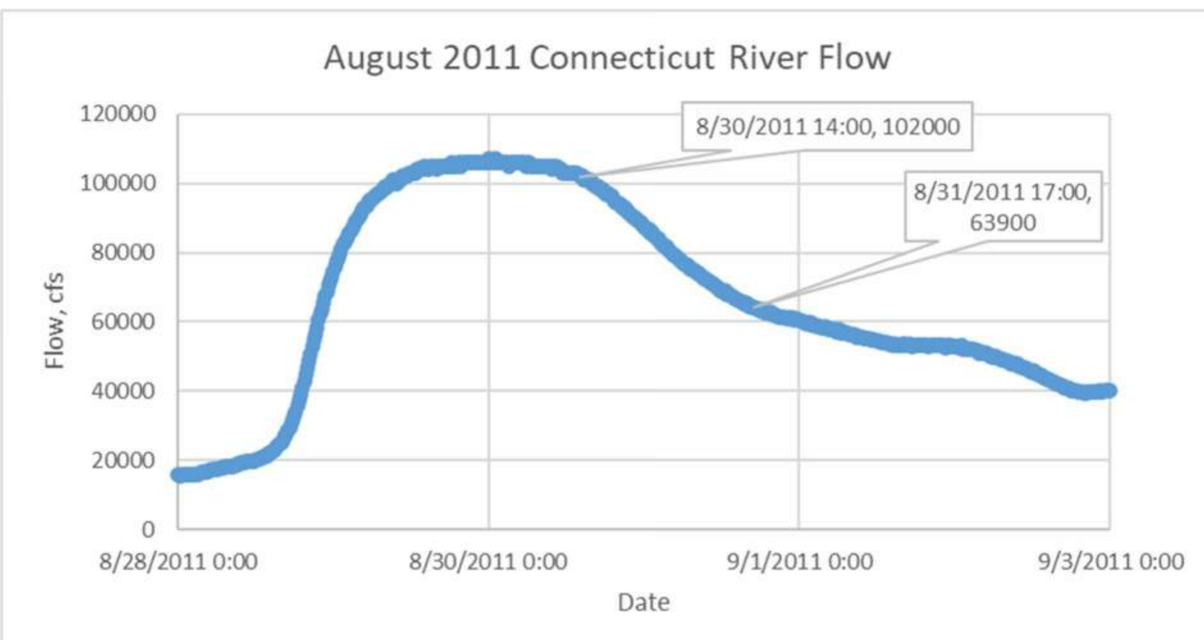


Figure A-8
August 2011 Flood Event Plot With Data Points Used for Falling Limb Analysis

Tighe & Bond

Appendix E: Predicted Connecticut River Water Levels

Connecticut River Estimated Water Level Over Time During 100-year storm event at Bottom Ash Basin A

Time (days)	Time (hours)	Flow Rate (cfs)	Estimated Connecticut River Elevation (feet, NAVD88)	Notes
-1.79	-43	27,000	103.50	Assumed starting "typical" water level
-0.89	-21	133,500	116.18	Switch from liinear to curved rise in water level
-0.875	-21	135,000	116.33	
-0.75	-18	152,900	118.09	
-0.625	-15	168,700	119.47	
-0.5	-12	179,900	120.37	
-0.375	-9	186,900	120.91	
-0.25	-6	190,800	121.20	
-0.125	-3	193,000	121.36	
0	0	187,000	120.80	Peak Flow
0.125	3	187,000	120.80	
0.25	6	184,725	120.75	
0.375	9	180,588	120.43	
0.5	12	176,450	120.10	Start "Falling Limb" Drop
0.625	15	172,313	119.77	
0.75	18	168,175	119.43	
0.875	21	164,038	119.08	
1	24	159,900	118.72	
1.125	27	155,763	118.35	
1.25	30	151,625	117.97	
1.375	33	147,488	117.58	
1.5	36	143,350	117.18	
1.625	39	139,213	116.77	
1.75	42	135,075	116.34	
1.875	45	130,938	115.97	
2	48	126,800	115.48	
2.125	51	122,663	114.98	
2.25	54	118,525	114.48	
2.375	57	114,388	113.99	
2.5	60	110,250	113.49	
2.625	63	106,113	112.99	
2.75	66	101,975	112.50	
2.875	69	97,838	112.00	
3	72	93,700	111.50	
3.125	75	89,563	111.01	
3.25	78	85,425	110.51	
3.375	81	81,288	110.01	
3.5	84	77,150	109.52	
3.625	87	73,013	109.02	
3.73	90	69,537	108.60	
3.75	90	68,875	108.53	
3.875	93	64,738	108.03	
4	96	60,600	107.53	
4.125	99	56,463	107.04	
4.13	99	56,297	107.02	
4.25	102	52,325	106.54	
4.375	105	48,188	106.04	
4.5	108	44,050	105.55	
4.625	111	39,913	105.05	
4.75	114	35,775	104.55	
4.875	117	31,638	104.06	
5	120	27,500	103.56	
5.02	120	27,000	103.50	Assumed flow/elevation of flow leveling off

Tighe & Bond