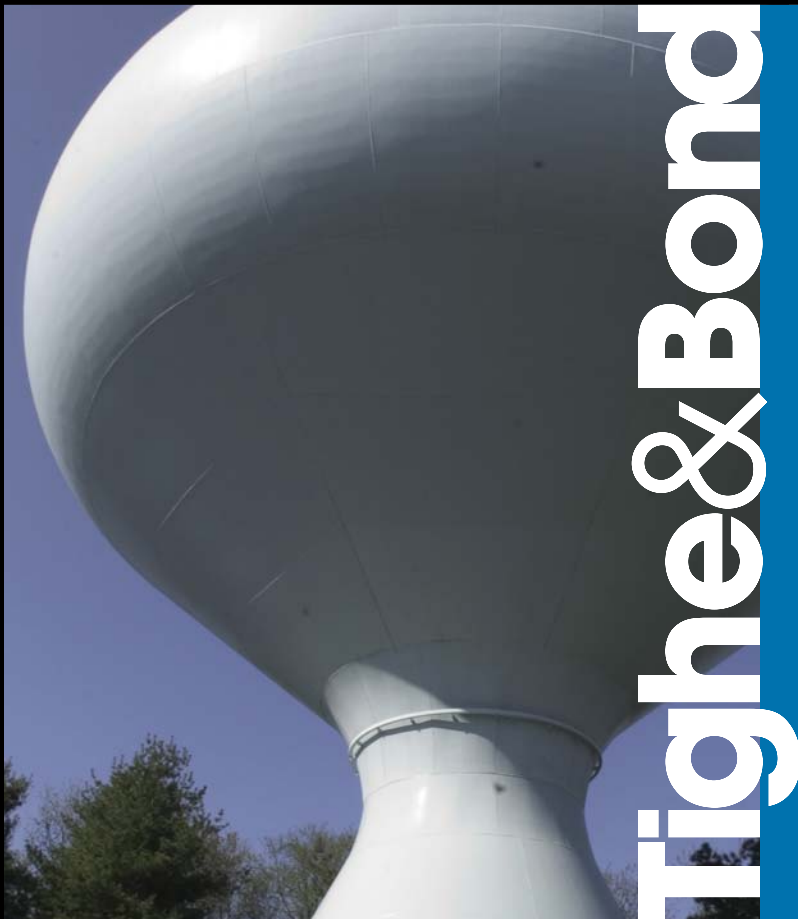


APPENDIX A

United States Department of Agriculture

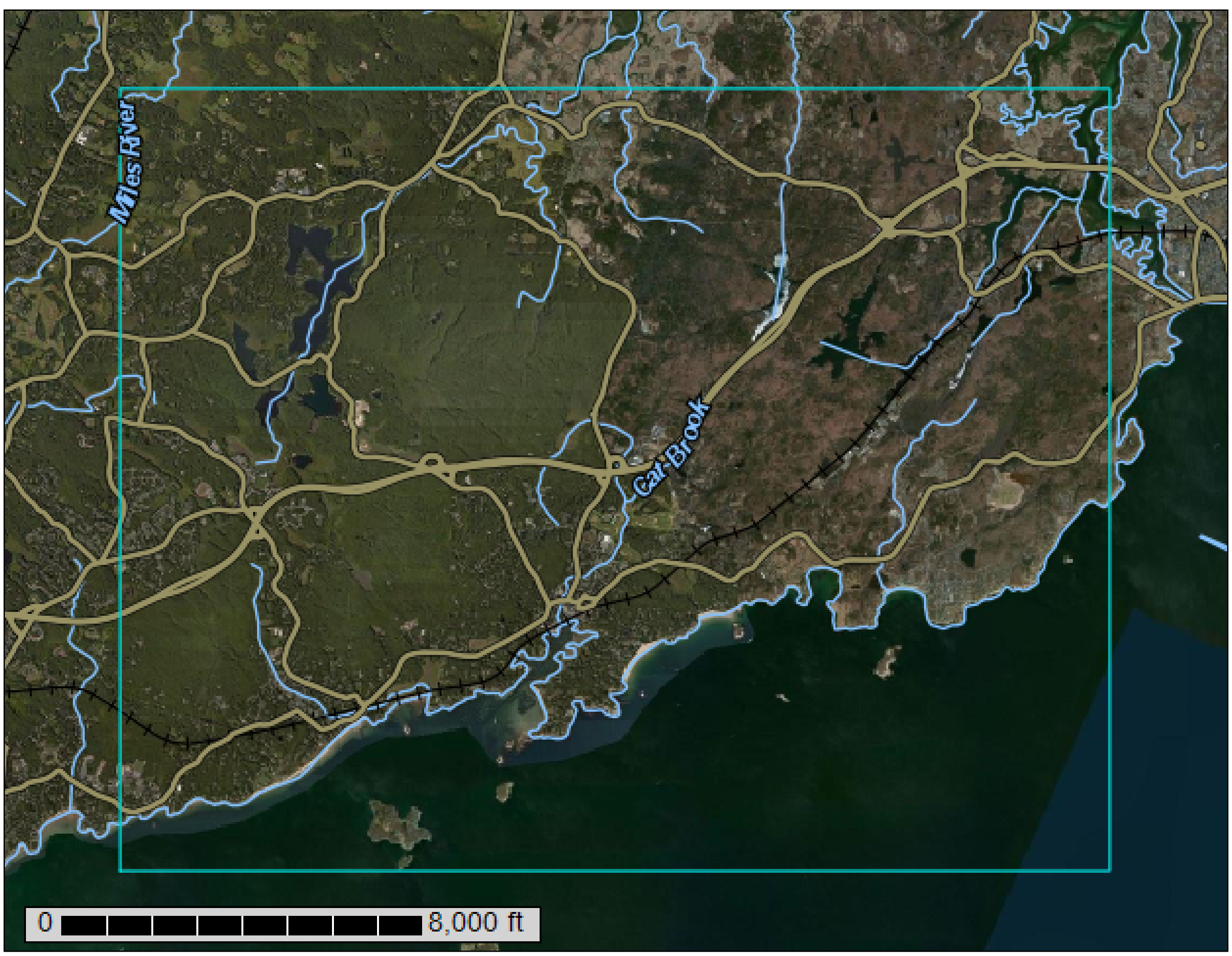
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Essex County, Massachusetts, Southern Part



October 10, 2015

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

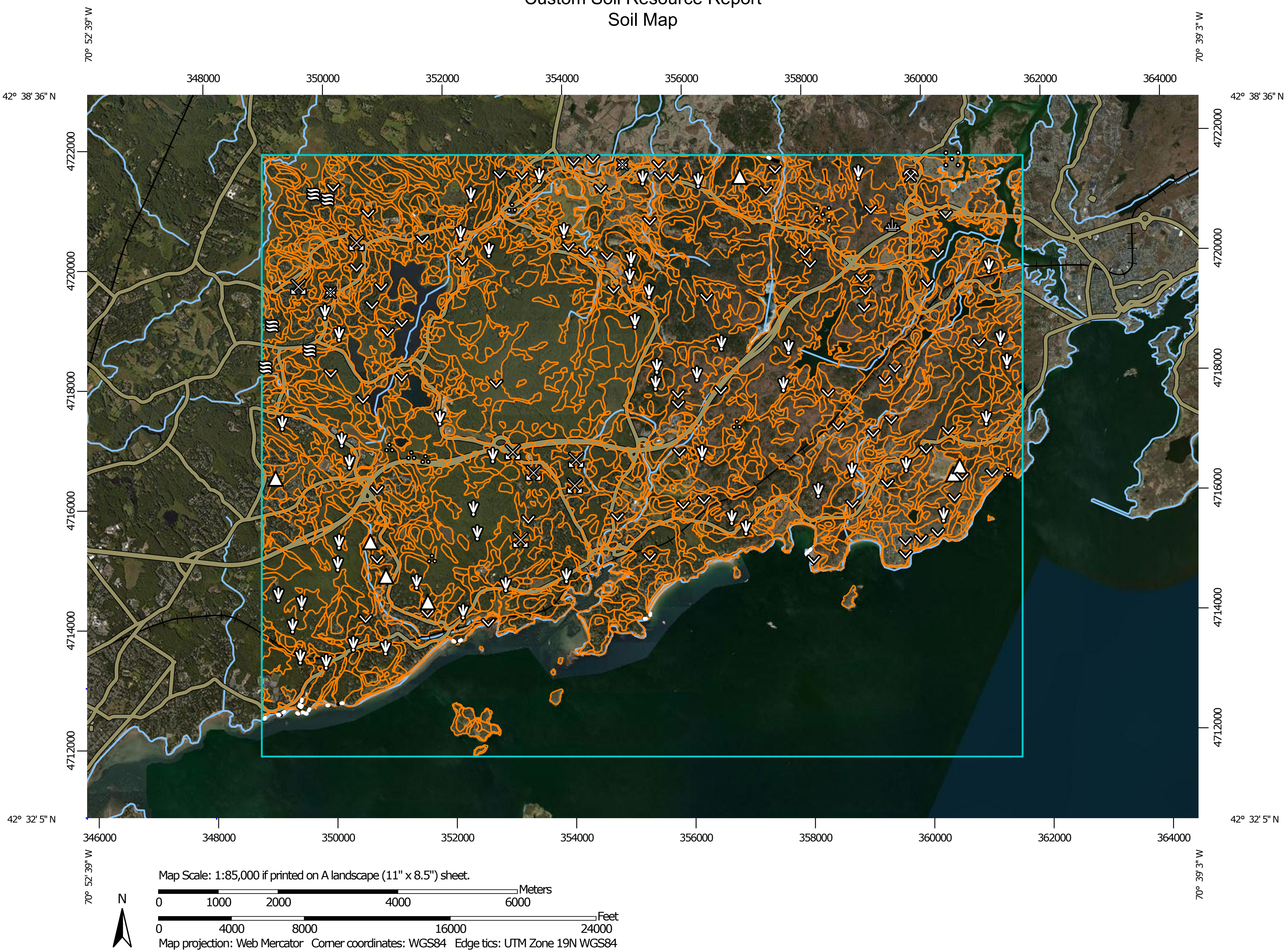
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


70° 52' 39" W
70° 39' 3" W
42° 38' 36" N
42° 32' 5" N
348000
350000
352000
354000
356000
358000
360000
362000
364000
346000
4722000
4720000
4718000
4716000
4714000
4712000
N
Map Scale: 1:85,000 if printed on A landscape (11" x 8.5") sheet.
Meters
0 1000 2000 4000 6000
Feet
0 4000 8000 16000 24000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Southern Part
Survey Area Data: Version 11, Sep 19, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Sep 19, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Essex County, Massachusetts, Southern Part (MA606)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1	Water	715.7	2.3%
12A	Maybid silt loam, 0 to 3 percent slopes	259.0	0.8%
14B	Scitico silt loam, 0 to 5 percent slopes	432.7	1.4%
31A	Walpole sandy loam, 0 to 3 percent slopes	166.0	0.5%
31B	Walpole fine sandy loam, 3 to 8 percent slopes	10.9	0.0%
32A	Wareham loamy sand, 0 to 3 percent slopes	101.1	0.3%
38A	Pipestone loamy fine sand, 0 to 3 percent slopes	6.3	0.0%
43A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	352.8	1.1%
51A	Swansea muck, 0 to 1 percent slopes	256.8	0.8%
52A	Freetown muck, 0 to 1 percent slopes	1,344.9	4.2%
53A	Freetown muck, ponded, 0 to 1 percent slopes MLRA 144A	107.2	0.3%
70B	Ridgebury fine sandy loam, 0 to 6 percent slopes	16.6	0.1%
71A	Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony	27.5	0.1%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	300.2	0.9%
73A	Whitman loam, 0 to 3 percent slopes, extremely stony	530.9	1.7%
102C	Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes	2,499.8	7.9%
102E	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	7,900.6	24.9%
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	616.9	1.9%
220A	Boxford silt loam, 0 to 3 percent slopes	65.8	0.2%
220B	Boxford silt loam, 3 to 8 percent slopes	264.6	0.8%
220C	Boxford silt loam, 8 to 15 percent slopes	16.1	0.1%

Essex County, Massachusetts, Southern Part (MA606)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
225B	Belgrade very fine sandy loam, 0 to 8 percent slopes	33.8	0.1%
242A	Hinckley gravelly fine sandy loam, 0 to 3 percent slopes	222.9	0.7%
242B	Hinckley gravelly fine sandy loam, 3 to 8 percent slopes	297.2	0.9%
242C	Hinckley gravelly fine sandy loam, 8 to 15 percent slopes	124.0	0.4%
242D	Hinckley gravelly fine sandy loam, 15 to 25 percent slopes	89.7	0.3%
242E	Hinckley gravelly fine sandy loam, 25 to 45 percent slopes	49.8	0.2%
250B	Pollux fine sandy loam, 0 to 8 percent slopes	31.3	0.1%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	181.7	0.6%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	349.3	1.1%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	111.3	0.4%
254D	Merrimac fine sandy loam, 15 to 25 percent slopes	44.6	0.1%
255A	Windsor loamy sand, 0 to 3 percent slopes	15.8	0.0%
255B	Windsor loamy sand, 3 to 8 percent slopes	36.7	0.1%
255C	Windsor loamy sand, 8 to 15 percent slopes	2.4	0.0%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	121.7	0.4%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	547.6	1.7%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	237.5	0.7%
276B	Ninigret fine sandy loam, 3 to 8 percent slopes	8.3	0.0%
300B	Montauk fine sandy loam, 3 to 8 percent slopes	44.6	0.1%
300C	Montauk fine sandy loam, 8 to 15 percent slopes	2.8	0.0%
301B	Montauk fine sandy loam, 3 to 8 percent slopes, very stony	70.8	0.2%
301C	Montauk fine sandy loam, 8 to 15 percent slopes, very stony	43.5	0.1%
301D	Montauk fine sandy loam, 15 to 25 percent slopes, very stony	22.5	0.1%
302C	Montauk fine sandy loam, 8 to 15 percent slopes, extremely stony	8.9	0.0%

Essex County, Massachusetts, Southern Part (MA606)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
302D	Montauk fine sandy loam, 15 to 25 percent slopes, extremely stony	10.0	0.0%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	37.4	0.1%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	30.7	0.1%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	4.6	0.0%
306B	Paxton fine sandy loam, 3 to 8 percent slopes, very stony	58.6	0.2%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	28.6	0.1%
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	81.9	0.3%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	44.1	0.1%
310C	Woodbridge fine sandy loam, 8 to 15 percent slopes	16.7	0.1%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	138.7	0.4%
311C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	69.9	0.2%
311D	Woodbridge fine sandy loam, 15 to 25 percent slopes, very stony	14.1	0.0%
315B	Scituate fine sandy loam, 3 to 8 percent slopes	11.1	0.0%
316B	Scituate fine sandy loam, 3 to 8 percent slopes, very stony	190.4	0.6%
316C	Scituate fine sandy loam, 8 to 15 percent slopes, very stony	22.1	0.1%
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	4.3	0.0%
318B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely bouldery	176.5	0.6%
318C	Scituate fine sandy loam, 8 to 15 percent slopes, extremely bouldery	53.3	0.2%
323B	Poquonock loamy sand, 3 to 8 percent slopes, very stony	14.4	0.0%
323C	Poquonock loamy sand, 8 to 15 percent slopes, very stony	30.6	0.1%
323D	Poquonock loamy sand, 15 to 25 percent slopes, very stony	10.0	0.0%

Essex County, Massachusetts, Southern Part (MA606)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
392E	Paxton and Montauk fine sandy loams, 25 to 45 percent slopes, extremely stony	4.4	0.0%
420B	Canton fine sandy loam, 3 to 8 percent slopes	25.6	0.1%
420C	Canton fine sandy loam, 8 to 20 percent slopes	3.2	0.0%
421B	Canton fine sandy loam, 3 to 8 percent slopes, very stony	139.3	0.4%
421C	Canton fine sandy loam, 8 to 15 percent slopes, very stony	168.4	0.5%
421D	Canton fine sandy loam, 15 to 25 percent slopes, very stony	76.2	0.2%
422B	Canton fine sandy loam, 3 to 8 percent slopes, extremely stony	72.6	0.2%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	162.3	0.5%
422D	Canton fine sandy loam, 15 to 25 percent slopes, extremely stony	120.7	0.4%
422E	Canton fine sandy loam, 25 to 35 percent slopes, extremely stony	45.3	0.1%
600	Pits, gravel	84.8	0.3%
602	Urban land	185.2	0.6%
607	Water, saline	421.3	1.3%
610	Beaches	65.0	0.2%
616A	Fluvaquents, frequently flooded, 0 to 3 percent slopes	11.3	0.0%
626B	Merrimac-Urban land complex, gently sloping	69.1	0.2%
651	Udorthents, smoothed	389.2	1.2%
652	Udorthents, refuse substratum	69.5	0.2%
702C	Udipsamments, rolling	7.0	0.0%
712A	Ipswich and Westbrook mucky peats, 0 to 2 percent slopes, very frequently flooded	565.2	1.8%
714B	Melrose fine sandy loam, 3 to 8 percent slopes	21.4	0.1%
720A	Whately Variant mucky fine sandy loam, 0 to 1 percent slopes	26.1	0.1%
722B	Annisquam fine sandy loam, 3 to 8 percent slopes, extremely bouldery	184.3	0.6%

Essex County, Massachusetts, Southern Part (MA606)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
722C	Annisquam fine sandy loam, 8 to 15 percent slopes, extremely bouldery	349.6	1.1%
722E	Annisquam fine sandy loam, 15 to 35 percent slopes, extremely bouldery	711.1	2.2%
723A	Elmridge fine sandy loam, 0 to 3 percent slopes	1.7	0.0%
723B	Elmridge fine sandy loam, 3 to 8 percent slopes	35.8	0.1%
725A	Shaker fine sandy loam, 0 to 3 percent slopes	45.0	0.1%
Subtotals for Soil Survey Area		**23,799.5**	**75.0%**
Totals for Area of Interest		**31,724.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Essex County, Massachusetts, Southern Part

1—Water

Map Unit Setting

National map unit symbol: 99m6
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

12A—Maybid silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vk65
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Maybid and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maybid

Setting

Landform: Depressions, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Soft silty glaciolacustrine deposits and/or firm silty marine deposits

Typical profile

O - 0 to 2 inches: muck
H2 - 2 to 7 inches: silt loam
H3 - 7 to 21 inches: silty clay loam
H4 - 21 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D

Minor Components

Scitico

Percent of map unit: 10 percent
Landform: Depressions

Swansea

Percent of map unit: 5 percent
Landform: Bogs

14B—Scitico silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: vkh3
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scitico and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scitico

Setting

Landform: Depressions, terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Soft silty and clayey glaciolacustrine deposits and/or soft silty and clayey marine deposits over hard silty and clayey glaciolacustrine deposits and/or hard silty and clayey marine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 42 inches: silty clay loam
H3 - 42 to 57 inches: silty clay loam
H4 - 57 to 70 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D

Minor Components

Maybid
Percent of map unit: 8 percent
Landform: Depressions

Boxford
Percent of map unit: 7 percent

31A—Walpole sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2svkl
Elevation: 0 to 1,020 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition
Walpole and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting
Landform: Deltas, depressions, outwash plains, depressions, outwash terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile
Oe - 0 to 1 inches: mucky peat
A - 1 to 7 inches: sandy loam

Bg - 7 to 21 inches: sandy loam
BC - 21 to 25 inches: gravelly sandy loam
C - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Minor Components

Scarboro

Percent of map unit: 10 percent
Landform: Deltas, outwash plains, outwash terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

Sudbury

Percent of map unit: 10 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear

31B—Walpole fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vkk3
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Walpole and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting

Landform: Terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 22 inches: sandy loam
H3 - 22 to 60 inches: stratified gravelly coarse sand to loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D

Minor Components

Scarboro

Percent of map unit: 5 percent
Landform: Terraces

Sudbury

Percent of map unit: 5 percent

Ninigret

Percent of map unit: 5 percent

32A—Wareham loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vkk6
Elevation: 100 to 1,000 feet
Mean annual precipitation: 45 to 54 inches

Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Wareham and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wareham

Setting

Landform: Terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 16 inches: loamy fine sand
H3 - 16 to 24 inches: loamy sand
H4 - 24 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Minor Components

Scarboro

Percent of map unit: 15 percent
Landform: Terraces

38A—Pipestone loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vkb0

Elevation: 600 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Pipestone and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pipestone

Setting

Landform: Valleys
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 28 inches: loamy sand
H3 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: About 14 inches to ortstein
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Minor Components

Wareham

Percent of map unit: 5 percent
Landform: Terraces

Deerfield

Percent of map unit: 5 percent

Scarboro

Percent of map unit: 5 percent
Landform: Terraces

43A—Scarboro mucky fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svky
Elevation: 0 to 1,320 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Scarboro and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro

Setting

Landform: Depressions, outwash deltas, outwash terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from schist and/or sandy glaciofluvial deposits derived from gneiss and/or sandy glaciofluvial deposits derived from granite

Typical profile

Oe - 0 to 3 inches: mucky peat
A - 3 to 11 inches: mucky fine sandy loam
Cg1 - 11 to 21 inches: sand
Cg2 - 21 to 65 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 2 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

Wareham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Walpole

Percent of map unit: 5 percent
Landform: Outwash plains, depressions, depressions, outwash terraces, deltas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave

51A—Swansea muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2trl2
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Swansea and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swansea

Setting

Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material over loose sandy and gravelly glaciofluvial deposits

Typical profile

Oa1 - 0 to 24 inches: muck

Oa2 - 24 to 34 inches: muck
Cg - 34 to 79 inches: coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D

Minor Components

Freetown

Percent of map unit: 10 percent
Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

Whitman

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

Scarboro

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

52A—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Kettles, depressions, depressions, bogs, marshes, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D

Minor Components

Scarboro

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

Swansea

Percent of map unit: 5 percent
Landform: Kettles, depressions, depressions, marshes, bogs, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave

Across-slope shape: Concave

Whitman

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

53A—Freetown muck, ponded, 0 to 1 percent slopes MLRA 144A

Map Unit Setting

National map unit symbol: 2t2qc
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Freetown, ponded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown, Ponded

Setting

Landform: Depressions, depressions, kettles, bogs, marshes, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D

Minor Components

Scarboro

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

Whitman, ponded

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

Swansea, ponded

Percent of map unit: 5 percent
Landform: Kettles, depressions, depressions, marshes, bogs, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

70B—Ridgebury fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: vkc8
Elevation: 50 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury

Setting

Landform: Depressions, drainageways

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 20 inches: gravelly sandy loam
H3 - 20 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 10 to 30 inches to densic material
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Minor Components

Whitman

Percent of map unit: 6 percent
Landform: Depressions

Woodbridge

Percent of map unit: 4 percent

71A—Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vkcd
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile
H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 20 inches: gravelly sandy loam
H3 - 20 to 60 inches: gravelly sandy loam

Properties and qualities
Slope: 0 to 3 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 10 to 30 inches to densic material
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Minor Components

Whitman
Percent of map unit: 8 percent
Landform: Depressions

Woodbridge
Percent of map unit: 4 percent

Scituate
Percent of map unit: 3 percent

71B—Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting
National map unit symbol: vkcl
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Ridgebury and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 20 inches: gravelly sandy loam
H3 - 20 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 10 to 30 inches to densic material
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Minor Components

Whitman

Percent of map unit: 8 percent
Landform: Depressions

Woodbridge

Percent of map unit: 4 percent

Scituate

Percent of map unit: 3 percent

73A—Whitman loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vkkk
Elevation: 0 to 2,100 feet

Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitman and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitman

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

O - 0 to 3 inches: muck
H2 - 3 to 7 inches: loam
H3 - 7 to 17 inches: gravelly fine sandy loam
H4 - 17 to 25 inches: fine sandy loam
H5 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 12 to 25 inches to densic material
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Minor Components

Ridgebury

Percent of map unit: 15 percent
Landform: Depressions

102C—Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: vk4f
Elevation: 100 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield and similar soils: 40 percent
Hollis and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, moderately deep coarse-loamy basal till derived from granite and gneiss over granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 34 inches: gravelly very fine sandy loam
H3 - 34 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Description of Hollis

Setting

Landform: Ridges on hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till derived from granite and gneiss over granite and gneiss

Typical profile

O - 0 to 2 inches: muck
H2 - 2 to 5 inches: fine sandy loam
H3 - 5 to 20 inches: gravelly fine sandy loam
H4 - 20 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Description of Rock Outcrop

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Canton

Percent of map unit: 4 percent

Montauk

Percent of map unit: 2 percent

Paxton

Percent of map unit: 2 percent

Whitman

Percent of map unit: 2 percent
Landform: Depressions

Woodbridge

Percent of map unit: 2 percent

Freetown

Percent of map unit: 1 percent
Landform: Bogs

Ridgebury

Percent of map unit: 1 percent
Landform: Depressions

Swansea

Percent of map unit: 1 percent
Landform: Bogs

102E—Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: vk4k
Elevation: 100 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield and similar soils: 40 percent
Hollis and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, moderately deep coarse-loamy basal till derived from granite and gneiss over granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 34 inches: gravelly very fine sandy loam
H3 - 34 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Description of Hollis

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till derived from granite and gneiss over granite and gneiss

Typical profile

O - 0 to 2 inches: muck
H2 - 2 to 5 inches: fine sandy loam
H3 - 5 to 20 inches: gravelly fine sandy loam
H4 - 20 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Description of Rock Outcrop

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Canton

Percent of map unit: 4 percent

Woodbridge

Percent of map unit: 2 percent

Montauk

Percent of map unit: 2 percent

Paxton

Percent of map unit: 2 percent

Whitman

Percent of map unit: 2 percent
Landform: Depressions

Ridgebury

Percent of map unit: 1 percent
Landform: Depressions

Swansea

Percent of map unit: 1 percent
Landform: Bogs

Freetown

Percent of map unit: 1 percent
Landform: Bogs

105D—Rock outcrop-Hollis complex, 3 to 25 percent slopes

Map Unit Setting

National map unit symbol: vkcq
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 65 percent
Hollis and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Parent material: Granite

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Description of Hollis

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till derived from granite and gneiss over granite

Typical profile

O - 0 to 2 inches: muck
H2 - 2 to 4 inches: fine sandy loam
H3 - 4 to 17 inches: gravelly fine sandy loam
H4 - 17 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Minor Components

Chatfield

Percent of map unit: 15 percent

220A—Boxford silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vk33
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Boxford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxford

Setting

Landform: Flats, valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Soft silty and clayey lacustrine deposits and/or soft silty and clayey marine deposits over hard silty and clayey lacustrine deposits and/or hard silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 17 inches: silt loam
H3 - 17 to 44 inches: silty clay loam
H4 - 44 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D

Minor Components

Scitico

Percent of map unit: 10 percent
Landform: Depressions

Maybid

Percent of map unit: 5 percent
Landform: Depressions

220B—Boxford silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk37
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Boxford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxford

Setting

Landform: Flats, valleys
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Soft silty and clayey lacustrine deposits and/or soft silty and clayey marine deposits over hard silty and clayey lacustrine deposits and/or hard silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 17 inches: silt loam
H3 - 17 to 44 inches: silty clay loam
H4 - 44 to 60 inches: silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None

Frequency of ponding: None
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D

Minor Components

Scitico

Percent of map unit: 10 percent
Landform: Depressions

Maybid

Percent of map unit: 5 percent
Landform: Depressions

220C—Boxford silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: vk3j
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Boxford and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxford

Setting

Landform: Hills, valleys
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Soft silty and clayey lacustrine deposits and/or soft silty and clayey marine deposits over hard silty and clayey lacustrine deposits and/or hard silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 17 inches: silt loam
H3 - 17 to 44 inches: silty clay loam
H4 - 44 to 60 inches: silty clay loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D

Minor Components

Scitico

Percent of map unit: 10 percent
Landform: Depressions

225B—Belgrade very fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk2z
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Belgrade and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belgrade

Setting

Landform: Valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-silty eolian deposits over soft coarse-silty glaciolacustrine deposits derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: very fine sandy loam
H2 - 9 to 42 inches: very fine sandy loam
H3 - 42 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Minor Components

Other soils

Percent of map unit: 5 percent
Landform: Depressions

242A—Hinckley gravelly fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vk5f
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam

H2 - 8 to 17 inches: gravelly loamy sand
H3 - 17 to 60 inches: stratified cobbly coarse sand to very gravelly loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Minor Components

Windsor

Percent of map unit: 10 percent

Sudbury

Percent of map unit: 3 percent

Wareham

Percent of map unit: 1 percent
Landform: Terraces

Swansea

Percent of map unit: 1 percent
Landform: Bogs

242B—Hinckley gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk5l
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Flood plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 17 inches: gravelly loamy sand
H3 - 17 to 60 inches: stratified cobbly coarse sand to very gravelly loamy fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Minor Components

Windsor

Percent of map unit: 10 percent

Sudbury

Percent of map unit: 3 percent

Wareham

Percent of map unit: 1 percent
Landform: Terraces

Swansea

Percent of map unit: 1 percent
Landform: Bogs

242C—Hinckley gravelly fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: vk5p

Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Hills, drainageways, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 17 inches: gravelly loamy sand
H3 - 17 to 60 inches: stratified cobbly coarse sand to very gravelly loamy fine sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A

Minor Components

Windsor

Percent of map unit: 12 percent

Swansea

Percent of map unit: 1 percent
Landform: Bogs

Wareham

Percent of map unit: 1 percent
Landform: Terraces

Sudbury

Percent of map unit: 1 percent

242D—Hinckley gravelly fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: vk5s
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 17 inches: gravelly loamy sand
H3 - 17 to 60 inches: stratified cobbly coarse sand to very gravelly loamy fine sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

242E—Hinckley gravelly fine sandy loam, 25 to 45 percent slopes

Map Unit Setting

National map unit symbol: vk5w
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 17 inches: gravelly loamy sand
H3 - 17 to 60 inches: stratified cobbly coarse sand to very gravelly loamy fine sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Minor Components

Swansea

Percent of map unit: 15 percent
Landform: Bogs

250B—Pollux fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: vkbf
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pollux and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pollux

Setting

Landform: Knolls, knolls, knolls
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy glaciofluvial deposits over hard coarse-loamy glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 35 inches: fine sandy loam
H3 - 35 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyqr
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Moraines, outwash plains, eskers, outwash terraces, kames
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear

Agawam

Percent of map unit: 3 percent
Landform: Moraines, outwash plains, eskers, outwash terraces, kames, stream terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

Windsor

Percent of map unit: 2 percent
Landform: Outwash terraces, dunes, outwash plains, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Eskers, kames, outwash terraces, moraines, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Kames, eskers, outwash plains, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear

Windsor

Percent of map unit: 3 percent
Landform: Outwash terraces, dunes, outwash plains, deltas
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Agawam

Percent of map unit: 2 percent
Landform: Kames, stream terraces, eskers, outwash terraces, moraines, outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, outwash terraces, eskers, moraines, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Outwash terraces, dunes, outwash plains, deltas
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear

Hinckley

Percent of map unit: 5 percent
Landform: Kames, eskers, outwash plains, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

254D—Merrimac fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: vk7c
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 15 inches: gravelly fine sandy loam
H3 - 15 to 22 inches: gravelly sandy loam
H4 - 22 to 60 inches: stratified very gravelly coarse sand to sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 15 percent

255A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 1,160 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Deltas, outwash plains, outwash terraces, dunes
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, outwash plains, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

255B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,040 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Deltas, outwash plains, outwash terraces, dunes
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, outwash plains, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

255C—Windsor loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svkq
Elevation: 0 to 1,260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Windsor and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
Ap - 1 to 11 inches: loamy sand
Bw - 11 to 31 inches: loamy sand
C - 31 to 65 inches: sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 10 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex

Deerfield

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

256A—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vk4s
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loose sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

O - 0 to 2 inches: muck
H2 - 2 to 7 inches: loamy fine sand
H3 - 7 to 26 inches: loamy fine sand
H4 - 26 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A

Minor Components

Windsor

Percent of map unit: 10 percent

Wareham

Percent of map unit: 5 percent
Landform: Terraces

260A—Sudbury fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vkj2
Elevation: 0 to 2,100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 19 inches: sandy loam
H3 - 19 to 26 inches: gravelly coarse sand
H4 - 26 to 60 inches: stratified very gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B

Minor Components

Merrimac

Percent of map unit: 10 percent

Walpole

Percent of map unit: 5 percent
Landform: Terraces

260B—Sudbury fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vkj4
Elevation: 0 to 2,100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Flats, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 19 inches: sandy loam
H3 - 19 to 26 inches: gravelly coarse sand
H4 - 26 to 60 inches: stratified very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Merrimac

Percent of map unit: 10 percent

Walpole

Percent of map unit: 5 percent
Landform: Terraces

276B—Ninigret fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk8d
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable loamy glaciofluvial deposits derived from granite and gneiss over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 33 inches: fine sandy loam
H3 - 33 to 60 inches: stratified very gravelly coarse sand to loamy fine sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 18 to 34 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Windsor

Percent of map unit: 12 percent

Walpole

Percent of map unit: 3 percent
Landform: Terraces

300B—Montauk fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk7l
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam

H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Scituate

Percent of map unit: 10 percent

Ridgebury

Percent of map unit: 5 percent
Landform: Depressions

300C—Montauk fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: vk7r
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex

Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Minor Components

Scituate

Percent of map unit: 10 percent

Ridgebury

Percent of map unit: 5 percent
Landform: Depressions

301B—Montauk fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk7t
Elevation: 0 to 400 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges

Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B

Minor Components

Scituate

Percent of map unit: 10 percent

Ridgebury

Percent of map unit: 5 percent
Landform: Depressions

301C—Montauk fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk7x
Elevation: 0 to 400 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B

Minor Components

Scituate

Percent of map unit: 12 percent

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions

301D—Montauk fine sandy loam, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk7z
Elevation: 0 to 400 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B

Minor Components

Scituate

Percent of map unit: 13 percent

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions

302C—Montauk fine sandy loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vk83
Elevation: 0 to 400 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Scituate

Percent of map unit: 10 percent

Hollis

Percent of map unit: 3 percent

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions

302D—Montauk fine sandy loam, 15 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vk86
Elevation: 0 to 400 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Scituate
Percent of map unit: 10 percent

Hollis
Percent of map unit: 5 percent

305B—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2t2qp
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Paxton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile
Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material

Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear

Ridgebury

Percent of map unit: 6 percent
Landform: Depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

305C—Paxton fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: vk8r
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 23 inches: fine sandy loam
H3 - 23 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Minor Components

Woodbridge

Percent of map unit: 8 percent

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions

305D—Paxton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: vk8v
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 23 inches: fine sandy loam
H3 - 23 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 15 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Minor Components

Woodbridge

Percent of map unit: 15 percent

306B—Paxton fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk91
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 23 inches: fine sandy loam
H3 - 23 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 15 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Woodbridge

Percent of map unit: 7 percent

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions

306C—Paxton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk9b

Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 23 inches: fine sandy loam
H3 - 23 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 15 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Woodbridge

Percent of map unit: 8 percent

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions

306D—Paxton fine sandy loam, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk9k
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 23 inches: fine sandy loam
H3 - 23 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 15 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Woodbridge

Percent of map unit: 15 percent

310B—Woodbridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2ql
Elevation: 0 to 1,470 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge, fine sandy loam, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Fine Sandy Loam

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D

Minor Components

Paxton

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex

Ridgebury

Percent of map unit: 8 percent
Landform: Depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave

310C—Woodbridge fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: vklr
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodbridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: fine sandy loam

H2 - 6 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Minor Components

Ridgebury

Percent of map unit: 10 percent
Landform: Depressions

Whitman

Percent of map unit: 5 percent
Landform: Depressions

311B—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2t2qr
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodbridge, very stony, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Very Stony

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave

Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D

Minor Components

Paxton, very stony

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex

Ridgebury, very stony

Percent of map unit: 8 percent
Landform: Depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave

311C—Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: vkmd
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodbridge and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Paxton

Percent of map unit: 7 percent

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions

311D—Woodbridge fine sandy loam, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: vkmm
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Woodbridge and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 25 inches: fine sandy loam
H3 - 25 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Paxton

Percent of map unit: 7 percent

Ridgebury

Percent of map unit: 3 percent
Landform: Depressions

315B—Scituate fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vkh9
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Scituate and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 34 inches: gravelly fine sandy loam
H3 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 34 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Minor Components

Ridgebury

Percent of map unit: 7 percent
Landform: Depressions

Whitman

Percent of map unit: 3 percent
Landform: Depressions

316B—Scituate fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vkhg
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scituate and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, shoulder
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 34 inches: gravelly fine sandy loam
H3 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 18 to 34 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Ridgebury
Percent of map unit: 7 percent
Landform: Depressions

Whitman
Percent of map unit: 3 percent
Landform: Depressions

316C—Scituate fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting
National map unit symbol: vkhk
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Scituate and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting
Landform: Hillsides, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile
H1 - 0 to 9 inches: fine sandy loam

H2 - 9 to 34 inches: gravelly fine sandy loam
H3 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 18 to 34 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Montauk

Percent of map unit: 7 percent

Ridgebury

Percent of map unit: 5 percent
Landform: Depressions

Hollis

Percent of map unit: 3 percent

317B—Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vkhp
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scituate and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Head slope, base slope

Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 34 inches: gravelly fine sandy loam
H3 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 34 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C

Minor Components

Ridgebury

Percent of map unit: 10 percent
Landform: Depressions

Whitman

Percent of map unit: 5 percent
Landform: Depressions

318B—Scituate fine sandy loam, 3 to 8 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: vkhr
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scituate and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, shoulder
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 34 inches: gravelly fine sandy loam
H3 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 34 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C

Minor Components

Annisquam

Percent of map unit: 8 percent

Ridgebury

Percent of map unit: 4 percent
Landform: Depressions

Hollis

Percent of map unit: 3 percent

318C—Scituate fine sandy loam, 8 to 15 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: vkhv
Mean annual precipitation: 45 to 54 inches

Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scituate and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hillsides, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 34 inches: gravelly fine sandy loam
H3 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 34 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C

Minor Components

Ridgebury

Percent of map unit: 10 percent
Landform: Depressions

Whitman

Percent of map unit: 5 percent
Landform: Depressions

323B—Poquonock loamy sand, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vkbm
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Poquonock and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poquonock

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits over dense loamy lodgment till derived from granite and gneiss

Typical profile

O - 0 to 1 inches: muck
H2 - 1 to 8 inches: loamy sand
H3 - 8 to 25 inches: loamy fine sand
H4 - 25 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 22 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Hollis

Percent of map unit: 8 percent

Woodbridge

Percent of map unit: 7 percent

323C—Poquonock loamy sand, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: vkbs
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Poquonock and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poquonock

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits over dense loamy lodgment till derived from granite and gneiss

Typical profile

O - 0 to 1 inches: muck
H2 - 1 to 8 inches: loamy sand
H3 - 8 to 25 inches: loamy fine sand
H4 - 25 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 22 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Woodbridge

Percent of map unit: 8 percent

Hollis

Percent of map unit: 7 percent

323D—Poquonock loamy sand, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: vkby
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Poquonock and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poquonock

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits over dense loamy lodgment till derived from granite and gneiss

Typical profile

O - 0 to 1 inches: muck
H2 - 1 to 8 inches: loamy sand
H3 - 8 to 25 inches: loamy fine sand
H4 - 25 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 22 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Woodbridge
Percent of map unit: 8 percent

Hollis
Percent of map unit: 7 percent

392E—Paxton and Montauk fine sandy loams, 25 to 45 percent slopes, extremely stony

Map Unit Setting
National map unit symbol: vk9q
Elevation: 0 to 400 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Paxton and similar soils: 65 percent
Montauk and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting
Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss

Typical profile
H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 23 inches: fine sandy loam
H3 - 23 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 25 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 15 to 38 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C

Description of Montauk

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 22 inches: fine sandy loam
H3 - 22 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 25 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Hollis

Percent of map unit: 15 percent

420B—Canton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk3p
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 7 inches: fine sandy loam
H2 - 7 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A

Minor Components

Scituate

Percent of map unit: 7 percent

Montauk

Percent of map unit: 5 percent

Swansea

Percent of map unit: 3 percent
Landform: Bogs

420C—Canton fine sandy loam, 8 to 20 percent slopes

Map Unit Setting

National map unit symbol: vk3s
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 7 inches: fine sandy loam
H2 - 7 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Minor Components

Montauk

Percent of map unit: 7 percent

Scituate

Percent of map unit: 5 percent

Swansea

Percent of map unit: 3 percent
Landform: Bogs

421B—Canton fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk3v
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Scituate

Percent of map unit: 7 percent

Montauk

Percent of map unit: 5 percent

Swansea

Percent of map unit: 3 percent
Landform: Bogs

421C—Canton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk3x
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Montauk

Percent of map unit: 7 percent

Scituate

Percent of map unit: 5 percent

Swansea

Percent of map unit: 3 percent
Landform: Bogs

421D—Canton fine sandy loam, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: vk3z
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Montauk

Percent of map unit: 10 percent

Scituate

Percent of map unit: 5 percent

422B—Canton fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vk41
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Minor Components

Scituate

Percent of map unit: 7 percent

Montauk

Percent of map unit: 5 percent

Swansea

Percent of map unit: 3 percent
Landform: Bogs

422C—Canton fine sandy loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vk43
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Minor Components

Montauk

Percent of map unit: 10 percent

Scituate

Percent of map unit: 3 percent

Hollis

Percent of map unit: 2 percent

422D—Canton fine sandy loam, 15 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vk45
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Minor Components

Montauk

Percent of map unit: 10 percent

Scituate

Percent of map unit: 3 percent

Hollis

Percent of map unit: 2 percent

422E—Canton fine sandy loam, 25 to 35 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: vk47
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 25 to 35 percent

Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Minor Components

Montauk

Percent of map unit: 15 percent

Hollis

Percent of map unit: 5 percent

600—Pits, gravel

Map Unit Setting

National map unit symbol: vkb3
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Parent material: Loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

602—Urban land

Map Unit Setting

National map unit symbol: vkjv
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated, filled, and made land

Minor Components

Udorthents

Percent of map unit: 7 percent

Hollis

Percent of map unit: 5 percent

Whitman

Percent of map unit: 3 percent
Landform: Depressions

Maybid

Percent of map unit: 1 percent
Landform: Depressions

Swansea

Percent of map unit: 1 percent
Landform: Bogs

Whately variant

Percent of map unit: 1 percent
Landform: Glacial lakes (relict)

Scarboro

Percent of map unit: 1 percent
Landform: Terraces

Freetown

Percent of map unit: 1 percent
Landform: Bogs

607—Water, saline

Map Unit Setting

National map unit symbol: vkmv
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Water, saline: 95 percent
Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Westbrook

Percent of map unit: 5 percent
Landform: Marshes

610—Beaches

Map Unit Setting

National map unit symbol: vk2q
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Beaches: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beaches

Setting

Parent material: Reworked sandy and gravelly glaciofluvial deposits derived from igneous and metamorphic rock and/or reworked sandy and gravelly marine deposits

616A—Fluvaquents, frequently flooded, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vk56
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave

Parent material: Friable loamy alluvium over friable sandy eolian deposits

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Bogs

Unnamed soils

Percent of map unit: 5 percent

626B—Merrimac-Urban land complex, gently sloping

Map Unit Setting

National map unit symbol: vk7g
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Merrimac and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Flats, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 15 inches: gravelly fine sandy loam
H3 - 15 to 22 inches: gravelly sandy loam
H4 - 22 to 60 inches: stratified very gravelly coarse sand to sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Description of Urban Land

Setting

Parent material: Excavated and filled land

Minor Components

Windsor

Percent of map unit: 4 percent

Hinckley

Percent of map unit: 4 percent

Sudbury

Percent of map unit: 4 percent

Deerfield

Percent of map unit: 2 percent

Ninigret

Percent of map unit: 2 percent

Wareham

Percent of map unit: 1 percent
Landform: Outwash plains

Pipestone

Percent of map unit: 1 percent

Scarboro

Percent of map unit: 1 percent
Landform: Terraces

Walpole

Percent of map unit: 1 percent
Landform: Outwash plains

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: vkjs
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 80 percent
Urban land: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Made land over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss and/or friable coarse-loamy basal till derived from granite and gneiss

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Urban Land

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

652—Udorthents, refuse substratum

Map Unit Setting

National map unit symbol: vk4v

Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Dumps: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions

Walpole

Percent of map unit: 1 percent
Landform: Terraces

Scarboro

Percent of map unit: 1 percent
Landform: Terraces

Whitman

Percent of map unit: 1 percent
Landform: Depressions

702C—Udipsamments, rolling

Map Unit Setting

National map unit symbol: vkjc
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Setting

Landform: Dunes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy eolian deposits derived from igneous and metamorphic rock

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None

Minor Components

Udorthents

Percent of map unit: 9 percent

Westbrook

Percent of map unit: 2 percent
Landform: Marshes

Scarboro

Percent of map unit: 2 percent
Landform: Terraces

Ipswich

Percent of map unit: 2 percent
Landform: Marshes

712A—Ipswich and Westbrook mucky peats, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqn
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Ipswich and similar soils: 55 percent
Westbrook and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ipswich

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partially- decomposed herbaceous organic material

Typical profile

Oe - 0 to 42 inches: mucky peat
Oa - 42 to 59 inches: muck

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 99.90 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 20.0
Available water storage in profile: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: Tidal Salt High Marsh mesic very frequently flooded (R144AR002CT), Tidal Salt Low Marsh mesic very frequently flooded (R144AR001CT)

Description of Westbrook

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partly-decomposed herbaceous organic material over loamy mineral material

Typical profile

Oe - 0 to 19 inches: mucky peat
Cg - 19 to 59 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 33.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded (R144AR001CT), Tidal Salt High Marsh mesic very frequently flooded (R144AR002CT)

Minor Components

Pawcatuck

Percent of map unit: 15 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Tidal Salt High Marsh mesic very frequently flooded (R144AR002CT), Tidal Salt Low Marsh mesic very frequently flooded (R144AR001CT)

714B—Melrose fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk6j
Elevation: 10 to 900 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Melrose and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melrose

Setting

Landform: Lakebeds (relict), deltas
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy glaciofluvial deposits derived from metamorphic rock and/or soft loamy glaciolacustrine deposits over hard clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 30 inches: fine sandy loam
H3 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Minor Components

Elmridge

Percent of map unit: 10 percent

Shaker

Percent of map unit: 5 percent
Landform: Depressions

720A—Whately Variant mucky fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: vkkc
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Whately variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whately Variant

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loose sandy glaciofluvial deposits over hard clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: mucky fine sandy loam
H2 - 10 to 24 inches: loamy sand
H3 - 24 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D

Minor Components

Shaker

Percent of map unit: 10 percent
Landform: Depressions

Swansea

Percent of map unit: 5 percent
Landform: Bogs

722B—Annisquam fine sandy loam, 3 to 8 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: vk2h
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Annisquam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Annisquam

Setting

Landform: Knolls, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over gravelly, dense loamy lodgment till derived from granite

Typical profile
H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: very gravelly fine sandy loam
H3 - 28 to 60 inches: very gravelly loamy coarse sand

Properties and qualities
Slope: 3 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Scituate
Percent of map unit: 3 percent

Hollis
Percent of map unit: 3 percent

Montauk
Percent of map unit: 3 percent

Ridgebury
Percent of map unit: 3 percent
Landform: Depressions

Chatfield
Percent of map unit: 3 percent

722C—Annisquam fine sandy loam, 8 to 15 percent slopes, extremely bouldery

Map Unit Setting
National map unit symbol: vk2k
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Annisquam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Annisquam

Setting

Landform: Knolls, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over gravelly, dense loamy lodgment till derived from granite

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: very gravelly fine sandy loam
H3 - 28 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Hollis

Percent of map unit: 4 percent

Chatfield

Percent of map unit: 4 percent

Montauk

Percent of map unit: 3 percent

Ridgebury

Percent of map unit: 2 percent
Landform: Depressions

Scituate

Percent of map unit: 2 percent

722E—Annisquam fine sandy loam, 15 to 35 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: vk2n
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Annisquam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Annisquam

Setting

Landform: Knolls, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over gravelly, dense loamy lodgment till derived from granite

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 28 inches: very gravelly fine sandy loam
H3 - 28 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B

Minor Components

Hollis
Percent of map unit: 5 percent

Montauk
Percent of map unit: 4 percent

Chatfield
Percent of map unit: 4 percent

Ridgebury
Percent of map unit: 1 percent
Landform: Depressions

Scituate
Percent of map unit: 1 percent

723A—Elmridge fine sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: vk4x
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Elmridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmridge

Setting
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over hard clayey lacustrine deposits and/or hard clayey marine deposits

Typical profile
O - 0 to 1 inches: muck
H2 - 1 to 9 inches: fine sandy loam
H3 - 9 to 24 inches: fine sandy loam
H4 - 24 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 3 percent

Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B

Minor Components

Shaker
Percent of map unit: 10 percent
Landform: Depressions

Melrose
Percent of map unit: 5 percent

723B—Elmridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: vk50
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Elmridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmridge

Setting
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over hard clayey lacustrine deposits and/or hard clayey marine deposits

Typical profile
O - 0 to 1 inches: muck

H2 - 1 to 9 inches: fine sandy loam
H3 - 9 to 24 inches: fine sandy loam
H4 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Melrose

Percent of map unit: 10 percent

Shaker

Percent of map unit: 5 percent
Landform: Depressions

725A—Shaker fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vkhx
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Shaker and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shaker

Setting

Landform: Depressions, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave

Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over hard clayey lacustrine deposits and/or firm clayey marine deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 31 inches: sandy loam
H3 - 31 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Minor Components

Whately variant

Percent of map unit: 10 percent
Landform: Depressions

Elmridge

Percent of map unit: 5 percent

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Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 1**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	0.4813295	92	44.2823
Commercial - Soil Type C	0.2013695	94	18.9287
Commercial - Soil Type D	0.7687470	95	73.0310
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	59.7666670	55	3287.1667
Forest - Soil Type C	4.5745470	70	320.2183
Forest - Soil Type D	22.3574500	77	1721.5237
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	3.3827060	88	297.6781
Industrial - Soil Type C	1.5265560	91	138.9166
Industrial - Soil Type D	0.1003350	93	9.3312
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.1823675	61	11.1244
Open Space - Soil Type C	0.1823675	74	13.4952
Open Space - Soil Type D	0.0000000	80	0.0000
Open Water	0.7380440	98	72.3283
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	21.2265220	68	1443.4035
Residential - Soil Type C	3.0271120	79	239.1418
Residential - Soil Type D	5.8960520	84	495.2684
	124.4121720		8185.8382

Weighted CN: 66

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.16	22.2

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.11	5.35	610	1.9
Segment C - D	unpaved	0.02	2.28	230	1.7
Segment D - E	unpaved	0.15	6.25	210	0.6
Segment E - F	unpaved	0.01	1.61	620	6.4

Total Tc = 32.7 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **Area 2**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	0.0295055	92	2.7145
Commercial - Soil Type C	0.0295055	94	2.7735
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	78.5247715	55	4318.8624
Forest - Soil Type C	1.0337415	70	72.3619
Forest - Soil Type D	39.3928500	77	3033.2495
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	6.6709650	88	587.0449
Industrial - Soil Type C	5.1479850	91	468.4666
Industrial - Soil Type D	3.2584850	93	303.0391
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.3073545	61	18.7486
Open Space - Soil Type C	0.0123755	74	0.9158
Open Space - Soil Type D	0.0000000	80	0.0000
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	2.1432190	68	145.7389
Residential - Soil Type C	0.2189090	79	17.2938
Residential - Soil Type D	0.3870230	84	32.5099
	137.1566900		9003.7195

Weighted CN: 66

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.06	32.8

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.055	3.78	290	1.3
Segment C - D	unpaved	0.01	1.61	3990	41.2

Total Tc = 75.3 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name:	**Sawmill Brook Watershed Analysis**
Project Number:	**M-1476-3-4**
Project Location:	**Manchester-by-the-Sea, MA**
Description:	**Existing Conditions CN & Tc Calculations**
Prepared By: **CRD**	Date: **September 8, 2015**

Designation: **Area 3**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	0.0000000	92	0.0000
Commercial - Soil Type C	0.0000000	94	0.0000
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	91.2347725	55	5017.9125
Forest - Soil Type C	0.4559385	70	31.9157
Forest - Soil Type D	25.7968300	77	1986.3559
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	0.0000000	88	0.0000
Industrial - Soil Type C	0.0000000	91	0.0000
Industrial - Soil Type D	0.4411070	93	41.0230
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.7374990	61	44.9874
Open Space - Soil Type C	0.0000000	74	0.0000
Open Space - Soil Type D	2.3157050	80	185.2564
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	0.0000000	68	0.0000
Residential - Soil Type C	0.0000000	79	0.0000
Residential - Soil Type D	0.0000000	84	0.0000
	120.9818520		7307.4509

Weighted CN: **60**

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.12	24.9

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.18	6.85	365	0.9
Segment C - D	unpaved	0.02	2.28	2150	15.7
Segment D - E	unpaved	0.01	1.61	1660	17.1

Total Tc = 58.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 4**
Location:

Cover Type	Area, ac	CN	A x CN
Cultivated Land - Soil Type A	0.0000000	72	0.0000
Cultivated Land - Soil Type B	0.2832580	81	22.9439
Cultivated Land - Soil Type C	0.0000000	88	0.0000
Cultivated Land - Soil Type D	0.0000000	91	0.0000
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	0.2121410	92	19.5170
Commercial - Soil Type C	0.0000000	94	0.0000
Commercial - Soil Type D	0.3709880	95	35.2439
Forest - Soil Type A	1.9701730	25	49.2543
Forest - Soil Type B	66.3823440	55	3651.0289
Forest - Soil Type C	7.9728160	70	558.0971
Forest - Soil Type D	6.7207360	77	517.4967
Industrial - Soil Type A	0.1547980	81	12.5386
Industrial - Soil Type B	0.8209655	88	72.2450
Industrial - Soil Type C	0.7870605	91	71.6225
Industrial - Soil Type D	0.0000000	93	0.0000
Open Space - Soil Type A	1.0156190	39	39.6091
Open Space - Soil Type B	2.1298345	61	129.9199
Open Space - Soil Type C	1.8269695	74	135.1957
Open Space - Soil Type D	0.0000000	80	0.0000
Open Water	0.0160190	98	1.5699
Residential - Soil Type A	2.1383920	51	109.0580
Residential - Soil Type B	53.2291420	68	3619.5817
Residential - Soil Type C	2.8236280	79	223.0666
Residential - Soil Type D	3.7732600	84	316.9538
	152.6281440		9584.9426

Weighted CN: **63**

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.07	30.9

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.12	5.59	365	1.1
Segment C - D	unpaved	0.01	1.61	3390	35.0

Total Tc = 67.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name:	**Sawmill Brook Watershed Analysis**
Project Number:	**M-1476-3-4**
Project Location:	**Manchester-by-the-Sea, MA**
Description:	**Existing Conditions CN & Tc Calculations**
Prepared By: **CRD**	Date: **September 8, 2015**

Designation: **Area 5**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	4.5807180	92	421.4261
Commercial - Soil Type C	0.0000000	94	0.0000
Commercial - Soil Type D	0.4414000	95	41.9330
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	400.1507000	55	22008.2885
Forest - Soil Type C	7.0185110	70	491.2958
Forest - Soil Type D	158.6166000	77	12213.4782
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	2.7357220	88	240.7435
Industrial - Soil Type C	0.0000000	91	0.0000
Industrial - Soil Type D	0.0000000	93	0.0000
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	5.1837990	61	316.2117
Open Space - Soil Type C	0.0546360	74	4.0431
Open Space - Soil Type D	5.0924340	80	407.3947
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	0.8820270	68	59.9778
Residential - Soil Type C	0.0000000	79	0.0000
Residential - Soil Type D	0.7779140	84	65.3448
	585.5344610		36270.1372

Weighted CN: 62

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.1	26.8

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.11	5.35	340	1.1
Segment C - D	unpaved	0.023	2.45	2840	19.3
Segment D - E	unpaved	0.005	1.14	4300	62.8

Total Tc = 110.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 6**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	77.1055250	55	4240.8039
Forest - Soil Type C	31.6154950	70	2213.0847
Forest - Soil Type D	79.9118000	77	6153.2086
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	4.7944175	88	421.9087
Industrial - Soil Type C	2.9058525	91	264.4326
Industrial - Soil Type D	5.7669230	93	536.3238
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.7483435	61	45.6490
Open Space - Soil Type C	0.2092595	74	15.4852
Open Space - Soil Type D	0.0771170	80	6.1694
Open Water	1.5568290	98	152.5692
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	11.6022500	68	788.9530
Residential - Soil Type C	1.1815200	79	93.3401
Residential - Soil Type D	4.9056750	84	412.0767
	222.3810070		15344.0048

Weighted CN: 69

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.15	22.7

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.1	5.10	620	2.0
Segment C - D	unpaved	0.004	1.02	4890	79.9

Total Tc = 104.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond Consulting Engineers Environmental Specialists	
Project Name:	Sawmill Brook Watershed Analysis
Project Number:	M-1476-3-4
Project Location:	Manchester-by-the-Sea, MA
Description:	Existing Conditions CN & Tc Calculations
Prepared By: CRD	Date: September 8, 2015

Designation: **Area 7**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	7.6448645	92	703.3275
Commercial - Soil Type C	1.5274255	94	143.5780
Commercial - Soil Type D	0.1847730	95	17.5534
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	82.2797180	55	4525.3845
Forest - Soil Type C	22.0388780	70	1542.7215
Forest - Soil Type D	54.5009900	77	4196.5762
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	7.4969680	88	659.7332
Industrial - Soil Type C	3.2601710	91	296.6756
Industrial - Soil Type D	0.4708370	93	43.7878
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.7639410	61	46.6004
Open Space - Soil Type C	0.0000000	74	0.0000
Open Space - Soil Type D	5.8189200	80	465.5136
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	8.3506505	68	567.8442
Residential - Soil Type C	3.9453645	79	311.6838
Residential - Soil Type D	0.7794350	84	65.4725
	199.0629360		13586.4523

Weighted CN: 68

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.3	17.2

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.06	3.95	1290	5.4
Segment C - D	unpaved	0.005	1.14	1211	17.7
Segment D - E	unpaved	0.01	1.61	841	8.7

Total Tc = 49.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 8**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0030000	89	0.2670
Commercial - Soil Type B	0.8806055	92	81.0157
Commercial - Soil Type C	0.1805565	94	16.9723
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	1.3140500	25	32.8513
Forest - Soil Type B	24.5143300	55	1348.2882
Forest - Soil Type C	16.4080900	70	1148.5663
Forest - Soil Type D	0.0396170	77	3.0505
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	7.8476305	88	690.5915
Industrial - Soil Type C	6.2926515	91	572.6313
Industrial - Soil Type D	0.1354370	93	12.5956
Open Space - Soil Type A	1.1303490	39	44.0836
Open Space - Soil Type B	0.0010770	61	0.0657
Open Space - Soil Type C	0.0000000	74	0.0000
Open Space - Soil Type D	0.0000000	80	0.0000
Residential - Soil Type A	2.6127490	51	133.2502
Residential - Soil Type B	5.6295575	68	382.8099
Residential - Soil Type C	3.6306515	79	286.8215
Residential - Soil Type D	0.0000000	84	0.0000
	70.6203520		4753.8605

Weighted CN: 67

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.15	22.7

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.008	1.44	1420	16.4

Total Tc = 39.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Existing Conditions CN & Tc Calculations** Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 9**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	114.3190950	55	6287.5502
Forest - Soil Type C	11.3404050	70	793.8284
Forest - Soil Type D	23.0580800	77	1775.4722
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	0.8992280	88	79.1321
Industrial - Soil Type C	0.0000000	91	0.0000
Industrial - Soil Type D	0.0000000	93	0.0000
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.5846950	61	35.6664
Open Space - Soil Type C	0.8978510	74	66.4410
Open Space - Soil Type D	2.0889870	80	167.1190
	153.1883410		9205.2091

Weighted CN: 60

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.15	22.7

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.1	5.10	530	1.7
Segment C - D	unpaved	0.008	1.44	3540	40.9

Total Tc = 65.4 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
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Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 10**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	49.0138700	55	2695.7629
Forest - Soil Type C	9.5524960	70	668.6747
Forest - Soil Type D	12.5813700	77	968.7655
	71.1477360		4333.2031

Weighted CN: 61

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.12	24.9

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.02	2.28	2254	16.5

Total Tc = 41.3 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name:	**Sawmill Brook Watershed Analysis**
Project Number:	**M-1476-3-4**
Project Location:	**Manchester-by-the-Sea, MA**
Description:	**Existing Conditions CN & Tc Calculations**
Prepared By:	**CRD** Date: **September 8, 2015**

Designation: **Area 11**
Location:

Cover Type	Area, ac	CN	A x CN
Cultivated Land - Soil Type A	0.0000000	72	0.0000
Cultivated Land - Soil Type B	0.0685500	81	5.5526
Cultivated Land - Soil Type C	0.0685500	88	6.0324
Cultivated Land - Soil Type D	0.8803650	91	80.1132
Forest - Soil Type A	2.6996860	25	67.4922
Forest - Soil Type B	91.1689330	55	5014.2913
Forest - Soil Type C	63.1804330	70	4422.6303
Forest - Soil Type D	16.5103600	77	1271.2977
Open Space - Soil Type A	0.6526330	39	25.4527
Open Space - Soil Type B	0.9131650	61	55.7031
Open Space - Soil Type C	1.6288510	74	120.5350
Open Space - Soil Type D	0.5415190	80	43.3215
Open Water	0.2306420	98	22.6029
Residential - Soil Type A	2.4906710	51	127.0242
Residential - Soil Type B	4.3719895	68	297.2953
Residential - Soil Type C	8.4222135	79	665.3549
Residential - Soil Type D	1.5005030	84	126.0423
	195.3290640		12350.7414

Weighted CN: 63

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.05	35.3

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.07	4.27	840	3.3
Segment C - D	unpaved	0.01	1.61	4120	42.6

Total Tc = 81.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 12**
Location:

Cover Type	Area, ac	CN	A x CN
Cultivated Land - Soil Type A	0.6340950	72	45.6548
Cultivated Land - Soil Type B	0.0069025	81	0.5591
Cultivated Land - Soil Type C	0.2796655	88	24.6106
Cultivated Land - Soil Type D	0.1347230	91	12.2598
Forest - Soil Type A	2.6848930	25	67.1223
Forest - Soil Type B	6.1097505	55	336.0363
Forest - Soil Type C	10.8562465	70	759.9373
Forest - Soil Type D	4.3346270	77	333.7663
Open Water	2.5482710	98	249.7306
Residential - Soil Type A	1.5636160	51	79.7444
Residential - Soil Type B	1.0276765	68	69.8820
Residential - Soil Type C	4.7672715	79	376.6144
Residential - Soil Type D	0.1794950	84	15.0776
	35.1272330		2370.9954

Weighted CN: 67

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.086	28.4

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.056	3.82	920	4.0
Segment C - D	unpaved	0.012	1.77	1290	12.2

Total Tc = 44.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **Area 13**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	15.0106400	55	825.5852
Forest - Soil Type C	16.3488900	70	1144.4223
Forest - Soil Type D	0.6096530	77	46.9433
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	1.6537130	88	145.5267
Industrial - Soil Type C	2.7249300	91	247.9686
Industrial - Soil Type D	0.2542820	93	23.6482
	36.6021080		2434.0944

Weighted CN: 67

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.053	34.5

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.11	5.35	700	2.2
Segment C - D	unpaved	0.01	1.61	2595	26.8

Total Tc = 63.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 14**
Location:

Cover Type	Area, ac	CN	A x CN
Cultivated Land - Soil Type A	0.0610400	72	4.3949
Cultivated Land - Soil Type B	0.0000000	81	0.0000
Cultivated Land - Soil Type C	0.1430460	88	12.5880
Cultivated Land - Soil Type D	0.0000000	91	0.0000
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	0.7424845	92	68.3086
Commercial - Soil Type C	0.6956585	94	65.3919
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	4.3478540	25	108.6964
Forest - Soil Type B	64.2755335	55	3535.1543
Forest - Soil Type C	35.1635835	70	2461.4508
Forest - Soil Type D	43.7558400	77	3369.1997
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	7.6404400	88	672.3587
Industrial - Soil Type C	13.8440500	91	1259.8086
Industrial - Soil Type D	0.8397800	93	78.0995
Open Space - Soil Type A	2.5349470	39	98.8629
Open Space - Soil Type B	5.6881740	61	346.9786
Open Space - Soil Type C	3.3474700	74	247.7128
Open Space - Soil Type D	0.5405180	80	43.2414
Residential - Soil Type A	0.4185010	51	21.3436
Residential - Soil Type B	2.8704970	68	195.1938
Residential - Soil Type C	1.4716380	79	116.2594
Residential - Soil Type D	0.8012590	84	67.3058
	189.1823140		12772.3497

Weighted CN: 68

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.086	28.4

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.11	5.35	825	2.6
Segment C - D	unpaved	0.01	1.61	3590	37.1
Segment E - F	unpaved	0.015	1.98	1900	16.0

Total Tc = 84.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 15**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	1.1053290	89	98.3743
Commercial - Soil Type B	2.7624160	92	254.1423
Commercial - Soil Type C	3.6066940	94	339.0292
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	1.4780120	25	36.9503
Forest - Soil Type B	7.0487515	55	387.6813
Forest - Soil Type C	11.6029625	70	812.2074
Forest - Soil Type D	0.0000000	77	0.0000
Open Space - Soil Type A	6.2413210	39	243.4115
Open Space - Soil Type B	4.3844480	61	267.4513
Open Space - Soil Type C	12.2569380	74	907.0134
Open Space - Soil Type D	0.0000000	80	0.0000
Open Water	0.7575120	98	74.2362
Residential - Soil Type A	2.8504210	51	145.3715
Residential - Soil Type B	1.2505335	68	85.0363
Residential - Soil Type C	1.6199555	79	127.9765
Residential - Soil Type D	0.0039260	84	0.3298
	56.9692200		3779.2112

Weighted CN: 66

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.12	24.9

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.11	5.35	225	0.7
Segment C - D	unpaved	0.013	1.84	2420	21.9

Total Tc = 47.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond Consulting Engineers Environmental Specialists	
Project Name:	**Sawmill Brook Watershed Analysis**
Project Number:	**M-1476-3-4**
Project Location:	**Manchester-by-the-Sea, MA**
Description:	**Existing Conditions CN & Tc Calculations**
Prepared By: **CRD**	Date: **September 8, 2015**

Designation: **Area 16**
Location:

Cover Type	Area, ac	CN	A x CN
Cultivated Land - Soil Type A	0.0000000	72	0.0000
Cultivated Land - Soil Type B	0.0000000	81	0.0000
Cultivated Land - Soil Type C	0.0738820	88	6.5016
Cultivated Land - Soil Type D	0.0000000	91	0.0000
Commercial - Soil Type A	0.5998970	89	53.3908
Commercial - Soil Type B	6.2823150	92	577.9730
Commercial - Soil Type C	6.9572250	94	653.9792
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	1.0710070	25	26.7752
Forest - Soil Type B	25.8914065	55	1424.0274
Forest - Soil Type C	27.1233665	70	1898.6357
Forest - Soil Type D	3.3719570	77	259.6407
Open Space - Soil Type A	28.2593400	39	1102.1143
Open Space - Soil Type B	16.9178495	61	1031.9888
Open Space - Soil Type C	29.2607295	74	2165.2940
Open Space - Soil Type D	0.0000000	80	0.0000
Residential - Soil Type A	7.6001010	51	387.6052
Residential - Soil Type B	16.7912330	68	1141.8038
Residential - Soil Type C	17.5399530	79	1385.6563
Residential - Soil Type D	1.6941540	84	142.3089
	189.4344160		12257.6947

Weighted CN: 65

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.19	20.7

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.04	3.23	1395	7.2
Segment C - D	unpaved	0.005	1.14	3055	44.6

Total Tc = 72.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 17**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	58.8637300	55	3237.5052
Forest - Soil Type C	7.2655540	70	508.5888
Forest - Soil Type D	16.8892200	77	1300.4699
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	0.8738010	88	76.8945
Industrial - Soil Type C	0.0000000	91	0.0000
Industrial - Soil Type D	0.3864040	93	35.9356
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.0983860	61	6.0015
Open Space - Soil Type C	0.5108140	74	37.8002
Open Space - Soil Type D	0.2498860	80	19.9909
Open Water	2.3070120	98	226.0872
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	8.9858820	68	611.0400
Residential - Soil Type C	2.2805250	79	180.1615
Residential - Soil Type D	0.5916320	84	49.6971
	99.3028460		6290.1723

Weighted CN: 63

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.06	32.8

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.09	4.84	1150	4.0
Segment C - D	unpaved	0.01	1.61	3280	33.9

Total Tc = 70.7 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 18**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	67.5319475	55	3714.2571
Forest - Soil Type C	8.9334105	70	625.3387
Forest - Soil Type D	10.7447800	77	827.3481
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	2.3922210	88	210.5154
Industrial - Soil Type C	0.6760360	91	61.5193
Industrial - Soil Type D	1.8701820	93	173.9269
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	1.0169250	61	62.0324
Open Space - Soil Type C	0.3940770	74	29.1617
Open Space - Soil Type D	3.7764440	80	302.1155
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	12.0038800	68	816.2638
Residential - Soil Type C	0.0974100	79	7.6954
Residential - Soil Type D	0.2069950	84	17.3876
	109.6443080		6847.5620

Weighted CN: 62

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.09	27.9

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.12	5.59	505	1.5
Segment C - D	unpaved	0.011	1.69	4615	45.5

Total Tc = 74.9 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 19**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	56.7524920	55	3121.3871
Forest - Soil Type C	10.5942720	70	741.5990
Forest - Soil Type D	10.8942400	77	838.8565
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.9408105	61	57.3894
Open Space - Soil Type C	0.9948375	74	73.6180
Open Space - Soil Type D	6.1952120	80	495.6170
Open Water	3.8543420	98	377.7255
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	17.0980300	68	1162.6660
Residential - Soil Type C	2.7846000	79	219.9834
Residential - Soil Type D	0.3797200	84	31.8965
	110.4885560		7120.7384

Weighted CN: 64

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.1	26.8

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.064	4.08	1190	4.9
Segment C - D	unpaved	0.013	1.84	1430	13.0

Total Tc = 44.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 20**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	0.5878800	92	54.0850
Commercial - Soil Type C	0.8112100	94	76.2537
Commercial - Soil Type D	0.0089780	95	0.8529
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	6.0729415	55	334.0118
Forest - Soil Type C	4.2213490	70	295.4944
Forest - Soil Type D	7.7075540	77	593.4817
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	0.4432680	88	39.0076
Industrial - Soil Type C	0.3894590	91	35.4408
Industrial - Soil Type D	1.6570170	93	154.1026
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.0000000	61	0.0000
Open Space - Soil Type C	0.0000000	74	0.0000
Open Space - Soil Type D	0.0003650	80	0.0292
Open Water	0.3600720	98	35.2871
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	1.8431930	68	125.3371
Residential - Soil Type C	8.6666330	79	684.6640
Residential - Soil Type D	3.5837980	84	301.0390
	36.3537175		2729.0868

Weighted CN: 75

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.13	24.1

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.07	4.27	470	1.8
Segment C - D	unpaved	0.005	1.14	2085	30.5

Total Tc = 56.4 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Existing Conditions CN & Tc Calculations** Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 21**
Location:

Cover Type	Area, ac	CN	A x CN
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	30.9244700	55	1700.8459
Forest - Soil Type C	7.7738120	70	544.1668
Forest - Soil Type D	17.5871800	77	1354.2129
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.2626280	61	16.0203
Open Space - Soil Type C	0.1036110	74	7.6672
Open Space - Soil Type D	1.6182250	80	129.4580
Open Water	0.5985200	98	58.6550
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	14.9731800	68	1018.1762
Residential - Soil Type C	0.1875550	79	14.8168
Residential - Soil Type D	0.4614880	84	38.7650
	74.4906690		4882.7841

Weighted CN: 66

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.19	20.7

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.015	1.98	2355	19.9

Total Tc = 40.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond Consulting Engineers Environmental Specialists	
Project Name:	Sawmill Brook Watershed Analysis
Project Number:	M-1476-3-4
Project Location:	Manchester-by-the-Sea, MA
Description:	Existing Conditions CN & Tc Calculations
Prepared By:	CRD Date: September 8, 2015

Designation: **Area 22**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	0.0000000	89	0.0000
Commercial - Soil Type B	1.6856195	92	155.0770
Commercial - Soil Type C	4.4715885	94	420.3293
Commercial - Soil Type D	1.0450260	95	99.2775
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	11.5052245	55	632.7873
Forest - Soil Type C	8.3242075	70	582.6945
Forest - Soil Type D	5.8662210	77	451.6990
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	1.6990270	61	103.6406
Open Space - Soil Type C	8.0298160	74	594.2064
Open Space - Soil Type D	0.0000000	80	0.0000
Open Water	0.2445050	98	23.9615
Residential - Soil Type A	0.0000000	51	0.0000
Residential - Soil Type B	5.1140770	68	347.7572
Residential - Soil Type C	20.2266740	79	1597.9072
Residential - Soil Type D	1.3563090	84	113.9300
	69.5682950		5123.2676

Weighted CN: 74

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.2	20.3

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.01	1.61	2640	27.3

Total Tc = 47.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Sawmill Brook Watershed Analysis**
Project Number: **M-1476-3-4**
Project Location: **Manchester-by-the-Sea, MA**
Description: **Existing Conditions CN & Tc Calculations**
Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 23**
Location:

Cover Type	Area, ac	CN	A x CN
Cultivated Land - Soil Type A	0.0000000	72	0.0000
Cultivated Land - Soil Type B	0.1615515	81	13.0857
Cultivated Land - Soil Type C	1.1720855	88	103.1435
Cultivated Land - Soil Type D	0.0000000	91	0.0000
Commercial - Soil Type A	1.0393830	89	92.5051
Commercial - Soil Type B	6.1427160	92	565.1299
Commercial - Soil Type C	14.1682360	94	1331.8142
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	1.1550670	25	28.8767
Forest - Soil Type B	31.1801290	55	1714.9071
Forest - Soil Type C	8.2102310	70	574.7162
Forest - Soil Type D	0.0000000	77	0.0000
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	0.0000000	88	0.0000
Industrial - Soil Type C	2.2760550	91	207.1210
Industrial - Soil Type D	0.0000000	93	0.0000
Open Space - Soil Type A	1.2117320	39	47.2575
Open Space - Soil Type B	0.0000000	61	0.0000
Open Space - Soil Type C	0.1933880	74	14.3107
Open Space - Soil Type D	0.0000000	80	0.0000
Open Water	1.9125480	98	187.4297
Residential - Soil Type A	17.9797300	51	916.9662
Residential - Soil Type B	21.4814870	68	1460.7411
Residential - Soil Type C	38.9467670	79	3076.7946
Residential - Soil Type D	0.0000000	84	0.0000
	147.2311060		10218.5700

Weighted CN: **69**

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.013	60.5

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.017	2.10	2970	23.5

Total Tc = 84.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Existing Conditions CN & Tc Calculations** Prepared By: **CRD** Date: **September 8, 2015**

Designation: **Area 24**
Location:

Cover Type	Area, ac	CN	A x CN
Commercial - Soil Type A	1.9172210	89	170.6327
Commercial - Soil Type B	4.5329700	92	417.0332
Commercial - Soil Type C	5.4558450	94	512.8494
Commercial - Soil Type D	0.0000000	95	0.0000
Forest - Soil Type A	0.0000000	25	0.0000
Forest - Soil Type B	26.7715400	55	1472.4347
Forest - Soil Type C	0.1550690	70	10.8548
Forest - Soil Type D	3.0804360	77	237.1936
Industrial - Soil Type A	0.0000000	81	0.0000
Industrial - Soil Type B	2.2327755	88	196.4842
Industrial - Soil Type C	2.2327755	91	203.1826
Industrial - Soil Type D	0.0000000	93	0.0000
Open Space - Soil Type A	0.0000000	39	0.0000
Open Space - Soil Type B	0.0024505	61	0.1495
Open Space - Soil Type C	0.3150935	74	23.3169
Open Space - Soil Type D	0.0000000	80	0.0000
Open Water	8.1189770	98	795.6597
Residential - Soil Type A	0.5921410	51	30.1992
Residential - Soil Type B	20.2509870	68	1377.0671
Residential - Soil Type C	11.8766070	79	938.2520
Residential - Soil Type D	0.0000000	84	0.0000
	87.5348880		6385.3097

Weighted CN: 73

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	300	0.06	32.8

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.165	6.55	230	0.6
Segment C - D	unpaved	0.017	2.10	3465	27.5

Total Tc = 60.9 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Appendix A-3
Saw Mill Brook Culvert Summary

Culvert #	Stream	Street	Inlet Dimensions (ft)		Inlet Elevation	Doucet Inlet Elevation	Doucet Road Centerline	Top of Road	Outlet Dimensions (ft)		Outlet Elevation	Doucet Outlet Elevation	Top of Road	Length (ft)	# of Crossings	Culvert Type	Culvert	
			Width	Height					Width	Height							Material	Condition
2	Cedar Swamp	School Street	2.67	2.67	40.20	***39.20***	***44.90***	45.80	3.33	2.83	39.10	***39.30***	45.80	45.00	3	box culvert	Dry Stone	old
2a	Cedar Swamp	School Street	1.50	1.50	41.40	***40.00***	***44.70***	45.40	1.50	1.50	41.10	***40..7***	45.40			round culvert	clay pipie	
2b	Cedar Swamp	School Street	3.00	2.58	40.80	***39.50***	***39.10***	44.90	3.00	3.33	40.40	***39.10***	45.00			dry stone culvert box		
3	Sawmill Brook	School Street	15.35	6.58	40.10	***38.40***	***48.10***	50.10	15.35	6.58	40.20	***38.40***	48.90	58.00	1	open bottom arch	Metal	new
4	Sawmill Brook	Atwater Avenue	14.70	8.30		***37.70***	***48.10***		14.70	8.30		***37.70***		42.00	1	open bottom arch	Metal	old
5	Sawmill Brook	Conservation Winchester Drive	9.00	5.58	40.10			47.10	9.00	5.67	39.80		47.10	38.00	1	open bottom arch	Metal	rusted
6	Sawmill Brook	School Street	1.10	1.10	N/A			N/A	1.10	1.10	N/A		N/A	28.00	1	round culvert	Concrete	new
7	Cat Brook	Forrest Road	11.60	2.90	43.60			48.20	11.60	2.90	43.90		48.50	20.20	1	open bottom arch	Stone	old- collapsing
8	Cat Brook	Load Place	2.00	2.00	44.30			47.90	2.00	2.00	44.30		47.30	30.70	3	round culvert	Plastic	new
9	Sawmill Brook	Pine Street	2.92	2.92	N/A			N/A	2.92	2.92	N/A		N/A	42.00	2	round culvert	Metal	old
10	Sawmill Brook	Rockwood Heights	1.83	1.58	N/A				1.83	1.25	N/A		N/A	25.00	2	embedded round culvert	concrete/stone	old
11	Cat Brook	Mill Street	12.50	3.70	33.50			40.40	12.00	5.58	31.70		40.50	20.10	1	open bottom arch	concrete	
12	Sawmill Brook	Millet Lane	5.00	5.00	46.50			49.30	2.50	2.50	46.30		52.20	35.00	1	round culvert	Concrete/metal	rusty outlet
13	Sawmill Brook	The Plains	5.00	2.00	45.80			51.20	5.00	2.75	45.00		51.80	40.00	1	open bottom arch (actually round)	Concrete	new
15	Sawmill Brook	Blue Heron Lane	2.50	2.50	N/A			N/A	2.50	2.50	N/A		N/A	28.00	1	open bottom arch	concrete	new
16	Sawmill Brook	Golf Course	12.00	9.42	11.50			21.60	11.50	9.58	11.40		21.60	20.00	*1*	*open bottom box culvert*	*stone*	
17	Sawmill Brook	Lincoln Street	12.00	6.00		***8.70***	***17.30***		12.00	6.00		***8.60***		50.00	1	open bottom arch	stone	good

Table 2-1
Saw Mill Brook Culvert Summary

Culvert #	Stream	Street	Inlet Dimensions (ft)		Inlet Elevation	Doucet Inlet Elevation	Doucet Road Centerline	Top of Road	Outlet Dimensions (ft)		Outlet Elevation	Doucet Outlet Elevation	Top of Road	Length (ft)	# of Crossings	Culvert Type	Culvert	
			Width	Height					Width	Height							Material	Condition
18	Causeway Brook	Lincoln Street	14.50	3.67		***8.20***	***16.30***		13.00	3.67		***8.20***		60.00	1	open bottom arch	stone	old but good
19	Causeway Brook	School Street- Golf	8.33	4.50		***9.00***	***15.60***		7.75	4.08		***8.90***		41.25	1	open bottom arch	metal	old but good
20	Causeway Brook	Summer Street	8.17	4.25		***10.70***	***17.90***		10.25	4.92		***10.70***		15.00	1	open bottom arch	metal	old
21	Causeway Brook	Summer Street	5.42	3.10	N/A			N/A	5.42	3.10	N/A		N/A	59.25	1	box culvert	concrete	old
22	Sawmill Brook	Norwood Avenue	14.25	5.50		***7.50***	***16.00***		13.00	5.42		***7.50***		42.00	1	bridge with abutments	metal/stone	old
23	Sawmill Brook	School Street	8.76	4.67		***3.60***	***13.10***		8.92	4.83		***3.10***		36.00	2	open bottom arch	concrete/stone	old
24	Causeway Brook	Summer Street	3.58	2.10	N/A			N/A	1.58	1.58	N/A		N/A	60.15	1	upstream bridge with abutments, dowstream round culvert	concrete/plastic	old- rusted
25	Sawmill Brook	Central Street	16.00	6.67		***-0.04***	***10.60***		14.00	8.25		***-4.00***		42.00	1	open bottom arch	stone	old collapsing
26	Sawmill Brook	MassDOT Mill Street	14.70	8.10		***17.80***			14.70	8.10		***17.50***			1	bridge with abutments	concrete	old
27	Sawmill Brook	Mill Street	7.10	7.10		***16.20***	***24.40***		6.80	6.80		***15.60***		47.00	1	round culvert	metal	old
30	Sawmill Brook	MassDOT Rte 128	14.00	6.50	26.1			44.6	14	6.5	18.3		45,5	60	1	box culvert	concrete	
36	Sawmill Brook	Mass DOT Rte 128 ramp	14.00	8.00	31.4			53.8	14	8	31.4		51.6	60	1	box culvert	concrete	

Notes:
July 2015 Survey completed by Doucet Survey Associates. Horizontal datum reference NAD83/2011 Massachusetts State Plane, Verticle Datum NAVD88.
August 24, 20017 Survey completed by Corcoran Associates, Inc. Horizantal Reference NAD 83 (FT), Vertical Datum NGVD 29 (FT)
Reminder of information results of May 30, 2015, volunteer data collection in Manchester-by-the-Sea

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 — Friday, 10 / 2 / 2015

Pond No. 1 - Pond 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 56.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	56.00	23,500	0	0
2.00	58.00	148,330	153,898	153,898
4.00	60.00	247,610	391,685	545,583

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 35.16	0.00	0.00	0.00
Span (in)	= 35.16	0.00	0.00	0.00
No. Barrels	= 2	0	0	0
Invert El. (ft)	= 56.00	0.00	0.00	0.00
Length (ft)	= 40.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	56.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.20	15,390	56.20	0.61 ic	---	---	---	---	---	---	---	---	---	0.611
0.40	30,780	56.40	2.38 ic	---	---	---	---	---	---	---	---	---	2.384
0.60	46,169	56.60	5.24 ic	---	---	---	---	---	---	---	---	---	5.240
0.80	61,559	56.80	9.12 ic	---	---	---	---	---	---	---	---	---	9.118
1.00	76,949	57.00	13.86 ic	---	---	---	---	---	---	---	---	---	13.86
1.20	92,339	57.20	19.43 ic	---	---	---	---	---	---	---	---	---	19.43
1.40	107,729	57.40	25.64 ic	---	---	---	---	---	---	---	---	---	25.64
1.60	123,119	57.60	32.45 ic	---	---	---	---	---	---	---	---	---	32.45
1.80	138,508	57.80	39.70 ic	---	---	---	---	---	---	---	---	---	39.70
2.00	153,898	58.00	47.22 ic	---	---	---	---	---	---	---	---	---	47.22
2.20	193,067	58.20	54.87 ic	---	---	---	---	---	---	---	---	---	54.87
2.40	232,235	58.40	62.37 ic	---	---	---	---	---	---	---	---	---	62.37
2.60	271,404	58.60	68.99 oc	---	---	---	---	---	---	---	---	---	68.99
2.80	310,572	58.80	72.03 oc	---	---	---	---	---	---	---	---	---	72.03
3.00	349,740	59.00	75.30 oc	---	---	---	---	---	---	---	---	---	75.30
3.20	388,909	59.20	83.50 oc	---	---	---	---	---	---	---	---	---	83.50
3.40	428,077	59.40	90.31 ic	---	---	---	---	---	---	---	---	---	90.31
3.60	467,246	59.60	94.86 ic	---	---	---	---	---	---	---	---	---	94.86
3.80	506,414	59.80	99.21 ic	---	---	---	---	---	---	---	---	---	99.21
4.00	545,583	60.00	103.37 ic	---	---	---	---	---	---	---	---	---	103.37

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Friday, 10 / 9 / 2015

Pond No. 2 - Pond 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 38.40 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	38.40	00	0	0
3.60	42.00	890,820	1,068,877	1,068,877
5.60	44.00	3,846,995	4,392,245	5,461,122
7.60	46.00	4,733,124	8,563,968	14,025,090
9.60	48.00	5,262,020	9,989,478	24,014,568
11.60	50.00	5,717,121	10,974,896	34,989,464
13.60	52.00	6,237,440	11,949,588	46,939,052

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 78.96	0.00	0.00	0.00
Span (in)	= 184.20	0.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 38.40	0.00	0.00	0.00
Length (ft)	= 58.00	0.00	0.00	0.00
Slope (%)	= 0.10	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 150.00	0.00	0.00	0.00
Crest El. (ft)	= 50.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	38.40	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.36	106,888	38.76	6.53 oc	---	---	---	0.00	---	---	---	---	---	6.529
0.72	213,775	39.12	15.12 oc	---	---	---	0.00	---	---	---	---	---	15.12
1.08	320,663	39.48	23.84 oc	---	---	---	0.00	---	---	---	---	---	23.84
1.44	427,551	39.84	32.57 oc	---	---	---	0.00	---	---	---	---	---	32.57
1.80	534,439	40.20	41.29 oc	---	---	---	0.00	---	---	---	---	---	41.29
2.16	641,326	40.56	50.01 oc	---	---	---	0.00	---	---	---	---	---	50.01
2.52	748,214	40.92	58.71 oc	---	---	---	0.00	---	---	---	---	---	58.71
2.88	855,102	41.28	67.41 oc	---	---	---	0.00	---	---	---	---	---	67.41
3.24	961,989	41.64	76.11 oc	---	---	---	0.00	---	---	---	---	---	76.11
3.60	1,068,877	42.00	84.80 oc	---	---	---	0.00	---	---	---	---	---	84.80
3.80	1,508,102	42.20	89.62 oc	---	---	---	0.00	---	---	---	---	---	89.62
4.00	1,947,326	42.40	94.45 oc	---	---	---	0.00	---	---	---	---	---	94.45
4.20	2,386,551	42.60	99.27 oc	---	---	---	0.00	---	---	---	---	---	99.27
4.40	2,825,775	42.80	104.10 oc	---	---	---	0.00	---	---	---	---	---	104.10
4.60	3,265,000	43.00	108.92 oc	---	---	---	0.00	---	---	---	---	---	108.92
4.80	3,704,224	43.20	113.74 oc	---	---	---	0.00	---	---	---	---	---	113.74
5.00	4,143,449	43.40	118.56 oc	---	---	---	0.00	---	---	---	---	---	118.56
5.20	4,582,673	43.60	123.39 oc	---	---	---	0.00	---	---	---	---	---	123.39
5.40	5,021,898	43.80	128.21 oc	---	---	---	0.00	---	---	---	---	---	128.21
5.60	5,461,122	44.00	133.03 oc	---	---	---	0.00	---	---	---	---	---	133.03
5.80	6,317,519	44.20	137.85 oc	---	---	---	0.00	---	---	---	---	---	137.85
6.00	7,173,916	44.40	142.67 oc	---	---	---	0.00	---	---	---	---	---	142.67
6.20	8,030,313	44.60	147.49 oc	---	---	---	0.00	---	---	---	---	---	147.49
6.40	8,886,709	44.80	152.31 oc	---	---	---	0.00	---	---	---	---	---	152.31
6.60	9,743,106	45.00	179.32 oc	---	---	---	0.00	---	---	---	---	---	179.32
6.80	10,599,503	45.20	338.53 oc	---	---	---	0.00	---	---	---	---	---	338.53
7.00	11,455,900	45.40	443.90 oc	---	---	---	0.00	---	---	---	---	---	443.90
7.20	12,312,297	45.60	528.67 oc	---	---	---	0.00	---	---	---	---	---	528.67
7.40	13,168,694	45.80	601.61 oc	---	---	---	0.00	---	---	---	---	---	601.61
7.60	14,025,090	46.00	666.62 oc	---	---	---	0.00	---	---	---	---	---	666.62
7.80	15,024,038	46.20	725.83 oc	---	---	---	0.00	---	---	---	---	---	725.83
8.00	16,022,986	46.40	780.56 oc	---	---	---	0.00	---	---	---	---	---	780.56
8.20	17,021,934	46.60	831.70 oc	---	---	---	0.00	---	---	---	---	---	831.70

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Pond 2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
8.40	18,020,882	46.80	879.87 oc	---	---	---	0.00	---	---	---	---	---	879.87
8.60	19,019,830	47.00	925.53 oc	---	---	---	0.00	---	---	---	---	---	925.53
8.80	20,018,778	47.20	969.05 oc	---	---	---	0.00	---	---	---	---	---	969.05
9.00	21,017,726	47.40	1010.70 oc	---	---	---	0.00	---	---	---	---	---	1010.70
9.20	22,016,674	47.60	1050.69 oc	---	---	---	0.00	---	---	---	---	---	1050.69
9.40	23,015,622	47.80	1089.22 oc	---	---	---	0.00	---	---	---	---	---	1089.22
9.60	24,014,568	48.00	1126.43 oc	---	---	---	0.00	---	---	---	---	---	1126.43
9.80	25,112,058	48.20	1162.45 oc	---	---	---	0.00	---	---	---	---	---	1162.45
10.00	26,209,548	48.40	1197.39 oc	---	---	---	0.00	---	---	---	---	---	1197.39
10.20	27,307,038	48.60	1231.33 oc	---	---	---	0.00	---	---	---	---	---	1231.33
10.40	28,404,528	48.80	1264.37 oc	---	---	---	0.00	---	---	---	---	---	1264.37
10.60	29,502,018	49.00	1296.56 oc	---	---	---	0.00	---	---	---	---	---	1296.56
10.80	30,599,508	49.20	1327.97 oc	---	---	---	0.00	---	---	---	---	---	1327.97
11.00	31,696,998	49.40	1350.38 ic	---	---	---	0.00	---	---	---	---	---	1350.38
11.20	32,794,488	49.60	1367.78 ic	---	---	---	0.00	---	---	---	---	---	1367.78
11.40	33,891,976	49.80	1384.97 ic	---	---	---	0.00	---	---	---	---	---	1384.97
11.60	34,989,464	50.00	1401.94 ic	---	---	---	0.00	---	---	---	---	---	1401.94
11.80	36,184,424	50.20	1418.71 ic	---	---	---	34.88	---	---	---	---	---	1453.59
12.00	37,379,384	50.40	1435.28 ic	---	---	---	98.66	---	---	---	---	---	1533.95
12.20	38,574,344	50.60	1451.67 ic	---	---	---	181.26	---	---	---	---	---	1632.92
12.40	39,769,304	50.80	1467.87 ic	---	---	---	279.06	---	---	---	---	---	1746.93
12.60	40,964,264	51.00	1483.90 ic	---	---	---	390.00	---	---	---	---	---	1873.90
12.80	42,159,224	51.20	1499.75 ic	---	---	---	512.67	---	---	---	---	---	2012.42
13.00	43,354,184	51.40	1515.44 ic	---	---	---	646.04	---	---	---	---	---	2161.48
13.20	44,549,144	51.60	1530.97 ic	---	---	---	789.31	---	---	---	---	---	2320.27
13.40	45,744,104	51.80	1546.34 ic	---	---	---	941.84	---	---	---	---	---	2488.17
13.60	46,939,052	52.00	1561.56 ic	---	---	---	1103.09	---	---	---	---	---	2664.64

...End

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Friday, 10 / 2 / 2015

Pond No. 3 - Pond 3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 37.70 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	37.70	8,961	0	0
4.30	42.00	896,992	1,426,895	1,426,895
6.30	44.00	1,270,225	2,156,208	3,583,103
8.30	46.00	1,403,064	2,671,921	6,255,024
10.30	48.00	1,728,489	3,125,588	9,380,612

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 99.60	0.00	0.00	0.00
Span (in)	= 176.40	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 37.70	0.00	0.00	0.00
Length (ft)	= 42.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	37.70	0.00	---	---	---	---	---	---	---	---	---	0.000
0.43	142,690	38.13	14.11 ic	---	---	---	---	---	---	---	---	---	14.11
0.86	285,379	38.56	39.92 ic	---	---	---	---	---	---	---	---	---	39.92
1.29	428,068	38.99	73.33 ic	---	---	---	---	---	---	---	---	---	73.33
1.72	570,758	39.42	102.92 oc	---	---	---	---	---	---	---	---	---	102.92
2.15	713,447	39.85	129.76 oc	---	---	---	---	---	---	---	---	---	129.76
2.58	856,137	40.28	156.57 oc	---	---	---	---	---	---	---	---	---	156.57
3.01	998,826	40.71	183.36 oc	---	---	---	---	---	---	---	---	---	183.36
3.44	1,141,516	41.14	210.14 oc	---	---	---	---	---	---	---	---	---	210.14
3.87	1,284,205	41.57	236.90 oc	---	---	---	---	---	---	---	---	---	236.90
4.30	1,426,895	42.00	263.66 oc	---	---	---	---	---	---	---	---	---	263.66
4.50	1,642,516	42.20	276.10 oc	---	---	---	---	---	---	---	---	---	276.10
4.70	1,858,136	42.40	288.55 oc	---	---	---	---	---	---	---	---	---	288.55
4.90	2,073,757	42.60	300.99 oc	---	---	---	---	---	---	---	---	---	300.99
5.10	2,289,378	42.80	313.43 oc	---	---	---	---	---	---	---	---	---	313.43
5.30	2,504,999	43.00	325.87 oc	---	---	---	---	---	---	---	---	---	325.87
5.50	2,720,620	43.20	338.30 oc	---	---	---	---	---	---	---	---	---	338.30
5.70	2,936,240	43.40	350.74 oc	---	---	---	---	---	---	---	---	---	350.74
5.90	3,151,861	43.60	363.18 oc	---	---	---	---	---	---	---	---	---	363.18
6.10	3,367,482	43.80	375.61 oc	---	---	---	---	---	---	---	---	---	375.61
6.30	3,583,103	44.00	388.05 oc	---	---	---	---	---	---	---	---	---	388.05
6.50	3,850,295	44.20	400.48 oc	---	---	---	---	---	---	---	---	---	400.48
6.70	4,117,487	44.40	412.92 oc	---	---	---	---	---	---	---	---	---	412.92
6.90	4,384,679	44.60	425.35 oc	---	---	---	---	---	---	---	---	---	425.35
7.10	4,651,871	44.80	437.79 oc	---	---	---	---	---	---	---	---	---	437.79
7.30	4,919,063	45.00	450.22 oc	---	---	---	---	---	---	---	---	---	450.22
7.50	5,186,255	45.20	462.65 oc	---	---	---	---	---	---	---	---	---	462.65
7.70	5,453,447	45.40	475.08 oc	---	---	---	---	---	---	---	---	---	475.08
7.90	5,720,639	45.60	487.52 oc	---	---	---	---	---	---	---	---	---	487.52
8.10	5,987,831	45.80	499.95 oc	---	---	---	---	---	---	---	---	---	499.95
8.30	6,255,024	46.00	512.38 oc	---	---	---	---	---	---	---	---	---	512.38
8.50	6,567,583	46.20	618.01 oc	---	---	---	---	---	---	---	---	---	618.01
8.70	6,880,142	46.40	710.73 oc	---	---	---	---	---	---	---	---	---	710.73
8.90	7,192,701	46.60	792.68 oc	---	---	---	---	---	---	---	---	---	792.68
9.10	7,505,260	46.80	866.92 oc	---	---	---	---	---	---	---	---	---	866.92
9.30	7,817,819	47.00	935.28 oc	---	---	---	---	---	---	---	---	---	935.28

Continues on next page...

Pond 3

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
9.50	8,130,378	47.20	998.98 oc	---	---	---	---	---	---	---	---	---	998.98
9.70	8,442,936	47.40	1058.85 oc	---	---	---	---	---	---	---	---	---	1058.85
9.90	8,755,495	47.60	1115.52 oc	---	---	---	---	---	---	---	---	---	1115.52
10.10	9,068,054	47.80	1169.44 oc	---	---	---	---	---	---	---	---	---	1169.44
10.30	9,380,612	48.00	1220.97 oc	---	---	---	---	---	---	---	---	---	1220.97

...End

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Friday, 10 / 2 / 2015

Pond No. 4 - Pond 4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 32.80 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	32.80	00	0	0
1.20	34.00	5,000	2,000	2,000
3.20	36.00	13,887	18,145	20,145
5.20	38.00	103,621	103,618	123,762
7.20	40.00	262,510	354,005	477,767
9.20	42.00	262,510	524,967	1,002,734

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 44.40	0.00	0.00	0.00
Span (in)	= 150.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 32.80	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	32.80	0.00	---	---	---	---	---	---	---	---	---	0.000
0.12	200	32.92	1.77 ic	---	---	---	---	---	---	---	---	---	1.769
0.24	400	33.04	5.00 ic	---	---	---	---	---	---	---	---	---	5.004
0.36	600	33.16	8.26 oc	---	---	---	---	---	---	---	---	---	8.261
0.48	800	33.28	11.39 oc	---	---	---	---	---	---	---	---	---	11.39
0.60	1,000	33.40	14.52 oc	---	---	---	---	---	---	---	---	---	14.52
0.72	1,200	33.52	17.64 oc	---	---	---	---	---	---	---	---	---	17.64
0.84	1,400	33.64	20.77 oc	---	---	---	---	---	---	---	---	---	20.77
0.96	1,600	33.76	23.89 oc	---	---	---	---	---	---	---	---	---	23.89
1.08	1,800	33.88	27.00 oc	---	---	---	---	---	---	---	---	---	27.00
1.20	2,000	34.00	30.12 oc	---	---	---	---	---	---	---	---	---	30.12
1.40	3,814	34.20	35.31 oc	---	---	---	---	---	---	---	---	---	35.31
1.60	5,629	34.40	40.49 oc	---	---	---	---	---	---	---	---	---	40.49
1.80	7,443	34.60	45.67 oc	---	---	---	---	---	---	---	---	---	45.67
2.00	9,258	34.80	50.85 oc	---	---	---	---	---	---	---	---	---	50.85
2.20	11,072	35.00	56.03 oc	---	---	---	---	---	---	---	---	---	56.03
2.40	12,887	35.20	61.21 oc	---	---	---	---	---	---	---	---	---	61.21
2.60	14,701	35.40	66.38 oc	---	---	---	---	---	---	---	---	---	66.38
2.80	16,516	35.60	71.55 oc	---	---	---	---	---	---	---	---	---	71.55
3.00	18,330	35.80	76.73 oc	---	---	---	---	---	---	---	---	---	76.73
3.20	20,145	36.00	81.90 oc	---	---	---	---	---	---	---	---	---	81.90
3.40	30,506	36.20	87.07 oc	---	---	---	---	---	---	---	---	---	87.07
3.60	40,868	36.40	92.24 oc	---	---	---	---	---	---	---	---	---	92.24
3.80	51,230	36.60	132.85 oc	---	---	---	---	---	---	---	---	---	132.85
4.00	61,592	36.80	187.88 oc	---	---	---	---	---	---	---	---	---	187.88
4.20	71,953	37.00	230.10 oc	---	---	---	---	---	---	---	---	---	230.10
4.40	82,315	37.20	265.70 oc	---	---	---	---	---	---	---	---	---	265.70
4.60	92,677	37.40	297.06 oc	---	---	---	---	---	---	---	---	---	297.06
4.80	103,039	37.60	325.41 oc	---	---	---	---	---	---	---	---	---	325.41
5.00	113,400	37.80	351.49 oc	---	---	---	---	---	---	---	---	---	351.49
5.20	123,762	38.00	375.76 oc	---	---	---	---	---	---	---	---	---	375.76
5.40	159,163	38.20	398.55 oc	---	---	---	---	---	---	---	---	---	398.55
5.60	194,563	38.40	420.11 oc	---	---	---	---	---	---	---	---	---	420.11
5.80	229,964	38.60	440.61 oc	---	---	---	---	---	---	---	---	---	440.61
6.00	265,364	38.80	453.66 ic	---	---	---	---	---	---	---	---	---	453.66

Continues on next page...

Pond 4

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
6.20	300,764	39.00	464.46 ic	---	---	---	---	---	---	---	---	---	464.46
6.40	336,165	39.20	475.02 ic	---	---	---	---	---	---	---	---	---	475.02
6.60	371,565	39.40	485.35 ic	---	---	---	---	---	---	---	---	---	485.35
6.80	406,966	39.60	495.46 ic	---	---	---	---	---	---	---	---	---	495.46
7.00	442,366	39.80	505.37 ic	---	---	---	---	---	---	---	---	---	505.37
7.20	477,767	40.00	515.09 ic	---	---	---	---	---	---	---	---	---	515.09
7.40	530,263	40.20	524.63 ic	---	---	---	---	---	---	---	---	---	524.63
7.60	582,760	40.40	534.00 ic	---	---	---	---	---	---	---	---	---	534.00
7.80	635,257	40.60	543.21 ic	---	---	---	---	---	---	---	---	---	543.21
8.00	687,754	40.80	552.26 ic	---	---	---	---	---	---	---	---	---	552.26
8.20	740,250	41.00	561.17 ic	---	---	---	---	---	---	---	---	---	561.17
8.40	792,747	41.20	569.94 ic	---	---	---	---	---	---	---	---	---	569.94
8.60	845,244	41.40	578.57 ic	---	---	---	---	---	---	---	---	---	578.57
8.80	897,741	41.60	587.08 ic	---	---	---	---	---	---	---	---	---	587.08
9.00	950,237	41.80	595.47 ic	---	---	---	---	---	---	---	---	---	595.47
9.20	1,002,734	42.00	603.74 ic	---	---	---	---	---	---	---	---	---	603.74

...End

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Friday, 10 / 2 / 2015

Pond No. 5 - Pond 5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 10.70 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	10.70	00	0	0
3.30	14.00	13,888	15,275	15,275
5.30	16.00	1,450,420	1,070,717	1,085,992
7.30	18.00	2,260,770	3,680,971	4,766,963

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 51.00	0.00	0.00	0.00
Span (in)	= 98.04	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 10.70	0.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	10.70	0.00	---	---	---	---	---	---	---	---	---	0.000
0.33	1,528	11.03	5.27 ic	---	---	---	---	---	---	---	---	---	5.273
0.66	3,055	11.36	14.91 ic	---	---	---	---	---	---	---	---	---	14.91
0.99	4,583	11.69	27.40 ic	---	---	---	---	---	---	---	---	---	27.40
1.32	6,110	12.02	42.19 ic	---	---	---	---	---	---	---	---	---	42.19
1.65	7,638	12.35	58.96 ic	---	---	---	---	---	---	---	---	---	58.96
1.98	9,165	12.68	77.50 ic	---	---	---	---	---	---	---	---	---	77.50
2.31	10,693	13.01	97.66 ic	---	---	---	---	---	---	---	---	---	97.66
2.64	12,220	13.34	119.32 ic	---	---	---	---	---	---	---	---	---	119.32
2.97	13,748	13.67	142.38 ic	---	---	---	---	---	---	---	---	---	142.38
3.30	15,275	14.00	166.75 ic	---	---	---	---	---	---	---	---	---	166.75
3.50	122,347	14.20	182.14 ic	---	---	---	---	---	---	---	---	---	182.14
3.70	229,419	14.40	197.97 ic	---	---	---	---	---	---	---	---	---	197.97
3.90	336,490	14.60	214.24 ic	---	---	---	---	---	---	---	---	---	214.24
4.10	443,562	14.80	230.93 ic	---	---	---	---	---	---	---	---	---	230.93
4.30	550,634	15.00	50.09 oc	---	---	---	---	---	---	---	---	---	50.09
4.50	657,705	15.20	112.01 oc	---	---	---	---	---	---	---	---	---	112.01
4.70	764,777	15.40	150.28 oc	---	---	---	---	---	---	---	---	---	150.28
4.90	871,849	15.60	180.61 oc	---	---	---	---	---	---	---	---	---	180.61
5.10	978,920	15.80	206.54 oc	---	---	---	---	---	---	---	---	---	206.54
5.30	1,085,992	16.00	229.56 oc	---	---	---	---	---	---	---	---	---	229.56
5.50	1,454,089	16.20	250.47 oc	---	---	---	---	---	---	---	---	---	250.47
5.70	1,822,186	16.40	269.76 oc	---	---	---	---	---	---	---	---	---	269.76
5.90	2,190,283	16.60	287.77 oc	---	---	---	---	---	---	---	---	---	287.77
6.10	2,558,380	16.80	304.71 oc	---	---	---	---	---	---	---	---	---	304.71
6.30	2,926,477	17.00	320.76 oc	---	---	---	---	---	---	---	---	---	320.76
6.50	3,294,574	17.20	336.04 oc	---	---	---	---	---	---	---	---	---	336.04
6.70	3,662,671	17.40	350.65 oc	---	---	---	---	---	---	---	---	---	350.65
6.90	4,030,768	17.60	364.69 oc	---	---	---	---	---	---	---	---	---	364.69
7.10	4,398,866	17.80	372.91 ic	---	---	---	---	---	---	---	---	---	372.91
7.30	4,766,963	18.00	380.33 ic	---	---	---	---	---	---	---	---	---	380.33

APPENDIX B

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	70.772 degrees West
Latitude	42.575 degrees North
Elevation	Unknown/Unavailable
Date/Time	Sat, 19 Sep 2015 14:15:15 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min
1yr	0.27	0.41	0.51	0.67	0.84	1.06
2yr	0.33	0.51	0.64	0.84	1.06	1.34
5yr	0.39	0.61	0.77	1.03	1.32	1.69
10yr	0.44	0.69	0.88	1.19	1.55	2.00
25yr	0.52	0.83	1.05	1.45	1.92	2.51
50yr	0.58	0.93	1.20	1.68	2.27	3.00
100yr	0.67	1.08	1.39	1.97	2.68	3.56
200yr	0.75	1.23	1.60	2.29	3.17	4.24
500yr	0.91	1.49	1.95	2.82	3.95	5.32

	1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.72	0.98	1.24	1.60	2.08	2.72	3.00
2yr	0.91	1.24	1.56	1.99	2.53	3.25	3.61
5yr	1.14	1.56	1.97	2.51	3.21	4.09	4.61
10yr	1.34	1.86	2.35	3.01	3.83	4.88	5.56
25yr	1.66	2.34	2.96	3.79	4.85	6.16	7.11
50yr	1.96	2.78	3.55	4.56	5.80	7.34	8.58
100yr	2.31	3.32	4.22	5.43	6.93	8.77	10.35
200yr	2.73	3.95	5.04	6.50	8.29	10.47	12.49
500yr	3.41	4.98	6.35	8.21	10.48	13.24	16.03

	1day	2day	4day	7day	10day	
1yr	2.41	2.88	3.31	4.01	4.70	**1yr**
2yr	2.87	3.47	3.99	4.75	5.39	**2yr**
5yr	3.62	4.43	5.08	6.01	6.77	**5yr**
10yr	4.32	5.34	6.10	7.18	8.05	**10yr**
25yr	5.45	6.84	7.79	9.10	10.14	**25yr**
50yr	6.50	8.25	9.37	10.89	12.07	**50yr**
100yr	7.76	9.96	11.28	13.04	14.38	**100yr**
200yr	9.26	12.01	13.58	15.61	17.14	**200yr**
500yr	11.72	15.41	17.36	19.82	21.62	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min
1yr	0.23	0.35	0.43	0.58	0.71	0.84
2yr	0.32	0.49	0.60	0.82	1.01	1.23
5yr	0.37	0.56	0.70	0.96	1.22	1.46
10yr	0.41	0.62	0.77	1.08	1.40	1.67

	1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.62	0.82	1.04	1.43	1.83	2.42	2.65
2yr	0.87	1.20	1.41	1.85	2.37	3.13	3.47
5yr	1.06	1.43	1.66	2.15	2.76	3.72	4.20
10yr	1.21	1.64	1.88	2.41	3.09	4.25	4.83

	1day	2day	4day	7day	10day	
1yr	2.14	2.54	2.93	3.56	4.19	1yr
2yr	2.77	3.34	3.85	4.60	5.21	2yr
5yr	3.29	4.04	4.64	5.54	6.23	5yr
10yr	3.76	4.64	5.34	6.34	7.10	10yr

25yr	0.46	0.71	0.88	1.25	1.65	1.98	**25yr**	1.42	1.94	2.21	2.80	3.57	5.08	5.79	**25yr**	4.49	5.57	6.42	7.57	8.34	**25yr**
50yr	0.51	0.77	0.96	1.39	1.87	2.26	**50yr**	1.61	2.21	2.50	3.12	3.98	5.83	6.63	**50yr**	5.16	6.37	7.37	8.66	9.70	**50yr**
100yr	0.57	0.86	1.07	1.55	2.13	2.56	**100yr**	1.84	2.51	2.82	3.49	4.42	6.69	7.59	**100yr**	5.92	7.29	8.46	9.92	11.01	**100yr**
200yr	0.63	0.95	1.20	1.74	2.42	2.92	**200yr**	2.09	2.86	3.19	3.88	4.89	7.70	8.71	**200yr**	6.81	8.38	9.73	11.36	12.46	**200yr**
500yr	0.73	1.08	1.39	2.02	2.88	3.48	**500yr**	2.48	3.40	3.76	4.47	5.61	9.30	10.47	**500yr**	8.23	10.07	11.73	13.63	14.69	**500yr**

Upper Confidence Limits

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.30	0.46	0.56	0.75	0.93	1.08	**1yr**	0.80	1.06	1.34	1.72	2.21	2.99	3.35	**1yr**	2.65	3.22	3.71	4.34	5.18	**1yr**
2yr	0.35	0.54	0.67	0.90	1.11	1.33	**2yr**	0.96	1.30	1.53	2.02	2.59	3.40	3.78	**2yr**	3.01	3.63	4.17	4.98	5.63	**2yr**
5yr	0.42	0.65	0.81	1.11	1.42	1.74	**5yr**	1.22	1.70	2.00	2.65	3.39	4.49	5.04	**5yr**	3.97	4.85	5.52	6.51	7.31	**5yr**
10yr	0.51	0.78	0.96	1.35	1.74	2.14	**10yr**	1.50	2.09	2.45	3.27	4.16	5.55	6.31	**10yr**	4.91	6.07	6.87	8.04	8.97	**10yr**
25yr	0.64	0.98	1.22	1.74	2.29	2.82	**25yr**	1.98	2.76	3.22	4.33	5.48	7.34	8.52	**25yr**	6.49	8.19	9.18	10.60	11.77	**25yr**
50yr	0.77	1.17	1.46	2.09	2.82	3.49	**50yr**	2.43	3.41	3.96	5.36	6.77	9.06	10.70	**50yr**	8.01	10.29	11.43	13.08	14.18	**50yr**
100yr	0.93	1.40	1.76	2.54	3.48	4.30	**100yr**	3.00	4.20	4.87	6.64	8.37	11.17	13.45	**100yr**	9.88	12.93	14.26	16.16	17.40	**100yr**
200yr	1.11	1.67	2.12	3.07	4.28	5.32	**200yr**	3.70	5.20	6.00	8.24	10.34	13.75	16.90	**200yr**	12.17	16.25	17.79	20.00	21.36	**200yr**
500yr	1.43	2.12	2.73	3.96	5.64	7.02	**500yr**	4.87	6.86	7.91	10.98	13.73	18.14	22.78	**500yr**	16.06	21.90	23.75	26.49	28.05	**500yr**

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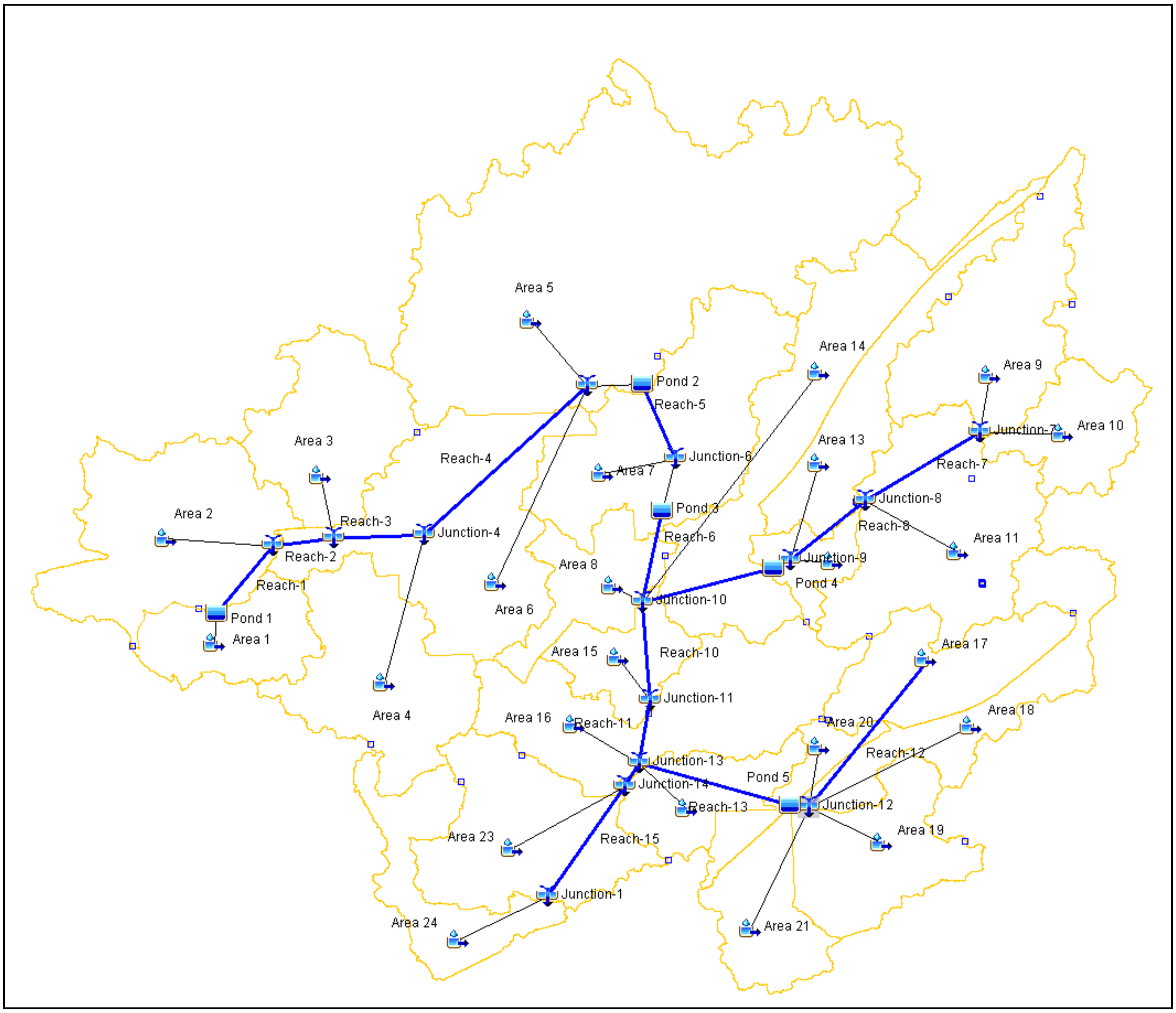
Climate Center

Project: MBTS

Basin Model : MBTS Watershed – Normal

Oct 09 13:58:03 EDT 2015

HEC-HMS



Project: MBTS Simulation Run: 2015 - 025 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:28:52

Basin Model: MBTS Watershed -
Meteorologic Model: 2015 - 025 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	409.0	19Sep2015, 13:17	2.14
Area 2	0.2143070	146.6	19Sep2015, 12:52	2.52
Area 1	0.1202500	130.4	19Sep2015, 12:27	2.72
Pond 1	0.1202500	56.7	19Sep2015, 12:59	2.68
Reach-1	0.1202500	56.7	19Sep2015, 13:12	2.65
Junction-2	0.3345570	199.7	19Sep2015, 12:55	2.57
Reach-2	0.3345570	199.6	19Sep2015, 12:57	2.56
Area 3	0.1890000	114.7	19Sep2015, 12:43	2.00
Junction-3	0.5235570	304.5	19Sep2015, 12:51	2.36
Reach-3	0.5235570	304.4	19Sep2015, 12:53	2.35
Area 4	0.2384815	154.2	19Sep2015, 12:47	2.26
Junction-4	0.7620385	456.6	19Sep2015, 12:51	2.32
Reach-4	0.7620385	456.5	19Sep2015, 13:00	2.30
Area 6	0.3474700	215.2	19Sep2015, 13:11	2.78
Junction-5	2.0244085	1054.8	19Sep2015, 13:07	2.31
Pond 2	2.0244085	198.1	19Sep2015, 16:34	1.37
Reach-5	2.0244085	198.1	19Sep2015, 16:40	1.35
Area 7	0.3110400	294.5	19Sep2015, 12:35	2.72
Junction-6	2.3354485	349.4	19Sep2015, 12:44	1.53
Pond 3	2.3354485	212.7	19Sep2015, 17:34	1.39
Reach-6	2.3354485	212.7	19Sep2015, 17:38	1.38
Area 9	0.2393600	136.1	19Sep2015, 12:47	2.00
Area 10	0.1111700	85.5	19Sep2015, 12:31	2.09
Junction-7	0.3505300	207.7	19Sep2015, 12:40	2.03
Reach-7	0.3505300	207.5	19Sep2015, 12:49	2.00
Area 11	0.3052000	161.7	19Sep2015, 13:04	2.24
Junction-8	0.6557300	359.7	19Sep2015, 12:55	2.11

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	359.6	19Sep2015, 12:59	2.11
Area 13	0.0571908	45.1	19Sep2015, 12:44	2.62
Area 12	0.0548863	52.6	19Sep2015, 12:32	2.63
Junction-9	0.7678071	432.3	19Sep2015, 12:55	2.18
Pond 4	0.7678071	394.0	19Sep2015, 13:10	2.18
Reach-9	0.7678071	394.0	19Sep2015, 13:13	2.17
Area 14	0.2956000	203.8	19Sep2015, 12:57	2.70
Area 8	0.1103443	112.8	19Sep2015, 12:28	2.63
Junction-10	3.5091999	774.7	19Sep2015, 13:04	1.71
Reach-10	3.5091999	774.7	19Sep2015, 13:08	1.69
Area 15	0.0890144	79.4	19Sep2015, 12:34	2.53
Junction-11	3.5982143	815.7	19Sep2015, 13:03	1.71
Reach-11	3.5982143	815.7	19Sep2015, 13:19	1.67
Area 19	0.1726400	146.4	19Sep2015, 12:32	2.36
Area 18	0.1713200	98.8	19Sep2015, 12:53	2.16
Area 17	0.1551600	97.1	19Sep2015, 12:50	2.25
Reach-12	0.1551600	97.0	19Sep2015, 12:56	2.24
Area 21	0.1163900	112.3	19Sep2015, 12:29	2.54
Area 20	0.0568027	62.9	19Sep2015, 12:38	3.38
Junction-12	0.6723127	465.5	19Sep2015, 12:39	2.40
Pond 5	0.6723127	211.4	19Sep2015, 13:31	2.40
Reach-13	0.6723127	211.4	19Sep2015, 13:33	2.39
Area 16	0.2959900	198.9	19Sep2015, 12:51	2.43
Area 22	0.1087000	128.1	19Sep2015, 12:33	3.29
Junction-13	4.6752170	1228.2	19Sep2015, 13:12	1.86
Reach-14	4.6752170	1227.8	19Sep2015, 13:20	1.84
Area 23	0.2300500	164.7	19Sep2015, 12:57	2.79
Junction-14	4.9052670	1363.5	19Sep2015, 13:19	1.88
Reach-15	4.9052670	1362.7	19Sep2015, 13:21	1.87
Area 24	0.1367700	128.0	19Sep2015, 12:46	3.18
Junction-1	5.0420370	1437.7	19Sep2015, 13:21	1.91

Project: MBTS Simulation Run: 2015 - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:27:57

Basin Model: MBTS Watershed -
Meteorologic Model: 2015 - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.91490	584.9	19Sep2015, 13:15	2.99
Area 2	0.214307	202.7	19Sep2015, 12:51	3.44
Area 1	0.12025	177.5	19Sep2015, 12:26	3.68
Pond 1	0.12025	70.7	19Sep2015, 13:01	3.62
Junction-2	0.334557	267.9	19Sep2015, 12:54	3.49
Reach-1	0.12025	70.7	19Sep2015, 13:13	3.59
Reach-2	0.334557	267.8	19Sep2015, 12:56	3.48
Area 3	0.189	166.5	19Sep2015, 12:42	2.83
Junction-3	0.523557	420.1	19Sep2015, 12:50	3.25
Reach-3	0.523557	420.0	19Sep2015, 12:52	3.24
Area 4	0.2384815	218.2	19Sep2015, 12:47	3.13
Junction-4	0.7620385	635.7	19Sep2015, 12:50	3.20
Reach-4	0.7620385	635.2	19Sep2015, 12:58	3.18
Area 6	0.34747	292.0	19Sep2015, 13:10	3.73
Junction-5	2.0244085	1472.5	19Sep2015, 13:05	3.19
Pond 2	2.0244085	322.4	19Sep2015, 15:57	2.08
Reach-5	2.0244085	322.4	19Sep2015, 16:02	2.07
Area 7	0.31104	400.9	19Sep2015, 12:34	3.67
Junction-6	2.3354485	486.0	19Sep2015, 12:35	2.28
Pond 3	2.3354485	304.5	19Sep2015, 18:14	2.08
Reach-6	2.3354485	304.5	19Sep2015, 18:17	2.07
Area 9	0.23936	197.8	19Sep2015, 12:46	2.82
Area 10	0.11117	122.8	19Sep2015, 12:30	2.94
Junction-7	0.35053	301.4	19Sep2015, 12:39	2.86
Reach-7	0.35053	301.0	19Sep2015, 12:48	2.83
Area 11	0.30520	229.1	19Sep2015, 13:03	3.11
Junction-8	0.65573	514.9	19Sep2015, 12:53	2.96

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.65573	514.8	19Sep2015, 12:56	2.95
Area 13	0.0571908	61.9	19Sep2015, 12:44	3.55
Area 12	0.0548863	72.1	19Sep2015, 12:31	3.57
Junction-9	0.7678071	617.3	19Sep2015, 12:53	3.04
Pond 4	0.7678071	499.0	19Sep2015, 13:17	3.04
Reach-9	0.7678071	498.9	19Sep2015, 13:20	3.03
Area 14	0.29560	278.0	19Sep2015, 12:57	3.64
Area 8	0.1103443	154.5	19Sep2015, 12:28	3.57
Junction-10	3.5091999	1006.0	19Sep2015, 13:07	2.46
Reach-10	3.5091999	1005.8	19Sep2015, 13:12	2.44
Area 15	0.0890144	109.6	19Sep2015, 12:33	3.46
Junction-11	3.5982143	1055.3	19Sep2015, 13:07	2.46
Reach-11	3.5982143	1055.1	19Sep2015, 13:22	2.41
Area 19	0.17264	205.2	19Sep2015, 12:32	3.25
Area 18	0.17132	141.0	19Sep2015, 12:52	3.02
Area 17	0.15516	137.4	19Sep2015, 12:49	3.13
Reach-12	0.15516	137.4	19Sep2015, 12:55	3.11
Area 21	0.11639	155.0	19Sep2015, 12:29	3.46
Area 20	0.0568027	82.3	19Sep2015, 12:38	4.43
Junction-12	0.6723127	652.1	19Sep2015, 12:38	3.29
Pond 5	0.6723127	241.7	19Sep2015, 13:40	3.29
Reach-13	0.6723127	241.7	19Sep2015, 13:43	3.29
Area 16	0.29599	277.1	19Sep2015, 12:50	3.33
Area 22	0.10870	168.3	19Sep2015, 12:32	4.32
Junction-13	4.6752170	1565.8	19Sep2015, 13:05	2.64
Reach-14	4.6752170	1565.6	19Sep2015, 13:12	2.61
Area 23	0.23005	223.3	19Sep2015, 12:56	3.75
Junction-14	4.9052670	1772.9	19Sep2015, 13:08	2.66
Reach-15	4.9052670	1772.7	19Sep2015, 13:10	2.65
Area 24	0.13677	169.2	19Sep2015, 12:45	4.20
Junction-1	5.0420370	1897.2	19Sep2015, 13:09	2.70

Project: MBTS Simulation Run: 2015 - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:27:01

Basin Model: MBTS Watershed -
Meteorologic Model: 2015 - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	808.9	19Sep2015, 13:14	4.08
Area 2	0.2143070	272.9	19Sep2015, 12:51	4.60
Area 1	0.1202500	236.0	19Sep2015, 12:26	4.88
Pond 1	0.1202500	88.7	19Sep2015, 13:02	4.81
Reach-1	0.1202500	88.7	19Sep2015, 13:13	4.76
Junction-2	0.3345570	353.8	19Sep2015, 12:53	4.66
Reach-2	0.3345570	353.7	19Sep2015, 12:55	4.65
Area 3	0.1890000	233.0	19Sep2015, 12:41	3.89
Junction-3	0.5235570	567.3	19Sep2015, 12:49	4.37
Reach-3	0.5235570	567.2	19Sep2015, 12:51	4.37
Area 4	0.2384815	299.2	19Sep2015, 12:46	4.24
Junction-4	0.7620385	863.5	19Sep2015, 12:49	4.33
Reach-4	0.7620385	862.9	19Sep2015, 12:56	4.30
Area 6	0.3474700	387.1	19Sep2015, 13:09	4.93
Junction-5	2.0244085	2000.4	19Sep2015, 13:03	4.31
Pond 2	2.0244085	478.7	19Sep2015, 15:35	3.03
Reach-5	2.0244085	478.7	19Sep2015, 15:40	3.01
Area 7	0.3110400	533.0	19Sep2015, 12:34	4.86
Junction-6	2.3354485	623.4	19Sep2015, 12:34	3.26
Pond 3	2.3354485	407.0	19Sep2015, 18:40	2.79
Reach-6	2.3354485	407.0	19Sep2015, 18:43	2.78
Area 9	0.2393600	276.8	19Sep2015, 12:45	3.89
Area 10	0.1111700	170.4	19Sep2015, 12:29	4.03
Junction-7	0.3505300	421.3	19Sep2015, 12:38	3.93
Reach-7	0.3505300	421.1	19Sep2015, 12:46	3.90
Area 11	0.3052000	314.5	19Sep2015, 13:02	4.22
Junction-8	0.6557300	712.5	19Sep2015, 12:51	4.05

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	712.1	19Sep2015, 12:54	4.04
Area 13	0.0571908	82.9	19Sep2015, 12:43	4.73
Area 12	0.0548863	96.3	19Sep2015, 12:31	4.75
Junction-9	0.7678071	852.5	19Sep2015, 12:51	4.14
Pond 4	0.7678071	588.6	19Sep2015, 13:25	4.14
Reach-9	0.7678071	588.6	19Sep2015, 13:28	4.13
Area 14	0.2956000	370.4	19Sep2015, 12:56	4.83
Area 8	0.1103443	206.5	19Sep2015, 12:27	4.75
Junction-10	3.5091999	1263.7	19Sep2015, 13:01	3.31
Reach-10	3.5091999	1263.4	19Sep2015, 13:05	3.29
Area 15	0.0890144	147.3	19Sep2015, 12:33	4.62
Junction-11	3.5982143	1341.0	19Sep2015, 13:00	3.32
Reach-11	3.5982143	1340.9	19Sep2015, 13:14	3.24
Area 19	0.1726400	279.1	19Sep2015, 12:31	4.38
Area 18	0.1713200	194.7	19Sep2015, 12:51	4.12
Area 17	0.1551600	188.4	19Sep2015, 12:48	4.24
Reach-12	0.1551600	188.3	19Sep2015, 12:54	4.22
Area 21	0.1163900	208.3	19Sep2015, 12:28	4.63
Area 20	0.0568027	105.7	19Sep2015, 12:38	5.71
Junction-12	0.6723127	887.1	19Sep2015, 12:37	4.43
Pond 5	0.6723127	275.7	19Sep2015, 13:50	4.43
Reach-13	0.6723127	275.7	19Sep2015, 13:52	4.42
Area 16	0.2959900	375.3	19Sep2015, 12:49	4.48
Area 22	0.1087000	217.2	19Sep2015, 12:32	5.60
Junction-13	4.6752170	1999.3	19Sep2015, 13:07	3.54
Reach-14	4.6752170	1999.1	19Sep2015, 13:13	3.51
Area 23	0.2300500	295.8	19Sep2015, 12:56	4.95
Junction-14	4.9052670	2267.0	19Sep2015, 13:09	3.58
Reach-15	4.9052670	2266.9	19Sep2015, 13:11	3.57
Area 24	0.1367700	219.6	19Sep2015, 12:45	5.45
Junction-1	5.0420370	2429.3	19Sep2015, 13:07	3.62

Project: MBTS Simulation Run: 2025 A1b - 025 yr

Start of Run: 19Sep2015, 00:00 Basin Model: MBTS Watershed -
End of Run: 20Sep2015, 00:01 Meteorologic Model: 2025 A1b - 025 yr
Compute Time: 29Sep2015, 16:33:15 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	437.3	19Sep2015, 13:16	2.28
Area 2	0.2143070	155.7	19Sep2015, 12:52	2.67
Area 1	0.1202500	138.1	19Sep2015, 12:27	2.88
Pond 1	0.1202500	58.9	19Sep2015, 12:59	2.83
Reach-1	0.1202500	58.9	19Sep2015, 13:12	2.80
Junction-2	0.3345570	210.7	19Sep2015, 12:55	2.72
Reach-2	0.3345570	210.7	19Sep2015, 12:57	2.71
Area 3	0.1890000	123.0	19Sep2015, 12:43	2.13
Junction-3	0.5235570	323.1	19Sep2015, 12:51	2.50
Reach-3	0.5235570	323.0	19Sep2015, 12:53	2.49
Area 4	0.2384815	164.6	19Sep2015, 12:47	2.40
Junction-4	0.7620385	485.6	19Sep2015, 12:51	2.46
Reach-4	0.7620385	485.4	19Sep2015, 12:59	2.44
Area 6	0.3474700	227.7	19Sep2015, 13:10	2.93
Junction-5	2.0244085	1122.4	19Sep2015, 13:06	2.45
Pond 2	2.0244085	218.4	19Sep2015, 16:25	1.48
Reach-5	2.0244085	218.4	19Sep2015, 16:31	1.46
Area 7	0.3110400	311.8	19Sep2015, 12:35	2.87
Junction-6	2.3354485	374.5	19Sep2015, 12:42	1.65
Pond 3	2.3354485	232.8	19Sep2015, 17:30	1.50
Reach-6	2.3354485	232.8	19Sep2015, 17:33	1.49
Area 9	0.2393600	146.0	19Sep2015, 12:47	2.13
Area 10	0.1111700	91.5	19Sep2015, 12:31	2.23
Junction-7	0.3505300	222.8	19Sep2015, 12:39	2.16
Reach-7	0.3505300	222.7	19Sep2015, 12:49	2.14
Area 11	0.3052000	172.6	19Sep2015, 13:04	2.38
Junction-8	0.6557300	384.8	19Sep2015, 12:54	2.25

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	384.7	19Sep2015, 12:58	2.24
Area 13	0.0571908	47.9	19Sep2015, 12:44	2.77
Area 12	0.0548863	55.8	19Sep2015, 12:32	2.78
Junction-9	0.7678071	462.3	19Sep2015, 12:54	2.32
Pond 4	0.7678071	408.9	19Sep2015, 13:12	2.32
Reach-9	0.7678071	408.9	19Sep2015, 13:15	2.31
Area 14	0.2956000	215.9	19Sep2015, 12:57	2.85
Area 8	0.1103443	119.6	19Sep2015, 12:28	2.78
Junction-10	3.5091999	810.0	19Sep2015, 13:05	1.83
Reach-10	3.5091999	809.9	19Sep2015, 13:09	1.81
Area 15	0.0890144	84.3	19Sep2015, 12:34	2.68
Junction-11	3.5982143	851.8	19Sep2015, 13:04	1.83
Reach-11	3.5982143	851.6	19Sep2015, 13:20	1.79
Area 19	0.1726400	156.0	19Sep2015, 12:32	2.50
Area 18	0.1713200	105.6	19Sep2015, 12:53	2.30
Area 17	0.1551600	103.6	19Sep2015, 12:50	2.39
Reach-12	0.1551600	103.5	19Sep2015, 12:56	2.38
Area 21	0.1163900	119.3	19Sep2015, 12:29	2.69
Area 20	0.0568027	66.1	19Sep2015, 12:38	3.56
Junction-12	0.6723127	495.7	19Sep2015, 12:38	2.54
Pond 5	0.6723127	216.9	19Sep2015, 13:32	2.54
Reach-13	0.6723127	216.9	19Sep2015, 13:35	2.54
Area 16	0.2959900	211.6	19Sep2015, 12:50	2.58
Area 22	0.1087000	134.7	19Sep2015, 12:33	3.46
Junction-13	4.6752170	1283.9	19Sep2015, 13:10	1.98
Reach-14	4.6752170	1282.5	19Sep2015, 13:18	1.96
Area 23	0.2300500	174.3	19Sep2015, 12:57	2.95
Junction-14	4.9052670	1431.1	19Sep2015, 13:17	2.01
Reach-15	4.9052670	1430.7	19Sep2015, 13:19	2.00
Area 24	0.1367700	134.7	19Sep2015, 12:46	3.35
Junction-1	5.0420370	1513.9	19Sep2015, 13:18	2.04

Project: MBTS Simulation Run: 2025 A1b - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:33:44

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1b - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	594.0	19Sep2015, 13:15	3.04
Area 2	0.2143070	205.6	19Sep2015, 12:51	3.49
Area 1	0.1202500	179.9	19Sep2015, 12:26	3.73
Pond 1	0.1202500	71.4	19Sep2015, 13:01	3.67
Reach-1	0.1202500	71.4	19Sep2015, 13:13	3.63
Junction-2	0.3345570	271.4	19Sep2015, 12:54	3.54
Reach-2	0.3345570	271.3	19Sep2015, 12:56	3.53
Area 3	0.1890000	169.2	19Sep2015, 12:42	2.87
Junction-3	0.5235570	426.1	19Sep2015, 12:50	3.29
Reach-3	0.5235570	426.0	19Sep2015, 12:52	3.28
Area 4	0.2384815	221.5	19Sep2015, 12:46	3.17
Junction-4	0.7620385	645.0	19Sep2015, 12:50	3.25
Reach-4	0.7620385	644.4	19Sep2015, 12:58	3.22
Area 6	0.3474700	295.9	19Sep2015, 13:10	3.78
Junction-5	2.0244085	1494.0	19Sep2015, 13:05	3.24
Pond 2	2.0244085	328.8	19Sep2015, 15:56	2.12
Reach-5	2.0244085	328.8	19Sep2015, 16:00	2.10
Area 7	0.3110400	406.4	19Sep2015, 12:34	3.72
Junction-6	2.3354485	491.7	19Sep2015, 12:35	2.32
Pond 3	2.3354485	308.6	19Sep2015, 18:16	2.11
Reach-6	2.3354485	308.6	19Sep2015, 18:19	2.10
Area 9	0.2393600	201.0	19Sep2015, 12:46	2.86
Area 10	0.1111700	124.8	19Sep2015, 12:30	2.98
Junction-7	0.3505300	306.2	19Sep2015, 12:39	2.90
Reach-7	0.3505300	306.1	19Sep2015, 12:47	2.87
Area 11	0.3052000	232.5	19Sep2015, 13:03	3.16
Junction-8	0.6557300	523.0	19Sep2015, 12:53	3.01

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	522.9	19Sep2015, 12:56	3.00
Area 13	0.0571908	62.8	19Sep2015, 12:44	3.60
Area 12	0.0548863	73.1	19Sep2015, 12:31	3.61
Junction-9	0.7678071	626.9	19Sep2015, 12:53	3.08
Pond 4	0.7678071	504.8	19Sep2015, 13:17	3.08
Reach-9	0.7678071	504.8	19Sep2015, 13:20	3.07
Area 14	0.2956000	281.8	19Sep2015, 12:57	3.69
Area 8	0.1103443	156.6	19Sep2015, 12:28	3.62
Junction-10	3.5091999	1018.4	19Sep2015, 13:07	2.49
Reach-10	3.5091999	1018.3	19Sep2015, 13:12	2.48
Area 15	0.0890144	111.1	19Sep2015, 12:33	3.51
Junction-11	3.5982143	1068.3	19Sep2015, 13:07	2.50
Reach-11	3.5982143	1068.2	19Sep2015, 13:22	2.44
Area 19	0.1726400	208.2	19Sep2015, 12:32	3.30
Area 18	0.1713200	143.2	19Sep2015, 12:52	3.06
Area 17	0.1551600	139.5	19Sep2015, 12:49	3.17
Reach-12	0.1551600	139.4	19Sep2015, 12:55	3.15
Area 21	0.1163900	157.2	19Sep2015, 12:29	3.51
Area 20	0.0568027	83.2	19Sep2015, 12:38	4.48
Junction-12	0.6723127	661.8	19Sep2015, 12:38	3.34
Pond 5	0.6723127	243.1	19Sep2015, 13:41	3.34
Reach-13	0.6723127	243.1	19Sep2015, 13:43	3.33
Area 16	0.2959900	281.1	19Sep2015, 12:50	3.38
Area 22	0.1087000	170.3	19Sep2015, 12:32	4.38
Junction-13	4.6752170	1582.9	19Sep2015, 13:05	2.68
Reach-14	4.6752170	1582.8	19Sep2015, 13:12	2.65
Area 23	0.2300500	226.3	19Sep2015, 12:56	3.80
Junction-14	4.9052670	1792.8	19Sep2015, 13:08	2.70
Reach-15	4.9052670	1792.6	19Sep2015, 13:10	2.69
Area 24	0.1367700	171.3	19Sep2015, 12:45	4.25
Junction-1	5.0420370	1919.3	19Sep2015, 13:09	2.74

Project: MBTS Simulation Run: 2025 A1b - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:34:08

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1b - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	818.6	19Sep2015, 13:14	4.13
Area 2	0.2143070	275.9	19Sep2015, 12:51	4.65
Area 1	0.1202500	238.5	19Sep2015, 12:26	4.93
Pond 1	0.1202500	89.5	19Sep2015, 13:02	4.86
Reach-1	0.1202500	89.4	19Sep2015, 13:13	4.81
Junction-2	0.3345570	357.5	19Sep2015, 12:53	4.71
Reach-2	0.3345570	357.4	19Sep2015, 12:56	4.70
Area 3	0.1890000	235.9	19Sep2015, 12:41	3.94
Junction-3	0.5235570	573.7	19Sep2015, 12:49	4.42
Reach-3	0.5235570	573.5	19Sep2015, 12:50	4.42
Area 4	0.2384815	302.6	19Sep2015, 12:46	4.29
Junction-4	0.7620385	873.2	19Sep2015, 12:49	4.38
Reach-4	0.7620385	872.5	19Sep2015, 12:56	4.34
Area 6	0.3474700	391.2	19Sep2015, 13:09	4.98
Junction-5	2.0244085	2023.0	19Sep2015, 13:03	4.36
Pond 2	2.0244085	485.4	19Sep2015, 15:35	3.07
Reach-5	2.0244085	485.4	19Sep2015, 15:39	3.05
Area 7	0.3110400	538.6	19Sep2015, 12:34	4.92
Junction-6	2.3354485	629.3	19Sep2015, 12:34	3.30
Pond 3	2.3354485	411.0	19Sep2015, 18:42	2.82
Reach-6	2.3354485	411.0	19Sep2015, 18:44	2.81
Area 9	0.2393600	280.2	19Sep2015, 12:45	3.93
Area 10	0.1111700	172.4	19Sep2015, 12:29	4.07
Junction-7	0.3505300	426.5	19Sep2015, 12:38	3.98
Reach-7	0.3505300	426.3	19Sep2015, 12:46	3.94
Area 11	0.3052000	318.2	19Sep2015, 13:02	4.27
Junction-8	0.6557300	721.0	19Sep2015, 12:51	4.10

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	720.7	19Sep2015, 12:55	4.08
Area 13	0.0571908	83.8	19Sep2015, 12:43	4.78
Area 12	0.0548863	97.4	19Sep2015, 12:31	4.80
Junction-9	0.7678071	862.7	19Sep2015, 12:51	4.19
Pond 4	0.7678071	592.5	19Sep2015, 13:25	4.18
Reach-9	0.7678071	592.5	19Sep2015, 13:28	4.17
Area 14	0.2956000	374.3	19Sep2015, 12:56	4.88
Area 8	0.1103443	208.7	19Sep2015, 12:27	4.80
Junction-10	3.5091999	1272.7	19Sep2015, 13:00	3.35
Reach-10	3.5091999	1272.5	19Sep2015, 13:04	3.32
Area 15	0.0890144	148.9	19Sep2015, 12:33	4.67
Junction-11	3.5982143	1352.1	19Sep2015, 13:00	3.36
Reach-11	3.5982143	1352.0	19Sep2015, 13:14	3.28
Area 19	0.1726400	282.3	19Sep2015, 12:31	4.43
Area 18	0.1713200	197.0	19Sep2015, 12:51	4.16
Area 17	0.1551600	190.6	19Sep2015, 12:48	4.29
Reach-12	0.1551600	190.5	19Sep2015, 12:54	4.27
Area 21	0.1163900	210.6	19Sep2015, 12:28	4.68
Area 20	0.0568027	106.7	19Sep2015, 12:37	5.76
Junction-12	0.6723127	897.4	19Sep2015, 12:37	4.48
Pond 5	0.6723127	277.2	19Sep2015, 13:50	4.48
Reach-13	0.6723127	277.2	19Sep2015, 13:52	4.47
Area 16	0.2959900	379.5	19Sep2015, 12:49	4.53
Area 22	0.1087000	219.3	19Sep2015, 12:32	5.65
Junction-13	4.6752170	2018.2	19Sep2015, 13:06	3.58
Reach-14	4.6752170	2018.1	19Sep2015, 13:13	3.55
Area 23	0.2300500	298.9	19Sep2015, 12:56	5.00
Junction-14	4.9052670	2288.7	19Sep2015, 13:09	3.62
Reach-15	4.9052670	2288.6	19Sep2015, 13:11	3.61
Area 24	0.1367700	221.7	19Sep2015, 12:45	5.51
Junction-1	5.0420370	2452.5	19Sep2015, 13:07	3.66

Project: MBTS Simulation Run: 2025 A1fi - 025 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:37:43

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1fi - 025 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	496.7	19Sep2015, 13:16	2.57
Area 2	0.2143070	174.7	19Sep2015, 12:52	2.98
Area 1	0.1202500	154.1	19Sep2015, 12:26	3.20
Pond 1	0.1202500	63.6	19Sep2015, 13:00	3.15
Reach-1	0.1202500	63.6	19Sep2015, 13:12	3.12
Junction-2	0.3345570	233.8	19Sep2015, 12:54	3.03
Reach-2	0.3345570	233.7	19Sep2015, 12:57	3.02
Area 3	0.1890000	140.5	19Sep2015, 12:42	2.41
Junction-3	0.5235570	362.2	19Sep2015, 12:50	2.80
Reach-3	0.5235570	362.1	19Sep2015, 12:52	2.79
Area 4	0.2384815	186.2	19Sep2015, 12:47	2.69
Junction-4	0.7620385	546.0	19Sep2015, 12:50	2.76
Reach-4	0.7620385	545.6	19Sep2015, 12:59	2.74
Area 6	0.3474700	253.8	19Sep2015, 13:10	3.26
Junction-5	2.0244085	1263.5	19Sep2015, 13:06	2.75
Pond 2	2.0244085	260.5	19Sep2015, 16:11	1.71
Reach-5	2.0244085	260.5	19Sep2015, 16:16	1.70
Area 7	0.3110400	347.9	19Sep2015, 12:34	3.20
Junction-6	2.3354485	423.5	19Sep2015, 12:39	1.90
Pond 3	2.3354485	268.3	19Sep2015, 17:39	1.73
Reach-6	2.3354485	268.3	19Sep2015, 17:42	1.73
Area 9	0.2393600	166.8	19Sep2015, 12:47	2.41
Area 10	0.1111700	104.1	19Sep2015, 12:30	2.52
Junction-7	0.3505300	254.4	19Sep2015, 12:39	2.44
Reach-7	0.3505300	254.3	19Sep2015, 12:48	2.42
Area 11	0.3052000	195.3	19Sep2015, 13:03	2.68
Junction-8	0.6557300	437.2	19Sep2015, 12:54	2.54

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	437.0	19Sep2015, 12:57	2.53
Area 13	0.0571908	53.6	19Sep2015, 12:44	3.09
Area 12	0.0548863	62.4	19Sep2015, 12:32	3.10
Junction-9	0.7678071	524.6	19Sep2015, 12:54	2.61
Pond 4	0.7678071	443.4	19Sep2015, 13:15	2.61
Reach-9	0.7678071	443.4	19Sep2015, 13:18	2.60
Area 14	0.2956000	241.1	19Sep2015, 12:57	3.17
Area 8	0.1103443	133.7	19Sep2015, 12:28	3.10
Junction-10	3.5091999	887.2	19Sep2015, 13:06	2.08
Reach-10	3.5091999	887.1	19Sep2015, 13:11	2.07
Area 15	0.0890144	94.5	19Sep2015, 12:34	3.00
Junction-11	3.5982143	931.7	19Sep2015, 13:06	2.09
Reach-11	3.5982143	931.4	19Sep2015, 13:21	2.04
Area 19	0.1726400	175.8	19Sep2015, 12:32	2.80
Area 18	0.1713200	119.9	19Sep2015, 12:52	2.59
Area 17	0.1551600	117.2	19Sep2015, 12:49	2.69
Reach-12	0.1551600	117.2	19Sep2015, 12:56	2.67
Area 21	0.1163900	133.8	19Sep2015, 12:29	3.00
Area 20	0.0568027	72.7	19Sep2015, 12:38	3.91
Junction-12	0.6723127	559.0	19Sep2015, 12:38	2.85
Pond 5	0.6723127	228.7	19Sep2015, 13:35	2.84
Reach-13	0.6723127	228.7	19Sep2015, 13:38	2.84
Area 16	0.2959900	238.1	19Sep2015, 12:50	2.88
Area 22	0.1087000	148.4	19Sep2015, 12:33	3.81
Junction-13	4.6752170	1399.6	19Sep2015, 13:05	2.25
Reach-14	4.6752170	1399.5	19Sep2015, 13:13	2.23
Area 23	0.2300500	194.1	19Sep2015, 12:57	3.27
Junction-14	4.9052670	1575.0	19Sep2015, 13:12	2.27
Reach-15	4.9052670	1574.4	19Sep2015, 13:14	2.27
Area 24	0.1367700	148.8	19Sep2015, 12:46	3.69
Junction-1	5.0420370	1674.6	19Sep2015, 13:14	2.31

Project: MBTS Simulation Run: 2025 A1fi - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:38:24

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1fi - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	713.3	19Sep2015, 13:14	3.62
Area 2	0.2143070	243.1	19Sep2015, 12:51	4.10
Area 1	0.1202500	211.2	19Sep2015, 12:26	4.37
Pond 1	0.1202500	81.0	19Sep2015, 13:01	4.30
Reach-1	0.1202500	81.0	19Sep2015, 13:13	4.26
Junction-2	0.3345570	317.2	19Sep2015, 12:54	4.16
Reach-2	0.3345570	317.2	19Sep2015, 12:56	4.15
Area 3	0.1890000	204.6	19Sep2015, 12:41	3.43
Junction-3	0.5235570	504.6	19Sep2015, 12:49	3.89
Reach-3	0.5235570	504.6	19Sep2015, 12:51	3.89
Area 4	0.2384815	264.7	19Sep2015, 12:46	3.77
Junction-4	0.7620385	766.5	19Sep2015, 12:49	3.85
Reach-4	0.7620385	765.7	19Sep2015, 12:57	3.82
Area 6	0.3474700	346.8	19Sep2015, 13:09	4.42
Junction-5	2.0244085	1775.7	19Sep2015, 13:04	3.83
Pond 2	2.0244085	412.1	19Sep2015, 15:44	2.62
Reach-5	2.0244085	412.1	19Sep2015, 15:48	2.61
Area 7	0.3110400	477.1	19Sep2015, 12:34	4.36
Junction-6	2.3354485	565.1	19Sep2015, 12:34	2.84
Pond 3	2.3354485	364.2	19Sep2015, 18:31	2.50
Reach-6	2.3354485	364.2	19Sep2015, 18:34	2.49
Area 9	0.2393600	243.0	19Sep2015, 12:46	3.43
Area 10	0.1111700	150.1	19Sep2015, 12:30	3.56
Junction-7	0.3505300	370.1	19Sep2015, 12:38	3.47
Reach-7	0.3505300	369.8	19Sep2015, 12:46	3.44
Area 11	0.3052000	278.1	19Sep2015, 13:02	3.75
Junction-8	0.6557300	628.3	19Sep2015, 12:52	3.58

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	628.0	19Sep2015, 12:55	3.57
Area 13	0.0571908	74.0	19Sep2015, 12:43	4.23
Area 12	0.0548863	86.0	19Sep2015, 12:31	4.25
Junction-9	0.7678071	752.2	19Sep2015, 12:52	3.67
Pond 4	0.7678071	551.1	19Sep2015, 13:22	3.67
Reach-9	0.7678071	551.1	19Sep2015, 13:25	3.66
Area 14	0.2956000	331.2	19Sep2015, 12:56	4.33
Area 8	0.1103443	184.5	19Sep2015, 12:27	4.25
Junction-10	3.5091999	1162.3	19Sep2015, 13:02	2.95
Reach-10	3.5091999	1162.1	19Sep2015, 13:06	2.93
Area 15	0.0890144	131.3	19Sep2015, 12:33	4.13
Junction-11	3.5982143	1230.4	19Sep2015, 13:02	2.96
Reach-11	3.5982143	1229.7	19Sep2015, 13:17	2.89
Area 19	0.1726400	247.6	19Sep2015, 12:31	3.90
Area 18	0.1713200	171.8	19Sep2015, 12:51	3.65
Area 17	0.1551600	166.7	19Sep2015, 12:48	3.77
Reach-12	0.1551600	166.6	19Sep2015, 12:54	3.74
Area 21	0.1163900	185.7	19Sep2015, 12:28	4.13
Area 20	0.0568027	95.8	19Sep2015, 12:38	5.17
Junction-12	0.6723127	787.2	19Sep2015, 12:37	3.95
Pond 5	0.6723127	261.1	19Sep2015, 13:46	3.95
Reach-13	0.6723127	261.0	19Sep2015, 13:49	3.94
Area 16	0.2959900	333.6	19Sep2015, 12:49	3.99
Area 22	0.1087000	196.6	19Sep2015, 12:32	5.06
Junction-13	4.6752170	1811.9	19Sep2015, 13:07	3.16
Reach-14	4.6752170	1811.7	19Sep2015, 13:14	3.13
Area 23	0.2300500	265.1	19Sep2015, 12:56	4.44
Junction-14	4.9052670	2053.2	19Sep2015, 13:09	3.19
Reach-15	4.9052670	2053.0	19Sep2015, 13:10	3.18
Area 24	0.1367700	198.3	19Sep2015, 12:45	4.92
Junction-1	5.0420370	2202.2	19Sep2015, 13:06	3.23

Project: MBTS Simulation Run: 2025 A1fi - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:42:51

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1fi - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1144.5	19Sep2015, 13:13	5.73
Area 2	0.2143070	376.5	19Sep2015, 12:50	6.33
Area 1	0.1202500	321.3	19Sep2015, 12:25	6.65
Pond 1	0.1202500	148.1	19Sep2015, 12:55	6.56
Reach-1	0.1202500	148.0	19Sep2015, 13:04	6.51
Junction-2	0.3345570	505.3	19Sep2015, 12:57	6.40
Reach-2	0.3345570	505.1	19Sep2015, 12:59	6.38
Area 3	0.1890000	333.1	19Sep2015, 12:40	5.51
Junction-3	0.5235570	787.4	19Sep2015, 12:48	6.07
Reach-3	0.5235570	787.2	19Sep2015, 12:50	6.06
Area 4	0.2384815	419.7	19Sep2015, 12:45	5.92
Junction-4	0.7620385	1203.6	19Sep2015, 12:48	6.02
Reach-4	0.7620385	1203.1	19Sep2015, 12:54	5.98
Area 6	0.3474700	526.1	19Sep2015, 13:08	6.71
Junction-5	2.0244085	2800.0	19Sep2015, 13:04	5.99
Pond 2	2.0244085	1114.4	19Sep2015, 14:26	4.48
Reach-5	2.0244085	1113.6	19Sep2015, 14:30	4.46
Area 7	0.3110400	726.2	19Sep2015, 12:33	6.64
Junction-6	2.3354485	1213.8	19Sep2015, 14:30	4.75
Pond 3	2.3354485	626.5	19Sep2015, 17:38	3.88
Reach-6	2.3354485	626.5	19Sep2015, 17:40	3.87
Area 9	0.2393600	395.9	19Sep2015, 12:44	5.50
Area 10	0.1111700	241.8	19Sep2015, 12:29	5.67
Junction-7	0.3505300	601.8	19Sep2015, 12:37	5.56
Reach-7	0.3505300	601.1	19Sep2015, 12:44	5.52
Area 11	0.3052000	441.8	19Sep2015, 13:01	5.89
Junction-8	0.6557300	1008.0	19Sep2015, 12:50	5.69

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1007.8	19Sep2015, 12:53	5.68
Area 13	0.0571908	113.6	19Sep2015, 12:42	6.48
Area 12	0.0548863	131.9	19Sep2015, 12:30	6.51
Junction-9	0.7678071	1203.8	19Sep2015, 12:49	5.80
Pond 4	0.7678071	880.0	19Sep2015, 13:20	5.79
Reach-9	0.7678071	879.8	19Sep2015, 13:22	5.78
Area 14	0.2956000	505.5	19Sep2015, 12:55	6.60
Area 8	0.1103443	282.7	19Sep2015, 12:27	6.51
Junction-10	3.5091999	1694.6	19Sep2015, 13:11	4.60
Reach-10	3.5091999	1694.4	19Sep2015, 13:15	4.57
Area 15	0.0890144	202.9	19Sep2015, 12:32	6.36
Junction-11	3.5982143	1773.1	19Sep2015, 13:12	4.61
Reach-11	3.5982143	1772.6	19Sep2015, 13:25	4.52
Area 19	0.1726400	388.6	19Sep2015, 12:31	6.09
Area 18	0.1713200	275.1	19Sep2015, 12:50	5.77
Area 17	0.1551600	264.4	19Sep2015, 12:47	5.92
Reach-12	0.1551600	264.3	19Sep2015, 12:52	5.89
Area 21	0.1163900	286.8	19Sep2015, 12:28	6.37
Area 20	0.0568027	139.4	19Sep2015, 12:37	7.58
Junction-12	0.6723127	1235.8	19Sep2015, 12:37	6.14
Pond 5	0.6723127	328.6	19Sep2015, 13:58	6.14
Reach-13	0.6723127	328.6	19Sep2015, 14:01	6.13
Area 16	0.2959900	520.5	19Sep2015, 12:48	6.20
Area 22	0.1087000	287.4	19Sep2015, 12:32	7.46
Junction-13	4.6752170	2596.9	19Sep2015, 12:57	4.92
Reach-14	4.6752170	2595.8	19Sep2015, 13:03	4.88
Area 23	0.2300500	401.7	19Sep2015, 12:55	6.73
Junction-14	4.9052670	2986.4	19Sep2015, 13:02	4.97
Reach-15	4.9052670	2985.7	19Sep2015, 13:04	4.96
Area 24	0.1367700	292.2	19Sep2015, 12:45	7.30
Junction-1	5.0420370	3224.4	19Sep2015, 13:03	5.02

Project: MBTS Simulation Run: 2050 A1b - 025 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:54:20

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1b - 025 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	509.9	19Sep2015, 13:16	2.63
Area 2	0.2143070	178.9	19Sep2015, 12:52	3.05
Area 1	0.1202500	157.6	19Sep2015, 12:26	3.27
Pond 1	0.1202500	64.7	19Sep2015, 13:00	3.22
Reach-1	0.1202500	64.7	19Sep2015, 13:12	3.19
Junction-2	0.3345570	238.9	19Sep2015, 12:54	3.10
Reach-2	0.3345570	238.9	19Sep2015, 12:57	3.09
Area 3	0.1890000	144.4	19Sep2015, 12:42	2.47
Junction-3	0.5235570	370.9	19Sep2015, 12:50	2.87
Reach-3	0.5235570	370.8	19Sep2015, 12:52	2.86
Area 4	0.2384815	191.0	19Sep2015, 12:47	2.76
Junction-4	0.7620385	559.5	19Sep2015, 12:50	2.83
Reach-4	0.7620385	559.4	19Sep2015, 12:58	2.80
Area 6	0.3474700	259.6	19Sep2015, 13:10	3.33
Junction-5	2.0244085	1295.1	19Sep2015, 13:05	2.82
Pond 2	2.0244085	269.9	19Sep2015, 16:09	1.77
Reach-5	2.0244085	269.9	19Sep2015, 16:14	1.75
Area 7	0.3110400	355.9	19Sep2015, 12:34	3.27
Junction-6	2.3354485	434.0	19Sep2015, 12:38	1.95
Pond 3	2.3354485	273.1	19Sep2015, 17:48	1.79
Reach-6	2.3354485	273.1	19Sep2015, 17:50	1.78
Area 9	0.2393600	171.4	19Sep2015, 12:47	2.47
Area 10	0.1111700	106.9	19Sep2015, 12:30	2.58
Junction-7	0.3505300	261.5	19Sep2015, 12:39	2.50
Reach-7	0.3505300	261.2	19Sep2015, 12:48	2.48
Area 11	0.3052000	200.4	19Sep2015, 13:03	2.74
Junction-8	0.6557300	448.8	19Sep2015, 12:53	2.60

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	448.7	19Sep2015, 12:57	2.59
Area 13	0.0571908	54.8	19Sep2015, 12:44	3.16
Area 12	0.0548863	63.8	19Sep2015, 12:32	3.17
Junction-9	0.7678071	538.6	19Sep2015, 12:53	2.67
Pond 4	0.7678071	451.5	19Sep2015, 13:15	2.67
Reach-9	0.7678071	451.5	19Sep2015, 13:18	2.67
Area 14	0.2956000	246.7	19Sep2015, 12:57	3.24
Area 8	0.1103443	136.9	19Sep2015, 12:28	3.17
Junction-10	3.5091999	904.8	19Sep2015, 13:06	2.14
Reach-10	3.5091999	904.7	19Sep2015, 13:11	2.12
Area 15	0.0890144	96.8	19Sep2015, 12:34	3.07
Junction-11	3.5982143	949.9	19Sep2015, 13:06	2.15
Reach-11	3.5982143	949.6	19Sep2015, 13:22	2.10
Area 19	0.1726400	180.3	19Sep2015, 12:32	2.87
Area 18	0.1713200	123.0	19Sep2015, 12:52	2.65
Area 17	0.1551600	120.3	19Sep2015, 12:49	2.75
Reach-12	0.1551600	120.2	19Sep2015, 12:55	2.74
Area 21	0.1163900	137.0	19Sep2015, 12:29	3.07
Area 20	0.0568027	74.2	19Sep2015, 12:38	3.99
Junction-12	0.6723127	573.0	19Sep2015, 12:38	2.91
Pond 5	0.6723127	230.8	19Sep2015, 13:36	2.91
Reach-13	0.6723127	230.8	19Sep2015, 13:39	2.91
Area 16	0.2959900	244.0	19Sep2015, 12:50	2.95
Area 22	0.1087000	151.4	19Sep2015, 12:33	3.89
Junction-13	4.6752170	1424.4	19Sep2015, 13:05	2.31
Reach-14	4.6752170	1423.7	19Sep2015, 13:13	2.28
Area 23	0.2300500	198.5	19Sep2015, 12:57	3.34
Junction-14	4.9052670	1603.5	19Sep2015, 13:12	2.33
Reach-15	4.9052670	1603.4	19Sep2015, 13:14	2.33
Area 24	0.1367700	151.8	19Sep2015, 12:46	3.77
Junction-1	5.0420370	1706.2	19Sep2015, 13:13	2.37

Project: MBTS Simulation Run: 2050 A1b - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:54:52

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1b - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	618.4	19Sep2015, 13:15	3.16
Area 2	0.2143070	213.3	19Sep2015, 12:51	3.61
Area 1	0.1202500	186.4	19Sep2015, 12:26	3.86
Pond 1	0.1202500	73.4	19Sep2015, 13:01	3.80
Reach-1	0.1202500	73.4	19Sep2015, 13:13	3.76
Junction-2	0.3345570	280.8	19Sep2015, 12:54	3.67
Reach-2	0.3345570	280.7	19Sep2015, 12:56	3.66
Area 3	0.1890000	176.5	19Sep2015, 12:42	2.98
Junction-3	0.5235570	442.2	19Sep2015, 12:50	3.41
Reach-3	0.5235570	442.0	19Sep2015, 12:52	3.41
Area 4	0.2384815	230.4	19Sep2015, 12:46	3.30
Junction-4	0.7620385	669.9	19Sep2015, 12:50	3.37
Reach-4	0.7620385	669.4	19Sep2015, 12:57	3.35
Area 6	0.3474700	306.4	19Sep2015, 13:10	3.91
Junction-5	2.0244085	1551.8	19Sep2015, 13:05	3.36
Pond 2	2.0244085	345.9	19Sep2015, 15:53	2.22
Reach-5	2.0244085	345.9	19Sep2015, 15:57	2.21
Area 7	0.3110400	421.0	19Sep2015, 12:34	3.85
Junction-6	2.3354485	506.7	19Sep2015, 12:35	2.43
Pond 3	2.3354485	319.7	19Sep2015, 18:20	2.20
Reach-6	2.3354485	319.7	19Sep2015, 18:23	2.19
Area 9	0.2393600	209.6	19Sep2015, 12:46	2.98
Area 10	0.1111700	130.0	19Sep2015, 12:30	3.10
Junction-7	0.3505300	319.3	19Sep2015, 12:38	3.02
Reach-7	0.3505300	319.1	19Sep2015, 12:47	2.99
Area 11	0.3052000	241.9	19Sep2015, 13:02	3.28
Junction-8	0.6557300	544.5	19Sep2015, 12:52	3.12

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	544.4	19Sep2015, 12:56	3.11
Area 13	0.0571908	65.1	19Sep2015, 12:43	3.73
Area 12	0.0548863	75.7	19Sep2015, 12:31	3.74
Junction-9	0.7678071	652.5	19Sep2015, 12:52	3.20
Pond 4	0.7678071	517.7	19Sep2015, 13:18	3.20
Reach-9	0.7678071	517.7	19Sep2015, 13:21	3.19
Area 14	0.2956000	292.0	19Sep2015, 12:56	3.82
Area 8	0.1103443	162.4	19Sep2015, 12:28	3.75
Junction-10	3.5091999	1051.9	19Sep2015, 13:07	2.59
Reach-10	3.5091999	1051.7	19Sep2015, 13:12	2.57
Area 15	0.0890144	115.3	19Sep2015, 12:33	3.63
Junction-11	3.5982143	1103.2	19Sep2015, 13:08	2.60
Reach-11	3.5982143	1103.0	19Sep2015, 13:22	2.54
Area 19	0.1726400	216.3	19Sep2015, 12:32	3.42
Area 18	0.1713200	149.1	19Sep2015, 12:52	3.18
Area 17	0.1551600	145.1	19Sep2015, 12:49	3.29
Reach-12	0.1551600	145.0	19Sep2015, 12:55	3.27
Area 21	0.1163900	163.1	19Sep2015, 12:29	3.64
Area 20	0.0568027	85.8	19Sep2015, 12:38	4.62
Junction-12	0.6723127	687.6	19Sep2015, 12:38	3.47
Pond 5	0.6723127	246.7	19Sep2015, 13:42	3.46
Reach-13	0.6723127	246.7	19Sep2015, 13:44	3.46
Area 16	0.2959900	291.9	19Sep2015, 12:50	3.51
Area 22	0.1087000	175.8	19Sep2015, 12:32	4.52
Junction-13	4.6752170	1629.1	19Sep2015, 13:06	2.78
Reach-14	4.6752170	1629.1	19Sep2015, 13:13	2.75
Area 23	0.2300500	234.3	19Sep2015, 12:56	3.93
Junction-14	4.9052670	1845.6	19Sep2015, 13:08	2.80
Reach-15	4.9052670	1845.5	19Sep2015, 13:10	2.79
Area 24	0.1367700	176.8	19Sep2015, 12:45	4.39
Junction-1	5.0420370	1978.2	19Sep2015, 13:08	2.84

Project: MBTS Simulation Run: 2050 A1b - 100 yr

Start of Run: 19Sep2015, 00:00 Basin Model: MBTS Watershed -
End of Run: 20Sep2015, 00:01 Meteorologic Model: 2050 A1b - 100 yr
Compute Time: 29Sep2015, 16:55:12 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	893.2	19Sep2015, 13:14	4.50
Area 2	0.2143070	299.1	19Sep2015, 12:50	5.03
Area 1	0.1202500	257.6	19Sep2015, 12:26	5.32
Pond 1	0.1202500	95.4	19Sep2015, 13:02	5.25
Reach-1	0.1202500	95.4	19Sep2015, 13:13	5.20
Junction-2	0.3345570	386.0	19Sep2015, 12:53	5.09
Reach-2	0.3345570	385.9	19Sep2015, 12:55	5.08
Area 3	0.1890000	258.1	19Sep2015, 12:41	4.30
Junction-3	0.5235570	622.6	19Sep2015, 12:48	4.80
Reach-3	0.5235570	622.5	19Sep2015, 12:50	4.79
Area 4	0.2384815	329.5	19Sep2015, 12:46	4.67
Junction-4	0.7620385	948.8	19Sep2015, 12:49	4.75
Reach-4	0.7620385	948.0	19Sep2015, 12:55	4.72
Area 6	0.3474700	422.4	19Sep2015, 13:09	5.38
Junction-5	2.0244085	2198.2	19Sep2015, 13:03	4.73
Pond 2	2.0244085	537.7	19Sep2015, 15:29	3.39
Reach-5	2.0244085	537.7	19Sep2015, 15:34	3.36
Area 7	0.3110400	581.9	19Sep2015, 12:34	5.31
Junction-6	2.3354485	674.7	19Sep2015, 12:34	3.62
Pond 3	2.3354485	442.9	19Sep2015, 18:48	3.05
Reach-6	2.3354485	442.9	19Sep2015, 18:51	3.03
Area 9	0.2393600	306.7	19Sep2015, 12:45	4.29
Area 10	0.1111700	188.3	19Sep2015, 12:29	4.44
Junction-7	0.3505300	466.5	19Sep2015, 12:38	4.34
Reach-7	0.3505300	466.1	19Sep2015, 12:45	4.30
Area 11	0.3052000	346.5	19Sep2015, 13:01	4.64
Junction-8	0.6557300	786.6	19Sep2015, 12:51	4.46

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	786.3	19Sep2015, 12:54	4.45
Area 13	0.0571908	90.7	19Sep2015, 12:43	5.17
Area 12	0.0548863	105.3	19Sep2015, 12:31	5.19
Junction-9	0.7678071	940.5	19Sep2015, 12:51	4.55
Pond 4	0.7678071	654.7	19Sep2015, 13:24	4.55
Reach-9	0.7678071	654.6	19Sep2015, 13:27	4.54
Area 14	0.2956000	404.6	19Sep2015, 12:56	5.28
Area 8	0.1103443	225.8	19Sep2015, 12:27	5.20
Junction-10	3.5091999	1337.6	19Sep2015, 12:59	3.62
Reach-10	3.5091999	1337.5	19Sep2015, 13:03	3.59
Area 15	0.0890144	161.4	19Sep2015, 12:33	5.06
Junction-11	3.5982143	1432.0	19Sep2015, 12:56	3.63
Reach-11	3.5982143	1431.5	19Sep2015, 13:10	3.55
Area 19	0.1726400	306.8	19Sep2015, 12:31	4.81
Area 18	0.1713200	214.9	19Sep2015, 12:51	4.53
Area 17	0.1551600	207.6	19Sep2015, 12:48	4.66
Reach-12	0.1551600	207.5	19Sep2015, 12:53	4.64
Area 21	0.1163900	228.2	19Sep2015, 12:28	5.07
Area 20	0.0568027	114.3	19Sep2015, 12:37	6.18
Junction-12	0.6723127	975.2	19Sep2015, 12:37	4.86
Pond 5	0.6723127	288.8	19Sep2015, 13:52	4.86
Reach-13	0.6723127	288.8	19Sep2015, 13:55	4.85
Area 16	0.2959900	412.0	19Sep2015, 12:49	4.91
Area 22	0.1087000	235.1	19Sep2015, 12:32	6.07
Junction-13	4.6752170	2159.6	19Sep2015, 13:04	3.88
Reach-14	4.6752170	2158.6	19Sep2015, 13:10	3.84
Area 23	0.2300500	322.6	19Sep2015, 12:55	5.40
Junction-14	4.9052670	2456.1	19Sep2015, 13:08	3.91
Reach-15	4.9052670	2455.9	19Sep2015, 13:10	3.90
Area 24	0.1367700	238.1	19Sep2015, 12:45	5.92
Junction-1	5.0420370	2631.9	19Sep2015, 13:07	3.96

Project: MBTS Simulation Run: 2050 A1fi - 025 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:55:32

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1fi - 025 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	738.6	19Sep2015, 13:14	3.74
Area 2	0.2143070	251.0	19Sep2015, 12:51	4.24
Area 1	0.1202500	217.8	19Sep2015, 12:26	4.50
Pond 1	0.1202500	83.1	19Sep2015, 13:01	4.44
Reach-1	0.1202500	83.0	19Sep2015, 13:13	4.39
Junction-2	0.3345570	326.9	19Sep2015, 12:53	4.29
Reach-2	0.3345570	326.9	19Sep2015, 12:56	4.28
Area 3	0.1890000	212.1	19Sep2015, 12:41	3.56
Junction-3	0.5235570	521.2	19Sep2015, 12:49	4.02
Reach-3	0.5235570	521.2	19Sep2015, 12:51	4.01
Area 4	0.2384815	273.8	19Sep2015, 12:46	3.89
Junction-4	0.7620385	792.2	19Sep2015, 12:49	3.98
Reach-4	0.7620385	791.7	19Sep2015, 12:56	3.95
Area 6	0.3474700	357.5	19Sep2015, 13:09	4.56
Junction-5	2.0244085	1835.4	19Sep2015, 13:04	3.96
Pond 2	2.0244085	429.7	19Sep2015, 15:41	2.73
Reach-5	2.0244085	429.7	19Sep2015, 15:46	2.71
Area 7	0.3110400	491.9	19Sep2015, 12:34	4.49
Junction-6	2.3354485	580.5	19Sep2015, 12:34	2.95
Pond 3	2.3354485	376.3	19Sep2015, 18:33	2.58
Reach-6	2.3354485	376.3	19Sep2015, 18:35	2.56
Area 9	0.2393600	251.9	19Sep2015, 12:45	3.55
Area 10	0.1111700	155.4	19Sep2015, 12:30	3.68
Junction-7	0.3505300	383.6	19Sep2015, 12:38	3.59
Reach-7	0.3505300	383.4	19Sep2015, 12:46	3.56
Area 11	0.3052000	287.7	19Sep2015, 13:02	3.87
Junction-8	0.6557300	650.5	19Sep2015, 12:52	3.71

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	650.2	19Sep2015, 12:55	3.69
Area 13	0.0571908	76.4	19Sep2015, 12:43	4.36
Area 12	0.0548863	88.8	19Sep2015, 12:31	4.38
Junction-9	0.7678071	778.7	19Sep2015, 12:51	3.79
Pond 4	0.7678071	560.7	19Sep2015, 13:23	3.79
Reach-9	0.7678071	560.7	19Sep2015, 13:26	3.78
Area 14	0.2956000	341.6	19Sep2015, 12:56	4.46
Area 8	0.1103443	190.3	19Sep2015, 12:27	4.38
Junction-10	3.5091999	1189.2	19Sep2015, 13:02	3.05
Reach-10	3.5091999	1189.1	19Sep2015, 13:06	3.03
Area 15	0.0890144	135.6	19Sep2015, 12:33	4.26
Junction-11	3.5982143	1260.6	19Sep2015, 13:01	3.06
Reach-11	3.5982143	1259.8	19Sep2015, 13:15	2.98
Area 19	0.1726400	255.9	19Sep2015, 12:31	4.03
Area 18	0.1713200	177.9	19Sep2015, 12:51	3.77
Area 17	0.1551600	172.5	19Sep2015, 12:48	3.89
Reach-12	0.1551600	172.4	19Sep2015, 12:54	3.87
Area 21	0.1163900	191.7	19Sep2015, 12:28	4.26
Area 20	0.0568027	98.5	19Sep2015, 12:38	5.31
Junction-12	0.6723127	813.6	19Sep2015, 12:37	4.08
Pond 5	0.6723127	264.9	19Sep2015, 13:47	4.07
Reach-13	0.6723127	264.9	19Sep2015, 13:50	4.07
Area 16	0.2959900	344.7	19Sep2015, 12:49	4.12
Area 22	0.1087000	202.1	19Sep2015, 12:32	5.20
Junction-13	4.6752170	1861.2	19Sep2015, 13:07	3.26
Reach-14	4.6752170	1860.9	19Sep2015, 13:14	3.23
Area 23	0.2300500	273.2	19Sep2015, 12:56	4.58
Junction-14	4.9052670	2109.2	19Sep2015, 13:09	3.29
Reach-15	4.9052670	2109.0	19Sep2015, 13:11	3.28
Area 24	0.1367700	204.0	19Sep2015, 12:45	5.06
Junction-1	5.0420370	2261.5	19Sep2015, 13:06	3.33

Project: MBTS Simulation Run: 2050 A1fi - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:55:56

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1fi - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1063.7	19Sep2015, 13:13	5.33
Area 2	0.2143070	351.7	19Sep2015, 12:50	5.91
Area 1	0.1202500	300.9	19Sep2015, 12:26	6.23
Pond 1	0.1202500	126.2	19Sep2015, 12:58	6.14
Reach-1	0.1202500	126.1	19Sep2015, 13:08	6.09
Junction-2	0.3345570	452.3	19Sep2015, 12:59	5.98
Reach-2	0.3345570	452.1	19Sep2015, 13:01	5.97
Area 3	0.1890000	309.0	19Sep2015, 12:40	5.12
Junction-3	0.5235570	734.4	19Sep2015, 12:48	5.66
Reach-3	0.5235570	734.3	19Sep2015, 12:50	5.65
Area 4	0.2384815	390.8	19Sep2015, 12:45	5.52
Junction-4	0.7620385	1121.8	19Sep2015, 12:48	5.61
Reach-4	0.7620385	1120.8	19Sep2015, 12:55	5.57
Area 6	0.3474700	493.0	19Sep2015, 13:08	6.28
Junction-5	2.0244085	2596.9	19Sep2015, 13:02	5.59
Pond 2	2.0244085	658.2	19Sep2015, 15:20	4.11
Reach-5	2.0244085	658.1	19Sep2015, 15:24	4.09
Area 7	0.3110400	680.1	19Sep2015, 12:33	6.21
Junction-6	2.3354485	777.8	19Sep2015, 12:34	4.37
Pond 3	2.3354485	530.7	19Sep2015, 18:46	3.55
Reach-6	2.3354485	530.7	19Sep2015, 18:48	3.53
Area 9	0.2393600	367.2	19Sep2015, 12:45	5.11
Area 10	0.1111700	224.6	19Sep2015, 12:29	5.27
Junction-7	0.3505300	558.3	19Sep2015, 12:37	5.16
Reach-7	0.3505300	557.7	19Sep2015, 12:45	5.12
Area 11	0.3052000	411.3	19Sep2015, 13:01	5.49
Junction-8	0.6557300	937.0	19Sep2015, 12:50	5.30

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	936.9	19Sep2015, 12:53	5.28
Area 13	0.0571908	106.2	19Sep2015, 12:42	6.06
Area 12	0.0548863	123.4	19Sep2015, 12:30	6.08
Junction-9	0.7678071	1119.5	19Sep2015, 12:50	5.40
Pond 4	0.7678071	810.4	19Sep2015, 13:21	5.39
Reach-9	0.7678071	810.3	19Sep2015, 13:23	5.38
Area 14	0.2956000	473.2	19Sep2015, 12:55	6.17
Area 8	0.1103443	264.6	19Sep2015, 12:27	6.09
Junction-10	3.5091999	1577.7	19Sep2015, 13:12	4.24
Reach-10	3.5091999	1577.6	19Sep2015, 13:15	4.21
Area 15	0.0890144	189.6	19Sep2015, 12:32	5.95
Junction-11	3.5982143	1649.9	19Sep2015, 13:13	4.25
Reach-11	3.5982143	1649.5	19Sep2015, 13:26	4.16
Area 19	0.1726400	362.4	19Sep2015, 12:31	5.68
Area 18	0.1713200	255.7	19Sep2015, 12:50	5.37
Area 17	0.1551600	246.2	19Sep2015, 12:48	5.51
Reach-12	0.1551600	246.0	19Sep2015, 12:53	5.49
Area 21	0.1163900	268.1	19Sep2015, 12:28	5.95
Area 20	0.0568027	131.4	19Sep2015, 12:37	7.13
Junction-12	0.6723127	1152.3	19Sep2015, 12:37	5.73
Pond 5	0.6723127	315.7	19Sep2015, 13:57	5.72
Reach-13	0.6723127	315.7	19Sep2015, 13:59	5.72
Area 16	0.2959900	485.7	19Sep2015, 12:48	5.78
Area 22	0.1087000	270.8	19Sep2015, 12:32	7.01
Junction-13	4.6752170	2463.9	19Sep2015, 12:59	4.55
Reach-14	4.6752170	2463.0	19Sep2015, 13:05	4.51
Area 23	0.2300500	376.4	19Sep2015, 12:55	6.31
Junction-14	4.9052670	2824.3	19Sep2015, 13:04	4.59
Reach-15	4.9052670	2823.7	19Sep2015, 13:06	4.58
Area 24	0.1367700	274.9	19Sep2015, 12:45	6.86
Junction-1	5.0420370	3039.8	19Sep2015, 13:05	4.64

Project: MBTS Simulation Run: 2050 A1fi - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:57:03

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1fi - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1445.9	19Sep2015, 13:12	7.23
Area 2	0.2143070	468.3	19Sep2015, 12:50	7.89
Area 1	0.1202500	396.6	19Sep2015, 12:25	8.24
Pond 1	0.1202500	221.2	19Sep2015, 12:49	8.14
Reach-1	0.1202500	221.1	19Sep2015, 12:58	8.08
Junction-2	0.3345570	681.5	19Sep2015, 12:53	7.95
Reach-2	0.3345570	681.4	19Sep2015, 12:55	7.94
Area 3	0.1890000	423.4	19Sep2015, 12:40	6.99
Junction-3	0.5235570	1055.8	19Sep2015, 12:50	7.60
Reach-3	0.5235570	1055.7	19Sep2015, 12:52	7.59
Area 4	0.2384815	527.5	19Sep2015, 12:45	7.44
Junction-4	0.7620385	1569.6	19Sep2015, 12:50	7.54
Reach-4	0.7620385	1568.1	19Sep2015, 12:56	7.50
Area 6	0.3474700	648.7	19Sep2015, 13:08	8.29
Junction-5	2.0244085	3569.8	19Sep2015, 13:02	7.51
Pond 2	2.0244085	1272.0	19Sep2015, 14:32	5.89
Reach-5	2.0244085	1272.0	19Sep2015, 14:35	5.86
Area 7	0.3110400	896.6	19Sep2015, 12:33	8.22
Junction-6	2.3354485	1396.9	19Sep2015, 14:15	6.18
Pond 3	2.3354485	1138.3	19Sep2015, 16:24	5.22
Reach-6	2.3354485	1138.0	19Sep2015, 16:26	5.20
Area 9	0.2393600	503.5	19Sep2015, 12:44	6.98
Area 10	0.1111700	305.8	19Sep2015, 12:28	7.17
Junction-7	0.3505300	764.4	19Sep2015, 12:37	7.04
Reach-7	0.3505300	763.8	19Sep2015, 12:44	6.99
Area 11	0.3052000	555.8	19Sep2015, 13:00	7.41
Junction-8	0.6557300	1273.4	19Sep2015, 12:49	7.19

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1273.1	19Sep2015, 12:52	7.17
Area 13	0.0571908	140.8	19Sep2015, 12:42	8.05
Area 12	0.0548863	163.3	19Sep2015, 12:30	8.08
Junction-9	0.7678071	1519.1	19Sep2015, 12:48	7.30
Pond 4	0.7678071	1132.3	19Sep2015, 13:18	7.29
Reach-9	0.7678071	1132.2	19Sep2015, 13:20	7.28
Area 14	0.2956000	624.9	19Sep2015, 12:55	8.17
Area 8	0.1103443	350.0	19Sep2015, 12:26	8.09
Junction-10	3.5091999	2120.9	19Sep2015, 13:09	6.00
Reach-10	3.5091999	2120.6	19Sep2015, 13:13	5.97
Area 15	0.0890144	252.1	19Sep2015, 12:32	7.93
Junction-11	3.5982143	2221.8	19Sep2015, 13:10	6.02
Reach-11	3.5982143	2221.0	19Sep2015, 13:22	5.92
Area 19	0.1726400	486.2	19Sep2015, 12:30	7.63
Area 18	0.1713200	347.1	19Sep2015, 12:50	7.28
Area 17	0.1551600	332.4	19Sep2015, 12:47	7.44
Reach-12	0.1551600	332.3	19Sep2015, 12:52	7.41
Area 21	0.1163900	356.3	19Sep2015, 12:28	7.94
Area 20	0.0568027	168.6	19Sep2015, 12:37	9.23
Junction-12	0.6723127	1546.7	19Sep2015, 12:36	7.68
Pond 5	0.6723127	377.4	19Sep2015, 14:03	7.67
Reach-13	0.6723127	377.4	19Sep2015, 14:05	7.66
Area 16	0.2959900	649.7	19Sep2015, 12:48	7.74
Area 22	0.1087000	348.6	19Sep2015, 12:31	9.10
Junction-13	4.6752170	3141.9	19Sep2015, 13:11	6.36
Reach-14	4.6752170	3141.6	19Sep2015, 13:17	6.31
Area 23	0.2300500	494.9	19Sep2015, 12:55	8.32
Junction-14	4.9052670	3565.2	19Sep2015, 13:12	6.41
Reach-15	4.9052670	3565.1	19Sep2015, 13:14	6.39
Area 24	0.1367700	355.6	19Sep2015, 12:44	8.93
Junction-1	5.0420370	3870.8	19Sep2015, 12:59	6.46

Project: MBTS Simulation Run: 2100 A1b - 025 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:57:21

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1b - 025 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	658.6	19Sep2015, 13:15	3.35
Area 2	0.2143070	226.0	19Sep2015, 12:51	3.82
Area 1	0.1202500	196.9	19Sep2015, 12:26	4.07
Pond 1	0.1202500	76.6	19Sep2015, 13:01	4.01
Reach-1	0.1202500	76.6	19Sep2015, 13:13	3.97
Junction-2	0.3345570	296.2	19Sep2015, 12:54	3.88
Reach-2	0.3345570	296.2	19Sep2015, 12:56	3.87
Area 3	0.1890000	188.4	19Sep2015, 12:41	3.17
Junction-3	0.5235570	468.5	19Sep2015, 12:49	3.62
Reach-3	0.5235570	468.5	19Sep2015, 12:51	3.61
Area 4	0.2384815	244.9	19Sep2015, 12:46	3.50
Junction-4	0.7620385	710.7	19Sep2015, 12:49	3.57
Reach-4	0.7620385	710.2	19Sep2015, 12:57	3.55
Area 6	0.3474700	323.5	19Sep2015, 13:09	4.13
Junction-5	2.0244085	1646.7	19Sep2015, 13:04	3.56
Pond 2	2.0244085	374.0	19Sep2015, 15:48	2.39
Reach-5	2.0244085	374.0	19Sep2015, 15:53	2.38
Area 7	0.3110400	444.8	19Sep2015, 12:34	4.06
Junction-6	2.3354485	531.4	19Sep2015, 12:34	2.60
Pond 3	2.3354485	338.3	19Sep2015, 18:26	2.33
Reach-6	2.3354485	338.3	19Sep2015, 18:29	2.31
Area 9	0.2393600	223.7	19Sep2015, 12:46	3.17
Area 10	0.1111700	138.5	19Sep2015, 12:30	3.30
Junction-7	0.3505300	340.8	19Sep2015, 12:38	3.21
Reach-7	0.3505300	340.4	19Sep2015, 12:47	3.18
Area 11	0.3052000	257.2	19Sep2015, 13:02	3.48
Junction-8	0.6557300	579.8	19Sep2015, 12:52	3.32

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	579.6	19Sep2015, 12:56	3.31
Area 13	0.0571908	68.9	19Sep2015, 12:43	3.94
Area 12	0.0548863	80.1	19Sep2015, 12:31	3.96
Junction-9	0.7678071	694.7	19Sep2015, 12:52	3.40
Pond 4	0.7678071	531.1	19Sep2015, 13:20	3.40
Reach-9	0.7678071	531.1	19Sep2015, 13:23	3.39
Area 14	0.2956000	308.6	19Sep2015, 12:56	4.04
Area 8	0.1103443	171.7	19Sep2015, 12:27	3.96
Junction-10	3.5091999	1103.7	19Sep2015, 13:04	2.75
Reach-10	3.5091999	1103.1	19Sep2015, 13:08	2.73
Area 15	0.0890144	122.1	19Sep2015, 12:33	3.84
Junction-11	3.5982143	1160.6	19Sep2015, 13:07	2.75
Reach-11	3.5982143	1160.0	19Sep2015, 13:21	2.69
Area 19	0.1726400	229.5	19Sep2015, 12:32	3.62
Area 18	0.1713200	158.7	19Sep2015, 12:52	3.38
Area 17	0.1551600	154.2	19Sep2015, 12:49	3.49
Reach-12	0.1551600	154.1	19Sep2015, 12:54	3.47
Area 21	0.1163900	172.7	19Sep2015, 12:29	3.85
Area 20	0.0568027	90.1	19Sep2015, 12:38	4.85
Junction-12	0.6723127	729.8	19Sep2015, 12:38	3.67
Pond 5	0.6723127	252.8	19Sep2015, 13:44	3.67
Reach-13	0.6723127	252.7	19Sep2015, 13:46	3.66
Area 16	0.2959900	309.6	19Sep2015, 12:49	3.71
Area 22	0.1087000	184.6	19Sep2015, 12:32	4.75
Junction-13	4.6752170	1706.0	19Sep2015, 13:06	2.94
Reach-14	4.6752170	1705.9	19Sep2015, 13:13	2.91
Area 23	0.2300500	247.4	19Sep2015, 12:56	4.15
Junction-14	4.9052670	1932.9	19Sep2015, 13:08	2.97
Reach-15	4.9052670	1932.8	19Sep2015, 13:10	2.96
Area 24	0.1367700	186.0	19Sep2015, 12:45	4.61
Junction-1	5.0420370	2073.7	19Sep2015, 13:06	3.00

Project: MBTS Simulation Run: 2100 A1b - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:57:41

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1b - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	664.8	19Sep2015, 13:15	3.38
Area 2	0.2143070	227.9	19Sep2015, 12:51	3.85
Area 1	0.1202500	198.6	19Sep2015, 12:26	4.11
Pond 1	0.1202500	77.1	19Sep2015, 13:01	4.05
Reach-1	0.1202500	77.1	19Sep2015, 13:13	4.01
Junction-2	0.3345570	298.6	19Sep2015, 12:54	3.91
Reach-2	0.3345570	298.6	19Sep2015, 12:56	3.90
Area 3	0.1890000	190.2	19Sep2015, 12:41	3.20
Junction-3	0.5235570	472.7	19Sep2015, 12:49	3.65
Reach-3	0.5235570	472.7	19Sep2015, 12:51	3.64
Area 4	0.2384815	247.2	19Sep2015, 12:46	3.53
Junction-4	0.7620385	717.0	19Sep2015, 12:49	3.61
Reach-4	0.7620385	716.6	19Sep2015, 12:57	3.58
Area 6	0.3474700	326.2	19Sep2015, 13:09	4.16
Junction-5	2.0244085	1661.4	19Sep2015, 13:04	3.59
Pond 2	2.0244085	378.3	19Sep2015, 15:48	2.42
Reach-5	2.0244085	378.3	19Sep2015, 15:52	2.40
Area 7	0.3110400	448.5	19Sep2015, 12:34	4.10
Junction-6	2.3354485	535.3	19Sep2015, 12:34	2.63
Pond 3	2.3354485	341.2	19Sep2015, 18:27	2.35
Reach-6	2.3354485	341.2	19Sep2015, 18:29	2.33
Area 9	0.2393600	225.9	19Sep2015, 12:46	3.20
Area 10	0.1111700	139.8	19Sep2015, 12:30	3.33
Junction-7	0.3505300	344.1	19Sep2015, 12:38	3.24
Reach-7	0.3505300	344.0	19Sep2015, 12:47	3.21
Area 11	0.3052000	259.6	19Sep2015, 13:02	3.51
Junction-8	0.6557300	585.5	19Sep2015, 12:52	3.35

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	585.3	19Sep2015, 12:56	3.34
Area 13	0.0571908	69.5	19Sep2015, 12:43	3.97
Area 12	0.0548863	80.8	19Sep2015, 12:31	3.99
Junction-9	0.7678071	701.5	19Sep2015, 12:52	3.43
Pond 4	0.7678071	533.3	19Sep2015, 13:20	3.43
Reach-9	0.7678071	533.3	19Sep2015, 13:23	3.42
Area 14	0.2956000	311.2	19Sep2015, 12:56	4.07
Area 8	0.1103443	173.2	19Sep2015, 12:27	3.99
Junction-10	3.5091999	1110.8	19Sep2015, 13:03	2.77
Reach-10	3.5091999	1110.3	19Sep2015, 13:08	2.75
Area 15	0.0890144	123.1	19Sep2015, 12:33	3.88
Junction-11	3.5982143	1169.2	19Sep2015, 13:06	2.78
Reach-11	3.5982143	1168.6	19Sep2015, 13:21	2.71
Area 19	0.1726400	231.6	19Sep2015, 12:32	3.65
Area 18	0.1713200	160.2	19Sep2015, 12:52	3.41
Area 17	0.1551600	155.6	19Sep2015, 12:49	3.52
Reach-12	0.1551600	155.6	19Sep2015, 12:54	3.50
Area 21	0.1163900	174.1	19Sep2015, 12:29	3.88
Area 20	0.0568027	90.7	19Sep2015, 12:38	4.89
Junction-12	0.6723127	736.3	19Sep2015, 12:38	3.70
Pond 5	0.6723127	253.7	19Sep2015, 13:44	3.70
Reach-13	0.6723127	253.7	19Sep2015, 13:47	3.69
Area 16	0.2959900	312.3	19Sep2015, 12:49	3.74
Area 22	0.1087000	186.0	19Sep2015, 12:32	4.78
Junction-13	4.6752170	1717.9	19Sep2015, 13:06	2.96
Reach-14	4.6752170	1717.8	19Sep2015, 13:14	2.93
Area 23	0.2300500	249.4	19Sep2015, 12:56	4.18
Junction-14	4.9052670	1946.6	19Sep2015, 13:08	2.99
Reach-15	4.9052670	1946.5	19Sep2015, 13:10	2.98
Area 24	0.1367700	187.4	19Sep2015, 12:45	4.65
Junction-1	5.0420370	2088.2	19Sep2015, 13:06	3.03

Project: MBTS   Simulation Run: 2100 A1b - 100 yr

Start of Run: 19Sep2015, 00:00   Basin Model: MBTS Watershed -
End of Run: 20Sep2015, 00:01   Meteorologic Model: 2100 A1b - 100 yr
Compute Time: 29Sep2015, 16:58:04   Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1122.5	19Sep2015, 13:13	5.62
Area 2	0.2143070	369.8	19Sep2015, 12:50	6.22
Area 1	0.1202500	315.7	19Sep2015, 12:25	6.54
Pond 1	0.1202500	142.3	19Sep2015, 12:55	6.45
Reach-1	0.1202500	142.1	19Sep2015, 13:05	6.40
Junction-2	0.3345570	491.2	19Sep2015, 12:58	6.28
Reach-2	0.3345570	491.1	19Sep2015, 13:00	6.27
Area 3	0.1890000	326.6	19Sep2015, 12:40	5.40
Junction-3	0.5235570	772.9	19Sep2015, 12:48	5.96
Reach-3	0.5235570	772.7	19Sep2015, 12:50	5.95
Area 4	0.2384815	411.9	19Sep2015, 12:45	5.81
Junction-4	0.7620385	1181.3	19Sep2015, 12:48	5.91
Reach-4	0.7620385	1180.4	19Sep2015, 12:54	5.87
Area 6	0.3474700	517.1	19Sep2015, 13:08	6.59
Junction-5	2.0244085	2741.9	19Sep2015, 13:04	5.88
Pond 2	2.0244085	1003.6	19Sep2015, 14:35	4.38
Reach-5	2.0244085	1002.2	19Sep2015, 14:38	4.36
Area 7	0.3110400	713.7	19Sep2015, 12:33	6.52
Junction-6	2.3354485	1096.0	19Sep2015, 14:38	4.64
Pond 3	2.3354485	603.7	19Sep2015, 17:55	3.79
Reach-6	2.3354485	603.7	19Sep2015, 17:57	3.77
Area 9	0.2393600	388.1	19Sep2015, 12:45	5.40
Area 10	0.1111700	237.1	19Sep2015, 12:29	5.56
Junction-7	0.3505300	590.0	19Sep2015, 12:37	5.45
Reach-7	0.3505300	589.5	19Sep2015, 12:45	5.41
Area 11	0.3052000	433.5	19Sep2015, 13:01	5.78
Junction-8	0.6557300	988.8	19Sep2015, 12:50	5.58

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	988.4	19Sep2015, 12:53	5.57
Area 13	0.0571908	111.6	19Sep2015, 12:42	6.37
Area 12	0.0548863	129.6	19Sep2015, 12:30	6.39
Junction-9	0.7678071	1181.0	19Sep2015, 12:50	5.69
Pond 4	0.7678071	861.1	19Sep2015, 13:20	5.68
Reach-9	0.7678071	861.0	19Sep2015, 13:23	5.67
Area 14	0.2956000	496.8	19Sep2015, 12:55	6.48
Area 8	0.1103443	277.8	19Sep2015, 12:27	6.40
Junction-10	3.5091999	1663.0	19Sep2015, 13:11	4.50
Reach-10	3.5091999	1662.7	19Sep2015, 13:15	4.47
Area 15	0.0890144	199.2	19Sep2015, 12:32	6.25
Junction-11	3.5982143	1739.6	19Sep2015, 13:12	4.51
Reach-11	3.5982143	1739.1	19Sep2015, 13:25	4.42
Area 19	0.1726400	381.5	19Sep2015, 12:31	5.98
Area 18	0.1713200	269.8	19Sep2015, 12:50	5.67
Area 17	0.1551600	259.5	19Sep2015, 12:47	5.81
Reach-12	0.1551600	259.3	19Sep2015, 12:52	5.78
Area 21	0.1163900	281.8	19Sep2015, 12:28	6.26
Area 20	0.0568027	137.2	19Sep2015, 12:37	7.46
Junction-12	0.6723127	1213.1	19Sep2015, 12:37	6.03
Pond 5	0.6723127	325.1	19Sep2015, 13:58	6.02
Reach-13	0.6723127	325.1	19Sep2015, 14:00	6.02
Area 16	0.2959900	511.1	19Sep2015, 12:48	6.08
Area 22	0.1087000	282.9	19Sep2015, 12:32	7.33
Junction-13	4.6752170	2562.2	19Sep2015, 12:57	4.82
Reach-14	4.6752170	2559.7	19Sep2015, 13:04	4.78
Area 23	0.2300500	394.8	19Sep2015, 12:55	6.62
Junction-14	4.9052670	2943.0	19Sep2015, 13:03	4.86
Reach-15	4.9052670	2942.3	19Sep2015, 13:05	4.85
Area 24	0.1367700	287.5	19Sep2015, 12:45	7.18
Junction-1	5.0420370	3175.1	19Sep2015, 13:03	4.92

Project: MBTS Simulation Run: 2100 A1fi - 025 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 16:58:27

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1fi - 025 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1241.2	19Sep2015, 13:13	6.21
Area 2	0.2143070	406.1	19Sep2015, 12:50	6.83
Area 1	0.1202500	345.6	19Sep2015, 12:25	7.16
Pond 1	0.1202500	172.5	19Sep2015, 12:52	7.07
Reach-1	0.1202500	172.3	19Sep2015, 13:02	7.01
Junction-2	0.3345570	564.2	19Sep2015, 12:56	6.90
Reach-2	0.3345570	564.1	19Sep2015, 12:58	6.88
Area 3	0.1890000	362.1	19Sep2015, 12:40	5.98
Junction-3	0.5235570	873.4	19Sep2015, 12:52	6.56
Reach-3	0.5235570	873.3	19Sep2015, 12:54	6.55
Area 4	0.2384815	454.4	19Sep2015, 12:45	6.41
Junction-4	0.7620385	1309.4	19Sep2015, 12:52	6.51
Reach-4	0.7620385	1307.8	19Sep2015, 12:58	6.47
Area 6	0.3474700	565.7	19Sep2015, 13:08	7.22
Junction-5	2.0244085	3051.4	19Sep2015, 13:03	6.48
Pond 2	2.0244085	1157.2	19Sep2015, 14:29	4.93
Reach-5	2.0244085	1157.2	19Sep2015, 14:32	4.91
Area 7	0.3110400	781.2	19Sep2015, 12:33	7.15
Junction-6	2.3354485	1270.6	19Sep2015, 14:12	5.21
Pond 3	2.3354485	737.7	19Sep2015, 15:48	4.31
Reach-6	2.3354485	737.7	19Sep2015, 15:51	4.29
Area 9	0.2393600	430.4	19Sep2015, 12:44	5.98
Area 10	0.1111700	262.3	19Sep2015, 12:29	6.15
Junction-7	0.3505300	654.0	19Sep2015, 12:37	6.03
Reach-7	0.3505300	653.4	19Sep2015, 12:44	5.99
Area 11	0.3052000	478.5	19Sep2015, 13:01	6.38
Junction-8	0.6557300	1093.0	19Sep2015, 12:50	6.17

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1092.9	19Sep2015, 12:52	6.15
Area 13	0.0571908	122.4	19Sep2015, 12:42	6.99
Area 12	0.0548863	142.0	19Sep2015, 12:30	7.01
Junction-9	0.7678071	1305.4	19Sep2015, 12:49	6.28
Pond 4	0.7678071	961.9	19Sep2015, 13:19	6.27
Reach-9	0.7678071	961.8	19Sep2015, 13:21	6.26
Area 14	0.2956000	544.1	19Sep2015, 12:55	7.10
Area 8	0.1103443	304.4	19Sep2015, 12:27	7.02
Junction-10	3.5091999	1832.7	19Sep2015, 13:10	5.05
Reach-10	3.5091999	1832.4	19Sep2015, 13:14	5.02
Area 15	0.0890144	218.7	19Sep2015, 12:32	6.86
Junction-11	3.5982143	1918.2	19Sep2015, 13:11	5.06
Reach-11	3.5982143	1917.7	19Sep2015, 13:24	4.97
Area 19	0.1726400	420.0	19Sep2015, 12:31	6.58
Area 18	0.1713200	298.2	19Sep2015, 12:50	6.26
Area 17	0.1551600	286.3	19Sep2015, 12:47	6.41
Reach-12	0.1551600	286.2	19Sep2015, 12:52	6.38
Area 21	0.1163900	309.2	19Sep2015, 12:28	6.87
Area 20	0.0568027	148.8	19Sep2015, 12:37	8.11
Junction-12	0.6723127	1335.9	19Sep2015, 12:36	6.63
Pond 5	0.6723127	344.1	19Sep2015, 14:00	6.63
Reach-13	0.6723127	344.1	19Sep2015, 14:02	6.62
Area 16	0.2959900	562.1	19Sep2015, 12:48	6.69
Area 22	0.1087000	307.2	19Sep2015, 12:32	7.99
Junction-13	4.6752170	2752.1	19Sep2015, 12:55	5.38
Reach-14	4.6752170	2750.7	19Sep2015, 13:02	5.34
Area 23	0.2300500	431.8	19Sep2015, 12:55	7.24
Junction-14	4.9052670	3175.0	19Sep2015, 13:01	5.43
Reach-15	4.9052670	3173.9	19Sep2015, 13:03	5.42
Area 24	0.1367700	312.7	19Sep2015, 12:44	7.82
Junction-1	5.0420370	3437.8	19Sep2015, 13:01	5.48

Project: MBTS Simulation Run: 2100 A1fi - 050 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 17:01:06

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1fi - 050 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1777.8	19Sep2015, 13:12	8.89
Area 2	0.2143070	568.7	19Sep2015, 12:49	9.61
Area 1	0.1202500	478.5	19Sep2015, 12:25	9.99
Pond 1	0.1202500	295.8	19Sep2015, 12:46	9.87
Reach-1	0.1202500	295.8	19Sep2015, 12:54	9.80
Junction-2	0.3345570	861.3	19Sep2015, 12:51	9.68
Reach-2	0.3345570	861.1	19Sep2015, 12:53	9.66
Area 3	0.1890000	523.1	19Sep2015, 12:39	8.64
Junction-3	0.5235570	1337.4	19Sep2015, 12:48	9.29
Reach-3	0.5235570	1337.3	19Sep2015, 12:50	9.28
Area 4	0.2384815	645.9	19Sep2015, 12:44	9.13
Junction-4	0.7620385	1973.3	19Sep2015, 12:48	9.23
Reach-4	0.7620385	1972.7	19Sep2015, 12:54	9.18
Area 6	0.3474700	782.0	19Sep2015, 13:07	10.03
Junction-5	2.0244085	4395.2	19Sep2015, 13:00	9.20
Pond 2	2.0244085	1490.3	19Sep2015, 14:33	7.44
Reach-5	2.0244085	1490.3	19Sep2015, 14:36	7.41
Area 7	0.3110400	1081.8	19Sep2015, 12:33	9.97
Junction-6	2.3354485	1636.1	19Sep2015, 14:16	7.75
Pond 3	2.3354485	1409.3	19Sep2015, 16:20	6.70
Reach-6	2.3354485	1409.3	19Sep2015, 16:22	6.68
Area 9	0.2393600	622.2	19Sep2015, 12:44	8.63
Area 10	0.1111700	376.4	19Sep2015, 12:28	8.83
Junction-7	0.3505300	944.0	19Sep2015, 12:36	8.69
Reach-7	0.3505300	943.3	19Sep2015, 12:43	8.64
Area 11	0.3052000	681.0	19Sep2015, 13:00	9.09
Junction-8	0.6557300	1565.5	19Sep2015, 12:48	8.85

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1565.2	19Sep2015, 12:51	8.83
Area 13	0.0571908	170.4	19Sep2015, 12:42	9.79
Area 12	0.0548863	197.6	19Sep2015, 12:30	9.82
Junction-9	0.7678071	1866.2	19Sep2015, 12:48	8.97
Pond 4	0.7678071	1508.9	19Sep2015, 13:11	8.96
Reach-9	0.7678071	1508.6	19Sep2015, 13:14	8.95
Area 14	0.2956000	754.8	19Sep2015, 12:55	9.91
Area 8	0.1103443	423.5	19Sep2015, 12:26	9.83
Junction-10	3.5091999	2703.0	19Sep2015, 13:09	7.55
Reach-10	3.5091999	2702.6	19Sep2015, 13:12	7.52
Area 15	0.0890144	305.8	19Sep2015, 12:32	9.65
Junction-11	3.5982143	2824.0	19Sep2015, 13:11	7.57
Reach-11	3.5982143	2822.4	19Sep2015, 13:22	7.46
Area 19	0.1726400	593.1	19Sep2015, 12:30	9.33
Area 18	0.1713200	426.4	19Sep2015, 12:49	8.95
Area 17	0.1551600	407.0	19Sep2015, 12:47	9.12
Reach-12	0.1551600	406.9	19Sep2015, 12:51	9.09
Area 21	0.1163900	432.2	19Sep2015, 12:27	9.66
Area 20	0.0568027	200.2	19Sep2015, 12:37	11.04
Junction-12	0.6723127	1887.7	19Sep2015, 12:36	9.38
Pond 5	0.6723127	497.6	19Sep2015, 13:55	9.38
Reach-13	0.6723127	497.6	19Sep2015, 13:57	9.37
Area 16	0.2959900	790.9	19Sep2015, 12:48	9.45
Area 22	0.1087000	414.7	19Sep2015, 12:31	10.90
Junction-13	4.6752170	3900.6	19Sep2015, 13:18	7.94
Reach-14	4.6752170	3899.2	19Sep2015, 13:24	7.89
Area 23	0.2300500	596.4	19Sep2015, 12:54	10.07
Junction-14	4.9052670	4348.9	19Sep2015, 13:11	8.00
Reach-15	4.9052670	4348.8	19Sep2015, 13:13	7.98
Area 24	0.1367700	424.2	19Sep2015, 12:44	10.72
Junction-1	5.0420370	4642.6	19Sep2015, 13:09	8.06

Project: MBTS Simulation Run: 2100 A1fi - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 29Sep2015, 17:01:27

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1fi - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	2192.4	19Sep2015, 13:11	10.99
Area 2	0.2143070	693.0	19Sep2015, 12:49	11.77
Area 1	0.1202500	579.6	19Sep2015, 12:25	12.18
Pond 1	0.1202500	385.0	19Sep2015, 12:44	12.04
Reach-1	0.1202500	384.7	19Sep2015, 12:51	11.96
Junction-2	0.3345570	1077.0	19Sep2015, 12:50	11.84
Reach-2	0.3345570	1076.6	19Sep2015, 12:51	11.82
Area 3	0.1890000	647.9	19Sep2015, 12:39	10.72
Junction-3	0.5235570	1678.1	19Sep2015, 12:47	11.42
Reach-3	0.5235570	1677.5	19Sep2015, 12:48	11.41
Area 4	0.2384815	793.2	19Sep2015, 12:44	11.25
Junction-4	0.7620385	2463.7	19Sep2015, 12:47	11.36
Reach-4	0.7620385	2462.6	19Sep2015, 12:52	11.31
Area 6	0.3474700	946.8	19Sep2015, 13:07	12.22
Junction-5	2.0244085	5411.6	19Sep2015, 12:59	11.32
Pond 2	2.0244085	1780.0	19Sep2015, 14:33	9.38
Reach-5	2.0244085	1780.0	19Sep2015, 14:36	9.35
Area 7	0.3110400	1310.6	19Sep2015, 12:32	12.16
Junction-6	2.3354485	1952.9	19Sep2015, 14:17	9.73
Pond 3	2.3354485	1732.6	19Sep2015, 16:04	8.59
Reach-6	2.3354485	1732.6	19Sep2015, 16:05	8.57
Area 9	0.2393600	770.8	19Sep2015, 12:43	10.71
Area 10	0.1111700	464.5	19Sep2015, 12:28	10.94
Junction-7	0.3505300	1168.7	19Sep2015, 12:36	10.78
Reach-7	0.3505300	1168.0	19Sep2015, 12:42	10.73
Area 11	0.3052000	837.0	19Sep2015, 12:59	11.21
Junction-8	0.6557300	1929.8	19Sep2015, 12:48	10.95

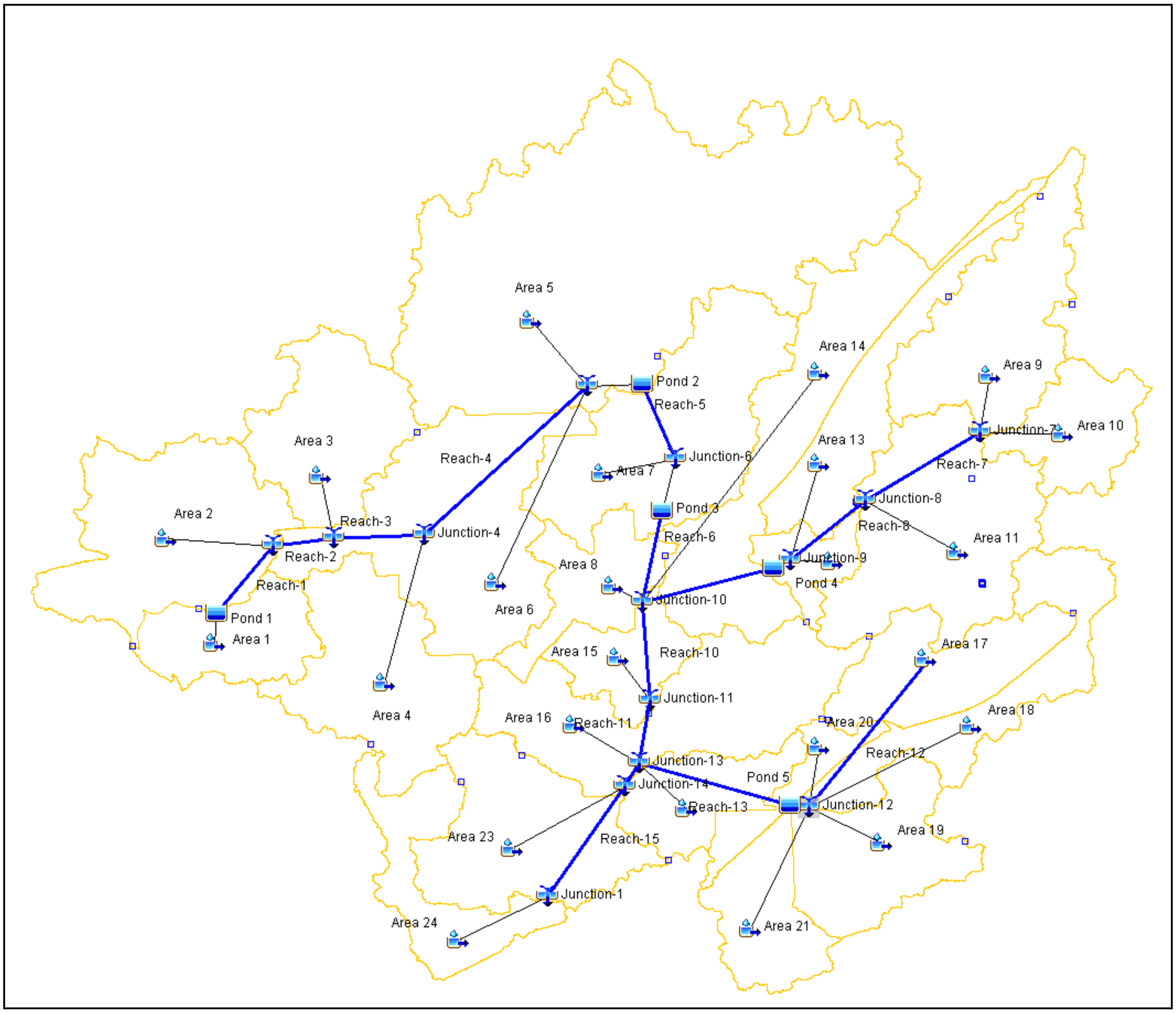
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1929.5	19Sep2015, 12:50	10.93
Area 13	0.0571908	207.1	19Sep2015, 12:41	11.96
Area 12	0.0548863	239.9	19Sep2015, 12:30	12.00
Junction-9	0.7678071	2298.9	19Sep2015, 12:47	11.08
Pond 4	0.7678071	1952.2	19Sep2015, 13:07	11.07
Reach-9	0.7678071	1951.9	19Sep2015, 13:09	11.05
Area 14	0.2956000	915.7	19Sep2015, 12:54	12.09
Area 8	0.1103443	514.2	19Sep2015, 12:26	12.01
Junction-10	3.5091999	3411.0	19Sep2015, 13:05	9.52
Reach-10	3.5091999	3410.8	19Sep2015, 13:08	9.49
Area 15	0.0890144	372.2	19Sep2015, 12:32	11.82
Junction-11	3.5982143	3576.0	19Sep2015, 13:06	9.54
Reach-11	3.5982143	3575.4	19Sep2015, 13:16	9.43
Area 19	0.1726400	725.9	19Sep2015, 12:30	11.48
Area 18	0.1713200	525.3	19Sep2015, 12:49	11.06
Area 17	0.1551600	500.0	19Sep2015, 12:46	11.25
Reach-12	0.1551600	499.7	19Sep2015, 12:50	11.21
Area 21	0.1163900	526.1	19Sep2015, 12:27	11.83
Area 20	0.0568027	238.9	19Sep2015, 12:37	13.29
Junction-12	0.6723127	2311.0	19Sep2015, 12:36	11.52
Pond 5	0.6723127	647.8	19Sep2015, 13:50	11.34
Reach-13	0.6723127	647.8	19Sep2015, 13:52	11.32
Area 16	0.2959900	966.4	19Sep2015, 12:47	11.60
Area 22	0.1087000	495.9	19Sep2015, 12:31	13.15
Junction-13	4.6752170	5014.8	19Sep2015, 13:12	9.93
Reach-14	4.6752170	5013.5	19Sep2015, 13:17	9.87
Area 23	0.2300500	721.7	19Sep2015, 12:54	12.26
Junction-14	4.9052670	5612.1	19Sep2015, 13:15	9.98
Reach-15	4.9052670	5611.6	19Sep2015, 13:16	9.97
Area 24	0.1367700	508.6	19Sep2015, 12:44	12.95
Junction-1	5.0420370	5926.4	19Sep2015, 13:15	10.05

Project: MBTS

Basin Model : MBTS Watershed – Normal

Oct 09 13:58:03 EDT 2015

HEC-HMS



Project: MBTS Simulation Run: 2015 - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 19:43:26

Basin Model: MBTS Watershed -
Meteorologic Model: 2015 - 100 yr
Control Specifications: Control 1

Area 5	0.9149000	808.9	19Sep2015, 13:14	4.08
Area 2	0.2143070	272.9	19Sep2015, 12:51	4.60
Area 1	0.1202500	236.0	19Sep2015, 12:26	4.88
Pond 1	0.1202500	88.7	19Sep2015, 13:02	4.81
Reach-1	0.1202500	88.7	19Sep2015, 13:13	4.76
Junction-2	0.3345570	353.8	19Sep2015, 12:53	4.66
Reach-2	0.3345570	353.7	19Sep2015, 12:55	4.65
Area 3	0.1890000	233.0	19Sep2015, 12:41	3.89
Junction-3	0.5235570	567.3	19Sep2015, 12:49	4.37
Reach-3	0.5235570	567.2	19Sep2015, 12:51	4.37
Area 4	0.2384815	299.2	19Sep2015, 12:46	4.24
Junction-4	0.7620385	863.5	19Sep2015, 12:49	4.33
Reach-4	0.7620385	862.9	19Sep2015, 12:56	4.30
Area 6	0.3474700	387.1	19Sep2015, 13:09	4.93
Junction-5	2.0244085	2000.4	19Sep2015, 13:03	4.31
Pond 2	2.0244085	478.7	19Sep2015, 15:35	3.03
Reach-5	2.0244085	478.7	19Sep2015, 15:40	3.01
Area 7	0.3110400	533.0	19Sep2015, 12:34	4.86
Junction-6	2.3354485	623.4	19Sep2015, 12:34	3.26
Pond 3	2.3354485	407.0	19Sep2015, 18:40	2.79
Reach-6	2.3354485	407.0	19Sep2015, 18:43	2.78
Area 9	0.2393600	276.8	19Sep2015, 12:45	3.89
Area 10	0.1111700	170.4	19Sep2015, 12:29	4.03
Junction-7	0.3505300	421.3	19Sep2015, 12:38	3.93
Reach-7	0.3505300	421.1	19Sep2015, 12:46	3.90
Area 11	0.3052000	314.5	19Sep2015, 13:02	4.22
Junction-8	0.6557300	712.5	19Sep2015, 12:51	4.05

Reach-8	0.6557300	712.1	19Sep2015, 12:54	4.04
Area 13	0.0571908	82.9	19Sep2015, 12:43	4.73
Area 12	0.0548863	96.3	19Sep2015, 12:31	4.75
Junction-9	0.7678071	852.5	19Sep2015, 12:51	4.14
Pond 4	0.7678071	588.6	19Sep2015, 13:25	4.14
Reach-9	0.7678071	588.6	19Sep2015, 13:28	4.13
Area 14	0.2956000	370.4	19Sep2015, 12:56	4.83
Area 8	0.1103443	206.5	19Sep2015, 12:27	4.75
Junction-10	3.5091999	1263.7	19Sep2015, 13:01	3.31
Reach-10	3.5091999	1263.4	19Sep2015, 13:05	3.29
Area 15	0.0890144	147.3	19Sep2015, 12:33	4.62
Junction-11	3.5982143	1341.0	19Sep2015, 13:00	3.32
Reach-11	3.5982143	1340.9	19Sep2015, 13:14	3.24
Area 19	0.1726400	279.1	19Sep2015, 12:31	4.38
Area 18	0.1713200	194.7	19Sep2015, 12:51	4.12
Area 17	0.1551600	188.4	19Sep2015, 12:48	4.24
Reach-12	0.1551600	188.3	19Sep2015, 12:54	4.22
Area 21	0.1163900	208.3	19Sep2015, 12:28	4.63
Area 20	0.0568027	105.7	19Sep2015, 12:38	5.71
Junction-12	0.6723127	887.1	19Sep2015, 12:37	4.43
Pond 5	0.6723127	275.7	19Sep2015, 13:50	4.43
Reach-13	0.6723127	275.7	19Sep2015, 13:52	4.42
Area 16	0.2959900	375.3	19Sep2015, 12:49	4.48
Area 22	0.1087000	212.7	19Sep2015, 12:32	5.47
Junction-13	4.6752170	1997.8	19Sep2015, 13:07	3.54
Reach-14	4.6752170	1997.5	19Sep2015, 13:13	3.51
Area 23	0.2300500	295.8	19Sep2015, 12:56	4.95
Junction-14	4.9052670	2265.1	19Sep2015, 13:09	3.57
Reach-15	4.9052670	2265.0	19Sep2015, 13:11	3.56
Area 24	0.1367700	219.6	19Sep2015, 12:45	5.45
Junction-1	5.0420370	2427.2	19Sep2015, 13:07	3.62

Project: MBTS Simulation Run: 2025 A1b - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 19:59:43

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1b - 100 yr
Control Specifications: Control 1

Area 5	0.9149000	818.6	19Sep2015, 13:14	4.13
Area 2	0.2143070	275.9	19Sep2015, 12:51	4.65
Area 1	0.1202500	238.5	19Sep2015, 12:26	4.93
Pond 1	0.1202500	89.5	19Sep2015, 13:02	4.86
Reach-1	0.1202500	89.4	19Sep2015, 13:13	4.81
Junction-2	0.3345570	357.5	19Sep2015, 12:53	4.71
Reach-2	0.3345570	357.4	19Sep2015, 12:56	4.70
Area 3	0.1890000	235.9	19Sep2015, 12:41	3.94
Junction-3	0.5235570	573.7	19Sep2015, 12:49	4.42
Reach-3	0.5235570	573.5	19Sep2015, 12:50	4.42
Area 4	0.2384815	302.6	19Sep2015, 12:46	4.29
Junction-4	0.7620385	873.2	19Sep2015, 12:49	4.38
Reach-4	0.7620385	872.5	19Sep2015, 12:56	4.34
Area 6	0.3474700	391.2	19Sep2015, 13:09	4.98
Junction-5	2.0244085	2023.0	19Sep2015, 13:03	4.36
Pond 2	2.0244085	485.4	19Sep2015, 15:35	3.07
Reach-5	2.0244085	485.4	19Sep2015, 15:39	3.05
Area 7	0.3110400	538.6	19Sep2015, 12:34	4.92
Junction-6	2.3354485	629.3	19Sep2015, 12:34	3.30
Pond 3	2.3354485	411.0	19Sep2015, 18:42	2.82
Reach-6	2.3354485	411.0	19Sep2015, 18:44	2.81
Area 9	0.2393600	280.2	19Sep2015, 12:45	3.93
Area 10	0.1111700	172.4	19Sep2015, 12:29	4.07
Junction-7	0.3505300	426.5	19Sep2015, 12:38	3.98
Reach-7	0.3505300	426.3	19Sep2015, 12:46	3.94
Area 11	0.3052000	318.2	19Sep2015, 13:02	4.27
Junction-8	0.6557300	721.0	19Sep2015, 12:51	4.10

Reach-8	0.6557300	720.7	19Sep2015, 12:55	4.08
Area 13	0.0571908	83.8	19Sep2015, 12:43	4.78
Area 12	0.0548863	97.4	19Sep2015, 12:31	4.80
Junction-9	0.7678071	862.7	19Sep2015, 12:51	4.19
Pond 4	0.7678071	592.5	19Sep2015, 13:25	4.18
Reach-9	0.7678071	592.5	19Sep2015, 13:28	4.17
Area 14	0.2956000	374.3	19Sep2015, 12:56	4.88
Area 8	0.1103443	208.7	19Sep2015, 12:27	4.80
Junction-10	3.5091999	1272.7	19Sep2015, 13:00	3.35
Reach-10	3.5091999	1272.5	19Sep2015, 13:04	3.32
Area 15	0.0890144	148.9	19Sep2015, 12:33	4.67
Junction-11	3.5982143	1352.1	19Sep2015, 13:00	3.36
Reach-11	3.5982143	1352.0	19Sep2015, 13:14	3.28
Area 19	0.1726400	282.3	19Sep2015, 12:31	4.43
Area 18	0.1713200	197.0	19Sep2015, 12:51	4.16
Area 17	0.1551600	190.6	19Sep2015, 12:48	4.29
Reach-12	0.1551600	190.5	19Sep2015, 12:54	4.27
Area 21	0.1163900	210.6	19Sep2015, 12:28	4.68
Area 20	0.0568027	106.7	19Sep2015, 12:37	5.76
Junction-12	0.6723127	897.4	19Sep2015, 12:37	4.48
Pond 5	0.6723127	277.2	19Sep2015, 13:50	4.48
Reach-13	0.6723127	277.2	19Sep2015, 13:52	4.47
Area 16	0.2959900	379.5	19Sep2015, 12:49	4.53
Area 22	0.1087000	214.8	19Sep2015, 12:32	5.53
Junction-13	4.6752170	2016.6	19Sep2015, 13:06	3.58
Reach-14	4.6752170	2015.8	19Sep2015, 13:13	3.54
Area 23	0.2300500	298.9	19Sep2015, 12:56	5.00
Junction-14	4.9052670	2286.6	19Sep2015, 13:09	3.61
Reach-15	4.9052670	2286.5	19Sep2015, 13:11	3.60
Area 24	0.1367700	221.7	19Sep2015, 12:45	5.51
Junction-1	5.0420370	2449.9	19Sep2015, 13:07	3.65

Project: MBTS Simulation Run: 2025 A1fi - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 20:07:44

Basin Model: MBTS Watershed -
Meteorologic Model: 2025 A1fi - 100 yr
Control Specifications: Control 1

Area 5	0.9149000	1144.5	19Sep2015, 13:13	5.73
Area 2	0.2143070	376.5	19Sep2015, 12:50	6.33
Area 1	0.1202500	321.3	19Sep2015, 12:25	6.65
Pond 1	0.1202500	148.1	19Sep2015, 12:55	6.56
Reach-1	0.1202500	148.0	19Sep2015, 13:04	6.51
Junction-2	0.3345570	505.3	19Sep2015, 12:57	6.40
Reach-2	0.3345570	505.1	19Sep2015, 12:59	6.38
Area 3	0.1890000	333.1	19Sep2015, 12:40	5.51
Junction-3	0.5235570	787.4	19Sep2015, 12:48	6.07
Reach-3	0.5235570	787.2	19Sep2015, 12:50	6.06
Area 4	0.2384815	419.7	19Sep2015, 12:45	5.92
Junction-4	0.7620385	1203.6	19Sep2015, 12:48	6.02
Reach-4	0.7620385	1203.1	19Sep2015, 12:54	5.98
Area 6	0.3474700	526.1	19Sep2015, 13:08	6.71
Junction-5	2.0244085	2800.0	19Sep2015, 13:04	5.99
Pond 2	2.0244085	1114.4	19Sep2015, 14:26	4.48
Reach-5	2.0244085	1113.6	19Sep2015, 14:30	4.46
Area 7	0.3110400	726.2	19Sep2015, 12:33	6.64
Junction-6	2.3354485	1213.8	19Sep2015, 14:30	4.75
Pond 3	2.3354485	626.5	19Sep2015, 17:38	3.88
Reach-6	2.3354485	626.5	19Sep2015, 17:40	3.87
Area 9	0.2393600	395.9	19Sep2015, 12:44	5.50
Area 10	0.1111700	241.8	19Sep2015, 12:29	5.67
Junction-7	0.3505300	601.8	19Sep2015, 12:37	5.56
Reach-7	0.3505300	601.1	19Sep2015, 12:44	5.52
Area 11	0.3052000	441.8	19Sep2015, 13:01	5.89
Junction-8	0.6557300	1008.0	19Sep2015, 12:50	5.69

Reach-8	0.6557300	1007.8	19Sep2015, 12:53	5.68
Area 13	0.0571908	113.6	19Sep2015, 12:42	6.48
Area 12	0.0548863	131.9	19Sep2015, 12:30	6.51
Junction-9	0.7678071	1203.8	19Sep2015, 12:49	5.80
Pond 4	0.7678071	880.0	19Sep2015, 13:20	5.79
Reach-9	0.7678071	879.8	19Sep2015, 13:22	5.78
Area 14	0.2956000	505.5	19Sep2015, 12:55	6.60
Area 8	0.1103443	282.7	19Sep2015, 12:27	6.51
Junction-10	3.5091999	1694.6	19Sep2015, 13:11	4.60
Reach-10	3.5091999	1694.4	19Sep2015, 13:15	4.57
Area 15	0.0890144	202.9	19Sep2015, 12:32	6.36
Junction-11	3.5982143	1773.1	19Sep2015, 13:12	4.61
Reach-11	3.5982143	1772.6	19Sep2015, 13:25	4.52
Area 19	0.1726400	388.6	19Sep2015, 12:31	6.09
Area 18	0.1713200	275.1	19Sep2015, 12:50	5.77
Area 17	0.1551600	264.4	19Sep2015, 12:47	5.92
Reach-12	0.1551600	264.3	19Sep2015, 12:52	5.89
Area 21	0.1163900	286.8	19Sep2015, 12:28	6.37
Area 20	0.0568027	139.4	19Sep2015, 12:37	7.58
Junction-12	0.6723127	1235.8	19Sep2015, 12:37	6.14
Pond 5	0.6723127	328.6	19Sep2015, 13:58	6.14
Reach-13	0.6723127	328.6	19Sep2015, 14:01	6.13
Area 16	0.2959900	520.5	19Sep2015, 12:48	6.20
Area 22	0.1087000	282.8	19Sep2015, 12:32	7.32
Junction-13	4.6752170	2594.7	19Sep2015, 12:57	4.92
Reach-14	4.6752170	2593.4	19Sep2015, 13:03	4.88
Area 23	0.2300500	401.7	19Sep2015, 12:55	6.73
Junction-14	4.9052670	2984.0	19Sep2015, 13:02	4.96
Reach-15	4.9052670	2983.6	19Sep2015, 13:04	4.95
Area 24	0.1367700	292.2	19Sep2015, 12:45	7.30
Junction-1	5.0420370	3222.2	19Sep2015, 13:03	5.02

Project: MBTS Simulation Run: 2050 A1b - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 20:15:53

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1b - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	893.2	19Sep2015, 13:14	4.50
Area 2	0.2143070	299.1	19Sep2015, 12:50	5.03
Area 1	0.1202500	257.6	19Sep2015, 12:26	5.32
Pond 1	0.1202500	95.4	19Sep2015, 13:02	5.25
Reach-1	0.1202500	95.4	19Sep2015, 13:13	5.20
Junction-2	0.3345570	386.0	19Sep2015, 12:53	5.09
Reach-2	0.3345570	385.9	19Sep2015, 12:55	5.08
Area 3	0.1890000	258.1	19Sep2015, 12:41	4.30
Junction-3	0.5235570	622.6	19Sep2015, 12:48	4.80
Reach-3	0.5235570	622.5	19Sep2015, 12:50	4.79
Area 4	0.2384815	329.5	19Sep2015, 12:46	4.67
Junction-4	0.7620385	948.8	19Sep2015, 12:49	4.75
Reach-4	0.7620385	948.0	19Sep2015, 12:55	4.72
Area 6	0.3474700	422.4	19Sep2015, 13:09	5.38
Junction-5	2.0244085	2198.2	19Sep2015, 13:03	4.73
Pond 2	2.0244085	537.7	19Sep2015, 15:29	3.39
Reach-5	2.0244085	537.7	19Sep2015, 15:34	3.36
Area 7	0.3110400	581.9	19Sep2015, 12:34	5.31
Junction-6	2.3354485	674.7	19Sep2015, 12:34	3.62
Pond 3	2.3354485	442.9	19Sep2015, 18:48	3.05
Reach-6	2.3354485	442.9	19Sep2015, 18:51	3.03
Area 9	0.2393600	306.7	19Sep2015, 12:45	4.29
Area 10	0.1111700	188.3	19Sep2015, 12:29	4.44
Junction-7	0.3505300	466.5	19Sep2015, 12:38	4.34
Reach-7	0.3505300	466.1	19Sep2015, 12:45	4.30
Area 11	0.3052000	346.5	19Sep2015, 13:01	4.64
Junction-8	0.6557300	786.6	19Sep2015, 12:51	4.46

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	786.3	19Sep2015, 12:54	4.45
Area 13	0.0571908	90.7	19Sep2015, 12:43	5.17
Area 12	0.0548863	105.3	19Sep2015, 12:31	5.19
Junction-9	0.7678071	940.5	19Sep2015, 12:51	4.55
Pond 4	0.7678071	654.7	19Sep2015, 13:24	4.55
Reach-9	0.7678071	654.6	19Sep2015, 13:27	4.54
Area 14	0.2956000	404.6	19Sep2015, 12:56	5.28
Area 8	0.1103443	225.8	19Sep2015, 12:27	5.20
Junction-10	3.5091999	1337.6	19Sep2015, 12:59	3.62
Reach-10	3.5091999	1337.5	19Sep2015, 13:03	3.59
Area 15	0.0890144	161.4	19Sep2015, 12:33	5.06
Junction-11	3.5982143	1432.0	19Sep2015, 12:56	3.63
Reach-11	3.5982143	1431.5	19Sep2015, 13:10	3.55
Area 19	0.1726400	306.8	19Sep2015, 12:31	4.81
Area 18	0.1713200	214.9	19Sep2015, 12:51	4.53
Area 17	0.1551600	207.6	19Sep2015, 12:48	4.66
Reach-12	0.1551600	207.5	19Sep2015, 12:53	4.64
Area 21	0.1163900	228.2	19Sep2015, 12:28	5.07
Area 20	0.0568027	114.3	19Sep2015, 12:37	6.18
Junction-12	0.6723127	975.2	19Sep2015, 12:37	4.86
Pond 5	0.6723127	288.8	19Sep2015, 13:52	4.86
Reach-13	0.6723127	288.8	19Sep2015, 13:55	4.85
Area 16	0.2959900	412.0	19Sep2015, 12:49	4.91
Area 22	0.1087000	230.6	19Sep2015, 12:32	5.94
Junction-13	4.6752170	2157.9	19Sep2015, 13:04	3.88
Reach-14	4.6752170	2157.2	19Sep2015, 13:10	3.84
Area 23	0.2300500	322.6	19Sep2015, 12:55	5.40
Junction-14	4.9052670	2454.6	19Sep2015, 13:09	3.91
Reach-15	4.9052670	2454.5	19Sep2015, 13:10	3.90
Area 24	0.1367700	238.1	19Sep2015, 12:45	5.92
Junction-1	5.0420370	2630.1	19Sep2015, 13:07	3.96

Project: MBTS Simulation Run: 2050 A1fi - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 20:27:56

Basin Model: MBTS Watershed -
Meteorologic Model: 2050 A1fi - 100 yr
Control Specifications: Control 1

Area 5	0.9149000	1445.9	19Sep2015, 13:12	7.23
Area 2	0.2143070	468.3	19Sep2015, 12:50	7.89
Area 1	0.1202500	396.6	19Sep2015, 12:25	8.24
Pond 1	0.1202500	221.2	19Sep2015, 12:49	8.14
Reach-1	0.1202500	221.1	19Sep2015, 12:58	8.08
Junction-2	0.3345570	681.5	19Sep2015, 12:53	7.95
Reach-2	0.3345570	681.4	19Sep2015, 12:55	7.94
Area 3	0.1890000	423.4	19Sep2015, 12:40	6.99
Junction-3	0.5235570	1055.8	19Sep2015, 12:50	7.60
Reach-3	0.5235570	1055.7	19Sep2015, 12:52	7.59
Area 4	0.2384815	527.5	19Sep2015, 12:45	7.44
Junction-4	0.7620385	1569.6	19Sep2015, 12:50	7.54
Reach-4	0.7620385	1568.1	19Sep2015, 12:56	7.50
Area 6	0.3474700	648.7	19Sep2015, 13:08	8.29
Junction-5	2.0244085	3569.8	19Sep2015, 13:02	7.51
Pond 2	2.0244085	1272.0	19Sep2015, 14:32	5.89
Reach-5	2.0244085	1272.0	19Sep2015, 14:35	5.86
Area 7	0.3110400	896.6	19Sep2015, 12:33	8.22
Junction-6	2.3354485	1396.9	19Sep2015, 14:15	6.18
Pond 3	2.3354485	1138.3	19Sep2015, 16:24	5.22
Reach-6	2.3354485	1138.0	19Sep2015, 16:26	5.20
Area 9	0.2393600	503.5	19Sep2015, 12:44	6.98
Area 10	0.1111700	305.8	19Sep2015, 12:28	7.17
Junction-7	0.3505300	764.4	19Sep2015, 12:37	7.04
Reach-7	0.3505300	763.8	19Sep2015, 12:44	6.99
Area 11	0.3052000	555.8	19Sep2015, 13:00	7.41
Junction-8	0.6557300	1273.4	19Sep2015, 12:49	7.19

Reach-8	0.6557300	1273.1	19Sep2015, 12:52	7.17
Area 13	0.0571908	140.8	19Sep2015, 12:42	8.05
Area 12	0.0548863	163.3	19Sep2015, 12:30	8.08
Junction-9	0.7678071	1519.1	19Sep2015, 12:48	7.30
Pond 4	0.7678071	1132.3	19Sep2015, 13:18	7.29
Reach-9	0.7678071	1132.2	19Sep2015, 13:20	7.28
Area 14	0.2956000	624.9	19Sep2015, 12:55	8.17
Area 8	0.1103443	350.0	19Sep2015, 12:26	8.09
Junction-10	3.5091999	2120.9	19Sep2015, 13:09	6.00
Reach-10	3.5091999	2120.6	19Sep2015, 13:13	5.97
Area 15	0.0890144	252.1	19Sep2015, 12:32	7.93
Junction-11	3.5982143	2221.8	19Sep2015, 13:10	6.02
Reach-11	3.5982143	2221.0	19Sep2015, 13:22	5.92
Area 19	0.1726400	486.2	19Sep2015, 12:30	7.63
Area 18	0.1713200	347.1	19Sep2015, 12:50	7.28
Area 17	0.1551600	332.4	19Sep2015, 12:47	7.44
Reach-12	0.1551600	332.3	19Sep2015, 12:52	7.41
Area 21	0.1163900	356.3	19Sep2015, 12:28	7.94
Area 20	0.0568027	168.6	19Sep2015, 12:37	9.23
Junction-12	0.6723127	1546.7	19Sep2015, 12:36	7.68
Pond 5	0.6723127	377.4	19Sep2015, 14:03	7.67
Reach-13	0.6723127	377.4	19Sep2015, 14:05	7.66
Area 16	0.2959900	649.7	19Sep2015, 12:48	7.74
Area 22	0.1087000	343.9	19Sep2015, 12:31	8.96
Junction-13	4.6752170	3140.6	19Sep2015, 13:11	6.35
Reach-14	4.6752170	3140.2	19Sep2015, 13:17	6.31
Area 23	0.2300500	494.9	19Sep2015, 12:55	8.32
Junction-14	4.9052670	3563.5	19Sep2015, 13:12	6.40
Reach-15	4.9052670	3563.4	19Sep2015, 13:14	6.39
Area 24	0.1367700	355.6	19Sep2015, 12:44	8.93
Junction-1	5.0420370	3868.0	19Sep2015, 12:59	6.46

Project: MBTS Simulation Run: 2100 A1b - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 20:43:42

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1b - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1122.5	19Sep2015, 13:13	5.62
Area 2	0.2143070	369.8	19Sep2015, 12:50	6.22
Area 1	0.1202500	315.7	19Sep2015, 12:25	6.54
Pond 1	0.1202500	142.3	19Sep2015, 12:55	6.45
Reach-1	0.1202500	142.1	19Sep2015, 13:05	6.40
Junction-2	0.3345570	491.2	19Sep2015, 12:58	6.28
Reach-2	0.3345570	491.1	19Sep2015, 13:00	6.27
Area 3	0.1890000	326.6	19Sep2015, 12:40	5.40
Junction-3	0.5235570	772.9	19Sep2015, 12:48	5.96
Reach-3	0.5235570	772.7	19Sep2015, 12:50	5.95
Area 4	0.2384815	411.9	19Sep2015, 12:45	5.81
Junction-4	0.7620385	1181.3	19Sep2015, 12:48	5.91
Reach-4	0.7620385	1180.4	19Sep2015, 12:54	5.87
Area 6	0.3474700	517.1	19Sep2015, 13:08	6.59
Junction-5	2.0244085	2741.9	19Sep2015, 13:04	5.88
Pond 2	2.0244085	1003.6	19Sep2015, 14:35	4.38
Reach-5	2.0244085	1002.2	19Sep2015, 14:38	4.36
Area 7	0.3110400	713.7	19Sep2015, 12:33	6.52
Junction-6	2.3354485	1096.0	19Sep2015, 14:38	4.64
Pond 3	2.3354485	603.7	19Sep2015, 17:55	3.79
Reach-6	2.3354485	603.7	19Sep2015, 17:57	3.77
Area 9	0.2393600	388.1	19Sep2015, 12:45	5.40
Area 10	0.1111700	237.1	19Sep2015, 12:29	5.56
Junction-7	0.3505300	590.0	19Sep2015, 12:37	5.45
Reach-7	0.3505300	589.5	19Sep2015, 12:45	5.41
Area 11	0.3052000	433.5	19Sep2015, 13:01	5.78
Junction-8	0.6557300	988.8	19Sep2015, 12:50	5.58

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	988.4	19Sep2015, 12:53	5.57
Area 13	0.0571908	111.6	19Sep2015, 12:42	6.37
Area 12	0.0548863	129.6	19Sep2015, 12:30	6.39
Junction-9	0.7678071	1181.0	19Sep2015, 12:50	5.69
Pond 4	0.7678071	861.1	19Sep2015, 13:20	5.68
Reach-9	0.7678071	861.0	19Sep2015, 13:23	5.67
Area 14	0.2956000	496.8	19Sep2015, 12:55	6.48
Area 8	0.1103443	277.8	19Sep2015, 12:27	6.40
Junction-10	3.5091999	1663.0	19Sep2015, 13:11	4.50
Reach-10	3.5091999	1662.7	19Sep2015, 13:15	4.47
Area 15	0.0890144	199.2	19Sep2015, 12:32	6.25
Junction-11	3.5982143	1739.6	19Sep2015, 13:12	4.51
Reach-11	3.5982143	1739.1	19Sep2015, 13:25	4.42
Area 19	0.1726400	381.5	19Sep2015, 12:31	5.98
Area 18	0.1713200	269.8	19Sep2015, 12:50	5.67
Area 17	0.1551600	259.5	19Sep2015, 12:47	5.81
Reach-12	0.1551600	259.3	19Sep2015, 12:52	5.78
Area 21	0.1163900	281.8	19Sep2015, 12:28	6.26
Area 20	0.0568027	137.2	19Sep2015, 12:37	7.46
Junction-12	0.6723127	1213.1	19Sep2015, 12:37	6.03
Pond 5	0.6723127	325.1	19Sep2015, 13:58	6.02
Reach-13	0.6723127	325.1	19Sep2015, 14:00	6.02
Area 16	0.2959900	511.1	19Sep2015, 12:48	6.08
Area 22	0.1087000	278.3	19Sep2015, 12:32	7.20
Junction-13	4.6752170	2559.9	19Sep2015, 12:57	4.82
Reach-14	4.6752170	2558.0	19Sep2015, 13:04	4.78
Area 23	0.2300500	394.8	19Sep2015, 12:55	6.62
Junction-14	4.9052670	2941.6	19Sep2015, 13:03	4.86
Reach-15	4.9052670	2940.8	19Sep2015, 13:05	4.85
Area 24	0.1367700	287.5	19Sep2015, 12:45	7.18
Junction-1	5.0420370	3173.5	19Sep2015, 13:03	4.91

Project: MBTS Simulation Run: 2100 A1fi - 100 yr

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 10Oct2015, 21:39:32

Basin Model: MBTS Watershed -
Meteorologic Model: 2100 A1fi - 100 yr
Control Specifications: Control 1

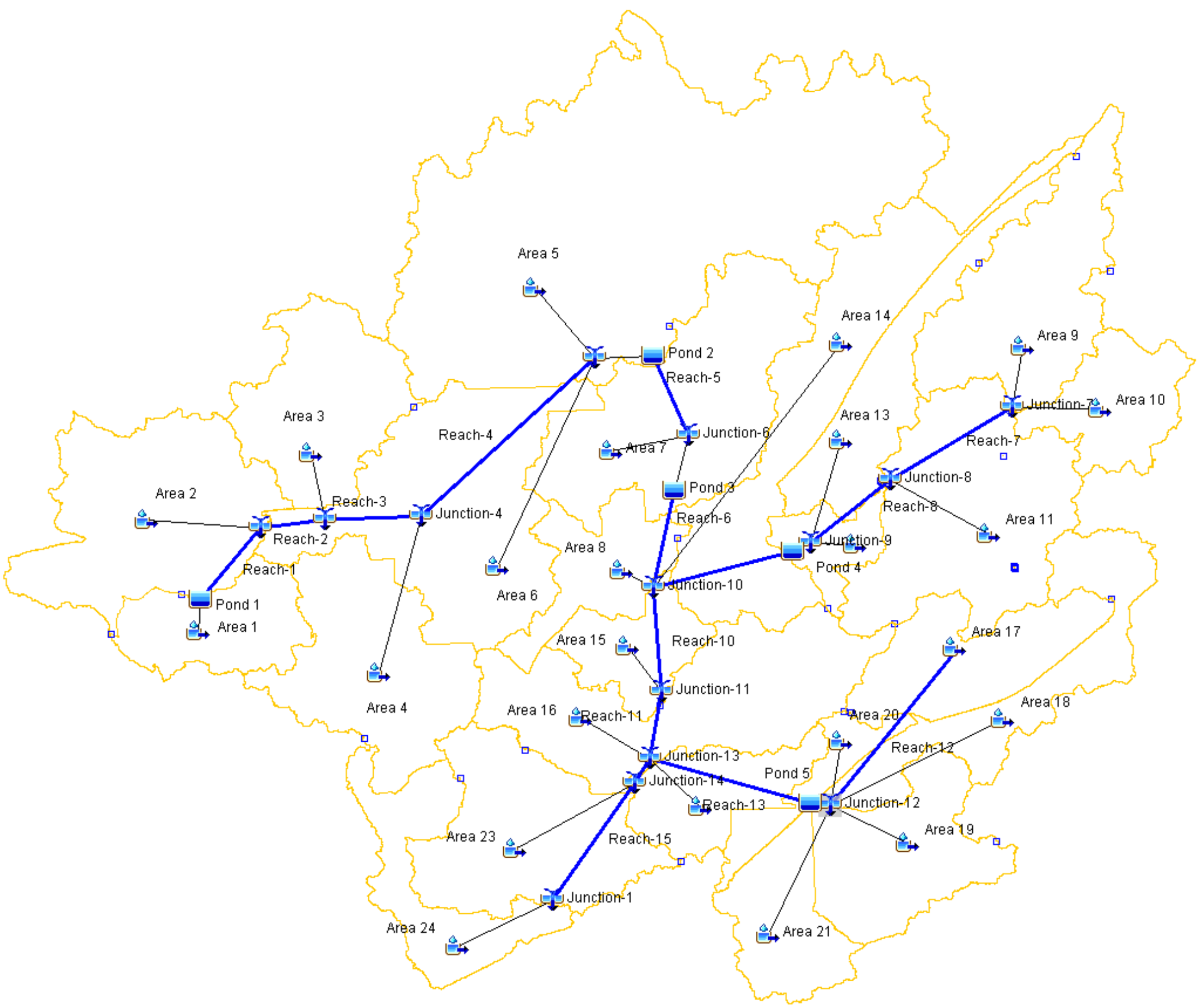
Area 5	0.9149000	2192.4	19Sep2015, 13:11	10.99
Area 2	0.2143070	693.0	19Sep2015, 12:49	11.77
Area 1	0.1202500	579.6	19Sep2015, 12:25	12.18
Pond 1	0.1202500	385.0	19Sep2015, 12:44	12.04
Reach-1	0.1202500	384.7	19Sep2015, 12:51	11.96
Junction-2	0.3345570	1077.0	19Sep2015, 12:50	11.84
Reach-2	0.3345570	1076.6	19Sep2015, 12:51	11.82
Area 3	0.1890000	647.9	19Sep2015, 12:39	10.72
Junction-3	0.5235570	1678.1	19Sep2015, 12:47	11.42
Reach-3	0.5235570	1677.5	19Sep2015, 12:48	11.41
Area 4	0.2384815	793.2	19Sep2015, 12:44	11.25
Junction-4	0.7620385	2463.7	19Sep2015, 12:47	11.36
Reach-4	0.7620385	2462.6	19Sep2015, 12:52	11.31
Area 6	0.3474700	946.8	19Sep2015, 13:07	12.22
Junction-5	2.0244085	5411.6	19Sep2015, 12:59	11.32
Pond 2	2.0244085	1780.0	19Sep2015, 14:33	9.38
Reach-5	2.0244085	1780.0	19Sep2015, 14:36	9.35
Area 7	0.3110400	1310.6	19Sep2015, 12:32	12.16
Junction-6	2.3354485	1952.9	19Sep2015, 14:17	9.73
Pond 3	2.3354485	1580.2	19Sep2015, 16:50	8.58
Reach-6	2.3354485	1580.1	19Sep2015, 16:52	8.56
Area 9	0.2393600	770.8	19Sep2015, 12:43	10.71
Area 10	0.1111700	464.5	19Sep2015, 12:28	10.94
Junction-7	0.3505300	1168.7	19Sep2015, 12:36	10.78
Reach-7	0.3505300	1168.0	19Sep2015, 12:42	10.73
Area 11	0.3052000	837.0	19Sep2015, 12:59	11.21
Junction-8	0.6557300	1929.8	19Sep2015, 12:48	10.95

Reach-8	0.6557300	1929.5	19Sep2015, 12:50	10.93
Area 13	0.0571908	207.1	19Sep2015, 12:41	11.96
Area 12	0.0548863	239.9	19Sep2015, 12:30	12.00
Junction-9	0.7678071	2298.9	19Sep2015, 12:47	11.08
Pond 4	0.7678071	1952.2	19Sep2015, 13:07	11.07
Reach-9	0.7678071	1951.9	19Sep2015, 13:09	11.05
Area 14	0.2956000	915.7	19Sep2015, 12:54	12.09
Area 8	0.1103443	514.2	19Sep2015, 12:26	12.01
Junction-10	3.5091999	3411.0	19Sep2015, 13:05	9.51
Reach-10	3.5091999	3410.8	19Sep2015, 13:08	9.48
Area 15	0.0890144	372.2	19Sep2015, 12:32	11.82
Junction-11	3.5982143	3576.0	19Sep2015, 13:06	9.54
Reach-11	3.5982143	3575.4	19Sep2015, 13:16	9.43
Area 19	0.1726400	725.9	19Sep2015, 12:30	11.48
Area 18	0.1713200	525.3	19Sep2015, 12:49	11.06
Area 17	0.1551600	500.0	19Sep2015, 12:46	11.25
Reach-12	0.1551600	499.7	19Sep2015, 12:50	11.21
Area 21	0.1163900	526.1	19Sep2015, 12:27	11.83
Area 20	0.0568027	238.9	19Sep2015, 12:37	13.29
Junction-12	0.6723127	2311.0	19Sep2015, 12:36	11.52
Pond 5	0.6723127	647.8	19Sep2015, 13:50	11.34
Reach-13	0.6723127	647.8	19Sep2015, 13:52	11.32
Area 16	0.2959900	966.4	19Sep2015, 12:47	11.60
Area 22	0.1087000	491.3	19Sep2015, 12:31	12.99
Junction-13	4.6752170	5013.6	19Sep2015, 13:12	9.92
Reach-14	4.6752170	5012.0	19Sep2015, 13:17	9.86
Area 23	0.2300500	721.7	19Sep2015, 12:54	12.26
Junction-14	4.9052670	5610.4	19Sep2015, 13:15	9.97
Reach-15	4.9052670	5609.6	19Sep2015, 13:16	9.96
Area 24	0.1367700	508.6	19Sep2015, 12:44	12.95
Junction-1	5.0420370	5923.7	19Sep2015, 13:15	10.04

Project: MBTS

Basin Model : MBTS Watershed – Normal

Oct 09 13:58:03 EDT 2015



Project: MBTS Simulation Run: PR1_2015_100

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 09Oct2015, 16:40:51

Basin Model: PROP School Stree
Meteorologic Model: 2015 - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	808.9	19Sep2015, 13:14	4.08
Area 2	0.2143070	272.9	19Sep2015, 12:51	4.60
Area 1	0.1202500	236.0	19Sep2015, 12:26	4.88
Pond 1	0.1202500	88.7	19Sep2015, 13:02	4.81
Reach-1	0.1202500	88.7	19Sep2015, 13:13	4.76
Junction-2	0.3345570	353.8	19Sep2015, 12:53	4.66
Reach-2	0.3345570	353.7	19Sep2015, 12:55	4.65
Area 3	0.1890000	233.0	19Sep2015, 12:41	3.89
Junction-3	0.5235570	567.3	19Sep2015, 12:49	4.37
Reach-3	0.5235570	567.2	19Sep2015, 12:51	4.37
Area 4	0.2384815	299.2	19Sep2015, 12:46	4.24
Junction-4	0.7620385	863.5	19Sep2015, 12:49	4.33
Reach-4	0.7620385	862.9	19Sep2015, 12:56	4.30
Area 6	0.3474700	387.1	19Sep2015, 13:09	4.93
Junction-5	2.0244085	2000.4	19Sep2015, 13:03	4.31
Pond 2	2.0244085	478.7	19Sep2015, 15:35	3.03
Reach-5	2.0244085	478.7	19Sep2015, 15:40	3.01
Area 7	0.3110400	533.0	19Sep2015, 12:34	4.86
Junction-6	2.3354485	623.4	19Sep2015, 12:34	3.26
Pond 3	2.3354485	407.0	19Sep2015, 18:40	2.79
Reach-6	2.3354485	407.0	19Sep2015, 18:43	2.78
Area 9	0.2393600	276.8	19Sep2015, 12:45	3.89
Area 10	0.1111700	170.4	19Sep2015, 12:29	4.03
Junction-7	0.3505300	421.3	19Sep2015, 12:38	3.93
Reach-7	0.3505300	421.1	19Sep2015, 12:46	3.90
Area 11	0.3052000	314.5	19Sep2015, 13:02	4.22
Junction-8	0.6557300	712.5	19Sep2015, 12:51	4.05

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	712.1	19Sep2015, 12:54	4.04
Area 13	0.0571908	82.9	19Sep2015, 12:43	4.73
Area 12	0.0548863	96.3	19Sep2015, 12:31	4.75
Junction-9	0.7678071	852.5	19Sep2015, 12:51	4.14
Pond 4	0.7678071	588.6	19Sep2015, 13:25	4.14
Reach-9	0.7678071	588.6	19Sep2015, 13:28	4.13
Area 14	0.2956000	370.4	19Sep2015, 12:56	4.83
Area 8	0.1103443	206.5	19Sep2015, 12:27	4.75
Junction-10	3.5091999	1263.7	19Sep2015, 13:01	3.31
Reach-10	3.5091999	1263.4	19Sep2015, 13:05	3.29
Area 15	0.0890144	147.3	19Sep2015, 12:33	4.62
Junction-11	3.5982143	1341.0	19Sep2015, 13:00	3.32
Reach-11	3.5982143	1340.9	19Sep2015, 13:14	3.24
Area 19	0.1726400	279.1	19Sep2015, 12:31	4.38
Area 18	0.1713200	194.7	19Sep2015, 12:51	4.12
Area 17	0.1551600	188.4	19Sep2015, 12:48	4.24
Reach-12	0.1551600	188.3	19Sep2015, 12:54	4.22
Area 21	0.1163900	208.3	19Sep2015, 12:28	4.63
Area 20	0.0568027	105.7	19Sep2015, 12:38	5.71
Junction-12	0.6723127	887.1	19Sep2015, 12:37	4.43
Pond 5	0.6723127	275.7	19Sep2015, 13:50	4.43
Reach-13	0.6723127	275.7	19Sep2015, 13:52	4.42
Area 16	0.2959900	375.3	19Sep2015, 12:49	4.48
Area 22	0.1087000	217.2	19Sep2015, 12:32	5.60
Junction-13	4.6752170	1999.3	19Sep2015, 13:07	3.54
Reach-14	4.6752170	1999.1	19Sep2015, 13:13	3.51
Area 23	0.2300500	295.8	19Sep2015, 12:56	4.95
Junction-14	4.9052670	2267.0	19Sep2015, 13:09	3.58
Reach-15	4.9052670	2266.9	19Sep2015, 13:11	3.57
Area 24	0.1367700	219.6	19Sep2015, 12:45	5.45
Junction-1	5.0420370	2429.3	19Sep2015, 13:07	3.62

Project: MBTS Simulation Run: PR1_2025b_100

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 09Oct2015, 16:41:45

Basin Model: PROP School Stree
Meteorologic Model: 2025 A1b - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	818.6	19Sep2015, 13:14	4.13
Area 2	0.2143070	275.9	19Sep2015, 12:51	4.65
Area 1	0.1202500	238.5	19Sep2015, 12:26	4.93
Pond 1	0.1202500	89.5	19Sep2015, 13:02	4.86
Reach-1	0.1202500	89.4	19Sep2015, 13:13	4.81
Junction-2	0.3345570	357.5	19Sep2015, 12:53	4.71
Reach-2	0.3345570	357.4	19Sep2015, 12:56	4.70
Area 3	0.1890000	235.9	19Sep2015, 12:41	3.94
Junction-3	0.5235570	573.7	19Sep2015, 12:49	4.42
Reach-3	0.5235570	573.5	19Sep2015, 12:50	4.42
Area 4	0.2384815	302.6	19Sep2015, 12:46	4.29
Junction-4	0.7620385	873.2	19Sep2015, 12:49	4.38
Reach-4	0.7620385	872.5	19Sep2015, 12:56	4.34
Area 6	0.3474700	391.2	19Sep2015, 13:09	4.98
Junction-5	2.0244085	2023.0	19Sep2015, 13:03	4.36
Pond 2	2.0244085	485.4	19Sep2015, 15:35	3.07
Reach-5	2.0244085	485.4	19Sep2015, 15:39	3.05
Area 7	0.3110400	538.6	19Sep2015, 12:34	4.92
Junction-6	2.3354485	629.3	19Sep2015, 12:34	3.30
Pond 3	2.3354485	411.0	19Sep2015, 18:42	2.82
Reach-6	2.3354485	411.0	19Sep2015, 18:44	2.81
Area 9	0.2393600	280.2	19Sep2015, 12:45	3.93
Area 10	0.1111700	172.4	19Sep2015, 12:29	4.07
Junction-7	0.3505300	426.5	19Sep2015, 12:38	3.98
Reach-7	0.3505300	426.3	19Sep2015, 12:46	3.94
Area 11	0.3052000	318.2	19Sep2015, 13:02	4.27
Junction-8	0.6557300	721.0	19Sep2015, 12:51	4.10

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	720.7	19Sep2015, 12:55	4.08
Area 13	0.0571908	83.8	19Sep2015, 12:43	4.78
Area 12	0.0548863	97.4	19Sep2015, 12:31	4.80
Junction-9	0.7678071	862.7	19Sep2015, 12:51	4.19
Pond 4	0.7678071	592.5	19Sep2015, 13:25	4.18
Reach-9	0.7678071	592.5	19Sep2015, 13:28	4.17
Area 14	0.2956000	374.3	19Sep2015, 12:56	4.88
Area 8	0.1103443	208.7	19Sep2015, 12:27	4.80
Junction-10	3.5091999	1272.7	19Sep2015, 13:00	3.35
Reach-10	3.5091999	1272.5	19Sep2015, 13:04	3.32
Area 15	0.0890144	148.9	19Sep2015, 12:33	4.67
Junction-11	3.5982143	1352.1	19Sep2015, 13:00	3.36
Reach-11	3.5982143	1352.0	19Sep2015, 13:14	3.28
Area 19	0.1726400	282.3	19Sep2015, 12:31	4.43
Area 18	0.1713200	197.0	19Sep2015, 12:51	4.16
Area 17	0.1551600	190.6	19Sep2015, 12:48	4.29
Reach-12	0.1551600	190.5	19Sep2015, 12:54	4.27
Area 21	0.1163900	210.6	19Sep2015, 12:28	4.68
Area 20	0.0568027	106.7	19Sep2015, 12:37	5.76
Junction-12	0.6723127	897.4	19Sep2015, 12:37	4.48
Pond 5	0.6723127	277.2	19Sep2015, 13:50	4.48
Reach-13	0.6723127	277.2	19Sep2015, 13:52	4.47
Area 16	0.2959900	379.5	19Sep2015, 12:49	4.53
Area 22	0.1087000	219.3	19Sep2015, 12:32	5.65
Junction-13	4.6752170	2018.2	19Sep2015, 13:06	3.58
Reach-14	4.6752170	2018.1	19Sep2015, 13:13	3.55
Area 23	0.2300500	298.9	19Sep2015, 12:56	5.00
Junction-14	4.9052670	2288.7	19Sep2015, 13:09	3.62
Reach-15	4.9052670	2288.6	19Sep2015, 13:11	3.61
Area 24	0.1367700	221.7	19Sep2015, 12:45	5.51
Junction-1	5.0420370	2452.5	19Sep2015, 13:07	3.66

Project: MBTS Simulation Run: PR1_2025fi_100

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 09Oct2015, 16:42:38

Basin Model: PROP School Stree
Meteorologic Model: 2025 A1fi - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1144.5	19Sep2015, 13:13	5.73
Area 2	0.2143070	376.5	19Sep2015, 12:50	6.33
Area 1	0.1202500	321.3	19Sep2015, 12:25	6.65
Pond 1	0.1202500	148.1	19Sep2015, 12:55	6.56
Reach-1	0.1202500	148.0	19Sep2015, 13:04	6.51
Junction-2	0.3345570	505.3	19Sep2015, 12:57	6.40
Reach-2	0.3345570	505.1	19Sep2015, 12:59	6.38
Area 3	0.1890000	333.1	19Sep2015, 12:40	5.51
Junction-3	0.5235570	787.4	19Sep2015, 12:48	6.07
Reach-3	0.5235570	787.2	19Sep2015, 12:50	6.06
Area 4	0.2384815	419.7	19Sep2015, 12:45	5.92
Junction-4	0.7620385	1203.6	19Sep2015, 12:48	6.02
Reach-4	0.7620385	1203.1	19Sep2015, 12:54	5.98
Area 6	0.3474700	526.1	19Sep2015, 13:08	6.71
Junction-5	2.0244085	2800.0	19Sep2015, 13:04	5.99
Pond 2	2.0244085	1114.4	19Sep2015, 14:26	4.48
Reach-5	2.0244085	1113.6	19Sep2015, 14:30	4.46
Area 7	0.3110400	726.2	19Sep2015, 12:33	6.64
Junction-6	2.3354485	1213.8	19Sep2015, 14:30	4.75
Pond 3	2.3354485	626.5	19Sep2015, 17:38	3.88
Reach-6	2.3354485	626.5	19Sep2015, 17:40	3.87
Area 9	0.2393600	395.9	19Sep2015, 12:44	5.50
Area 10	0.1111700	241.8	19Sep2015, 12:29	5.67
Junction-7	0.3505300	601.8	19Sep2015, 12:37	5.56
Reach-7	0.3505300	601.1	19Sep2015, 12:44	5.52
Area 11	0.3052000	441.8	19Sep2015, 13:01	5.89
Junction-8	0.6557300	1008.0	19Sep2015, 12:50	5.69

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1007.8	19Sep2015, 12:53	5.68
Area 13	0.0571908	113.6	19Sep2015, 12:42	6.48
Area 12	0.0548863	131.9	19Sep2015, 12:30	6.51
Junction-9	0.7678071	1203.8	19Sep2015, 12:49	5.80
Pond 4	0.7678071	880.0	19Sep2015, 13:20	5.79
Reach-9	0.7678071	879.8	19Sep2015, 13:22	5.78
Area 14	0.2956000	505.5	19Sep2015, 12:55	6.60
Area 8	0.1103443	282.7	19Sep2015, 12:27	6.51
Junction-10	3.5091999	1694.6	19Sep2015, 13:11	4.60
Reach-10	3.5091999	1694.4	19Sep2015, 13:15	4.57
Area 15	0.0890144	202.9	19Sep2015, 12:32	6.36
Junction-11	3.5982143	1773.1	19Sep2015, 13:12	4.61
Reach-11	3.5982143	1772.6	19Sep2015, 13:25	4.52
Area 19	0.1726400	388.6	19Sep2015, 12:31	6.09
Area 18	0.1713200	275.1	19Sep2015, 12:50	5.77
Area 17	0.1551600	264.4	19Sep2015, 12:47	5.92
Reach-12	0.1551600	264.3	19Sep2015, 12:52	5.89
Area 21	0.1163900	286.8	19Sep2015, 12:28	6.37
Area 20	0.0568027	139.4	19Sep2015, 12:37	7.58
Junction-12	0.6723127	1235.8	19Sep2015, 12:37	6.14
Pond 5	0.6723127	328.6	19Sep2015, 13:58	6.14
Reach-13	0.6723127	328.6	19Sep2015, 14:01	6.13
Area 16	0.2959900	520.5	19Sep2015, 12:48	6.20
Area 22	0.1087000	287.4	19Sep2015, 12:32	7.46
Junction-13	4.6752170	2596.9	19Sep2015, 12:57	4.92
Reach-14	4.6752170	2595.8	19Sep2015, 13:03	4.88
Area 23	0.2300500	401.7	19Sep2015, 12:55	6.73
Junction-14	4.9052670	2986.4	19Sep2015, 13:02	4.97
Reach-15	4.9052670	2985.7	19Sep2015, 13:04	4.96
Area 24	0.1367700	292.2	19Sep2015, 12:45	7.30
Junction-1	5.0420370	3224.4	19Sep2015, 13:03	5.02

Project: MBTS Simulation Run: PR1_2050b_100

Start of Run:	19Sep2015, 00:00	Basin Model:	PROP School Stree
End of Run:	20Sep2015, 00:01	Meteorologic Model:	2050 A1b - 100 yr
Compute Time:	09Oct2015, 16:43:11	Control Specifications:	Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	893.2	19Sep2015, 13:14	4.50
Area 2	0.2143070	299.1	19Sep2015, 12:50	5.03
Area 1	0.1202500	257.6	19Sep2015, 12:26	5.32
Pond 1	0.1202500	95.4	19Sep2015, 13:02	5.25
Reach-1	0.1202500	95.4	19Sep2015, 13:13	5.20
Junction-2	0.3345570	386.0	19Sep2015, 12:53	5.09
Reach-2	0.3345570	385.9	19Sep2015, 12:55	5.08
Area 3	0.1890000	258.1	19Sep2015, 12:41	4.30
Junction-3	0.5235570	622.6	19Sep2015, 12:48	4.80
Reach-3	0.5235570	622.5	19Sep2015, 12:50	4.79
Area 4	0.2384815	329.5	19Sep2015, 12:46	4.67
Junction-4	0.7620385	948.8	19Sep2015, 12:49	4.75
Reach-4	0.7620385	948.0	19Sep2015, 12:55	4.72
Area 6	0.3474700	422.4	19Sep2015, 13:09	5.38
Junction-5	2.0244085	2198.2	19Sep2015, 13:03	4.73
Pond 2	2.0244085	537.7	19Sep2015, 15:29	3.39
Reach-5	2.0244085	537.7	19Sep2015, 15:34	3.36
Area 7	0.3110400	581.9	19Sep2015, 12:34	5.31
Junction-6	2.3354485	674.7	19Sep2015, 12:34	3.62
Pond 3	2.3354485	442.9	19Sep2015, 18:48	3.05
Reach-6	2.3354485	442.9	19Sep2015, 18:51	3.03
Area 9	0.2393600	306.7	19Sep2015, 12:45	4.29
Area 10	0.1111700	188.3	19Sep2015, 12:29	4.44
Junction-7	0.3505300	466.5	19Sep2015, 12:38	4.34
Reach-7	0.3505300	466.1	19Sep2015, 12:45	4.30
Area 11	0.3052000	346.5	19Sep2015, 13:01	4.64
Junction-8	0.6557300	786.6	19Sep2015, 12:51	4.46

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	786.3	19Sep2015, 12:54	4.45
Area 13	0.0571908	90.7	19Sep2015, 12:43	5.17
Area 12	0.0548863	105.3	19Sep2015, 12:31	5.19
Junction-9	0.7678071	940.5	19Sep2015, 12:51	4.55
Pond 4	0.7678071	654.7	19Sep2015, 13:24	4.55
Reach-9	0.7678071	654.6	19Sep2015, 13:27	4.54
Area 14	0.2956000	404.6	19Sep2015, 12:56	5.28
Area 8	0.1103443	225.8	19Sep2015, 12:27	5.20
Junction-10	3.5091999	1337.6	19Sep2015, 12:59	3.62
Reach-10	3.5091999	1337.5	19Sep2015, 13:03	3.59
Area 15	0.0890144	161.4	19Sep2015, 12:33	5.06
Junction-11	3.5982143	1432.0	19Sep2015, 12:56	3.63
Reach-11	3.5982143	1431.5	19Sep2015, 13:10	3.55
Area 19	0.1726400	306.8	19Sep2015, 12:31	4.81
Area 18	0.1713200	214.9	19Sep2015, 12:51	4.53
Area 17	0.1551600	207.6	19Sep2015, 12:48	4.66
Reach-12	0.1551600	207.5	19Sep2015, 12:53	4.64
Area 21	0.1163900	228.2	19Sep2015, 12:28	5.07
Area 20	0.0568027	114.3	19Sep2015, 12:37	6.18
Junction-12	0.6723127	975.2	19Sep2015, 12:37	4.86
Pond 5	0.6723127	288.8	19Sep2015, 13:52	4.86
Reach-13	0.6723127	288.8	19Sep2015, 13:55	4.85
Area 16	0.2959900	412.0	19Sep2015, 12:49	4.91
Area 22	0.1087000	235.1	19Sep2015, 12:32	6.07
Junction-13	4.6752170	2159.6	19Sep2015, 13:04	3.88
Reach-14	4.6752170	2158.6	19Sep2015, 13:10	3.84
Area 23	0.2300500	322.6	19Sep2015, 12:55	5.40
Junction-14	4.9052670	2456.1	19Sep2015, 13:08	3.91
Reach-15	4.9052670	2455.9	19Sep2015, 13:10	3.90
Area 24	0.1367700	238.1	19Sep2015, 12:45	5.92
Junction-1	5.0420370	2631.9	19Sep2015, 13:07	3.96

Project: MBTS Simulation Run: PR1_2050fi_100

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 09Oct2015, 16:43:44

Basin Model: PROP School Stree
Meteorologic Model: 2050 A1fi - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1445.9	19Sep2015, 13:12	7.23
Area 2	0.2143070	468.3	19Sep2015, 12:50	7.89
Area 1	0.1202500	396.6	19Sep2015, 12:25	8.24
Pond 1	0.1202500	221.2	19Sep2015, 12:49	8.14
Reach-1	0.1202500	221.1	19Sep2015, 12:58	8.08
Junction-2	0.3345570	681.5	19Sep2015, 12:53	7.95
Reach-2	0.3345570	681.4	19Sep2015, 12:55	7.94
Area 3	0.1890000	423.4	19Sep2015, 12:40	6.99
Junction-3	0.5235570	1055.8	19Sep2015, 12:50	7.60
Reach-3	0.5235570	1055.7	19Sep2015, 12:52	7.59
Area 4	0.2384815	527.5	19Sep2015, 12:45	7.44
Junction-4	0.7620385	1569.6	19Sep2015, 12:50	7.54
Reach-4	0.7620385	1568.1	19Sep2015, 12:56	7.50
Area 6	0.3474700	648.7	19Sep2015, 13:08	8.29
Junction-5	2.0244085	3569.8	19Sep2015, 13:02	7.51
Pond 2	2.0244085	1161.7	19Sep2015, 14:41	5.88
Reach-5	2.0244085	1161.7	19Sep2015, 14:44	5.85
Area 7	0.3110400	896.6	19Sep2015, 12:33	8.22
Junction-6	2.3354485	1342.3	19Sep2015, 13:37	6.17
Pond 3	2.3354485	1113.6	19Sep2015, 16:44	5.21
Reach-6	2.3354485	1113.3	19Sep2015, 16:46	5.19
Area 9	0.2393600	503.5	19Sep2015, 12:44	6.98
Area 10	0.1111700	305.8	19Sep2015, 12:28	7.17
Junction-7	0.3505300	764.4	19Sep2015, 12:37	7.04
Reach-7	0.3505300	763.8	19Sep2015, 12:44	6.99
Area 11	0.3052000	555.8	19Sep2015, 13:00	7.41
Junction-8	0.6557300	1273.4	19Sep2015, 12:49	7.19

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1273.1	19Sep2015, 12:52	7.17
Area 13	0.0571908	140.8	19Sep2015, 12:42	8.05
Area 12	0.0548863	163.3	19Sep2015, 12:30	8.08
Junction-9	0.7678071	1519.1	19Sep2015, 12:48	7.30
Pond 4	0.7678071	1132.3	19Sep2015, 13:18	7.29
Reach-9	0.7678071	1132.2	19Sep2015, 13:20	7.28
Area 14	0.2956000	624.9	19Sep2015, 12:55	8.17
Area 8	0.1103443	350.0	19Sep2015, 12:26	8.09
Junction-10	3.5091999	2120.9	19Sep2015, 13:09	5.99
Reach-10	3.5091999	2120.6	19Sep2015, 13:13	5.96
Area 15	0.0890144	252.1	19Sep2015, 12:32	7.93
Junction-11	3.5982143	2221.8	19Sep2015, 13:10	6.01
Reach-11	3.5982143	2221.0	19Sep2015, 13:22	5.91
Area 19	0.1726400	486.2	19Sep2015, 12:30	7.63
Area 18	0.1713200	347.1	19Sep2015, 12:50	7.28
Area 17	0.1551600	332.4	19Sep2015, 12:47	7.44
Reach-12	0.1551600	332.3	19Sep2015, 12:52	7.41
Area 21	0.1163900	356.3	19Sep2015, 12:28	7.94
Area 20	0.0568027	168.6	19Sep2015, 12:37	9.23
Junction-12	0.6723127	1546.7	19Sep2015, 12:36	7.68
Pond 5	0.6723127	377.4	19Sep2015, 14:03	7.67
Reach-13	0.6723127	377.4	19Sep2015, 14:05	7.66
Area 16	0.2959900	649.7	19Sep2015, 12:48	7.74
Area 22	0.1087000	348.6	19Sep2015, 12:31	9.10
Junction-13	4.6752170	3141.9	19Sep2015, 13:11	6.35
Reach-14	4.6752170	3141.6	19Sep2015, 13:17	6.30
Area 23	0.2300500	494.9	19Sep2015, 12:55	8.32
Junction-14	4.9052670	3565.2	19Sep2015, 13:12	6.40
Reach-15	4.9052670	3565.1	19Sep2015, 13:14	6.39
Area 24	0.1367700	355.6	19Sep2015, 12:44	8.93
Junction-1	5.0420370	3870.8	19Sep2015, 12:59	6.46

Project: MBTS Simulation Run: PR1_2100b_100

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 09Oct2015, 16:45:19

Basin Model: PROP School Stree
Meteorologic Model: 2100 A1b - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	1122.5	19Sep2015, 13:13	5.62
Area 2	0.2143070	369.8	19Sep2015, 12:50	6.22
Area 1	0.1202500	315.7	19Sep2015, 12:25	6.54
Pond 1	0.1202500	142.3	19Sep2015, 12:55	6.45
Reach-1	0.1202500	142.1	19Sep2015, 13:05	6.40
Junction-2	0.3345570	491.2	19Sep2015, 12:58	6.28
Reach-2	0.3345570	491.1	19Sep2015, 13:00	6.27
Area 3	0.1890000	326.6	19Sep2015, 12:40	5.40
Junction-3	0.5235570	772.9	19Sep2015, 12:48	5.96
Reach-3	0.5235570	772.7	19Sep2015, 12:50	5.95
Area 4	0.2384815	411.9	19Sep2015, 12:45	5.81
Junction-4	0.7620385	1181.3	19Sep2015, 12:48	5.91
Reach-4	0.7620385	1180.4	19Sep2015, 12:54	5.87
Area 6	0.3474700	517.1	19Sep2015, 13:08	6.59
Junction-5	2.0244085	2741.9	19Sep2015, 13:04	5.88
Pond 2	2.0244085	1003.6	19Sep2015, 14:35	4.38
Reach-5	2.0244085	1002.2	19Sep2015, 14:38	4.36
Area 7	0.3110400	713.7	19Sep2015, 12:33	6.52
Junction-6	2.3354485	1096.0	19Sep2015, 14:38	4.64
Pond 3	2.3354485	603.7	19Sep2015, 17:55	3.79
Reach-6	2.3354485	603.7	19Sep2015, 17:57	3.77
Area 9	0.2393600	388.1	19Sep2015, 12:45	5.40
Area 10	0.1111700	237.1	19Sep2015, 12:29	5.56
Junction-7	0.3505300	590.0	19Sep2015, 12:37	5.45
Reach-7	0.3505300	589.5	19Sep2015, 12:45	5.41
Area 11	0.3052000	433.5	19Sep2015, 13:01	5.78
Junction-8	0.6557300	988.8	19Sep2015, 12:50	5.58

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	988.4	19Sep2015, 12:53	5.57
Area 13	0.0571908	111.6	19Sep2015, 12:42	6.37
Area 12	0.0548863	129.6	19Sep2015, 12:30	6.39
Junction-9	0.7678071	1181.0	19Sep2015, 12:50	5.69
Pond 4	0.7678071	861.1	19Sep2015, 13:20	5.68
Reach-9	0.7678071	861.0	19Sep2015, 13:23	5.67
Area 14	0.2956000	496.8	19Sep2015, 12:55	6.48
Area 8	0.1103443	277.8	19Sep2015, 12:27	6.40
Junction-10	3.5091999	1663.0	19Sep2015, 13:11	4.50
Reach-10	3.5091999	1662.7	19Sep2015, 13:15	4.47
Area 15	0.0890144	199.2	19Sep2015, 12:32	6.25
Junction-11	3.5982143	1739.6	19Sep2015, 13:12	4.51
Reach-11	3.5982143	1739.1	19Sep2015, 13:25	4.42
Area 19	0.1726400	381.5	19Sep2015, 12:31	5.98
Area 18	0.1713200	269.8	19Sep2015, 12:50	5.67
Area 17	0.1551600	259.5	19Sep2015, 12:47	5.81
Reach-12	0.1551600	259.3	19Sep2015, 12:52	5.78
Area 21	0.1163900	281.8	19Sep2015, 12:28	6.26
Area 20	0.0568027	137.2	19Sep2015, 12:37	7.46
Junction-12	0.6723127	1213.1	19Sep2015, 12:37	6.03
Pond 5	0.6723127	325.1	19Sep2015, 13:58	6.02
Reach-13	0.6723127	325.1	19Sep2015, 14:00	6.02
Area 16	0.2959900	511.1	19Sep2015, 12:48	6.08
Area 22	0.1087000	282.9	19Sep2015, 12:32	7.33
Junction-13	4.6752170	2562.2	19Sep2015, 12:57	4.82
Reach-14	4.6752170	2559.7	19Sep2015, 13:04	4.78
Area 23	0.2300500	394.8	19Sep2015, 12:55	6.62
Junction-14	4.9052670	2943.0	19Sep2015, 13:03	4.86
Reach-15	4.9052670	2942.3	19Sep2015, 13:05	4.85
Area 24	0.1367700	287.5	19Sep2015, 12:45	7.18
Junction-1	5.0420370	3175.1	19Sep2015, 13:03	4.92

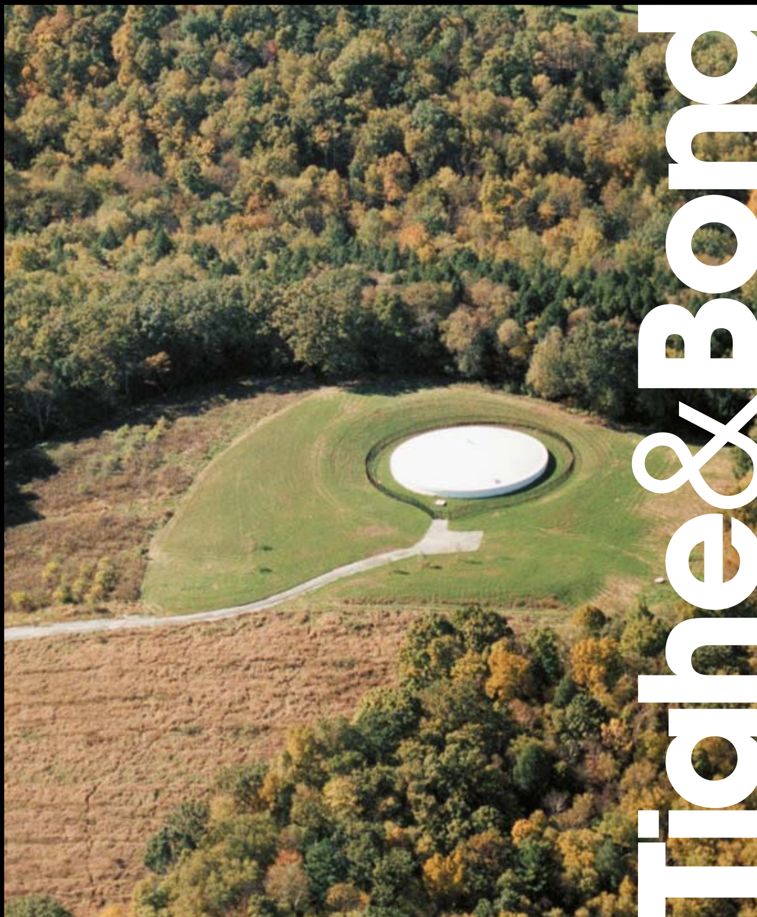
Project: MBTS Simulation Run: PR1_2100fi_100

Start of Run: 19Sep2015, 00:00
End of Run: 20Sep2015, 00:01
Compute Time: 09Oct2015, 16:46:06

Basin Model: PROP School Stree
Meteorologic Model: 2100 A1fi - 100 yr
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Area 5	0.9149000	2192.4	19Sep2015, 13:11	10.99
Area 2	0.2143070	693.0	19Sep2015, 12:49	11.77
Area 1	0.1202500	579.6	19Sep2015, 12:25	12.18
Pond 1	0.1202500	385.0	19Sep2015, 12:44	12.04
Reach-1	0.1202500	384.7	19Sep2015, 12:51	11.96
Junction-2	0.3345570	1077.0	19Sep2015, 12:50	11.84
Reach-2	0.3345570	1076.6	19Sep2015, 12:51	11.82
Area 3	0.1890000	647.9	19Sep2015, 12:39	10.72
Junction-3	0.5235570	1678.1	19Sep2015, 12:47	11.42
Reach-3	0.5235570	1677.5	19Sep2015, 12:48	11.41
Area 4	0.2384815	793.2	19Sep2015, 12:44	11.25
Junction-4	0.7620385	2463.7	19Sep2015, 12:47	11.36
Reach-4	0.7620385	2462.6	19Sep2015, 12:52	11.31
Area 6	0.3474700	946.8	19Sep2015, 13:07	12.22
Junction-5	2.0244085	5411.6	19Sep2015, 12:59	11.32
Pond 2	2.0244085	1298.1	19Sep2015, 15:07	9.18
Reach-5	2.0244085	1298.1	19Sep2015, 15:10	9.15
Area 7	0.3110400	1310.6	19Sep2015, 12:32	12.16
Junction-6	2.3354485	1812.9	19Sep2015, 13:03	9.55
Pond 3	2.3354485	1314.3	19Sep2015, 17:38	8.33
Reach-6	2.3354485	1314.3	19Sep2015, 17:40	8.30
Area 9	0.2393600	770.8	19Sep2015, 12:43	10.71
Area 10	0.1111700	464.5	19Sep2015, 12:28	10.94
Junction-7	0.3505300	1168.7	19Sep2015, 12:36	10.78
Reach-7	0.3505300	1168.0	19Sep2015, 12:42	10.73
Area 11	0.3052000	837.0	19Sep2015, 12:59	11.21
Junction-8	0.6557300	1929.8	19Sep2015, 12:48	10.95

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-8	0.6557300	1929.5	19Sep2015, 12:50	10.93
Area 13	0.0571908	207.1	19Sep2015, 12:41	11.96
Area 12	0.0548863	239.9	19Sep2015, 12:30	12.00
Junction-9	0.7678071	2298.9	19Sep2015, 12:47	11.08
Pond 4	0.7678071	1952.2	19Sep2015, 13:07	11.07
Reach-9	0.7678071	1951.9	19Sep2015, 13:09	11.05
Area 14	0.2956000	915.7	19Sep2015, 12:54	12.09
Area 8	0.1103443	514.2	19Sep2015, 12:26	12.01
Junction-10	3.5091999	3411.0	19Sep2015, 13:05	9.34
Reach-10	3.5091999	3410.7	19Sep2015, 13:08	9.30
Area 15	0.0890144	372.2	19Sep2015, 12:32	11.82
Junction-11	3.5982143	3576.0	19Sep2015, 13:06	9.37
Reach-11	3.5982143	3575.4	19Sep2015, 13:16	9.24
Area 19	0.1726400	725.9	19Sep2015, 12:30	11.48
Area 18	0.1713200	525.3	19Sep2015, 12:49	11.06
Area 17	0.1551600	500.0	19Sep2015, 12:46	11.25
Reach-12	0.1551600	499.7	19Sep2015, 12:50	11.21
Area 21	0.1163900	526.1	19Sep2015, 12:27	11.83
Area 20	0.0568027	238.9	19Sep2015, 12:37	13.29
Junction-12	0.6723127	2311.0	19Sep2015, 12:36	11.52
Pond 5	0.6723127	647.8	19Sep2015, 13:50	11.34
Reach-13	0.6723127	647.8	19Sep2015, 13:52	11.32
Area 16	0.2959900	966.4	19Sep2015, 12:47	11.60
Area 22	0.1087000	495.9	19Sep2015, 12:31	13.15
Junction-13	4.6752170	5014.8	19Sep2015, 13:12	9.78
Reach-14	4.6752170	5013.5	19Sep2015, 13:17	9.72
Area 23	0.2300500	721.7	19Sep2015, 12:54	12.26
Junction-14	4.9052670	5612.1	19Sep2015, 13:15	9.84
Reach-15	4.9052670	5611.6	19Sep2015, 13:16	9.82
Area 24	0.1367700	508.6	19Sep2015, 12:44	12.95
Junction-1	5.0420370	5926.4	19Sep2015, 13:15	9.90



APPENDIX C

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Weather History for KBVY - May, 2006

Saturday, May 13, 2006

Daily Weekly Monthly Custom

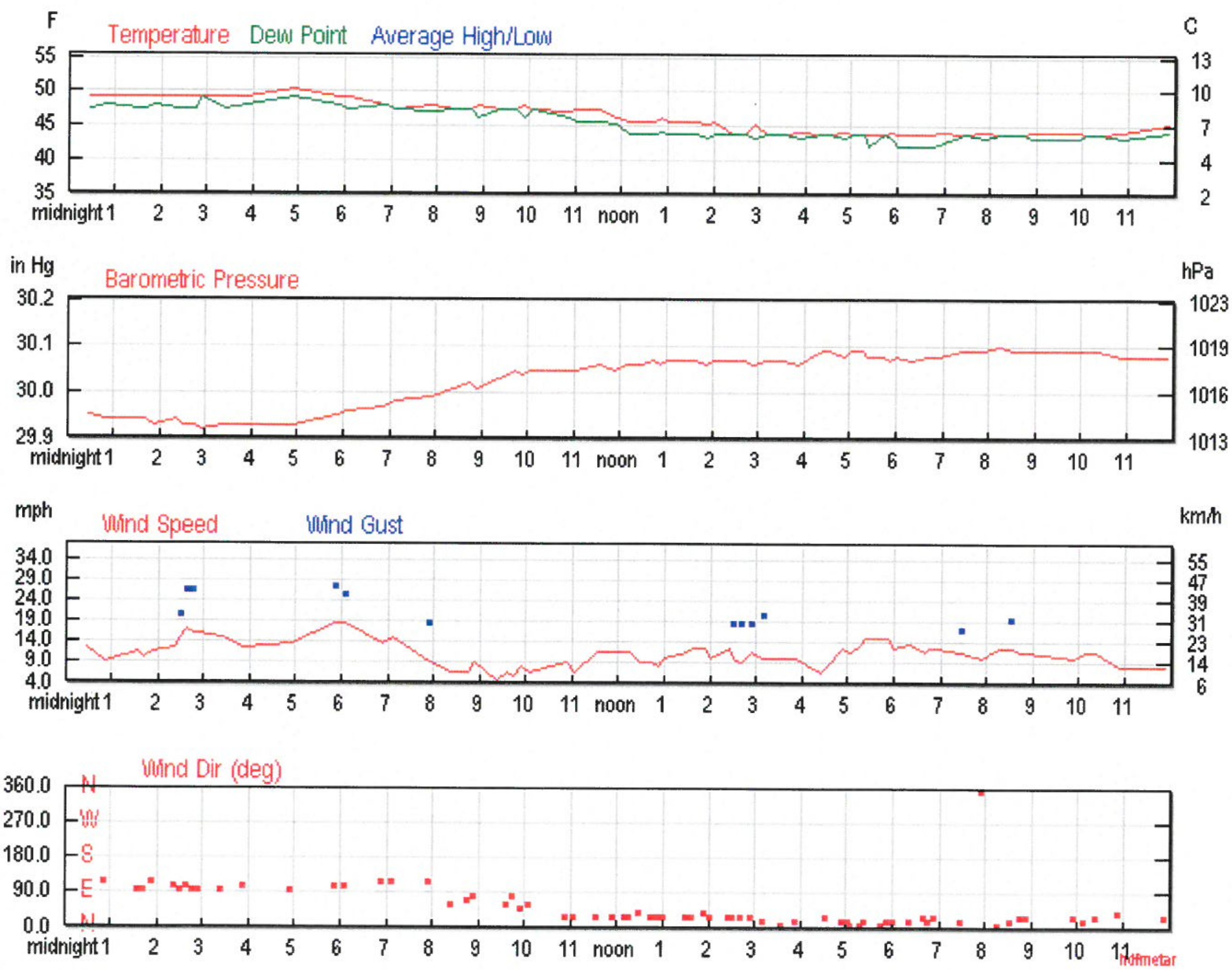
	Actual	Average (KBOS)	Record (KBOS)
Temperature			
Mean Temperature	**48** °F	**57** °F	
Max Temperature	**51** °F	**65** °F	**87** °F (1947)
Min Temperature	**44** °F	**49** °F	**38** °F (1882)
Degree Days			
Heating Degree Days	18	8	
Month to date heating degree days		133	
Since 1 July heating degree days		5514	
Cooling Degree Days	0	0	
Month to date cooling degree days		0	
Year to date cooling degree days		3	
Moisture			
Dew Point	**46** °F		
Average Humidity	96		
Maximum Humidity	100		
Minimum Humidity	93		
Precipitation			
Precipitation	**4.32** in	**0.10** in	**3.84** in (2006)
Month to date precipitation		1.36	
Year to date precipitation		16.03	

Sea Level Pressure	
Sea Level Pressure	**30.04** in
Wind	
Wind Speed	**12** mph (NE)
Max Wind Speed	**18** mph
Max Gust Speed	**28** mph
Visibility	**2** miles
Events	Fog , Rain

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



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KBVY

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

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Astronomy

May. 13, 2006	**Rise**	**Set**
Actual Time	5:23 AM EDT	7:56 PM EDT
Civil Twilight	4:51 AM EDT	8:29 PM EDT
Nautical Twilight	4:11 AM EDT	9:09 PM EDT
Astronomical Twilight	3:26 AM EDT	9:54 PM EDT
Moon	8:55 PM EDT (5/13)	5:09 AM EDT (5/13)
Length of Visible Light	15h 37m	
Length of Day	14h 33m	

Full, 100% of the Moon is Illuminated

May 13	May 20	May 27	Jun 3	Jun 11
Full	Last Quarter	New	First Quarter	Full

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Hourly Weather History & Observations

Time (EDT)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip
12:27 AM	**50.0** °F	-	**48.2** °F	94%	**29.95** in	**3.0** mi	East	**12.7** mph	**21.9** mph	**0.05** in
12:53 AM	**50.0** °F	-	**48.9** °F	96%	**29.94** in	**3.0** mi	ESE	**9.2** mph	-	**0.18** in
1:35 AM	**50.0** °F	-	**48.2** °F	94%	**29.94** in	**2.0** mi	East	**11.5** mph	-	**0.00** in

1:42 AM	50.0 °F	-	48.2 °F	94%	29.94 in	1.2 mi	East	10.4 mph	-	0.00 in
1:53 AM	50.0 °F	-	48.9 °F	96%	29.93 in	1.0 mi	ESE	11.5 mph	-	0.00 in
2:23 AM	50.0 °F	-	48.2 °F	94%	29.94 in	0.8 mi	ESE	12.7 mph	20.7 mph	0.03 in
2:30 AM	50.0 °F	-	48.2 °F	94%	29.93 in	1.5 mi	East	15.0 mph	20.7 mph	0.09 in
2:39 AM	50.0 °F	-	48.2 °F	94%	29.93 in	2.5 mi	ESE	17.3 mph	26.5 mph	0.13 in
2:45 AM	50.0 °F	-	48.2 °F	94%	29.93 in	3.0 mi	East	16.1 mph	26.5 mph	0.14 in
2:53 AM	50.0 °F	-	50.0 °F	100%	29.92 in	2.5 mi	East	16.1 mph	-	0.16 in
3:24 AM	50.0 °F	-	48.2 °F	94%	29.93 in	3.0 mi	East	15.0 mph	27.6 mph	0.18 in
3:53 AM	50.0 °F	-	48.9 °F	96%	29.93 in	4.0 mi	ESE	12.7 mph	-	0.27 in
4:53 AM	51.1 °F	-	50.0 °F	96%	29.93 in	5.0 mi	East	13.8 mph	25.3 mph	0.14 in
5:53 AM	50.0 °F	-	48.9 °F	96%	29.95 in	1.2 mi	ESE	18.4 mph	27.6 mph	0.01 in
6:04 AM	50.0 °F	-	48.2 °F	94%	29.96 in	0.5 mi	ESE	18.4 mph	25.3 mph	N/A
6:53 AM	48.9 °F	-	48.9 °F	100%	29.97 in	0.8 mi	ESE	13.8 mph	-	0.00 in
7:07 AM	48.2 °F	-	48.2 °F	100%	29.98 in	0.5 mi	ESE	15.0 mph	20.7 mph	N/A
7:53 AM	48.9 °F	-	48.0 °F	97%	29.99 in	1.0 mi	ESE	9.2 mph	18.4 mph	0.02 in
8:24 AM	48.2 °F	-	48.2 °F	100%	30.01 in	1.5 mi	ENE	6.9 mph	-	0.12 in
8:44 AM	48.2 °F	-	48.2 °F	100%	30.02 in	1.8 mi	ENE	6.9 mph	-	0.25 in
8:53 AM	48.9 °F	-	46.9 °F	93%	30.01 in	3.0 mi	East	9.2 mph	-	0.27 in
9:21 AM	48.2 °F	-	48.2 °F	100%	30.03 in	1.8 mi	Variable	4.6 mph	-	0.10 in
9:34 AM	48.2 °F	-	48.2 °F	100%	30.04 in	3.0 mi	ENE	6.9 mph	-	0.14 in

9:44 AM	48.2 °F	-	48.2 °F	100%	30.05 in	1.8 mi	East	5.8 mph	-	0.20 in
9:53 AM	48.9 °F	-	46.9 °F	93%	30.04 in	0.8 mi	NE	8.1 mph	-	0.37 in
10:04 AM	48.2 °F	-	48.2 °F	100%	30.05 in	1.0 mi	ENE	6.9 mph	-	0.14 in
10:53 AM	48.0 °F	-	46.9 °F	96%	30.05 in	1.8 mi	NNE	9.2 mph	-	0.45 in
11:02 AM	48.2 °F	-	46.4 °F	93%	30.05 in	1.5 mi	NNE	6.9 mph	-	0.06 in
11:32 AM	48.2 °F	-	46.4 °F	93%	30.06 in	2.0 mi	NNE	11.5 mph	-	0.19 in
11:53 AM	46.9 °F	-	46.0 °F	97%	30.05 in	2.0 mi	NNE	11.5 mph	-	0.26 in
12:09 PM	46.4 °F	41.1 °F	44.6 °F	93%	30.06 in	3.0 mi	NNE	11.5 mph	-	0.03 in
12:15 PM	46.4 °F	41.1 °F	44.6 °F	93%	30.06 in	1.8 mi	NNE	11.5 mph	-	0.06 in
12:29 PM	46.4 °F	41.9 °F	44.6 °F	93%	30.06 in	3.0 mi	NE	9.2 mph	-	0.09 in
12:43 PM	46.4 °F	41.9 °F	44.6 °F	93%	30.07 in	1.8 mi	NNE	9.2 mph	-	0.12 in
12:53 PM	46.9 °F	-	45.0 °F	93%	30.06 in	2.0 mi	NNE	8.1 mph	-	0.14 in
1:01 PM	46.4 °F	41.5 °F	44.6 °F	93%	30.07 in	1.5 mi	NNE	10.4 mph	-	0.03 in
1:30 PM	46.4 °F	41.1 °F	44.6 °F	93%	30.07 in	1.5 mi	NNE	11.5 mph	-	0.07 in
1:38 PM	46.4 °F	40.7 °F	44.6 °F	93%	30.07 in	1.2 mi	NNE	12.7 mph	-	0.09 in
1:53 PM	46.0 °F	40.2 °F	44.1 °F	93%	30.06 in	2.0 mi	NE	12.7 mph	-	0.16 in
2:02 PM	46.4 °F	41.5 °F	44.6 °F	93%	30.07 in	1.8 mi	NNE	10.4 mph	-	0.00 in
2:24 PM	44.6 °F	38.4 °F	44.6 °F	100%	30.07 in	0.8 mi	NNE	12.7 mph	18.4 mph	0.13 in
2:31 PM	44.6 °F	39.2 °F	44.6 °F	100%	30.07 in	0.8 mi	NNE	10.4 mph	18.4 mph	0.19 in
2:40 PM	44.6 °F	39.7 °F	44.6 °F	100%	30.07 in	1.0 mi	NNE	9.2 mph	18.4 mph	0.27 in

PM										
2:53 PM	46.0 °F	40.6 °F	44.1 °F	93%	30.06 in	2.5 mi	NNE	11.5 mph	18.4 mph	0.30 in
3:09 PM	44.6 °F	39.2 °F	44.6 °F	100%	30.07 in	1.2 mi	NNE	10.4 mph	20.7 mph	0.05 in
3:33 PM	44.6 °F	39.2 °F	44.6 °F	100%	30.07 in	3.0 mi	North	10.4 mph	-	0.19 in
3:53 PM	45.0 °F	39.7 °F	44.1 °F	97%	30.06 in	1.8 mi	NNE	10.4 mph	19.6 mph	0.22 in
4:25 PM	44.6 °F	40.7 °F	44.6 °F	100%	30.09 in	2.0 mi	Variable	6.9 mph	-	0.17 in
4:32 PM	44.6 °F	40.2 °F	44.6 °F	100%	30.09 in	1.2 mi	NNE	8.1 mph	-	0.21 in
4:53 PM	45.0 °F	38.9 °F	44.1 °F	97%	30.08 in	1.8 mi	NNE	12.7 mph	-	0.32 in
5:01 PM	44.6 °F	38.8 °F	44.6 °F	100%	30.09 in	2.0 mi	NNE	11.5 mph	-	0.03 in
5:05 PM	44.6 °F	38.8 °F	44.6 °F	100%	30.09 in	2.0 mi	North	11.5 mph	-	0.05 in
5:17 PM	44.6 °F	38.1 °F	44.6 °F	100%	30.09 in	2.0 mi	North	13.8 mph	18.4 mph	0.10 in
5:24 PM	44.6 °F	37.8 °F	42.8 °F	93%	30.08 in	1.2 mi	NNE	15.0 mph	-	0.14 in
5:43 PM	44.6 °F	37.8 °F	44.6 °F	100%	30.08 in	2.0 mi	North	15.0 mph	20.7 mph	0.25 in
5:53 PM	45.0 °F	38.2 °F	44.1 °F	97%	30.07 in	2.5 mi	NNE	15.0 mph	-	0.28 in
6:01 PM	44.6 °F	38.4 °F	42.8 °F	93%	30.08 in	3.0 mi	NNE	12.7 mph	-	0.02 in
6:21 PM	44.6 °F	38.1 °F	42.8 °F	93%	30.07 in	2.0 mi	NNE	13.8 mph	-	N/A
6:39 PM	44.6 °F	38.8 °F	42.8 °F	93%	30.08 in	4.0 mi	NNE	11.5 mph	19.6 mph	0.11 in
6:44 PM	44.6 °F	38.4 °F	42.8 °F	93%	30.08 in	1.8 mi	NNE	12.7 mph	-	0.16 in
6:53 PM	45.0 °F	38.9 °F	43.0 °F	93%	30.08 in	1.5 mi	NNE	12.7 mph	17.3 mph	0.19 in
7:28 PM	44.6 °F	38.8 °F	44.6 °F	100%	30.09 in	3.0 mi	NNE	11.5 mph	17.3 mph	0.04 in
7:53	45.0 °F	39.7 °F	44.1 °F	97%	30.09 in	2.5 mi	North	10.4 mph	-	0.09 in

PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
8:15 PM	**44.6** °F	**38.4** °F	**44.6** °F	100%	**30.10** in	**3.0** mi	North	**12.7** mph	**18.4** mph	**0.03** in
8:32 PM	**44.6** °F	**38.4** °F	**44.6** °F	100%	**30.09** in	**2.0** mi	NNE	**12.7** mph	**19.6** mph	**0.05** in
8:44 PM	**44.6** °F	**38.8** °F	**44.6** °F	100%	**30.09** in	**4.0** mi	NNE	**11.5** mph	-	**0.06** in
8:53 PM	**45.0** °F	**39.3** °F	**44.1** °F	97%	**30.09** in	**4.0** mi	NNE	**11.5** mph	-	**0.06** in
9:53 PM	**45.0** °F	**39.7** °F	**44.1** °F	97%	**30.09** in	**5.0** mi	NNE	**10.4** mph	**16.1** mph	**0.05** in
10:08 PM	**44.6** °F	**38.8** °F	**44.6** °F	100%	**30.09** in	**2.0** mi	NNE	**11.5** mph	-	**0.10** in
10:24 PM	**44.6** °F	**38.8** °F	**44.6** °F	100%	**30.09** in	**5.0** mi	NNE	**11.5** mph	-	**0.15** in
10:53 PM	**45.0** °F	**40.6** °F	**44.1** °F	97%	**30.08** in	**7.0** mi	NE	**8.1** mph	**17.3** mph	**0.18** in
11:53 PM	**46.0** °F	**41.9** °F	**45.0** °F	96%	**30.08** in	**2.0** mi	NNE	**8.1** mph	-	**0.20** in

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Weather History for KBVY - May, 2006

Sunday, May 14, 2006

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**46** °F	-	
Max Temperature	**48** °F	**62** °F	**79** °F (1981)
Min Temperature	**44** °F	**42** °F	**33** °F (1999)
Degree Days			
Heating Degree Days	19		
Moisture			
Dew Point	**44** °F		
Average Humidity	94		
Maximum Humidity	100		
Minimum Humidity	93		
Precipitation			
Precipitation	**4.95** in	-	- ()
Sea Level Pressure			
Sea Level Pressure	**30.11** in		
Wind			
Wind Speed	**10** mph (NE)		
Max Wind Speed	**21** mph		
Max Gust Speed	**28** mph		
Visibility	**2** miles		

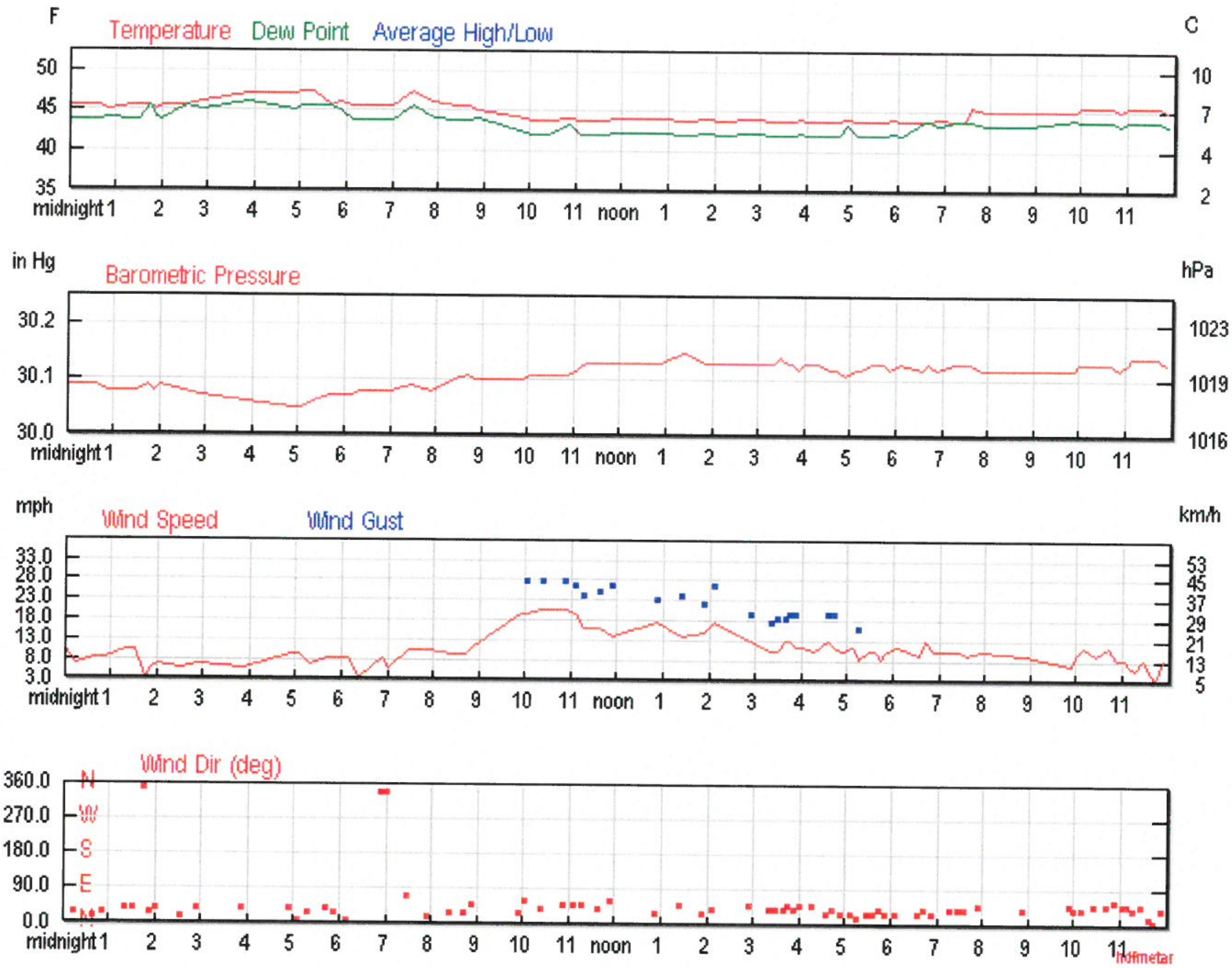
Events	Rain , Thunderstorm

Averages and records for this station are not official NWS values.

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



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Airport or City:

KBVY

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

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Astronomy

May. 14, 2006	Rise	Set
Actual Time	5:22 AM EDT	7:57 PM EDT
Civil Twilight	4:50 AM EDT	8:30 PM EDT
Nautical Twilight	4:10 AM EDT	9:10 PM EDT
Astronomical Twilight	3:24 AM EDT	9:56 PM EDT
Moon	10:05 PM EDT (5/14)	5:45 AM EDT (5/14)
Length of Visible Light	15h 39m	
Length of Day	14h 35m	

Full, 98% of the Moon is Illuminated

May 14	May 20	May 27	Jun 3	Jun 11
Full	Last Quarter	New	First Quarter	Full

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Hourly Weather History & Observations

Time (EDT)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip
12:00 AM	**46.4** °F	**41.5** °F	**44.6** °F	93%	**30.09** in	**1.5** mi	NNE	**10.4** mph	-	**0.08** in
12:14 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.09** in	**3.0** mi	NNE	**6.9** mph	-	**0.13** in
12:39 AM	**46.4** °F	**42.4** °F	**44.6** °F	93%	**30.09** in	**2.0** mi	NNE	**8.1** mph	-	**0.23** in
12:53 AM	**46.0** °F	**41.9** °F	**45.0** °F	96%	**30.08** in	**3.0** mi	NNE	**8.1** mph	-	**0.29** in
1:22 AM	**46.4** °F	**41.5** °F	**44.6** °F	93%	**30.08** in	**2.5** mi	NE	**10.4** mph	-	**0.12** in
1:32 AM	**46.4** °F	**41.5** °F	**44.6** °F	93%	**30.08** in	**1.5** mi	NE	**10.4** mph	-	**0.21** in
1:44 AM	**46.4** °F	**45.2** °F	**46.4** °F	100%	**30.09** in	**2.0** mi	North	**3.5** mph	-	**0.28** in

1:53 AM	**46.0** °F	**43.1** °F	**45.0** °F	96%	**30.08** in	**2.0** mi	NNE	**5.8** mph	-	**0.32** in
2:00 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.09** in	**2.5** mi	NE	**6.9** mph	-	**0.01** in
2:32 AM	**46.4** °F	**43.5** °F	**46.4** °F	100%	**30.08** in	**4.0** mi	NNE	**5.8** mph	-	**0.08** in
2:53 AM	**46.9** °F	-	**46.0** °F	97%	**30.07** in	**5.0** mi	NE	**6.9** mph	-	**0.11** in
3:53 AM	**48.0** °F	-	**46.9** °F	96%	**30.06** in	**10.0** mi	NE	**5.8** mph	-	**0.07** in
4:53 AM	**48.0** °F	-	**46.0** °F	93%	**30.05** in	**3.0** mi	NE	**9.2** mph	-	**0.05** in
5:05 AM	**48.2** °F	-	**46.4** °F	93%	**30.05** in	**2.5** mi	North	**9.2** mph	-	**0.06** in
5:17 AM	**48.2** °F	-	**46.4** °F	93%	**30.06** in	**5.0** mi	NNE	**6.9** mph	-	N/A
5:42 AM	**46.4** °F	**42.4** °F	**46.4** °F	100%	**30.07** in	**2.0** mi	NE	**8.1** mph	-	**0.11** in
5:53 AM	**46.9** °F	-	**46.0** °F	97%	**30.07** in	**1.5** mi	NNE	**8.1** mph	-	**0.20** in
6:08 AM	**46.4** °F	**42.4** °F	**44.6** °F	93%	**30.07** in	**2.0** mi	North	**8.1** mph	-	N/A
6:22 AM	**46.4** °F	**45.2** °F	**44.6** °F	93%	**30.08** in	**1.2** mi	Variable	**3.5** mph	-	**0.25** in
6:53 AM	**46.4** °F	**42.4** °F	**44.6** °F	93%	**30.08** in	**3.0** mi	NNW	**8.1** mph	-	N/A
7:02 AM	**46.4** °F	**43.5** °F	**44.6** °F	93%	**30.08** in	**1.8** mi	NNW	**5.8** mph	-	**0.07** in
7:28 AM	**48.2** °F	-	**46.4** °F	93%	**30.09** in	**3.0** mi	ENE	**10.4** mph	-	**0.31** in
7:53 AM	**46.9** °F	-	**45.0** °F	93%	**30.08** in	**1.5** mi	NNE	**10.4** mph	-	**0.38** in
8:24 AM	**46.4** °F	**41.9** °F	**44.6** °F	93%	**30.10** in	**2.5** mi	NNE	**9.2** mph	-	**0.13** in
8:42 AM	**46.4** °F	**41.9** °F	**44.6** °F	93%	**30.11** in	**1.2** mi	NNE	**9.2** mph	-	**0.23** in
8:53 AM	**46.0** °F	**40.6** °F	**45.0** °F	96%	**30.10** in	**1.2** mi	NE	**11.5** mph	-	**0.31** in
9:53 AM	**45.0** °F	**37.1** °F	**43.0** °F	93%	**30.10** in	**1.5** mi	NNE	**19.6** mph	**26.5** mph	**0.52** in

10:03 AM	44.6 °F	36.6 °F	42.8 °F	93%	30.11 in	2.0 mi	ENE	19.6 mph	27.6 mph	0.04 in
10:23 AM	44.6 °F	36.4 °F	42.8 °F	93%	30.11 in	1.5 mi	NE	20.7 mph	27.6 mph	0.16 in
10:53 AM	45.0 °F	36.9 °F	44.1 °F	97%	30.11 in	2.0 mi	NE	20.7 mph	27.6 mph	0.32 in
11:05 AM	44.6 °F	36.6 °F	42.8 °F	93%	30.12 in	1.8 mi	NE	19.6 mph	26.5 mph	0.06 in
11:15 AM	44.6 °F	37.4 °F	42.8 °F	93%	30.13 in	2.0 mi	NE	16.1 mph	24.2 mph	0.10 in
11:38 AM	44.6 °F	37.4 °F	42.8 °F	93%	30.13 in	1.8 mi	NE	16.1 mph	25.3 mph	0.19 in
11:53 AM	45.0 °F	38.5 °F	43.0 °F	93%	30.13 in	3.0 mi	ENE	13.8 mph	26.5 mph	0.24 in
12:53 PM	45.0 °F	37.6 °F	43.0 °F	93%	30.13 in	5.0 mi	NNE	17.3 mph	23.0 mph	0.08 in
1:23 PM	44.6 °F	38.1 °F	42.8 °F	93%	30.15 in	1.8 mi	NE	13.8 mph	24.2 mph	0.04 in
1:53 PM	45.0 °F	38.2 °F	43.0 °F	93%	30.13 in	2.5 mi	NNE	15.0 mph	21.9 mph	0.13 in
2:05 PM	44.6 °F	37.2 °F	42.8 °F	93%	30.13 in	1.2 mi	NE	17.3 mph	26.5 mph	0.07 in
2:53 PM	45.0 °F	38.9 °F	43.0 °F	93%	30.13 in	1.2 mi	NE	12.7 mph	19.6 mph	0.30 in
3:21 PM	44.6 °F	39.2 °F	42.8 °F	93%	30.13 in	3.0 mi	NE	10.4 mph	17.3 mph	0.04 in
3:29 PM	44.6 °F	39.2 °F	42.8 °F	93%	30.14 in	2.5 mi	NE	10.4 mph	18.4 mph	0.05 in
3:38 PM	44.6 °F	38.4 °F	42.8 °F	93%	30.13 in	2.5 mi	NE	12.7 mph	18.4 mph	0.06 in
3:45 PM	44.6 °F	38.4 °F	42.8 °F	93%	30.13 in	5.0 mi	NE	12.7 mph	19.6 mph	0.06 in
3:53 PM	45.0 °F	39.3 °F	43.0 °F	93%	30.12 in	5.0 mi	NE	11.5 mph	19.6 mph	0.06 in
4:01 PM	44.6 °F	38.8 °F	42.8 °F	93%	30.13 in	3.0 mi	NE	11.5 mph	-	0.00 in
4:16 PM	44.6 °F	39.2 °F	42.8 °F	93%	30.13 in	1.8 mi	NE	10.4 mph	18.4 mph	0.05 in
4:36	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PM	44.6 °F	38.4 °F	42.8 °F	93%	30.12 in	2.0 mi	NNE	12.7 mph	19.6 mph	0.16 in
4:44 PM	44.6 °F	38.8 °F	42.8 °F	93%	30.12 in	1.2 mi	NE	11.5 mph	19.6 mph	0.20 in
4:53 PM	45.0 °F	39.7 °F	44.1 °F	97%	30.11 in	1.2 mi	NNE	10.4 mph	-	0.26 in
5:07 PM	44.6 °F	38.8 °F	42.8 °F	93%	30.12 in	2.0 mi	NNE	11.5 mph	18.4 mph	0.06 in
5:14 PM	44.6 °F	40.2 °F	42.8 °F	93%	30.12 in	1.8 mi	NNE	8.1 mph	16.1 mph	0.11 in
5:28 PM	44.6 °F	39.2 °F	42.8 °F	93%	30.13 in	2.0 mi	NNE	10.4 mph	-	0.17 in
5:37 PM	44.6 °F	39.2 °F	42.8 °F	93%	30.13 in	1.8 mi	NNE	10.4 mph	-	0.21 in
5:43 PM	44.6 °F	40.2 °F	42.8 °F	93%	30.13 in	3.0 mi	NE	8.1 mph	-	0.22 in
5:53 PM	45.0 °F	39.7 °F	43.0 °F	93%	30.12 in	2.5 mi	NNE	10.4 mph	17.3 mph	0.25 in
6:05 PM	44.6 °F	38.8 °F	42.8 °F	93%	30.13 in	1.5 mi	NNE	11.5 mph	-	0.07 in
6:34 PM	44.6 °F	39.7 °F	44.6 °F	100%	30.12 in	0.8 mi	NNE	9.2 mph	-	0.28 in
6:42 PM	44.6 °F	38.4 °F	44.6 °F	100%	30.13 in	1.2 mi	NE	12.7 mph	-	0.31 in
6:53 PM	45.0 °F	39.7 °F	44.1 °F	97%	30.12 in	1.5 mi	NNE	10.4 mph	-	0.35 in
7:18 PM	44.6 °F	39.2 °F	44.6 °F	100%	30.13 in	3.0 mi	NE	10.4 mph	-	0.11 in
7:27 PM	44.6 °F	39.2 °F	44.6 °F	100%	30.13 in	2.5 mi	NE	10.4 mph	-	0.14 in
7:35 PM	46.4 °F	41.9 °F	44.6 °F	93%	30.13 in	3.0 mi	NE	9.2 mph	-	0.15 in
7:53 PM	46.0 °F	41.0 °F	44.1 °F	93%	30.12 in	3.0 mi	NE	10.4 mph	-	0.21 in
8:53 PM	46.0 °F	41.4 °F	44.1 °F	93%	30.12 in	3.0 mi	NE	9.2 mph	-	0.13 in
9:53 PM	46.0 °F	42.5 °F	45.0 °F	96%	30.12 in	3.0 mi	NE	6.9 mph	-	0.14 in
9:59 PM	46.4 °F	41.9 °F	44.6 °F	93%	30.13 in	2.5 mi	NE	9.2 mph	-	0.02 in
10:10										

10:10 PM	46.4 °F	41.1 °F	44.6 °F	93%	30.13 in	5.0 mi	NE	11.5 mph	-	0.04 in
10:25 PM	46.4 °F	41.9 °F	44.6 °F	93%	30.13 in	6.0 mi	NE	9.2 mph	-	0.05 in
10:41 PM	46.4 °F	41.1 °F	44.6 °F	93%	30.13 in	2.5 mi	NE	11.5 mph	-	0.08 in
10:53 PM	46.0 °F	41.9 °F	44.1 °F	93%	30.12 in	1.8 mi	ENE	8.1 mph	-	0.12 in
11:02 PM	46.4 °F	42.4 °F	44.6 °F	93%	30.13 in	2.5 mi	NE	8.1 mph	-	0.01 in
11:09 PM	46.4 °F	42.9 °F	44.6 °F	93%	30.14 in	3.0 mi	NE	6.9 mph	-	0.02 in
11:16 PM	46.4 °F	43.5 °F	44.6 °F	93%	30.14 in	1.8 mi	NE	5.8 mph	-	N/A
11:28 PM	46.4 °F	42.4 °F	44.6 °F	93%	30.14 in	2.0 mi	NE	8.1 mph	-	0.07 in
11:38 PM	46.4 °F	44.3 °F	44.6 °F	93%	30.14 in	3.0 mi	NNE	4.6 mph	-	0.09 in
11:43 PM	46.4 °F	45.2 °F	44.6 °F	93%	30.14 in	2.5 mi	North	3.5 mph	-	0.09 in
11:53 PM	46.0 °F	41.9 °F	44.1 °F	93%	30.13 in	2.0 mi	NE	8.1 mph	-	0.11 in

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Weather History for KBVY - May, 2006

Monday, May 15, 2006

Daily | Weekly | Monthly | Custom

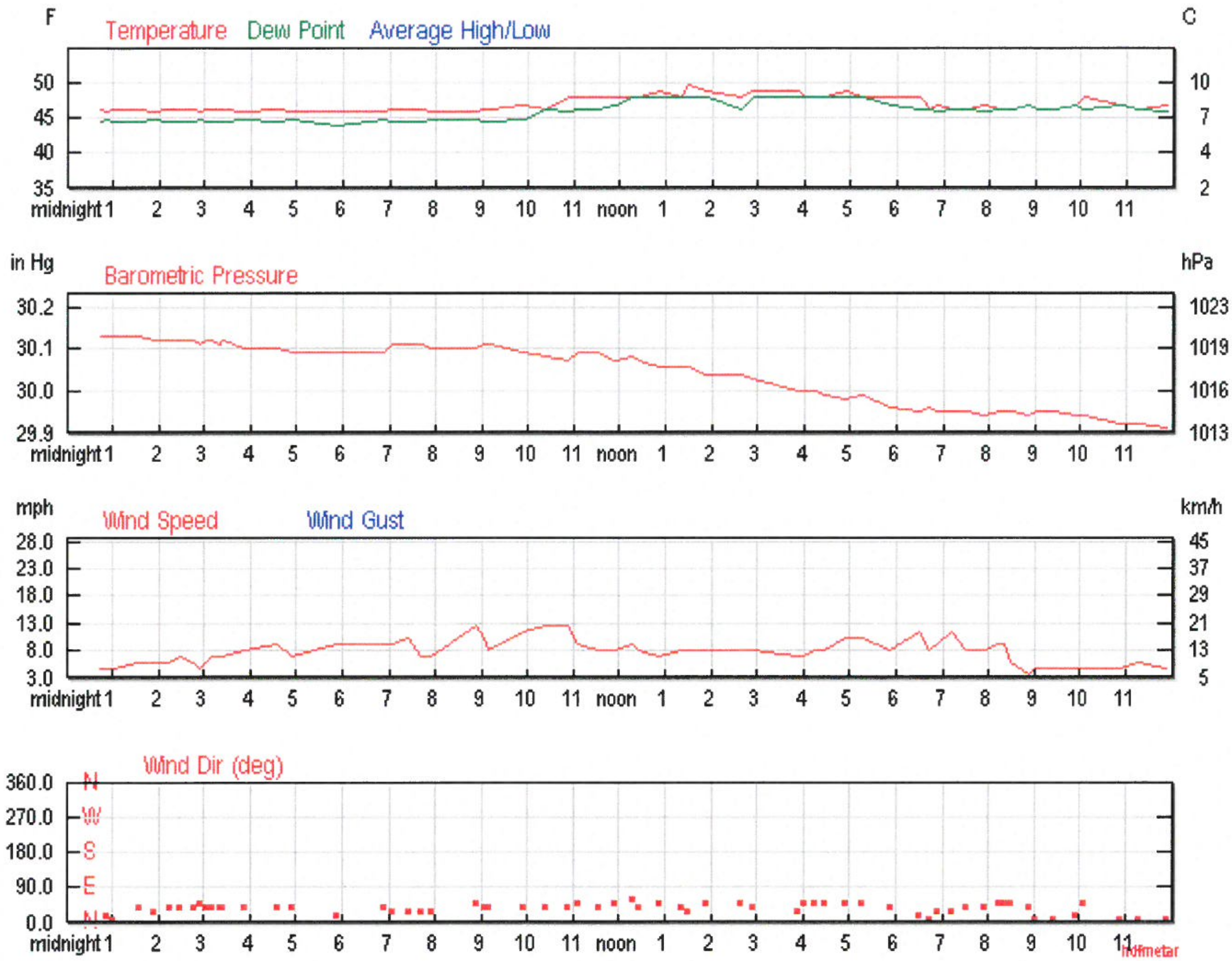
	Actual	Average	Record
Temperature			
Mean Temperature	**48** °F	-	
Max Temperature	**50** °F	**62** °F	**88** °F (2004)
Min Temperature	**46** °F	**42** °F	**37** °F (2013)
Degree Days			
Heating Degree Days	17		
Moisture			
Dew Point	**46** °F		
Average Humidity	96		
Maximum Humidity	100		
Minimum Humidity	93		
Precipitation			
Precipitation	**1.15** in	-	- ()
Sea Level Pressure			
Sea Level Pressure	**30.04** in		
Wind			
Wind Speed	**7** mph (NE)		
Max Wind Speed	**13** mph		
Max Gust Speed	**18** mph		
Visibility	**2** miles		

Events	Fog , Rain , Thunderstorm

Averages and records for this station are not official NWS values.

T = Trace of Precipitation, MM = Missing Value Source: NWS Daily Summary

Daily Weather History Graph



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KBVY

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Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

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Astronomy

May. 15, 2006	Rise	Set
Actual Time	5:21 AM EDT	7:58 PM EDT
Civil Twilight	4:49 AM EDT	8:31 PM EDT
Nautical Twilight	4:08 AM EDT	9:12 PM EDT
Astronomical Twilight	3:23 AM EDT	9:58 PM EDT
Moon	11:10 PM EDT (5/15)	6:30 AM EDT (5/15)
Length of Visible Light	15h 42m	
Length of Day	14h 37m	

Waning Gibbous, 94% of the Moon is Illuminated

May 15	May 20	May 27	Jun 3	Jun 11
Waning Gibbous	Last Quarter	New	First Quarter	Full

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Hourly Weather History & Observations

Time (EDT)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip
12:43 AM	**46.4** °F	**44.3** °F	**44.6** °F	93%	**30.13** in	**2.0** mi	NNE	**4.6** mph	-	**0.06** in
12:53 AM	**46.0** °F	**43.9** °F	**45.0** °F	96%	**30.13** in	**2.0** mi	NNE	**4.6** mph	-	**0.06** in
1:01 AM	**46.4** °F	**44.3** °F	**44.6** °F	93%	**30.13** in	**2.0** mi	North	**4.6** mph	-	**0.01** in
1:33 AM	**46.4** °F	**43.5** °F	**44.6** °F	93%	**30.13** in	**2.0** mi	NE	**5.8** mph	-	**0.03** in
1:53 AM	**46.0** °F	**43.1** °F	**45.0** °F	96%	**30.12** in	**4.0** mi	NNE	**5.8** mph	-	**0.03** in
2:14 AM	**46.4** °F	**43.5** °F	**44.6** °F	93%	**30.12** in	**2.0** mi	NE	**5.8** mph	-	**0.01** in
2:28 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.12** in	**6.0** mi	NE	**6.9** mph	-	N/A

2:46 AM	**46.4** °F	**43.5** °F	**44.6** °F	93%	**30.12** in	**2.5** mi	NE	**5.8** mph	-	**0.04** in
2:53 AM	**46.0** °F	**43.9** °F	**45.0** °F	96%	**30.11** in	**2.5** mi	NE	**4.6** mph	-	**0.05** in
3:02 AM	**46.4** °F	**43.5** °F	**44.6** °F	93%	**30.12** in	**3.0** mi	NE	**5.8** mph	-	**0.01** in
3:09 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.12** in	**2.5** mi	NE	**6.9** mph	-	**0.03** in
3:20 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.11** in	**3.0** mi	NE	**6.9** mph	-	**0.05** in
3:22 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.12** in	**4.0** mi	NE	**6.9** mph	-	**0.05** in
3:53 AM	**46.0** °F	**41.9** °F	**45.0** °F	96%	**30.10** in	**6.0** mi	NE	**8.1** mph	-	**0.10** in
4:34 AM	**46.4** °F	**41.9** °F	**44.6** °F	93%	**30.10** in	**8.0** mi	NE	**9.2** mph	-	**0.08** in
4:53 AM	**46.0** °F	**42.5** °F	**45.0** °F	96%	**30.09** in	**7.0** mi	NE	**6.9** mph	-	**0.10** in
5:53 AM	**46.0** °F	**41.4** °F	**44.1** °F	93%	**30.09** in	**6.0** mi	NNE	**9.2** mph	-	**0.07** in
6:53 AM	**46.0** °F	**41.4** °F	**45.0** °F	96%	**30.09** in	**5.0** mi	NE	**9.2** mph	-	**0.01** in
7:03 AM	**46.4** °F	**41.9** °F	**44.6** °F	93%	**30.11** in	**1.8** mi	NNE	**9.2** mph	-	N/A
7:26 AM	**46.4** °F	**41.5** °F	**44.6** °F	93%	**30.11** in	**0.8** mi	NNE	**10.4** mph	-	**0.10** in
7:40 AM	**46.4** °F	**42.9** °F	**44.6** °F	93%	**30.11** in	**1.0** mi	NNE	**6.9** mph	-	**0.18** in
7:53 AM	**46.0** °F	**42.5** °F	**45.0** °F	96%	**30.10** in	**1.0** mi	NNE	**6.9** mph	-	**0.27** in
8:53 AM	**46.0** °F	**40.2** °F	**45.0** °F	96%	**30.10** in	**2.0** mi	NE	**12.7** mph	-	**0.23** in
9:04 AM	**46.4** °F	**41.5** °F	**44.6** °F	93%	**30.11** in	**4.0** mi	NE	**10.4** mph	-	**0.00** in
9:09 AM	**46.4** °F	**42.4** °F	**44.6** °F	93%	**30.11** in	**1.8** mi	NE	**8.1** mph	-	**0.00** in
9:53 AM	**46.9** °F	-	**45.0** °F	93%	**30.09** in	**1.5** mi	NE	**11.5** mph	-	**0.07** in
10:23 AM	**46.4** °F	**40.7** °F	**46.4** °F	100%	**30.08** in	**3.0** mi	NE	**12.7** mph	**18.4** mph	**0.03** in

10:53 AM	**48.0** °F	-	**46.0** °F	93%	**30.07** in	**7.0** mi	NE	**12.7** mph	-	**0.03** in
11:06 AM	**48.2** °F	-	**46.4** °F	93%	**30.09** in	**1.8** mi	NE	**9.2** mph	-	**0.00** in
11:33 AM	**48.2** °F	-	**46.4** °F	93%	**30.09** in	**1.2** mi	NE	**8.1** mph	-	**0.02** in
11:53 AM	**48.0** °F	-	**46.9** °F	96%	**30.07** in	**1.2** mi	NE	**8.1** mph	-	**0.03** in
12:18 PM	**48.2** °F	-	**48.2** °F	100%	**30.08** in	**1.8** mi	ENE	**9.2** mph	-	N/A
12:26 PM	**48.2** °F	-	**48.2** °F	100%	**30.07** in	**1.2** mi	NE	**8.1** mph	-	**0.01** in
12:53 PM	**48.9** °F	-	**48.0** °F	97%	**30.06** in	**1.2** mi	NE	**6.9** mph	-	**0.01** in
1:22 PM	**48.2** °F	-	**48.2** °F	100%	**30.06** in	**0.8** mi	NE	**8.1** mph	-	**0.00** in
1:29 PM	**50.0** °F	-	**48.2** °F	94%	**30.06** in	**1.2** mi	NNE	**8.1** mph	-	**0.00** in
1:53 PM	**48.9** °F	-	**48.0** °F	97%	**30.04** in	**1.2** mi	NE	**8.1** mph	-	**0.00** in
2:38 PM	**48.2** °F	-	**46.4** °F	93%	**30.04** in	**0.8** mi	NE	**8.1** mph	-	**0.01** in
2:53 PM	**48.9** °F	-	**48.0** °F	97%	**30.03** in	**1.2** mi	NE	**8.1** mph	-	**0.02** in
3:53 PM	**48.9** °F	-	**48.0** °F	97%	**30.00** in	**1.8** mi	NNE	**6.9** mph	-	**0.03** in
4:01 PM	**48.2** °F	-	**48.2** °F	100%	**30.00** in	**2.0** mi	NE	**6.9** mph	-	**0.00** in
4:15 PM	**48.2** °F	-	**48.2** °F	100%	**30.00** in	**3.0** mi	NE	**8.1** mph	-	**0.01** in
4:28 PM	**48.2** °F	-	**48.2** °F	100%	**29.99** in	**2.5** mi	NE	**8.1** mph	-	**0.01** in
4:53 PM	**48.9** °F	-	**48.0** °F	97%	**29.98** in	**1.2** mi	NE	**10.4** mph	-	**0.01** in
5:14 PM	**48.2** °F	-	**48.2** °F	100%	**29.99** in	**0.8** mi	NE	**10.4** mph	-	N/A
5:53 PM	**48.0** °F	-	**46.9** °F	96%	**29.96** in	**0.5** mi	NE	**8.1** mph	-	N/A
6:28 PM	**48.2** °F	-	**46.4** °F	93%	**29.95** in	**1.5** mi	NNE	**11.5** mph	-	**0.01** in

6:43 PM	46.4 °F	42.4 °F	46.4 °F	100%	29.96 in	2.0 mi	North	8.1 mph	-	0.01 in
6:53 PM	46.9 °F	-	46.0 °F	97%	29.95 in	1.8 mi	NNE	9.2 mph	-	0.01 in
7:11 PM	46.4 °F	41.1 °F	46.4 °F	100%	29.95 in	0.5 mi	NNE	11.5 mph	-	0.00 in
7:30 PM	46.4 °F	42.4 °F	46.4 °F	100%	29.95 in	0.2 mi	NE	8.1 mph	-	N/A
7:53 PM	46.9 °F	-	46.0 °F	97%	29.94 in	0.2 mi	NE	8.1 mph	-	0.00 in
8:12 PM	46.4 °F	41.9 °F	46.4 °F	100%	29.95 in	0.5 mi	NE	9.2 mph	-	N/A
8:21 PM	46.4 °F	41.9 °F	46.4 °F	100%	29.95 in	0.2 mi	NE	9.2 mph	-	0.01 in
8:28 PM	46.4 °F	43.5 °F	46.4 °F	100%	29.95 in	0.5 mi	NE	5.8 mph	-	0.01 in
8:53 PM	46.9 °F	-	46.9 °F	100%	29.94 in	0.8 mi	NE	3.5 mph	-	0.01 in
9:02 PM	46.4 °F	44.3 °F	46.4 °F	100%	29.95 in	1.0 mi	North	4.6 mph	-	N/A
9:25 PM	46.4 °F	44.3 °F	46.4 °F	100%	29.95 in	0.8 mi	North	4.6 mph	-	N/A
9:53 PM	46.9 °F	-	46.9 °F	100%	29.94 in	0.8 mi	NNE	4.6 mph	-	N/A
10:05 PM	48.2 °F	-	46.4 °F	93%	29.94 in	1.0 mi	NE	4.6 mph	-	N/A
10:53 PM	46.9 °F	-	46.9 °F	100%	29.92 in	1.0 mi	North	4.6 mph	-	N/A
11:16 PM	46.4 °F	43.5 °F	46.4 °F	100%	29.92 in	0.8 mi	North	5.8 mph	-	N/A
11:53 PM	46.9 °F	-	46.0 °F	97%	29.91 in	0.8 mi	North	4.6 mph	-	0.01 in

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Weather History for KBVY - May, 2006

Tuesday, May 16, 2006

Daily Weekly Monthly Custom

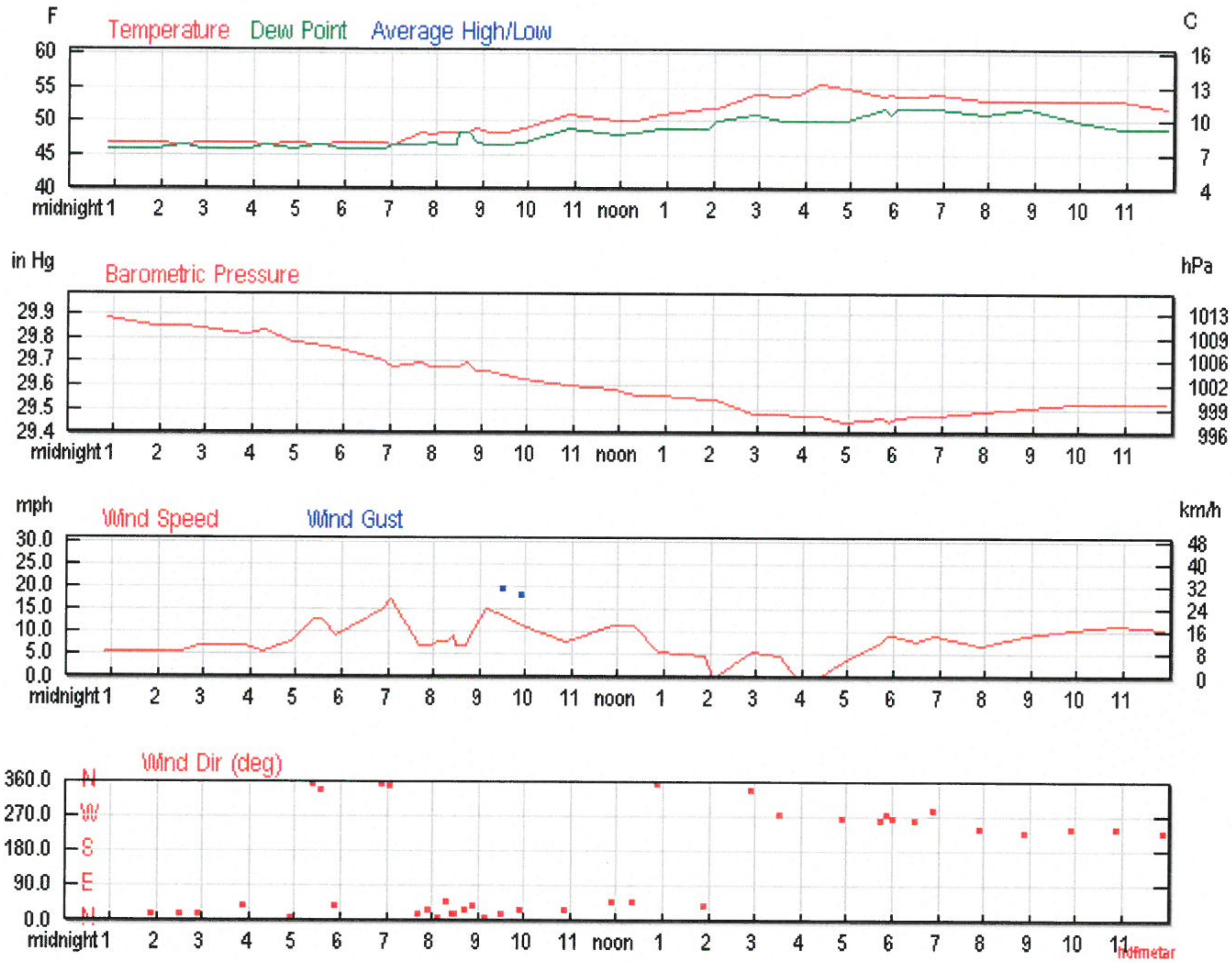
	Actual	Average	Record
Temperature			
Mean Temperature	**50** °F	-	
Max Temperature	**55** °F	**62** °F	**84** °F (1980)
Min Temperature	**46** °F	**42** °F	**35** °F (1999)
Degree Days			
Heating Degree Days	14		
Moisture			
Dew Point	**48** °F		
Average Humidity	94		
Maximum Humidity	100		
Minimum Humidity	82		
Precipitation			
Precipitation	**0.56** in	-	- ()
Sea Level Pressure			
Sea Level Pressure	**29.62** in		
Wind			
Wind Speed	**8** mph (North)		
Max Wind Speed	**17** mph		
Max Gust Speed	**21** mph		
Visibility	**6** miles		

Events | Fog , Rain

Averages and records for this station are not official NWS values.

T = Trace of Precipitation, MM = Missing Value | Source: NWS Daily Summary

Daily Weather History Graph



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KBVY

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Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

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Astronomy

May. 16, 2006	Rise	Set
Actual Time	5:20 AM EDT	7:59 PM EDT
Civil Twilight	4:48 AM EDT	8:32 PM EDT
Nautical Twilight	4:07 AM EDT	9:13 PM EDT
Astronomical Twilight	3:21 AM EDT	9:59 PM EDT
Moon	No Moon Rise	7:28 AM EDT (5/16)
Length of Visible Light	15h 44m	
Length of Day	14h 39m	

Waning Gibbous, 87% of the Moon is Illuminated

May 16	May 20	May 27	Jun 3	Jun 11
Waning Gibbous	Last Quarter	New	First Quarter	Full

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Hourly Weather History & Observations

Time (EDT)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip
12:53 AM	**46.9** °F	-	**46.0** °F	97%	**29.88** in	**0.5** mi	North	**5.8** mph	-	N/A
1:53 AM	**46.9** °F	-	**46.0** °F	97%	**29.85** in	**0.8** mi	NNE	**5.8** mph	-	N/A
2:30 AM	**46.4** °F	**43.5** °F	**46.4** °F	100%	**29.85** in	**1.0** mi	NNE	**5.8** mph	-	N/A
2:53 AM	**46.9** °F	-	**46.0** °F	97%	**29.84** in	**1.0** mi	NNE	**6.9** mph	-	N/A
3:53 AM	**46.9** °F	-	**46.0** °F	97%	**29.81** in	**1.8** mi	NE	**6.9** mph	-	**0.01** in
4:17 AM	**46.4** °F	**43.5** °F	**46.4** °F	100%	**29.83** in	**2.5** mi	Variable	**5.8** mph	-	**0.00** in
4:53 AM	**46.9** °F	-	**46.0** °F	97%	**29.78** in	**1.5** mi	North	**8.1** mph	-	**0.01** in

5:22 AM	46.4 °F	40.7 °F	46.4 °F	100%	29.77 in	2.5 mi	North	12.7 mph	-	0.02 in
5:33 AM	46.4 °F	40.7 °F	46.4 °F	100%	29.76 in	3.0 mi	NNW	12.7 mph	-	0.03 in
5:53 AM	46.9 °F	-	46.0 °F	97%	29.75 in	3.0 mi	NE	9.2 mph	-	0.10 in
6:53 AM	46.9 °F	-	46.0 °F	97%	29.70 in	2.5 mi	North	15.0 mph	-	0.13 in
7:04 AM	46.4 °F	39.5 °F	46.4 °F	100%	29.68 in	4.0 mi	North	17.3 mph	-	0.02 in
7:40 AM	48.2 °F	-	46.4 °F	93%	29.69 in	2.5 mi	NNE	6.9 mph	-	0.05 in
7:53 AM	48.0 °F	-	46.9 °F	96%	29.68 in	2.0 mi	NNE	6.9 mph	-	0.08 in
8:08 AM	48.2 °F	-	46.4 °F	93%	29.68 in	1.5 mi	North	8.1 mph	-	0.04 in
8:18 AM	48.2 °F	-	46.4 °F	93%	29.68 in	2.0 mi	NE	8.1 mph	-	0.07 in
8:26 AM	48.2 °F	-	46.4 °F	93%	29.68 in	1.8 mi	NNE	9.2 mph	-	0.08 in
8:29 AM	48.2 °F	-	48.2 °F	100%	29.68 in	2.0 mi	NNE	6.9 mph	-	0.09 in
8:41 AM	48.2 °F	-	48.2 °F	100%	29.69 in	1.8 mi	NNE	6.9 mph	-	0.11 in
8:53 AM	48.9 °F	-	46.9 °F	93%	29.66 in	2.0 mi	NE	10.4 mph	-	0.13 in
9:08 AM	48.2 °F	-	46.4 °F	93%	29.66 in	4.0 mi	North	15.0 mph	20.7 mph	N/A
9:31 AM	48.2 °F	-	46.4 °F	93%	29.64 in	1.8 mi	NNE	13.8 mph	19.6 mph	0.02 in
9:53 AM	48.9 °F	-	46.9 °F	93%	29.63 in	3.0 mi	NNE	11.5 mph	18.4 mph	0.03 in
10:53 AM	51.1 °F	-	48.9 °F	92%	29.60 in	10.0 mi	NNE	8.1 mph	-	0.01 in
11:53 AM	50.0 °F	-	48.0 °F	93%	29.58 in	10.0 mi	NE	11.5 mph	18.4 mph	0.00 in
12:21 PM	50.0 °F	-	48.2 °F	94%	29.56 in	8.0 mi	NE	11.5 mph	-	0.00 in
12:53 PM	51.1 °F	-	48.9 °F	92%	29.56 in	4.0 mi	North	5.8 mph	-	0.02 in

1:53 PM	52.0 °F	-	48.9 °F	89%	29.54 in	10.0 mi	NE	4.6 mph	-	0.00 in
2:04 PM	51.8 °F	-	50.0 °F	94%	29.54 in	10.0 mi	Calm	Calm	-	N/A
2:53 PM	54.0 °F	-	51.1 °F	90%	29.48 in	10.0 mi	NNW	5.8 mph	-	N/A
3:30 PM	53.6 °F	-	50.0 °F	88%	29.48 in	10.0 mi	West	4.6 mph	-	N/A
3:53 PM	54.0 °F	-	50.0 °F	86%	29.47 in	10.0 mi	Calm	Calm	-	N/A
4:18 PM	55.4 °F	-	50.0 °F	82%	29.47 in	10.0 mi	Calm	Calm	-	N/A
4:53 PM	55.0 °F	-	50.0 °F	83%	29.45 in	10.0 mi	West	3.5 mph	-	N/A
5:45 PM	53.6 °F	-	51.8 °F	94%	29.46 in	9.0 mi	West	8.1 mph	-	0.01 in
5:53 PM	54.0 °F	-	51.1 °F	90%	29.45 in	10.0 mi	West	9.2 mph	-	0.01 in
6:00 PM	53.6 °F	-	51.8 °F	94%	29.46 in	8.0 mi	West	9.2 mph	-	0.00 in
6:30 PM	53.6 °F	-	51.8 °F	94%	29.47 in	4.0 mi	West	8.1 mph	-	0.02 in
6:53 PM	54.0 °F	-	52.0 °F	93%	29.47 in	10.0 mi	WNW	9.2 mph	-	0.03 in
7:53 PM	53.1 °F	-	51.1 °F	93%	29.49 in	10.0 mi	WSW	6.9 mph	-	N/A
8:53 PM	53.1 °F	-	52.0 °F	96%	29.51 in	10.0 mi	SW	9.2 mph	-	N/A
9:53 PM	53.1 °F	-	50.0 °F	89%	29.52 in	10.0 mi	WSW	10.4 mph	-	N/A
10:53 PM	53.1 °F	-	48.9 °F	86%	29.52 in	10.0 mi	WSW	11.5 mph	-	N/A
11:53 PM	52.0 °F	-	48.9 °F	89%	29.52 in	10.0 mi	SW	10.4 mph	-	N/A

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Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Antecedent Moisture Conditions Adjustment** Prepared By: **CRD** Date: **September 22, 2015**

Designation: **Area 1**

Weighted CN: **68** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **83**

Designation: **Area 2**

Weighted CN: **66** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **82**

Designation: **Area 3**

Weighted CN: **60** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **78**

Designation: **Area 4**

Weighted CN: **63** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **80**

Designation: **Area 5**

Weighted CN: **62** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **79**

Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Antecedent Moisture Conditions Adjustment** Prepared By: **CRD** Date: **September 22, 2015**

Designation: **Area 6**

Weighted CN: **69** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **84**

Designation: **Area 7**

Weighted CN: **68** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **83**

Designation: **Area 8**

Weighted CN: **67** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **82**

Designation: **Area 9**

Weighted CN: **60** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **78**

Designation: **Area 10**

Weighted CN: **61** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **78**

Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Antecedent Moisture Conditions Adjustment** Prepared By: **CRD** Date: **September 22, 2015**

Designation: **Area 11**

Weighted CN: **63** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **80**

Designation: **Area 12**

Weighted CN: **67** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **82**

Designation: **Area 13**

Weighted CN: **67** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **82**

Designation: **Area 14**

Weighted CN: **68** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **83**

Designation: **Area 15**

Weighted CN: **66** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **82**

Designation: **Area 16**

Weighted CN: **65** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **81**

Designation: **Area 17**

Weighted CN: **63** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **80**

Designation: **Area 18**

Weighted CN: **62** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **79**

Designation: **Area 19**

Weighted CN: **64** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **80**

Tighe&Bond Consulting Engineers Environmental Specialists	Project Name: **Sawmill Brook Watershed Analysis** Project Number: **M-1476-3-4** Project Location: **Manchester-by-the-Sea, MA** Description: **Antecedent Moisture Conditions Adjustment** Prepared By: **CRD** Date: **September 22, 2015**

Designation: **Area 20**

Weighted CN: **75** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **87**

Designation: **Area 21**

Weighted CN: **66** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **82**

Designation: **Area 22**

Weighted CN: **74** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **87**

Designation: **Area 23**

Weighted CN: **69** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

RCN_{AMC3} = **84**

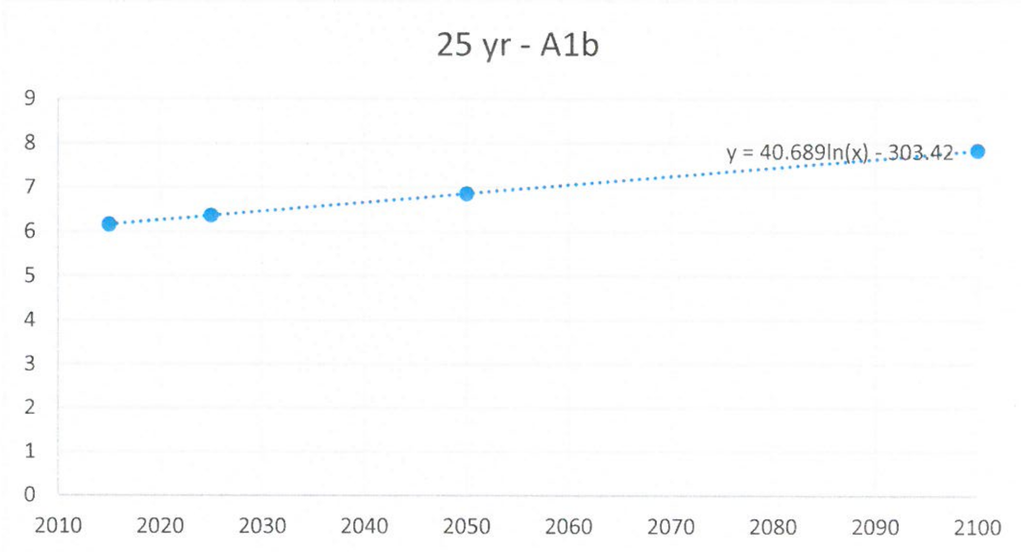
Designation: **Area 24**

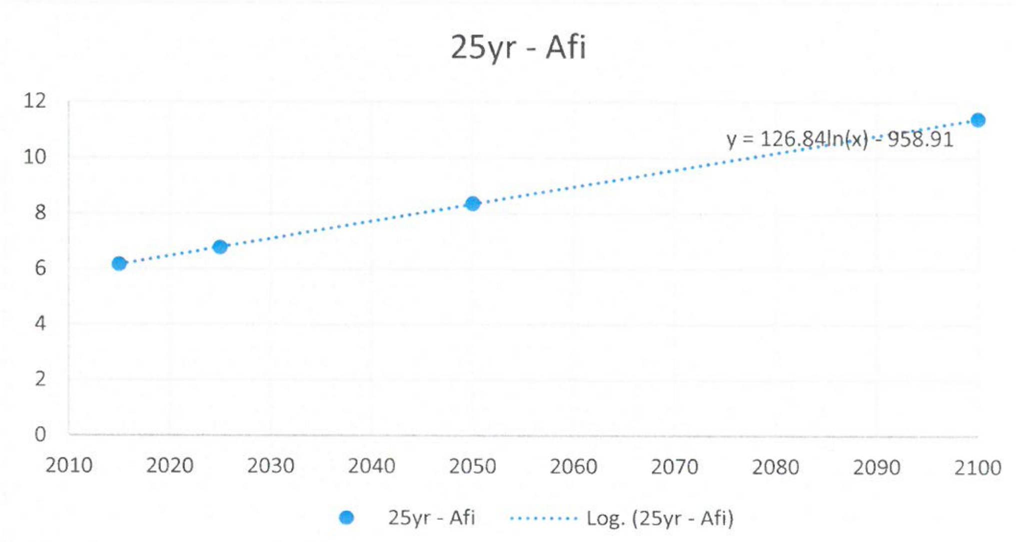
Weighted CN: **73** (AMC_2)

$$RCN_{AMC3} = \frac{23RCN_{AMC2}}{10+0.13RCN_{AMC2}}$$

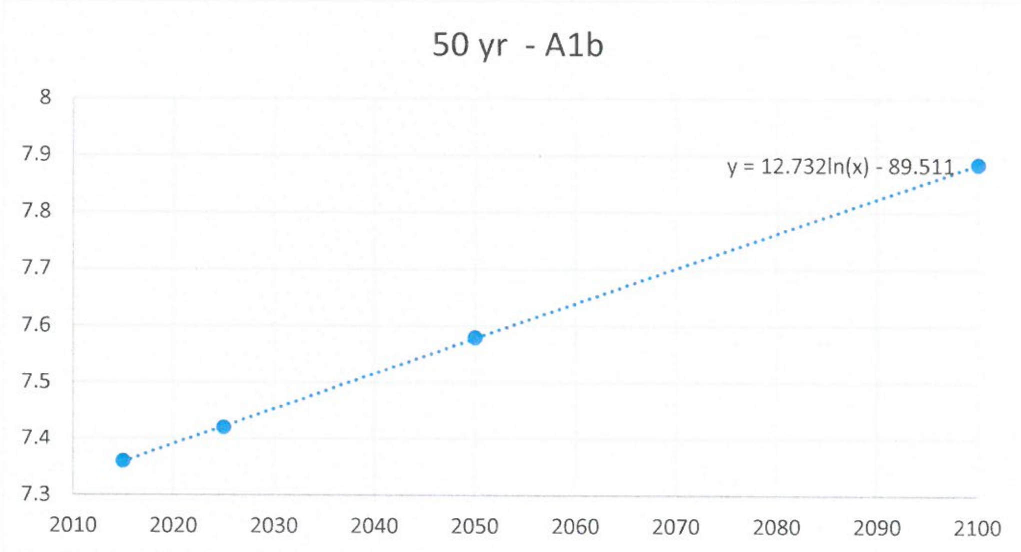
RCN_{AMC3} = **86**

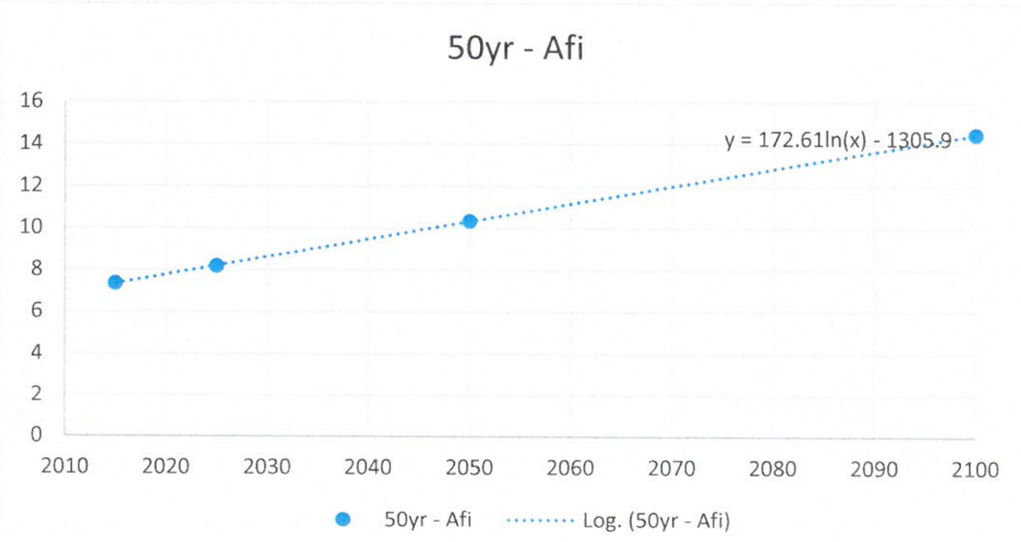
Year	25 yr -A1b	25yr - Afi
2015	6.16	6.16
2025	6.36	6.77
2050	6.86	8.35
2100	7.84	11.39



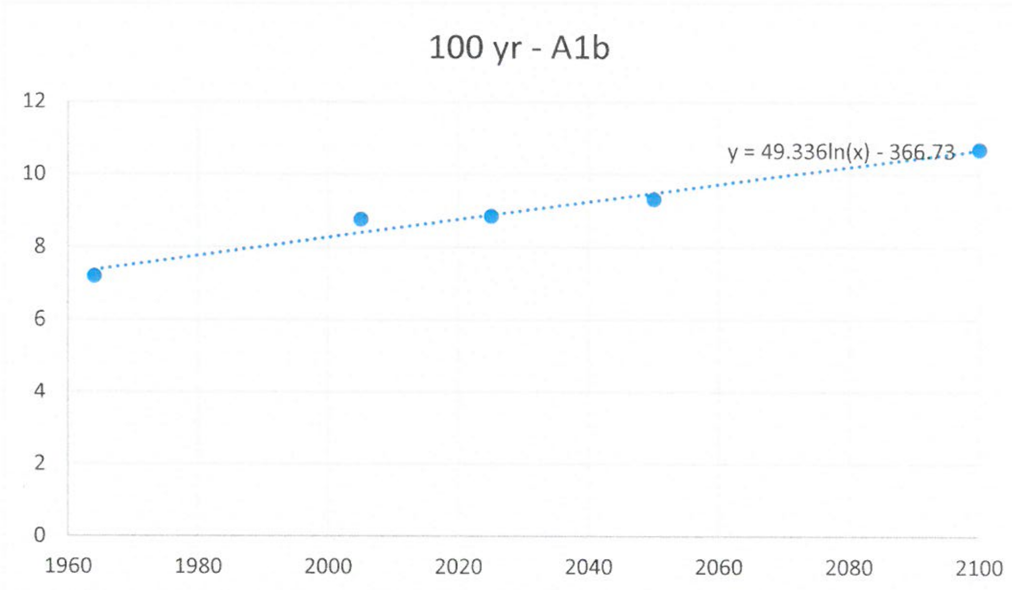


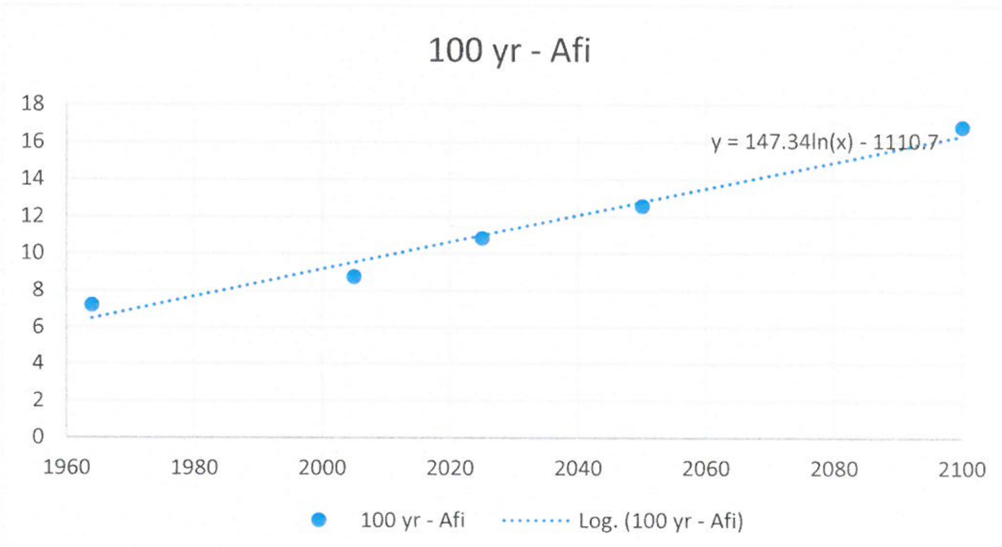
Year	50 yr -A1b	50yr - Afi
2015	7.36	7.36
2025	7.42	8.19
2050	7.58	10.34
2100	7.88	14.48





Year	100 yr -A1b	100 yr - Afi
1964	7.2	7.2
2005	8.76	8.76
2025	8.85	10.82
2050	9.31	12.58
2100	10.69	16.82





APPENDIX D

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2006 May			2015 25 year storm			2015 50 year storm			2015 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.2	Y	0.3	45.4	Y	0.5	45.5	Y	0.6	45.7	Y	0.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.2	Y	0.5	45.4	Y	0.7	45.5	Y	0.8	45.7	Y	1.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.2	Y	6.1	45.4	Y	6.3	45.5	Y	6.4	45.7	Y	6.6
3	**11161**	Sawmill Brook	School Street	48.1	43.0	N	-	41.9	N	-	43.1	N	-	44.5	N	-
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.8	N	-	40.9	N	-	41.8	N	-	42.7	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	45.5	N	-	47.3	Y	0.2	47.3	Y	0.2	47.5	Y	0.4
11	**1869**	Cat Brook	Mill Street	40.4	37.7	N	-	37.6	N	-	39.3	N	-	40.2	N	-
12	**1777**	Sawmill Brook	Millet Lane	51.5	49.6	N	-	51.6	Y	0.1	51.8	Y	0.3	51.9	Y	0.4
13	**1570**	Sawmill Brook	The Plains	51.2	48.7	N	-	50.7	N	-	50.8	N	-	50.9	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	46.2	N	-	47.3	N	-	47.4	N	-	47.5	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	18.7	N	-	19.9	N	-	21.7	Y	0.0	22.6	Y	1.0
17	**3686**	Sawmill Brook	Lincoln Street	17.3	17.9	Y	0.6	18.2	Y	0.8	18.4	Y	1.1	18.7	Y	1.4
18	**378**	Causeway Brook	Lincoln Street	16.3	16.6	Y	0.3	16.8	Y	0.4	17.0	Y	0.7	17.3	Y	1.0
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.6	Y	1.0	16.8	Y	1.2	17.0	Y	1.4	17.4	Y	1.8

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2006 May			2015 25 year storm			2015 50 year storm			2015 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	17.6	N	-	18.1	Y	0.2	18.2	Y	0.3	18.3	Y	0.4
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.4	Y	0.4	16.6	Y	0.6	16.8	Y	0.8	17.1	Y	1.1
23	**1629**	Sawmill Brook	School Street	13.1	13.6	Y	0.5	14.1	Y	1.0	14.5	Y	1.4	14.9	Y	1.8
25	**199**	Sawmill Brook	Central Street	10.6	10.8	Y	0.2	11.7	Y	1.1	12.1	Y	1.5	12.5	Y	1.9
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	24.5	N	-	22.9	N	-	24.4	N	-	24.7	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	24.4	Y	< 0.1	22.9	N	-	24.3	N	-	24.6	Y	0.2
28	**17648**	Sawmill Brook	Route 128	56.0	51.7	N	-	53.0	N	-	53.5	N	-	54.5	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	50.4	N	-	52.0	Y	< 0.1	52.6	Y	0.6	53.4	Y	1.4
32	**16328**	Sawmill Brook	Route 128	54.0	50.9	N	-	52.6	N	-	53.2	N	-	54.0	N	-
33	**15106**	Sawmill Brook	Route 128	52.0	50.4	N	-	52.0	Y	< 0.1	52.6	Y	0.6	53.4	Y	1.4
34	**14218**	Sawmill Brook	Route 128	52.0	49.4	N	-	51.0	N	-	51.7	N	-	52.3	Y	0.3
35	**16328**	Sawmill Brook	Route 128	54.0	50.9	N	-	52.6	N	-	53.2	N	-	54.0	N	-
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.6	N	-	33.7	N	-	34.6	N	-	35.3	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Storm Surge Balanced Energy (A1b) 25 year storm			2025 Storm Surge Balanced Energy (A1b) 50 year storm			2025 Storm Surge Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.4	Y	0.5	45.5	Y	0.6	45.7	Y	0.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.4	Y	0.7	45.5	Y	0.8	45.7	Y	1.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.4	Y	6.3	45.5	Y	6.4	45.7	Y	6.6
3	**11161**	Sawmill Brook	School Street	48.1	42.1	N	-	43.1	N	-	44.5	N	-
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.1	N	-	41.8	N	-	42.7	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.3	Y	0.2	47.3	Y	0.2	47.5	Y	0.4
11	**1869**	Cat Brook	Mill Street	40.4	37.9	N	-	39.4	N	-	40.2	N	-
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.6	Y	0.1	51.8	Y	0.3	51.8	Y	0.3
13	**1570**	Sawmill Brook	The Plains	51.2	50.7	N	-	50.8	N	-	50.9	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.3	N	-	47.4	N	-	47.6	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	20.2	N	-	21.7	Y	0.1	22.6	Y	1.0
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.2	Y	0.9	18.4	Y	1.1	18.7	Y	1.4
18	**378**	Causeway Brook	Lincoln Street	16.3	16.8	Y	0.5	17.0	Y	0.7	17.3	Y	1.0
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.8	Y	1.2	17.1	Y	1.5	17.3	Y	1.7

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Storm Surge Balanced Energy (A1b) 25 year storm			2025 Storm Surge Balanced Energy (A1b) 50 year storm			2025 Storm Surge Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.1	Y	0.2	18.2	Y	0.3	18.3	Y	0.4
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.6	Y	0.6	16.8	Y	0.8	17.1	Y	1.1
23	**1629**	Sawmill Brook	School Street	13.1	14.2	Y	1.1	14.5	Y	1.4	14.9	Y	1.8
25	**199**	Sawmill Brook	Central Street	10.6	11.8	Y	1.2	12.1	Y	1.5	12.4	Y	1.8
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	23.3	N	-	24.5	N	-	24.7	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	23.2	N	-	24.4	Y	< 0.1	24.5	Y	0.1
28	**17648**	Sawmill Brook	Route 128	56.0	53.0	N	-	53.6	N	-	54.5	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.2	Y	0.2	52.6	Y	0.6	53.4	Y	1.4
32	**16328**	Sawmill Brook	Route 128	54.0	52.7	N	-	53.2	N	-	54.0	N	-
33	**15106**	Sawmill Brook	Route 128	52.0	52.2	Y	0.2	52.6	Y	0.6	53.4	Y	1.4
34	**14218**	Sawmill Brook	Route 128	52.0	51.1	N	-	51.7	N	-	52.3	Y	0.3
35	**16328**	Sawmill Brook	Route 128	54.0	52.7	N	-	53.2	N	-	54.0	N	-
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	33.9	N	-	34.6	N	-	35.4	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Storm Surge Fossil Intensive Energy (A1fi) 25 year storm			2025 Storm Surge Fossil Intensive Energy (A1fi) 50 year storm			2025 Storm Surge Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.4	Y	0.5	45.6	Y	0.7	48.4	Y	3.5
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.4	Y	0.7	45.6	Y	0.9	48.4	Y	3.7
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.4	Y	6.3	45.6	Y	6.5	48.4	Y	9.3
3	**11161**	Sawmill Brook	School Street	48.1	42.5	N	-	43.9	N	-	48.4	Y	0.3
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.5	N	-	42.3	N	-	44.5	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.3	Y	0.2	47.4	Y	0.3	48.5	Y	1.4
11	**1869**	Cat Brook	Mill Street	40.4	38.5	N	-	40.0	N	-	40.6	Y	0.2
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.7	Y	0.2	51.8	Y	0.3	52.0	Y	0.5
13	**1570**	Sawmill Brook	The Plains	51.2	50.8	N	-	50.9	N	-	51.1	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.3	N	-	47.5	N	-	48.5	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	20.8	N	-	22.8	Y	1.2	22.8	Y	1.2
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.3	Y	1.0	18.5	Y	1.2	19.0	Y	1.7
18	**378**	Causeway Brook	Lincoln Street	16.3	16.9	Y	0.6	17.2	Y	0.9	17.7	Y	1.4
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.9	Y	1.3	17.2	Y	1.6	17.7	Y	2.1

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Storm Surge Fossil Intensive Energy (A1fi) 25 year storm			2025 Storm Surge Fossil Intensive Energy (A1fi) 50 year storm			2025 Storm Surge Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.1	Y	0.2	18.3	Y	0.4	18.5	Y	0.6
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.7	Y	0.7	17.0	Y	0.9	17.4	Y	1.4
23	**1629**	Sawmill Brook	School Street	13.1	14.3	Y	1.2	14.6	Y	1.5	15.2	Y	2.1
25	**199**	Sawmill Brook	Central Street	10.6	11.9	Y	1.3	12.3	Y	1.7	12.7	Y	2.1
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	23.7	N	-	24.6	N	-	25.3	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	23.6	N	-	24.6	Y	0.2	24.9	Y	0.5
28	**17648**	Sawmill Brook	Route 128	56.0	53.2	N	-	54.1	N	-	55.4	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	53.1	Y	1.1	54.2	Y	2.2
32	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.6	N	-	54.8	Y	0.8
33	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	53.1	Y	1.1	54.2	Y	2.2
34	**14218**	Sawmill Brook	Route 128	52.0	51.5	N	-	52.1	Y	0.1	52.7	Y	0.7
35	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.6	N	-	54.8	Y	0.8
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.3	N	-	35.0	N	-	36.8	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Storm Surge Balanced Energy (A1b) 25 year storm			2050 Storm Surge Balanced Energy (A1b) 50 year storm			2050 Storm Surge Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.5	Y	0.6	45.6	Y	0.6	45.7	Y	0.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.5	Y	0.8	45.6	Y	0.8	45.7	Y	1.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.5	Y	6.4	45.6	Y	6.5	45.7	Y	6.6
3	**11161**	Sawmill Brook	School Street	48.1	42.6	N	-	43.3	N	-	45.0	N	-
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.5	N	-	41.9	N	-	43.0	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.3	Y	0.2	47.3	Y	0.2	47.6	Y	0.5
11	**1869**	Cat Brook	Mill Street	40.4	38.6	N	-	39.6	N	-	40.3	N	-
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.7	Y	0.2	51.7	Y	0.2	51.9	Y	0.4
13	**1570**	Sawmill Brook	The Plains	51.2	50.8	N	-	50.8	N	-	50.9	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.4	N	-	47.4	N	-	47.6	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	20.9	N	-	22.0	Y	0.4	22.8	Y	1.2
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.3	Y	1.0	18.4	Y	1.1	18.7	Y	1.4
18	**378**	Causeway Brook	Lincoln Street	16.3	16.9	Y	0.6	17.1	Y	0.8	17.4	Y	1.1
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.9	Y	1.3	17.1	Y	1.5	17.5	Y	1.9

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Storm Surge Balanced Energy (A1b) 25 year storm			2050 Storm Surge Balanced Energy (A1b) 50 year storm			2050 Storm Surge Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.2	Y	0.3	18.2	Y	0.3	18.4	Y	0.5
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.7	Y	0.7	16.8	Y	0.8	17.2	Y	1.2
23	**1629**	Sawmill Brook	School Street	13.1	14.3	Y	1.2	14.6	Y	1.5	14.9	Y	1.8
25	**199**	Sawmill Brook	Central Street	10.6	12.0	Y	1.4	12.3	Y	1.7	12.6	Y	2.0
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	23.8	N	-	24.5	N	-	24.8	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	23.7	N	-	24.4	Y	< 0.1	24.6	Y	0.2
28	**17648**	Sawmill Brook	Route 128	56.0	53.3	N	-	53.7	N	-	54.8	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	52.7	Y	0.7	53.6	Y	1.6
32	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.3	N	-	54.2	Y	0.2
33	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	52.7	Y	0.7	53.6	Y	1.6
34	**14218**	Sawmill Brook	Route 128	52.0	51.5	N	-	51.7	N	-	52.4	Y	0.4
35	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.3	N	-	54.2	Y	0.2
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.3	N	-	34.7	N	-	35.6	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Storm Surge Fossil Intensive Energy (A1fi) 25 year storm			2050 Storm Surge Fossil Intensive Energy (A1fi) 50 year storm			2050 Storm Surge Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.6	Y	0.7	46.6	Y	1.7	49.0	Y	4.1
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.6	Y	0.9	46.6	Y	1.9	49.0	Y	4.3
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.6	Y	6.5	46.6	Y	7.5	49.0	Y	9.9
3	**11161**	Sawmill Brook	School Street	48.1	44.0	N	-	46.2	N	-	49.0	Y	0.9
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	42.4	N	-	43.7	N	-	48.3	Y	0.2
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.4	Y	0.3	48.1	Y	0.9	49.0	Y	1.9
11	**1869**	Cat Brook	Mill Street	40.4	40.0	N	-	40.5	Y	0.1	40.7	Y	0.3
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.8	Y	0.3	51.9	Y	0.4	53.0	Y	1.5
13	**1570**	Sawmill Brook	The Plains	51.2	50.9	N	-	51.1	N	-	51.2	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.5	N	-	48.1	N	-	49.1	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	22.6	Y	1.0	22.9	Y	1.3	23.1	Y	1.5
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.6	Y	1.3	18.9	Y	1.6	19.3	Y	2.0
18	**378**	Causeway Brook	Lincoln Street	16.3	17.3	Y	1.0	17.6	Y	1.3	18.1	Y	1.8
19	**1280**	Causeway Brook	School Street- Golf	15.6	17.3	Y	1.7	17.7	Y	2.1	18.1	Y	2.5

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Storm Surge Fossil Intensive Energy (A1fi) 25 year storm			2050 Storm Surge Fossil Intensive Energy (A1fi) 50 year storm			2050 Storm Surge Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.3	Y	0.4	18.5	Y	0.6	18.6	Y	0.7
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	17.0	Y	1.0	17.3	Y	1.3	17.7	Y	1.7
23	**1629**	Sawmill Brook	School Street	13.1	14.7	Y	1.6	15.2	Y	2.1	15.6	Y	2.5
25	**199**	Sawmill Brook	Central Street	10.6	12.4	Y	1.8	12.7	Y	2.1	12.9	Y	2.3
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	24.7	N	-	25.0	N	-	27.7	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	24.6	Y	0.2	24.8	Y	0.4	25.4	Y	1.0
28	**17648**	Sawmill Brook	Route 128	56.0	54.2	N	-	55.3	N	-	55.9	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	53.1	Y	1.1	54.0	Y	2.0	54.9	Y	2.9
32	**16328**	Sawmill Brook	Route 128	54.0	53.7	N	-	54.7	Y	0.7	55.7	Y	1.7
33	**15106**	Sawmill Brook	Route 128	52.0	53.1	Y	1.1	54.0	Y	2.0	54.9	Y	2.9
34	**14218**	Sawmill Brook	Route 128	52.0	52.1	Y	0.1	52.7	Y	0.7	52.9	Y	0.9
35	**16328**	Sawmill Brook	Route 128	54.0	53.7	N	-	54.7	Y	0.7	55.7	Y	1.7
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	35.1	N	-	36.2	N	-	39.7	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Storm Surge Balanced Energy (A1b) 25 year storm			2100 Storm Surge Balanced Energy (A1b) 50 year storm			2100 Storm Surge Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.6	Y	0.7	45.6	Y	0.7	48.3	Y	3.4
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.6	Y	0.9	45.6	Y	0.9	48.3	Y	3.6
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.6	Y	6.5	45.6	Y	6.5	48.3	Y	9.2
3	**11161**	Sawmill Brook	School Street	48.1	43.5	N	-	43.6	N	-	48.3	Y	0.2
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	42.1	N	-	42.1	N	-	44.3	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.4	Y	0.3	47.4	Y	0.3	48.4	Y	1.3
11	**1869**	Cat Brook	Mill Street	40.4	39.9	N	-	39.9	N	-	40.5	Y	0.1
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.8	Y	0.3	51.8	Y	0.3	52.0	Y	0.5
13	**1570**	Sawmill Brook	The Plains	51.2	50.9	N	-	50.9	N	-	51.1	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.4	N	-	47.4	N	-	48.4	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	22.4	Y	0.8	22.4	Y	0.8	22.9	Y	1.3
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.5	Y	1.2	18.5	Y	1.2	19.0	Y	1.7
18	**378**	Causeway Brook	Lincoln Street	16.3	17.1	Y	0.8	17.1	Y	0.8	17.7	Y	1.4
19	**1280**	Causeway Brook	School Street- Golf	15.6	17.1	Y	1.5	17.1	Y	1.5	17.7	Y	2.1

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Storm Surge Balanced Energy (A1b) 25 year storm			2100 Storm Surge Balanced Energy (A1b) 50 year storm			2100 Storm Surge Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.3	Y	0.4	18.2	Y	0.4	18.5	Y	0.6
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.9	Y	0.9	16.9	Y	0.9	17.4	Y	1.4
23	**1629**	Sawmill Brook	School Street	13.1	14.6	Y	1.5	14.7	Y	1.6	15.2	Y	2.1
25	**199**	Sawmill Brook	Central Street	10.6	12.6	Y	2.0	12.6	Y	2.0	13.0	Y	2.4
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	24.5	N	-	24.5	N	-	25.2	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	24.4	Y	< 0.1	24.4	Y	< 0.1	24.9	Y	0.5
28	**17648**	Sawmill Brook	Route 128	56.0	53.9	N	-	53.9	N	-	55.4	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.9	Y	0.9	52.9	Y	0.9	54.1	Y	2.1
32	**16328**	Sawmill Brook	Route 128	54.0	53.4	N	-	53.5	N	-	54.8	Y	0.8
33	**15106**	Sawmill Brook	Route 128	52.0	52.9	Y	0.9	52.9	Y	0.9	54.1	Y	2.1
34	**14218**	Sawmill Brook	Route 128	52.0	51.9	N	-	51.9	N	-	52.6	Y	0.6
35	**16328**	Sawmill Brook	Route 128	54.0	53.4	N	-	53.5	N	-	54.8	Y	0.8
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.8	N	-	34.8	N	-	36.7	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Storm Surge Fossil Intensive Energy (A1fi) 25 year storm			2100 Storm Surge Fossil Intensive Energy (A1fi) 50 year storm			2100 Storm Surge Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	48.6	Y	3.7	49.1	Y	4.2	49.7	Y	4.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	48.6	Y	3.9	49.1	Y	4.4	49.7	Y	5.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	48.6	Y	9.5	49.1	Y	10.0	49.7	Y	10.6
3	**11161**	Sawmill Brook	School Street	48.1	48.6	Y	0.5	49.1	Y	1.0	49.7	Y	1.6
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	45.3	N	-	48.8	Y	0.7	49.6	Y	1.5
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	48.6	Y	1.5	49.2	Y	2.1	49.7	Y	2.6
11	**1869**	Cat Brook	Mill Street	40.4	40.6	Y	0.2	40.9	Y	0.5	41.2	Y	0.8
12	**1777**	Sawmill Brook	Millet Lane	51.5	52.0	Y	0.5	52.1	Y	0.6	52.2	Y	0.7
13	**1570**	Sawmill Brook	The Plains	51.2	51.3	Y	< 0.1	51.3	Y	0.1	51.4	Y	0.2
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	48.7	N	-	49.3	N	-	49.8	Y	0.5
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	23.0	Y	1.4	23.4	Y	1.8	23.6	Y	2.0
17	**3686**	Sawmill Brook	Lincoln Street	17.3	19.1	Y	1.8	19.6	Y	2.3	20.0	Y	2.7
18	**378**	Causeway Brook	Lincoln Street	16.3	17.8	Y	1.5	18.5	Y	2.2	19.0	Y	2.7
19	**1280**	Causeway Brook	School Street- Golf	15.6	17.9	Y	2.3	18.5	Y	2.9	19.0	Y	3.4

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Storm Surge Fossil Intensive Energy (A1fi) 25 year storm			2100 Storm Surge Fossil Intensive Energy (A1fi) 50 year storm			2100 Storm Surge Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.6	Y	0.7	18.8	Y	0.9	19.1	Y	1.2
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	17.5	Y	1.5	18.0	Y	2.0	18.4	Y	2.4
23	**1629**	Sawmill Brook	School Street	13.1	15.3	Y	2.2	16.0	Y	2.9	16.5	Y	3.4
25	**199**	Sawmill Brook	Central Street	10.6	13.1	Y	2.5	13.4	Y	2.8	13.7	Y	3.1
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	25.6	N	-	30.7	N	-	38.6	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	25.0	Y	0.6	25.7	Y	1.3	26.0	Y	1.6
28	**17648**	Sawmill Brook	Route 128	56.0	55.6	N	-	56.6	Y	0.6	57.4	Y	1.4
31	**15106**	Sawmill Brook	Route 128	52.0	54.4	Y	2.4	55.6	Y	3.6	56.4	Y	4.4
32	**16328**	Sawmill Brook	Route 128	54.0	55.1	Y	1.1	56.4	Y	2.4	57.2	Y	3.2
33	**15106**	Sawmill Brook	Route 128	52.0	54.4	Y	2.4	55.6	Y	3.6	56.4	Y	4.4
34	**14218**	Sawmill Brook	Route 128	52.0	52.7	Y	0.7	52.7	Y	0.7	53.7	Y	1.7
35	**16328**	Sawmill Brook	Route 128	54.0	55.1	Y	1.1	56.4	Y	2.4	57.2	Y	3.2
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	37.5	N	-	42.4	N	-	48.4	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Sea Level Rise Balanced Energy (A1b) 25 year storm			2025 Sea Level Rise Balanced Energy (A1b) 50 year storm			2025 Sea Level Rise Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.4	Y	0.5	45.5	Y	0.6	45.7	Y	0.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.4	Y	0.7	45.5	Y	0.8	45.7	Y	1.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.4	Y	6.3	45.5	Y	6.4	45.7	Y	6.6
3	**11161**	Sawmill Brook	School Street	48.1	42.1	N	-	43.1	N	-	44.5	N	-
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.1	N	-	41.8	N	-	42.7	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.3	Y	0.2	47.3	Y	0.2	47.5	Y	0.4
11	**1869**	Cat Brook	Mill Street	40.4	37.9	N	-	39.4	N	-	40.2	N	-
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.6	Y	0.1	51.8	Y	0.3	51.8	Y	0.3
13	**1570**	Sawmill Brook	The Plains	51.2	50.7	N	-	50.8	N	-	50.9	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.3	N	-	47.4	N	-	47.6	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	20.2	N	-	21.7	Y	0.1	22.6	Y	1.0
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.2	Y	0.9	18.4	Y	1.1	18.7	Y	1.4
18	**378**	Causeway Brook	Lincoln Street	16.3	16.8	Y	0.4	17.0	Y	0.7	17.3	Y	1.0
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.8	Y	1.2	17.0	Y	1.4	17.3	Y	1.7

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Sea Level Rise Balanced Energy (A1b) 25 year storm			2025 Sea Level Rise Balanced Energy (A1b) 50 year storm			2025 Sea Level Rise Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.1	Y	0.2	18.2	Y	0.3	18.3	Y	0.4
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.6	Y	0.6	16.8	Y	0.8	17.1	Y	1.1
23	**1629**	Sawmill Brook	School Street	13.1	14.2	Y	1.1	14.5	Y	1.4	14.8	Y	1.7
25	**199**	Sawmill Brook	Central Street	10.6	11.8	Y	1.2	12.2	Y	1.6	12.5	Y	1.9
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	23.3	N	-	24.5	N	-	24.7	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	23.2	N	-	24.4	Y	< 0.1	24.5	Y	0.1
28	**17648**	Sawmill Brook	Route 128	56.0	53.0	N	-	53.6	N	-	54.5	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.2	Y	0.2	52.6	Y	0.6	53.4	Y	1.4
32	**16328**	Sawmill Brook	Route 128	54.0	52.7	N	-	53.2	N	-	54.0	N	-
33	**15106**	Sawmill Brook	Route 128	52.0	52.2	Y	0.2	52.6	Y	0.6	53.4	Y	1.4
34	**14218**	Sawmill Brook	Route 128	52.0	51.1	N	-	51.7	N	-	52.3	Y	0.3
35	**16328**	Sawmill Brook	Route 128	54.0	52.7	N	-	53.2	N	-	54.0	N	-
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	33.9	N	-	34.6	N	-	35.4	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Sea Level Rise Fossil Intensive Energy (A1fi) 25 year storm			2025 Sea Level Rise Fossil Intensive Energy (A1fi) 50 year storm			2025 Sea Level Rise Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.4	Y	0.5	45.6	Y	0.7	48.4	Y	3.5
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.4	Y	0.7	45.6	Y	0.9	48.4	Y	3.7
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.4	Y	6.3	45.6	Y	6.5	48.4	Y	9.3
3	**11161**	Sawmill Brook	School Street	48.1	42.5	N	-	43.9	N	-	48.4	Y	0.3
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.5	N	-	42.3	N	-	44.5	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.3	Y	0.2	47.4	Y	0.3	48.5	Y	1.4
11	**1869**	Cat Brook	Mill Street	40.4	38.5	N	-	40.0	N	-	40.6	Y	0.2
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.7	Y	0.2	51.8	Y	0.3	52.0	Y	0.5
13	**1570**	Sawmill Brook	The Plains	51.2	50.8	N	-	50.9	N	-	51.1	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.3	N	-	47.5	N	-	48.5	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	20.8	N	-	22.8	Y	1.2	22.8	Y	1.2
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.3	Y	1.0	18.5	Y	1.2	19.0	Y	1.7
18	**378**	Causeway Brook	Lincoln Street	16.3	16.9	Y	0.6	17.2	Y	0.9	17.7	Y	1.4
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.9	Y	1.3	17.2	Y	1.6	17.7	Y	2.1

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2025 Sea Level Rise Fossil Intensive Energy (A1fi) 25 year storm			2025 Sea Level Rise Fossil Intensive Energy (A1fi) 50 year storm			2025 Sea Level Rise Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.2	Y	0.3	18.3	Y	0.4	18.5	Y	0.6
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.7	Y	0.7	17.0	Y	0.9	17.4	Y	1.4
23	**1629**	Sawmill Brook	School Street	13.1	14.3	Y	1.2	14.7	Y	1.6	15.2	Y	2.1
25	**199**	Sawmill Brook	Central Street	10.6	12.0	Y	1.4	12.4	Y	1.8	12.5	Y	1.9
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	23.7	N	-	24.6	N	-	25.3	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	23.6	N	-	24.6	Y	0.2	24.9	Y	0.5
28	**17648**	Sawmill Brook	Route 128	56.0	53.2	N	-	54.1	N	-	55.4	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	53.1	Y	1.1	54.2	Y	2.2
32	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.6	N	-	54.8	Y	0.8
33	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	53.1	Y	1.1	54.2	Y	2.2
34	**14218**	Sawmill Brook	Route 128	52.0	51.5	N	-	52.1	Y	0.1	52.7	Y	0.7
35	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.6	N	-	54.8	Y	0.8
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.3	N	-	35.0	N	-	36.8	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Sea Level Rise Balanced Energy (A1b) 25 year storm			2050 Sea Level Rise Balanced Energy (A1b) 50 year storm			2050 Sea Level Rise Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.5	Y	0.6	45.6	Y	0.6	45.7	Y	0.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.5	Y	0.8	45.6	Y	0.8	45.7	Y	1.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.5	Y	6.4	45.6	Y	6.5	45.7	Y	6.6
3	**11161**	Sawmill Brook	School Street	48.1	42.6	N	-	43.3	N	-	45.0	N	-
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	41.5	N	-	41.9	N	-	43.0	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.3	Y	0.2	47.3	Y	0.2	47.6	Y	0.5
11	**1869**	Cat Brook	Mill Street	40.4	38.6	N	-	39.6	N	-	40.3	N	-
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.7	Y	0.2	51.7	Y	0.2	51.9	Y	0.4
13	**1570**	Sawmill Brook	The Plains	51.2	50.8	N	-	50.8	N	-	50.9	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.4	N	-	47.4	N	-	47.6	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	20.9	N	-	22.0	Y	0.4	22.8	Y	1.2
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.3	Y	1.0	18.4	Y	1.1	18.7	Y	1.4
18	**378**	Causeway Brook	Lincoln Street	16.3	16.9	Y	0.6	17.1	Y	0.8	17.4	Y	1.1
19	**1280**	Causeway Brook	School Street- Golf	15.6	16.9	Y	1.3	17.1	Y	1.5	17.4	Y	1.8

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Sea Level Rise Balanced Energy (A1b) 25 year storm			2050 Sea Level Rise Balanced Energy (A1b) 50 year storm			2050 Sea Level Rise Balanced Energy (A1b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.2	Y	0.3	18.2	Y	0.3	18.4	Y	0.5
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.7	Y	0.7	16.8	Y	0.8	17.2	Y	1.2
23	**1629**	Sawmill Brook	School Street	13.1	14.3	Y	1.2	14.5	Y	1.4	15.0	Y	1.9
25	**199**	Sawmill Brook	Central Street	10.6	12.0	Y	1.4	12.2	Y	1.6	12.3	Y	1.7
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	23.8	N	-	24.5	N	-	24.8	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	23.7	N	-	24.4	Y	< 0.1	24.6	Y	0.2
28	**17648**	Sawmill Brook	Route 128	56.0	53.3	N	-	53.7	N	-	54.8	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	52.7	Y	0.7	53.6	Y	1.6
32	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.3	N	-	54.2	Y	0.2
33	**15106**	Sawmill Brook	Route 128	52.0	52.4	Y	0.4	52.7	Y	0.7	53.6	Y	1.6
34	**14218**	Sawmill Brook	Route 128	52.0	51.5	N	-	51.7	N	-	52.4	Y	0.4
35	**16328**	Sawmill Brook	Route 128	54.0	52.9	N	-	53.3	N	-	54.2	Y	0.2
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.3	N	-	34.7	N	-	35.6	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Sea Level Rise Fossil Intensive Energy (A1fi) 25 year storm			2050 Sea Level Rise Fossil Intensive Energy (A1fi) 50 year storm			2050 Sea Level Rise Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.6	Y	0.7	46.6	Y	1.7	49.0	Y	4.1
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.6	Y	0.9	46.6	Y	1.9	49.0	Y	4.3
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.6	Y	6.5	46.6	Y	7.5	49.0	Y	9.9
3	**11161**	Sawmill Brook	School Street	48.1	44.0	N	-	46.2	N	-	49.0	Y	0.9
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	42.4	N	-	43.7	N	-	48.3	Y	0.2
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.4	Y	0.3	48.1	Y	0.9	49.0	Y	1.9
11	**1869**	Cat Brook	Mill Street	40.4	40.0	N	-	40.5	Y	0.1	40.7	Y	0.3
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.8	Y	0.3	51.9	Y	0.4	53.0	Y	1.5
13	**1570**	Sawmill Brook	The Plains	51.2	50.9	N	-	51.1	N	-	51.2	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.5	N	-	48.1	N	-	49.1	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	22.6	Y	1.0	22.9	Y	1.3	23.1	Y	1.5
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.6	Y	1.3	18.9	Y	1.6	19.3	Y	2.0
18	**378**	Causeway Brook	Lincoln Street	16.3	17.2	Y	0.9	17.6	Y	1.3	18.1	Y	1.8
19	**1280**	Causeway Brook	School Street- Golf	15.6	17.2	Y	1.6	17.7	Y	2.1	18.1	Y	2.5

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2050 Sea Level Rise Fossil Intensive Energy (A1fi) 25 year storm			2050 Sea Level Rise Fossil Intensive Energy (A1fi) 50 year storm			2050 Sea Level Rise Fossil Intensive Energy (A1fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.3	Y	0.4	18.5	Y	0.6	18.6	Y	0.7
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	17.0	Y	1.0	17.3	Y	1.3	17.7	Y	1.7
23	**1629**	Sawmill Brook	School Street	13.1	14.7	Y	1.6	15.2	Y	2.1	15.6	Y	2.5
25	**199**	Sawmill Brook	Central Street	10.6	12.4	Y	1.8	12.5	Y	1.9	12.8	Y	2.2
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	24.7	N	-	25.0	N	-	27.7	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	24.6	Y	0.2	24.8	Y	0.4	25.4	Y	1.0
28	**17648**	Sawmill Brook	Route 128	56.0	54.2	N	-	55.3	N	-	55.9	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	53.1	Y	1.1	54.0	Y	2.0	54.9	Y	2.9
32	**16328**	Sawmill Brook	Route 128	54.0	53.7	N	-	54.7	Y	0.7	55.7	Y	1.7
33	**15106**	Sawmill Brook	Route 128	52.0	53.1	Y	1.1	54.0	Y	2.0	54.9	Y	2.9
34	**14218**	Sawmill Brook	Route 128	52.0	52.1	Y	0.1	52.7	Y	0.7	52.9	Y	0.9
35	**16328**	Sawmill Brook	Route 128	54.0	53.7	N	-	54.7	Y	0.7	55.7	Y	1.7
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	35.1	N	-	36.2	N	-	39.7	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Sea Level Rise Balanced Energy (b) 25 year storm			2100 Sea Level Rise Balanced Energy (b) 50 year storm			2100 Sea Level Rise Balanced Energy (b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	45.6	Y	0.7	45.6	Y	0.7	48.3	Y	3.4
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	45.6	Y	0.9	45.6	Y	0.9	48.3	Y	3.6
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	45.6	Y	6.5	45.6	Y	6.5	48.3	Y	9.2
3	**11161**	Sawmill Brook	School Street	48.1	43.5	N	-	43.6	N	-	48.3	Y	0.2
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	42.1	N	-	42.1	N	-	44.3	N	-
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	47.4	Y	0.3	47.4	Y	0.3	48.4	Y	1.3
11	**1869**	Cat Brook	Mill Street	40.4	39.9	N	-	39.9	N	-	40.5	Y	0.1
12	**1777**	Sawmill Brook	Millet Lane	51.5	51.8	Y	0.3	51.8	Y	0.3	52.0	Y	0.5
13	**1570**	Sawmill Brook	The Plains	51.2	50.9	N	-	50.9	N	-	51.1	N	-
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	47.4	N	-	47.4	N	-	48.4	N	-
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	22.4	Y	0.8	22.4	Y	0.8	22.9	Y	1.3
17	**3686**	Sawmill Brook	Lincoln Street	17.3	18.5	Y	1.2	18.5	Y	1.2	19.0	Y	1.7
18	**378**	Causeway Brook	Lincoln Street	16.3	17.1	Y	0.8	17.1	Y	0.8	17.7	Y	1.4
19	**1280**	Causeway Brook	School Street- Golf	15.6	17.1	Y	1.5	17.1	Y	1.5	17.7	Y	2.1

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Sea Level Rise Balanced Energy (b) 25 year storm			2100 Sea Level Rise Balanced Energy (b) 50 year storm			2100 Sea Level Rise Balanced Energy (b) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.3	Y	0.4	18.2	Y	0.4	18.5	Y	0.6
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	16.9	Y	0.9	16.9	Y	0.9	17.4	Y	1.4
23	**1629**	Sawmill Brook	School Street	13.1	14.6	Y	1.5	14.6	Y	1.5	15.2	Y	2.1
25	**199**	Sawmill Brook	Central Street	10.6	12.2	Y	1.6	12.2	Y	1.6	12.7	Y	2.1
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	24.5	N	-	24.5	N	-	25.2	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	24.4	Y	< 0.1	24.4	Y	< 0.1	24.9	Y	0.5
28	**17648**	Sawmill Brook	Route 128	56.0	53.9	N	-	53.9	N	-	55.4	N	-
31	**15106**	Sawmill Brook	Route 128	52.0	52.9	Y	0.9	52.9	Y	0.9	54.1	Y	2.1
32	**16328**	Sawmill Brook	Route 128	54.0	53.4	N	-	53.5	N	-	54.8	Y	0.8
33	**15106**	Sawmill Brook	Route 128	52.0	52.9	Y	0.9	52.9	Y	0.9	54.1	Y	2.1
34	**14218**	Sawmill Brook	Route 128	52.0	51.9	N	-	51.9	N	-	52.6	Y	0.6
35	**16328**	Sawmill Brook	Route 128	54.0	53.4	N	-	53.5	N	-	54.8	Y	0.8
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	34.8	N	-	34.8	N	-	36.7	N	-

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

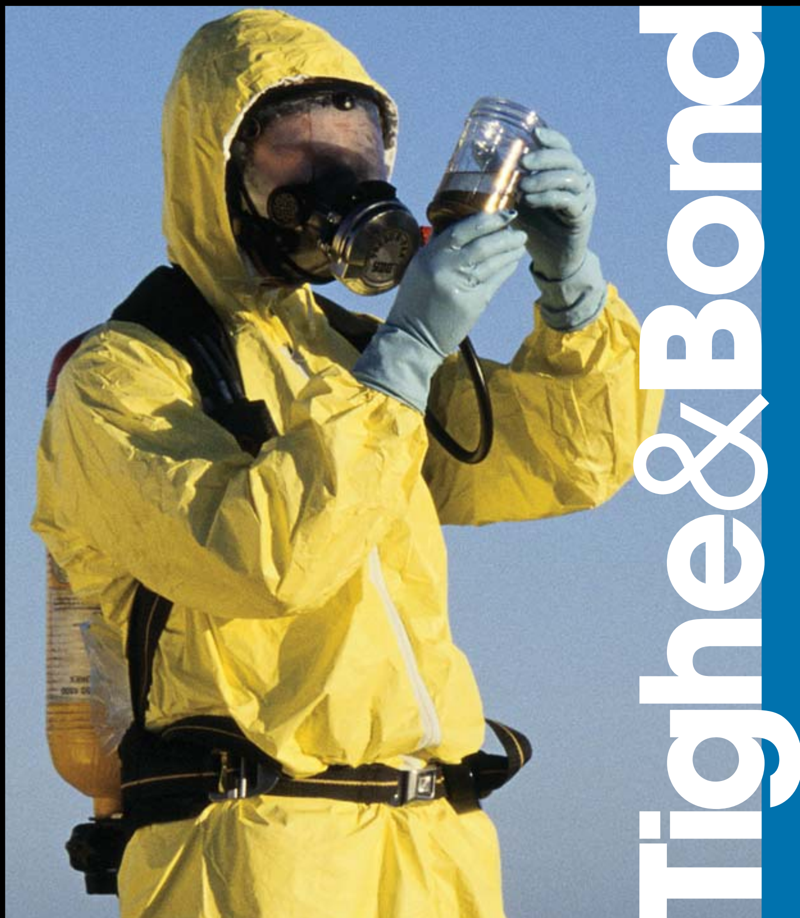
Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Sea Level Rise Fossil Intensive Energy (fi) 25 year storm			2100 Sea Level Rise Fossil Intensive Energy (fi) 50 year storm			2100 Sea Level Rise Fossil Intensive Energy (fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
2	**11479.5**	Cedar Swamp	Old School Street	44.9	48.6	Y	3.7	49.1	Y	4.2	49.7	Y	4.8
2a	**11479.5**	Cedar Swamp	Old School Street	44.7	48.6	Y	3.9	49.1	Y	4.4	49.7	Y	5.0
2b	**11479.5**	Cedar Swamp	Old School Street	39.1	48.6	Y	9.5	49.1	Y	10.0	49.7	Y	10.6
3	**11161**	Sawmill Brook	School Street	48.1	48.6	Y	0.5	49.1	Y	1.0	49.7	Y	1.6
4	**9168**	Sawmill Brook	Atwater Avenue	48.1	45.3	N	-	48.8	Y	0.7	49.6	Y	1.5
5	**13499**	Sawmill Brook	Conservation Winchester Drive	47.1	48.6	Y	1.5	49.2	Y	2.1	49.7	Y	2.6
11	**1869**	Cat Brook	Mill Street	40.4	40.6	Y	0.2	40.9	Y	0.5	41.2	Y	0.8
12	**1777**	Sawmill Brook	Millet Lane	51.5	52.0	Y	0.5	52.1	Y	0.6	52.2	Y	0.7
13	**1570**	Sawmill Brook	The Plains	51.2	51.3	Y	< 0.1	51.3	Y	0.1	51.4	Y	0.2
15	**1111**	Sawmill Brook	Blue Heron Lane	49.3	48.7	N	-	49.3	N	-	49.8	Y	0.5
16	**5192**	Sawmill Brook	Golf Course Driveway	21.6	23.0	Y	1.4	23.4	Y	1.8	23.6	Y	2.0
17	**3686**	Sawmill Brook	Lincoln Street	17.3	19.1	Y	1.8	19.7	Y	2.4	20.1	Y	2.8
18	**378**	Causeway Brook	Lincoln Street	16.3	17.8	Y	1.5	18.5	Y	2.2	19.6	Y	3.3
19	**1280**	Causeway Brook	School Street- Golf	15.6	17.9	Y	2.3	18.5	Y	2.9	19.6	Y	4.0

Appendix D: Hydraulic Modeling Results
Culvert Overtopping Under Existing and Future Conditions

Tighe&Bond

Culvert #	HEC-RAS River Station Number	Stream	Street	Top of Road Elevation	2100 Sea Level Rise Fossil Intensive Energy (fi) 25 year storm			2100 Sea Level Rise Fossil Intensive Energy (fi) 50 year storm			2100 Sea Level Rise Fossil Intensive Energy (fi) 100 year storm		
					WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
20	**1757**	Causeway Brook	Summer Street	17.9	18.6	Y	0.7	18.7	Y	0.8	19.7	Y	1.8
22	**2653**	Sawmill Brook	Norwood Avenue	16.0	17.5	Y	1.5	18.0	Y	2.0	19.2	Y	3.2
23	**1629**	Sawmill Brook	School Street	13.1	15.3	Y	2.2	16.0	Y	2.9	18.5	Y	5.4
25	**199**	Sawmill Brook	Central Street	10.6	12.8	Y	2.2	13.2	Y	2.6	18.3	Y	7.7
26	**7686**	Sawmill Brook	MassDOT Mill Street	46.0	25.6	N	-	30.7	N	-	38.6	N	-
27	**7533.5**	Sawmill Brook	Mill Street	24.4	25.0	Y	0.6	25.7	Y	1.3	26.0	Y	1.6
28	**17648**	Sawmill Brook	Route 128	56.0	55.6	N	-	56.6	Y	0.6	57.4	Y	1.4
31	**15106**	Sawmill Brook	Route 128	52.0	54.4	Y	2.4	55.6	Y	3.6	56.4	Y	4.4
32	**16328**	Sawmill Brook	Route 128	54.0	55.1	Y	1.1	56.4	Y	2.4	57.2	Y	3.2
33	**15106**	Sawmill Brook	Route 128	52.0	54.4	Y	2.4	55.6	Y	3.6	56.4	Y	4.4
34	**14218**	Sawmill Brook	Route 128	52.0	52.7	Y	0.7	52.7	Y	0.7	53.7	Y	1.7
35	**16328**	Sawmill Brook	Route 128	54.0	55.1	Y	1.1	56.4	Y	2.4	57.2	Y	3.2
36	**8131.5**	Sawmill Brook	Mass DOT Rte 128 ramp	51.6	37.5	N	-	42.4	N	-	48.4	N	-



APPENDIX E

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Total Flow (cfs)						
		Existing Conditions	Iteration 1: Central, School, Norwood with Stream Widening	Iteration 2: Old School Street Flood Mitigation	Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening	Iteration 4: Golf Course Flood Mitigation	Iteration 5: Golf Course and Old School Street Flood Mitigation	Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening
Main Stem	18954	73	73	73	73	73	73	73
Main Stem	18646	73	73	73	73	73	73	73
Main Stem	18340	73	73	73	73	73	73	73
Main Stem	18034	73	73	73	73	73	73	73
Main Stem	17728	73	73	73	73	73	73	73
Main Stem	17708	73	73	73	73	73	73	73
Main Stem	17648	**Culverts 28 & 29 - Route 128**						
Main Stem	17588	73	73	73	73	73	73	73
Main Stem	17568	73	73	73	73	73	73	73
Main Stem	17383	73	73	73	73	73	73	73
Main Stem	17183	73	73	73	73	73	73	73
Main Stem	16983	280	280	280	280	280	280	280
Main Stem	16783	280	280	280	280	280	280	280
Main Stem	16583	280	280	280	280	280	280	280
Main Stem	16383	280	280	280	280	280	280	280
Main Stem	16353	280	280	280	280	280	280	280
Main Stem	16328	**Culverts 32 & 35 - Route 128**						
Main Stem	16303	280	280	280	280	280	280	280
Main Stem	16273	280	280	280	280	280	280	280
Main Stem	16041	280	280	280	280	280	280	280
Main Stem	15741	280	280	280	280	280	280	280
Main Stem	15461	442	442	442	442	442	442	442
Main Stem	15181	442	442	442	442	442	442	442
Main Stem	15151	442	442	442	442	442	442	442
Main Stem	15106	**Culverts 31 & 33 - Route 128**						
Main Stem	15061	442	442	442	442	442	442	442
Main Stem	15031	442	442	442	442	442	442	442
Main Stem	14343	669	669	669	669	669	669	669
Main Stem	14293	669	669	669	669	669	669	669
Main Stem	14218	**Culvert 34 - Route 128**						
Main Stem	14143	669	669	669	669	669	669	669
Main Stem	14093	669	669	669	669	669	669	669
Main Stem 2	13539	669	669	669	669	669	669	669
Main Stem 2	13519	669	669	669	669	669	669	669
Main Stem 2	13499	**Culvert 5 - Old Essex Road**						
Main Stem 2	13479	669	669	669	669	669	669	669
Main Stem 2	13459	669	669	669	669	669	669	669
Main Stem 2	12989	669	669	669	669	669	669	669
Main Stem 2	12501	669	669	669	669	669	669	669
Main Stem 2	12013	669	669	669	669	669	669	669
Main Stem 2	11525	1551	1551	237	237	1551	237	1551
Main Stem 2	11505	1551	1551	237	237	1551	237	1551
Main Stem 2	11479.5	**Culvert 2 - Old School Street**						
Main Stem 2	11436	1551	1551	237	237	1551	237	1551
Main Stem 3	11211	345	345	237	237	345	237	345
Main Stem 3	11191	345	345	237	237	345	237	345
Main Stem 3	11161	**Culvert 3 - School Street**						
Main Stem 3	11131	345	345	237	237	345	237	345
Main Stem 3	11111	345	345	237	237	345	237	345
Main Stem 3	10488	345	345	237	237	345	237	345
Main Stem 3	9846	345	345	237	237	345	237	345
Main Stem 3	9204	319	319	267	267	319	267	319
Main Stem 3	9190	319	319	267	267	319	267	319

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Total Flow (cfs)						
		Existing Conditions	Iteration 1: Central, School, Norwood with Stream Widening	Iteration 2: Old School Street Flood Mitigation	Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening	Iteration 4: Golf Course Flood Mitigation	Iteration 5: Golf Course and Old School Street Flood Mitigation	Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening
Main Stem 3	9168	**Culvert 4 - Atwater Avenue**						
Main Stem 3	9146	319	319	267	267	319	267	319
Main Stem 3	9132	319	319	267	267	319	267	319
Main Stem 3	8443	319	319	267	267	319	267	319
Main Stem 3	8176	319	319	267	267	319	267	319
Main Stem 3	8146	319	319	267	267	319	267	319
Main Stem 3	8131.5	**Culvert 36 - Route 128 Ramp**						
Main Stem 3	8117	319	319	267	267	319	267	319
Main Stem 3	8087	319	319	267	267	319	267	319
Main Stem 3	7769	319	319	267	267	319	267	319
Main Stem 3	7739	319	319	267	267	319	267	319
Main Stem 3	7686	**Culvert 26 - Route 128**						
Main Stem 3	7633	319	319	267	267	319	267	319
Main Stem 3	7598	319	319	267	267	319	267	319
Main Stem 3	7570	319	319	267	267	319	267	319
Main Stem 3	7558	319	319	267	267	319	267	319
Main Stem 3	7533.5	**Culvert 27 - Mill Street**						
Main Stem 3	7506	319	319	267	267	319	267	319
Main Stem 3	7494	319	319	267	267	319	267	319
Main Stem 3	7219	319	319	267	267	319	267	319
Main Stem 3	6932	319	319	267	267	319	267	319
Main Stem 3	6645	319	319	267	267	319	267	319
Main Stem 3	6358	1051	1051	1038	1038	1051	1038	1051
Main Stem 4	6071	1051	1051	1038	1038	1051	1038	1051
Main Stem 4	5784	1051	1051	1038	1038	1051	1038	1051
Main Stem 4	5497	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	5210	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	5192	**Culvert 16 - Golf Course Driveway**						
Main Stem 4	5174	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	4810	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	4448	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	4086	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	3724	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	3712	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	3686	**Culvert 17 - Lincoln Street**						
Main Stem 4	3660	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	3648	1103	1103	1088	1088	1103	1088	1103
Main Stem 4	3168	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	3071.8	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2975.6	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2879.4	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2783.2	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2687	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2673	1629	1629	1612	1612	1629	1612	1629

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Total Flow (cfs)						
		Existing Conditions	Iteration 1: Central, School, Norwood with Stream Widening	Iteration 2: Old School Street Flood Mitigation	Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening	Iteration 4: Golf Course Flood Mitigation	Iteration 5: Golf Course and Old School Street Flood Mitigation	Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening
Main Stem 5	2653	**Culvert 22 - Norwood Avenue**						
Main Stem 5	2619	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2522.8	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2426.6	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2330.4	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2234.2	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	2138	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	1658	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	1648	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	1629	**Culvert 23 - School Street**						
Main Stem 5	1600	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	1259	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	918	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	577	1629	1629	1612	1612	1629	1612	1629
Main Stem 5	236	1845	1845	1829	1829	1845	1829	1845
Main Stem 5	199	**Culvert 25 - Central Street**						
Main Stem 5	150	1845	1845	1829	1829	1845	1829	1845
Main Stem 5	0	1845	1845	1829	1829	1845	1829	1845

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Total Flow (cfs)						
		Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation	Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements and Old School Street Flood Mitigation	Iteration 9: Central, School, Norwood Culvert Increase with Lincoln Street Culvert Decrease	Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements	Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook	Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook
Main Stem	18954	73	73	73	73	73	73	73
Main Stem	18646	73	73	73	73	73	73	73
Main Stem	18340	73	73	73	73	73	73	73
Main Stem	18034	73	73	73	73	73	73	73
Main Stem	17728	73	73	73	73	73	73	73
Main Stem	17708	73	73	73	73	73	73	73
Main Stem	17648	**Culverts 28 & 29 - Route 128**						
Main Stem	17588	73	73	73	73	73	73	73
Main Stem	17568	73	73	73	73	73	73	73
Main Stem	17383	73	73	73	73	73	73	73
Main Stem	17183	73	73	73	73	73	73	73
Main Stem	16983	280	280	280	280	280	280	280
Main Stem	16783	280	280	280	280	280	280	280
Main Stem	16583	280	280	280	280	280	280	280
Main Stem	16383	280	280	280	280	280	280	280
Main Stem	16353	280	280	280	280	280	280	280
Main Stem	16328	**Culverts 32 & 35 - Route 128**						
Main Stem	16303	280	280	280	280	280	280	280
Main Stem	16273	280	280	280	280	280	280	280
Main Stem	16041	280	280	280	280	280	280	280
Main Stem	15741	280	280	280	280	280	280	280
Main Stem	15461	442	442	442	442	442	442	442
Main Stem	15181	442	442	442	442	442	442	442
Main Stem	15151	442	442	442	442	442	442	442
Main Stem	15106	**Culverts 31 & 33 - Route 128**						
Main Stem	15061	442	442	442	442	442	442	442
Main Stem	15031	442	442	442	442	442	442	442
Main Stem	14343	669	669	669	669	669	669	669
Main Stem	14293	669	669	669	669	669	669	669
Main Stem	14218	**Culvert 34 - Route 128**						
Main Stem	14143	669	669	669	669	669	669	669
Main Stem	14093	669	669	669	669	669	669	669
Main Stem 2	13539	669	669	669	669	669	669	669
Main Stem 2	13519	669	669	669	669	669	669	669
Main Stem 2	13499	**Culvert 5 - Old Essex Road**						
Main Stem 2	13479	669	669	669	669	669	669	669
Main Stem 2	13459	669	669	669	669	669	669	669
Main Stem 2	12989	669	669	669	669	669	669	669
Main Stem 2	12501	669	669	669	669	669	669	669
Main Stem 2	12013	669	669	669	669	669	669	669
Main Stem 2	11525	1551	237	237	1551	1551	1551	1551
Main Stem 2	11505	1551	237	237	1551	1551	1551	1551
Main Stem 2	11479.5	**Culvert 2 - Old School Street**						
Main Stem 2	11436	1551	237	237	1551	1551	1551	1551
Main Stem 3	11211	345	237	237	345	345	345	345
Main Stem 3	11191	345	237	237	345	345	345	345
Main Stem 3	11161	**Culvert 3 - School Street**						
Main Stem 3	11131	345	237	237	345	345	345	345
Main Stem 3	11111	345	237	237	345	345	345	345
Main Stem 3	10488	345	237	237	345	345	345	345
Main Stem 3	9846	345	237	237	345	345	345	345
Main Stem 3	9204	319	267	267	319	319	319	319
Main Stem 3	9190	319	267	267	319	319	319	319

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Total Flow (cfs)						
		Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation	Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements and Old School Street Flood Mitigation	Iteration 9: Central, School, Norwood Culvert Increase with Lincoln Street Culvert Decrease	Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements	Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook	Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook
Main Stem 3	9168	**Culvert 4 - Atwater Avenue**						
Main Stem 3	9146	319	267	267	319	319	319	319
Main Stem 3	9132	319	267	267	319	319	319	319
Main Stem 3	8443	319	267	267	319	319	319	319
Main Stem 3	8176	319	267	267	319	319	319	319
Main Stem 3	8146	319	267	267	319	319	319	319
Main Stem 3	8131.5	**Culvert 36 - Route 128 Ramp**						
Main Stem 3	8117	319	267	267	319	319	319	319
Main Stem 3	8087	319	267	267	319	319	319	319
Main Stem 3	7769	319	267	267	319	319	319	319
Main Stem 3	7739	319	267	267	319	319	319	319
Main Stem 3	7686	**Culvert 26 - Route 128**						
Main Stem 3	7633	319	267	267	319	319	319	319
Main Stem 3	7598	319	267	267	319	319	319	319
Main Stem 3	7570	319	267	267	319	319	319	319
Main Stem 3	7558	319	267	267	319	319	319	319
Main Stem 3	7533.5	**Culvert 27 - Mill Street**						
Main Stem 3	7506	319	267	267	319	319	319	319
Main Stem 3	7494	319	267	267	319	319	319	319
Main Stem 3	7219	319	267	267	319	319	319	319
Main Stem 3	6932	319	267	267	319	319	319	319
Main Stem 3	6645	319	267	267	319	319	319	319
Main Stem 3	6358	1051	1038	1038	1051	1051	1051	1051
Main Stem 4	6071	1051	1038	1038	1051	1051	1051	1051
Main Stem 4	5784	1051	1038	1038	1051	1051	1051	1051
Main Stem 4	5497	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	5210	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	5192	**Culvert 16 - Golf Course Driveway**						
Main Stem 4	5174	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	4810	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	4448	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	4086	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	3724	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	3712	1103	1088	1088	1103	1103	1103	1103
Main Stem 4	3686	**Culvert 17 - Lincoln Street**						
Main Stem 4	3660	1103	1088	1080	1103	1103	1103	1103
Main Stem 4	3648	1103	1088	1080	1103	1103	1103	1103
Main Stem 4	3168	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	3071.8	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2975.6	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2879.4	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2783.2	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2687	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2673	1629	1612	1561	1629	1629	1629	1629

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Total Flow (cfs)						
		Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation	Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements and Old School Street Flood Mitigation	Iteration 9: Central, School, Norwood Culvert Increase with Lincoln Street Culvert Decrease	Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements	Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook	Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook
Main Stem 5	2653	**Culvert 22 - Norwood Avenue**						
Main Stem 5	2619	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2522.8	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2426.6	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2330.4	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2234.2	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	2138	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	1658	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	1648	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	1629	**Culvert 23 - School Street**						
Main Stem 5	1600	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	1259	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	918	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	577	1629	1612	1561	1629	1629	1629	1629
Main Stem 5	236	1845	1829	1723	1845	1845	1845	1845
Main Stem 5	199	**Culvert 25 - Central Street**						
Main Stem 5	150	1845	1829	1723	1845	1845	1845	1845
Main Stem 5	0	1845	1829	1723	1845	1845	1845	1845

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Water Surface Elevation (ft)							
		Existing Conditions	Iteration 1: Central, School, Norwood with Stream Widening	Iteration 2: Old School Street Flood Mitigation	Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening	Iteration 4: Golf Course Flood Mitigation	Iteration 5: Golf Course and Old School Street Flood Mitigation	Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening	Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation
Main Stem	18954	54.51	54.49	54.49	54.49	54.49	54.49	54.51	54.51
Main Stem	18646	54.36	54.34	54.34	54.34	54.34	54.34	54.36	54.36
Main Stem	18340	53.49	53.46	53.46	53.46	53.46	53.46	53.49	53.49
Main Stem	18034	53.73	53.75	53.75	53.75	53.75	53.75	53.73	53.73
Main Stem	17728	53.69	53.72	53.72	53.72	53.72	53.72	53.69	53.69
Main Stem	17708	53.67	53.69	53.69	53.69	53.69	53.69	53.67	53.67
Main Stem	17648	**Culverts 28 & 29 - Route 128**							
Main Stem	17588	53.41	53.44	53.44	53.44	53.44	53.44	53.41	53.41
Main Stem	17568	53.41	53.44	53.44	53.44	53.44	53.44	53.41	53.41
Main Stem	17383	53.42	53.45	53.45	53.45	53.45	53.45	53.42	53.42
Main Stem	17183	53.42	53.44	53.44	53.44	53.44	53.44	53.42	53.42
Main Stem	16983	53.41	53.43	53.43	53.43	53.43	53.43	53.41	53.41
Main Stem	16783	53.39	53.41	53.41	53.41	53.41	53.41	53.39	53.39
Main Stem	16583	53.32	53.34	53.34	53.34	53.34	53.34	53.32	53.32
Main Stem	16383	53.27	53.30	53.30	53.30	53.30	53.30	53.27	53.27
Main Stem	16353	53.26	53.29	53.29	53.29	53.29	53.29	53.26	53.26
Main Stem	16328	**Culverts 32 & 35 - Route 128**							
Main Stem	16303	53.24	53.26	53.26	53.26	53.26	53.26	53.24	53.24
Main Stem	16273	53.23	53.25	53.25	53.25	53.25	53.25	53.23	53.23
Main Stem	16041	53.10	53.12	53.12	53.12	53.12	53.12	53.10	53.10
Main Stem	15741	53.08	53.11	53.11	53.11	53.11	53.11	53.08	53.08
Main Stem	15461	52.81	52.84	52.84	52.84	52.84	52.84	52.81	52.81
Main Stem	15181	52.71	52.74	52.74	52.74	52.74	52.74	52.71	52.71
Main Stem	15151	52.70	52.73	52.73	52.73	52.73	52.73	52.70	52.70
Main Stem	15106	**Culverts 31 & 33 - Route 128**							
Main Stem	15061	52.62	52.64	52.64	52.64	52.64	52.64	52.62	52.62
Main Stem	15031	52.61	52.63	52.63	52.63	52.63	52.63	52.61	52.61
Main Stem	14343	51.84	51.87	51.87	51.87	51.87	51.87	51.84	51.84
Main Stem	14293	51.74	51.78	51.78	51.78	51.78	51.78	51.74	51.74
Main Stem	14218	**Culvert 34 - Route 128**							
Main Stem	14143	49.78	49.79	49.79	49.79	49.79	49.79	49.78	49.78
Main Stem	14093	49.30	49.34	49.34	49.34	49.34	49.34	49.30	49.30
Main Stem 2	13539	47.34	47.36	47.31	47.31	47.36	47.31	47.34	47.34
Main Stem 2	13519	47.34	47.36	47.31	47.31	47.36	47.31	47.34	47.34
Main Stem 2	13499	**Culvert 5 - Old Essex Road**							
Main Stem 2	13479	45.02	45.01	44.30	44.30	45.01	44.30	45.02	45.02
Main Stem 2	13459	45.56	45.55	45.00	45.00	45.55	45.00	45.56	45.56
Main Stem 2	12989	45.56	45.55	45.00	45.00	45.55	45.00	45.56	45.56
Main Stem 2	12501	45.55	45.54	44.99	44.99	45.54	44.99	45.55	45.55
Main Stem 2	12013	45.55	45.54	44.99	44.99	45.54	44.99	45.55	45.55
Main Stem 2	11525	45.55	45.54	44.99	44.99	45.54	44.99	45.55	45.55
Main Stem 2	11505	45.55	45.54	44.99	44.99	45.54	44.99	45.55	45.55
Main Stem 2	11479.5	**Culvert 2 - Old School Street**							
Main Stem 2	11436	43.52	43.52	42.60	42.60	43.52	42.60	43.52	43.52
Main Stem 3	11211	43.51	43.51	42.60	42.60	43.51	42.60	43.51	43.51
Main Stem 3	11191	43.27	43.26	42.43	42.43	43.26	42.43	43.27	43.27
Main Stem 3	11161	**Culvert 3 - School Street**							
Main Stem 3	11131	42.37	42.37	41.91	41.91	42.37	41.91	42.37	42.37
Main Stem 3	11111	42.54	42.54	42.01	42.01	42.54	42.01	42.54	42.54
Main Stem 3	10488	42.50	42.50	41.97	41.97	42.50	41.97	42.50	42.50
Main Stem 3	9846	42.47	42.47	41.95	41.95	42.47	41.95	42.47	42.47
Main Stem 3	9204	42.44	42.44	41.91	41.91	42.44	41.91	42.44	42.44
Main Stem 3	9190	41.91	41.91	41.44	41.44	41.91	41.44	41.91	41.91

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	**HEC-RAS River Station Number**	**Water Surface Elevation (ft)**							
		Existing Conditions	Iteration 1: Central, School, Norwood with Stream Widening	Iteration 2: Old School Street Flood Mitigation	Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening	Iteration 4: Golf Course Flood Mitigation	Iteration 5: Golf Course and Old School Street Flood Mitigation	Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening	Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation
Main Stem 3	9168	**Culvert 4 - Atwater Avenue**							
Main Stem 3	9146	40.24	40.21	39.93	39.93	40.21	39.93	40.24	40.24
Main Stem 3	9132	40.15	40.17	39.98	39.98	40.17	39.98	40.15	40.15
Main Stem 3	8443	36.50	36.50	36.28	36.28	36.50	36.28	36.50	36.50
Main Stem 3	8176	35.22	35.26	34.76	34.76	35.26	34.76	35.22	35.22
Main Stem 3	8146	34.67	34.72	34.29	34.29	34.72	34.29	34.67	34.67
Main Stem 3	8131.5	**Culvert 36 - Route 128 Ramp**							
Main Stem 3	8117	33.26	33.06	32.79	32.79	33.06	32.79	33.26	33.26
Main Stem 3	8087	31.79	31.81	31.75	31.75	31.81	31.75	31.79	31.79
Main Stem 3	7769	24.48	24.48	23.89	23.89	24.48	23.89	24.48	24.48
Main Stem 3	7739	24.47	24.46	23.88	23.88	24.46	23.87	24.47	24.47
Main Stem 3	7686	**Culvert 26 - Route 128**							
Main Stem 3	7633	24.33	24.33	23.79	23.79	24.33	23.78	24.33	24.33
Main Stem 3	7598	24.40	24.40	23.85	23.85	24.40	23.84	24.40	24.40
Main Stem 3	7570	24.41	24.41	23.85	23.85	24.41	23.85	24.41	24.41
Main Stem 3	7558	24.41	24.41	23.79	23.79	24.41	23.78	24.41	24.41
Main Stem 3	7533.5	**Culvert 27 - Mill Street**							
Main Stem 3	7506	22.02	22.02	21.94	21.94	22.01	21.93	22.02	22.01
Main Stem 3	7494	22.08	22.08	21.98	21.98	22.08	21.98	22.08	22.08
Main Stem 3	7219	22.09	22.09	21.99	21.99	22.08	21.98	22.09	22.08
Main Stem 3	6932	22.08	22.08	21.98	21.98	22.08	21.98	22.08	22.08
Main Stem 3	6645	22.08	22.08	21.98	21.98	22.08	21.98	22.08	22.07
Main Stem 3	6358	22.06	22.06	21.96	21.96	22.06	21.95	22.06	22.05
Main Stem 4	6071	22.04	22.04	21.94	21.94	22.04	21.94	22.04	22.04
Main Stem 4	5784	22.03	22.03	21.93	21.93	22.03	21.93	22.03	22.03
Main Stem 4	5497	22.02	22.02	21.92	21.92	22.02	21.91	22.02	22.01
Main Stem 4	5210	21.98	21.98	21.88	21.88	21.98	21.88	21.98	21.98
Main Stem 4	5192	**Culvert 16 - Golf Course Driveway**							
Main Stem 4	5174	18.73	18.70	18.72	18.69	18.60	18.59	18.15	17.35
Main Stem 4	4810	18.52	18.49	18.52	18.48	18.56	18.54	16.99	17.22
Main Stem 4	4448	18.51	18.48	18.51	18.47	18.54	18.53	17.22	17.20
Main Stem 4	4086	18.48	18.44	18.48	18.44	18.52	18.51	17.10	17.15
Main Stem 4	3724	18.44	18.40	18.44	18.40	18.49	18.47	16.99	17.06
Main Stem 4	3712	18.44	18.40	18.43	18.39	18.49	18.47	16.97	17.04
Main Stem 4	3686	**Culvert 17 - Lincoln Street**							
Main Stem 4	3660	17.21	16.83	17.20	16.81	17.56	17.54	16.84	16.84
Main Stem 4	3648	17.21	16.82	17.19	16.80	17.56	17.53	16.83	16.83
Main Stem 4	3168	17.04	16.56	17.02	16.54	16.88	16.86	16.58	16.58
Main Stem 5	3071.8	17.01	16.52	17.00	16.50	17.02	17.00	16.54	16.54
Main Stem 5	2975.6	16.98	16.47	16.97	16.46	16.99	16.97	16.50	16.50
Main Stem 5	2879.4	16.95	16.43	16.94	16.42	16.96	16.94	16.46	16.46
Main Stem 5	2783.2	16.93	16.39	16.91	16.38	16.94	16.91	16.42	16.42
Main Stem 5	2687	16.90	16.35	16.89	16.34	16.91	16.89	16.38	16.38
Main Stem 5	2673	16.84	16.18	16.83	16.17	16.85	16.83	16.22	16.22

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Water Surface Elevation (ft)							
		Existing Conditions	Iteration 1: Central, School, Norwood with Stream Widening	Iteration 2: Old School Street Flood Mitigation	Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening	Iteration 4: Golf Course Flood Mitigation	Iteration 5: Golf Course and Old School Street Flood Mitigation	Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening	Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation
Main Stem 5	2653	**Culvert 22 - Norwood Avenue**							
Main Stem 5	2619	15.31	13.90	15.26	13.87	15.28	15.26	13.92	13.92
Main Stem 5	2522.8	15.08	13.82	15.05	13.79	15.08	15.05	13.83	13.83
Main Stem 5	2426.6	15.02	13.82	14.99	13.78	15.02	14.99	13.82	13.82
Main Stem 5	2330.4	14.98	13.69	14.94	13.66	14.97	14.94	13.70	13.70
Main Stem 5	2234.2	14.95	13.64	14.91	13.61	14.94	14.91	13.64	13.64
Main Stem 5	2138	14.93	13.62	14.90	13.58	14.93	14.90	13.62	13.62
Main Stem 5	1658	14.41	12.79	14.37	12.76	14.39	14.37	12.79	12.79
Main Stem 5	1648	14.54	12.91	14.51	12.87	14.53	14.51	12.91	12.91
Main Stem 5	1629	**Culvert 23 - School Street**							
Main Stem 5	1600	12.86	11.90	12.82	11.87	12.83	12.82	11.89	11.89
Main Stem 5	1259	12.79	11.83	12.75	11.79	12.77	12.75	11.81	11.81
Main Stem 5	918	12.76	11.77	12.72	11.74	12.74	12.72	11.76	11.76
Main Stem 5	577	12.66	11.58	12.62	11.55	12.63	12.62	11.56	11.56
Main Stem 5	236	12.24	10.56	12.19	10.54	12.20	12.19	10.54	10.54
Main Stem 5	199	**Culvert 25 - Central Street**							
Main Stem 5	150	6.26	6.26	6.25	6.25	6.26	6.25	6.26	6.26
Main Stem 5	0	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Water Surface Elevation (ft)					
		Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements Old School Street Flood Mitigation	Iteration 9: Central, School, and Norwood Culvert Improvements and reduction to Lincoln Culvert	Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements	Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook	Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook
Main Stem	18954	54.51	54.51	54.51	54.49	54.49	54.49
Main Stem	18646	54.36	54.36	54.36	54.34	54.34	54.34
Main Stem	18340	53.49	53.49	53.49	53.46	53.46	53.46
Main Stem	18034	53.73	53.73	53.73	53.75	53.75	53.75
Main Stem	17728	53.69	53.69	53.69	53.72	53.72	53.72
Main Stem	17708	53.67	53.67	53.67	53.69	53.69	53.69
Main Stem	17648	**Culverts 28 & 29 - Route 128**					
Main Stem	17588	53.41	53.41	53.41	53.44	53.44	53.44
Main Stem	17568	53.41	53.41	53.41	53.44	53.44	53.44
Main Stem	17383	53.42	53.42	53.42	53.45	53.45	53.45
Main Stem	17183	53.42	53.42	53.42	53.44	53.44	53.44
Main Stem	16983	53.41	53.41	53.41	53.43	53.43	53.43
Main Stem	16783	53.39	53.39	53.39	53.41	53.41	53.41
Main Stem	16583	53.32	53.32	53.32	53.34	53.34	53.34
Main Stem	16383	53.27	53.27	53.27	53.30	53.30	53.30
Main Stem	16353	53.26	53.26	53.26	53.29	53.29	53.29
Main Stem	16328	**Culverts 32 & 35 - Route 128**					
Main Stem	16303	53.24	53.24	53.24	53.26	53.26	53.26
Main Stem	16273	53.23	53.23	53.23	53.25	53.25	53.25
Main Stem	16041	53.10	53.10	53.10	53.12	53.12	53.12
Main Stem	15741	53.08	53.08	53.08	53.11	53.11	53.11
Main Stem	15461	52.81	52.81	52.81	52.84	52.84	52.84
Main Stem	15181	52.71	52.71	52.71	52.74	52.74	52.74
Main Stem	15151	52.70	52.70	52.70	52.73	52.73	52.73
Main Stem	15106	**Culverts 31 & 33 - Route 128**					
Main Stem	15061	52.62	52.62	52.62	52.64	52.64	52.64
Main Stem	15031	52.61	52.61	52.61	52.63	52.63	52.63
Main Stem	14343	51.84	51.84	51.84	51.87	51.87	51.87
Main Stem	14293	51.74	51.74	51.74	51.78	51.78	51.78
Main Stem	14218	**Culvert 34 - Route 128**					
Main Stem	14143	49.78	49.78	49.78	49.79	49.79	49.79
Main Stem	14093	49.30	49.30	49.30	49.34	49.34	49.34
Main Stem 2	13539	47.31	47.31	47.34	47.36	47.36	47.36
Main Stem 2	13519	47.31	47.31	47.34	47.36	47.36	47.36
Main Stem 2	13499	**Culvert 5 - Old Essex Road**					
Main Stem 2	13479	44.31	44.31	45.02	45.01	45.01	45.01
Main Stem 2	13459	45.00	45.00	45.56	45.55	45.55	45.55
Main Stem 2	12989	45.00	45.00	45.56	45.55	45.55	45.55
Main Stem 2	12501	45.00	45.00	45.55	45.54	45.54	45.54
Main Stem 2	12013	44.99	44.99	45.55	45.54	45.54	45.54
Main Stem 2	11525	44.99	44.99	45.55	45.54	45.54	45.54
Main Stem 2	11505	44.99	44.99	45.55	45.54	45.54	45.54
Main Stem 2	11479.5	**Culvert 2 - Old School Street**					
Main Stem 2	11436	42.60	42.60	43.52	43.52	43.52	43.52
Main Stem 3	11211	42.60	42.60	43.51	43.51	43.51	43.51
Main Stem 3	11191	42.43	42.43	43.27	43.26	43.26	43.26
Main Stem 3	11161	**Culvert 3 - School Street**					
Main Stem 3	11131	41.92	41.92	42.37	42.37	42.37	42.37
Main Stem 3	11111	42.01	42.01	42.54	42.54	42.54	42.54
Main Stem 3	10488	41.97	41.97	42.50	42.50	42.50	42.50
Main Stem 3	9846	41.95	41.95	42.47	42.47	42.47	42.47
Main Stem 3	9204	41.91	41.91	42.44	42.44	42.44	42.44
Main Stem 3	9190	41.44	41.44	41.91	41.91	41.91	41.91

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Water Surface Elevation (ft)					
		Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements Old School Street Flood Mitigation	Iteration 9: Central, School, and Norwood Culvert Improvements and reduction to Lincoln Culvert	Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements	Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook	Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook
Main Stem 3	9168	**Culvert 4 - Atwater Avenue**					
Main Stem 3	9146	39.96	39.96	40.24	40.21	40.21	40.21
Main Stem 3	9132	39.97	39.97	40.15	40.17	40.17	40.17
Main Stem 3	8443	36.28	36.28	36.50	36.50	36.50	36.50
Main Stem 3	8176	34.71	34.71	35.22	35.26	35.26	35.26
Main Stem 3	8146	34.21	34.21	34.67	34.72	34.72	34.72
Main Stem 3	8131.5	**Culvert 36 - Route 128 Ramp**					
Main Stem 3	8117	32.97	32.97	33.26	33.06	33.06	33.06
Main Stem 3	8087	31.74	31.74	31.79	31.81	31.81	31.81
Main Stem 3	7769	23.89	23.89	24.48	24.48	24.48	24.48
Main Stem 3	7739	23.88	23.88	24.47	24.46	24.46	24.46
Main Stem 3	7686	**Culvert 26 - Route 128**					
Main Stem 3	7633	23.79	23.79	24.33	24.33	24.33	24.33
Main Stem 3	7598	23.85	23.85	24.40	24.40	24.40	24.40
Main Stem 3	7570	23.85	23.85	24.41	24.41	24.41	24.41
Main Stem 3	7558	23.79	23.79	24.41	24.41	24.41	24.41
Main Stem 3	7533.5	**Culvert 27 - Mill Street**					
Main Stem 3	7506	21.94	21.94	22.02	22.02	22.02	22.02
Main Stem 3	7494	21.99	21.99	22.08	22.08	22.08	22.08
Main Stem 3	7219	21.99	21.99	22.09	22.09	22.09	22.09
Main Stem 3	6932	21.99	21.99	22.08	22.08	22.08	22.08
Main Stem 3	6645	21.99	21.99	22.08	22.08	22.08	22.08
Main Stem 3	6358	21.97	21.97	22.06	22.06	22.06	22.06
Main Stem 4	6071	21.95	21.95	22.04	22.04	22.04	22.04
Main Stem 4	5784	21.93	21.93	22.03	22.03	22.03	22.03
Main Stem 4	5497	21.92	21.92	22.02	22.02	22.02	22.02
Main Stem 4	5210	21.89	21.89	21.98	21.98	21.98	21.98
Main Stem 4	5192	**Culvert 16 - Golf Course Driveway**					
Main Stem 4	5174	18.12	18.68	18.71	18.73	18.70	18.71
Main Stem 4	4810	17.05	18.47	18.49	18.52	18.48	18.50
Main Stem 4	4448	17.25	18.47	18.49	18.51	18.48	18.49
Main Stem 4	4086	17.14	18.43	18.45	18.48	18.44	18.45
Main Stem 4	3724	17.04	18.39	18.41	18.44	18.40	18.41
Main Stem 4	3712	17.02	18.39	18.41	18.43	18.39	18.41
Main Stem 4	3686	**Culvert 17 - Lincoln Street**					
Main Stem 4	3660	16.82	16.75	16.84	17.07	16.65	16.84
Main Stem 4	3648	16.82	16.74	16.83	17.06	16.64	16.84
Main Stem 4	3168	16.57	16.48	16.58	16.86	16.29	16.58
Main Stem 5	3071.8	16.53	16.43	16.54	16.83	16.24	16.53
Main Stem 5	2975.6	16.49	16.39	16.50	16.80	16.19	16.49
Main Stem 5	2879.4	16.45	16.35	16.46	16.77	16.14	16.45
Main Stem 5	2783.2	16.41	16.32	16.42	16.74	16.09	16.41
Main Stem 5	2687	16.37	16.27	16.38	16.70	16.04	16.37
Main Stem 5	2673	16.21	16.11	16.22	16.59	15.84	16.23

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	HEC-RAS River Station Number	Water Surface Elevation (ft)					
		Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements Old School Street Flood Mitigation	Iteration 9: Central, School, and Norwood Culvert Improvements and reduction to Lincoln Culvert	Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements	Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook	Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook
Main Stem 5	2653	**Culvert 22 - Norwood Avenue**					
Main Stem 5	2619	13.86	13.71	14.76	14.36	13.14	13.14
Main Stem 5	2522.8	13.76	13.58	14.44	14.31	13.25	13.25
Main Stem 5	2426.6	13.74	13.55	14.33	14.31	13.26	13.26
Main Stem 5	2330.4	13.61	13.40	14.24	14.23	13.01	13.01
Main Stem 5	2234.2	13.56	13.34	14.18	14.20	12.95	12.95
Main Stem 5	2138	13.54	13.31	14.15	14.18	12.92	12.92
Main Stem 5	1658	12.68	12.39	11.85	13.55	11.97	11.97
Main Stem 5	1648	12.79	12.48	11.96	13.68	11.97	11.97
Main Stem 5	1629	**Culvert 23 - School Street**					
Main Stem 5	1600	11.89	11.66	11.91	11.35	11.88	11.88
Main Stem 5	1259	11.82	11.56	11.80	11.10	11.82	11.82
Main Stem 5	918	11.76	11.50	11.74	11.03	11.77	11.77
Main Stem 5	577	11.57	11.30	11.55	10.71	11.58	11.58
Main Stem 5	236	10.58	10.30	10.51	8.97	10.56	10.56
Main Stem 5	199	**Culvert 25 - Central Street**					
Main Stem 5	150	6.25	6.19	6.27	9.01	6.26	6.26
Main Stem 5	0	5.77	5.77	5.77	8.86	5.77	5.77

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	Culvert	HEC-RAS River Station Number	Top of Road Elevation	Existing Conditions			Iteration 1: Central, School, Norwood with Stream Widening			Iteration 2: Old School Street Flood Mitigation			Iteration 3: Central, School, Norwood with Old School Street and Sawmill Brook Widening		
				WS Elevation (ft)	**Overtop? (Y/N)**	**Quantity (ft)**	**WS Elevation (ft)**	**Overtop? (Y/N)**	**Quantity (ft)**	**WS Elevation (ft)**	**Overtop? (Y/N)**	**Quantity (ft)**	**WS Elevation (ft)**	**Overtop? (Y/N)**	**Quantity (ft)**
Main Stem	Culverts 28 & 29 Route 128	17648	56.0	53.7	N	-	53.7	N	-	53.7	N	-	53.7	N	-
Main Stem	Culverts 32 & 35 Route 128	16328	54.0	53.3	N	-	53.3	N	-	53.3	N	-	53.3	N	-
Main Stem	Culverts 31 & 33 Route 128	15106	52.0	52.7	Y	0.7	52.7	Y	0.7	52.7	Y	0.7	52.7	Y	0.7
Main Stem	Culvert 34 Route 128	14218	52.0	51.7	N	-	51.8	N	-	51.8	N	-	51.8	N	-
Main Stem 2	Culvert 5 Old Essex Road	13499	47.1	47.3	Y	0.2	47.4	Y	0.3	47.3	Y	0.2	47.3	Y	0.2
Main Stem 2	Culvert 2 Old School Street	11479.5	44.9	45.6	Y	0.6	45.5	Y	0.6	45.0	Y	0.1	45.0	Y	0.1
Main Stem 2	Culvert 2a Old School Street	11479.5	44.7	45.6	Y	0.8	45.5	Y	0.8	45.0	Y	0.3	45.0	Y	0.3
Main Stem 2	Culvert 2b Old School Street	11479.5	39.1	45.6	Y	6.5	45.5	Y	6.4	45.0	Y	5.9	45.0	Y	5.9
Main Stem 3	Culvert 3 School Street	11161	48.1	43.3	N	-	43.3	N	-	42.4	N	-	42.4	N	-
Main Stem 3	Culvert 4 Atwater Avenue	9168	48.1	41.9	N	-	41.9	N	-	41.4	N	-	41.4	N	-
Main Stem 3	Culvert 36 Route 128 Ramp	8131.5	51.6	34.7	N	-	34.7	N	-	34.3	N	-	34.3	N	-
Main Stem 3	Culvert 26 Route 128	7686	46.0	24.5	N	-	24.5	N	-	23.9	N	-	23.9	N	-
Main Stem 3	Culvert 27 Mill Street	7533.5	24.4	24.4	N	0.0	24.4	Y	0.0	23.8	N	-	23.8	N	-
Main Stem 4	Culvert 16 Golf Course Driveway	5192	21.6	22.0	Y	0.4	22.0	Y	0.4	21.9	Y	0.3	21.9	Y	0.3
Main Stem 4	Culvert 17 Lincoln Street	3686	17.3	18.4	Y	1.1	18.4	Y	1.1	18.4	Y	1.1	18.4	Y	1.1
Main Stem 5	Culvert 22 Norwood Avenue	2653	16.0	16.8	Y	0.8	16.2	Y	0.2	16.8	Y	0.8	16.2	Y	0.2
Main Stem 5	Culvert 23 School Street	1629	13.1	14.5	Y	1.4	12.9	N	-	14.5	Y	1.4	12.9	N	-
Main Stem 5	Culvert 25 Central Street	199	10.6	12.2	Y	1.6	10.6	N	-	12.2	Y	1.6	10.5	N	-

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	Culvert	HEC-RAS River Station Number	Top of Road Elevation	Iteration 4: Golf Course Flood Mitigation			Iteration 5: Golf Course and Old School Street Flood Mitigation			Iteration 6: Central, School, Norwood, and Lincoln Culvert Improvements with Channel Widening			Iteration 7: Central, School, Norwood, and Lincoln Culvert Improvements and Golf Course Flood Mitigation		
				WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
Main Stem	Culverts 28 & 29 Route 128	17648	56.0	53.7	N	-	53.7	N	-	53.7	N	-	53.7	N	-
Main Stem	Culverts 32 & 35 Route 128	16328	54.0	53.3	N	-	53.3	N	-	53.3	N	-	53.3	N	-
Main Stem	Culverts 31 & 33 Route 128	15106	52.0	52.7	Y	0.7	52.7	Y	0.7	52.7	Y	0.7	52.7	Y	0.7
Main Stem	Culvert 34 Route 128	14218	52.0	51.8	N	-	51.8	N	-	51.7	N	-	51.7	N	-
Main Stem 2	Culvert 5 Old Essex Road	13499	47.1	47.4	Y	0.3	47.3	Y	0.2	47.3	Y	0.2	47.3	Y	0.2
Main Stem 2	Culvert 2 Old School Street	11479.5	44.9	45.5	Y	0.6	45.0	Y	0.1	45.6	Y	0.6	45.6	Y	0.6
Main Stem 2	Culvert 2a Old School Street	11479.5	44.7	45.5	Y	0.8	45.0	Y	0.3	45.6	Y	0.8	45.6	Y	0.8
Main Stem 2	Culvert 2b Old School Street	11479.5	39.1	45.5	Y	6.4	45.0	Y	5.9	45.6	Y	6.5	45.6	Y	6.5
Main Stem 3	Culvert 3 School Street	11161	48.1	43.3	N	-	42.4	N	-	43.3	N	-	43.3	N	-
Main Stem 3	Culvert 4 Atwater Avenue	9168	48.1	41.9	N	-	41.4	N	-	41.9	N	-	41.9	N	-
Main Stem 3	Culvert 36 Route 128 Ramp	8131.5	51.6	34.7	N	-	34.3	N	-	34.7	N	-	34.7	N	-
Main Stem 3	Culvert 26 Route 128	7686	46.0	24.5	N	-	23.9	N	-	24.5	N	-	24.5	N	-
Main Stem 3	Culvert 27 Mill Street	7533.5	24.4	24.4	Y	0.0	23.8	N	-	24.4	Y	0.0	24.4	Y	0.0
Main Stem 4	Culvert 16 Golf Course Driveway	5192	21.6	22.0	Y	0.4	21.9	Y	0.3	22.0	Y	0.4	22.0	Y	0.4
Main Stem 4	Culvert 17 Lincoln Street	3686	17.3	18.5	Y	1.2	18.5	Y	1.2	17.0	N	-	17.0	N	-
Main Stem 5	Culvert 22 Norwood Avenue	2653	16.0	16.9	Y	0.9	16.8	Y	0.8	16.2	Y	0.2	16.2	Y	0.2
Main Stem 5	Culvert 23 School Street	1629	13.1	14.5	Y	1.4	14.5	Y	1.4	12.9	N	-	12.9	N	-
Main Stem 5	Culvert 25 Central Street	199	10.6	12.2	Y	1.6	12.2	Y	1.6	10.5	N	-	10.5	N	-

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	Culvert	HEC-RAS River Station Number	Top of Road Elevation	Iteration 8: Central, School, Norwood, and Lincoln Culvert Improvements and Old School Street Flood Mitigation			Iteration 9: Central, School, Norwood Culvert Increase with Lincoln Street Culvert Decrease			Iteration 10: Central, School, and Norwood Culvert Improvements with No Channel Improvements			Iteration 11: Central, School, and Norwood Culvert Improvements with Widening Sawmill Brook		
				WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)	WS Elevation (ft)	Overtop? (Y/N)	Quantity (ft)
Main Stem	Culverts 28 & 29 Route 128	17648	56.0	53.7	N	-	53.7	N	-	53.7	N	-	53.7	N	-
Main Stem	Culverts 32 & 35 Route 128	16328	54.0	53.3	N	-	53.3	N	-	53.3	N	-	53.3	N	-
Main Stem	Culverts 31 & 33 Route 128	15106	52.0	52.7	Y	0.7	52.7	Y	0.7	52.7	Y	0.7	52.7	Y	0.7
Main Stem	Culvert 34 Route 128	14218	52.0	51.7	N	-	51.7	N	-	51.7	N	-	51.8	N	-
Main Stem 2	Culvert 5 Old Essex Road	13499	47.1	47.3	Y	0.2	47.3	Y	0.2	47.3	Y	0.2	47.4	Y	0.3
Main Stem 2	Culvert 2 Old School Street	11479.5	44.9	45.0	Y	0.1	45.0	Y	0.1	45.6	Y	0.6	45.5	Y	0.6
Main Stem 2	Culvert 2a Old School Street	11479.5	44.7	45.0	Y	0.3	45.0	Y	0.3	45.6	Y	0.8	45.5	Y	0.8
Main Stem 2	Culvert 2b Old School Street	11479.5	39.1	45.0	Y	5.9	45.0	Y	5.9	45.6	Y	6.5	45.5	Y	6.4
Main Stem 3	Culvert 3 School Street	11161	48.1	42.4	N	-	42.4	N	-	43.3	N	-	43.3	N	-
Main Stem 3	Culvert 4 Atwater Avenue	9168	48.1	41.4	N	-	41.4	N	-	41.9	N	-	41.9	N	-
Main Stem 3	Culvert 36 Route 128 Ramp	8131.5	51.6	34.2	N	-	34.2	N	-	34.7	N	-	34.7	N	-
Main Stem 3	Culvert 26 Route 128	7686	46.0	23.9	N	-	23.9	N	-	24.5	N	-	24.5	N	-
Main Stem 3	Culvert 27 Mill Street	7533.5	24.4	23.8	N	-	23.8	N	-	24.4	Y	0.0	24.4	Y	0.0
Main Stem 4	Culvert 16 Golf Course Driveway	5192	21.6	21.9	Y	0.3	21.9	Y	0.3	22.0	Y	0.4	22.0	Y	0.4
Main Stem 4	Culvert 17 Lincoln Street	3686	17.3	17.0	N	-	18.4	Y	1.1	18.4	Y	1.1	18.4	Y	1.1
Main Stem 5	Culvert 22 Norwood Avenue	2653	16.0	16.2	Y	0.2	16.1	Y	0.1	16.2	Y	0.2	16.6	Y	0.6
Main Stem 5	Culvert 23 School Street	1629	13.1	12.8	N	-	12.5	N	-	12.0	N	-	13.7	Y	0.6
Main Stem 5	Culvert 25 Central Street	199	10.6	10.6	N	-	10.3	N	-	10.5	N	-	9.0	N	-

Appendix E
Evaluation of Flood Mitigation Projects - Modeling Iterations

Reach	Culvert	HEC-RAS River Station Number	Top of Road Elevation	Iteration 12: Central, School, and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook			Iteration 13: Central, School and Norwood Culvert Improvements with Widening and Deepening to Sawmill Brook		
				WS Elevation (ft)	**Overtop? (Y/N)**	**Quantity (ft)**	**WS Elevation (ft)**	**Overtop? (Y/N)**	**Quantity (ft)**
Main Stem	Culverts 28 & 29 Route 128	17648	56.0	53.7	N	-	53.7	N	-
Main Stem	Culverts 32 & 35 Route 128	16328	54.0	53.3	N	-	53.3	N	-
Main Stem	Culverts 31 & 33 Route 128	15106	52.0	52.7	Y	0.7	52.7	Y	0.7
Main Stem	Culvert 34 Route 128	14218	52.0	51.8	N	-	51.8	N	-
Main Stem 2	Culvert 5 Old Essex Road	13499	47.1	47.4	Y	0.3	47.4	Y	0.3
Main Stem 2	Culvert 2 Old School Street	11479.5	44.9	45.5	Y	0.6	45.5	Y	0.6
Main Stem 2	Culvert 2a Old School Street	11479.5	44.7	45.5	Y	0.8	45.5	Y	0.8
Main Stem 2	Culvert 2b Old School Street	11479.5	39.1	45.5	Y	6.4	45.5	Y	6.4
Main Stem 3	Culvert 3 School Street	11161	48.1	43.3	N	-	43.3	N	-
Main Stem 3	Culvert 4 Atwater Avenue	9168	48.1	41.9	N	-	41.9	N	-
Main Stem 3	Culvert 36 Route 128 Ramp	8131.5	51.6	34.7	N	-	34.7	N	-
Main Stem 3	Culvert 26 Route 128	7686	46.0	24.5	N	-	24.5	N	-
Main Stem 3	Culvert 27 Mill Street	7533.5	24.4	24.4	Y	0.0	24.4	Y	0.0
Main Stem 4	Culvert 16 Golf Course Driveway	5192	21.6	22.0	Y	0.4	22.0	Y	0.4
Main Stem 4	Culvert 17 Lincoln Street	3686	17.3	18.4	Y	1.1	18.4	Y	1.1
Main Stem 5	Culvert 22 Norwood Avenue	2653	16.0	15.8	N	-	15.8	N	-
Main Stem 5	Culvert 23 School Street	1629	13.1	12.0	N	-	12.0	N	-
Main Stem 5	Culvert 25 Central Street	199	10.6	10.6	N	-	10.6	N	-