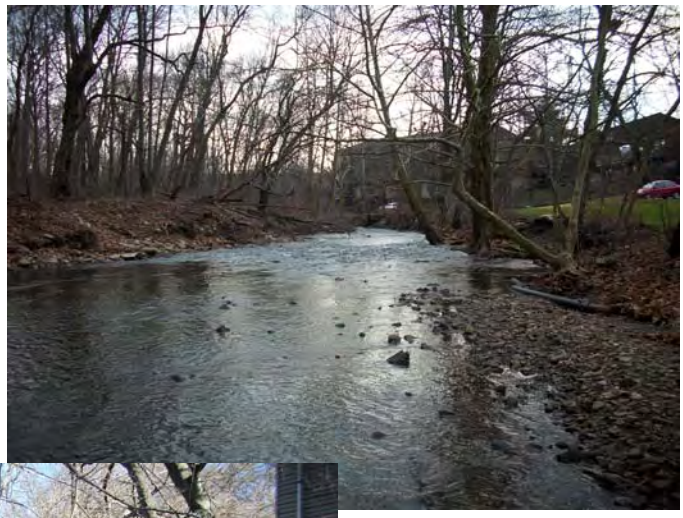
DRAFT
WATERSHED EVALUATION OF THE NOROTON RIVER



MMI #1581-04-3

June 30, 2010

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1.0 INTRODUCTION

1.1 Purpose and Scope

Residences and businesses along the Noroton River in Darien, Connecticut have been experiencing increased flooding in recent years. These flood events have been increasing in frequency, with at least three events occurring in the past two years. The source of the flooding is not clear in all locations, and this study identifies specific causes. In some locations, complaints appear related to street flooding caused by insufficient street drainage. In other areas, the complaints are related to channel flooding. The varied causes of the flooding lead to the need to seek varied solutions.

The Town of Darien selected Milone & MacBroom, Inc. (MMI) in September 2008 to evaluate flooding conditions along several watercourses within the community. The Noroton River is the third watershed to be studied. It is unique because it forms the western border of the town of Darien with the town of Stamford; therefore, the watershed is shared by the towns. This report presents the work completed by MMI in the evaluation of the Noroton River and recommendations for mitigation where possible.

The scope of the project entails the following tasks:

- Evaluation of existing conditions. This includes both field investigation as well as review of available published data about the watershed.

- Field survey. The town recently purchased townwide topographic mapping that was used as the basis for much of this work. Similar, high resolution topographic mapping was available from the Town of Stamford. Supplemental field survey of critical locations within the channel was performed by MMI.

- Hydrologic evaluation of the watershed. This was performed to predict peak flow rates through the watershed during a variety of rainfall scenarios. A rainfall-runoff simulation modeling technique was used to determine peak flow rates. The results were compared to previously published Federal Emergency Management Agency (FEMA) data, regression analysis results, and gauge analysis results.

- Hydraulic analysis of the river channel. This modeling was completed to predict water surface elevations under existing conditions during different flow rates (as determined through the hydrology).

- Evaluation of mitigation measures. Using the hydrologic and hydraulic data, alternatives were evaluated to reduce the predicted water surface elevations during flood events.

- Development of a master plan for long-term improvements. The goal of this project is to develop a long-term plan for the town to use in mitigating flooding along the Noroton River.

It must be noted that a variety of factors often conspire to generate modern drainage and flood-related problems. As such, the solution to drainage problems can be complicated, with improvements in one location potentially contributing to worsening conditions in other areas. Therefore, in developing an overall plan for drainage and flood management within a watershed, recommendations often seek to balance the needs of all community members rather than focusing solely on one neighborhood.

1.2 Summary of Flooding Concerns

Through information provided by the town of Darien residents and staff and field observations by MMI, the following areas were identified as having experienced flooding or possibly contributing to the flooding that has been occurring:

- ✓ Kelsey Street neighborhood between West Avenue and the railroad: This neighborhood has experienced flooding during large rain events. Flooding in this area appears to be caused by an undersized drainage system.

- ✓ Lynn Court: The channel takes a sharp bend just upstream of the Lynn Court neighborhood. During high flows, water leaves the channel and floods homes adjacent to the channel. Residents feel as though flooding is compounded by an undersized drainage system collecting from a large area.

- ✓ Camp Avenue: The river bends upstream of the Camp Avenue bridge and during large floods overtops the banks, flooding a commercial property upstream of the bridge.

- ✓ Greenwood Road: At least one home off Greenwood Road, between Camp Avenue and Woodway Road, reported flooding during the 2007 large flood.

- ✓ Hickory Lane/Deepwood: Neighborhood north of Middlesex Road experiences drainage problems during large storms.

While the watershed extends north of Woodway Country Club into New Canaan, extensive flooding has not been reported upstream of Woodway Road. During a public information meeting on December 17, 2009, MMI invited comments from residents in the watershed. Few residents attended and only discussed the few areas mentioned above, with no complaints in the upper watershed. This report focuses on review and analysis of known flooding problems in the town of Darien. However, there are many low-lying buildings close to the Noroton River, over the town line in Stamford. Impacts to those areas are considered in the alternatives analysis so that any improvements made to address the flooding problems in Darien do not have a negative impact on other low-lying properties.

2.0 EXISTING CONDITIONS

2.1 Study Area

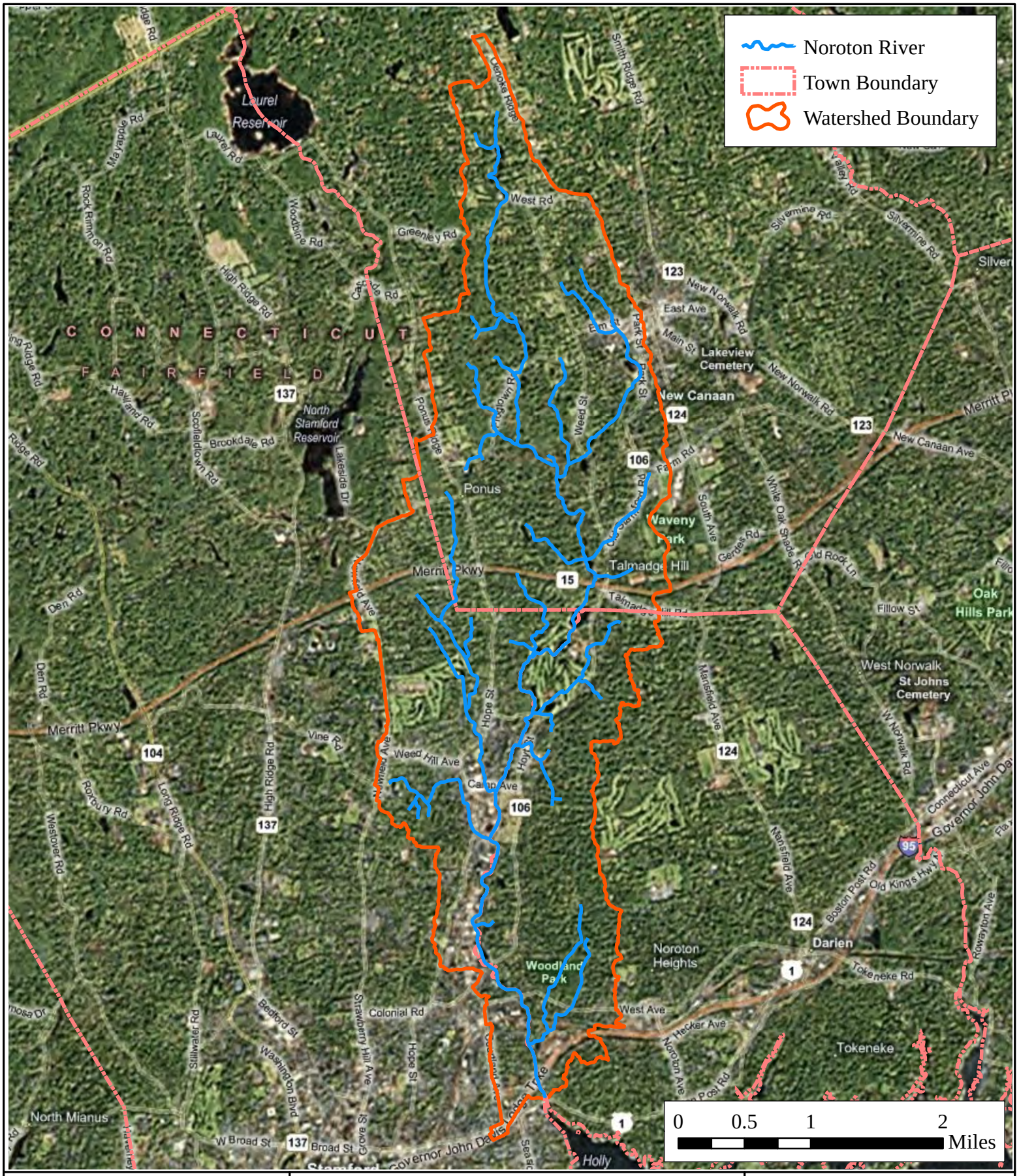
This evaluation is intended to identify the causes of the flooding and evaluate potential solutions to reduce flooding along the main stem of the Noroton River in the town of Darien. Hydrologic analyses consider the full watershed area including the portions in New Canaan and Stamford while hydraulic modeling of the channel extends from the Noroton River's mouth at Holly Pond upstream to the New Canaan town line in the Woodway Country Club. The Noroton River watershed has a drainage area of 11.04 square miles (7,065 acres) at its confluence with Holly Pond. Figure 2-1 depicts the watershed of the Noroton River.

Note that throughout this report references are made to left and right banks of the channel. In all instances, left and right are oriented looking downstream.

2.2 Watershed Characteristics

Flooding along streams and rivers is a normal, natural phenomenon that occurs due to excess surface runoff from precipitation or snowmelt. Human activities that increase impervious surfaces (e.g., parking lots, driveways, and rooftops) and modify floodplains can modify natural flooding patterns. Watershed topography, geology, and vegetation influence runoff rates, which in turn influence the shape, size, and slope of stream channels and floodplains. These factors then influence the presence, depth, and velocity of floodwaters, which may damage public and private property.

Erosion and deposition of sediments along alluvial channels often create large, nearly level areas of land called floodplains. Floodplains naturally help convey floodwaters to supplement the channel's capacity. Many floodplains have level, stone-free surfaces that



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3
MXD: H:\2-1-WS.mxd
SOURCE: Microsoft Virtual Earth

N

Watershed Map

Map By: JSC
Date: March 2010
Scale: 1"=5,000'

SHEET: Figure 2-1

are attractive locations for farms, roads, and communities. However, they remain prone to inundation, and flood damages occur.

The following sections of text describe the natural and current conditions of the Noroton River watershed and how these conditions relate to flooding.

2.2.1 Land Use

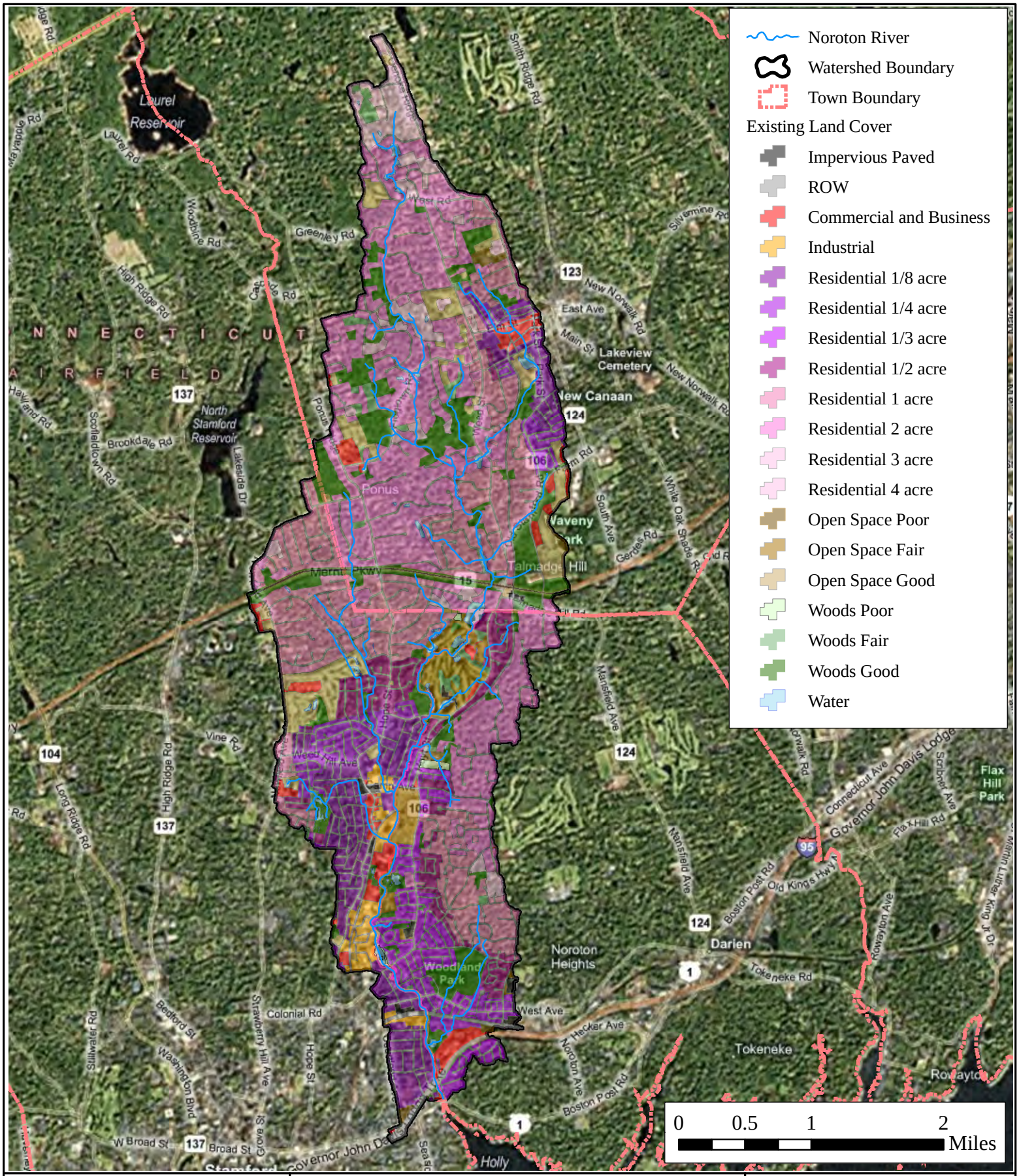
Land use strongly dictates the hydrology of a watershed. Impervious surfaces such as pavement and buildings contribute larger quantities of water more quickly to the rivers and streams. The Noroton River watershed spans the towns of Darien, Stamford, and New Canaan, each with its own zoning regulations that dictate allowed uses. The zoned land uses typically match the current use of the land and were used as a basis for evaluating existing land cover. After the zoning district was assigned to each tax map parcel, high resolution aerial photographs were used to correct for areas where current land use does not match zoning (i.e., a parcel zoned one-acre residential currently forest with no homes was assigned a land cover of woods). Parcels with different land cover were split to correctly define land use (i.e., a school parcel was split into commercial and business for buildings and parking areas and open space for athletic fields). Water features were also added because water provides no infiltration. Table 2-1 defines the land use types within the Noroton River watershed, and Figure 2-2 presents this information graphically.

Each town has designated areas for commercial and business enterprises and industrial uses, both zones associated with a high level of impervious surface. These developed zones are concentrated in Stamford between Middlesex Road and Camp Avenue, adjacent to the river. Small sections are also spread throughout the watershed and include large institutions such as schools.

Approximately 65% of the Noroton River watershed consists of residential land use. The three towns have similar zoning categories and span between high density residential (1/8 acre) and large lots (four acre). Aerial photography shows a large number of trees in these residential areas, which is good although the hydrologic effect of the impervious area from the house and parking lot does have an impact on runoff and so can contribute to flooding. The road rights-of-way (ROW) were separated from the residential lots because of their higher percentage of impervious surface, and the roads provide direct routes for stormwater to follow. These residential areas have a cumulative effect on overall watershed hydrology and can contribute to flooding.

TABLE 2-1
Land Use Cover Types
Noroton River Watershed

Cover Type and Condition	Area (acres)	Percent of Watershed (%)
Woods Good	663.3	9.4
Woods Fair	93.3	1.3
Woods Poor	12.0	0.2
Open Space Good	330.1	4.7
Open Space Fair	183.2	2.6
Open Space Poor	32.5	0.5
Residential 4 acre	290.9	4.1
Residential 2 acre	1,708.1	24.2
Residential 1 acre	1,269.0	18.0
Residential 1/2 acre	313.6	4.4
Residential 1/3 acre	264.6	3.7
Residential 1/4 acre	275.4	3.9
Residential 1/8 acre	484.1	6.9
Commercial and Business	196.3	2.8
Industrial	104.9	1.5
Newly Graded	7.1	0.1
ROW	682.8	9.7
Impervious Paved	54.4	0.8
Water	99.2	1.4
Total Area:	7,065.0	100.0



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MXD: H:\2-2-Landcover.mxd

SOURCE: Microsoft Virtual Earth

N

Existing Land Cover

Map By: JSC

Date: March 2010

Scale: 1"=5,000'

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2.2.2 Surficial Materials

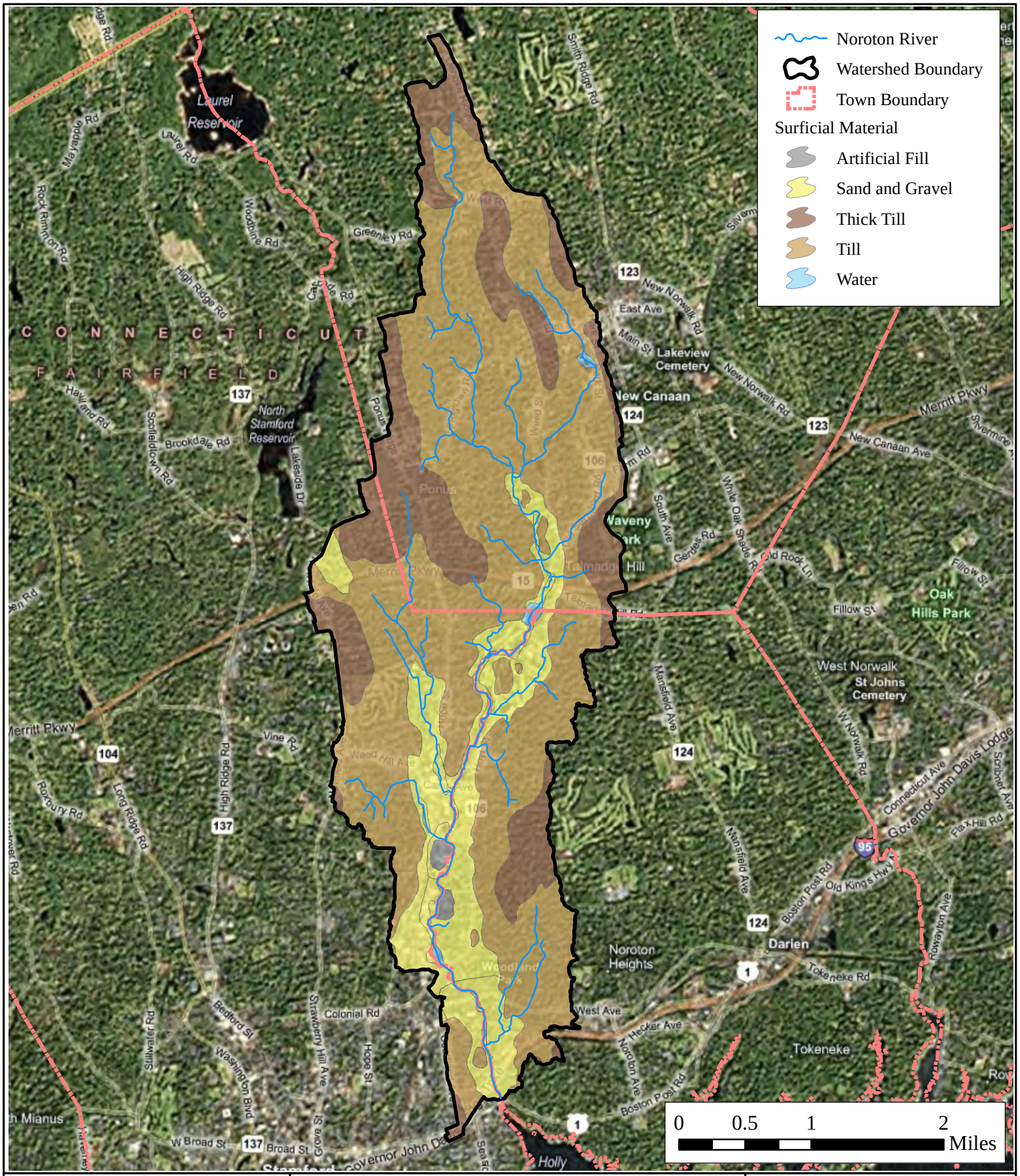
The volume and runoff rates within a watershed are attributed in part to the underlying soil characteristics of the area. Sand and gravel materials allow more rainfall to infiltrate into the ground than silts and clays, reducing the volume of runoff generated. In contrast, shallow bedrock, glacial till soils, and saturated wetlands limit infiltration, which correlates to an increase in runoff.

Figure 2-3 depicts the surficial materials of the watershed. Glacial deposits dominate with 83% of the watershed underlain by till or thick till. Another 17% is composed of alluvial sand and gravel deposits that are generally located along the Noroton River main stem. Alluvial deposits are concentrated in a thick swatch along the main stem of the river in the lower section of the watershed. These areas are not seen along many of the tributaries.

Although artificial till makes up a relatively small portion of the watershed, its presence is very significant due to its proximity to the river and type of material covered. The areas around the artificial fill, and presumably under the fill, are comprised of sand and gravel, with high infiltration capacity that serves to reduce surface runoff and potential for flooding. The two filled sections, totaling 32 acres, no longer function as natural floodplains, thereby reducing storage for floodwater adjacent to the channel and infiltration, both of which increase flooding in other locations. The filling of floodplains along the channel is evident in other locations but not captured by the coarse scale of this mapping.

2.2.3 Bedrock Geology

Geology is important to the occurrence and relative effects of natural hazards such as flooding. Thus, it is important to understand the geologic setting and variation of bedrock and surficial formations in the region. Bedrock geology is shown in Figure 2-4.



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MMI#: 1581-04-3
MXD: H:\2-3-Surficial.mxd
SOURCE: Microsoft Virtual Earth

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Surficial Material

Map By: JSC
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Scale: 1"=5,000'

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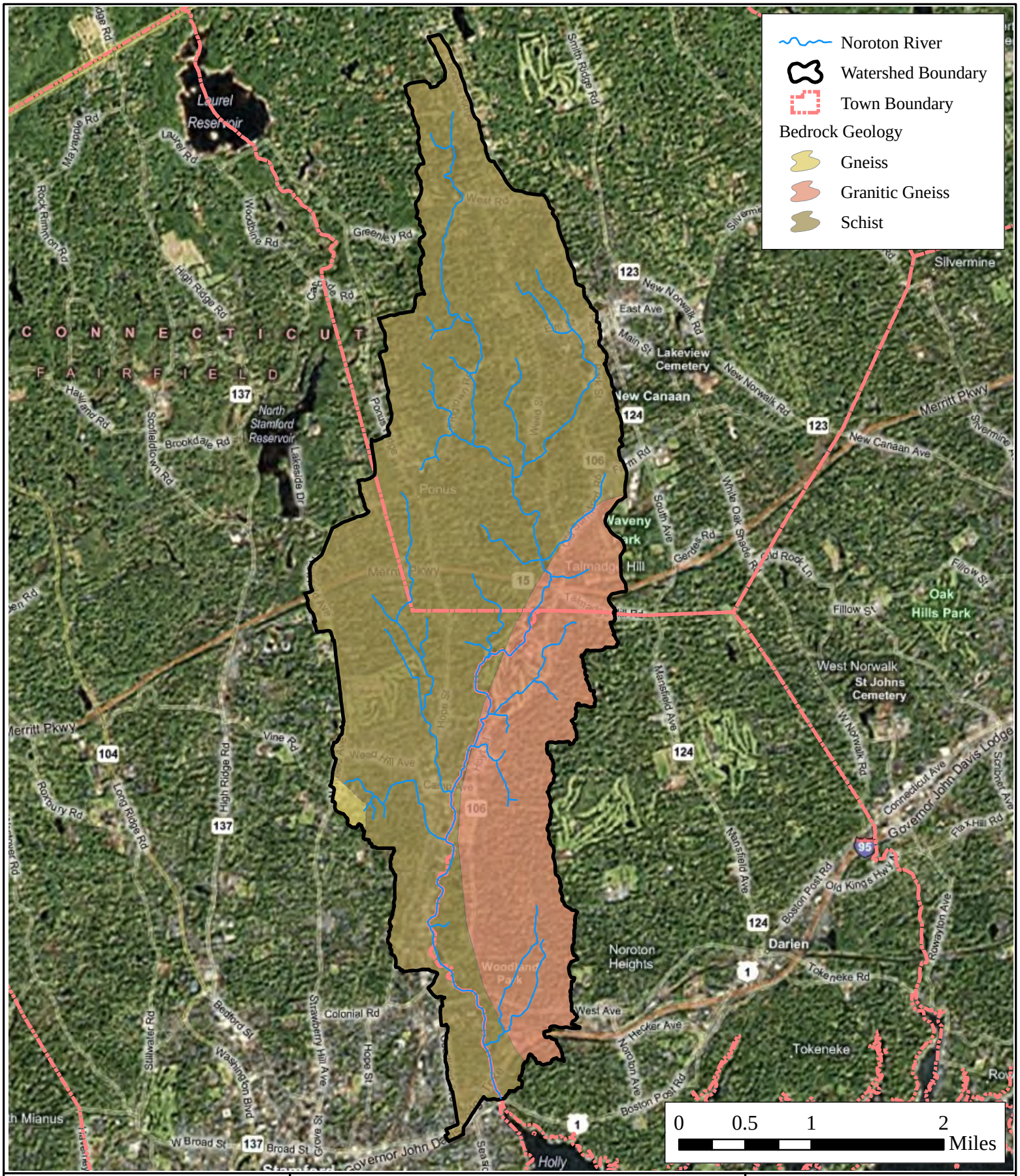

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SOURCE: Microsoft Virtual Earth

N

Bedrock Geology Map

Map By: JSC

Date: March 2010

Scale: 1"=5,000'

SHEET: Figure 2-4

The region's bedrock consists of two general lithologies: metasedimentary and metaigneous schists. All bedrock in the region is crystalline; no sedimentary rocks are present. The schists, gneisses, and granitic gneisses are organized into bands of rock along the bedrock plane and tend to strike in a northeasterly direction. The majority of the watershed is underlain by schist. The eastern flank of the watershed is underlain by a layer of granitic gneiss, and a small sliver at the western edge is underlain by gneiss. These metamorphic rocks tend to be resistant to erosion, which in turn results in low levels of sediment supplied to the channel. The overall drainage pattern in the Noroton River watershed is that the channels run north to south. The watershed is narrow relative to its overall length. The result is that floodplains tend to be narrow and discontinuous. No notable outcroppings were observed along the river corridor.

2.2.4 FEMA Floodplain

FEMA has defined regulatory floodplains for a number of selected channels for the purposes of identifying properties that are prone to flooding. The floodplain limits are published in Flood Insurance Studies (FIS) that are published by a town or county, depending on the location. The limit of flooding can be determined for any rainfall event or storm, but the "regulatory limit" (sometimes referred to as the "base flood") is considered to have a 1% chance of occurring in any given year (the so-called 100-year storm). Floodplains are defined by an elevation.

FEMA also designates a floodway along some channels. After a floodplain is delineated, the floodway is defined by encroaching on the floodplain until the predicted water surface elevation increases by one foot. Construction activities (e.g., building construction, bridge replacements, and channel realignment) in the floodway must not increase the water surface elevation by more than 0.1 foot.

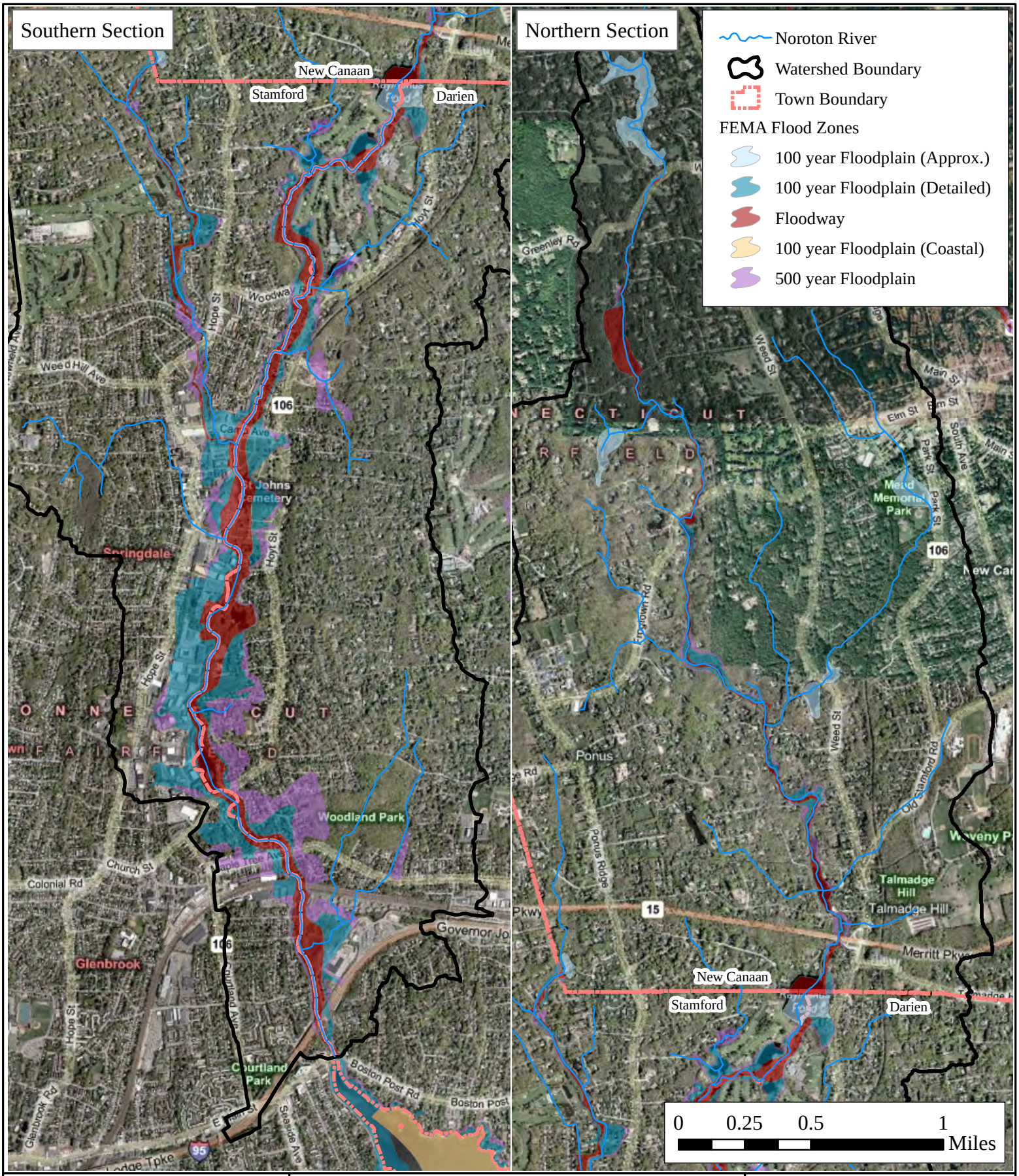
In its FIS of Darien (1993), FEMA defined a floodplain and floodway along the main stem Noroton River that extends from a few hundred feet upstream of Boston Post Road

to just shy of the town line with New Canaan in the Woodway Country Club as shown on Figure 2-5. The Noroton River defines the border between the town of Darien and the city of Stamford. The City of Stamford defines FEMA zones based on a very similar detailed study. The floodplain and floodway elevations in the City of Stamford FIS (1993) have very slight variations (on the order of 0.1 feet) from the Darien FIS although lettered cross sections and river distances match.

Although the Darien portion of the effective floodplain of the Noroton River ends a few hundred feet downstream of the corporate limit with New Canaan, an effective floodplain and floodways do exist in New Canaan as described in New Canaan's 1990 FIS. At the town boundary, a 7.5-foot water surface elevation discrepancy exists across an approximately 700-foot long section of Raymond's Pond. This 700-foot section is represented in Figure 2-5 as the approximate A zone floodplain, between the two detailed studies. The Darien FIS upstream cross section Y has an elevation of 110.1 feet NGVD (matches City of Stamford FIS, 1993). The New Canaan FIS downstream cross section A has an elevation of 117.6 feet NGVD. The New Canaan FIS states that the downstream starting water surface elevation in Raymond's Pond was "obtained from the Flood Insurance Study for the Town of Norwalk." The Noroton River flows south to Darien and Stamford, not Norwalk, indicating an error in either the FIS reporting or starting water surface elevation.

2.2.5 Threatened and Endangered Species

The Connecticut Department of Environmental Protection (DEP) maintains a Natural Diversity Database (NDDB) of locations where state and federally endangered, threatened, and/or special concern species have been identified. The presence of such species can impact the ability to obtain state and federal permits for projects that require work in this area.



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MXD: H:\2-5-fema.mxd
SOURCE: Microsoft Virtual Earth

N

FEMA Zones Map

Map By: JSC
Date: March 2010
Scale: 1"=2,500'

SHEET: Figure 2-5

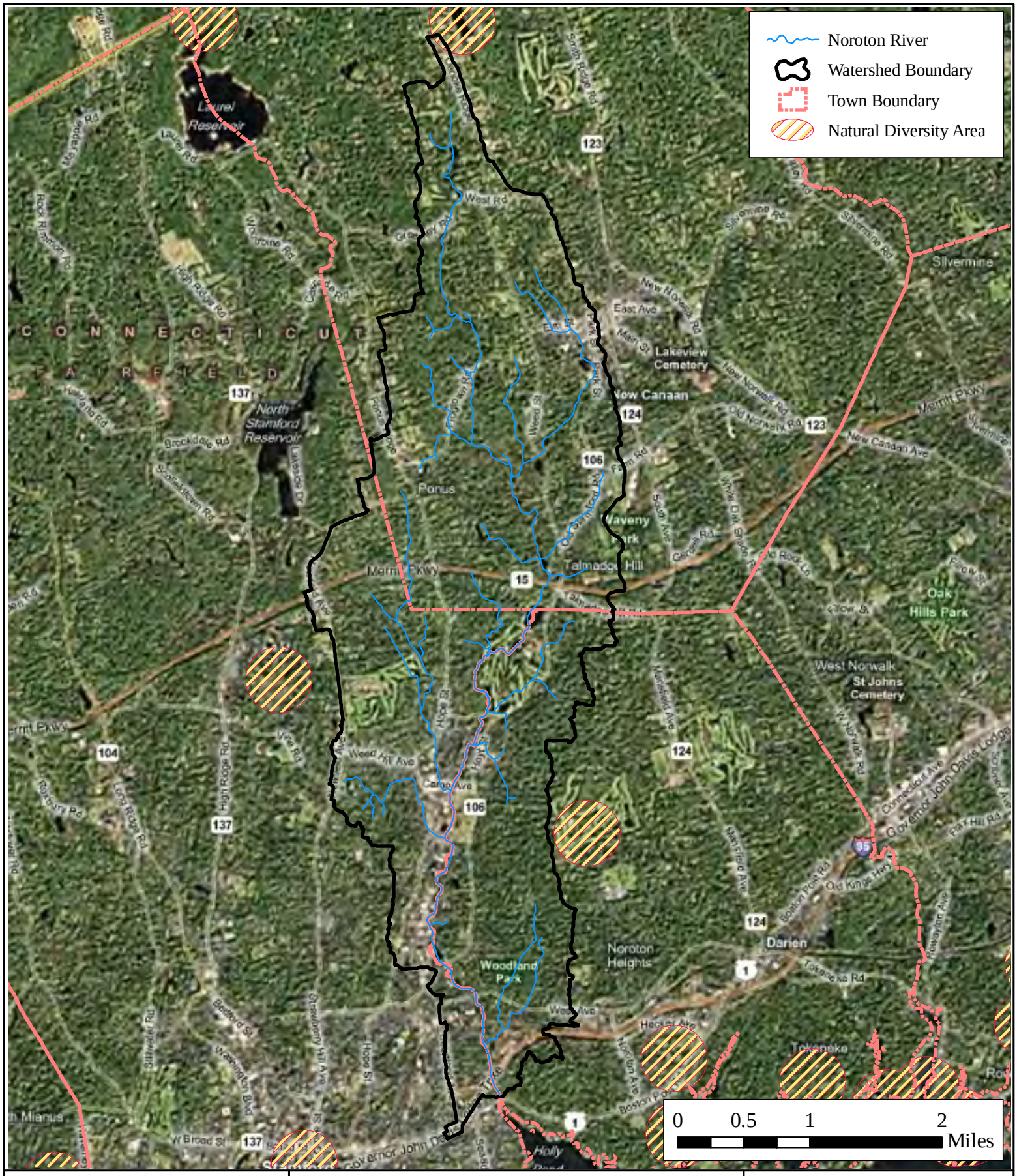
According to the December 2009 NDDB mapping, there are no areas of concern within the Noroton River watershed. Additional correspondence with state and/or federal agencies is not required at this time. Natural diversity areas in the region are shown in Figure 2-6.

2.3 Channel Evaluation

The Noroton River main stem was evaluated during a river assessment walk performed by MMI staff on December 15 and 16, 2009. The channel evaluation started downstream at Boston Post Road and continued upstream to the town boundary with New Canaan at Raymond's Pond in Woodway Country Club. During this visit, the overall condition of the river was evaluated, and observations were made with regard to bank height, condition, vegetation, and channel bed material. Bridges, culverts, and dams were evaluated for damage and compatibility with river process. During our investigation, storm drainage discharge locations, bank armoring locations, footbridges, and private dams were identified. Appendix A includes a figure depicting these features.

2.3.1 Crossing Structure Evaluation

Crossing structures greatly impact a river system. A natural channel cross section includes an active channel and a floodplain. The active channel typically carries flows up to what is called bankfull flow, which is expected to occur with a frequency of about once every two years. The floodplain is adjacent to the channel and is inundated when the active channel capacity is exceeded, during large flows during large storm events, or during a spring snowmelt. Both the floodplain and active channel are necessary to provide adequate flood capacity during large flows. Bridges and culverts are often built so that flow area is constricted at high flows.



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3
MXD: H:\2-6-NDDB.mxd
SOURCE: CT DEP, Microsoft Virtual Earth

3

Natural Diversity Database Map

Map By: JSC
Date: March 2010
Scale: 1"=5,000'

SHEET: Figure 2-6

The openings of the crossing structures often do not equal the cross sectional area of the active channel and therefore constrict flows. Crossing structure abutments typically fill the floodplain, directing overbank flow through the crossing opening. The constriction of flows increases water velocities and causes erosion and scour at structures. Often a constriction will not allow water to pass through the structure as fast as the water is reaching the structure, causing a backwater upstream. Backwater is when water cannot pass a constriction or blockage fast enough and ponds upstream. This causes the water to rise in elevation, flooding upstream areas, and a slowing in velocity that allows dropping sediment in the stream.

A total of 20 bridges were observed along the Noroton River between Holly Pond and the New Canaan town line (Table 2-2). Structure type was varied and included everything from a large overpass to small wooden footbridges. The overall condition of each crossing was evaluated, and any signs of scour or damage were noted. Structures were generally in good condition; some were noted to have minor damage such as a few loose or missing rocks. The downstream railroad crossing showed signs of bed scour with lifting of paver stones and separation of the ceiling at section joints. Interstate 95 culverts, the upstream railroad crossing, and the Camp Avenue bridge each have small cracks. Scour was also noted at Interstate 95, Woodway Road, and multiple golf course bridges. Scour is one indication of an undersized structure as it is often caused by increased velocities when water is constricted through the bridge opening.

Substrate inconsistency when comparing upstream to downstream often identifies insufficient openings. When upstream sediments are larger than downstream, a backwater condition may exist upstream that is slowing water velocities and allowing larger sediments to settle. This was observed at some structures, such as the cobbles observed upstream of Interstate 95 and gravel downstream.

Cross sectional areas generally should increase in size from upstream to downstream, corresponding to the increase in water volume from the top of the watershed to the bottom due to the addition of tributary flows. The cross sectional areas of the structures were estimated from field measurements. The structures at Woodway Road, Camp Avenue, and Interstate 95 stand out as being smaller than the surrounding ones and may be undersized. Some structures have less flow capacity than listed in Table 2-2. The skew angle was not considered, which reduces the capacity of a structure opening because the channel is not properly aligned with the opening.

Dams in addition to constricting flow and blocking overbank flows also prevent natural sediment transport through the system. They catch sediments upstream and decrease sediment load to the downstream channel. An unnatural sediment regime will contribute to destabilization of a channel, exacerbating erosion and channel migration. Dams change overall slope of a channel, changing river morphology and channel structure. Dams segment a river channel, creating blockages to natural migration of many aquatic organisms. One significant dam exists adjacent to the St. John's Cemetery, impounding water and sediments 600 feet upstream. The dam shows signs of scour around the side.

2.3.2 Channel Morphology

Channel morphology is created by the combination of the natural and unnatural effects of climate, geology, land use, and basin physiographic conditions. Along the main stem of the Noroton River, the most common channel morphology observed was an unnatural altered state that is not easily classified in traditional geomorphic systems. Many of these altered stream sections did not have common bed features of riffles or steps and pools but a smooth flat bottom more similar to plane bed morphology. There were sections exhibiting the more natural condition of plane bed, riffle pools, and step pools. A few of the upper reaches exhibited characteristics of riffle pool morphology and have been classified as such although many have alterations.

TABLE 2-2
Bridge and Culvert Assessment Summary

Location	Structure Type	Structure Length (feet)	Width (feet)	Upstream Height (feet)	Downstream Height (feet)	Cross Sectional Area (square feet)	Skew/ Degrees	Substrate Upstream	Substrate Downstream	Scour Evidence	Condition/Notes
Boston Post Road / Route 1	Concrete Divided Bridge	80	40	10.8 box	12.9 ½ circle	432	none	cobble	gravel	Original slab bottom on downstream side broken and scoured	Scour affecting downstream side
Interstate 95	Triple Concrete Box Culverts	297	15.7	7	7	329.7	yes 20	cobble/ sand/ gravel	concrete / gravel	Downstream scour pool and riprap bed	Cracks at dividers and debris accumulated upstream
Railroad Crossing (DS)	Large Rounded Sectioned Structure	99	23	25	27	1962.5	yes 30	cobble/ sand/ gravel	pavers	Some bed pavers uplifted or displaced	Separation between sections of ceiling
West Avenue / Maple Tree Road	Bridge	55	36	12.5	11	423	none	gravel	gravel	Large concrete slabs under bridge, possible previous channel paving?	Good condition, some debris accumulation
Middlesex Road/ Glenbrook Road/ Route 106	Highway Overpass Bridge, Two Openings	54	119	14.5	14.5	1402.8	yes 15	gravel/ small boulder	gravel/ small boulder	None	Good condition
Railroad Crossing (US)	Timber/ I-beam bridge	10.5	27	11.5	11.5	310.5	none	gravel/ cobble	gravel/ cobble	None	Loose rocks on abutments; some debris under bridge
Camp Avenue	Stone Masonry Bridge	46.5	24	6	5	132	none	cobble/ gravel	cobble/ gravel	None	Cracks in bridge ceiling, otherwise good condition

Location	Structure Type	Structure Length (feet)	Width (feet)	Upstream Height (feet)	Downstream Height (feet)	Cross Sectional Area (square feet)	Skew/ Degrees	Substrate Upstream	Substrate Downstream	Scour Evidence	Condition/Notes
Woodway Road	Stone Arch, Concrete Bottom	45	24	3.5	5.5	108	none	sand	gravel	Scour pool at upstream entrance	Good condition, sand and debris accumulating upstream
Golf Course #1	Cart Bridge/ Wooden Deck With Stone Ramps	7	29	4.5	4.5	130.5	none	gravel/ sand	gravel/ sand	None	Grass and sediment island accumulated upstream
Golf Course #2	Cart Bridge/ Wooden Deck With Block Ramps	7	22	4	4	88	none	gravel/ sand	gravel/ sand	Right bank scour	Good
Golf Course #3	Cart Bridge/ Wooden Deck With Block Ramps	7	21	7	7	147	none	gravel/ sand	gravel/ sand	Upstream bank scour	Rocks missing from abutments
Golf Course #4	Cart Bridge/ Wooden Deck No Ramps	7	26	2.5	2.5	65	none	gravel/ sand	gravel/ sand	Upstream bank failure/erosion	Low hanging utility lines under deck
Golf Course #5	Cart Bridge/ Wooden Deck No Ramps	7	23	4	4	92	none	gravel/ sand	gravel/ sand	Upstream bank scour	Good
Golf Course #6	Pedestrian Bridge/Wooden Deck No Ramps or I-beams	3.5	17	3.5	3.5	59.5	none	gravel/ sand	gravel/ sand	None	Good
Golf Course #7	Road Bridge, Stone Abutments	13.5	21	4.5	4.5	94.5	none	gravel/ sand	gravel/ sand	None	Sediment accumulation and grass island upstream

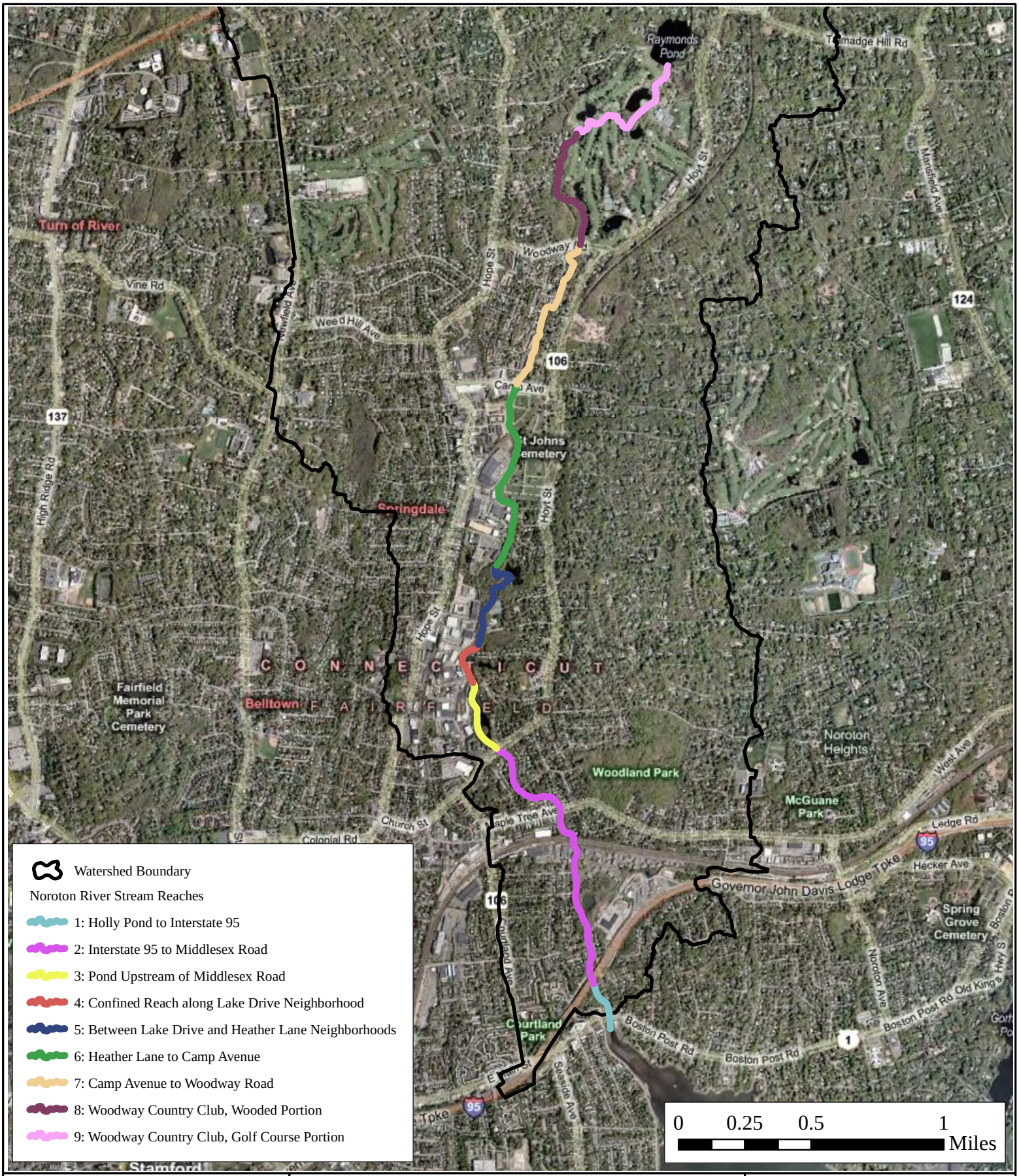
Location	Structure Type	Structure Length (feet)	Width (feet)	Upstream Height (feet)	Downstream Height (feet)	Cross Sectional Area (square feet)	Skew/ Degrees	Substrate Upstream	Substrate Downstream	Scour Evidence	Condition/Notes
Golf Course #8	Cart Bridge/ Wooden Deck No Ramps	8	21	4	4	84	none	gravel/ sand	gravel/ sand	None	Good
Golf Course #9	Cart Bridge/ Wooden Deck No Ramps	8	28	3.5	3.5	98	none	gravel/ sand	gravel/ sand	None	Left abutment rocks loose
Golf Course #10	Road Bridge, Stone Abutments		19	4.5	4.5	85.5	none	gravel/ sand	gravel/ sand	Upstream bank erosion, riprap failing	Downstream wall blocking flow and eroding
Golf Course #11	Road Bridge, Stone Arch	9	24	8.5	6	174	none	gravel/ sand	gravel/ sand	None	Good
Golf Course #12	Cart Bridge/ Wooden Deck No Ramps	6.5	48	6	6	288	none	gravel/ sand	gravel/ sand	None	Good
Golf Course #13	Road Bridge, Stone Arch	13	16	5	5	80	none	gravel/ sand	gravel/ sand	None	Good

Generally, morphology is related to channel slope, with riffle pools in areas with channel slope of one to two percent, step pools with four to eight percent slopes, and cascades with slopes in excess of eight percent. While riffle pools have the potential to store sediment, step pools tend to have limited sediment accumulation because they have the stream power to transport whatever sediment is supplied to the channel. Floodplains within these channel types tend to be small and discontinuous. Riffle pools, on the other hand, have the ability to store more sediment. Their sinuosity tends to be higher, which in turn can allow for floodplain development.

The main stem of the Noroton River channel was subdivided into reaches based on observed differences in channel morphology, floodplain and riparian characteristics, and channel encroachments. Reach breaks were identified during a river assessment walk performed by MMI staff on December 15 and 16, 2009. Reach descriptions are sequenced starting downstream with Holly Pond and walking upstream. Table 2-3 provides a summary of the nine reaches identified. In Figure 2-7, the delineated reaches are identified, and relevant road references are also displayed in the map.

TABLE 2-3
Reach Descriptions
Noroton River Channel

Reach Number	Description	Length (feet)	Geomorphic Stream Type
1	Holly Pond to Interstate 95	1,002	Tidal Pond and Riffle Pool
2	Interstate 95 to Middlesex Road	2,762	Altered Riffle Pool
3	Pond Upstream of Middlesex Road	1,518	Impounded
4	Confined Reach Along Lake Drive Neighborhood	991	Altered Plane Bed
5	Between Lake Drive and Heather Lane Neighborhoods	2,193	Riffle Pool with Natural Pond
6	Heather Lane to Camp Avenue	4,058	Altered Riffle Pool with Impoundment
7	Camp Avenue to Woodway Road	3,384	Riffle Pool
8	Woodway Country Club, Wooded Portion	2,721	Riffle Pool
9	Woodway Country Club, Golf Course Portion	3,118	Riffle Pool



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3
MXD: H:\2-7-reaches.mxd
SOURCE: Microsoft Virtual Earth

N

Mainstem Stream Reach Locations

Map By: JSC
Date: March 2010
Scale: 1"=2,500'

SHEET: Figure 2-7

Reach 1: Holly Pond to Interstate 95

The Noroton River discharges into Holly Pond, a tidally influenced extension of Long Island Sound. This pond has multiple low head dam structures and land bridges where it exits into Long Island Sound. The entire reach appears to have some degree of tidal influence. The water takes on riverine characteristics just below the Boston Post Road bridge, where it is confined by retaining walls on both banks. Upstream and downstream of the Boston Post Road bridge, the channel is encroached by a commercial building extending into the channel on one bank and a road close to the opposite bank (Photo 2-1).

Photo 2-1. Looking upstream from the Boston Post Road bridge.

The land area surrounding this reach is densely covered with residential and commercial development. Riverfront properties have buildings, yards, fences, and parking very close to the river's edge. Stormwater runoff enters the channel through multiple outfalls near both Interstate 95 and Boston Post Road. The channel is semiconfined with some floodplain access into the backyards of homes along Brookside Drive. Retaining walls and riprap are present along most of the banks in this reach. A narrow strip of trees is present along parts of the banks.

This reach takes on a riffle-pool type bedform, with some gravel point bar formation. Scour at both the Boston Post Road and Interstate 95 crossings and tidal nature of this area both influence the channel bedform. The bankfull width was measured to be 42 feet with a bankfull depth of 3.5 feet.

Construction plans from 1958 suggest historic channel alteration spanning the entire reach from the outlet of Holly Pond (then called Cove Pond) upstream to Camp Avenue (John J. Baffa, 1958). The plans show channel realignment, bank armoring, and channel lowering and concrete pavement at outlets of both Boston Post Road and Interstate 95. These plans were not fully implemented, showing nonpresent overflow culverts at Boston Post Road and concrete channel lining.

Reach 2: Interstate 95 to Middlesex Road

Photo 2-2. Channel upstream of West Avenue Bridge.

This reach is characterized by residential development along both sides of the river. Neighborhoods along the river in Darien include Brookside Drive, Avalon Darien, Holmes Avenue, Park Lane, Rose Lane, and Denhurst Place. Similarly, the Stamford side of the river is primarily residential but includes multiple low-lying apartment complexes and the Northeast Metals commercial property. Development extends close to the river although the steep banks appear to keep most buildings out of flood danger. In the narrow strips of vegetation along the banks, multiple invasive species were identified including burning bush, bittersweet vine, briars, and Japanese knotweed.

The channel is mostly confined within tall 10- to 15-foot banks, with extremely limited access to the floodplain. In the vicinity of West Avenue, a section of lower floodplain exists, upstream on the left and downstream on the right, but both have homes and apartment buildings built in it (Photo 2-2). Many of the banks have erosion, riprap, or failing riprap or walls. One large bank mass failure is occurring just downstream of the

railroad bridge, and another tall eroding bank is located upstream of the railroad, both on the Darien side of the river. Bed morphology resembles most closely a riffle-pool form although this reach has multiple long runs with deep water and muck and sand bottoms. One of the long runs has developed a significant sand bar. Some transverse bars have formed as well as very short, steep cobble riffle features. Bankfull width varies along the reach between 37 and 24 feet.

Historic alteration influences the current condition and bedform of this reach. Channel improvement plans from the 1950s show channel widening, lowering, and bank armoring extending from Interstate 95 upstream through the entire reach (Baffa, 1958). Lack of floodplain access noted during the site walk is explained in the plans by designation of many wetlands, meander bends, and areas adjacent to the channel proposed for filling. Many areas shown as fill areas on these plans are now home sites. These plans call for removal of Rose Lane and Lenox Drive bridges and multiple smaller footbridges, which were not replaced. A gravel pit operation was noted between Brookside Drive and Lenox Avenue. This area is currently a long mucky run and the location of the sand bar noted in the site walk. Historic alternation of this river explains the dysfunction of river and floodplain processes.

Road crossings in this reach generally appear to be of a large enough size to minimally influence flooding. Interstate 95 is made up of three 16-feet wide by seven-foot tall concrete box culverts. These culverts were perched on the downstream end, possibly to block tidal influence during a tidal surge. The railroad crossing is a large rounded arch structure built in three

Photo 2-3. Railroad crossing in Reach 2, looking upstream. Note paver stones along channel.

phases and in varying degrees of repair (Photo 2-3). The channel through this structure is locally very steep with dislodging paver stones lining the bed. This structure is not aligned with the river direction, with sharp turns upstream and downstream, most likely causing the observed erosion in the area. The West Avenue crossing is an I-beam bridge with concrete abutments 36 feet wide. There is some evidence of failing bed pavement under this bridge as well. The Middlesex Road (Route 106) bridge is a large overpass type structure with a concrete pier. The pier is not lined up parallel to flow and splits the water inefficiently but is large enough to pose no flood threats. Each of these road crossings, along with many additional stormwater outfalls, contributes stormwater directly to the river, many outfalls smelling strongly of gasoline or of sewage. During the stream walk, the water along this reach was turbid, obscuring the channel bottom in all but the shallowest water.

Reach 3: Pond upstream of Middlesex Road

Upstream of the Middlesex Road bridge, the river steeply rises up to the mouth of a large ponded area (Photo 2-4). This steep section of channel is comprised of 12- to 24-inch angular rock and appeared to be non-natural. Historic channel improvement plans call for construction of a rock dam at this location (Baffa, 1958). These plans also note a gravel pit operation at this location. This dam impounds an over 1,000-foot long pond that is over 300 feet at its widest location. A forested island is present near the downstream end. The Stamford side of the pond is lined with a concrete wall and has industrial buildings and parking. Many stormwater outfalls are located along this side of the pond. The Darien side of the river has a small treed buffer

Photo 2-4. Looking upstream at rock dam, impoundment, and Stamford industrial area.

and residential homes along Fresh Meadow Lane, Phillips Drive, and Lake Drive. This pond was not wadable, and depths were not noted. Debris is accumulating at the downstream end including multiple trees and trash. Sand accumulation is visible, but the extent was not determined due to water depths and the size of the pond.

Reach 4: Confined Reach Along Lake Drive Neighborhood

This short reach is significantly different from the wide ponded section downstream and the upstream reach with a wider accessible floodplain with lack of significant encroachments. The channel is confined within heavily riprapped steep banks in a narrow channel with a width of only 21 feet (Photo 2-5). Lake Drive homes are close to the river on the Darien side. In Stamford, industrial buildings, parking, and storage are very close to the river. Trash and nonused materials spill into the river along with multiple large stormwater outfalls. An island at the bend collects debris and trash in the channel. The bed material appears to be a mix of riprap and sands. This section has been so heavily altered that it no longer has a natural bedform. The remains of a small stone dam are present but are of no significant impact to the channel.

Photo 2-5. Looking upstream between Lake Drive neighborhood and Viaduct Road in Stamford.

Maps of channel improvements in this area show channel realignment, installation of dikes on both banks, and bed lowering of four feet through this area, explaining the tall banks (Baffa 1958). Vegetation is limited to sparse trees and shrubs on the banks. No floodplain access is available in this reach.

Reach 5: Between Lake Drive and Heather Lane Neighborhoods

Photo 2-6. Looking upstream where channel enters pond, some debris is accumulating in pond.

Compared to the upstream and downstream reaches, this section of river has a much more natural path. Although altered in the 1950s, the channel does not have the hard bank armoring and constrictions located in other sections of the channel. This section was straightened, widened, and lowered up to 10 feet at the upstream end of the reach. It is bordered on the Stamford side with the Univeristy of Bridgeport but maintains a moderate forested buffer. The Darien side of the river does not have major encroachments other than a tennis court in the floodplain. The river has good access to a low elevation floodplain with a natural forest cover.

This section of river travels through a large wetland and pond. Channel improvement plans from the 1950s show the improved channel path following the Riverbend Road adjacent to the pond but not joined. At some point, the river overtopped its banks and flowed into the pond, carving a new channel both into and out of the pond (Photo 2-6). The now abandoned channel will act as a flood chute during high flows but has been partially blocked by debris accumulated in the channel. Eight-inch diameter trees have grown in the abandoned channel, indicating that this realignment is not new. Signs in the area show that this area is controlled by the Darien Land Trust.

This section of channel has been able to develop a riffle-pool bed morphology. The channel has a bankfull width of 35 feet, much wider than most other channel locations. The channel bed is gravel with some small cobble. Midchannel bars have formed in the channel downstream of the pond. These are presumably remnant sediments from when

the channel carved a new path through the pond. There is an eroding outside bend at the downstream end of the reach, just upstream of the narrow confinment.

Reach 6: Heather Lane to Camp Avenue

Photo 2-7. Looking upstream at back of Lynn Court home. Note failing gabion armoring.

This section of channel is confined within tall banks, in most locations armored with riprap, gabions, or retaining walls. The channel is very straight. The lower portion of this reach is confined between neighborhoods along Heather Lane and Lynn Court. These neighborhoods are built close to the river, with some homes very low. The channel takes a tight S-turn upstream of the Lynn Court neighborhood just as it comes out of the cemetery. Erosion and failing armoring are present on the Lynn Court bend (Photo 2-7). Upstream of Lynn Court, the channel flows between the St. John's Cemetery on the Darien side and an industrial area on the Stamford side. The industrial area is paved all the way to the top of the retaining wall serving as the channel bank (Photo 2-8). The cemetery extends all the way to the channel, with a very narrow strip of vegetation mostly comprised of knotweed on the channel bank. Upstream of the railroad crossing, a large new residential complex has been built in Stamford. These very large buildings have a small lawn buffer to the river.

A riffle-pool bed pattern exists in some short locations of the channel although the alteration and straightening have left most locations with no bed features. Channel width varies between 20 and 26 feet. There are a significant number of stormwater outfalls from both sides of the river.

Channel improvements from the 1950s show extensive channel lowering of up to 10 feet near Heather Lane. Interestingly, the low homes near Lynn Court did have some backyard filling in the 1950s, but the channel was not lowered at this location. These plans show that the retaining walls on the Stamford side of the river were present at the time as well as some of the cemetery walls and the dam. Large areas of land adjacent to the channel were filled between the railroad crossing and Camp Avenue.

Photo 2-8. Looking upstream at the dam and Stamford industrial area.

A second railroad crossing and Camp Avenue bridges both influence this reach. Both crossings are relatively large but do constrict the river and floodplain. The railroad crossing is 27 feet wide and comprised of I-beams and railroad ties supported by concrete abutments. This bridge shows signs of old channel pavement and remains of old pilings in the channel bed. The Camp Avenue bridge is stone masonry with a slight arch shape. The bridge is only 24.6 feet wide. A significant dam is located along the cemetery downstream of the railroad crossing (Photo 2-8). This dam impounds a few hundred feet of channel and has accumulated large amounts of sand upstream.

Reach 7: Camp Avenue to Woodway Road

This reach flows through residential neighborhoods, including homes along Greenwood Avenue and Hoyt Street. Homes tend to be set back from the river and generally appear to be above a flood elevation. Stamford also has residential homes through this section although they tend to be closer to the river and include multiple apartment building complexes in addition to single-family homes (Photo 2-10). This section of river does

have walls and riprap along most of the banks, but these are generally on a property-to-property basis instead of a river-long application. Thick stands of bamboo line the river for long sections on both banks (Photo 2-10). Bank and floodplain vegetation includes small stands of forest but is primarily manicured back yards. A small well connected section of floodplain is present just downstream of Woodway Road. The Woodway Road bridge is actually a culvert with a stone headwall built to look like a bridge. The concrete bottom of the culvert is creating scour pools upstream and downstream and creating a backwater condition upstream.

The river sinuosity is more natural than downstream sections. A riffle-pool morphology is present with many long riffles. A plane-bed section exists in a steep locally straightened section just upstream of Camp Avenue where the channel has been constricted by Garland Drive and a commercial property building and parking.

Photo 2-9. Looking upstream at apartments in Stamford on River Place adjacent to the river.

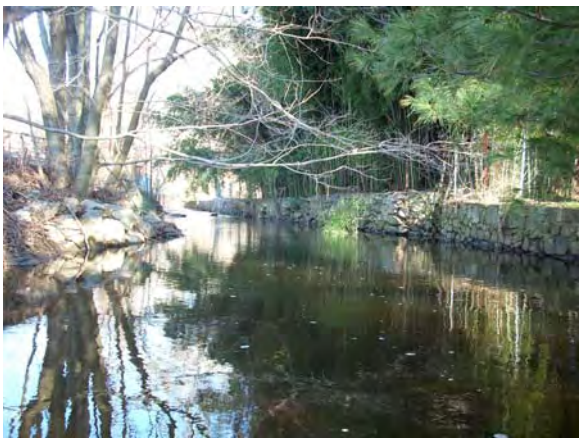


Photo 2-10. Looking upstream at walls and a thick bamboo stand along the river.

<u>Reach 8: Woodway Country Club, Wooded Portion</u>

Upstream of Woodway Road, the Noroton River flows through the Woodway Country Club property. This property has been split into two reaches to better describe the impacts of the golf course in the upper section. The downstream reach flows through a

section of woods adjacent to the golf course. It is allowed to follow a primarily natural course through the woods. In one location, a riprap berm separates the channel from one of the golf course ponds. The channel has meandered through the forest over time, with two flood chute/old channel paths present. The channel has a riffle-pool morphology and a gravel and sand bed, with a bankfull width of 18 feet. A chain link fence is located across the river in the woods and has been pushed over by flows and debris carried by the river (Photo 2-11).

Photo 2-11. Looking upstream, a chain link fence across the river in forest adjacent to Woodway Golf Course.

In the upper part of this reach, the river flows behind homes on Little John Lane in Stamford. These homes have some impact on the river and, generally, the lawns are mowed to the top of the bank. Two of the homes appear to have historically altered the water's path to divert a portion into a small channel through their backyards, creating small lawn islands. In the channel near these homes, there are two boulder and cobble step bed features that may be the remains of old dams.

The Noroton River flows through two small golf course bridges at the downstream end of this reach, just upstream of Woodway Road. The area around these bridges is mowed to the edge of the channel.

Reach 9: Woodway Country Club, Golf Course Portion

The Noroton River flows through the Woodway Country Club's golf course. The town boundary with New Canaan is in Raymond's Pond at the upper end of the golf course.

The channel flows under 13 bridges in the golf course. A few of these bridges are substantial stone road bridges, but the majority are small pedestrian and golf cart bridges that would probably be dislodged during a large flood (Photo 2-12). These bridges do have an effect on local hydraulics, and many have bank and channel scour nearby.

The channel has a riffle-pool formation, with a bankfull width of 13 feet. The bank and riparian vegetation is made up almost entirely of manicured lawn in this reach. There are small sections of trees and wetland plants. The channel has maintained a natural sinuosity, but it has been riprapped and walled at many locations.

Photo 2-12. Examples of bridges in the Woodway Golf Course.

2.4 Rainfall and Flow Monitoring

MMI staff installed equipment to monitor rainfall and discharge in the Noroton River from January 21, 2010 through May 19, 2010. A tipping bucket rain gauge was installed on the roof of the Darien town hall. The collected data was used to develop daily rainfall values. A pressure transducer was installed inside a perforated PVC pipe on the main stem Noroton River approximately 400 feet downstream of the terminus of Lenox Avenue in Stamford.

During the monitoring period, there were eight days with a total rainfall of 1.1 inches or more, and there were 16 days with a total rainfall over 0.3 inches (Figure 2-8). MMI made a total of seven stream flow measurements, one of which occurred during a rainfall event. The rating curve that was developed was a power best fit regression line.

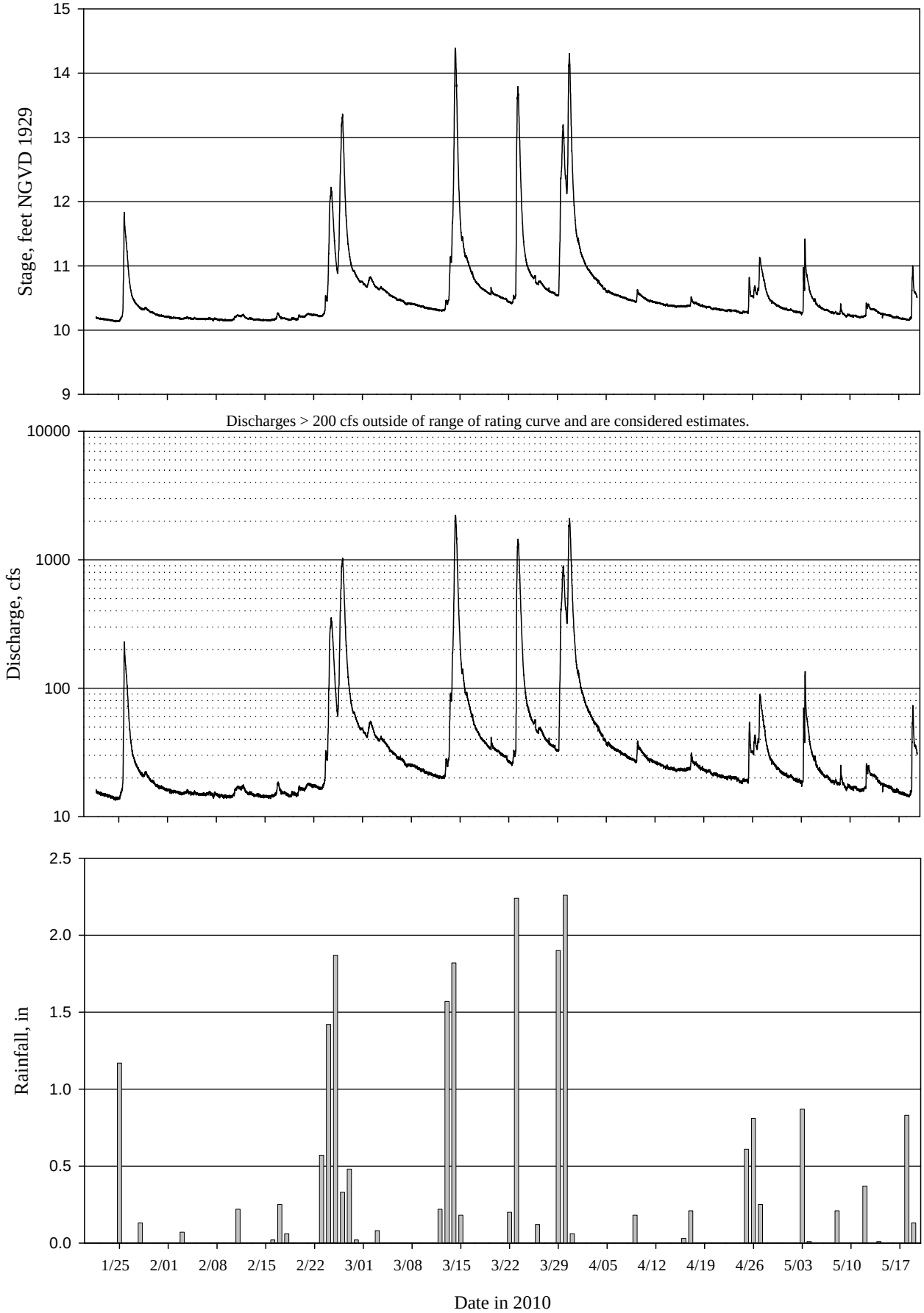
The largest flow during the current monitoring period occurred on March 14, 2010. The hydrograph suggests that the highest flow during the monitoring period was approximately 2,200 cubic feet per second (cfs) although this particular peak stream flow is well above the upper end of the rating curve and should be considered an estimate. This value of 2,200 cfs is greater than the 10-year discharge (see Table 3-2) but still well below bankfull discharge as measured at the temporary gauging station. The large storm events of March 14, 2010, March 23, 2010, and March 30, 2010 suggested that the channel peaks and recedes quickly in response to rainfall. Appendix B presents the rating curve data.

2.5 Connecticut Rainfall and Stream Flow Patterns

In evaluating and understanding drainage and flooding, it is imperative to understand rainfall trends and how these relate to changes in stream flow. While Section 3.0 of this report directly addresses the hydrologic modeling completed by MMI, this section is intended to document how actual data supports changing stream flows throughout Connecticut.

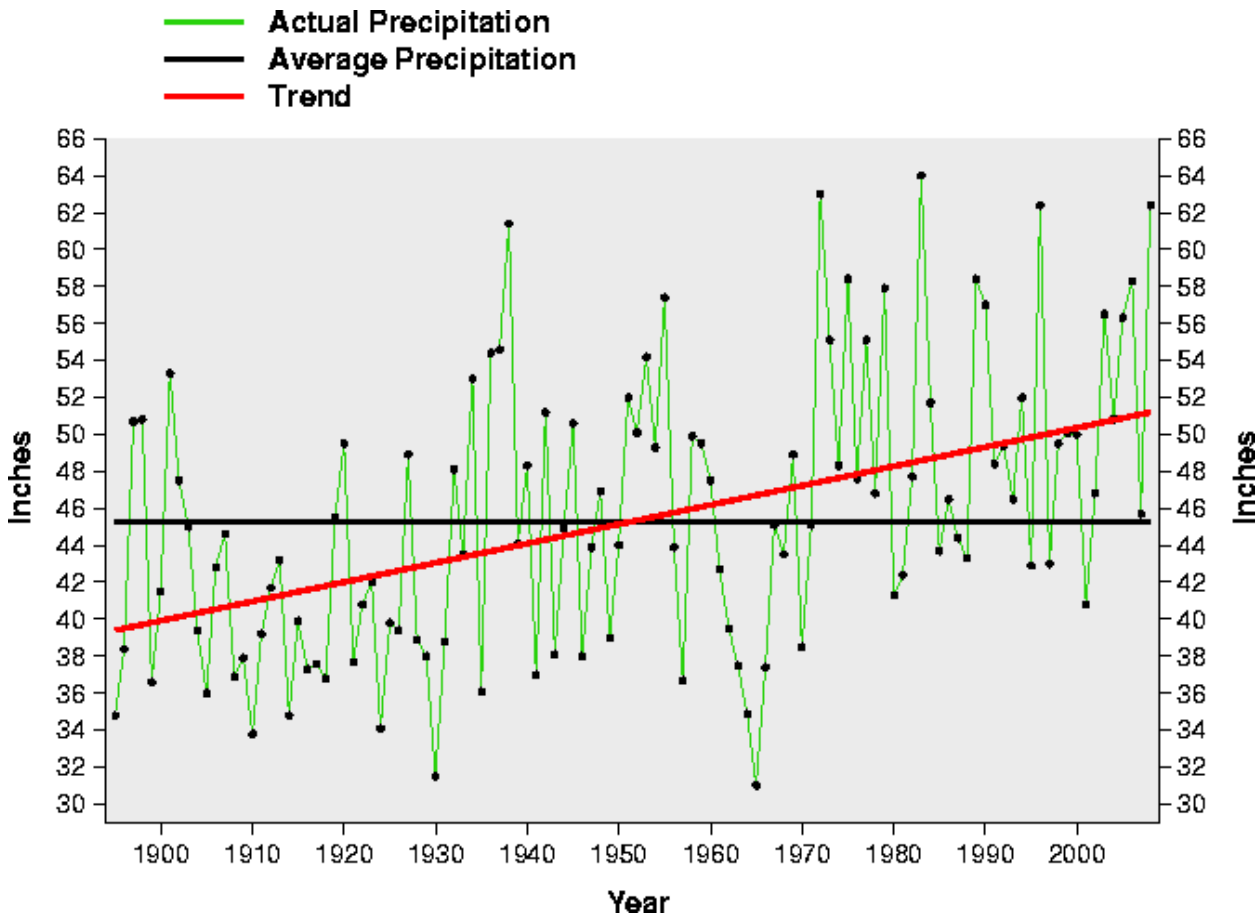
It is well documented that changes associated with land development and other activities can alter hydrologic conditions by modifying the way water moves over, through, and from the land. Watershed deforestation for lumber, firewood, charcoal, and farming was the first impact of colonial settlers. Subsequent drainage of wetlands, channelization, and gravel mining resulted in modification of watershed runoff through the 19th century. During the 20th century, watershed modifications included increased impervious cover (often the result of construction of residential subdivisions, roads, retail stores, and the like) and storm drains with direct discharges to surface water bodies.

Figure 2-8
Observed Daily Rainfall and Stream Flow from MMI Monitoring



In broad classification, typical impacts to wetlands and water resources due to the alteration of hydrologic conditions associated with land development and other activities include: (1) degraded water quality; (2) unnatural stream channel geomorphic changes; and (3) increased frequency and severity of flooding.

In New England, the effects of urbanization are exacerbated by changes in rainfall patterns that have been observed. Connecticut's annual mean precipitation has consistently increased through the last century, with the increase generally measuring 0.96 inches per decade. This trend is depicted graphically in Figure 2-9.



Source: NOAA, National Climatalogical Data Center

FIGURE 2-9 Precipitation Trends in Connecticut 1895-2008

Despite the controversy surrounding the causes of climate change, scientists generally agree that the earth is undergoing a warming trend. Scientific models suggest that the rate of evaporation will increase as the climate warms, which will increase global precipitation. Precipitation is projected to show little change in spring, increase by 10% in summer and fall, and increase by 30% in winter. The amount of precipitation on extremely wet or snowy days in winter is likely to also increase. Since the precipitation increases are not projected to be linear over the course of the year, it is expected that when storm events occur larger rainfall amounts will be recorded and at higher intensities than in the past.

This combination of increased rainfall intensity and increased runoff rates will invariably result in increases in stream flows. This trend is already evident when evaluating stream flow data in Connecticut. Unfortunately, no long-term flow monitoring has occurred on the Noroton River. However, the United States Geological Survey (USGS) has operated a gauge (#01205500) on the nearby Housatonic River for nearly 70 years. Figure 2-10 depicts the mean annual flow in cubic feet per second for water years 1929 to 2006, the most recent year for which data are available. While the drainage area at this gauge is substantially larger than that of the Noroton River (1,544 mi^2 vs 11.0 mi^2), the data from this gauge indicate that annual stream flow has increased on this river by approximately 6.7 cfs/year. It is important to understand that the increases in annual stream flows equate to higher water elevations in the channel at the start of a storm and, hence, less storage area available for flood flows.

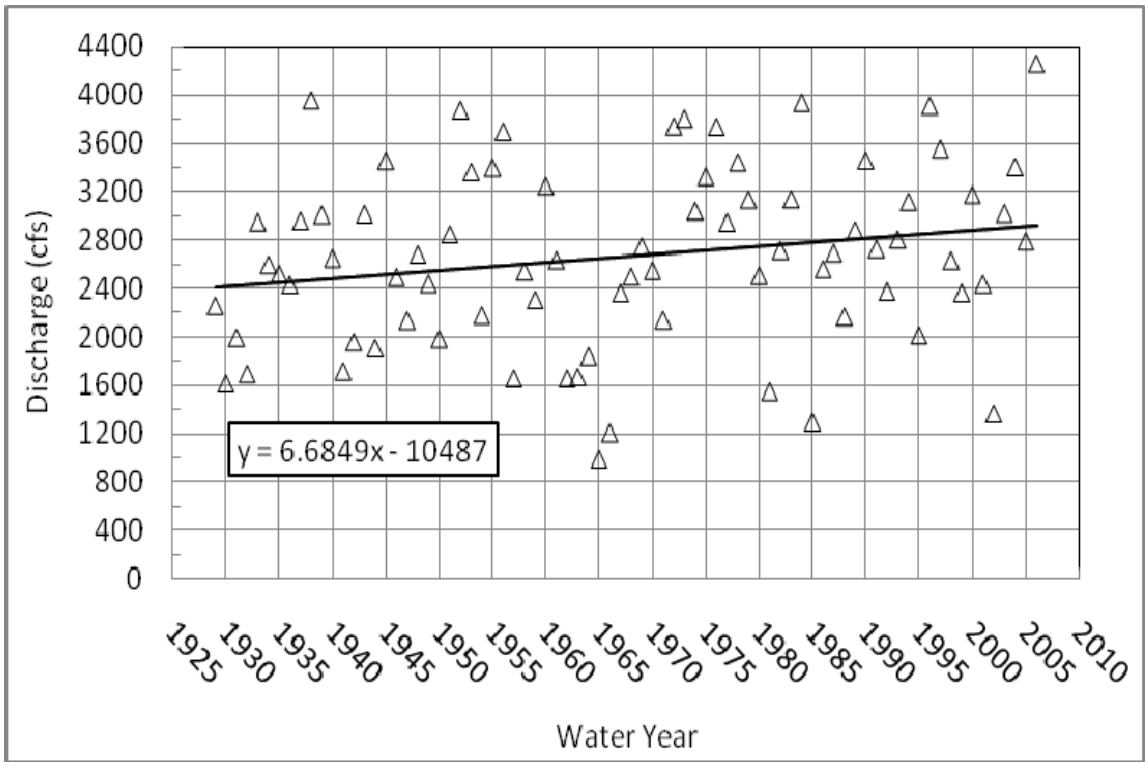


FIGURE 2-10 Annual Mean Stream Flow - Housatonic River at Stevenson, Connecticut

While the precipitation and flow data cannot prove that runoff on the Noroton River is increasing, these data are suggestive of a trend toward increased rainfall and runoff in Connecticut.

2.6 Recent Flood Events

A series of significant rainstorms in 2006 and 2007 has led to damaging floods in southwest Connecticut, including Darien. The 2007 storms that led to significant flooding include:

- March 2, 2007, when 3.9 inches of rain were recorded at a rain gauge in Darien that National Weather Service staff occasionally report. http://www.erh.noaa.gov/okx/readtext.php?file=pns/03022007.txt

- April 16, 2007, which was a Nor'easter with a storm total of 5.9 inches at the above-mentioned gauge in Darien. (http://www.erh.noaa.gov/okx/readtext.php?file=pns/04162007.txt) Numerous homes were flooded throughout Darien. Fairfield County was declared a disaster area following this flood event to allow communities the opportunity to recoup funding from FEMA for the repair work.

- October 11, 2007, which was a flash flood that led to Governor Rell requesting disaster relief funds from the Small Business Administration for victims in Fairfield County who suffered damages from the flooding.

A heavy rainstorm on April 22-23, 2006 had a storm total of 5.1 inches at the National Weather Service Darien gauge. All of these storms led to flooding on the Noroton River that caused damage to several homes as well as infrastructure such as roads and storm sewers.

3.0 EXISTING CONDITIONS HYDROLOGY

In evaluating the extent of flooding, the volume of water generated during a storm event is an important element. The height of water during flood events is directly related to the amount of rainfall that is converted to runoff. As previously discussed, flow rates in a river channel are a function of the watershed size, land use characteristics, soil characteristics, and vegetation as well as rainfall patterns. Hydrology is the science of using that information to determine stream flow rates. This stream flow data can then be used in conjunction with information on the river channel characteristics to predict the depth of water flow during various flood events.

There are a variety of methods for estimating flood flows in a watershed, each with varying degrees of accuracy. The most accurate method is direct measurement. However, direct measurement of rainfall and stream flows must be performed over very long periods of time to be statistically meaningful.

In some instances, the USGS maintains stream flow gauges that can be used to predict flows in nearby similar watersheds. Regression equations are developed by the USGS using stream flows from gauge data and cross referencing that data with other factors such as elevation, slope, and size of the watershed along with other factors such as the percentage of urbanization and watershed area served by storm drainage. The result is an equation that can be used to estimate stream flows for any watercourse in Connecticut. Since the regression is developed using field data collected from within Connecticut, the resulting equation is considered to be a moderately accurate predictor of flows. That being said, other methods such as development of hydrologic models using computer programs and real time stream flow measurement can yield more accurate results.

It is important to note when using stream flow measurements and regression equations for measuring stream flow that data from past storm events is being used. Therefore,

factors such as changing rainfall patterns and watershed development are not accurately reflected in the resulting flows.

3.1 Flood Flow Estimates From Available Sources

3.1.1 FEMA FIS Flows

The effective peak discharges as published by FEMA in the September 1993 FIS for the Town of Darien were examined. This study provides discharge values in cubic feet per second (cfs) at two locations within the Noroton River watershed. As described in the study, the peak flow rates were originally estimated based on the Regional Frequency Method or regression equation analysis, which were published in 1977. Subsequently, the peak flow rates were increased based on the results of a hydrologic report prepared by Leonard Jackson Associates during the 1993 restudy of the river. Table 3-2 in Section 3.1.3 presents the peak flow rates used in the FIS.

Given the changes in stream flow rates that have been observed in Connecticut in recent years, we would expect the flow rates in the FIS to be lower than actual stream flows, which would underestimate the extents of flooding under various storm events. The effect of post-1977 residential and commercial development within Connecticut would also not be reflected in these flows.

3.1.2 Comparison to Nearby Gauge Data

USGS published gauge data from four nearby watercourses was evaluated as part of our work. A gauge analysis of available flow data was performed using the USGS computer program entitled PKFQWin, Version 5.2.0. The four gauges analyzed are the Rippowam River at Stamford, Connecticut, the Five Mile River near Norwalk, Connecticut, Keeler's Brook at Norwalk, Connecticut, and the Five Mile River near New Canaan, Connecticut. The period of record for each of these gauges is relatively short, with the longest period

of record being 34 years for the Keeler's Brook gauge. Table 3-1 below summarizes relevant data regarding each gauge.

TABLE 3-1
USGS Gauge Information

Gauge Description	USGS ID #	Drainage Area ($mile^2$)	Period of Record		
			Begin Date	End Date	Yrs of Data
Rippowam River at Stamford, CT	01209901	34.0	1978-01-26	2007-04-16	11
Five Mile River near Norwalk, CT	01209970	8.96	1955-10-16	1984-05-30	24
Keeler's Brook at Norwalk, CT	01209775	2.33	1951-03-30	1984-07-07	34
Five Mile River near New Canaan, CT	01209761	1.00	1998-06-12	2007-04-27	10

Based on the information provided in the table above, the Rippowam River (USGS #01209901) and Five Mile River near New Canaan (USGS #01209761) gauges both have a more recent period of record although the number of data points is relatively limited. The remaining two gauges, the Five Mile River near Norwalk (USGS #01209770) and Keeler's Brook (USGS #01209775), have older periods of record, with more than twice as many data points. Ideally, the data set would have both a recent period of record and numerous data points.

The records set at both the Rippowam River gauge (USGS #01209901) and the Five Mile River near New Canaan gauge (USGS #01209761) contain data points that were apparently under the influence of upstream dams that regulate flow. For analysis purposes, the effect of the dams was removed when entering the flow values in the PKFQWin computer program prior to analysis.

The limited number of sample points for each gauge indicates that the validity of the statistical analysis is limited; however, given the vagaries of hydrologic analysis, cross referencing of data is always considered good practice. Peak flow estimates obtained in the gauge analysis are summarized in Table 3-2 of Section 3.1.3 below.

3.1.3 Summary of Flow Data Collected

*-

Table 3-2 presents a summary of the flows determined by the methods described above. When comparing data that have different contributing areas, a useful technique in hydrology is to normalize flow by its contributing drainage area. When dividing flow by drainage area, the resulting unit is cubic feet per second per square mile (csm). This analysis suggests what runoff a square mile of land is capable of generating, and it allows for a comparison of flows. This data will also be utilized for comparing peak flow rates generated through the computer modeling effort later in this section of the report.

TABLE 3-2
Comparison of Peak Flow (cfs) and
Unit Peak Flow (csm) for the Noroton River

Peak Flow Estimates						
Analysis/ Point of Interest	**Drainage Area (mile^2)**	**2-Year Flow (cfs)**	**10-Year Flow (cfs)**	**50-Year Flow (cfs)**	**100-Year Flow (cfs)**	**500-Year Flow (cfs)**
FEMA FIS Noroton River						
At Darien – New Canaan Corporate Limit	5.6	NA	1,400	2,975	4,150	7,800
At Conrail	11.9	NA	1,900	3,900	5,300	9,700
PKFQWin (USGS Gauge Peak Flow Analysis)						
Five Mile River (USGS #01209761)[1,2]	1.00	36	57	77	86	110
Keeler's Brook (USGS #01209775)[1]	2.33	219	597	1,167	1,496	2,524
Five Mile River (USGS #01209770)[1]	8.96	566	1,100	1,689	1,974	2,731
Rippowam River (USGS #01209901)[1,3]	34.0	1,457	1,966	3,455	4,265	6,664
Unit Peak Flow Estimates						
	Drainage Area (mile^2)	**2-Year Unit Flow (csm)**	**10-Year Unit Flow (csm)**	**50-Year Unit Flow (csm)**	**100-Year Unit Flow (csm)**	**500-Year Unit Flow (csm)**
FEMA FIS Noroton River						
At Darien – New Canaan Corporate Limit	5.6	NA	250	531	741	1,393
At Conrail	11.9	NA	160	328	445	815
PKFQWin (USGS Gauge Peak Flow Analysis)						
Five Mile River (USGS #01209761)	1.00	36	57	77	86	110
Keeler's Brook (USGS #01209775)	2.33	94	256	501	642	1,083
Five Mile River (USGS #01209770)	8.96	63	123	189	220	305
Rippowam River (USGS #01209901)	34.0	25	58	102	125	196

1. Values derived from entering peak flow values into PKFQWin. Reported values are the Bulletin 17B estimate. Regulated peaks were included in the analysis.
2. Annual peaks were recorded during Water Years 1998 through 2005.
3. Annual peaks were recorded during Water Years 1978 to 1982 and 2002 to 2005.

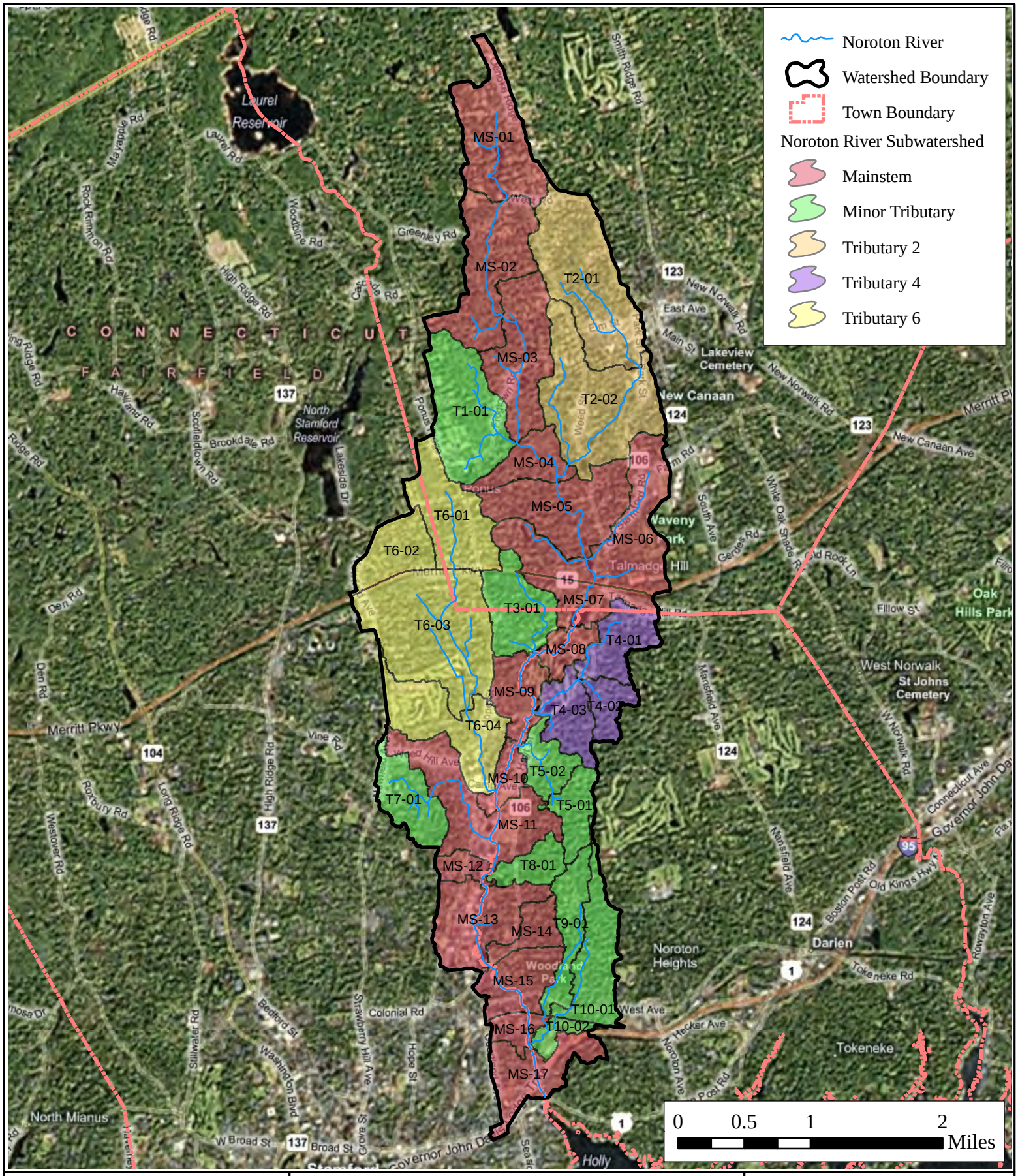
3.2 Existing Conditions Hydrology Model Development

As part of this study, the computer modeling program known as the Hydrologic Engineering Center - Hydrologic Modeling System HEC-HMS (Version 3.4) was used to predict the peak flow rates for the various storm events. Created by the U.S. Army Corps of Engineers (ACOE), the HEC-HMS program forecasts the rate of surface water runoff and river flow rates based upon several factors. The model input data includes information about the contributing watershed area, the runoff curve number (CN), the lag time of the watershed, the available storage volume analyzed with the watershed, the channel routing, and rainfall data for the area. Each of these elements is described in the ensuing text.

3.2.1 Subwatershed Delineations

Mapping within the Noroton River watershed was obtained from the Town of Darien. The data provided was developed by James W. Sewall Company of Old Town, Maine under contract to the town. The information provided included topography, roadways, and buildings. Since the Noroton River forms the western boundary between the town of Darien and the town of Stamford, additional mapping available from the Town of Stamford was also used as a supplement during watershed delineation. In addition, available mapping in the town of New Canaan was also used to supplement in areas where the Noroton River extended to the north beyond the Darien corporate limits.

The overall Noroton River watershed, including its numerous tributaries, was divided into 35 subwatersheds. Figure 3-1 presents the delineated subwatershed boundaries. Table 3-3 provides a general geographic description of the outlet point or point of analysis of each subwatershed.



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3

MXD: H:\3-1-subbasins.mxd

SOURCE: Microsoft Virtual Earth

N

Subwatershed Map

Map By: JSC

Date: March 2010

Scale: 1"=5,000'

SHEET: Figure 3-1

TABLE 3-3
Noroton River Subwatershed Descriptions

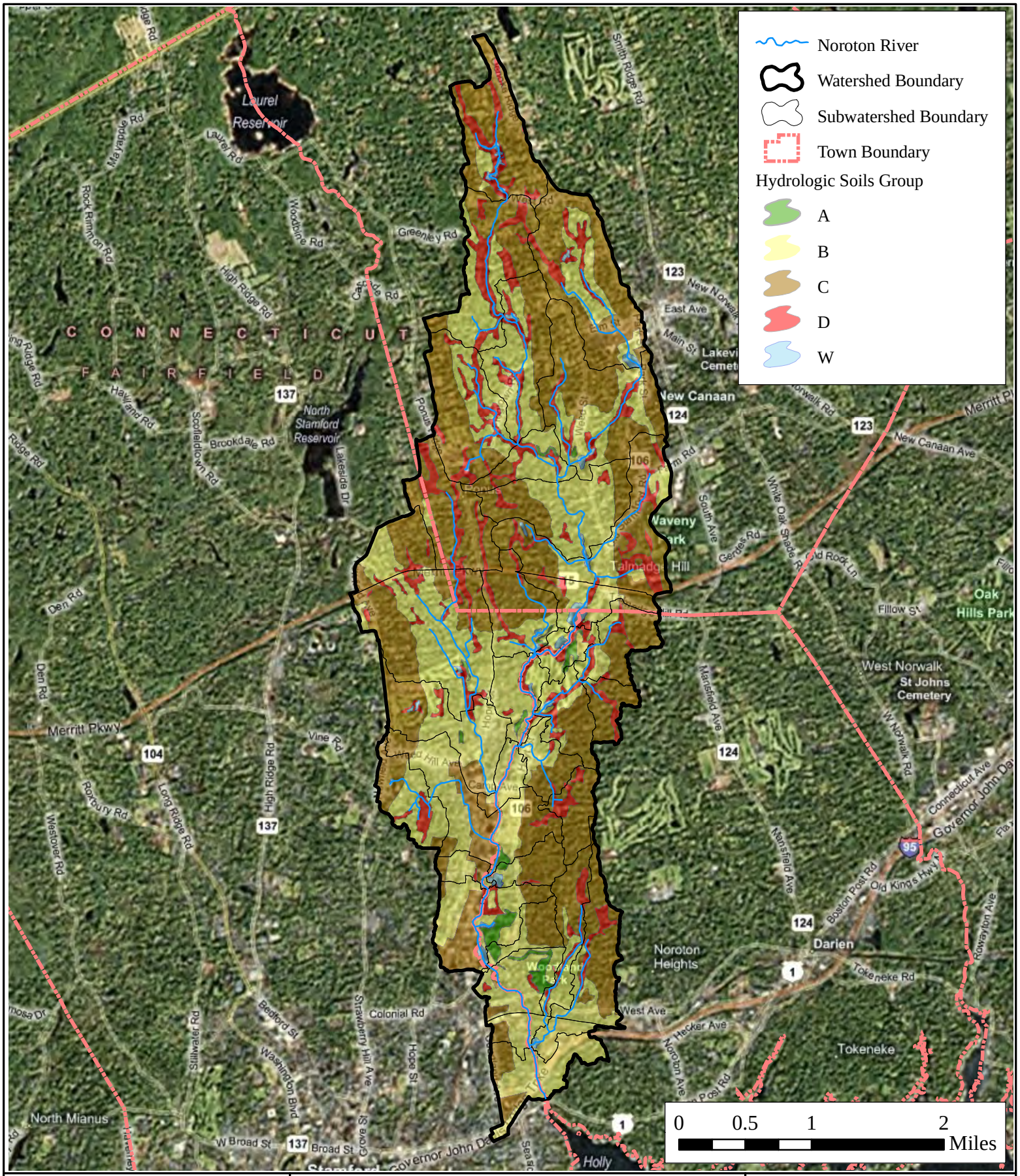
Subwatershed	Town	Downstream Analysis Point
Main Stem – Noroton River		
MS-01	New Canaan	West Road and Greenley Road intersection
MS-02	New Canaan	South of Wahackme Road
MS-03	New Canaan	Confluence with Tributary #1, north of Welles Lane
MS-04	New Canaan	Confluence with Tributary #2, between Spring Water Lane and Knapp Lane
MS-05	New Canaan	Pond between Spring Water Lane and Bickford Lane
MS-06	New Canaan	Main stem at Merritt Parkway (CT Route 15)
MS-07	Darien	Raymond's Pond outlet
MS-08	Darien	Confluence with Tributary #3, Woodway Country Club
MS-09	Darien	Confluence with Tributary #5, near Greenwood Avenue
MS-10	Darien	Upstream railroad crossing near St. John's Cemetery
MS-11	Darien	Main stem inlet to bifurcation area
MS-12	Darien	Main stem just downstream of bifurcation area
MS-13	Darien	Inline pond outlet just upstream of Middlesex Road
MS-14	Darien	Main stem at Middlesex Road (CT Route 106) crossing
MS-15	Darien	Main stem at downstream railroad crossing
MS-16	Darien	Confluence with Tributary #10, between downstream railroad and I-95
MS-17	Darien	Main stem at Boston Post Road (US Route 1)
Tributaries – Noroton River		
T1-01	New Canaan	Confluence with main stem, north of Welles Lane
T2-01	New Canaan	Mead Memorial Park
T2-02	New Canaan	Confluence with main stem, south of Indian Waters Drive
T3-01	Darien	Confluence with main stem in Woodway Country Club
T4-01	Darien	Tributary #4 headwaters north to Woodway Country Club
T4-02	Darien	Tributary #4 headwaters south to Woodway Country Club
T4-03	Darien	Confluence with main stem, near Woodway Road
T5-01	Darien	Tributary #5 headwaters to Camp Avenue
T5-02	Darien	Confluence with main stem, near Greenwood Avenue
T6-01	New Canaan	Tributary #6 headwaters east to Merritt Parkway/CT Route 15
T6-02	Stamford	Tributary #6 headwaters west to Merritt Parkway/CT Route 15
T6-03	Stamford	Tributary #6 at confluence upstream of Bouton Street West
T6-04	Stamford	Confluence with main stem, just downstream of Camp Avenue
T7-01	Stamford	Tributary #7 to large wetland near Sleepy Hollow Lane
T8-01	Darien	Tributary #8 to bifurcation area
T9-01	Darien	Tributary #9 to downstream railroad crossing
T10-01	Darien	Tributary #10 to downstream railroad crossing
T10-02	Darien	Confluence with main stem, between downstream railroad and I-95

3.2.2 Runoff Curve Numbers

The runoff CN system was developed by the Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service [SCS]). CNs range from 30 to 98 based on a combination of underlying soil type and current land use.

Cover type and hydrologic condition in each subwatershed were determined from GIS zoning information provided by the Town of Darien, Town of Stamford, and Town of New Canaan, supplemented by 2008 aerial photography. Using the cover type and hydrologic conditions listed in Table 2-2a of the TR-55 user's manual, parcel data was classified as open space, impervious (paved), right-of-way (urban or rural), urban (commercial or industrial), residential separated by lot size, and wooded (USDA, 1986). General land use categories were presented in Section 2.0 of this report.

Soil types in the watershed were determined from the Connecticut Department of Environmental Protection GIS database of the NRCS soil survey for Fairfield County, Connecticut, which includes Hydrologic Soil Group (HSG) classifications of all soils. The NRCS divides soils into four HSGs: A, B, C, or D, depending on their infiltration capacity and ability to absorb water. Hydrologic group A soils have high infiltration capacity and consist of well drained soils. Group D soils have the lowest infiltration capacity and, hence, generate the highest runoff rates. Sandy soils would generally be considered HSG A or B because of their high potential infiltration capacity. Table 3-4 is a summary of watershed area covered by each soil type. Figure 3-2 depicts the soil group classifications for this watershed.



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3

MXD: H:\3-2-hydrosoils.mxd

SOURCE: Microsoft Virtual Earth

N

Hyrologic Soils Map

Map By: JSC

Date: March 2010

Scale: 1"=5,000'

SHEET: Figure 3-2

TABLE 3-4
Land Area of Each Hydrologic Soil Group

Hydrologic Soil Group	Acres	Percent of Total
A	93.3	1.3%
B	2,742.9	38.8%
C	3,261.8	46.2%
D	887.6	12.6%
Water	79.3	1.1%
Total	7,065	100%

Based on the HSG types and land cover type, weighted CNs were developed for each subwatershed. Areas of imperviousness such as parking lots and buildings were assigned a CN of 98. The CNs used in the model were based on CNs for Connecticut developed by MMI to reflect conditions in Connecticut rather than the Midwestern conditions that were used to develop the NRCS's published CNs. These numbers have been accepted for use by the NRCS. A memo documenting these numbers and a letter from the NRCS authorizing their use are presented in Appendix C. CN calculations for each subwatershed in the Noroton River watershed are presented in Appendix D. A summary of the CNs used in the HEC-HMS model is presented in Table 3-5.

TABLE 3-5
CN Values for Existing Conditions HEC-HMS Model

Subwatershed	Area (mi^2)	SCS Composite CN Value
Main Stem – Noroton River		
MS-01	0.482	75
MS-02	0.521	70
MS-03	0.442	69
MS-04	0.190	66
MS-05	0.483	68
MS-06	0.621	75
MS-07	0.197	74
MS-08	0.116	72
MS-09	0.207	69
MS-10	0.107	74
MS-11	0.527	77
MS-12	0.079	80
MS-13	0.390	80
MS-14	0.130	75
MS-15	0.241	69
MS-16	0.091	79
MS-17	0.298	80
Tributaries – Noroton River		
T1-01	0.502	70
T2-01	0.685	76
T2-02	0.691	72
T3-01	0.305	73
T4-01	0.232	74
T4-02	0.129	76
T4-03	0.213	75
T5-01	0.165	76
T5-02	0.153	73
T6-01	0.385	76
T6-02	0.222	72
T6-03	0.797	70
T6-04	0.417	74
T7-01	0.253	75
T8-01	0.135	70
T9-01	0.228	72
T10-01	0.333	79
T10-02	0.073	80

3.2.3 Time of Concentration

Time of concentration is defined as the time it takes a drop of water to travel from the most hydrologically distant point in the watershed (or subwatershed) to the watershed (or subwatershed) outlet. This value generally defines how quickly after the start of a rainfall event that peak flows will be observed in the stream channel or outlet point. For each subwatershed, sheet flow, shallow concentrated flow, and channel flow values were determined based on the available topography and mapping data. Calculations of the time of concentration for each subwatershed are presented in Appendix E. The time of concentration units are in hours.

The HEC-HMS model requires input as lag time rather than time of concentration. Although there are varying definitions of lag time, it is typically taken as the length of time from the start of runoff to the peak of flow through the watershed. NRCS has established a relationship between lag time and the time of concentration as follows:

$$T_l = 0.6t_c$$

Where: T_l = lag time

T_c = time of concentration

The coefficient of 0.6 in the equation accounts for the fact that on average the time to peak flow in the watershed is 60% of the time it takes water from the outer limits of the watershed to reach the outlet. Table 3-6 presents the lag time for each subwatershed that was used as input data to the HMS model.

TABLE 3-6
Lag Time Values Used in the Existing Conditions HEC-HMS Model

Subwatershed	SCS Lag Time (min)
Main Stem – Noroton River	
MS-01	40.2
MS-02	37.6
MS-03	37.2
MS-04	26.5
MS-05	31.1
MS-06	22.0
MS-07	19.1
MS-08	35.3
MS-09	37.5
MS-10	18.3
MS-11	42.2
MS-12	19.3
MS-13	33.1
MS-14	23.2
MS-15	30.4
MS-16	30.1
MS-17	25.6
Tributaries – Noroton River	
T1-01	31.3
T2-01	34.5
T2-02	34.1
T3-01	25.2
T4-01	32.1
T4-02	32.2
T4-03	38.0
T5-01	32.8
T5-02	18.9
T6-01	45.5
T6-02	22.0
T6-03	32.7
T6-04	29.7
T7-01	21.4
T8-01	25.2
T9-01	39.3
T10-01	38.1
T10-02	17.5

3.2.4 Surface Water Storage and Reservoir Routing

There are numerous surface water bodies and existing storage areas within the Noroton River watershed. In an effort to focus on the study reach within the town of Darien, four large water bodies (Table 3-7) were incorporated into the existing condition hydrologic model as reservoir storage. While there are a number of other relatively small storage areas located throughout the Noroton River watershed, only those having significant potential storage were considered. A brief description of each storage area follows.

TABLE 3-7
Existing Reservoir Routing in the Noroton River Watershed

Surface Water Body	General Location	Surface Elevation (NAVD)	Surface Area (acres)
Raymond's Pond	Northwestern corner of Darien	103.3	12.0
Upstream Railroad Crossing	Near St. John's Cemetery	66.0	4.2
Bifurcation Area	Southwest of the Heather Lane neighborhood	39.0	2.6
Inline Pond at Middlesex Rd	150 linear feet upstream of Middlesex Road	30.0	5.8

Raymond's Pond

Raymond's Pond is located in the northwestern corner of the town of Darien, extending beyond the boundary into New Canaan and Stamford. The normal water surface elevation is approximately of 103.3 feet NAVD. The pond has a surface area of approximately 12 acres and is located on the Noroton River. The majority of the watershed contributing to Raymond's Pond lies within New Canaan. The watershed area at the outlet of Raymond's Pond is approximately 4.8 square miles.

Upstream Railroad Crossing

The upstream railroad crossing was included as a storage area within the hydrologic model based on the results of the Hydrologic Engineering Center – River Analysis System (HEC-RAS) hydraulic model. The results of the hydraulic model show that a significant backwater occurs upstream of the undersized bridge opening. Therefore, a storage area extending upstream was incorporated into the model in an effort to account for the attenuation of peak flows behind the crossing. Because there is no formal impoundment, the stage upstream of the bridge opening must overtop the channel banks before gaining any significant amounts of surface area and storage. Although the channel invert upstream of the bridge is approximately elevation 57.0, relatively large amounts of storage do not begin to accumulate until elevation 66.0, where the storage begins to spread onto the adjacent floodplain and overtop the channel banks. Approximately 4.2 acres of surface area are provided at elevation 66.0. The watershed area to this point on the Noroton River is approximately 8.3 square miles.

As part of the hydraulic mitigation efforts, the upstream railroad bridge was targeted as a potential improvement by enlarging the bridge opening, thereby allowing more flow through the bridge during any given storm event and lowering flood elevations upstream near Camp Avenue and the adjacent neighborhoods. Enlarging the bridge would modify the attenuation effect of the bridge, which was analyzed in the proposed hydrology analysis. Additional discussion is provided in the following sections of this report.

Bifurcation Area

The bifurcation area is located to the southwest of the Heather Lane neighborhood. The area is defined by a relatively large pond that is located in line with the Noroton River. Evidence of a former channel to the west around the

pond is apparent in the field, which currently acts as a flood chute activating during elevated flow events. The water surface elevation of the pond is approximately 39.0 feet NAVD, and the surface area is approximately 2.6 acres. The watershed area to this point on the Noroton River is approximately 9.2 square miles.

In-line Pond at Middlesex Road

The in-line pond is located approximately 150 linear feet upstream of the Middlesex Road bridge. The pond was created as part of a gravel mining operation that was located in the area, and historic channel modification plans indicate that a pond was created by building a rock dam that still exists today. The impoundment extends over 1,000 linear feet upstream and is 300 feet across at its widest point. The water body covers a surface area of approximately 5.8 acres and has a water surface elevation of 30.0 feet NAVD. The watershed area to this point on the Noroton River is approximately 9.6 square miles.

The reservoir routing calculations are performed by the computer modeling software by balancing the amount of flow entering the pond with the available storage volume and discharge capacity of the outlet to determine the outflow. Reservoir routing involves developing a hydrograph to determine the volume of runoff into the impoundment and routing the flow through the impoundment to determine both the outflow hydrograph and the maximum storage levels. The stage versus storage relationship of each impoundment was calculated using available topography mapping for the town of Darien and city of Stamford. The outlet configuration of each impoundment was inserted into the model as input and was utilized by the model to calculate stage versus discharge capacity relationships. Each impoundment used a combination of several outlets, including the primary spillway or outlet and the top of dam or roadway, which were modeled as a broad-crested weir. Table 3-8 below lists each reservoir routing area as well as its identifier used in the model.

TABLE 3-8
Existing Conditions Reservoir Routing Areas

Storage Area Name	Model ID
Raymond's Pond	P-MS-07
Upstream Railroad Crossing	P-MS-10
Bifurcation Area	P-MS-11
In-line Pond at Middlesex Road	P-MS-13

3.2.5 Channel Routing

Streams and floodplains with limited storage volume yet mild gradients, wide widths, or long lengths may delay the downstream movement of flow due to low water velocity. This limited flood attenuation is represented in the hydrology model as channel routing to describe the amount of time required for stormwater to flow from the upper reaches of a sub-basin to its outlet point. The amount of time water travels to the sub-basin outlet is a function of the size, shape, slope, and roughness of the open channel or enclosed conduit. Channel routing was applied to 22 reaches in the Noroton River watershed (Table 3-9) using the Muskingum-Cunge method for both open channels and conduits.

TABLE 3-9

Channel Routing Reaches

Reach ID	Description of Reach
R-MS-02	Flow at outlet of watershed MS-01 routed through watershed MS-02
R-MS-03	Flow at outlet of watershed MS-02 routed through watershed MS-03
R-MS-04	Flow at outlet of watersheds MS-03 and T1-01 routed through watershed MS-04
R-T2-02	Flow at outlet of watershed T2-01 routed through watershed T2-02
R-MS-05	Flow at outlet of watersheds MS-04 and T2-02 routed through watershed MS-05
R-MS-06	Flow at outlet of watershed MS-05 routed through watershed MS-06
R-MS-08	Flow at outlet of Raymond's Pond (P-MS-07) routed through watershed MS-08
R-MS-09A	Flow at outlet of watersheds MS-08 and T3-01 routed through watershed MS-09
R-T4-03	Flow at outlet of watershed sT4-01 and T4-02 routed through watershed T4-03
R-MS-09B	Flow at outlet of watershed T4-03 routed through watershed MS-09
R-T5-02	Flow at outlet of watershed T5-01 routed through watershed T5-02
R-MS-10	Flow at outlet of watersheds MS-09 and T5-02 routed through watershed MS-10
R-T6-03	Flow at outlet of watersheds T6-01 and T6-02 routed through watershed T6-03
R-T6-04	Flow at outlet of watershed T6-03 routed through watershed T6-04
R-MS-11A	Flow at outlet of watershed MS-10 routed through watershed MS-11
R-MS-11B	Flow at outlet of watershed T7-01 routed through watershed MS-11
R-MS-11C	Flow at outlet of watersheds MS-10 and T7-01 routed through watershed MS-11
R-MS-13	Flow at outlet of watershed MS-12 routed through watershed MS-13
R-MS-15	Flow at outlet of watershed MS-14 routed through watershed MS-15
R-MS-16	Flow at outlet of watersheds MS-15 and T9-01 routed through watershed MS-16
R-T10-02	Flow at outlet of watershed T10-01 routed through watershed T10-02
R-MS-17	Flow at outlet of watersheds MS-16 and T10-02 routed through watershed MS-17

Note: The list of reaches in the table above are ordered hydrologically as they appear in the hydrologic model, moving from upstream to downstream through the watershed.

3.2.6 Precipitation

Precipitation is a critical element in hydrologic modeling. The total depth of rainfall during a storm event as well as the intensity of that rainfall play a strong role in dictating the overall runoff from a watershed. The standard of practice for design engineers in Connecticut is to use rainfall data published in Technical Paper 40 (TP-40) by the United States Weather Bureau in 1961. TP-40 provides rainfall depths over a 24-hour period equated to a storm frequency (i.e., 100-year storm or 1% chance recurrence). TP-40 predicts rainfall depths based on storm data from the first half of the 20th century.

More recently, the University of Connecticut (UConn) published the document "Rainfall In Connecticut" (Miller et al., 1997). This report estimates rainfall depths over a 24-hour period using data through the early 1990s.

Table 3-10 presents a summary of data from both sources. It is important to note that the references to the 2-year, 10-year, etc. storm event are somewhat misleading. In fact, a 2-year storm is one that has a chance of occurring once every two years. Therefore, there is a 50% chance that it could occur in any given year; a 100-year storm has a 1% chance of occurrence in any given year. Table 3-10 reflects this annual occurrence potential rather than the somewhat outdated reference to the 2-, 10-, 50-, and 100-year events.

TABLE 3-10
Rainfall Depth Over 24-Hour Period

	Total Rainfall (Inches)				
Source	**50%**	**10%**	**4%**	**2%**	**1%**
TP-40 (1961)	3.3	5.0	5.7	6.4	7.2
University of Connecticut (1997)	3.55	5.2	6.5	7.6	8.8

The more recent data from UConn reflects a trend of increasing precipitation that has been observed in Connecticut. It is important to note that these depths are for a storm over a 24-hour period. Variations in the length of storm can impact the runoff rates from watersheds. For example, if 3.5 inches of rainfall were to occur over a six-hour period rather than over 24 hours, the result would be increased flooding of streams and streets.

The HMS model was run using both the TP-40 and UConn data for the purposes of evaluating the impact of rainfall variability.

3.3 Results of Existing Conditions Analysis

Table 3-11 presents the predicted channel flow rates at select areas within the watershed; values presented are peak flow (cfs) and unit peak flow (csm). HEC-HMS input and output files are presented in Appendix F. Results are presented for both sets of rainfall data as discussed above.

In comparing Table 3-11 to the data presented in Table 3-2, the results of the HMS analysis appear to overestimate flows when using both the TP-40 rainfall data and the UConn data. The reason for these high values is a combination of factors. With just under 60% of the watershed containing hydrologic soil groups C or D, such an environment will lead to higher runoff values than other watersheds of similar size and development pattern. In part, the overestimation is a limitation of the model itself, which is conservative in its flow predictions.

Furthermore, estimating land cover using a categorical approach such as applying a land cover of "one-acre residential" over portions of the watershed rather than specifying individual areas of impervious, wooded, and grassed cover can potentially overestimate the CN value applied to that particular portion of the subwatershed. The result can potentially lead to higher overall composite CN values, which have been developed that way by design to build conservatism into the modeling approach. The method of applying a categorical land cover is a common approach, where delineating individual impervious, grassed, and wooded cover type would be time prohibitive and beyond the scope of this study.

While we believe that the UConn data reflects more current rainfall data, the hydraulic analysis in the following sections is based on the flow rates generated with the TP-40 rainfall. Use of the UConn data would result in all improvements being oversized. For example, a 30-foot wide bridge might be sufficient to pass a 1% storm based on the TP-40 data but, at the same location, a 40-foot wide structure might be needed to pass the 1%

storm based on the UConn flows. While some overdesign is prudent and acceptable, the financial implications for the town are potentially significant. We have presented the UConn analysis here to provide the town with an understanding of the potential flow increases.

TABLE 3-11
Predicted Peak Flows and Unit Flows From HMS Modeling

Watershed Location	**Raymond's Pond Outlet**		**Upstream Railroad Crossing**		**Middlesex Road (CT Route 106)**		**Boston Post Road (US Route 1)**	
Watershed Area (sq. mi.)	4.81		8.26		9.64		11.04	
Annual Occurrence (Storm Event)	cfs	csm	cfs	csm	cfs	csm	cfs	csm
50% (2-year)								
TP-40 Rainfall	868	180.4	1,267	153.4	1,407	146.0	1,522	137.9
UConn Rainfall	1,064	221.1	1,550	187.6	1,724	178.8	1,862	168.6
10% (10-year)								
TP-40 Rainfall	2,321	482.5	3,190	386.2	3,512	364.3	3,771	341.6
UConn Rainfall	2,510	521.8	3,436	416.0	3,772	391.3	4,039	365.9
4% (25-year)								
TP-40 Rainfall	3,045	633.0	4,247	514.1	4,566	473.6	4,851	439.4
UConn Rainfall	3,802	790.4	5,467	661.9	5,977	620.0	6,337	574.0
2% (50-year)								
TP-40 Rainfall	3,701	769.5	5,306	642.3	5,820	603.8	6,159	557.9
UConn Rainfall	4,812	1,000	7,161	866.9	7,702	799.0	8,210	743.7
1% (100-year)								
TP-40 Rainfall	4,507	936.9	6,658	806.1	7,074	733.8	7,581	686.7
UConn Rainfall	6,148	1,278	9,288	1,124	10,017	1,039	10,575	957.8

For comparative purposes, the peak flow rates at each gauge obtained for the various recurrence intervals during the PKFQWin gauge analysis were scaled based on watershed area. The methodology used to scale the flows is outlined in the USGS document known as Guidelines for Determining Flood Flow Frequency or Bulletin #17b. The equation used to scale the peak flows based on watershed area is shown below.

$$Q_1 / Q_2 = (A_1 / A_2)^n$$

Where: Q_1 = Scaled Noroton River peak flow rate

Q_2 = Gauge analysis peak flow rate

A_1 = Drainage area of Noroton River (11.04 sq mi)

A_2 = Drainage area at USGS gauge (varies)

n = regression equation exponent *

* The exponent n was obtained from the exponents used in the regression equations corresponding to the various storm events, as found in Table 5 of the USGS report entitled "Regression Equations for Estimating Flood Flows for the 2-yr, 10-yr, 25-yr, 50-yr, 100-yr, and 500-yr Recurrence Intervals in Connecticut" by Elizabeth A. Ahearn, Scientific Investigations Report 2004-5160.

The results of the HEC-HMS modeling are compared to the peak flow rates scaled from each gauge in Table 3-12 below. Both the peak flow and unit peak flow estimates are summarized in the table.

TABLE 3-12
Comparison of Scaled Peak Flow (cfs) and
Scaled Unit Peak Flow (cfm) for the Noroton River

Peak Flow Estimate					
Analysis / Methodology	**2-Year Flow (cfs)**	**10-Year Flow (cfs)**	**25-Year Flow (cfs)**	**50-Year Flow (cfs)**	**100-Year Flow (cfs)**
HEC-HMS Modeling					
TP-40 rainfall	1,522	3,771	4,851	6,159	7,581
UCONN rainfall	1,862	4,039	6,337	8,210	10,575
Scaled From Gauge Analysis Results					
Five Mile River near New Canaan (USGS #01209761)	220	349	427	493	562
Keeler's Brook at Norwalk (USGS #01209775)	708	1,938	2,931	3,890	5,042
Five Mile River near Norwalk (USGS #01209770)	662	1,288	1,671	1,985	2,324
Rippowam River at Stamford (USGS #01209901)	367	839	1,164	1,447	1,772
Unit Peak Flow Estimate					
Analysis / Methodology	**2-Year Flow (csm)**	**10-Year Flow (csm)**	**25-Year Flow (csm)**	**50-Year Flow (csm)**	**100-Year Flow (csm)**
HEC-HMS Modeling					
TP-40 rainfall	137.9	341.6	439.4	557.9	686.7
UCONN rainfall	168.6	365.9	574.0	743.7	957.8
Scaled From Gauge Analysis Results					
Five Mile River near New Canaan (USGS #01209761)	20	32	39	45	51
Keeler's Brook at Norwalk (USGS #01209775)	64	176	266	352	457
Five Mile River near Norwalk (USGS #01209770)	60	117	151	180	211
Rippowam River at Stamford (USGS #01209901)	33	76	105	131	161

As anticipated, the estimates of peak flow scaled from the results of the gauge analysis do not closely coincide with the results of the HEC-HMS modeling. The scaled estimates closest to the hydrologic modeling results occur with the Keeler's Brook gauge, where peak flow and unit peak flow estimates are approximately 50% to 60% of the values predicted with HEC-HMS. As previously stated, the hydrologic model is limited by the data available to generate the required input and is known to overestimate peak flows as a result. The model is generally used for design purposes; therefore, a level of conservatism is built into the resulting peak flows, which carry over into the design of flood management measures and improvements.

4.0 EXISTING CONDITIONS HYDRAULIC ANALYSIS

4.1 Introduction

The term "hydraulic analysis" refers to the computational prediction of a river's water elevations, depths, and velocities for specified water discharge rates. This analysis is used to predict the elevation that floodwaters will reach given different river flows.

The evaluation of flood conditions requires an understanding of both the amount of flow that is being managed and the conditions within the channel that dictate the elevations that water will reach under a variety of flows. This determination of flood elevations is made through hydraulic analysis as described in this section.

Hydraulic analysis is commonly performed using the ACOE HEC-RAS software. The model is used to compute water surface profiles for one-dimensional, steady state, and gradually varied flow. This model can accommodate a full network of channels, a dendritic system, or a single river reach. HEC-RAS is capable of modeling water surface profiles under subcritical, supercritical, and mixed flow conditions.

The basic computational procedure of HEC-RAS is the solution of the one-dimensional energy equation. Energy losses are evaluated by friction (Manning's Equation) and the contraction/expansion coefficient multiplied by the change in velocity head. The momentum equation is used in situations where the water surface profile is rapidly varied. These situations include mixed flow regime calculations, hydraulics of dams and bridges, and evaluating profiles at a river confluence.

In developing a hydraulic model, channel cross section data were used to define the channel at selected locations. Critical cross section locations may include areas of broad floodplain, channel constrictions caused by erosion, or the construction of floodwalls and/or bridge crossings. At each location, the channel is defined by elevation as well as

the type of vegetation present on the channel banks and the makeup of the channel bed. All of these influence water elevations during flood events.

In some instances, the elevation of water in the downstream end of the channel at the start of the storm event plays an important role in the modeling effort. This initial "tailwater" can influence flood elevations in the study channel although the length of this influence varies based on the slope of the channel bed and the height of the water. The initial water levels are based upon that of the river into which a stream discharges.

4.2 Hydraulic Modeling Methods

In considering hydraulic modeling, it must be understood that the FIS of a community represents the legal regulatory limits associated with flooding and flood management. In some instances, the established limits do not accurately reflect field conditions, yet the data in the FIS must still be considered and respected until it is formally changed by FEMA. It is likely that most of the improvements made as a result of this study will require review by FEMA prior to construction. Therefore, we have completed the modeling described in the following text in accordance with FEMA's protocols. FEMA's protocols require the following sequence of modeling efforts:

FEMA Effective Model: This is the model that supports the data presented in the FIS. This model is provided by FEMA as a starting point for analysis.

Duplicate Effective Model: As its name implies, this is a duplicate of the model provided by FEMA. The purpose of this is to ensure that the results presented by FEMA can be reasonably duplicated using current computers and software.

Revised Duplicate Effective Model: In this step, any errors in the FEMA model are corrected. This may include bridge openings or coefficients that are used to represent losses at structures or channel bends.

Existing Conditions Model: Often FEMA's modeling efforts are broad brush and do not reflect detailed analysis of every structure in the channel. In addition, FEMA cross sections can sometimes be so far apart that they cannot accurately reflect channel conditions. In the existing conditions analysis, additional cross sections are added to the model to ensure an adequate level of detail is represented.

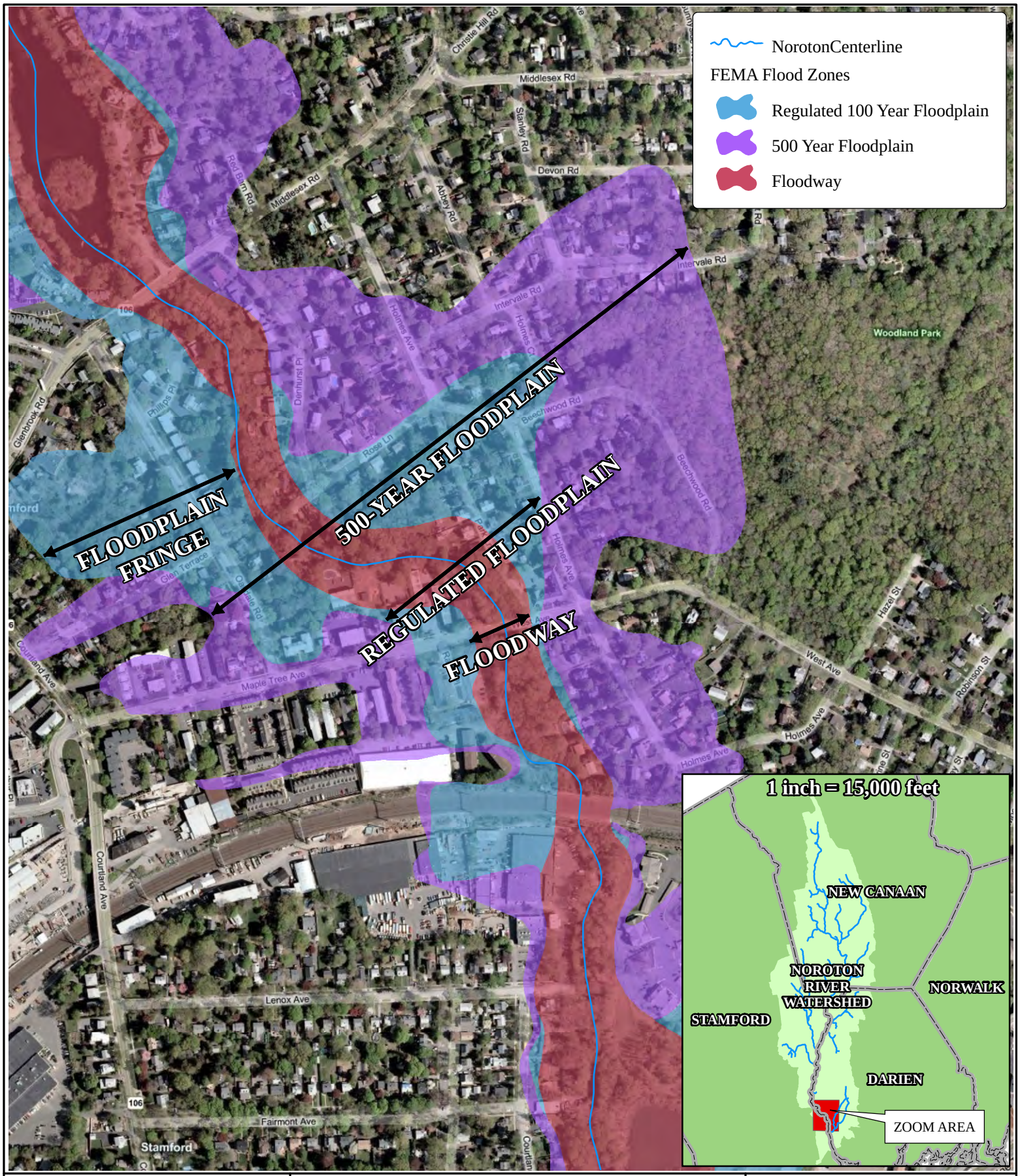
Through the progression of this modeling, the predicted water surface elevations can change for a variety of reasons. Therefore, the results of each step are compared to those of the previous model iteration.

FEMA also defined a floodway for the Noroton River. The floodway of a channel is defined by first determining the floodplain elevation and then constricting the flow along the floodplain until the water surface elevation has increased by one foot. From a regulatory perspective, proposed construction activities cannot increase water surface elevations in the floodway by more than 0.01 feet. In the floodplain area between the floodplain limit and floodway, water surface elevation increases of up to one foot are allowed from development projects. Figure 4-1 depicts a sample map of a floodplain and floodway.

4.3 Effective, Effective Duplicate, and Revised Effective Duplicate Floodplain Models

4.3.1 Effective FEMA Model

An initial FIS of Darien with Flood Insurance Rate Maps (FIRMs) was published in 1978. The FIS included a detailed study of the Noroton River between Raymond's Pond at the border with New Canaan and just upstream of Boston Post Road at Holly Pond. The 1993 FIS indicates that the Noroton River was restudied in detail at that time. The model distributed MMI from FEMA contractors uses the HEC-2 step backwater model as described in the current FIS. HEC-2 is the precursor modeling software to HEC-RAS.



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, CT

MMI#: 1581-04-2

MXD: H:4-1 FloodZones.mxd

SOURCE: Town of Darien & http://magic.lib.uconn.edu/

N

FEMA Flood Zones Example

DATE: March 2010

SCALE: 1" = 400'

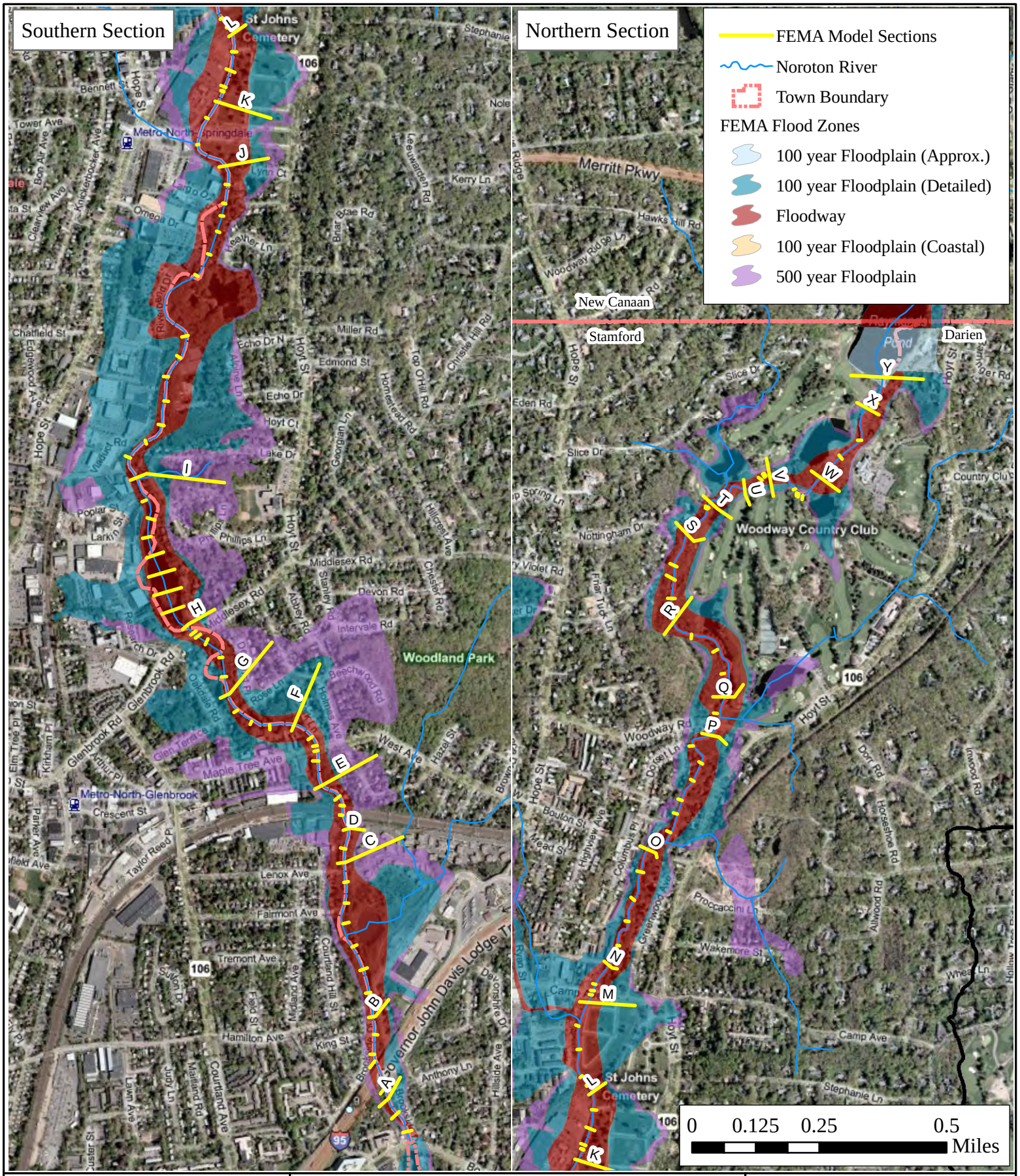
SHEET: Figure 4-1

Upon comparison of the published data in the FIS and the Effective FEMA Model, minor differences in river stationing and water surface elevations were found. These small differences may be due to differences in rounding or model run version. No difference was major enough to indicate that the HEC-2 file received is not the correct Effective FEMA Model. Figure 4-2 presents the locations of each FEMA lettered cross section, which are used as points of reference through the remainder of this document. The Effective FEMA Model also includes many intermediate cross sections that define the channel and floodplain but are not reported in the FIS. The Effective FEMA Model input and output is included in Appendix G along with a comparison of river distances between the published FIS and the Effective FEMA Model.

4.3.2 Duplicate Effective Model

The Duplicate Effective Model was created by inputting the FEMA Effective Model into the ACOE HEC-RAS 4.0 program (USACOE, 2005). This model retains differences from the FIS as mentioned above in addition to typos and errors present in the HEC-2 code. Flow rates from the FIS were used for this model run as well. Boundary conditions were maintained from HEC-2, including a downstream starting water surface elevation, and run in subcritical flow regime. An upstream boundary condition of normal depth was used. Unlike HEC-2, HEC-RAS requires an upstream boundary condition.

HEC-2 and HEC-RAS have some differences in modeling approach including conveyance calculations; bridge, culvert, and dam modeling approaches; and critical depth calculations. Each of these model differences can, and is expected to, cause some differences in results. One of the largest differences is in the input and calculations at structures. HEC-RAS does not allow the coincident location of bridge face cross sections and the bridge structure, as was allowed in HEC-2. Bridge lengths were reduced by two feet to separate bridge face cross sections from the structure without alteration of cross



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3

MXD: H:\4-2-femasections.mxd

SOURCE: Microsoft Virtual Earth

N

Cross Section Locations in FEMA Model

Map By: JSC

Date: March 2010

Scale: 1"=1,300'

SHEET: Figure 4-2

section location and bed slopes. Bridge deck information did not in all cases import from HEC-2 correctly, leaving "holes" between the high chord and ground. Bridge decks were checked and, where necessary, the low chord was lowered to completely block conveyance between the high chord and ground in overbank.

The Duplicate Effective Model approximately represents the FEMA Effective Model although in multiple locations the predicted water surface elevations varied. Table 4-1 is a comparison of published water surface elevations and the results of MMI's Duplicate Effective Model. The downstream Railroad Crossing and West Avenue Bridges are producing a higher backwater condition in the Duplicate Effective Model than reported in the FIS. As a result, water surface elevations at cross sections E, F, G, H, I, J, and K predicted in the Duplicate Effective Model are significantly higher than in the FIS. Other lettered cross sections approximate the FEMA Effective profile within -0.1 and 0.4 feet.

4.3.3 Revised Duplicate Effective Model

Modeling errors and obvious typos were corrected in the Duplicate Effective Model to create the Revised Duplicate Effective Model. Flow rates from the FIS were retained for this modeling effort. The following changes and corrections were incorporated:

- Changed flow regime from subcritical to mixed because supercritical is possible at larger structures during high flows and is typically used in current modeling practices.

- Changed method of calculating conveyance from "between every coordinate point (HEC2 Style)" to "at breaks in n values only." This is the standard calculation method for use in HEC-RAS.

- Removed duplicate and unnecessary extra cross sections at bridge face upstream and downstream of the four bridges in the golf course.

- The dam structure represented as a bridge in HEC-2 was input as an in-line structure using information provided in the HEC-2 model.

The base flood elevation profile generated from the Revised Duplicate Effective Model largely matches the Duplicate Effective Model. Subcritical flow occurs at the downstream face of Interstate 95 culverts, causing lower water surface elevations of up to 3.3 feet upstream (FEMA E). In the constricted channel cross section downstream of FEMA J, the critical depth is reached, causing a dip in water surface elevations downstream of FEMA J. At the downstream face of the railroad bridge, critical depth is also calculated, causing a dip of up to 2.2 feet downstream at FEMA L. Table 4-1 presents a comparison of elevations.

TABLE 4-1

Comparison of Water Surface Elevation Between Published 1993 FIS, Effective FEMA Duplicate, and Revised Effective Duplicate Models 1% Recurrence Discharge

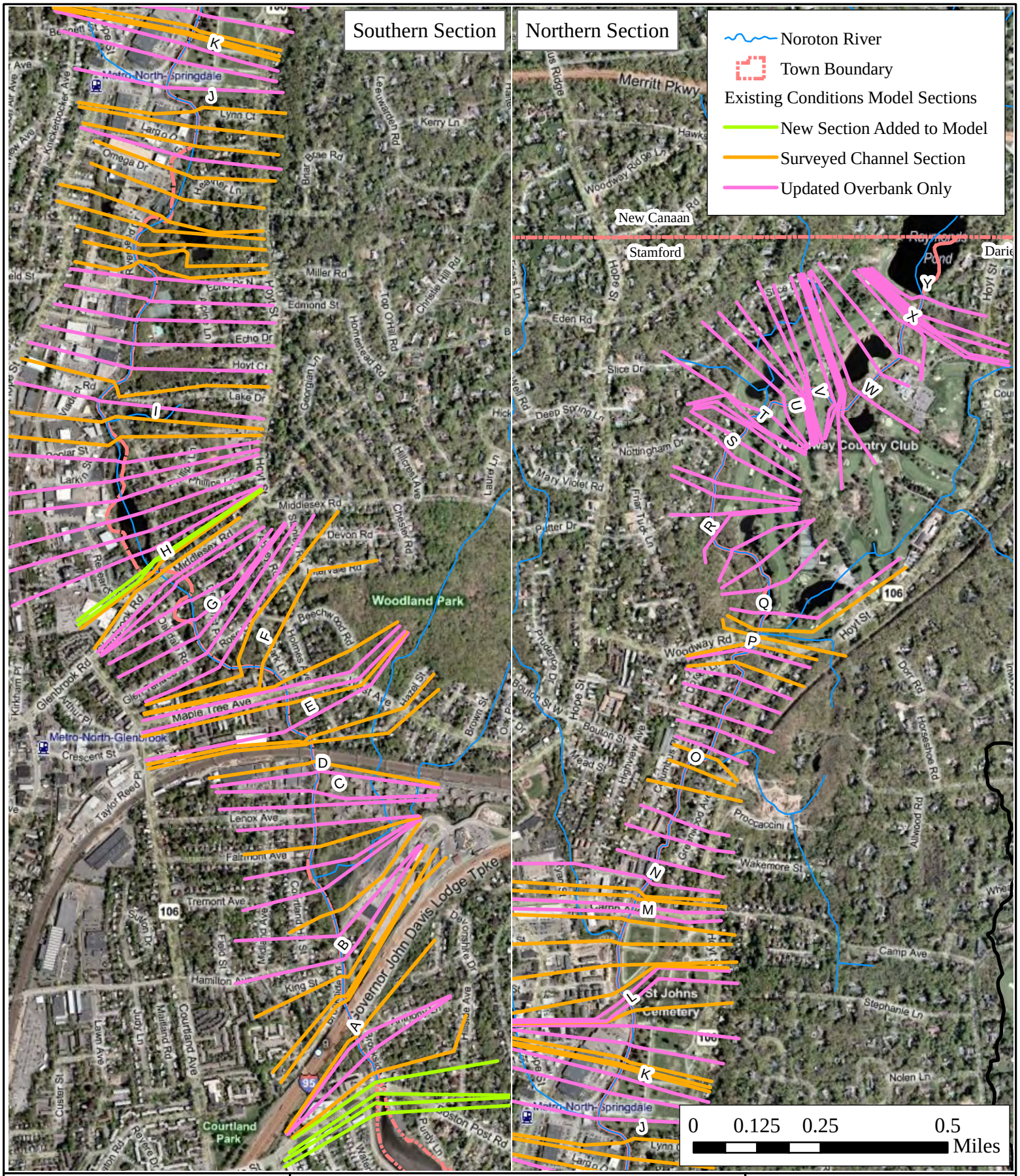
FEMA Cross Section Location		Water Surface Elevation (feet NGVD)				
Letter	Description	FIS (Without Floodway)	Effective Duplicate Model	Difference (Effective Duplicate - FIS)	Revised Effective Duplicate Model	Difference (Revised Duplicate - Effective Duplicate)
A	110' DS of Interstate 95	13.3	13.3	0.0	13.3	0.0
B	500' US of Interstate 95	23.1	23.1	0.0	23.1	0.0
C	165' DS of Railroad Crossing	24.1	24.2	0.1	24.2	0.0
D	530' DS of Railroad Crossing	27.4	27.4	0.0	27.4	0.0
E	375' DS of West Avenue	36.9	38.5	1.6	35.2	-3.3
F	320' US of West Avenue	39.9	42.3	2.4	42.3	0.0
G	745' DS of Middlesex Road	40.7	42.7	2.0	42.7	0.0
H	100' US of Middlesex Road	41.5	43.2	1.7	43.2	0.0
I	1,890' US of Middlesex Road	42.2	43.6	1.4	43.6	0.0
J	At Bend US of Lynn Court	60.6	63.7	3.1	63.7	0.0
K	100' DS of Dam	65	65.9	0.9	65.9	0.0
L	90' DS of Railroad Crossing	68.1	68.2	0.1	66.1	-2.2
M	85' DS of Camp Avenue	77.1	77.0	-0.1	77.0	0.0
N	320' US of Camp Avenue	77.4	77.6	0.2	77.6	0.0
O	1,630' US of Camp Avenue	81.6	81.8	0.2	81.8	0.0
P	100' DS of Woodway Road	88.4	88.6	0.2	88.6	0.0
Q	261' US of Woodway Road	93.9	94.0	0.1	94.0	0.0
R	1,320' US of Woodway Road	94.1	94.3	0.2	94.3	0.0
S	2,375' US of Woodway Road	96.9	97.1	0.1	97.1	0.0
T	2,800' US of Woodway Road	98.9	99.3	0.4	99.3	0.0
U	3,390' US of Woodway Road	99.8	99.8	0.0	99.8	0.0
V	3,710' US of Woodway Road	101.6	101.8	0.2	101.8	0.0
W	4,490' US of Woodway Road	102.8	102.9	0.1	102.9	0.0
X	5,445' US of Woodway Road	106.8	106.9	0.1	106.9	0.0
Y	5,840' US of Woodway Road	110.1	110.2	0.1	110.2	0.0

4.4 Existing Conditions Model

4.4.1 Model Development

Changes to the system have occurred since the Effective FEMA Model was created. The Town of Darien has high resolution aerial photography and topographic mapping with one-foot contour data created in 2008, which served as a basis for the model updates. Because the Noroton River forms the corporate limits between Darien and Stamford, Darien's mapping does not extend across the entire right overbank area of the cross sections. Stamford also has high resolution mapping with two-foot contours created in 2005, which was used for updating right overbank elevations. HEC-GeoRAS 4.1.1, an extension for ArcGIS (ESRI 2006), was used to extract stream system geometry from terrain data for automated input to HEC-RAS. HEC-GeoRAS is an interactive platform for setting up all geometry components necessary for HEC-RAS modeling and viewing results. Topography from the two municipalities was processed using ArcGIS to create a triangulated irregular network (TIN) representing ground elevation for use in modeling.

The stream centerline and overbank distances were delineated based on the high resolution mapping, updating the distance between cross sections and length of river channel from the FEMA model. FEMA Effective Model cross section locations were maintained, and additional new cross sections were added where necessary. Floodplain topography was extracted from the 2008 Town of Darien and 2005 City of Stamford topographic mapping with HEC-GeoRAS for all model cross sections. Field survey of the wet channel cross section completed by MMI was then substituted into the model for all new cross sections and to update selected FEMA Effective Model cross sections. Figure 4-3 depicts the location of cross sections used in the Existing Conditions Model according to their data source. Of the 136 total cross sections in the model, 84 FEMA sections were retained, 46 sections were resurveyed as part of this project, and six were newly surveyed and added to the model.



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien, Stamford, and New Canaan, CT

MMI#: 1581-04-3

MXD: H:\4-3-existingsections.mxd

SOURCE: Microsoft Virtual Earth

N

Cross Section Locations in Existing Conditions Model

Map By: JSC

Date: March 2010

Scale: 1"=1,300'

SHEET: Figure 4-3

Bridge and culvert geometry was updated with survey, field measurements, and existing bridge plans. Bridge plans reviewed for this study are listed in the References section of this report. Five of the 13 total structures were updated with new survey information as part of this study, including the one significant dam. Ineffective flow areas (i.e., locations where water ponds but does not move) were updated based on new geometry and current guidelines in the HEC-RAS user manual. Flow obstructions such as buildings were delineated in GIS and imported into HEC-RAS with HEC-GeoRAS.

The model was extended downstream to include the Boston Post Road bridge (Route 1). Three additional surveyed cross sections were added to the model downstream of Boston Post Road to define the downstream boundary conditions. This bridge was added to the model to evaluate possible backwatering caused by the structure.

Manning's N values used in the FEMA Effective Model were verified and updated based on field observations, digital photographs, and high resolution aerial photography. N values were varied horizontally in HEC-RAS to allow for accurate representation of changes in roughness in each cross section. N values in the channel are between 0.03 and 0.05, and n values in the overbank ranged from 0.035 to 0.1.

Expansion and contraction coefficients were verified and largely maintained from the FEMA Effective Duplicate Model. The Duplicate Effective Model typically specified 0.1 and 0.3, with 0.3 and 0.5 at bridge cross sections. These were verified and corrected where necessary.

The vertical datum of the HEC-RAS model was updated from NGVD 1929, which is the datum of the Effective Model and reported in the FIS, to the current standard of NAVD 1988. A conversion factor of -1.10 was used as calculated using the National Geodetic Survey VERTCON online software.

Flow data developed by MMI and documented in Section 3.0 was used in this hydraulic model. The FEMA Effective Model included three flow change locations. The flow increased upstream of the railroad bridge in St. John's Cemetery. There was then a temporary decrease in flows through the pond just downstream of Heather Lane before flows were restored to their upstream values. A total of seven flow change locations were included in the Existing Conditions model. These locations represented either in-line storage features or input of significant tributary flow (Table 4-2). As described in detail in Section 3.0, the Existing Conditions flows are higher than the FEMA Effective flows.

TABLE 4-2
Estimated Existing Peak Flows Used for the Hydraulic Model

Flow Change Location		100-Year Discharge (cfs)	
Description	**HEC-RAS River Station**	**FEMA Effective**	**MMI Updated**
Raymond's Pond outflow	24,704	4,150	4,507
At confluence with Tributary #5	17,133	--	5,525
At railroad bridge crossing	14,501	5,300	7,158
Bifurcation Pond inflow	15,105	3,447	--
Bifurcation Pond outflow	10,364	5,300	7,036
In-line pond upstream of Middlesex Road outflow	6,850	--	7,074
At CONNRail bridge crossing	4,071	--	7,294
At confluence with Tributary #10	2,495	--	7,501
At Boston Post Road crossing	334	--	7,581

The upstream model boundary condition was maintained as normal depth (S = 0.0009). The Effective FEMA Model used a downstream starting water surface elevation of 4.7 feet NGVD for all flow profiles although the Effective Profile shows higher elevations for each profile based on backwatering from the Atlantic Ocean. The FIS report described the lower elevation used in the model as the mean spring high tide level in Long Island Sound. The downstream boundary condition used in the Existing Condition

model is normal depth (S = .0046). An additional trial was run to determine the influence of the tide in Holly Pond, using known water surface elevations associated with the tidal storm surge as indicated on the 1993 FIS Profile. The high water surface levels of the storm surge converge with the normal water surface elevation at the downstream face of Boston Post Road and do not affect conditions farther upstream.

The Existing Conditions Model covers 4.68 miles of the Noroton River. The river stationing indicates a net increase in total stream length of 0.17 miles due to higher resolution data defining a more sinuous channel and extension of the model approximately 430 feet downstream to include the Boston Post Road bridge instead of starting upstream of the structure. This bridge was included to evaluate conditions downstream of Interstate 95 during floods.

4.4.2 Existing Conditions Results

Peak 100-year existing conditions water surface elevations are generally higher than the FEMA Effective base flood elevations. Higher values are in part a result of higher flow values used in the model. Cross sections in the country club upstream of Woodway Road have more similar flows and, therefore, water surface elevations are relatively consistent with FEMA. Changes in channel and floodplain configurations identified by MMI also increase predicted water surface elevations, such as inclusion of blocked obstructions where buildings are located in the floodplain.

Water surface elevations in the lower sections of the model predict water surface elevations up to 5.1 feet higher than the Revised Effective Duplicate model. Differences are mainly attributed to higher flow values used in the lower sections of the model. The inclusion of the Boston Post Road bridge causes backwatering affecting inundation at the downstream end of Interstate 95. This increase in water surface elevation may be partially causing the increase upstream of Interstate 95 as well. Updated survey information at Interstate 95 and the downstream railroad crossing may also be causing the large increase in inundation upstream of these structures. Inundation depths are showing

to be on the order of one to two feet deeper than the FEMA Effective Model upstream of West Avenue and Middlesex Road.

Many structures on the system are undersized and contribute to local and upstream flooding. Examination of the water surface profile (Appendix I-1) shows that all the bridges increase the upstream water surface elevation. Some bridges are completely overtopped by backwatering from downstream, including West Avenue, Camp Avenue, Woodway Road, and the four golf course bridges. Flow over these roadway surfaces at this storm level will not be reduced without addressing the downstream backwatering.

Supercritical flow occurs at three locations – downstream of FEMA J, downstream of FEMA L, and at FEMA N. These sections have shallow fast flow with backwatering upstream caused by a channel constriction point. The profile shows a dip in water surface with much deeper water upstream.

Table 4-3 presents water surface elevations for the Existing Conditions Model and Revised Effective Duplicate Model results. Appendix H contains the HEC-RAS summary report generated for the Existing Conditions Model and also a summary of river stationing differences between the two models. Appendix I-1 presents an Existing Conditions profile for the estimated 100-year peak flood event in comparison to the FEMA Effective profile.

TABLE 4-3
Comparison of Water Surface Elevations
Revised Effective Duplicate and Existing Conditions Model Results
100-Year (1%) Recurrence Discharge

FEMA Cross Section Location		Water Surface Elevation			
Letter	Description	Revised Effective Duplicate (NGVD)	Revised Effective Duplicate (NAVD)	Existing Conditions (NAVD)	Difference (Existing - Revised Duplicate)
A	110' DS of Interstate 95	13.31	12.2	17.3	5.1
B	500' US of Interstate 95	23.07	22.0	23.7	1.8
C	165' DS of Railroad Crossing	24.2	23.1	23.5	0.4
D	530' DS of Railroad Crossing	27.4	26.3	27.8	1.5
E	375' DS of West Avenue	35.15	34.1	37.3	3.2
F	320' US of West Avenue	42.25	41.2	41.5	0.3
G	745' DS of Middlesex Road	42.66	41.6	41.8	0.3
H	100' US of Middlesex Road	43.22	42.1	42.1	0.0
I	1,890' US of Middlesex Road	43.63	42.5	43.5	1.0
J	At Bend US of Lynn Court	63.69	62.6	58.9	-3.7
K	100' DS of Dam	65.92	64.8	64.5	-0.4
L	90' DS of Railroad Crossing	66.06	65.0	68.4	3.5
M	85' DS of Camp Avenue	77.02	75.9	75.3	-0.6
N	320' US of Camp Avenue	77.62	76.5	72.9	-3.7
O	1,630' US of Camp Avenue	81.83	80.7	84.0	3.3
P	100' DS of Woodway Road	88.64	87.5	88.3	0.7
Q	261' US of Woodway Road	94.02	92.9	91.8	-1.2
R	1,320' US of Woodway Road	94.31	93.2	93.0	-0.2
S	2,375' US of Woodway Road	97.05	96.0	96.8	0.9
T	2,800' US of Woodway Road	99.26	98.2	98.4	0.3
U	3,390' US of Woodway Road	99.77	98.7	99.7	1.0
V	3,710' US of Woodway Road	101.77	100.7	100.3	-0.4
W	4,490' US of Woodway Road	102.86	101.8	102.3	0.6
X	5,445' US of Woodway Road	106.92	105.8	107.4	1.6
Y	5,840' US of Woodway Road	110.18	109.1	110.9	1.8

Floodplain mapping was developed by exporting HEC-RAS results back to ArcGIS using HEC-GeoRAS for each flood profile. The FEMA Effective floodplain and Existing

Conditions Model results for the 100-year flood were compared, and this mapping is presented in Appendix I-2. The inundation area of the Existing Conditions model extends beyond the FEMA floodplain in multiple areas and is expected to be larger due to larger discharges modeled. The shape of the Existing Conditions floodplain is also much more detailed as it is based on more accurate topography. Water depth was calculated and mapped for the inundated area and presented in Appendix I-3.

A larger portion of the residential areas off Brookside Drive between Boston Post Road and upstream of Interstate 95 is shown to be in the floodplain. The Effective Model did not include the effects of the Boston Post Road bridge, which causes backwatering in this area. Upstream of the downstream railroad crossing, a few additional homes are included in the floodplain due to backwatering upstream of the structure. Between West Avenue and Middlesex Road, the floodplain has increased significantly including areas on Park Lane, Holmes Avenue, Beechwood Road, Intervale Road, Rose Lane, and Denhurst Place. Upstream of Middlesex Road, additional areas along Fresh Meadow Lane, Red Barn Road, Phillips Lane, and Lake Drive are shown to be in the floodplain. A few additional homes are shown within the floodplain along Heather Lane and Lynn Court. Upstream of Camp Avenue, there are minor changes in the floodplain extent, with only small changes along Hoyt Street and Greenwood Avenue. The floodplain has not changed to include additional neighborhoods upstream of Woodway Road.

Water depth mapping shows that some of these properties may be subject to more than nuisance and basement flooding (Appendix I-3). Water depth categories have been created to show locations with predicted depths during the 100-year storm event over a range from less than one foot to greater than six feet. These depths are expected to be conservative based on our conservative flow values.

The enlargement of the floodplain inundation area in many locations is more extensive in the Town of Stamford and is not addressed in this report. Many industrial and high density residential and commercial parcels are now included in the floodplain which during a large flood may have significant water quality impacts.

4.4.3 Model Validation

Limited data are available to calibrate the hydrology and hydraulic models developed for the Noroton River. The absence of long-term gauge data necessitates monitoring for model calibration. No large floods took place during this study while MMI gauges were deployed, and high water marks were not apparent during field investigations. A preliminary model validation was performed based on available information from both the MMI gauge and on flood observations and damages from Darien residents following the April 15, 2007 flood event.

The hydrology and hydraulic models need to be calibrated to refine them prior to moving into the design phase of the flood control recommendations. Continuing stream gauging and recording high water marks during large floods will be important to facilitate quantitative calibration.

One approximately bankfull flood event occurred on February 25, 2010 while the MMI gauge was in the stream. Field measurement of discharge was completed during the rising limb of the hydrograph, missing the peak flow. Limited water surface elevations were observed at bridge face sections in close time proximity to the discharge measurement. This data was used for a rough comparison to HEC-RAS model results.

At the datalogger location, the HEC-RAS model results were only 0.5 feet lower than the average observed water surface elevation. During the discharge measurement period, the water surface elevation at the gauge changed 0.2 feet during one hour, indicating that observations may have temporal error due to the changing hydrograph. For this known discharge and stage, the Existing Conditions model accurately predicts results. Model results are expected to predict slightly lower water surface elevations for a low flow event. The model will be used for large storm events with much deeper water and necessitate lower roughness values compared to a low flow such as this validation storm. Other observed locations include some amount of error in determining the exact

discharge at time of measurement because flows were only measured at the one gauge location. The MMI gauge was located closer to the downstream end of the hydraulic model reach. The discharge measurements were scaled by a ratio of drainage areas to approximately transfer the discharge at the gauge to the bridge locations.

Unfortunately, measurements of water surface elevation were recorded at bridge face locations where the bridge hydraulics strongly affects water surface elevations and often causes unique local effects that are sensitive to discharge. Observed water surface elevations were well duplicated by the Existing Conditions model for this observed event. The water surface elevations predicted ranged between -0.56 and 1.4 feet different from observations as shown in Table 4-4. The 1.4 foot difference in elevation at Woodway Road may be due to the large distance to the measured gauge location where the flow was measured.

TABLE 4-4
Comparison of Observed Water Surface Elevations During 2/25/2010 Storm to Existing Conditions HEC-RAS Results

Street	Measurement Location	HEC-RAS Existing Conditions River Station	Observed Water Surface Elevation (ft NAVD)	HEC-RAS Water Surface Elevation (ft NAVD)	Difference
DS I-95	Staff gauge	872	4.0	3.7	-0.3
Gauge Location	Gauge cross section	2954	11.8	11.2	-0.5
West Avenue	US, center of bridge, sidewalk	4791	25.2	24.8	-0.4
Camp Avenue	US, center of bridge, top of rock wall	15527	64.4	64.2	-0.2
Woodway Road	US, center of bridge opening, top of stone arch	18922	81.7	83.2	1.4

During the April 15, 2007 storm, 5.9 inches of rain were recorded at a rain gauge in Darien (National Weather Service, 2009). This precipitation event falls between the 10-year (5.0 inches) and 50-year (6.4 inches of rain) TP-40 rainfall events. The flood discharge falls between the 10-year (4,304 cfs) and 50-year (6,948 cfs) recurrence

interval discharges (refer to Table 3-8). Information from residents contained a qualitative description of flooding such as basement flooding or water damage to landscaping. Some responses gave more specific flood depth information that was used for preliminary model validation.

Two locations along the Noroton River have documented flood elevations from the April 15, 2007 storm event. Reasonable agreement exists at the two locations of reported flood elevations between reported flood levels and Existing Conditions model results (Table 4-5). At 42 Lake Drive, the flood report vaguely described home damage, so a specific elevation was not determined. The finished floor elevation is slightly above the 50–year storm, which could have resulted in basement and yard damage. At 21 Lynn Court, an elevation was estimated from an indoor high water mark, which for this storm is just below the modeled 10-year water surface elevation. This indicates that either the existing conditions model is conservative or water surface elevations may not have risen inside the home as high as in the river.

TABLE 4-5
Comparison of Reported Flood Elevations During April 15, 2007 Storm to Existing Conditions HEC-RAS Results

Property Location	Information Reported by Resident	Estimated Flood Elevation From Reported Information	River Station	HEC-RAS Existing Conditions Water Surface Elevation	
				10-year	50-year
42 Lake Drive	Reported flooding damage in home, could be basement flooding	Unclear (finished floor surveyed at 42.97')	9095	39.05	42.81
21 Lynn Court	12.5" off shower floor in first floor of home flooding completely surrounded home	55.15' (finished floor surveyed at 54.11')	12530	55.73	58.4

The coarse information available at the time of this study should be added to as more flood information becomes available. Water surface elevations collected during future storm events can be used to further validate the accuracy of the HEC-RAS models presented in this report.

4.4.4 Existing Condition Model Run With FEMA Effective Flows

Observations and reports of flooding indicate that the Existing Conditions hydraulic modeling may overestimate the extent of flooding. The hydrology modeling produced high flows compared to alternative methods of discharge estimation and FEMA Effective Flow values (Section 3.0). This indicates that flooding may be overestimated by high flow values used in the Existing Conditions model.

The FEMA Effective flow values were run with the updated Existing Conditions hydraulic model geometry to estimate flooding characteristics. The extent of flooding throughout the system was generally comparable to the Existing Conditions floodplain although water surface elevations were similar to FEMA Effective values (Table 4-5). The water surface profile was plotted for comparison with the FEMA Effective and Existing Conditions profiles (Appendix I-1). Differences between the FEMA Effective model and the Existing Conditions model were expected and attributed to changes in geometry including updated channel cross sections and bridge geometry. A few of the bridges with more significant changes from the FEMA Effective model, such as Boston Post Road, Interstate 95, and the downstream railroad crossing, all included newly surveyed geometry that was a substantial change from the FEMA Effective model. As discussed in Section 4.4.2, the Existing Conditions model with the updated flows has higher water surface elevations in the lower reaches of the model due to larger flows.

The floodplain was mapped and plotted for comparison with the FEMA Effective and Existing Conditions results (Appendix I-2). The Existing Conditions floodplain with FEMA flows falls between the Existing Conditions with updated flows and the FEMA Effective Model. Differences are expected due to high resolution newly updated topography, which has much greater detail than the topography used to create the FEMA Effective floodplain. Although the water surface elevations are comparable to the FEMA Effective profile, the extent of the floodplain is much more similar to the Existing Conditions with updated flows.

Although the extent of flooding predicted with the Existing Conditions model with updated flows is greater than when modeled with FEMA Effective flows, the same constriction points are identified regardless of hydrology used. Boston Post Road, West Avenue, the upstream railroad crossing, Camp Avenue, and Woodway Road overtop the roadway and increase flooding upstream. The Interstate 95 and downstream railroad bridge are undersized and raise water surfaces upstream.

TABLE 4-6
Comparison of Water Surface Elevations
Existing Conditions with FEMA Flow Values and Updated Flow Model Results
100-Year (1%) Recurrence Discharge

FEMA Cross Section Location		Water Surface Elevation (Feet NAVD)		
Letter	Description	Existing Conditions With Updated Flows	Existing Conditions With FEMA Flows	Difference (FEMA - Updated)
A	110' DS of Interstate 95	17.75	15.7	-1.5
B	500' US of Interstate 95	24.72	21.1	-2.6
C	165' DS of Railroad Crossing	24.16	22.0	-1.5
D	530' DS of Railroad Crossing	29.7	24.4	-3.4
E	375' DS of West Avenue	39.24	32.5	-4.8
F	320' US of West Avenue	42.2	39.6	-1.9
G	745' DS of Middlesex Road	42.51	40.0	-1.9
H	100' US of Middlesex Road	43.33	41.0	-1.1
I	1,890' US of Middlesex Road	44.44	42.1	-1.4
J	At Bend US of Lynn Court	59.19	58.2	-0.7
K	100' DS of Dam	64.71	63.9	-0.6
L	90' DS of Railroad Crossing	68.53	69.3	0.8
M	85' DS of Camp Avenue	75.53	74.6	-0.7
N	320' US of Camp Avenue	72.87	74.2	1.3
O	1,630' US of Camp Avenue	83.99	81.4	-2.6
P	100' DS of Woodway Road	88.27	87.4	-0.8
Q	261' US of Woodway Road	91.76	91.2	-0.6
R	1,320' US of Woodway Road	92.99	92.1	-0.8
S	2,375' US of Woodway Road	96.83	95.9	-0.9
T	2,800' US of Woodway Road	98.42	97.8	-0.6
U	3,390' US of Woodway Road	99.7	98.9	-0.8

FEMA Cross Section Location		Water Surface Elevation (Feet NAVD)		
Letter	Description	Existing Conditions With Updated Flows	Existing Conditions With FEMA Flows	Difference (FEMA - Updated)
V	3,710' US of Woodway Road	100.27	99.7	-0.6
W	4,490' US of Woodway Road	102.34	101.7	-0.7
X	5,445' US of Woodway Road	107.38	106.2	-1.2
Y	5,840' US of Woodway Road	110.87	110.0	-0.8

4.5 Natural Conditions Model

The natural condition model where all bridges, culverts, and dams are removed from the system geometry can be used to understand the influence of man-made structures on the channel by providing a baseline of potential floodwater surface elevations purely based on channel geometry. Natural conditions modeling highlights the presence of constrictions, changes in channel slope, and variations in channel cross sectional area that control floodwater surface elevations. Comparison of natural and existing conditions often shows where improvements to structures have the ability to decrease flooding. HEC-RAS model output summary is included in Appendix J.

The existing natural conditions model showed expected lower peak floodwater surface elevations upstream of removed structures as compared to the full existing conditions model with structures (Table 4-6). The natural conditions profile was plotted for comparison to the existing conditions 100-year chance event and is presented in Appendix K. The larger the difference in water surface elevation upstream of bridges the more likely the structure is causing flooding due to reduced conveyance. The Boston Post Road, Interstate 95, Woodway Road, and both railroad bridges have the most limiting conveyance, with smaller reductions at other structures. This model also shows that the removal of the West Avenue, Middlesex Road, and Camp Avenue bridges has limited effect on peak floodwater surface elevations, indicating that the channel geometry

is controlling flood levels in this area. The small bridges in the Woodway Country Club have minimal effect on water surface elevation of such a large flow.

The floodplain associated with the natural conditions was mapped and shown in comparison with existing conditions in Appendix K. The inundation area for the 100-year event shows little difference to the existing conditions floodplain. Small differences are seen upstream of the constricting bridges, noted above.

TABLE 4-7
Comparison of Water Surface Elevations
Revised Existing Conditions and Natural Conditions Model Results
1% Recurrence Discharge

FEMA Cross Section Location		Water Surface Elevation (Feet NAVD)		
Letter	Description	Existing Conditions (NAVD)	Natural Conditions (NAVD)	Difference (Natural - Existing)
A	110' DS of Interstate 95	17.27	14.6	-2.7
B	500' US of Interstate 95	23.72	22.0	-1.7
C	165' DS of Railroad Crossing	23.53	22.6	-1.0
D	530' DS of Railroad Crossing	27.79	27.9	0.1
E	375' DS of West Avenue	37.26	34.2	-3.1
F	320' US of West Avenue	41.49	40.0	-1.5
G	745' DS of Middlesex Road	41.81	40.6	-1.3
H	100' US of Middlesex Road	42.07	41.0	-1.1
I	1,890' US of Middlesex Road	43.52	43.0	-0.5
J	At Bend US of Lynn Court	58.92	58.9	0.0
K	100' DS of Dam	64.46	64.5	0.0
L	90' DS of Railroad Crossing	68.43	70.0	1.5
M	85' DS of Camp Avenue	75.31	72.4	-3.0
N	320' US of Camp Avenue	72.87	72.9	0.0
O	1,630' US of Camp Avenue	83.99	84.0	0.0
P	100' DS of Woodway Road	88.27	88.3	0.0
Q	261' US of Woodway Road	91.76	89.9	-1.9
R	1,320' US of Woodway Road	92.99	92.3	-0.7
S	2,375' US of Woodway Road	96.83	96.8	0.0
T	2,800' US of Woodway Road	98.42	98.1	-0.3
U	3,390' US of Woodway Road	99.7	99.6	-0.1
V	3,710' US of Woodway Road	100.27	99.8	-0.5
W	4,490' US of Woodway Road	102.34	102.2	-0.2

FEMA Cross Section Location		Water Surface Elevation (Feet NAVD)		
Letter	Description	Existing Conditions (NAVD)	Natural Conditions (NAVD)	Difference (Natural - Existing)
X	5,445' US of Woodway Road	107.38	107.4	0.0
Y	5,840' US of Woodway Road	110.87	110.8	-0.1

5.0 EVALUATION OF FLOOD MITIGATION MEASURES

Flood mitigation opportunities can be related to managing stream flow rates or modification of the channel and structures. Management of stream flows would come by providing storage within the watershed similar to what might be provided for development of a single lot. The difference would be that management of flows from an 11-square-mile watershed requires more land area than management of flow from a single site. Modification of the channel and/or structures can reduce flood elevations by allowing flow to pass downstream more readily through increased capacity.

The following is a discussion of potential flood mitigation measures for the Noroton River. The first section addresses the potential for reducing downstream flow rates through hydrologic changes within the overall watershed. The second section addresses channel and structure improvements as a hydraulic mitigation approach. A third section is included on floodproofing of structures. While the proposed mitigation, if implemented, will reduce flood depths under some conditions, it is important to understand that property adjacent to river channels may always be subject to flooding. Therefore, it may be necessary to floodproof specific structures rather than relying on channel modifications alone.

5.1 Proposed Hydrologic Mitigation

The primary method for providing hydrologic mitigation is through the use of stormwater storage, which reduces flow rates to downstream floodprone areas through the use of detention. Flow detention or attenuation can be achieved by modifying an existing storage area or creating new storage areas.

The goal for any stormwater storage area is to provide as much storage and attenuation as possible without causing adverse flooding of adjacent areas. This is best achieved when a relatively large watershed area can be collected by an impoundment that has a

proportional amount of available storage and can utilize the detention capabilities of the impoundment and outlet configuration to the full extent. Storage volume can be increased a number of different ways, such as excavation of adjacent areas, increasing berm heights, or constructing new berms or dikes. Existing storage areas can be optimized by modifying the outlet of the impoundment in order to increase, detain, and utilize the available storage volume efficiently.

The difference in timing from different portions of the overall watershed also plays an important role with stormwater detention and downstream peak flow rates. Storage in the upper one-third of the overall watershed typically has the greatest impact on downstream peak flows due to the attenuation or delay of the peak outflow discharging from the storage area in relation to peak flows in the channel downstream. The delaying effect allows flow rates to peak and begin to recede in the downstream channel before the peak outflow from the upper watershed reaches those floodprone areas. Without the delay, the timing of the peaks is likely to coincide more closely. Likewise, providing storage in the lower one-third of the overall watershed can sometimes be detrimental as peak flows from a lower portion of the watershed will occur later in the storm event and, therefore, have the potential to occur more closely to the peak flow in the main channel.

As described in Section 3.0 of this report, the overall watershed for the Noroton River covers a large portion of Darien and extends into the town of New Canaan to the north and into the city of Stamford to the west as well. The majority of the Noroton River watershed is generally developed in all three municipalities. As a result, available areas to increase flood storage are limited. Although numerous surface water bodies and wetland areas exist within the overall Noroton River watershed, most either provide too little storage in relation to the amount of contributing watershed or do not collect enough of the watershed to take full advantage of their available storage.

At this time, hydrologic modeling of potential storage areas has not been analyzed to determine whether peak flow rates are reduced in the Noroton River. As mentioned

above, the greatest impact to peak flows typically occurs when storage areas are added in the upper one-third of the overall watershed. The watershed areas originating in the town of Darien occur in the middle and lower one-third of the watershed. Although some additional storage located within the town of Darien may provide a benefit, a review of the subwatersheds in Darien did not result in areas that are readily available to store stormwater or produce areas that have significant amounts of storage and collect a relatively large amount of watershed. The potential to store stormwater in the upper one-third of the overall watershed may exist although those areas would be located in the town of New Canaan or the city of Stamford. If these potential storage areas are to be pursued further, coordination with the neighboring municipalities would be required to insure agreement between all stakeholders and interested parties.

5.2 Proposed Hydraulic Mitigation

As discussed in Section 4.0, there are a number of factors contributing to flooding along the Noroton River. The causes of flooding vary along the stream corridor and, therefore, the solutions also vary. Because flooding in one location along the channel can impact upstream properties, the upstream and downstream improvements are often inextricably linked. Therefore, the proposed alternatives described in this section were evaluated in isolation and then subsequently evaluated in combination to determine the combined effects of the improvements.

Various flood mitigation measures have been evaluated. The assessment started with evaluation of localized mitigation measures, and then cumulative measures that evaluated two or more alternatives were modeled.

For all alternatives evaluated, the preliminary 1% chance (100-year return interval) flood event flow of 7,591 cubic feet per second (cfs) was used. The history of channel modification decreases the number of alternatives effective at larger storm volumes. Alternatives were also evaluated to see if they reduce flooding for the 4% chance (25-

year return interval) flood event of 4,851 cfs (see Section 3.0). The steady flow existing conditions HEC-RAS model presented in Section 4.4 was used as a basis for this analysis. HEC-RAS output summary tables for each alternative are presented in Appendix L. Table 5-1 is a summary of all alternatives modeled.

TABLE 5-1
Summary of Alternatives

Alternative	Location	Description
1	Downstream of Railroad Crossing Near Avalon Darien Neighborhood	Create Floodbench on Left Bank; Remove Channel Constriction
2	Downstream Railroad Bridge	Increase Capacity at Railroad Bridge by Adding Overflow Culvert
3A	West Avenue	Replace West Avenue Bridge
3B	West Avenue	Widen Channel Upstream of West Avenue
3C	West Avenue	3A + 3B
4A	Sharp Bend at Lynn Court	Repaired and Increased Height of Existing Berm
4B	Sharp Bend at Lynn Court	Softened Bend, Removed Building
5	Dam in St. John's Cemetery	Remove Unused Dam and Upstream Sediments
6	Railroad Bridge in St. John's Cemetery	Replace Railroad Bridge and Modify Upstream and Downstream Approaches
7A	Upstream of Camp Avenue	Widen Channel Upstream of Camp Avenue
7B	Upstream of Camp Avenue	Alternatives 6 and 7A

5.2.1 Alternative 1: Create Floodbench Near Avalon Darien Neighborhood

Statement of Problem: There is significant flooding upstream of the downstream railroad crossing, extending upstream of West Avenue. The channel downstream of the railroad takes a sharp turn and is constricted in a narrow heavily rock-armored section of channel with tall steep banks and no access to floodplain or overbank flow areas. Modeling indicates high velocities through this area and that the constriction may be influencing the water exiting the railroad structure. Significant erosion is occurring on the left bank, and a large channel-spanning debris jam has accumulated at the upstream end of the

constricted section. Due to the heavy armoring of the channel, during a large flood water could potentially exacerbate the eroding section and carve a new floodpath into the Avalon Darien neighborhood, taking the path of least resistance.

Proposed Mitigation: A new floodplain area was modeled, carved into the tall armored left bank adjacent to the Avalon Darien neighborhood (Figure 5-1). A floodbench at this location would provide a channel cross section more similar to what is seen upstream and downstream of the area, with a small adjacent floodplain, removing the constriction. The floodbench would begin just upstream of the erosion hotspot, grading the bank at a 3:1 slope to improve stability. The floodbench would be approximately 500 feet along the channel and vary from approximately 0 to 60 feet wide. The channel was maintained in its current location and form, including the currently armored toe. Creation of the floodbench would require significant excavation and removal of trees. Modeling assumed a 15-foot offset from the current Avalon Darien fenceline to the new top of bank.

Results of Analysis: Increasing channel overbank flow area decreased predicted water surface elevations by 2.7 feet for the 100-year event. Without additional changes at the bridge, these changes in water surface do not significantly affect water surface elevations upstream of the railroad crossing. This alternative is considered to be beneficial although large changes in water surface elevation are not shown by the modeling. Average channel velocities were decreased, which would decrease debris jamming and reduce further erosion hazards. Table 5-2 presents a summary of the results of this modeling.

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LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-1 Alt1
SOURCE: Microsoft Virtual Earth

N

Alternative 1

Map By: JSC
Date: May 2010
Scale: 1"=150'

SHEET: Figure 5-1

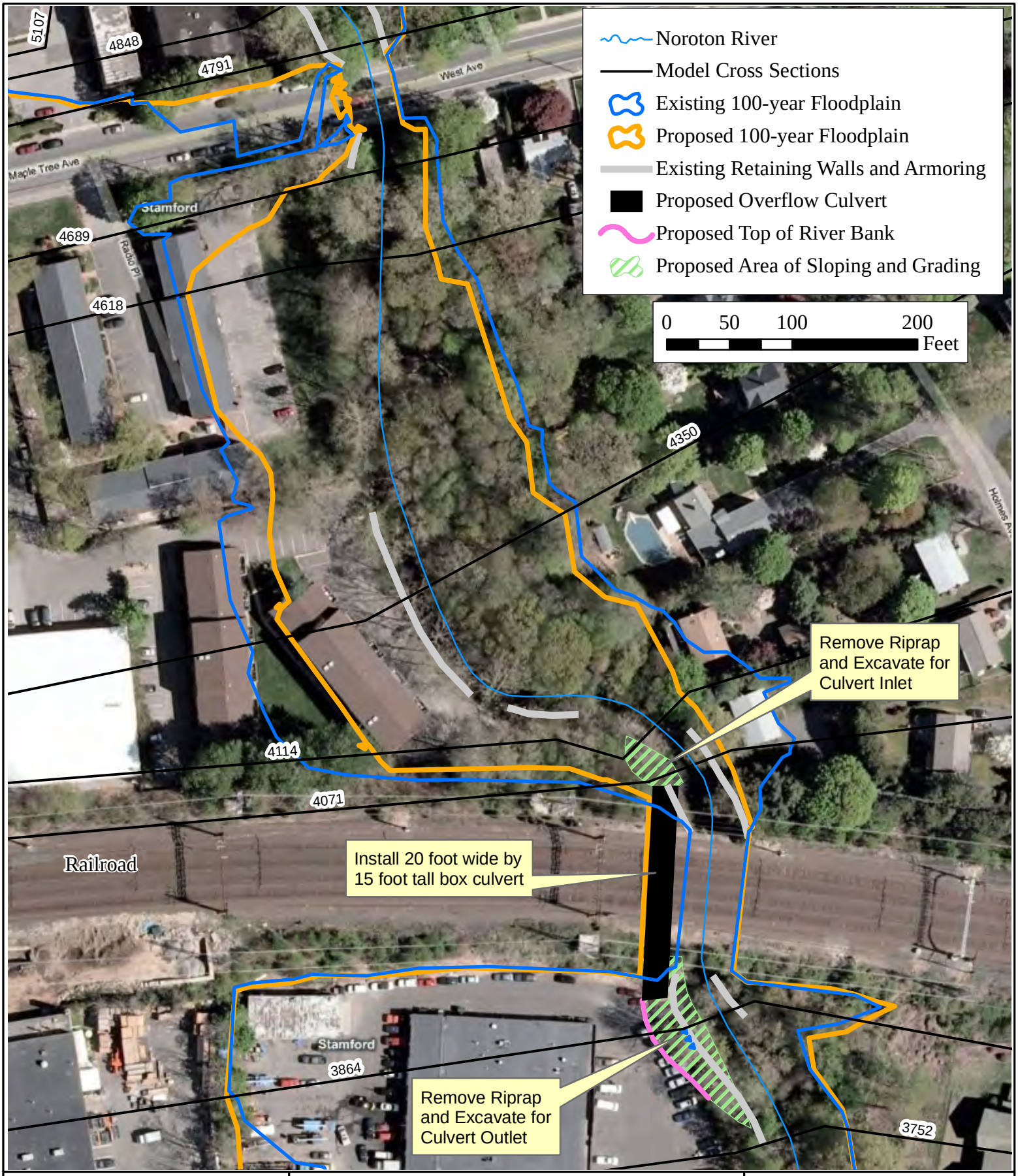
TABLE 5-2
Results of Alternative 1

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25-Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year r
Interstate 95							
	1260	20.1	20.1	0.0	23.6	23.6	0.0
	1335	20.1	20.1	0.0	23.7	23.7	0.0
	1544	20.9	20.9	0.0	23.9	23.9	0.0
B	1724	20.8	20.8	0.0	23.7	23.7	0.0
	1978	20.9	20.9	0.0	23.6	23.6	0.0
	2232	21.6	21.6	0.0	24.6	24.6	0.0
	2495	21.8	21.8	0.0	24.8	24.8	0.0
	2752	21.8	21.8	0.0	24.8	24.8	0.0
	2954	21.6	21.6	0.0	24.7	24.7	0.0
	3183	21.1	21.5	0.4	24.6	24.7	0.1
C	3386	21.7	21.8	0.1	23.5	24.4	0.8
	3536	22.1	22.2	0.1	23.9	24.6	0.7
D	3752	23.9	23.0	-0.9	27.8	25.1	-2.7
	3864	24.6	24.0	-0.5	28.0	26.4	-1.6
Conrail							
	4071	29.6	29.5	0.0	36.4	36.4	0.0
	4114	31.4	31.4	0.0	37.3	37.3	0.0

5.2.2 Alternative 2: Modify Downstream Railroad Bridge

Statement of Problem: Neighborhoods upstream of West Avenue along Holmes Avenue, Park Lane, and Rose Lane are shown within the existing conditions floodplain. The West Avenue bridge experiences backwatering from the railroad crossing downstream, blocking conveyance of water. Reducing backwatering at the West Avenue bridge would restore conveyance and could reduce upstream flooding.

Proposed Mitigation: An overflow culvert was added to the west of the existing arch through the tall railroad embankment (Figure 5-2). Due to the poor alignment of the



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LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-2 Alt2
SOURCE: Microsoft Virtual Earth

N

Alternative 2

Map By: JSC
Date: May 2010
Scale: 1"=100'

SHEET: Figure 5-2

current opening and the wide embankment, an overflow culvert would be very long. A 170-foot long, 20-foot wide, 15-foot tall box culvert was modeled. Low flows would still be concentrated in the existing channel. The downstream exit of the culvert would need extensive grading and require a small area currently used as parking for the industrial area in Stamford.

Results of Analysis: This alternative provided significant water surface elevation reduction between the railroad crossing and West Avenue. Benefits did not extend upstream of West Avenue, where the problem flooding is occurring. Table 5-3 presents the results of this analysis.

TABLE 5-3
Results of Alternative 2

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25-Year	Proposed Conditions 25- Year r	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
D	3752	23.9	23.9	0.0	27.8	27.8	0.0
	3864	24.6	26.1	1.5	28.0	29.4	1.4
Conrail							
	4071	29.6	27.1	-2.4	36.4	31.3	-5.1
	4114	31.4	28.2	-3.2	37.3	32.9	-4.4
E	4350	31.4	28.3	-3.1	37.3	32.9	-4.4
	4618	31.6	29.7	-1.9	37.3	33.1	-4.2
	4689	31.5	27.6	-3.9	37.4	32.7	-4.6
West Avenue							
	4791	34.6	34.6	0.0	39.1	38.5	-0.6
	4848	35.8	35.8	0.0	40.6	40.6	0.0

5.2.3 Alternative 3A: Replace West Avenue Bridge

Statement of Problem: Extensive flooding occurs upstream of the West Avenue bridge even after relieving downstream backwatering by replacement of the railroad crossing,

presented above. The rise in water surface elevation directly upstream of West Avenue bridge indicates that the bridge is undersized and contributing to flooding upstream.

Proposed Mitigation: The West Avenue bridge was modeled as a 45-foot wide opening, increasing the width by nine feet (Figure 5-3). The bridge was expanded to the left (Darien side) of the river. The upstream cross section required widening for a smooth transition to the wider bridge opening. The wider bridge fits without significant encroachment on adjoining properties.

Results of Analysis: This alternative shows reductions in water surface elevations upstream. The predicted water surface elevations for the 25-year storm were reduced up to 2.7 feet upstream of West Avenue, with smaller reductions extending upstream of Middlesex Road. The 100-year predicted water surface elevations were reduced by up to one foot upstream of West Avenue, with a very small increase in water surface elevation upstream of Middlesex Road. Table 5-4 presents the results of this analysis.

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LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-3 Alt3A
SOURCE: Microsoft Virtual Earth

N

Alternative 3A

Map By: JSC
Date: May 2010
Scale: 1"=300'

SHEET: Figure 5-3

TABLE 5-4
Results of Alternative 3A

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25-Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	4689	31.5	31.5	0.0	37.4	37.4	0.0
West Avenue							
	4791	34.6	33.2	-1.5	39.1	39.7	0.5
	4848	35.8	33.1	-2.7	40.6	39.6	-1.0
F	5107	36.6	34.4	-2.1	41.5	40.7	-0.8
	5330	37.1	35.6	-1.5	41.7	40.9	-0.8
	5553	37.1	35.6	-1.5	41.7	40.9	-0.8
	5753	36.5	35.0	-1.5	41.6	40.8	-0.8
G	5950	37.7	37.4	-0.2	41.8	41.1	-0.7
	6145	37.7	37.5	-0.2	41.8	41.1	-0.7
	6348	37.2	37.0	-0.2	41.5	40.7	-0.8
	6584	37.8	37.6	-0.2	41.7	41.0	-0.7
	6661	38.2	38.1	-0.1	41.9	41.3	-0.6
Middlesex Road							
	6777	39.0	38.9	-0.1	42.1	42.2	0.1
H	6850	39.1	38.9	-0.1	42.1	42.2	0.1
	6907	39.3	39.2	-0.1	42.4	42.5	0.1
	6923	39.5	39.4	-0.1	42.6	42.7	0.1
	7095	39.7	39.6	-0.1	42.8	42.9	0.1
	7307	39.7	39.6	-0.1	42.8	42.9	0.1
	7512	39.7	39.6	-0.1	42.8	42.9	0.1
	7717	39.7	39.6	-0.1	42.8	42.9	0.1
	7925	39.6	39.5	-0.1	42.7	42.8	0.1
	8130	39.8	39.7	-0.1	42.8	42.9	0.1
	8351	39.2	39.1	-0.1	42.5	42.6	0.1
I	8593	40.6	40.6	-0.1	43.5	43.6	0.0
	8837	40.6	40.5	-0.1	43.5	43.6	0.1
	9095	41.1	40.6	-0.5	43.2	43.3	0.1
	9350	43.0	42.8	-0.2	44.2	44.2	0.0
	9606	43.0	42.8	-0.2	44.2	44.2	0.0
	9864	43.2	43.0	-0.1	44.4	44.4	0.0
	10120	43.4	43.3	-0.1	44.6	44.6	0.0
	10364	43.7	43.7	-0.1	45.0	45.0	0.0
	10499	44.4	44.4	0.0	45.4	45.4	0.0

5.2.4 Alternative 3B: Channel Improvements Upstream of West Avenue

Statement of Problem: Flooding upstream of West Avenue was improved but not eliminated by replacement of either the railroad or West Avenue bridges. Examination of the natural profile shows that the water surface elevations in this area were only slightly reduced by complete removal of the bridges. This indicates that the channel cross section upstream of West Avenue is limiting conveyance.

Proposed Mitigation: Channel capacity upstream of West Avenue was increased. The channel was widened for 1,200 feet upstream of West Avenue, extending to approximately 200 feet upstream of Rose Lane (Figure 5-4). All channel widening was on the left bank (Darien side), leaving the right bank intact. Implementation is considered to be more feasible if all work is performed within the town of Darien. The removal of one building at #2 Park Lane would be necessary to complete this channel widening without widening on the Stamford side. This building is listed as being owned by Conn-American Water Company. An approximate channel base width of 45 feet was used. This width approximates the upstream and downstream channel sections. The left bank was graded at a 2:1 slope. This steep slope was chosen to minimize impacts to adjoining properties and eliminate the need to remove a second home on Park Lane. The alternative channel configuration preserves a 25-foot setback from the edge of Park Lane.

Results of Analysis: This alternative produces little reduction of flooding for either the 25- or 100-year storm intensities. Small reductions of less than 0.7 feet are predicted for the 25-year storm, extending upstream of Middlesex Avenue. The 100-year storm has smaller reductions of only 0.4 feet upstream of West Avenue. The 100-year water surface elevation was increased upstream of Middlesex Road. This alternative is not considered to be worth the large costs without also implementing additional flood control measures. Table 5-5 presents the results of this analysis.

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MXD: H:\5-4 Alt3B
SOURCE: Microsoft Virtual Earth

N

Alternative 3B

Map By: JSC
Date: May 2010
Scale: 1"=300'

SHEET: Figure 5-4

TABLE 5-5

Results of Alternative 3B

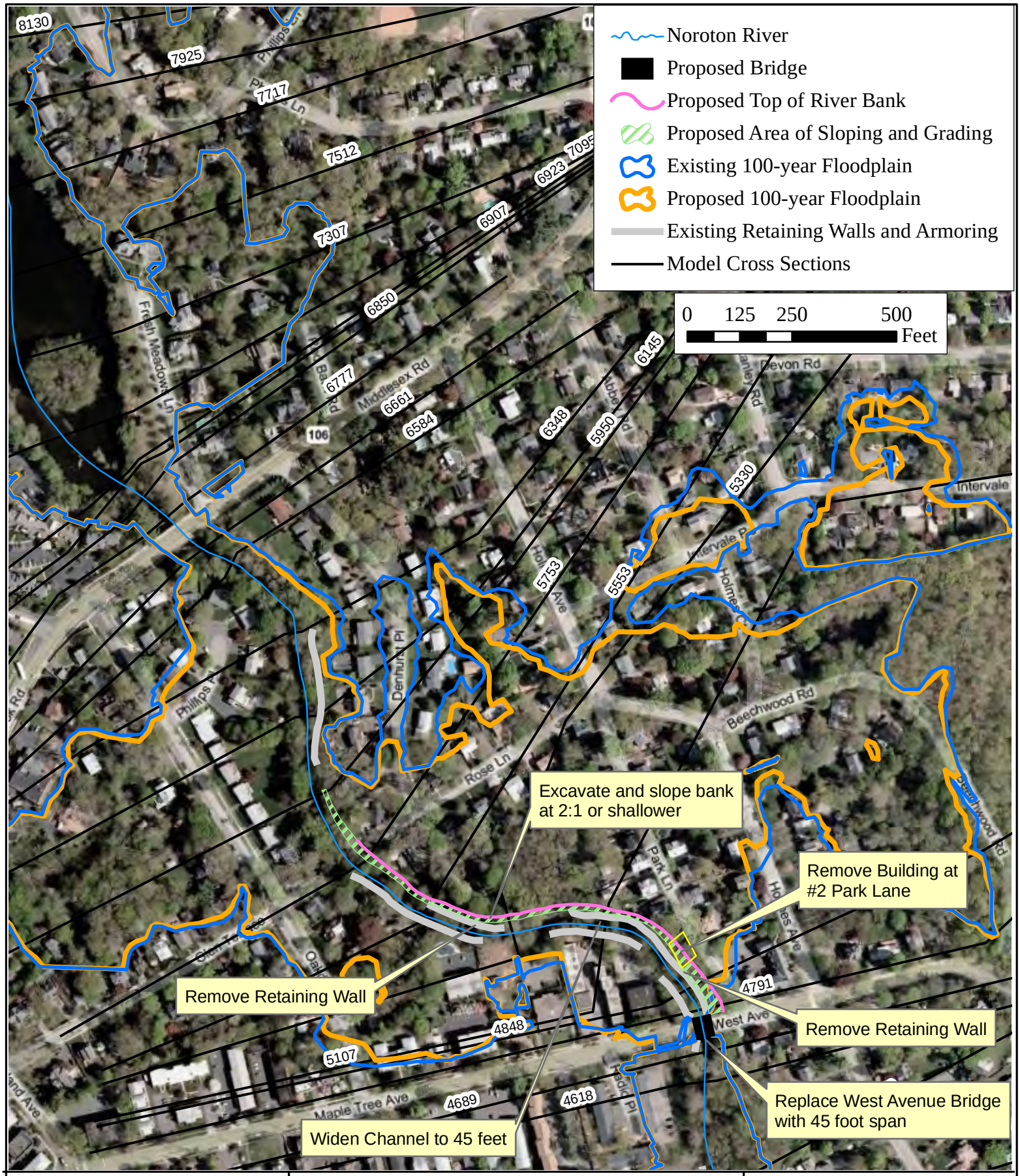
Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25-Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	4689	31.5	31.5	0.0	37.4	37.4	0.0
West Avenue							
	4791	34.6	35.3	0.7	39.1	40.4	1.3
	4848	35.8	35.4	-0.3	40.6	40.3	-0.3
F	5107	36.6	36.2	-0.4	41.5	41.2	-0.3
	5330	37.1	36.7	-0.4	41.7	41.4	-0.3
	5553	37.1	36.7	-0.4	41.7	41.4	-0.3
	5753	36.5	36.4	-0.1	41.6	41.3	-0.2
G	5950	37.7	37.1	-0.6	41.8	41.5	-0.3
	6145	37.7	37.1	-0.6	41.8	41.5	-0.3
	6348	37.2	36.5	-0.7	41.5	41.1	-0.4
	6584	37.8	37.3	-0.5	41.7	41.3	-0.3
	6661	38.2	37.8	-0.4	41.9	41.6	-0.3
Middlesex Road							
	6777	39.0	38.6	-0.4	42.1	42.5	0.4
H	6850	39.1	38.7	-0.4	42.1	42.5	0.5
	6907	39.3	39.0	-0.4	42.4	42.8	0.4
	6923	39.5	39.2	-0.4	42.6	43.0	0.4
	7095	39.7	39.3	-0.3	42.8	43.1	0.4
	7307	39.7	39.4	-0.3	42.8	43.2	0.4
	7512	39.7	39.4	-0.3	42.8	43.2	0.4
	7717	39.7	39.4	-0.3	42.8	43.1	0.4
	7925	39.6	39.3	-0.3	42.7	43.0	0.4
	8130	39.8	39.5	-0.3	42.8	43.2	0.4
	8351	39.2	38.9	-0.4	42.5	43.0	0.5
I	8593	40.6	40.5	-0.2	43.5	43.8	0.2
	8837	40.6	40.4	-0.2	43.5	43.8	0.2
	9095	41.1	41.1	0.0	43.2	43.6	0.3
	9350	43.0	43.0	0.0	44.2	44.3	0.1
	9606	43.0	43.0	0.0	44.2	44.3	0.1
	9864	43.2	43.2	0.0	44.4	44.5	0.1
	10120	43.4	43.4	0.0	44.6	44.7	0.1
	10364	43.7	43.7	0.0	45.0	45.1	0.1
	10499	44.4	44.4	0.0	45.4	45.5	0.0

5.2.5 Alternative 3C: Alternative 3A + Alternative 3B

Statement of Problem: Flooding persists upstream of West Avenue after consideration of either bridge replacement or channel widening. Additional reduction of water surface elevation is desired.

Proposed Mitigation: The replacement of the West Avenue bridge with a 45-foot span was modeled in combination with upstream channel improvements (Figure 5-5). This alternative uses configurations described in Alternatives 3A and 3B.

Results of Analysis: Predicted water surface elevations were reduced further, as compared to Alternatives 3A or 3B modeled individually. The 25-year water surface elevations were reduced up to 2.7 feet upstream of West Avenue. The 100-year storm does not predict a rise in water surface elevation upstream of Middlesex Road, as was predicted in Alternatives 3A and 3B. Inclusion of channel widening improved results of bridge replacement alone in the areas upstream of Rose Lane and extending upstream of Middlesex Road. The channel constriction had been causing some backwatering in that upstream area. Table 5-6 presents the results of this analysis.



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LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-5 Alt3C
SOURCE: Microsoft Virtual Earth

N

Alternative 3C

Map By: JSC
Date: May 2010
Scale: 1"=300'

SHEET: Figure 5-5

TABLE 5-6
Results of Alternative 3C

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25-Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	4689	31.5	31.5	0.0	37.4	37.4	0.0
West Avenue							
	4791	34.6	33.2	-1.5	39.1	39.7	0.5
	4848	35.8	33.2	-2.6	40.6	39.7	-0.9
F	5107	36.6	34.4	-2.1	41.5	40.6	-0.9
	5330	37.1	35.3	-1.8	41.7	40.8	-0.9
	5553	37.1	35.3	-1.8	41.7	40.8	-0.9
	5753	36.5	34.9	-1.6	41.6	40.7	-0.8
G	5950	37.7	36.1	-1.6	41.8	41.0	-0.9
	6145	37.7	36.2	-1.5	41.8	41.0	-0.9
	6348	37.2	35.4	-1.8	41.5	40.5	-1.0
	6584	37.8	36.6	-1.2	41.7	40.8	-0.8
	6661	38.2	37.3	-1.0	41.9	41.2	-0.7
Middlesex Road							
	6777	39.0	38.1	-0.9	42.1	42.0	0.0
H	6850	39.1	38.2	-0.9	42.1	42.1	0.0
	6907	39.3	38.5	-0.8	42.4	42.4	0.0
	6923	39.5	38.7	-0.8	42.6	42.6	0.0
	7095	39.7	38.9	-0.7	42.8	42.8	0.0
	7307	39.7	39.0	-0.7	42.8	42.8	0.0
	7512	39.7	39.0	-0.7	42.8	42.8	0.0
	7717	39.7	39.0	-0.7	42.8	42.8	0.0
	7925	39.6	38.9	-0.7	42.7	42.7	0.0
	8130	39.8	39.1	-0.7	42.8	42.8	0.0
	8351	39.2	38.3	-0.9	42.5	42.5	0.0
I	8593	40.6	40.3	-0.4	43.5	43.5	0.0
	8837	40.6	40.2	-0.4	43.5	43.5	0.0
	9095	41.1	41.1	0.0	43.2	43.2	0.0

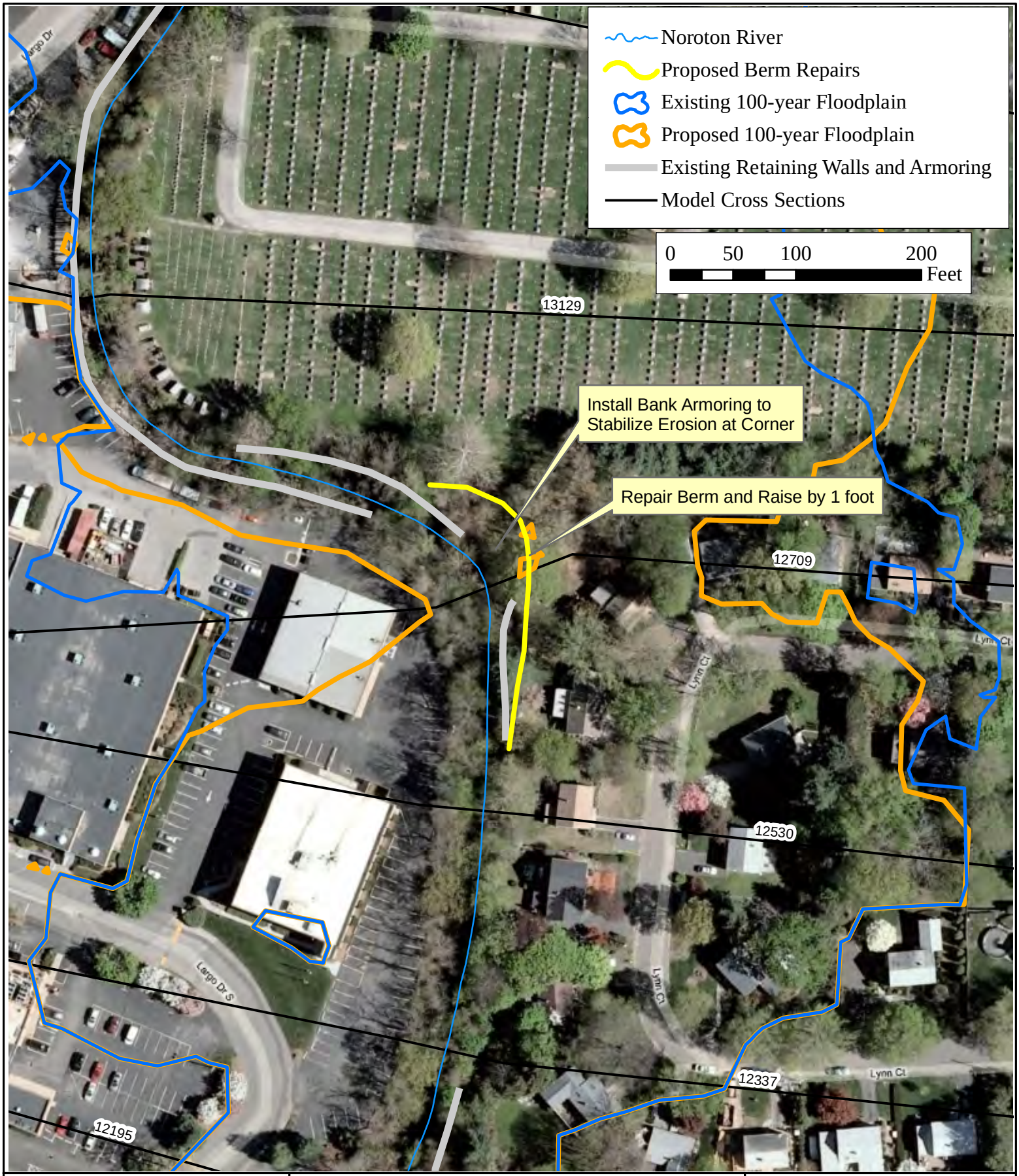
5.2.6 Alternative 4A: Repair Berm at Sharp Bend Near Lynn Court

Statement of Problem: Residents along Lynn Court have experienced flooding in multiple recent storm events. Reports include water flowing in the channel exiting the

channel and flowing between the homes instead of taking the sharp bend of the river. A small berm was built in the past to deflect overbank flows downstream instead of into the neighborhood. The berm is deteriorated and eroded away at the sharp bend. Significant erosion is occurring at the bend, and gabion type armoring is failing.

Proposed Mitigation: This alternative includes repairing the berm at the sharp bend by rebuilding to the height of approximately 27 feet NAVD and adding one foot to deflect a design storm of the 25-year flood water surface elevation (total height of five feet) (Figure 5-6). Bank stabilization will be necessary to control current erosion and prevent further sharpening of the already sharp bend. This alternative assumed some bank grading and installation of bank armoring, without encroaching further into the channel cross section.

Results of Analysis: This alternative has a local decrease in water surface elevation in the vicinity of the sharp bend. Channel velocities are increased due to a more confined flow area. This alternative does not address backwatering into storm drainage or complete isolation of the neighborhood by building a sealed levee; therefore, inundation in the neighborhood is expected to still occur. Benefits of this alternative are not all quantified in the hydraulic model. Deflection of upstream floodwater along the path of the channel and not into the neighborhood is expected. During smaller storm events, significant flooding has occurred from water exiting the channel along this now cut-off route. Continued erosion and migration of the sharp bend should be halted or slowed. Table 5-7 presents the results of this analysis.



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LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-6 Alt4A
SOURCE: Microsoft Virtual Earth

N

Alternative 4A

Map By: JSC
Date: May 2010
Scale: 1"=100'

SHEET: Figure 5-6

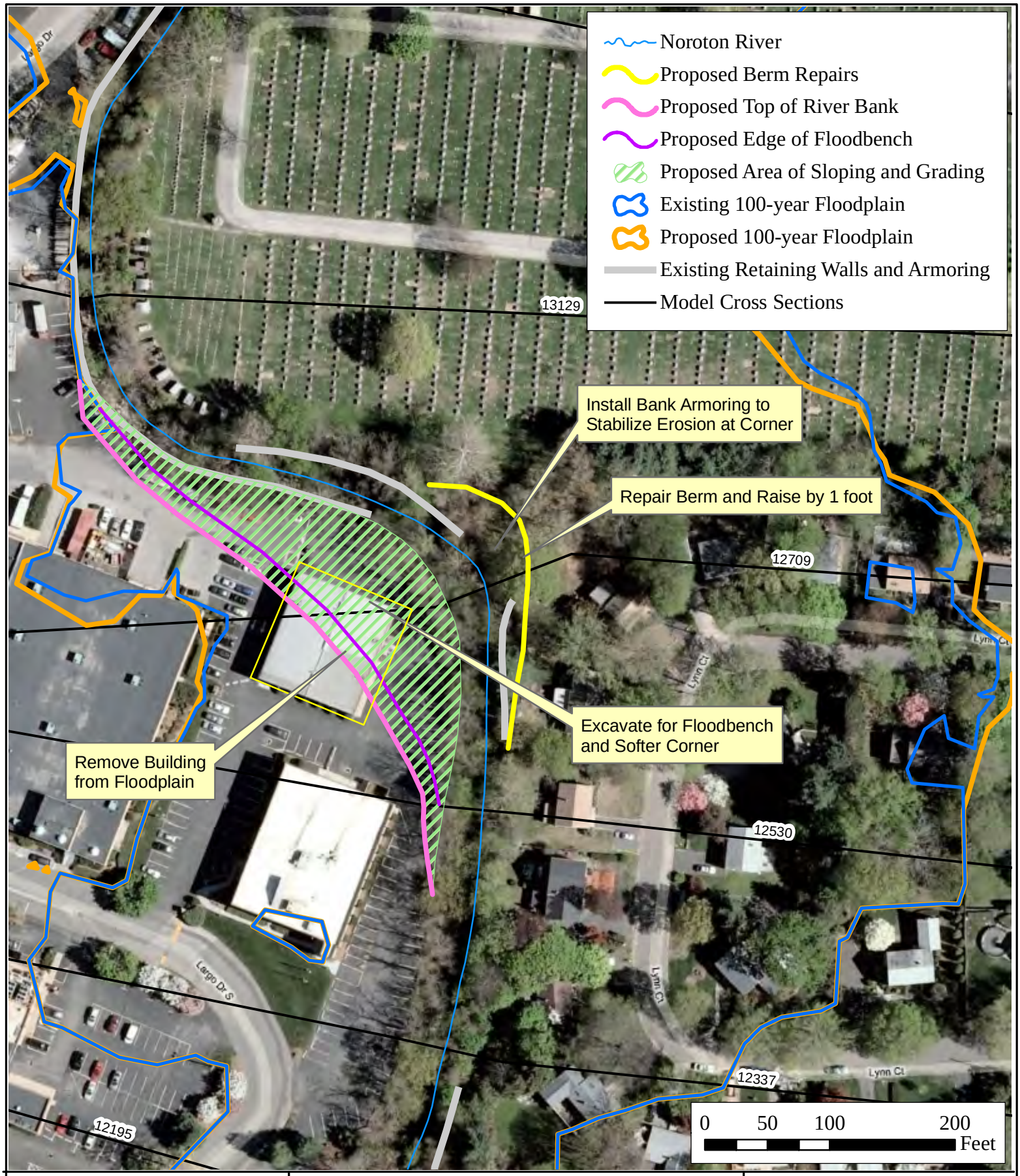
TABLE 5-7
Results of Alternative 4A

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25- Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	12530	56.8	56.8	0.0	58.7	58.7	0.0
J	12709	57.2	56.8	-0.4	58.9	55.6	-3.3
	13129	58.9	59.5	0.6	60.7	63.2	2.5
	13435	62.6	62.6	0.0	63.6	63.6	0.0
K	13634	63.5	63.5	0.0	64.5	64.5	0.0
	13742	63.5	63.5	0.0	64.3	64.3	0.0

5.2.7 Alternative 4B: Realign Sharp Bend Near Lynn Court

Statement of Problem: The river takes a sharp S-turn bend at the downstream side of St. John's Cemetery. It is confined between the cemetery on the north, Lynn Court residences to the east, and commercial buildings and parking to the west. The filling and encroachment of the floodplain have eliminated any natural floodplain areas that would help to contain flood flows. The unnaturally sharp bends have been created as these areas were developed. As described above, flooding of the Lynn Court neighborhood occurs in part because overbank flows travel straight east into this neighborhood when the channel makes the sharp turn to the south. Pressure of flow directed at the bank at the sharp turn has eroded the bank and caused erosion and continued sharpening of the turn.

Proposed Mitigation: Softening of the river bend at Lynn Court is proposed along with berming and bend armoring presented in Alternative 4A (Figure 5-7). Softening of a river bend increases conveyance along the river's main path and directs the majority of the flow and velocities along the river instead of toward the bank. In order to create a larger radius curve (less sharp bend), the river must be moved toward the west into the existing commercial area. This alternative would include removal of parking and a building in Stamford, which is considered to be an extreme measure. The building is



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LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-7 Alt4B
SOURCE: Microsoft Virtual Earth

N

Alternative 4B

Map By: JSC
Date: May 2010
Scale: 1"=100'

SHEET: Figure 5-7

shown to be in the 100-year floodplain and 25-year inundation area and may be a candidate for removal as part of a floodplain mitigation program.

Results of Analysis: This alternative does not produce results well defined in the hydraulic model, showing a slight increase in water surface elevation at the bend and decreases upstream in the cemetery. The inclusion of the additional cross-sectional area has allowed the flood volume to remain expanded across the floodplain, as it does upstream in St. John's Cemetery. The channel downstream is still constricted, producing the same water surface elevations downstream of the bend and in the Lynn Court neighborhood. Water velocities are decreased at the bend, which would decrease erosion potential and better allow the water to travel the main path of the channel. Benefits not quantified by the modeling include a lower tendency for the channel to avulse from its current path and additional increase in conveyance not considered in a model with this level of detail. Table 5-8 presents the results of this analysis.

TABLE 5-8
Results of Alternative 4B

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25- Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	12530	56.8	56.8	0.0	58.7	58.7	0.0
J	12709	57.2	58.1	0.8	58.9	59.8	0.8
	13129	58.9	56.3	-2.6	60.7	60.0	-0.7
	13435	62.6	62.6	0.0	63.6	63.6	0.0
K	13634	63.5	63.5	0.0	64.5	64.5	0.0
	13742	63.5	63.5	0.0	64.3	64.3	0.0
Dam							

Mitigation for smaller scale storm events is recommended for this area. This includes features discussed as part of Alternative 4A. Restabilization of the sharp bend with armoring and instream deflectors will move flow along the channel path. Rebuilding of

the small berm will help keep water from the main flow from entering the Lynn Court neighborhood. As properties are sold or redeveloped, the path of the river and flooding of the areas should be considered, and river work explored in Alternative 4B could be implemented over time.

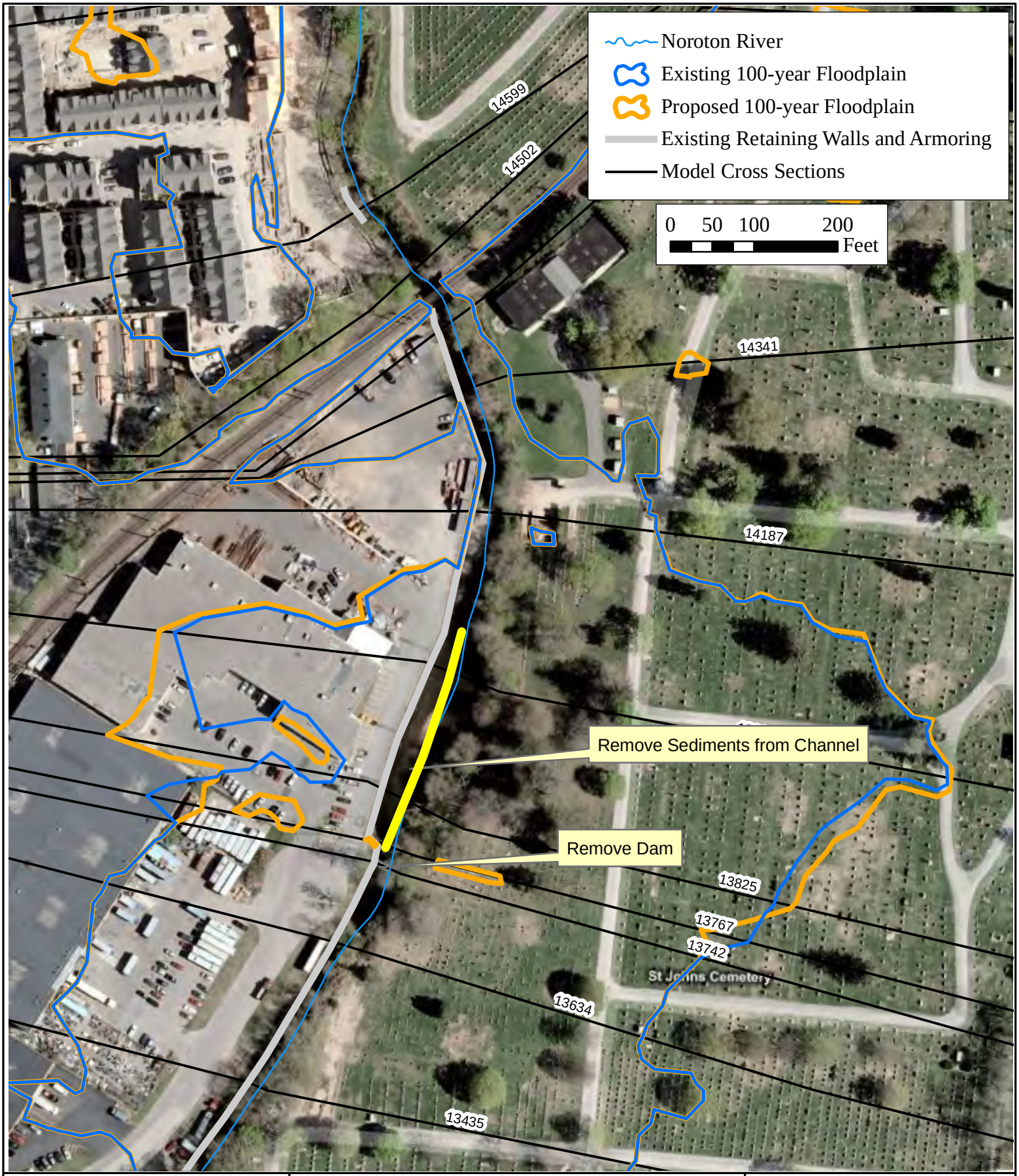
Further reduction of flooding within the Lynn Court neighborhood would require large-scale expensive channel re-engineering. This scale of project was pursued in the 1950s on the Noroton River, and time has judged these efforts as varying in effectiveness. The channel along and downstream of Lynn Court appears to be under capacity to completely contain the flows modeled. Inundation of the surrounding neighborhoods occurs even at the 25-year storm. The neighborhood was originally built within the floodplain that would help to convey these large-scale flood flows. Major projects could be undertaken to widen, deepen, and generally increase the capacity of the downstream channel. Effects on downstream properties of such a project would need to be considered.

5.2.8 Alternative 5: Remove Dam Near St. John's Cemetery

Statement of Problem: A dam impounds water and sediments adjacent to St. John's Cemetery. This dam is unused and has signs of deterioration and scour. Significant flooding occurs upstream of the railroad crossing. The railroad crossing is backwatered by the dam impoundment during flood flows.

Proposed Mitigation: The dam was removed from the model along with upstream sediments (Figure 5-8). Sediments were removed in the 400 feet upstream of the dam to create a constant 0.0081 bed slope connecting sections of channel upstream and downstream. Up to 3.3 feet of sediments were removed, increasing channel capacity.

Summary of Results: The effect was small and localized between the dam removal site and the railroad bridge. There is no reduction in water surface elevations upstream of the



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Noroton River Watershed Drainage Evaluation

LOCATION: **Darien and Stamford, CT**

MMI#: 1581-04-3
MXD: H:\5-8 Alt5
SOURCE: Microsoft Virtual Earth

N

Alternative 5

Map By: JSC
Date: May 2010
Scale: 1"=150'

SHEET: **Figure 5-8**

railroad bridge. This alternative should be combined with improvements at the railroad bridge to evaluate compound effects. Table 5-9 presents these results.

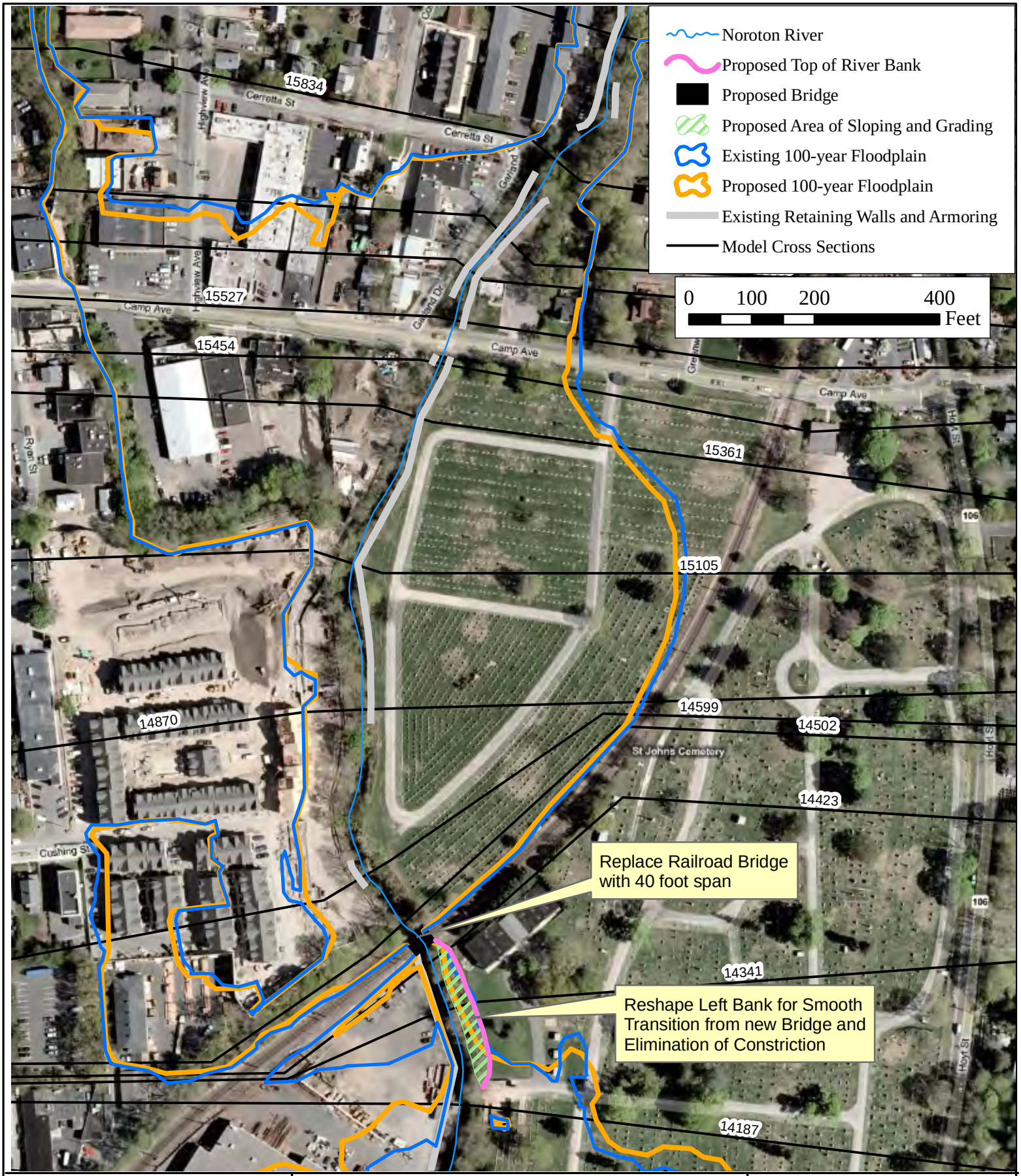
TABLE 5-9
Results of Alternative 5

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25- Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	13742	63.5	63.5	0.0	64.3	64.3	0.0
Dam							
	13767	64.7	63.4	-1.2	65.4	63.9	-1.5
	13825	65.0	64.1	-0.9	65.5	66.6	1.1
	13988	65.7	64.8	-0.9	66.7	66.9	0.2
	14187	65.4	62.7	-2.7	63.9	63.9	0.0
L	14341	65.9	65.9	0.0	68.4	68.4	0.0
	14423	70.1	70.1	0.0	69.3	69.3	0.0
Conrail							
	14501	74.0	74.0	0.0	75.2	75.2	0.0

5.2.9 Alternative 6: Replace Upstream Railroad Bridge in St. John's Cemetery

Statement of Problem: The upstream railroad bridge, located in St. John's Cemetery, is undersized, increasing water surface levels upstream. Backwatering from this bridge overtops Camp Avenue during large storm events. Residents have complained of flooding in this area. Backwatering may also contribute to overall drainage issues in the surrounding neighborhoods. The elevated railroad embankment spans the entire floodplain, blocking all overbank flow and increasing flood potential upstream.

Proposed Mitigation: Multiple bridge configurations were explored. A 40-foot clear bridge span was selected as the best alternative to replace the 28-foot timber bridge (Figure 5-9). The upstream and downstream approaches would need to be modified to accommodate the larger bridge opening. Downstream of the bridge, the channel is constricted between a tall bank of the cemetery and a concrete wall along the industrial



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-9 Alt6
SOURCE: Microsoft Virtual Earth

N

Alternative 6

Map By: JSC
Date: May 2010
Scale: 1"=200'

SHEET: Figure 5-9

area parking lot. To facilitate a smooth transition from the enlarged bridge opening, 200 feet of the downstream channel must be widened. Channel widening is not expected to significantly impact adjacent properties, and modeling contained channel improvements to the shrubby bank and 10 feet of lawn on the cemetery property.

Summary of Results: Increasing conveyance at this bridge decreased water surface elevations upstream by up to 5.5 feet for the 25-year event. Reductions in water surface elevations of approximately one foot were seen upstream of Camp Avenue for both the 100-year and 25-year events. Table 5-10 summarizes results.

TABLE 5-10
Results of Alternative 6

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25- Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
Dam							
	13767	64.7	64.7	0.0	65.4	65.4	0.0
	13825	65.0	65.0	0.0	65.5	65.5	0.0
	13988	65.7	65.7	0.0	66.7	66.7	0.0
	14187	65.4	65.4	0.0	63.9	65.9	2.0
L	14341	65.9	65.8	-0.1	68.4	65.0	-3.4
	14423	70.1	66.0	-4.0	69.3	67.1	-2.2
Conrail							
	14502	74.0	68.5	-5.5	75.2	74.3	-0.9
	14599	74.1	69.2	-4.9	75.2	74.3	-0.9
	14870	74.1	69.8	-4.3	75.2	74.4	-0.9
	15105	74.2	70.0	-4.2	75.3	74.4	-0.8
M	15361	74.2	70.2	-4.0	75.3	74.5	-0.8
	15454	74.2	72.5	-1.6	75.3	74.5	-0.8
Camp Avenue							
	15527	74.2	73.2	-1.0	75.3	74.5	-0.9
	15610	74.3	73.4	-0.9	75.4	74.7	-0.8
	15688	74.4	73.8	-0.7	75.6	74.9	-0.6
N	15834	73.6	71.4	-2.2	72.9	72.9	0.0
	16072	76.0	76.0	0.0	77.9	77.9	0.0

Even after replacement, the railroad crossing causes increased water surface levels upstream. This flooding upstream is exacerbated by the severe floodplain constriction of the railroad embankment crossing the floodplain that is necessary to the function of the railroad. Decreasing channel resistance and backwatering downstream from the dam and removal of sediment accumulation may increase capacity at the bridge. The removal of the downstream dam and sediments was modeled in conjunction with this alternative. There was no additional flood relief from the two alternatives modeled individually.

In order to understand the effects that enlarging the railroad bridge opening would have on the downstream hydrology, the existing conditions HEC-HMS model was modified to include the new opening. By increasing the width of the opening, the relationship between discharge and stage would be modified from a reservoir routing standpoint. For example, at any given stage or elevation, the discharge capacity would be greater through the enlarged opening, thus allowing more stormwater to leave the upstream storage area and detaining less when compared to the existing condition at the same elevation. Table 5-11 below compares the peak flow rates during existing conditions to the flows after the enlarged opening has been constructed.

TABLE 5-11
Predicted Peak Flows and Unit Peak Flows – Existing vs. Alternative 6

Watershed Location	**Upstream Railroad Crossing**		**Bifurcation Pond Outflow**		**Middlesex Road (CT Route 106)**		**Boston Post Road (US Route 1)**	
Watershed Area (sq. mi.)	8.26		9.18		9.64		11.04	
Annual Occurrence (Storm Event)	cfs	csm	cfs	csm	cfs	csm	cfs	csm
50% (2-year)								
Existing	1,267	153.4	1,359	148.0	1,407	146.0	1,522	137.9
Alternative 6	1,274	154.2	1,361	148.2	1,414	146.7	1,528	138.4
10% (10-year)								
Existing	3,190	386.2	3.443	375.0	3,512	364.3	3,771	341.6
Alternative 6	3,405	412.3	3,669	399.7	3,755	389.5	4,029	364.9
4% (25-year)								
Existing	4,247	514.1	4,457	485.5	4,566	473.6	4,851	439.4
Alternative 6	4,319	522.9	4,645	506.0	4,735	491.1	5,100	461.9
2% (50-year)								
Existing	5,306	642.3	5,711	622.1	5,820	603.8	6,159	557.9
Alternative 6	5,300	641.6	5,727	623.9	5,831	604.9	6,251	566.2
1% (100-year)								
Existing	6,658	806.1	7,036	766.4	7,074	733.8	7,581	686.7
Alternative 6	6,707	812.0	7,240	788.7	7,230	750.0	7,714	698.7

Note: All peak flow rates and unit peak flow rates assume TP-40 rainfall depths for each annual occurrence event.

5.2.10 Alternative 7A: Channel Improvements Upstream of Camp Avenue

Statement of Problem: Immediately upstream of Camp Avenue, a commercial building has experienced repeated flooding. Residents have also experienced flooding in the neighborhood along Greenwood Avenue. Farther upstream, the floodplain extends across Hoyt Street (Route 106), a main thoroughfare. The channel upstream of Camp Avenue has been heavily modified from both sides, with building of apartment buildings in Stamford and retaining walls in Darien. Examination of the existing conditions and natural conditions water surface profiles shows that even with removal of downstream bridges the water surface elevation is not lowered. This indicates that the channel cross section is limiting conveyance through this reach.

Proposed Mitigation: The 1,400 feet of channel upstream of Camp Avenue were widened where necessary (Figure 5-10). The possible cross section was limited in multiple locations without removal of infrastructure. The commercial building and location of Garland Drive limited the cross section location without removing the building to 25 feet wide. The 25-foot channel width was used in this alternative. Many locations would not require channel work because they are already wide enough. All channel modification was modeled on the Darien side of the river, holding the Stamford channel bank toe constant.

Summary of Results: Increasing channel conveyance at constriction locations predicted lowered water surface elevations for both the 25- and 100-year storms. Flood levels were lowered by 1.1 feet for the 25-year storm and 1.3 feet for the 100-year storm. No benefits were seen immediately upstream of Camp Avenue because of backwatering from downstream structures. Table 5-12 summarizes the results.

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Noroton River Watershed Drainage Evaluation

LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-10 Alt7A
SOURCE: Microsoft Virtual Earth

N

Alternative 7A

Map By: JSC
Date: May 2010
Scale: 1"=250'

SHEET: Figure 5-10

TABLE 5-12
Results of Alternative 7A

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25- Year	Proposed Conditions 25- Year	Difference 25- Year	Existing Conditions 100- Year	Proposed Conditions 100- Year	Difference 100- Year
	15454	74.2	74.2	0.0	75.3	75.3	0.0
Camp Avenue							
	15527	74.2	74.2	0.0	75.3	75.3	0.0
	15610	74.3	74.3	0.0	75.4	75.4	0.0
	15688	74.4	74.4	0.0	75.6	75.5	0.0
N	15834	73.6	73.5	-0.1	72.9	73.8	1.0
	16072	76.0	74.9	-1.1	77.9	76.8	-1.1
	16345	79.2	78.1	-1.1	81.9	80.6	-1.3
	16568	80.0	78.9	-1.1	82.4	81.2	-1.2
	16900	81.6	80.9	-0.6	83.8	83.2	-0.6
O	17133	81.9	81.4	-0.5	84.0	83.5	-0.5
	17410	83.0	82.7	-0.3	85.2	84.9	-0.3
	17499	83.0	82.8	-0.3	85.2	84.8	-0.3
	17701	83.4	83.2	-0.2	85.5	85.3	-0.3
	17851	84.0	83.9	-0.1	85.8	85.5	-0.2
	18102	85.3	85.3	0.0	86.7	86.6	-0.1
	18298	86.0	86.0	0.0	87.2	87.2	0.0
	18523	86.7	86.7	0.0	87.9	87.9	0.0
P	18753	87.1	87.1	0.0	88.3	88.3	0.0
	18826	86.3	86.3	0.0	88.0	88.0	0.0
Woodway Road							

5.2.11 Alternative 7B: Alternative 7A + Alternative 6

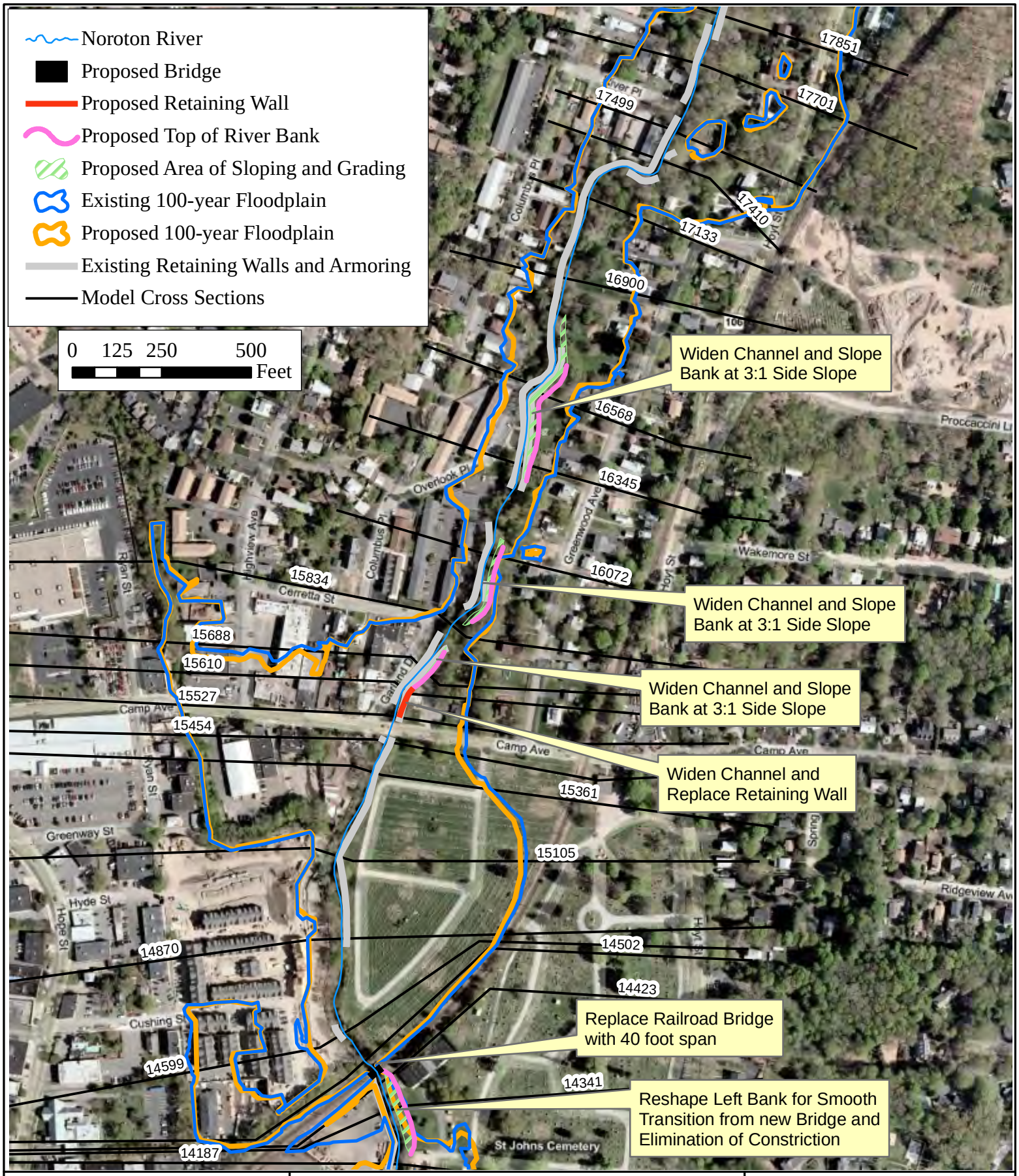
Statement of Problem: Flooding upstream of Camp Avenue was modestly reduced by the channel modification presented in Alternative 7A and railroad bridge replacement presented in Alternative 6. Alternative 7A had limited benefits immediately upstream of Camp Avenue due to backwatering from downstream.

Proposed Mitigation: The replacement of the railroad bridge presented in Alternative 6 was modeled in combination with channel modifications upstream of Camp Avenue presented in Alternative 7A (Figure 5-11).

Summary of Results: The combination of the two alternatives did not further reduce flooding from what was achieved individually. Table 5-13 summarizes the results.

TABLE 5-13
Results of Alternative 7B

Cross Section Location	Existing Conditions River Station	Water Surface Elevation (feet NAVD)					
		Existing Conditions 25-Year	Proposed Conditions 25-Year	Difference 25-Year	Existing Conditions 100-Year	Proposed Conditions 100-Year	Difference 100-Year
	13988	65.7	65.7	0.0	66.7	66.7	0.0
	14187	65.4	65.4	0.0	63.9	65.9	2.0
L	14341	65.9	65.8	-0.2	68.4	65.0	-3.4
	14423	70.1	65.9	-4.1	69.3	67.1	-2.2
Conrail							
	14501	74.0	68.5	-5.5	75.2	74.3	-0.9
	14599	74.1	69.2	-4.9	75.2	74.3	-0.9
	14870	74.1	69.8	-4.4	75.2	74.4	-0.9
	15105	74.2	70.0	-4.2	75.3	74.4	-0.8
M	15361	74.2	70.2	-4.0	75.3	74.5	-0.8
	15454	74.2	72.5	-1.6	75.3	74.5	-0.8
Camp Avenue							
	15527	74.2	73.2	-1.0	75.3	74.5	-0.9
	15610	74.3	73.4	-0.9	75.4	74.6	-0.8
	15688	74.4	73.7	-0.7	75.6	74.9	-0.7
N	15834	73.6	72.8	-0.8	72.9	73.8	1.0
	16072	76.0	74.9	-1.1	77.9	76.8	-1.1
	16345	79.2	78.0	-1.1	81.9	80.6	-1.3
	16568	80.0	78.9	-1.1	82.4	81.2	-1.2
	16900	81.6	80.9	-0.6	83.8	83.2	-0.6
O	17133	81.9	81.4	-0.5	84.0	83.5	-0.5
	17410	83.0	82.7	-0.3	85.2	84.9	-0.3
	17499	83.0	82.8	-0.3	85.2	84.8	-0.3
	17701	83.4	83.2	-0.2	85.5	85.3	-0.3
	17851	84.0	83.9	-0.1	85.8	85.5	-0.2
	18102	85.3	85.3	0.0	86.7	86.6	-0.1
	18298	86.0	86.0	0.0	87.2	87.2	0.0



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Noroton River Watershed Drainage Evaluation

LOCATION: Darien and Stamford, CT

MMI#: 1581-04-3
MXD: H:\5-11 Alt7B
SOURCE: Microsoft Virtual Earth

N

Alternative 7B

Map By: JSC
Date: May 2010
Scale: 1"=250'

SHEET: Figure 5-11

5.3 Floodproofing Measures for Individual Structures

The hydraulic improvements analyzed in Section 5.2, when implemented, will provide flooding relief for some structures along the Noroton River. However, it is important to realize that the improvements will not protect all properties. Equally important is the understanding that despite the best efforts of the town and its design engineers some properties adjacent to stream channels will continue to flood. Flood mitigation improvements are typically designed for the 1% chance storm. However, variations in rainfall depth and intensity will always have the potential to generate flooding in unanticipated ways. To that end, in our opinion some property owners along the Noroton River should consider floodproofing of structures rather than relying on channel modifications alone to mitigate flooding.

There are three basic approaches to floodproofing individual structures: (1) elevation of the building; (2) relocation of the structure; or (3) structural floodproofing. Each approach is described below. Additional information can be obtained through publications listed in the References section of this report.

5.3.1 Elevation of Buildings

Elevation is exactly as the name implies, raising the finished floor elevation of a structure above the predicted flood elevation. FEMA encourages, as we support, setting finished floor elevations two feet above the predicted elevation of the 1% chance flood. Buildings can be elevated onto a foundation wall, piers, columns, or piles. The selected approach depends on the proximity of the structure to the channel as well as the structural qualities of the underlying soils. In areas very close to the channel, piers or piles may be a better solution so that floodwaters can flow under the structure rather than being blocked.

This approach is feasible, and it does create a reliable protection. However, elevating a building can be costly. Consideration must be given to not only the structure but service utilities as well. Electric boxes and air conditioning units must be elevated to fully protect the building. The end result of elevation may not be aesthetically pleasing, particularly if the elevation must be in excess of two or three feet. Stairs may be required to access the building, and zoning regulations may have height restrictions so this must be considered. Depending on the height of elevation and site-specific conditions, basements may need to be eliminated as part of this process.

5.3.2 Relocation of Buildings

Relocation of structures is exactly what the name implies – moving an entire structure away from the channel. In many instances along the Noroton River, this is not feasible within the available land area of residential lots. Therefore, the structure may need to be relocated to an entirely different building lot, at which point this may not be the most economically appropriate solution.

5.3.3 Structural Floodproofing of Buildings

With structural floodproofing, the structure remains in place and attempts are made to minimize flood damage by protecting the structure from the rising floodwaters. A number of floodproofing approaches are available for residential homeowners including levees, floodwalls, closures, and sealants. The former two techniques are often considered together as barriers and the latter two techniques as dry floodproofing.

Barrier Floodproofing

Barriers must be designed and constructed under the supervision of a qualified professional engineer. As has been observed in this country in recent years, barrier

protection is only suitable when it is properly constructed and when routine maintenance is performed.

Levees: A levee is an embankment intended to contain floodwaters within the channel. These structures can be built at a localized scale, protecting a single home or a small development. If this approach is taken, the design phase is critical as homeowners must be willing to live with the changed landscape. The other key decision during the design phase is determining the height of the levee, which in turn determines the level of protection for the homeowner. In many instances, a levee might be built to protect up to a 10% or 4% flood and will be overtopped by larger floods. Once overtopped, floodwaters cannot typically drain by gravity, and a pump station is then needed to evacuate floodwater.

Increasing protection (i.e., up to the 1% storm) requires larger land area because levees are typically six to eight times as wide as they are high in order to limit erosion. During the construction phase, the levee should be constructed under the supervision of a qualified professional engineer. The type of material used to construct the levee is critical since the use of material that is not impervious will result in seepage through the levee. Failure of the levee through improper construction can have disastrous effects for property owners that assumed they were protected. Once the levee is constructed, ongoing maintenance is also important to ensure the levee functions as it was designed to.

Floodwalls: Floodwalls are vertical concrete structures intended to contain floodwater in a channel. In many instances, these are constructed after a flood or series of damaging floods have occurred. Like levees, floodwalls can be built on a local scale but do not require as much space. Some floodwalls are built to protect an isolated structure such as a door or air conditioning unit. Similar to levees, design of these structures requires the supervision of a professional engineer.

Dry Floodproofing

Dry floodproofing techniques are intended to protect structures by preventing floodwaters from entering. This is typically done by constructing watertight doors and windows, sometimes providing gasketed covers that must be installed prior to a pending flood. The difficulty is that these methods often rely on a homeowner to install the gasketed materials.

Before either of these techniques is deployed, it is imperative that a homeowner have a professional engineer assess the home and its foundation. Because floodwater can exert significant hydrodynamic and hydrostatic pressure on a building, the building's structural integrity should be assessed to determine if dry floodproofing techniques are appropriate and verify that the structure can sustain the anticipated flooding. When structures flood, the hydrostatic pressures balance out on each side of the foundation, and structural integrity is not as much of an issue.

Closures: The material used to create an enclosure varies from plywood sheets to steel stop logs. It is important to note that it is difficult to construct these structures in such a way as to be completely watertight. As such, the installation of pumps often accompanies the construction of a closure.

Sealants: Many wall structures leak water unless specific construction techniques are implemented. Therefore, property owners who experience less than three feet of flooding may find sealants an appropriate form of flood protection. Sealants can be made of a variety of materials, but most commonly these are plastic. Installation must be completed carefully to prevent any holes from developing. Because the plastic is under pressure during a flood, a small hole will create a leak that can grow and eventually flood the structure.

The effectiveness of sealants varies considerably depending on the exterior construction material of the structure. Sealants are typically recommended for buildings without a basement. If the structure does have a basement, the presence of an effective drain system is an important consideration before embarking on a sealant project as leaks from the sealant will inevitably occur.

As an alternative to sealant materials for existing brick wall or concrete houses, a plastic liner can be set against the brick and then an additional brick layer constructed to hide the liner. Slab-on-grade structures tend to be somewhat easier to seal because there are fewer joints for the water to enter.

5.4 Opinion of Probable Implementation Costs for Mitigation Alternatives 1-7

Goodwives River Watershed Evaluation

Alternative #	Description	Cost Opinion (2010$)
Alternative 1	Create flood bench on left bank; remove channel constriction downstream of railroad crossing near Avalon Darien	$1,050,000
Alternative 2	Add overflow culvert at downstream railroad bridge	$3,090,000
Alternative 3a	Replace West Avenue Bridge	$1,950,000
Alternative 3b	Widen channel upstream of West Avenue	$1,790,000
Alternative 3c	Combination of Alternatives 3a and 3b	$3,430,000
Alternative 4a	Repair and increase height of berm at bend near Lynn Court	$90,000
Alternative 4b	Soften bend, remove building at bend near Lynn Court	$4,060,000
Alternative 5	Remove unused dam and upstream sediments at St. John's Cemetery	$500,000
Alternative 6	Replace bridge and modify upstream and downstream approaches at railroad bridge in St. John's Cemetery	$1,160,000
Alternative 7a	Widen channel upstream of Camp Avenue	$800,000
Alternative 7b	Combination of 6 and 7a	$1,640,000

6.0 ANALYSIS OF SELECT DRAINAGE SYSTEMS

6.1 Introduction

Residences and businesses in the Noroton River watershed in Darien, Connecticut have been experiencing increased flooding in recent years. These flood events have been increasing in frequency, with at least three events occurring since 2007. The source of the flooding has not been identified. In some locations, complaints appear related to street flooding caused by insufficient drainage systems. In other areas, the complaints are related to channel flooding. The varied causes of the flooding lead to the need to seek varied solutions.

This section presents the work completed by MMI in the evaluation of selected street drainage systems within the Noroton River watershed and recommendations for mitigation where possible. MMI worked with town staff to identify critical areas. Four such areas were identified and are shown in Figure 6-1:

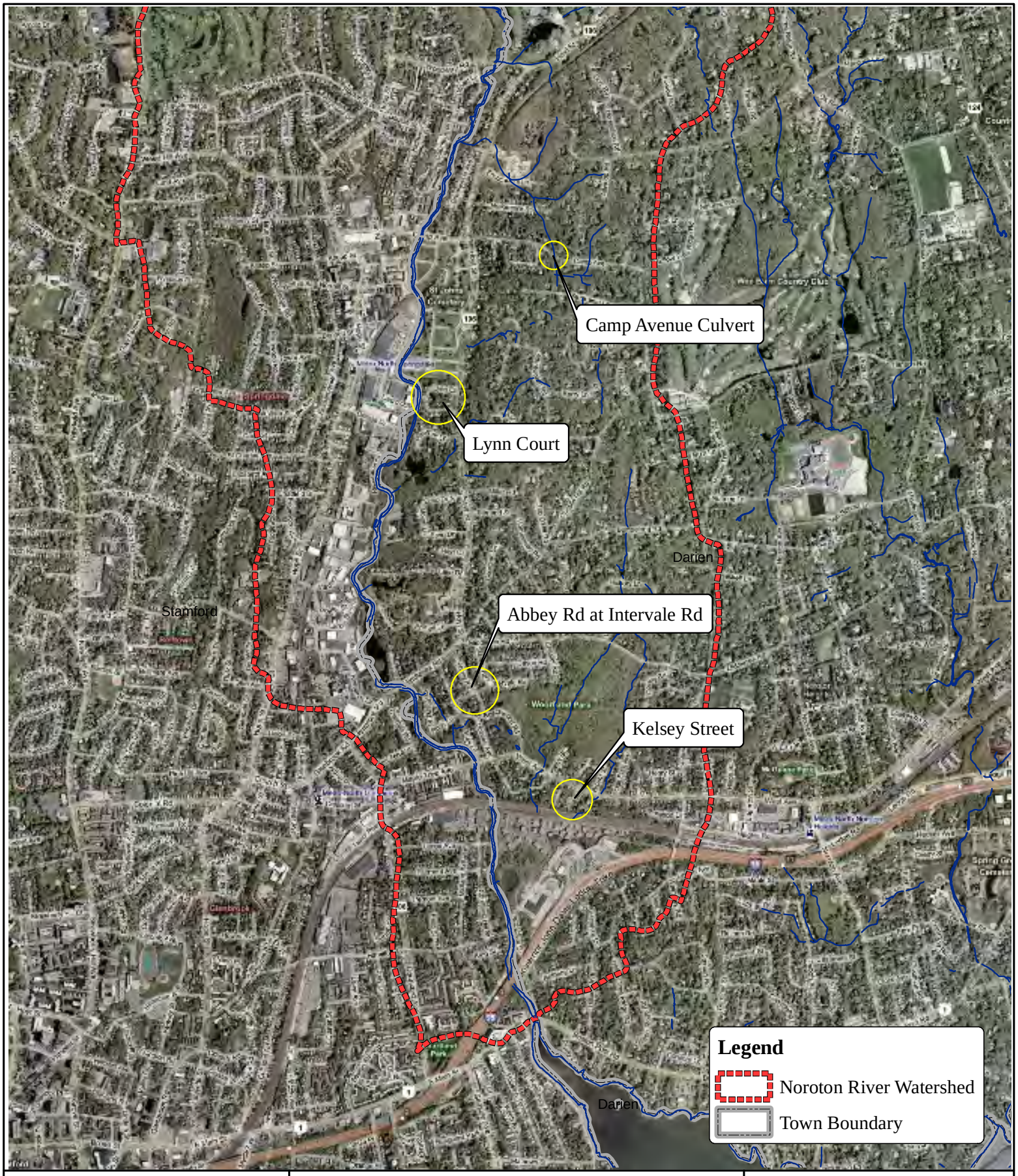
1) *Kelsey Street and Moore Street* - This area does not drain directly to the river and does not appear to be influenced by the river. It has been studied recently by Redniss and Mead to determine if flooding was a result of an undersized culvert adjacent to the railroad tracks. It is more likely the result of undersized culverts adjacent to Moore Street.

2) *Lynn Court* - Lynn Court is located directly adjacent to the Noroton River, separated at its closest point by approximately 110 feet. There is limited storm drainage infrastructure, and flooding appears to be a result of water surface elevations in the river. FEMA mapping indicates a large percentage of the development is within the 100-year floodplain, with some houses located within the delineated floodway.

3) *Abbey Road at Intervale Road* – The intersection of these two streets occurs at a low spot prone to flooding. An extensive system of street drainage structures and piping collects stormwater runoff from Chester Road, Devon Road, Intervale Road, Holmes Court, and Rose Lane before discharging to an open channel south of Rose Lane. The open channel discharges to the Noroton River approximately 400 feet south.

4) *Camp Avenue Culvert* – A drainage channel under Camp Avenue overtops during significant storm events and results in surface flow down Camp Avenue to Hoyt Street.

The purpose of this analysis is to determine the cause of the street flooding problems and identify potential solutions. The systems were analyzed for the 25-year event (4% annual recurrence chance) per Table 4.1 in the Town of Darien Drainage Manual. Evaluation of drainage systems in each area was completed and is described in the following text.



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Storm Drainage Study Areas

LOCATION:
Darien, CT

MMI#: 1581-04-3
MXD: H:\Overall Location.mxd
SOURCE: CT DEP

3

Noroton River Watershed Evaluation

Map By: BAM
Date: May 2010
Scale: 1"=2,000'

SHEET:
Figure 6-1

6.2 Storm Drainage Analysis

6.2.1 Common Stormwater Design Terms

When discussing storm drainage systems, it is helpful to understand some commonly used terminology, including the following:

Inlets: Inlets are entry points into the system, generally grates that are set on top of catch basins. For some structures, an opening may exist along the curb line. Inlets are said to be curbed (Type C) if an inlet exists along the curb line. Inlets are said to be curbless (Type C-L) if no such opening exists. Manholes are structures in a drainage system but do not serve as inlets.

Bypass flow: Flow that bypasses an inlet and flows along the gutter line or other flow path to the next downstream inlet.

Gutter: Portion of the roadway along the curb or edge of pavement (in the case of curbless roadways).

Hydraulic grade line: A theoretical line whose height can be defined as the height above the invert of a pipe to which pressure would cause water to rise if a tube were inserted into the pipe during peak flow. If the hydraulic grade line is calculated to be above the elevation of the top of a catch basin or manhole, then water will flow from the system out of the structure and into the roadway. Therefore, for design purposes, maintaining a hydraulic grade line below the elevation of the top of the structure is imperative to eliminate flooding.

Tailwater: The elevation of water in the receiving stream at the drainage system outfall. In the case of this analysis, tailwater on the drainage system is the elevation of water in the Noroton River. This varies depending on tide cycle and also storm and flood events in the Noroton River watershed.

6.2.2 Methodology

MMI compiled base mapping of the study areas using the Sewall survey data supplied by the town, which utilizes the North American Vertical Datum of 1988 (NAVD88). Mapping of the drainage system depicts the location and elevation of structures (e.g., catch basins, manholes) and the size, type, and elevation of piping. This information was used to evaluate existing conditions within the system. Field investigation of the three drainage systems was completed to confirm pipe sizes and lengths, top of frame elevations, and invert elevations. While MMI attempted to field verify all of the elements in the drainage system through a field investigation, there were some areas where piping was not found or interconnects to the system were identified without any structures (and so could not be directly observed). In those cases, the angle and location of the cross pipe connection was estimated.

Existing and proposed conditions storm drainage analyses were performed using the StormCAD software package from Bentley Systems, Inc. This software determines the capacity of existing pipes and assists in the design of new systems by estimating flow rates from the watershed using the Rational Method, determining inlet capacity (i.e., the rate at which water can flow into the inlet grate), structure losses (e.g., due to changes in direction or sudden expansions or contractions), pipe losses (e.g., due to friction or elevation), and pipe capacities within the system.

The existing conditions model of each drainage system represents all known pipes and structures within the drainage system where appropriate. Each of the models was first

run assuming a tailwater elevation based on MMI hydraulic modeling. In order to evaluate the efficiency of the drainage systems independent of any tailwater conditions, the existing conditions analysis was then run assuming there was no tailwater on the system.

In some cases, piping within the system was found to be undersized. Where this was the case, system modifications were evaluated independent of any tailwater effects. The systems were analyzed for the 25-year storm event.

Three basic factors dictate the extent and duration of roadway flooding: inlet capacity, pipe capacity, and downstream tailwater conditions. Inlet capacity is the amount of stormwater flowing along the street that can be intercepted by a catch basin grate. This is a function of the volume and velocity of flow, the width of the grate that is available to intercept flow, and slope of the roadway. If inlet capacity is not adequate, stormwater then bypasses to the next downstream inlet. In cases where inlet capacity is severely limited, bypass flows accumulate until the gutter flow reaches either a system outlet or a sag point where it will pond.

Pipe capacity influences the performance of a drainage system by controlling the amount of water that can be passed from one catch basin to the next. Pipe capacity is dictated not only by pipe size but by the slope of the pipe and material of construction. If the pipe is too small to pass the amount of flow entering the basin both through the grate and through upstream pipes, water will accumulate in the catch basin until it spills over the top of the basin (or pushes open the top of a manhole) and causes street flooding. The model reflects this condition by the calculated hydraulic grade line (HGL). Connecticut Department of Transportation (CT DOT) storm drainage sizing requirements dictate a required one foot of freeboard from the elevation of the HGL to the catch basin top of frame. This requirement provides a necessary safety factor for system sizing in addition to simply calculating the capacity of a pipe for a given flow.

6.3 Kelsey Street and Moore Street

Reported flooding has occurred throughout the Kelsey Street neighborhood. As part of this work effort, MMI performed a field walk of the area and met with landowners to discuss prior flooding events. MMI also visited the site on February 25, 2009 during a significant storm event to observe the stormwater conveyance structures.

A video of flooding events that took place on March 2, 2007 shows stormwater overtopping the channel on Moore Street, sheet flowing down the driveway of 7 Moore Street and into the garage. The stormwater then flooded the yards of #1 and #2 Kelsey Street before eventually discharging back into the channel and the 54" pipe at the headwall near the end of Kelsey Street. Footage indicated that the 54" pipe was not quite flowing full, having about one foot of the pipe still open at the top. This indicates that conveyance capacity of the 54" pipe may not be the cause of upstream flooding. The video also showed a small yard drain in the front yard of #2 Kelsey Street that had water ponding over the grate.

A second video documented flooding during an April 2007 storm. The video clearly identifies where the stormwater overflows the channel and runs down Moore Street and into driveways. This video did not show overtopping of West Street, indicating that the existing corrugated metal pipe (CMP) cross culvert appears to have capacity for this storm. The problems begin shortly after the flow from this cross culvert exits a 36" reinforced concrete pipe (RCP) south of the first driveway on the east side of Moore Street. Here the water flows in an open channel that has vertical stone-lined walls on both sides. The stormwater begins to come out of the channel upstream of the next 36" RCP driveway cross culvert, which either does not have enough capacity or in which there is some blockage. The overflow then makes its way down Moore Street, with some going back into the channel at the end and the rest flowing down the driveway of 7 Moore Street.

It is unclear whether the box culvert under the railroad, which is thought to flow south, actually flows north into the 54" CMP. There is a custom manhole at this location made to connect the box culvert and the 54" pipe. An observation during low flow (less than an inch of water) indicated flow into the 54" pipe. The invert appears to have been hand formed to direct the flow from the box culvert in the direction of flow in the pipe. This connection should be reviewed during a higher flow situation to see if the flow in the box culvert reverses direction.

Based on the videos and field observations, it appears that the weak links in the drainage system in the Moore Street/Kelsey Street area are the cross culverts and narrow channel on the east side of Moore Street.

6.3.1 Kelsey Street Watershed Area and Drainage System

Limits of the Kelsey Street watershed are delineated in Figure 6-2. The watershed encompasses approximately 174 acres and generally drains from north to south beginning on the north side of Bumpalong Road near Waterbury Lane. The watershed delineation begins at the lower terminus where flow from an open channel drains into a 54" CMP at the railroad tracks. This pipe runs parallel to the railroad in a westerly direction to where it eventually discharges to the Noroton River. The watershed primarily consists of residential lots with mature tree cover beyond the limits of established lawn areas.

Kelsey Street is an approximately 400-foot long private curbless dead-end street originating at West Avenue and having a southern terminus approximately 60 feet north of the railroad tracks. The curbless road is approximately 20 feet wide with no piped drainage system. A lip at the intersection with West Avenue prevents gutter flow on West Ave from running down Kelsey Street. All surface runoff from Kelsey Street collects along the gutter line and flows to an open drainage swale adjacent to the railroad tracks.

The drainage swale south of Kelsey Street and adjacent to the railroad tracks collects drainage from the entire watershed and terminates at a concrete headwall where stormwater enters the 54" CMP (shown in the photo to the right). Surface water from Kelsey Street and the immediate neighborhood flows overland into the swale. The upper part of the watershed drains by a combination of overland flow, open channels, and enclosed drainage system. An unnamed watercourse collects the majority of the watershed north of West Street and flows under West Street through a 53"x36" CMP arch. A 30" pipe in West Avenue conveys the eastern part of the watershed westerly and connects to the pipe arch at a built-up structure just east of Moore Street. This combined drainage then flows in a southerly direction through a series of open channels and 36" culverts (under driveways) and discharges into a trapezoidal channel at a 48" CMP located at an abandoned driveway. From here, the channel runs parallel to the railroad tracks ending just south of Kelsey Street at the 54" CMP.

The culvert is an extension of a 60" culvert paralleling the train tracks for approximately 1,100 feet in a westerly direction, where it ultimately discharges into the Noroton River. The open channel is lined with an articulated precast concrete revetment. The trapezoidal channel and the 54" CMP were improvements made by the CT DOT per design plans entitled "Assignment #10 Darien Ditch," dated December 2, 2002. These improvements were implemented to address a severe erosion condition in the area that was affecting the stability of the railroad infrastructure. As part of that project, a 20"x 42" stone box culvert located under the railroad tracks was connected to the new 54" CMP extension. This stone box culvert extends southerly to the Avalon Darien apartment complex. While the method of connection was not found during a field visit, a 48" RCP conveys the flow from the cross culvert through the complex to an existing watercourse. This pipe existed prior to the Avalon development and still remains active.

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Kelsey Street and Moore Street

LOCATION: **Darien, CT**

MMI#: 1581-04-3
MXD: H:\Kelsey.mxd
SOURCE: CT DEP

3

Noroton River Watershed Evaluation

Map By: BAM
Date: May 2010
Scale: 1"=700'

SHEET: **Figure 6-2**

6.3.2 Kelsey Street Outfall Characteristics

In evaluating the drainage system, the characteristics of the outfall and the receiving stream are critical as they can have a dramatic influence on flooding. The 60" CMP adjacent to the railroad tracks has an outfall at the Noroton River near FEMA Section D. The MMI existing conditions HEC-RAS model developed for the watershed study indicates that during a 25-year design storm the predicted water surface elevation in the Noroton River at this location is 23.86 feet.

6.3.3 Kelsey Street Existing Conditions Analysis

Flooding reports in this area prompted a study by Redniss & Mead, Inc. in March 2008. The focus of this study was the existing drainage pipe that parallels the Metro North railroad tracks. Their report noted that the 54" culvert was installed around 2002 by the CT DOT as a 100-foot extension of the 60" corrugated metal culvert. The 2008 report found that the installation of this extension may have negatively impacted the ability of this culvert to accept flow from the channel and surrounding areas in extreme rain events based on culvert invert elevations, the decrease in size from the existing 60" diameter pipe, and conveyance issues with the downstream 20" x 42" stone box culvert that appears to convey flow to the south. This study computed the drainage area and predicted peak rates of runoff to Kelsey Street. These flows are summarized below.

Storm Event (year)	Q Peak (cfs)
2	80.69
10	186.59
25	219.66

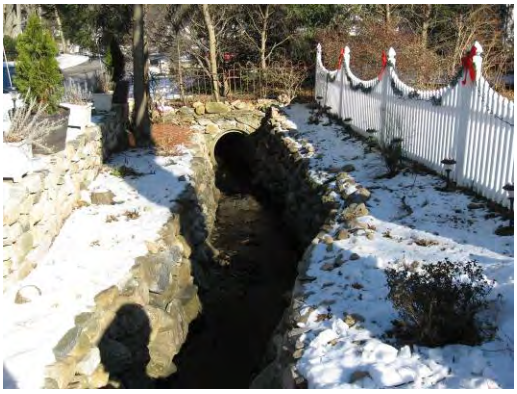
Redniss & Mead performed an additional drainage analysis in May 2009 for Westerly Court, a proposed development to the east of the Moore Street/Kelsey Street neighborhood, on the south side of West Avenue. The analysis noted that previous

flooding events have been reported to the west of the site where stormwater has spilled over an unnamed watercourse's banks, flowed down Moore Street, and created a backup of water entering the state-owned culvert paralleling the railroad tracks at Kelsey Street.

The analysis computed the contributing watershed to the existing 36" RCP in West Avenue. The computed 25-year storm flow is 99.90 cfs. This does not include the additional drainage area to the unnamed watercourse, which converges with the street drainage system and discharges to Moore Street.

As noted, MMI believes that flooding problems are a result of the undersized culverts and drainage swales adjacent to Moore Street rather than a downstream pinch point at the existing 54" culvert. However, at some point the capacity of the 54" culvert may be reached, and further flooding problems would be likely.

The photo to the right shows the downstream outlet of the West Avenue culvert, discharging into the drainage swale with nearly vertical walls adjacent to Moore Street.

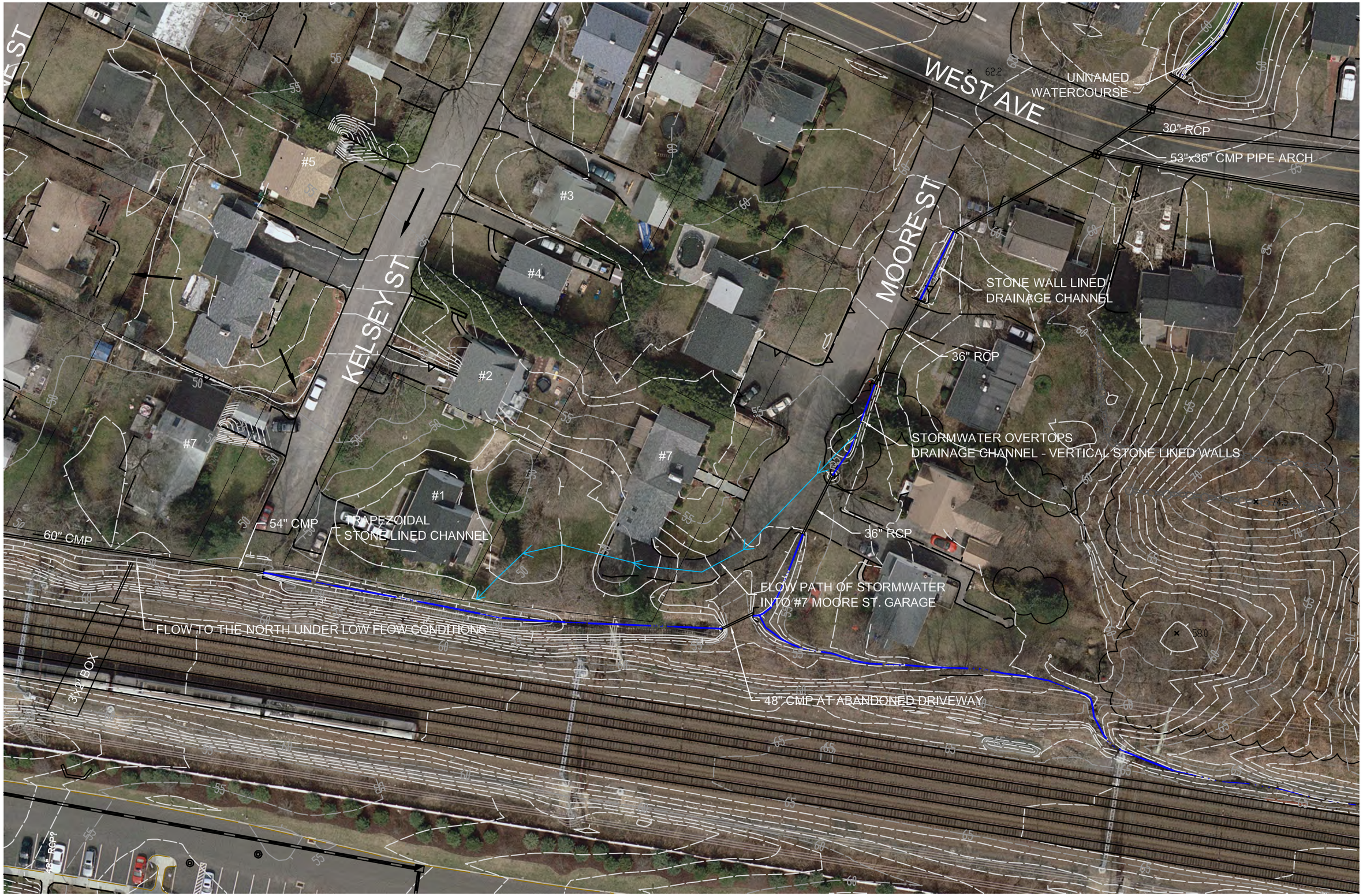


The photo to the left is of an existing driveway culvert further downstream along this drainage swale. There is minimal cover over the pipe, and the existing drainage swale is not as highly defined.

MMI computed the watershed to Moore Street in order to evaluate the capacity of the culvert and swale drainage system. The total watershed to the West Avenue culvert that

discharges to the Moore Street culverts and drainage swale is approximately 155 acres. This includes the drainage to the unnamed watercourse north of West Avenue in addition to the street drainage systems contributing to the West Avenue flow. Based on this watershed and computed time of concentration of 47 minutes, the estimated 25-year flow to the Moore Street drainage swale is approximately 181 cfs. TR-55 computations to support this estimation are appended.

Utilizing town topographic mapping, an average slope was computed for the drainage swale and existing 36" culverts. With a slope of approximately 0.0057 ft/ft, a 36" pipe only has the capacity to convey approximately 50 cfs. The open sections of drainage swales will convey even less as they are on average only two feet deep in the section where overtopping has been seen to occur. Based on a Manning's equation and an assumed minimum slope, the existing 53"x36" pipe arch under West Avenue has the capacity to convey approximately 42 cfs. Although the equivalent diameter of a pipe arch with these dimensions is a 48" pipe, the Manning's coefficient of roughness for the CMP (0.024) is more restrictive than that of a concrete pipe (0.013). It is evident that both the West Avenue culvert and the downstream drainage swale driveway culverts are undersized for the 25-year design storm.



Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_KELSEY.DWG Layout: fig6-3

Plotted by: BECKYM On this date: Fri, 2010 May 21 - 12:49pm

N W E S

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REVISIONS

STORM DRAINAGE SYSTEM - KELSEY STREET

NOROTON RIVER WATERSHED EVALUATION
STORM DRAINAGE SYSTEM ANALYSIS

KELSEY STREET AND MOORE STREET
DARIEN, CONNECTICUT

DESIGNED	DRAWN	CHECKED
-	BAM	DO

SCALE: 1"=50'

DATE: MAY 2010

PROJECT NO.: 1581-04-3

SHEET NO.: **FIG. 6-3**

6.3.4 Kelsey Street Proposed Conditions Analysis

Based on the existing conditions analysis of existing pipe capacities, the most appropriate solution would be to increase the size of the West Avenue culvert and the Moore Street drainage swale culverts. The goal of any proposed modifications is to convey the flow from a 25-year design storm.

It would make sense to replace the culvert/swale system with a 54" pipe to match the existing downstream pipe because the watershed to each location is very similar. There is not a large addition in flow from Kelsey Street itself. A 54" (4.5 feet) diameter pipe at the existing slope has the capacity to convey approximately 148 cfs, which is less than the computed 181 cfs.

Further analysis would be required to determine the feasibility of installing a larger pipe or alternate shaped culvert given the shallow slopes and limited cover at West Avenue and the downstream driveway crossings. A three-foot high by seven-foot wide box culvert installed at the existing slope has a conveyance capacity of 187 cfs. Parallel pipe arches may provide equivalent conveyance area as a more feasible option. Potential conflicts with existing utilities would have to be investigated, and rights to construct the new system would have to be acquired from private property owners.

As an alternative, we looked at the topography of West Street, and it seems feasible to extend the existing storm drainage system westerly to the Noroton River. This option would divert the majority of the watershed area away from the Moore Street/Kelsey Street neighborhood. The new pipe in West Street could also be sized to accommodate other drainage areas along the West Street corridor. The new pipe would discharge at the West Street bridge over the Noroton River at the Stamford town line about 600 feet upstream of the current discharge. State and local permits would likely be required if this alternate was pursued.

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STORM DRAINAGE SYSTEM - MOORE STREET CULVERT IMPROVEMENTS

DESIGNED	--
DRAWN	BAM
CHECKED	DO

NOROTON RIVER WATERSHED EVALUATION
STORM DRAINAGE SYSTEM ANALYSIS

LOCATION
KELSEY STREET AND MOORE STREET
DARIEN, CONNNECTICUT

DATE	MAY 2010
SCALE	1"=50'
PROJ. NO.	1581-04-3

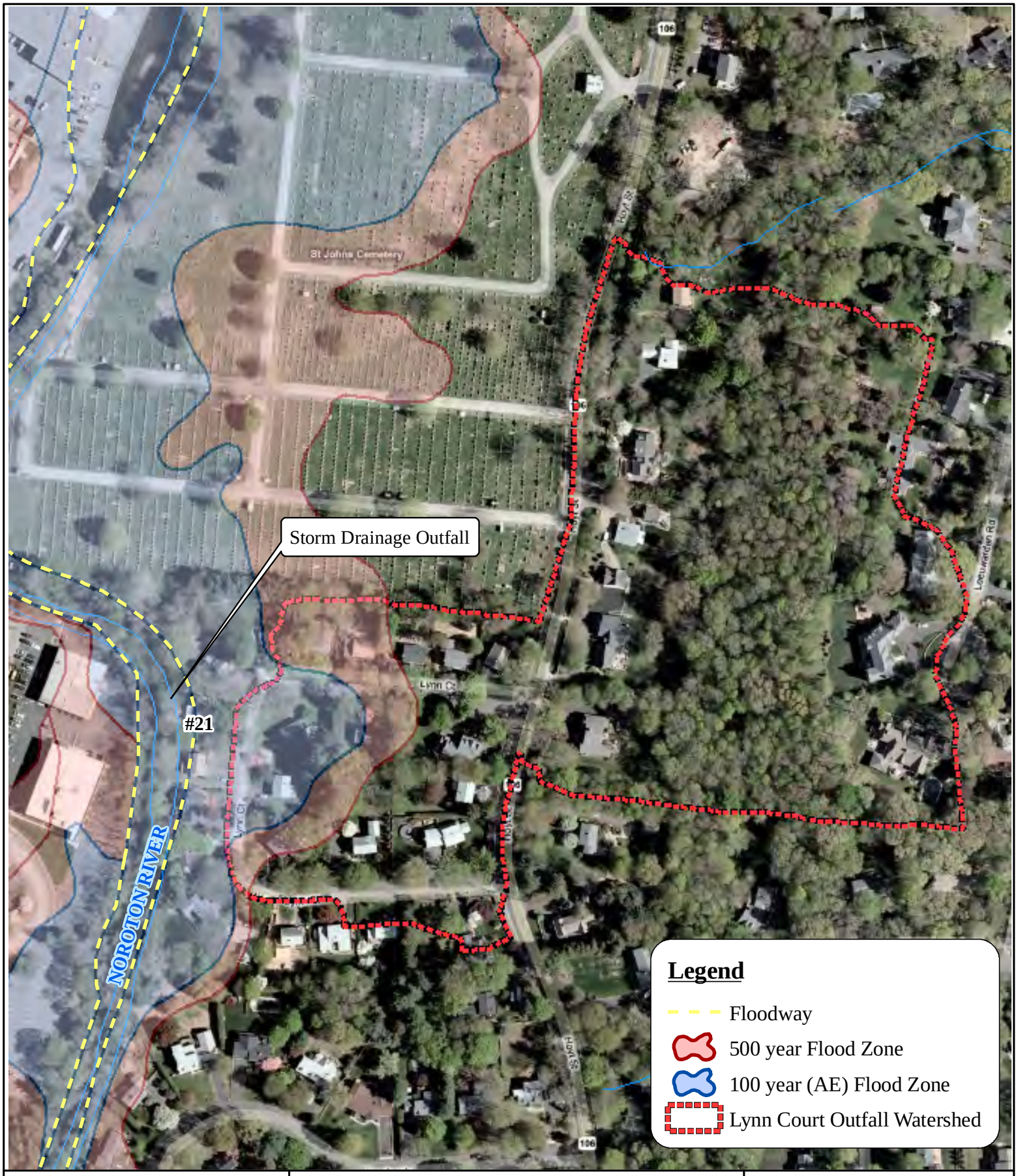
SHEET
FIG. 6-4

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_KELSEY.DWG Layout Tab:6-4
Plotted by: BECKYM On this date: Fri, 2010 May 21 - 12:49pm

6.4 Lynn Court

The majority of flooding incidents reported by residents of Lynn Court indicate that the flooding is caused by the Noroton River overflowing its banks. Therefore, it may not be possible to provide relief to Lynn Court without first implementing flood control projects downstream. As part of our work, MMI performed a field walk of the Lynn Court area on February 25, 2010 to observe existing conditions and seek to verify the information gathered. On March 9, 2010, MMI met with the resident of #21 Lynn Court to discuss prior flooding events. The residence at #21 Lynn Court suffered damage in both the April 2007 and October 2007 floods. The photo to the right is taken from the right bank looking across the Noroton River at the northwest corner of #21 Lynn Court. Erosion along the left bank indicates previous overtopping of the riverbanks, which has resulted in flooding of lower Lynn Court and #21 Lynn Court.

According to available mapping, flood control improvements were implemented throughout the lower reaches of the Noroton River in 1958 by the State of Connecticut Water Resources Commission. The 1958 improvements entailed the construction of a widened, trapezoidal channel through a length of the Noroton River. Near Lynn Court, the channel was widened to 60 feet, coincident with a bend in the stream. Upstream of this section, channel bottom widths were 50 feet, and downstream bottom widths were 46 feet. Data at this section includes a high water flood elevation of 58.6 feet in 1955 under existing conditions, a proposed water surface elevation of approximately 56 feet associated with an improved channel, and a channel invert elevation of 48.12 feet. Lynn Court is a circular road having a northern and southern intersection with Hoyt Street. It has a total length of approximately 1,130 feet. The curbless pavement is approximately 24 feet wide. Existing residences are set back approximately 40 feet from the edge of pavement and, in total, there are 24 homes whose driveways access Lynn Court.



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Lynn Court Drainage System

LOCATION: **Darien, CT**

MMI#: 1581-04-3
MXD: H:\Lynn.mxd
SOURCE: CT DEP

3

Noroton River Watershed Evaluation

Map By: BAM
Date: May 2010
Scale: 1"=200'

SHEET: **Figure 6-5**

6.4.1 Lynn Court Watershed Area and Drainage System

The total drainage area to the Lynn Court outfall to the Noroton River is approximately 16.5 acres in size. The Lynn Court drainage system consists of a series of catch basins and storm drainage pipes through the northern half of the loop road. The drainage system receives overland runoff from a portion of Hoyt Street, which is a state road, in addition to Lynn Court. The first catch basin identified as CB1 on Figure 6-6 appears to be located in the state right-of-way for Hoyt Street and would be maintained by the CT DOT. The majority of pipes in the system are 12" RCP, with the last catch basin connection via a 24" RCP and the outfall via a 30" RCP set along the banks of the Noroton River at the rear of #21 Lynn Court.

6.4.2 Lynn Court Outfall Characteristics

In evaluating the drainage system, the characteristics of the outfall and the receiving stream are critical as they can have a dramatic influence on flooding. Therefore, MMI identified some important characteristics of the outfall and its receiving stream, the Noroton River.

Based on the existing FEMA floodplain mapping for Fairfield County, the 100-year water surface elevation in the river at FEMA Section J, just upstream of the system outfall, is 60 feet. The existing conditions modeling of the Noroton River completed by MMI and documented in a separate report indicates a 100-year water surface elevation at this location of 63 feet and a 25-year water surface elevation of 57.21 feet.

The elevation of Lynn Court near #21 is approximately 53.0 feet, with a low spot at the house's driveway of 52.8 feet. The surveyed elevation of the 30" outfall is 47.53 feet. Ground contours in the vicinity of the storm drainage outfall are also at elevation 53.0 and below. MMI modeling indicates a two-year water surface elevation in the river of 52.10 feet and a 10-year water surface elevation of 56.16 feet. These elevations indicate

that this area is subject to flooding from the Noroton River for the 10-year design storm and that tailwater is expected to affect storm drainage conveyance for the two-year storm.

6.4.3 Lynn Court Existing Conditions Analysis

The Noroton River makes a bend in this region, with flow almost directly in line with #21 Lynn Court. The river's left bank is severely eroded just upstream of #21 Lynn Court, and the gabions behind the house are beginning to be undermined and are leaning toward the river at the upper end.. Surface drainage from the impervious areas at the industrial facility on the right bank sheet flows via a bituminous leakoff across from #21 Lynn Court.

The computed 25-year design storm flow for the Lynn Court drainage system watershed is approximately 25 cfs. The capacity of the existing 30" RCP outfall pipe, using Manning's equation and the existing slope of 1.1%, is 43 cfs. It appears that the outfall is appropriately sized for the 25-year design storm. The StormCAD analysis of the system indicates that the pipes at the lower section of the system do not surcharge the lower catch basin during the 25-year storm.

The drainage system analysis was completed assuming that the outfalls would flow freely and not be affected by any tailwater conditions in order to focus on the capacity of the drainage pipes. The model indicates overtopping of catch basins 2, 3, 4, and 5. Surcharge at the upper catch basin (CB2) contributes additional stormwater running down the road, eventually reaching the lower catch basins near #21 Lynn Court. Without tailwater at the outfall, it appears that the storm drainage system is not the cause of flooding at the low point in Lynn Court as any upgradient surcharge enters the lower system basins, and the downgradient pipes flow under pressure. However, upgrades to the system would allow for storm drainage to be conveyed by pipe instead of overland flow to the low spot in Lynn Court.

6.4.4 Lynn Court Proposed Conditions Analysis

The StormCAD model indicates that the existing 12" pipes at the upper run of the system are undersized for the predicted 25-year design flows. The proposed scenario modeled consisted of the replacement of the two 12" pipes along the main stem with 18" RCPs set at the existing invert elevations. This increase in pipe capacity eliminates surcharge at CB2 and CB5, allowing storm drainage to enter the pipe system sooner than if it were allowed to sheet flow down Lynn Court.

Although modeling of these upgraded upstream pipes within the Lynn Court drainage system eliminates surcharge in the upgradient portions of the system, the primary flooding issue in this area is caused by the Noroton River flooding. Even if the street drainage is modified, water surface elevations in the river may prohibit the discharge of runoff via the existing outfall. The existing outfall could be equipped with a check valve to prohibit river water from entering the pipe; however, if the outfall is below the water surface elevation of the river, surcharge at Lynn Court catch basins may still occur and only exacerbate flooding at the low spot in Lynn Court.

Additional instream channel modifications may be implemented to alleviate flooding at #21 Lynn Court and in the low point of the street. These include bank stabilization, construction of a berm, and flow deflectors. These possible modifications are more fully detailed in Section 5.2.

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LYNN COURT DRAINAGE SYSTEM EXISTING CONDITIONS

NOROTON RIVER WATERSHED EVALUATION

DESIGNED	--
DRAWN	BAM
CHECKED	DO

LOCATION
LYNN COURT
DARIEN, CONNNECTICUT

DATE	MAY 2010
SCALE	1"=100'
PROJ. NO.	1581-04-3

SHEET
Fig. 6-6

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_LYNN COURT.DWG Layout Tab:EXISTING
Plotted by: BECKYM On this date: Thu, 2010 April 29 - 4:25pm

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_LYNN COURT.DWG Layout Tab:PROPOSED

Plotted by: BECKYM On this date: Thu, 2010 April 29 - 4:25pm

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LYNN COURT DRAINAGE SYSTEM EXISTING CONDITIONS

DESIGNED	--
DRAWN	BAM
CHECKED	DO

NOROTON RIVER WATERSHED EVALUATION

LOCATION
LYNN COURT
DARIEN, CONNNECTICUT

DATE	MAY 2010
SCALE	1"=100'
PROJ. NO.	1581-04-3

SHEET
Fig. 6-7

6.5 Abbey Road at Intervale Road

Frequent flooding has been reported at the intersection of Abbey Road and Intervale Road. This intersection is at a low point in the neighborhood and contains catch basins that convey stormwater from a number of surrounding streets. During a field visit on March 9, 2010, it was noted that a number of garages in the area appear to be set at or below roadway elevation, leading to the conclusion that residents near this intersection experience flooding from street drainage.

6.5.1 Watershed Area and Drainage System

The majority of the pipes in the upstream portion of the area's drainage system are 12" RCP, with an increase in pipe size occurring at the junction of the cross country line joining the Devon Road drainage system and the Intervale drainage system between Forest Street and Stanley Road. At this junction, the drainage piping transitions first from a 12" RCP to an 18" RCP, then to 24" RCP. The upstream catch basin at the cross country line from Devon Road was used as the upstream limit of the StormCAD model and the limits of the field survey.

Holmes Avenue is generally cross pitched to the east side where a series of catch basins collects runoff in the gutter line. The west side of Holmes Avenue is curbed. The catch basin structures have 18"x18" cast iron grates. At the intersection of Holmes Avenue and Rose Lane, an additional drainage system connects from the southern portion of Holmes Avenue and Holmes Court. Here a 24" RCP crosses Holmes Avenue. and runs in Rose Lane to a low point. From the low point, a 24" RCP extends southerly to daylight in an open channel that leads to the Noroton River.

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REVISIONS

ABBEY ROAD AT INTERVALE ROAD STORM DRAINAGE SYSTEM

NOROTON RIVER WATERSHED EVALUATION
STORM DRAINAGE SYSTEM ANALYSIS

ABBEY ROAD AT INTERVALE ROAD
DARIEN, CONNECTICUT

DO	BAM	DO
DESIGNED	DRAWN	CHECKED

SCALE: 1" = 300'

DATE: MAY 2010

PROJECT NO: 1581-04-3

MXD NAME:
H:\Abbey_Intervale.MXD

FIGURE 6-8

SHEET NO.

6.5.2 Outfall Characteristics

The Intervale drainage system discharges at a 24" RCP outfall south of Rose Lane, a private road, into an open channel approximately 400 feet upstream of the Noroton River. A resident of Rose Lane indicated that debris in the channel may be contributing to stormwater backup on Rose Lane. The same resident indicated that the house on the corner of Rose Lane and Park Lane (#26 Park Lane) frequently floods. The house's garage is set noticeably lower than the surrounding houses.

FEMA floodplain mapping indicates that Rose Lane and the section of Park Lane south of the Rose Lane intersection are located within the mapped 100-year floodplain. The nearest FEMA cross section to the outfall is Section F (MMI Section 4850) through the Noroton River. The FEMA 100-year water surface elevation here is 39.9 feet, and the 10-year water surface elevation is 31 feet. The MMI HEC-RAS modeled water surface elevation at this cross section for the 25-year storm is 38.72 feet. The invert elevation of the outfall is 26.88 feet, indicating that tailwater elevation would be expected to have a significant effect on storm drainage conveyance capacity.

6.5.3 Existing Conditions Analysis

Field survey of the analyzed portion of the drainage system was performed by MMI in April 2010 to complete a StormCAD model of the system. For the analysis, it was assumed that tailwater was not a contributing factor in order to evaluate the system's actual capacity for a 25-year design storm. Results of the modeling program indicated surcharge of every structure in the modeled system. The model indicates pressure flow at the upstream limit of the model, at upstream manholes, and in the cross country line. Figures 6-9a and 6-9b depict storm drainage within the limits of the model area.

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_INTERVALE.DWG Layout: 1581-6-9A

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NOROTON RIVER WATERSHED EVALUATION
STORM DRAINAGE ANALYSIS

ABBEY ROAD AND INTERVAL EROAD
DARIEN, CONNECTICUT

DESIGNED	DRAWN	CHECKED
--	BAM	DO

SCALE: 1"=60'

DATE: MAY 2010

PROJECT NO.: 1581-04-3

SHEET NO.: Fig. 6-9a

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_INTERVALE.DWG Layout: fig6-9B

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STORM DRAINAGE ANALYSIS

ABBEY ROAD AND INTERVAL EROAD
DARIEN, CONNECTICUT

--	BAM	DO
DESIGNED	DRAWN	CHECKED

SCALE: 1"=60'

DATE: MAY 2010

PROJECT NO.: 1581-04-3

SHEET NO.: **Fig. 6-9b**

6.5.4 Proposed Conditions Analysis

Upgrade Existing System

The goal of any proposed modifications was to convey the flow from a 25-year design storm. The first modeled option entailed the upgrade of pipes within the existing system. The existing connection between the solid cover manhole structure in Rose Lane and the last catch basin in the system is set 1.6 feet higher than the outfall pipe invert elevation. Modifications to the system begin with the replacement of the outfall pipe with a 36" RCP and eight upstream pipes with 36" RCP set at the existing lowest invert elevations, including the Rose Lane cross connection. Upstream of CB-6, the existing 24" RCPs should be upgraded with 30" RCPs upgradient to the existing manhole in Intervale Road where the cross country line connects. The existing 12" RCP cross country line should be replaced with a 24" RCP. The combination of all these pipe upgrades will allow the 25-year design storm to be conveyed without surcharge. The total length of pipe to be replaced with this option is approximately 1,710 linear feet. Figures 6-10a and 6-10b depict the proposed improvements.

Alternate Alignments/Outfall Locations

In addition to upgrades within the system, alternatives to the configuration involving cross connections and alternative bypasses were evaluated. Rose Lane is a private street, abandoned by the town when the bridge across the river was removed. Upgradient town storm drainage discharges through the private street's system and is compounding flooding problems in this area. This raises the question of whether an alternate discharge location is available.

Alternative 1 – Park Lane

The adjacent Park Lane is a private road as well; therefore, putting a system down that street would likely require easements, and similar issues would still remain with mixing public and private drainage. However, the alignment would be relatively simple to implement with three new catch basins and about 720 feet of pipe. A preliminary layout of this alternative is depicted in Figure 6-11. This additional pipe would likely need to be 36", but sizing calculations were not done for the alternates. Assuming a minimum slope of 0.50%, the deepest part of the system would be between eight and nine feet deep, and the outfall elevation would be approximately 28.9 feet. This outlet elevation seems reasonable since the topographic maps show the normal river elevation at about 25.0 feet at that location. Upgrades of the system upstream of the Rose Lane intersection would still be required to accommodate the 25-year storm flow. Utility conflicts would need to be evaluated. The advantages and drawbacks for this alternative discharge alignment are as follows:

Advantages:

- Reasonable alignment and depth
- Would improve drainage on Park Lane
- Would separate existing drainage system in Rose Lane (private)

Drawbacks:

- Easements would be required
- A new discharge point would need to be permitted
- Additional cost associated with pipe extension

Alternate 2 – Holmes Avenue

Another option would be to bypass storm drainage flow from the system south down Holmes Avenue and through West Avenue to an existing discharge at the Noroton River near the existing West Avenue bridge. There is limited storm drainage in West Avenue,

with two catch basins located at the intersection with Park Lane discharging to the river south of the bridge. The existing downstream wingwall at the bridge is located at an approximate elevation of 31.0 feet with the normal water surface as represented in the topographical maps at approximately elevation 25.0 feet. This alignment is longer at about 1,200 feet again starting at the intersection with Rose Lane. A preliminary layout of this alternative is depicted in Figure 6-11. This additional pipe would likely need to be 36", but sizing calculations were not done for the alternates and would need to include more watershed area for the additional catch basins proposed.

This alternative also has more vertical grade change with which to deal. Assuming a minimum slope of 0.50%, the deepest part of the system would be over 17 feet deep at the intersection of Holmes Avenue and West Avenue. Continuing the same minimum slope to the existing outfall location would require an outlet invert at approximately 26.5 feet. This outlet elevation seems feasible since the topographic maps show a normal river elevation of approximately 25.0 feet in this area. Upgrades of the system upstream of the Rose Lane intersection would still be required to accommodate the 25-year storm flow. Additional upgrades of the existing system in Holmes Avenue would also be required. Utility conflicts would need to be evaluated. The advantages and drawbacks for this alternative discharge alignment are as follows:

Advantages:

- Would improve drainage on Holmes Avenue
- Would utilize an existing outfall location
- Would keep all the town drainage system in public roadways

Drawbacks:

- The depth of the system would add to the cost and make installation difficult
- Requires more pipe and more upgrades than Alternative 1

Alternate 3 – Holmes Court

A third alternate for alleviating flooding at the Abbey Road/ Intervale Road intersection would involve the same route down Holmes Court and Holmes Avenue to West Avenue. Currently, the low area at Abbey Road and Intervale Road drains via storm pipe to the west section of Holmes Avenue, in the opposite direction of surface contours. Only a portion of Holmes Court is upgradient of this low area, with most of the street draining to the south to Holmes Avenue. A bypass line through Holmes Court connecting to Holmes and West Avenues would provide relief to the system at the problem intersection.

The bypass line again would be quite deep in order to achieve a minimum slope of 0.5% to its outfall at the river. In West Avenue, the depth would be approximately 13 to 17 feet deep, with the lowest portion in Holmes Avenue at a depth of over 18 feet. This may be reason enough that construction of the line would just not be economically feasible or constructible in existing roads.

Conclusion

Based on the above analysis of alternative alignments, it seems that there is not a clear optional alignment that has abundant advantages. Unless the town sees a compelling reason to seek an alternative outlet point, the most cost effective option appears to be upgrading the existing system where it currently lies.

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NOROTON RIVER WATERSHED EVALUATION
STORM DRAINAGE ANALYSIS

ABBEY ROAD AND INTERVAL EROAD
DARIEN, CONNECTICUT

--	BAM	DO
DESIGNED	DRAWN	CHECKED

SCALE 1"=60'

DATE MAY 2010

PROJECT NO. 1581-04-3

Fig. 6-10a

SHEET NO.

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_INTERVALE.DWG Layout: tab6-10B

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STORM DRAINAGE ANALYSIS

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DARIEN, CONNECTICUT

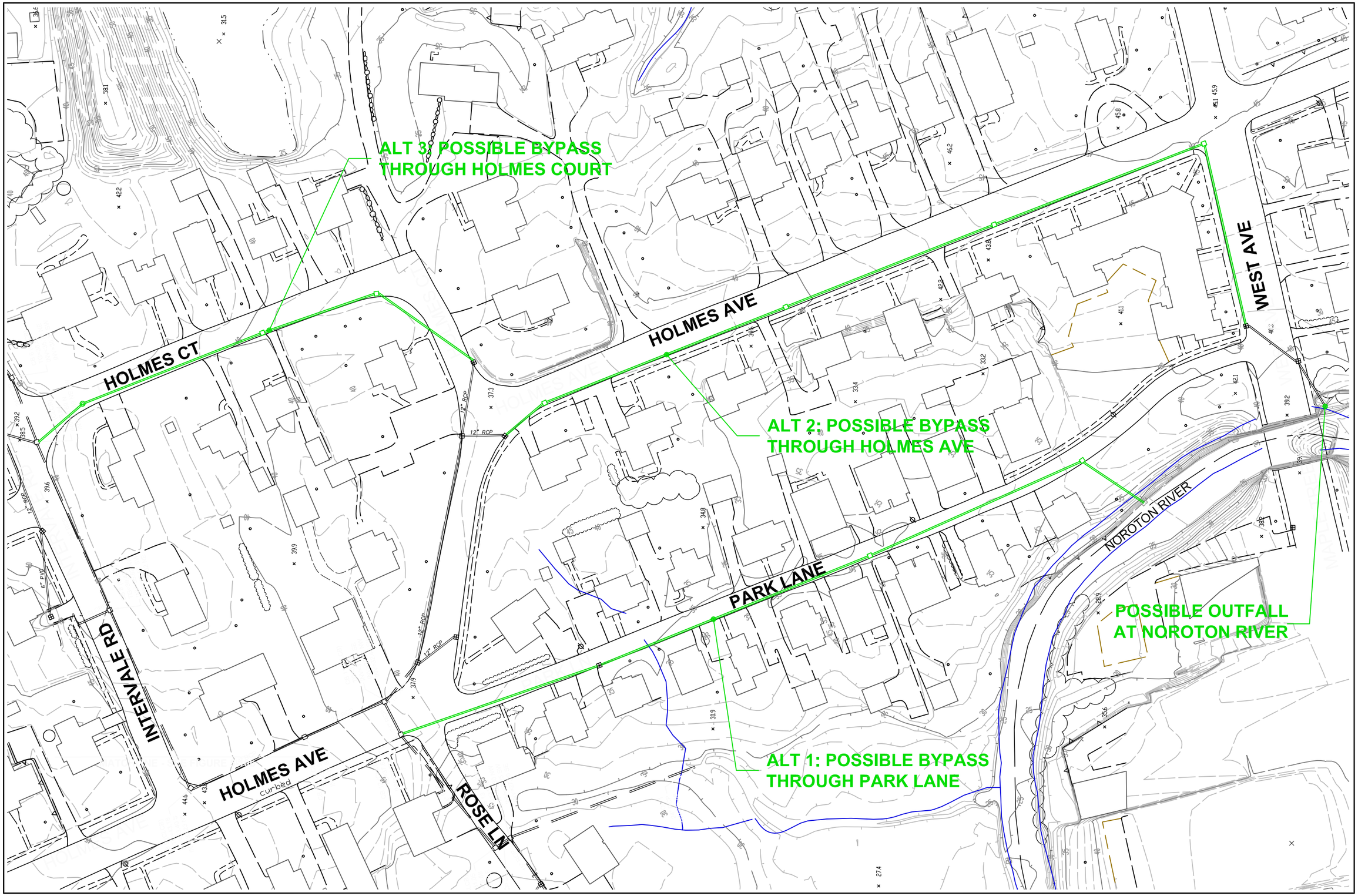
--	BAM	DO
DESIGNED	DRAWN	CHECKED

SCALE: 1"=60'

DATE: MAY 2010

PROJECT NO.: 1581-04-3

SHEET NO.: Fig. 6-10b



Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_INTERVALE.DWG Layout Tab:6-11

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REVISIONS

ABBEY ROAD AT INTERVALE ROAD BYPASS ALTERNATIVES

NOROTON RIVER WATERSHED EVALUATION
STORM DRAINAGE ANALYSIS

ABBEY ROAD AND INTERVAL EROAD
DARIEN, CONNECTICUT

–	BAM	DO
DESIGNED	DRAWN	CHECKED

SCALE: 1"=80'

DATE: MAY 2010

PROJECT NO.: 1581-04-3

SHEET NO.: **Fig. 6-11**

6.6 Camp Avenue Culvert

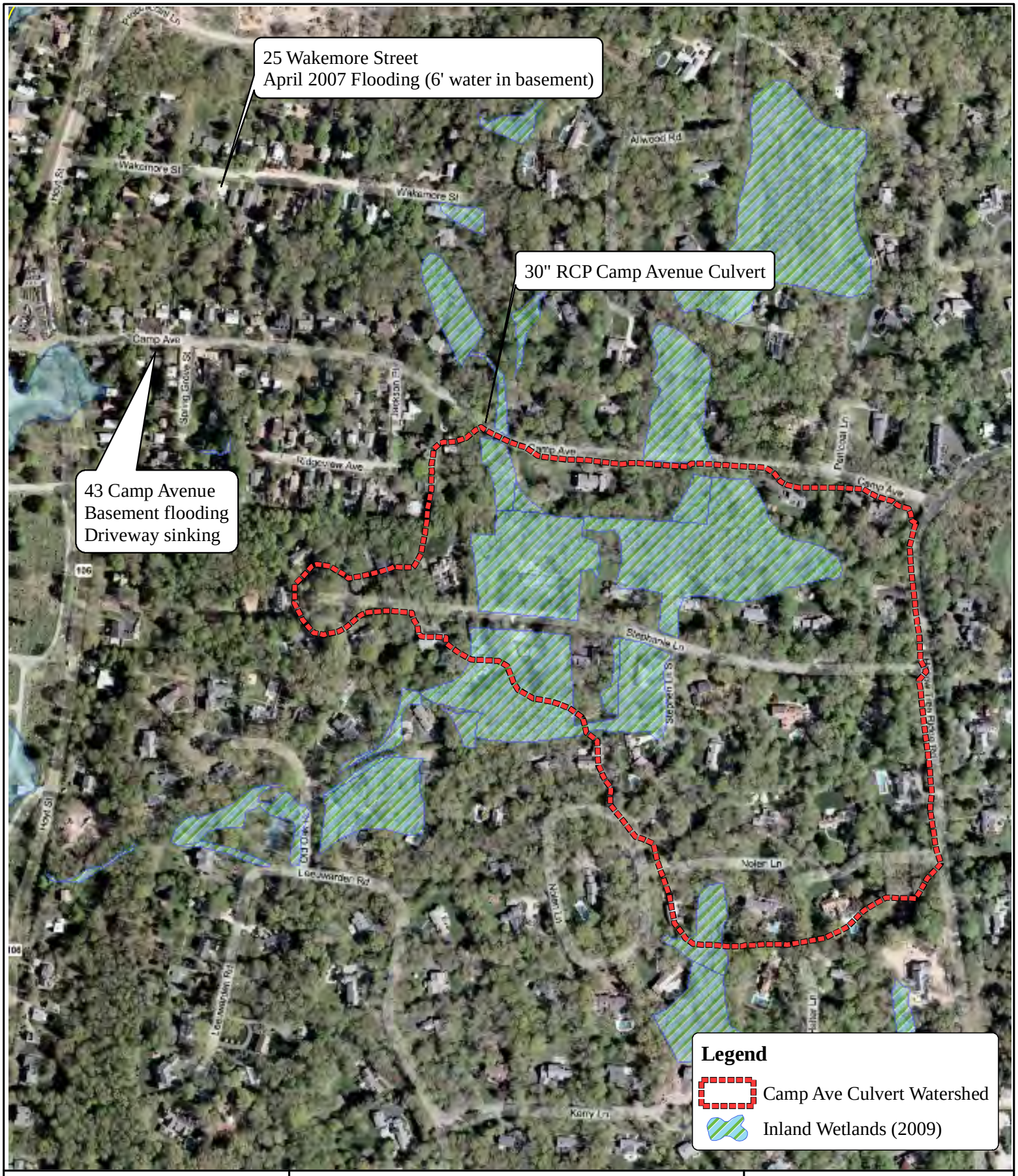
An existing 30" RCP culvert located approximately 300 feet east of the Jackson Place intersection conveys the flow from a drainage ditch under Camp Avenue. During significant storm events, water has been seen to overtop the banks of the drainage ditch and flow down Camp Avenue toward Hoyt Street. A field visit on March 9, 2010 confirmed that elevations of the stream's west bank are noticeably lower than its east bank and the culvert's headwall. The top of the headwall is approximately 4.5 feet above the culvert inlet elevation while the west bank is only three feet above the culvert inlet. This difference allows floodwaters to overtop the western bank and flow onto Camp Avenue before overtopping the culvert headwall.

The drainage ditch originates adjacent to Stephanie Lane and flows northward under Camp Avenue and Wakemore Street, a private road approximately 560 feet north of Camp Avenue. The unnamed watercourse continues to flow northward under the railroad culvert north of the intersection of Greenwood Avenue and Hoyt Street before discharging to the Noroton River.

6.6.1 Watershed Area and Drainage System

The drainage ditch that passes under Camp Avenue receives runoff from a significant watershed both north and south of Camp Avenue. Specifically, it collects street drainage from Stephanie Lane, Nolen Lane, and Camp Avenue in addition to overland flow via a series of drainage ditches and ponds. In total, the contributing watershed to the 30" RCP culvert is approximately 44 acres.

North of Wakemore Street, a former gravel processing operation is proposed to be developed by Vespera into an age-restricted community. A detailed drainage study was completed by Stearns & Wheeler, LLC as part of this development's application process. The drainage study analyzed the watershed to the Canaan Metro North railroad culvert north of the Vespera site. This study was used to aid in the delineation of the watershed to the Camp Avenue culvert.



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Camp Avenue Culvert Watershed

LOCATION:
Darien, CT

MMI#: 1581-04-3
MXD: H:\Camp.mxd
SOURCE: CT DEP

3

Noroton River Watershed Evaluation

Map By: BAM
Date: May 2010
Scale: 1"=400'

SHEET:
Figure 6-12

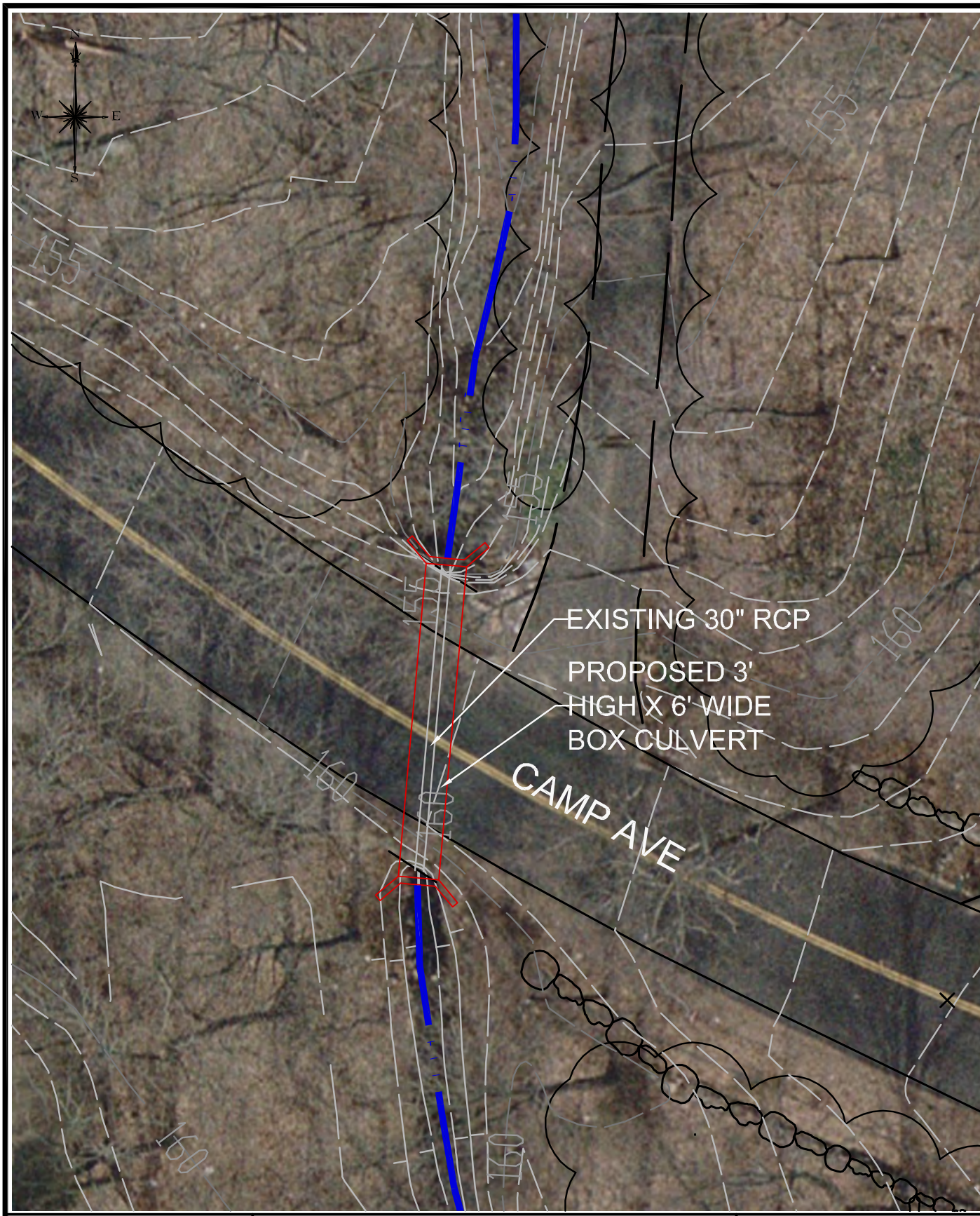
6.6.2 Existing Conditions Analysis

MMI computed the watershed to the existing culvert and found it to be approximately 44 acres. With a computed time of concentration of 42 minutes, the anticipated flow from a 25-year design storm is approximately 130 cfs. TR-55 computations for this watershed have been appended.

A Manning's equation computation of the pipe's capacity at a slope of 6.74% yields a maximum flow of 106.48 cfs. However, a Hydraflow culvert analysis of the structure indicates that the headwall will overtop at a flow of 52 cfs with a normal tailwater elevation, and the western bank, which is 1.5 feet lower than the top of the headwall, will overtop at a flow of 32 cfs. Downstream of the culvert crossing, the slope of the drainage ditch varies between 5% and 10%. It is inferred that tailwater elevations are not a contributing factor to the flooding problems. It is evident that the configuration of the culvert under existing conditions will lead to overtopping for the 25-year design storm.

6.6.3 Proposed Conditions Analysis

Options for alleviating overtopping would be to place fill along the channel's low (western) side in order to raise the bank elevation equal to the channel's eastern bank as well as increase the size of the cross culvert. Replacing the existing 30" RCP with a 3' high by 6' wide box culvert would provide conveyance capacity for well over the 25-year design storm. A culvert of this size would allow the conveyance of up to 155 cfs before overtopping the headwall. The construction of a box culvert would entail installation of wingwalls both upstream and downstream of the cross culvert. These wingwalls would prohibit the overtopping of flow from the low side of the channel.



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CAMP AVENUE PROPOSED
CULVERT MODIFICATIONS

NOROTON RIVER
WATERSHED EVALUATION

DESIGNED	BAM
DRAWN	BAM
CHECKED	DO

LOCATION
CAMP AVENUE
DARIEN, CONNNECTICUT

DATE	MAY 2010
SCALE	1"=20'
PROJ. NO.	1581-04-3

FIGURE
Fig. 6-13

Drawing: H:\1581-04-3 NOROTON RIVER\DWG\STORM SYSTEM ANALYSIS\STORM SYSTEM ANALYSIS_CAMP.DWG Layout Tab:FIGURE
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6.7 Conclusions

Based on review and modeling of the four problem areas, it has been determined that modifications to the systems will result in an increase in conveyance capacity, but additional measures will need to be implemented to alleviate flooding. Prior to the implementation of any of the proposed modifications for the three study areas, a detailed survey is required to determine elevations of all structures and to confirm pipe lengths. With this survey data, the feasibility of the modifications must also be established.

Kelsey Street and Moore Street

The previous drainage study of this area prepared by Redniss & Mead focused on the capacity of the 54-inch pipe that was implemented by the CT DOT. With that work already part of the public record, our work focused on the capacity of the existing conveyance system between that inlet and West Street. After meeting with the residents most affected by the localized drainage issues, it was evident from their video footage and firsthand accounts that this part of the system had less capacity to convey peak flows than the 54" pipe. The video recordings showed overtopping of existing drainage channels due to undersized driveway culverts, where stormwater would then run through the streets and adjacent properties before entering the open channel along the railroad tracks. The video also showed that the capacity of the 54" pipe had not been reached during these storms. It was clear that the localized flooding was due to overtopping of the drainage system in Moore Street rather than the inlet or tailwater constrictions at the railroad culverts. While the pipe system along the railroad tracks also has its limitations, which may lead to localized flooding, the upstream drainage system is more easily compromised.

Replacing the existing drainage swales and driveway culverts with a larger culvert from the outlet of the West Avenue culvert downstream to the trapezoidal channel running parallel to the railroad tracks will contain stormwater and eliminate bank overtopping for

the 25-year storm analyzed. Given cover constraints at the existing driveway crossings, MMI recommends the installation of a low profile type of structure such as a 3' high by 7' wide box culvert or equivalent pipe arches. Whatever the selected improvement, further work would be required to evaluate potential utility conflicts, grading, easements, and other issues that may be revealed in a more detailed design for construction.

Lynn Court

The flooding at Lynn Court is primarily attributed to floodwaters from the Noroton River overtopping the channel banks or backing up through the existing storm drainage system. Modeling of the existing system indicates that the upgrade of two 12" diameter pipes to 18" pipes would alleviate surcharge at some structures and reduce the volume of surface runoff on the street. Although upgrades to the existing storm drainage system could be completed, these improvements will not alleviate the primary cause of flooding in this region, which is caused by water surface elevations in the Noroton River. Section 5.2 details possible riverbank improvement options in this area. However, given the proximity of the houses to the river and their finished floor elevations, they would remain within the FEMA delineated 100-year floodplain and partially in the floodway. Floodproofing measures for individual houses as detailed in Section 5.3 would help to limit the damage and should be implemented. The town may also consider establishing a warning protocol to notify residents if one does not exist already.

Intervale Road

Flooding problems have been noted at the intersection of Abbey Road and Intervale Road, a low-lying intersection in an extensive drainage system that receives runoff from approximately 2.6 acres. Downstream flooding has also been noted at Rose Lane during a significant storm event wherein a large portion of the area was inundated by floodwaters. Although a storm drainage model of this area indicates undersized pipes, the flooding was most likely due to backwater from the Noroton River (in the 100-year

floodplain). Options for addressing the flooding at Abbey Road include upgrading of system pipe sizes from the cross country line at Devon Road down through the outfall at Rose Lane; installation of a bypass system through Holmes Avenue and West Avenue to the Noroton River from the catch basin located at the intersection of Rose Lane and Holmes Avenue; or installation of a bypass system through Holmes and West Avenues to the river via Holmes Court. All three options would entail extensive construction related to replacement of existing pipes. The options for rerouting the storm drainage would also require the installation of additional pipe. The proposed improvements considered a 25-year design storm. Rainfall events beyond the 25-year storm and backwater conditions associated with the Noroton River may continue to cause flooding of low-lying areas in this neighborhood.

Camp Avenue Culvert

Flooding noted at the Camp Avenue culvert appears to be a result of a slightly undersized culvert and the low elevation of the channel bank on its west side. By replacing the 30" RCP with a 3' x 6' box culvert with wingwalls having a suitable height and length to compensate for the low grade on the west side, overtopping of the culvert will be eliminated.

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Bridge plans were evaluated for updating the hydraulic modeling. Plans reviewed include the following:

- *Boston Post Road Bridge (Route 1)* – Plan "Bridge over Noroton River (Bridge # 00315)" by Connecticut Department of Transportation Bridge Design Unit, Dated March 1956.
- *Camp Avenue* – Plan "Camp Avenue, Stamford, Over Noroton River" J. Brownfield Jr. Engineer and Surveyor. Dated July 15, 1949.
- *West Avenue* – Plan "Bridge Over Noroton River on Route 118" by State of Connecticut Department of Transportation, Dated November 2, 1956.
- *Woodway Road* – Plan "Eaton Avenue Rigid Frame Bridge over Noroton River, General Plan" by State of Connecticut Department of Transportation, Dated May 15, 1946.

1581-04-3-m410-rpt.doc

APPENDIX A

Stream Evaluation Observations

APPENDIX B

Rating Curve Computations

APPENDIX C

NRCS Memo Approving Curve Numbers

APPENDIX D

Curve Number Computations

APPENDIX E

Time of Concentration Computations

APPENDIX F

HEC-HMS Data Files

APPENDIX G

Effective Model Provided by FEMA and River Stationing Differences

APPENDIX H

Existing Conditions HEC-RAS Model Output Summary and River Stationing Differences Between Effective and Existing

APPENDIX I

Existing Conditions
Channel Profile and Floodplain Mapping

APPENDIX J

Natural Conditions HEC-RAS Model Output Summary

APPENDIX K

Natural Conditions
Channel Profile and Floodplain Mapping

APPENDIX L

Proposed Conditions HEC-RAS Model Output

APPENDIX M

Kelsey Street Drainage Computations

APPENDIX N

Lynn Court Drainage Computations

APPENDIX O

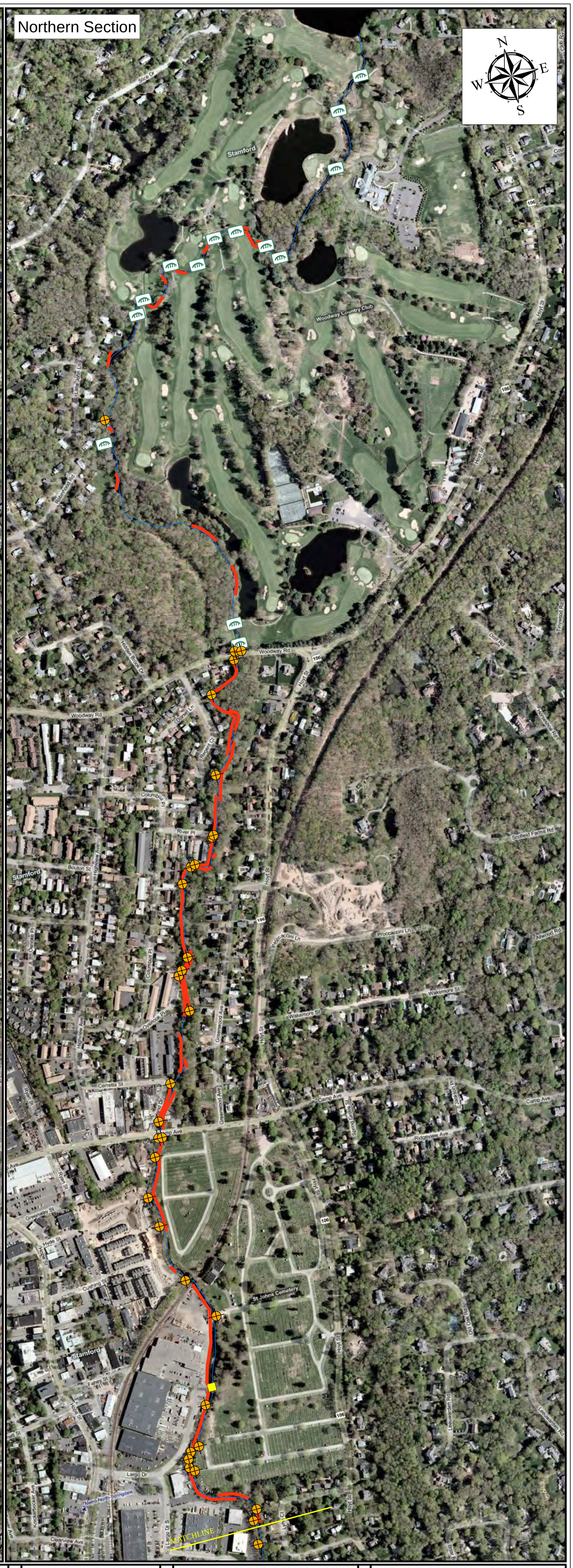
Intervale Road Drainage Computations

APPENDIX P

Camp Avenue Culvert Drainage Computations

APPENDIX A

Stream Evaluation Observations



Appendix A

SHEET NO.

DESIGNED	JSC
DRAWN	JSC
CHECKED	NHB
SCALE:	1" = 300'
DATE:	March 2010
PROJECT NO:	1581-04-3
MXD NAME:	H:\Appendix\A-NRObserved.MXD

Stream Evaluation Observations

Noroton River Watershed Drainage Evaluation

Darien and Stamford, Connecticut

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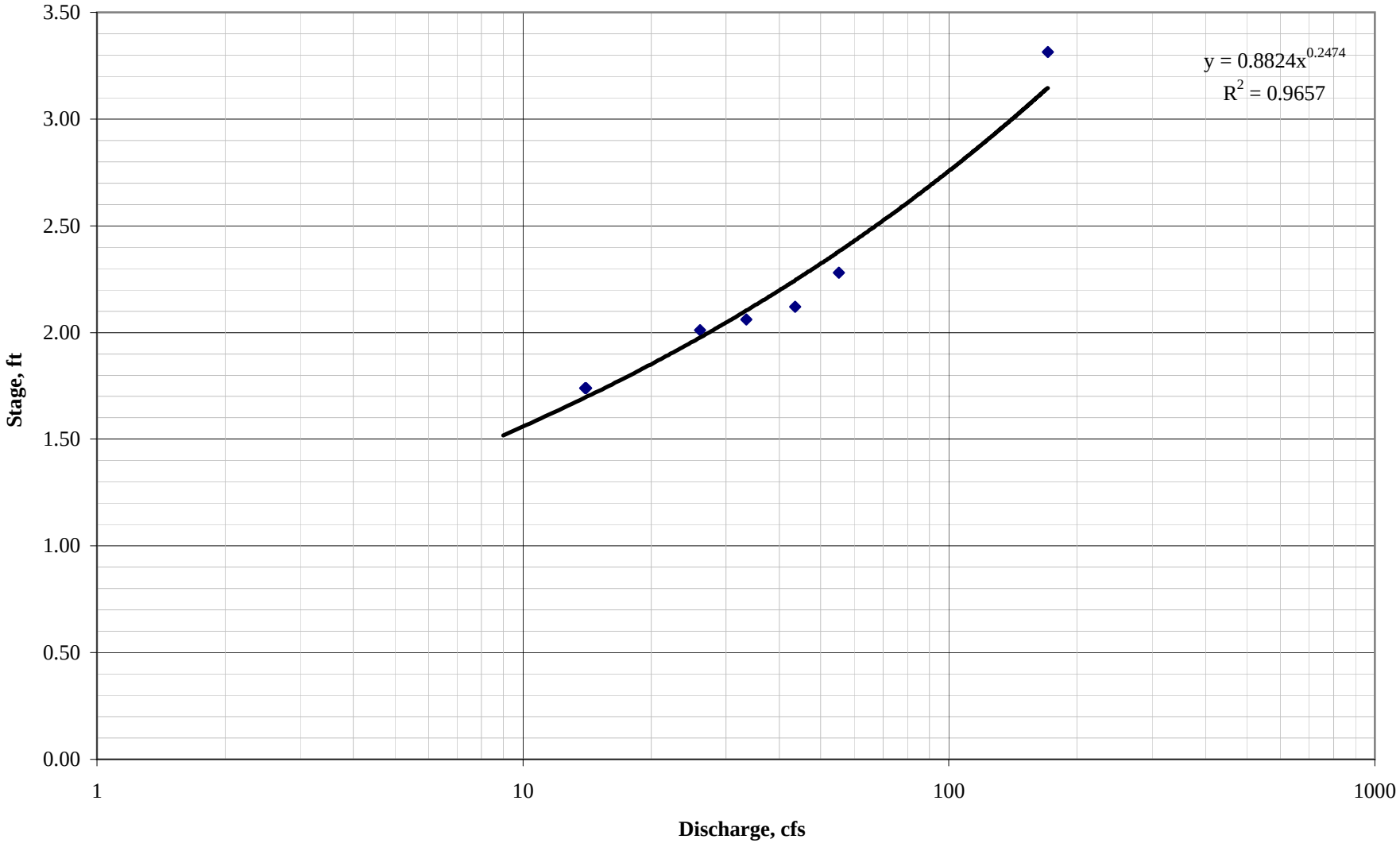
APPENDIX B

Rating Curve Computations

Appendix B.
Noroton River Rating Curve
400 Feet Downstream of the Terminus of Lenox Avenue in Stamford



APPENDIX C

NRCS Memo Approving Curve Numbers

MEMORANDUM

TO: DEP Hydrology Research Committee

FROM: James G. MacBroom, P.E.
Milone & MacBroom, Inc.

DATE: August 13, 1998

RE: Applied Single Runoff Event Simulation (Hydrology) Computer Models

---

A. Introduction

Single event simulation computer models such as the NRCS "TR-20 Hydrology" and U.S. Army Corps of Engineers "HEC-1" are in widespread use to determine peak flow rates in ungauged watersheds.

The models are used for the planning and design of dams, bridges, culverts, channels, and flood storage detention basins, plus are used for regulatory permit applications.

They continue to have broad support among the regulatory agencies and municipal engineers, even though there is a general consensus that peak flow results are often higher than analysis of stream gauge results. A careful review of the literature, instruction manuals, and review of actual models indicates many users are not utilizing the model's flexible input options, resulting in excessively high flow predictions. Consequently, it is important to be aware of specific methods of developing input data to best represent watershed runoff conditions and to minimize overly conservative or unreasonable assumptions.

The comments below are applicable to the TR-20 model and to the HEC-1 model when using the curve number (CN) input data option. They are intended as guidelines on how to develop custom site specific input data to improve watershed parameters and to re-emphasize basic modeling procedures. For example, in many cases, the user manuals allow and encourage development of custom CN parameters, but most users opt for the higher default values.

Note that it is always desirable to check computer model results against nearby gauging stations and their statistical flood frequency analysis prepared by USGS. In large watersheds with little storage, the USGS regression equations may also be used. For small watersheds under 200 acres in size and with little storage, the Rational method remains viable for determining peak flows.

B. Subwatersheds

1. Computer model results appear to improve when large watersheds are subdivided into numerous small subwatersheds. Special care should be used to emphasize homogeneous watersheds with similar soils, land use, and topography. On watersheds with diverse CN values, it may be desirable to split the watershed into smaller areas rather than use the average CN value.

2. There are hydrologists who believe that the directly connected impervious cover in a basin should be considered separately from pervious areas (Golding, 1997). A single subwatershed with dispersed impervious cover may be represented by using two separate hydrographs, one for pervious areas and one for impervious areas (with separate CN, TC values) and then combining them. By evaluating pervious and impervious areas separately, the errors in averaging their CN and TC values can be minimized.

3. The "reservoir routing" of hydrographs through impoundments, lakes, wetlands and constricted areas is an important part of the models. A review of numerous models indicates users often omit potential storage areas. The modeler should attempt to evaluate all possible storage areas as they have a large influence on the final results. Note that in some cases road culverts with high embankments may delay runoff and should be treated as a reservoir.

4. The use of the channel routing techniques are specially important when using small subwatershed with limited time of concentrations and where overbank flow occurs on floodplains. The SCS TR-20 channel routing procedure (ATKIN) is awkward but technically sound. It reduces peak flows due to both channel storage and travel time through the reach.

   The size of the simplistic prismatic cross section used to determine the X and M coefficients should represent the cross section at the estimated flow rate. The cross section values for a two-year flood contained in a channel are not always suitable for a 100-year event that flows on a broad floodplain. In the latter case, the "channel" width used in the computations approaches the floodplain width. Typical values of "X" range from 0.01 to 10, with the lower values representing lower velocities and increased attenuation. The values of "M" range from 1 to 2. The lower values of M represent lower velocities. The reach lengths should be over 500 feet. Small reach lengths do not provide attenuation and may have a travel time less than Δt main time increment.

5. The HEC-1 model provides five alternate methods of routing hydrographs through channel reaches. A careful review of the channel characteristics is necessary to

select the most appropriate method. The attached table (USACOE, 1996) provides some guidelines. The "Munsingum-Cunge" method is generally preferred.

6. Some watersheds have very irregular topography that may have areas draining to isolated depressions or vernal pools without any type of discharge to riverine systems and which are not visible on standard USGS topographic maps. The TR-20 and HEC-1 user manuals do not address this condition. This situation can be handled by reducing the watershed area to reflect only the effective runoff producing area.

C. Runoff Curve Numbers

The SCS runoff curve number (CN) is an empirical system to determine surface runoff volumes from specified rainfall. While there are questions about the fundamental theory for the curve number, this topic is beyond the scope of this paper. However, there is much that can be done to improve their application. SCS publications provide recommended values of CN as a function of soil types, vegetation, and land use. The TR-20 model user manual does not provide data on how to develop CN values, so most engineers use the TR-55 tables. However, earlier SCS publications (NEH4, 1972) provide the raw data. Unfortunately, the original research of the CN values was rather limited and poorly documented (Hjelmfelt, 1991). In urban areas, the published values are using conservative assumptions. Therefore, skilled modelers need to understand how CN values are established and use their judgment in adjusting them for specific watersheds. Use of a fixed CN value is questionable because the percentage of precipitation that becomes runoff should vary with rainfall intensity.

A revised form has been prepared for use in computing the subwatershed runoff curve numbers (CN). The revised form provides space for adjusting the hydrologic soil group for disturbed or urban conditions, and for modifying the CN value for disconnected impervious areas. The following comments on determining the CN value should be considered:

1. The TR-55 manual (June 1986) allows one to deviate from the published natural soil types in urban areas where the soil profiles and infiltration rates have been modified. For example, a natural type D soil may be cut, filled, or regraded, then covered with a pervious type B topsoil. TR-55 appendix A, page A-l, recommends the following adjusted soil types in disturbed areas:

HSG	Soil Textures	Runoff Potential
A	Sand, loamy sand, or sandy loam	Low
B	Silt loam or loam	Moderate
C	Sandy clay loam	High when saturated
D	Clay loam, silty clay loam, sandy clay, silty clay or clay	High

2. The CN value for ponds and lakes is 98.

3. The SCS recommended CN values published in TR-55 for developed areas assume relatively high levels of impervious cover. The percentage of impervious cover assumed for each land use in the TR-55 manual are tabulated below. A literature and site plan review indicates that the TR-55 published CN values for residential areas are consistently higher than local land use practice in suburban Connecticut towns.

   Site specific CN values can be measured or computed for specific watersheds, based on zoning, rather than using default values. MMI has computed impervious cover values for residential areas based on typical Connecticut site plans and zoning as noted below. The values are compared with TR-55 and other published studies. The results below suggest that the impervious cover levels used in TR-55 and other SCS publications to determine CN values are generally on the high side, leading to high CN values.

Total Impervious Cover,
% of Watershed

Land Use	SCS TR-55	Debo & Reese (1995)	Alley & Veenhuls (1982)	MMI
1/8 acre. Res.	65		30-49	40
1/4 acre Res.	38		30-49	31
1/3 acre Res.	30		22-31	24
1/2 acre Res.	25	30	13-16	20
1 acre Res.	20	12	13-16	13
2 acre Res.	12	6		11
Commercial	85	75	88	Varies
Industrial	72	90	60	60
Apartment		60	60	Varies

4. A U.S. Geological Survey study performed in conjunction with the New Jersey Department of Environmental Protection (Stankowski, 1972) also studied the range of watershed total impervious cover levels as a function of land use with the following findings:

Land Use	Total Impervious Cover, Percent of Watershed for Various Densities		
	Low	Medium	High
Single-family Residential	12	25	40
Multiple-family Residential	60	70	80
Commercial	80	90	100
Industrial	40	70	90
Open Space, Recreational	0	0	0

The highest impervious cover values were found in higher density urban centers, and the lowest values in rural areas. The New Jersey USGS impervious cover range in residential areas is consistent with MMI computations and the data by Alley and Veenhuls. The data indicates that the SCS TR-55 assumed impervious cover values are generally higher than published data.

5. Field observations and published literature indicates that many impervious areas drain onto pervious soils that allow some infiltration to occur, thereby reducing the effect of impervious areas. For developed areas, the SCS curve numbers in TR-55 assume that all impervious areas are connected to and discharge directly into drainage systems, or have concentrated shallow flow to a drainage system preventing subsequent infiltration into pervious soils (See TR-55 Table 2-2a, footnote 2).

   If the runoff from the impervious area passes over a pervious area as sheet flow, it will be subject to infiltration and surface storage and is not considered as an effective impervious area (Prandit and Gopalakrisknon).

   New CN values can be computed with the effective impervious cover, or Figure 2-4 in TR-55 can be used to reduce CN values for watersheds with extensive "Disconnected" impervious areas. This often applies to parking lots without curbs or catch basins, and roof runoff discharging overland. The key issue is to determine what percentage of the total impervious cover is effective in producing runoff.

   a. MMI has recomputed residential CN values for each soil type based upon the assumption that the road and driveway impervious areas are effective and connected directly to drain systems, but the roofs are not connected to a central storm drain system. This is a very common condition, especially for larger lots.

CN Values
Residential Areas

Land Use	Standard SCS TR-55 Values A	B	C	D	MMI Values, With Disconnected Rooftops A	B	C	D
1/8 acre. Res.	77	85	90	92	52	68	78	84
1/4 acre Res.	61	75	83	87	50	68	77	84
1/3 acre Res.	57	72	81	86				
1/2 acre Res.	54	70	80	85	47	66	77	83
1 acre Res.	51	68	79	84	43	64	75	81
2 acre Res.	46	65	77	82	40	60	74	80

b. In an article published in the ASCE Journal of Hydraulic Engineering, two USGS researchers (Alley and Veenhuls) tabulated the impervious cover and effective impervious cover for 19 urban watersheds near Denver. Their data suggests that the effective impervious area in residential areas is only about 60% of the total impervious cover.

Their equation for effective impervious area (EIA) is:

$$EIA = 0.15\ (TIA)^{1.41}$$

TIA = Total Impervious Area, % of watershed

The article indicates that the use of TIA instead of EIA in hydrologic models will overestimate runoff volumes and peak flows for ungauged watersheds.

c. Sutherland (Fall 1995) provides a summary of USGS research on effective impervious cover in 40 watersheds in Oregon. In order to get more accurate estimates of runoff, ineffective impervious areas that do not contribute to runoff should be subtracted from the total impervious area to get the effective value. Using USGS data, Sutherland developed a series of equations to estimate the effective impervious cover in four types of basins:

- Highly Connected Basins - Roads with curbs and storm drains, no drywells or infiltration units, roof runoff connected to storm drains or to street. This is typical of many urban areas.

$$EIA = 0.4\ (TIA)^{1.2}$$

- Average Basins – Roads with curbs and storm drains, no dry wells or infiltration units, few roof runoff connections to storm drains. This is typical of many suburban areas with modern curbed roadways with storm drains, but where the driveways and roads do not necessarily drain directly to the road or storm drain.

  $EIA = 0.1\ (TIA)^{1.5}$

- Moderate Connected Basins – 50% of urban areas are without storm drains, some swales and ditches in use, most rooftops not connected to storm drains, few drywells or infiltration units. This condition is typical of many older neighborhoods where many streets lack curbs or storm drains.

  $EIA = 0.04\ (TIA)^{1.7}$

- Low Connected Basins – Few urban areas with storm drains, or 70% of areas drain to drywells or infiltration areas.

  $EIA = 0.01\ (TIA)^{2.0}$

6. The total impervious cover areas determined by MMI for residential areas (paragraph C3) have been combined with the Sutherland (1995) equations to estimate the effective impervious area corresponding to four levels of connectivity, as noted below:

Effective Impervious Cover, % of Watershed

Residential Land Use	MMI TIA, %	Highly Connected*	Average Basins*	Moderately Connected*	Low Connectivity*	USGS Denver Range**
1/8 Ac	40	33.4	25.3	21.2	16.0	18-32
1/4 Ac	31	24.6	17.3	13.7	9.6	11-19
1/3 Ac	24	18.1	11.8	8.9	5.8	11-19
1/2 Ac	20	14.6	8.9	6.5	4.0	7-10
1 Ac	13	8.7	4.7	3.1	1.7	7-10
2 Ac	11	7.1	3.6	2.4	1.2	
Formula		$0.4(T)^{1.2}$	$0.1\ (5)^{1.5}$	$0.04(T)^{1.7}$	$0.01(T)^{2.0}$	

* Computed based upon the Sutherland equation using MMI TIA.
** Range of values found in Denver watersheds by Alley & Veenhuls.

The effective impervious cover results for basins with Sutherland's "average connectivity" are very similar to the range of values found in the Denver area USGS study (Alley and Veenhuls, 1983). As expected, the effective impervious cover values for basins with moderate and low levels of connectivity are below the range of values in Denver.

7. MMI has recomputed composite CN values for residential land uses and soil types. They are based upon the MMI estimated impervious cover (paragraph C3) modified by Sutherland's net effective impervious areas, with average connectivity. The CN values for the pervious areas of building lots less than one acre are based on SCS open space CN values, while larger lots assume that the pervious area is 25% wooded.

MMI Composite CN Values*
Effective Impervious Area Plus Pervious Areas, Average Connectivity

Lot Size	MMI EIA %	CN Values by Soil Types A	B	C	D
1/8 Ac	25.3	54	70	80	85
1/4 Ac	17.3	49	67	78	83
1/3 Ac	11.8	46	65	77	82
1/2 Ac	8.9	44	64	76	82
1 Ac	4.7	40	61	74	80
2 Ac	3.6	39	60	73	80

* CN = [(EIA)98] + (100 – EIA) (Pervious CN) ÷ 100.

The above values are quite similar to those determined in paragraph C5A.

Similarly, residential CN values may be computed for watersheds with higher or lower connectivity.

8. The SCS CN values used in TR-55 Table 2-2a for open space (lawns, parks, golf courses, cemeteries) are based upon poor, fair, and good pasture conditions. The three CN classes are listed at <50%, 50% to 75%, and >75% ground cover.

The TR-55 CN values for open space have been found to correspond exactly with Figure 22-23 from Chow's Handbook of Applied Hydrology, using assumed ground cover densities of 30%, 65%, and 90% cover. In Connecticut, where grass lawns are seldom in the form of pastures and are usually providing full ground cover with few,

if any, areas of bare soil, it will often be appropriate to use the Chow Figure 22-23 CN values for 100% ground cover rather than the higher SCS CN values for >75% ground cover as shown below.

	Ground Cover Actual %	CN Values by Soil Type A	B	C	D
Open Space (lawns, parks, golf courses, cemeteries, etc.)					
TR-55 Poor Condition (grass cover < 50%)	(30%)	68	79	86	89
TR-55 Fair Condition (grass cover 50% to 75%)	(65%)	49	69	79	84
TR-55 Good Condition (grass cover > 75%)	(90%)	39	61	74	80
MMI Excellent Condition	100%	36	55	70	80

The above table indicates that the reasonable assumption of 100% ground cover in most open space areas will reduce the CN values for open grass areas on A, B, and C soils.

9. Connecticut has extensive woodlands with both tree canopies and shrub layers with ground cover. Common practice in use of hydrology models is to assign CN values to these areas based upon the published TR-55 values for "woods." A review indicates these values may overestimate runoff in Connecticut forest lands.

The published CN values for "woods" in the TR-55 Table 2-2c are based upon small farm wood lots, occasionally grazed or cut for firewood. This represents a disturbed woodland, similar to small wooded areas in residential neighborhoods. The values do not correspond to a mature forest land cover as found in rural areas of Connecticut and will overestimate CN values. Other references are available.

The SCS Hydrology Manual (NEH4) and Chow's Handbook of Applied Hydrology (1964) both provide guidance on selecting CN values for humid forested areas. The key factors are soil types and the thickness and condition of the humus organic material on the forest floor. The humus consists of porous partially decomposed organic material, mixed with mineral soils, in the O1 and A1 horizons. A review of the county soils surveys indicates Connecticut woodland soils typically have three to eight inches of humus. Based upon an assumed four inches of a loose humus, the hydrologic condition is IV, with the following CN values (NEH#4, Fig. 9.2):

	CN Values by Soil Type A	B	C	D
Forest, 4" Humus	30	50	60	67
TR-55 Woods, Good Condition	30	55	70	77

previous

The above CN values for forest with four inches of humus are much lower than the commonly used TR-55 values. CN values for forests with other humus conditions can be obtained from the attached figure.

D. Time of Concentration

The time of concentration (TC) input data for the TR-20 and HEC-1 models is an important input variable and has a significant impact on the final computed peak flow rates. In small watersheds, the overland flow component of the TC is critical. In larger watersheds, the channel travel times and routings tend to dominate overall lag periods.

The preferred procedure is to utilize a modified version of the three step "velocity method" as described in TR-55. The recommended procedure is:

1. The "sheet flow" (also called overland flow) component is used as per TR-55. The flow length varies, from as little as 100 feet in irregular topography that channelizes the water, to several hundred feet on smooth permeable soils that delay concentrated flow. SCS suggests a 300-foot limit, while Haan (1982) recommends up to 450 feet, depending on site conditions.

2. The "shallow concentrated flow" component of the time of concentration can be determined with or without using TR-55 figure 3.1. The figure is based on the Manning equation with fixed predetermined values of Manning Equation Roughness factor "N" and hydraulic radius "R". Instead of using these fixed values, one may use the Manning equation with appropriate values of "N" and "R". The attached page from the King County (Washington) Surface Water Design Manual provides suggested values.

3. The "channel flow" velocities should normally be computed with the Manning equation as in TR-55, with special attention to selecting appropriate "N" values and depths for each channel segment.

   In computing the channel slope, it is important to omit the vertical grade differences that occur over short lengths, such as waterfalls, rapids, and sudden drops, because their inclusion would alter the mean channel slope (Chow, 1964).

4. It is important to use multiple stream reaches for determining flow velocities with the Manning equation, each with a uniform slope, rather than averaging overall slopes. The sum of travel times for a steep segment and a flat segment is much greater than the composite travel time of an equivalent average slope segment due to the non-linear terms in the Mannings equation.

5. For large floods, much of the water flow is on the vegetated overbank floodplains rather than in the comparatively smooth channel. Use the appropriate composite friction coefficient for computing the time of travel.

6. The flow velocities of a two-year flood in a channel are different than for a 100-year overbank flood. It is not always appropriate to use a single TC value for a wide range of flood depths.

7. The computed flow velocities should be checked by comparing them to the threshold velocity of the observed bed material. For example, computed velocities of five feet per second are not reasonable on a fine sandy bed which would have been eroded.

8. Do not use the SCS Lag method of TC.

9. The time of travel through small ponds and lakes is zero. For large lakes, use the wave equation to determine the lake's wave velocity and travel time. The following velocities result:

Water Depth, FT	Velocity, FPS
2	8.0
4	11.3
8	16.0

10. Many natural channels in the upland portions of Connecticut have relatively steep gradients. The computation of mean velocities for use in the time of concentration, using standard steady state uniform flow techniques (Mannings equation) can lead to supercritical flow conditions and velocities, with a rapid time of concentration leading to high peak flow predictions.

    Research shows that supercritical flow in natural channels seldom occurs over long reaches (Trieste, 1992). This is due to high friction roughness, formation of riffles or chutes with mild gradient pools, and energy dissipating hydraulic jumps.

    Channels with Froude numbers over 1.0 (supercritical) are very erosive and tend to readjust into cascades/riffles with flat pools (Anderson et al, 1996). This reduces mean velocities and increases TC. Reasonable mean channel velocities can be assumed to have an upper limit at critical depth. For steep sheds, this is approximated by:

$$V = 3.81\ R^{0.83}\ S^{0.12}$$

E. Precipitation

1. Rainfall totals used in the TR-20 model are not automatically adjusted for annual or partial duration data sets. The conversion from annual data series to partial-duration series is:

Frequency	Conversion Multiplier
2	1.13
5	1.04
10	1.01
25	1.00

2. The point rainfall data from publications such as TP-40 and HMR-35 should have a watershed area adjustment for basins greater than 10 square miles. The HEC-1 model has an optional step to do this. In the TR-20 model, it can be done manually using the adjustment factors in the HEC-1 manual. This adjustment reduces the net rainfall depths because intense storm cells have a discrete size and seldom cover large watersheds uniformly.

3. The TR-20 model has seven pre-coded rainfall distributions. The Type III storm pattern is used as the standard in Connecticut, and reviewers generally object to use of alternatives. The precipitation data in TP-40 and HMR-35 can be used to create site specific rain distributions in lieu of the standard SCS Type III.

F. Time Increment

1. The main time increment affects the number of points used to define hydrographs. The TR-20 and HEC-1 models both have a limit of 300 points which may not allow use of small ΔT values for long duration storms. Ideally, the Δt value should be 0.1 to 0.3 TC so that the rising limb of the hydrograph has several computed points. It is difficult to select an ideal Δt value when the subwatersheds vary in size. For very small subareas, Δt maximum is 0.5 TC of smallest subarea. Typical values are 0.1 to 1.0 hours.

2. Avoid use of subwatersheds with a larger TC range, particularly with the TR-20 model, as the computer may not evaluate the peak points on small hydrographs.

3. The Δt value may be changed (increased) part way through a run by using a new increment card in the TR-50 model.

G. Lag Time

The SCS hydrology methods use the watershed's time of concentration as a key input data relating to unit hydrograph development. Internally, the TR-20 program computes unit hydrographs based on watershed lag. The watershed lag is generally defined as the time interval between the centroid of rainfall to the center of mass of runoff, or peak of unit hydrograph. It may be thought of as a weighted time of travel.

It can be expressed as:

$$\text{Lag} = K\ TC\ (\text{SCS, NEH4})$$

$$K = \text{Coefficient less than } 1.0$$

In the TR-20 program, a value K = 0.6 is used (Han, 1982) based upon empirical data. It may vary depending on watershed characteristics. In a "frying pan" shaped watershed, with an outlet at the end of handle, K may approach 1.0. In small basins with simple drainage patterns, the time of concentration may be very close to the lag time of peak flow (Chow, 1964). This adjustment would tend to decrease predicted peak flows.

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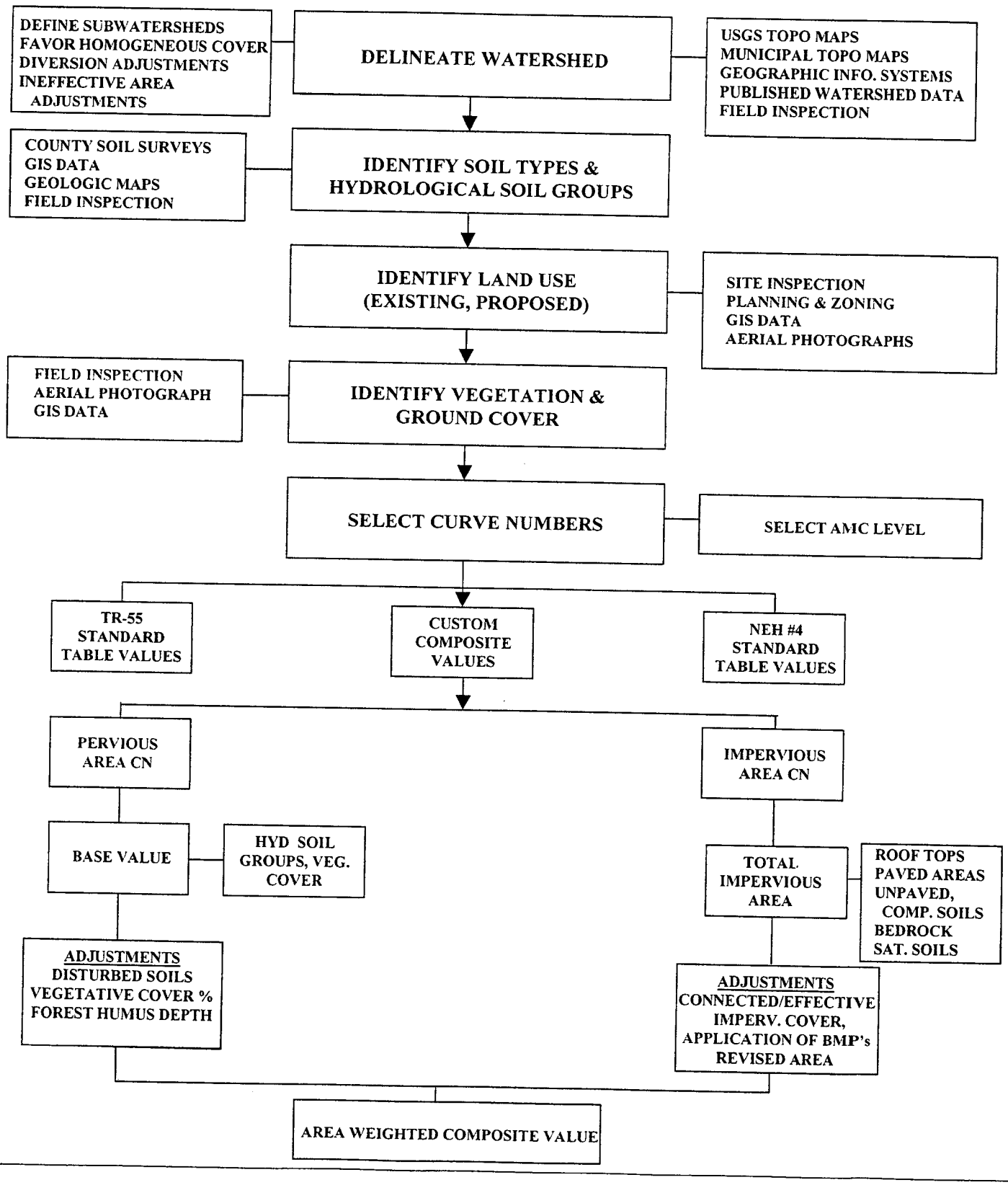
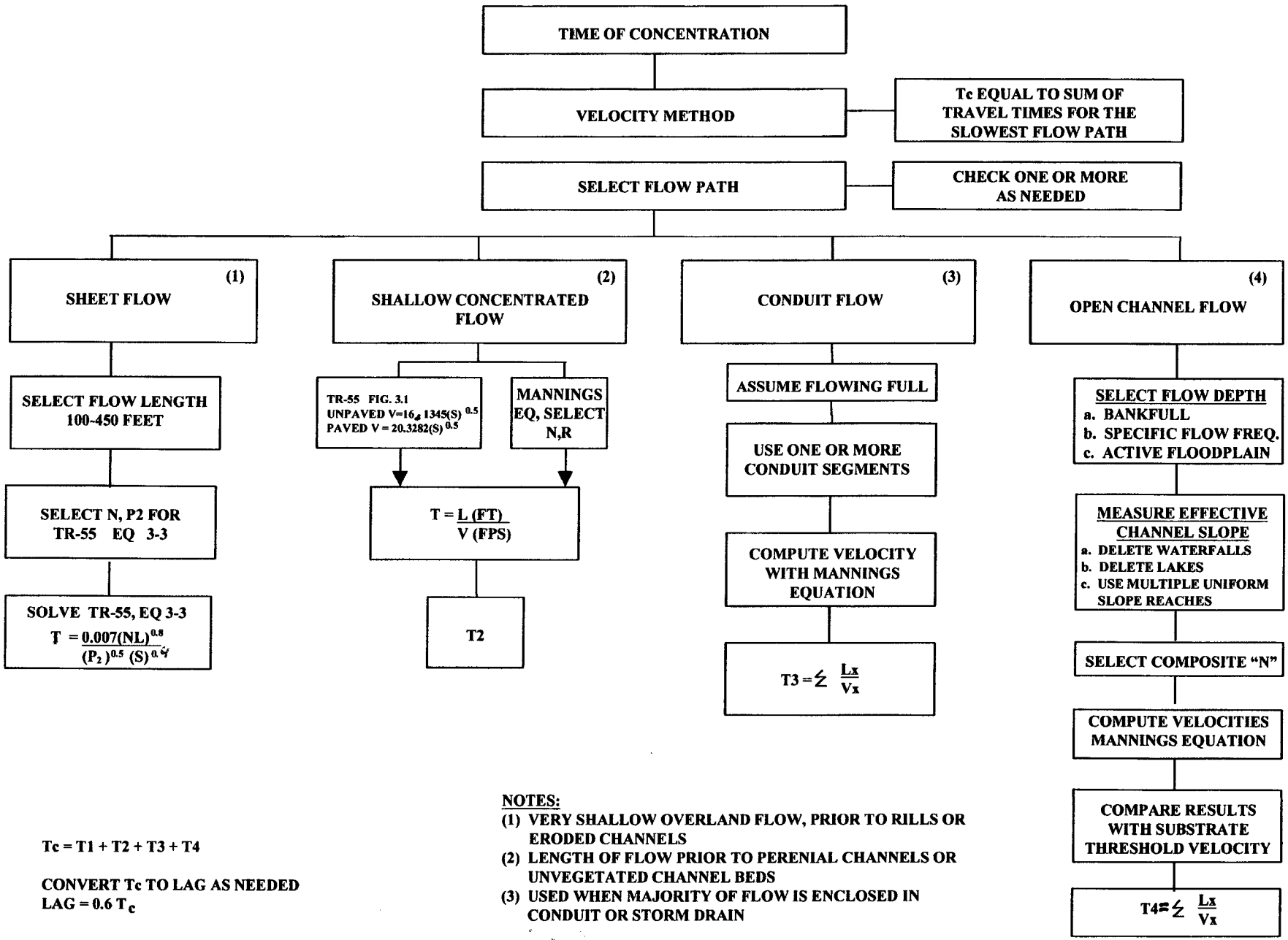
DRAFT
MMI

HYDROLOGIC CURVE NUMBER DETERMINATIONS FOR RAINFALL - RUNOFF RELATIONSHIPS



TIME OF CONCENTRATION PROCEDURE



$T_c = T1 + T2 + T3 + T4$

CONVERT Tc TO LAG AS NEEDED
LAG = 0.6 T_c

NOTES:

(1) VERY SHALLOW OVERLAND FLOW, PRIOR TO RILLS OR ERODED CHANNELS
(2) LENGTH OF FLOW PRIOR TO PERENIAL CHANNELS OR UNVEGETATED CHANNEL BEDS
(3) USED WHEN MAJORITY OF FLOW IS ENCLOSED IN CONDUIT OR STORM DRAIN

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: _____ By: _____ Date: _____
Location: _____ Checked: _____ Date: _____
Circle one Present Developed Watershed: _____
Circle one T_c T_t Subwatershed: _____

Sheet flow (applicable to T_c only)

		Segment ID		
1. Surface description (Table 3-1)				
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)				
3. Flow Length, L (< 300ft)	ft.			
4. Two-year 24-hr rainfall, P_2	in.			
5. Land slope, s	ft./ft.			
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		=	

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID				
7. Surface description						
8. Manning's roughness coeff., n						
9. Paved or unpaved						
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.					
11. Flow Length, L	ft.					
12. Watercourse slope, s	ft./ft.					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.					
14. $T_t = \frac{L}{3600 * V}$	hr.		+		=	

Channel flow

		Segment ID							
15. Channel Bottom width, b	ft.								
16. Horizontal side slope component, z (z horiz:1 vert)	ft.								
17. Depth of flow, d	ft.								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$								
19. Wetted perimeter, P_w	ft.								
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.								
21. Channel slope, s	ft./ft.								
22. Manning's roughness coeff., n									
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.								
24. Flow length, L	ft.								
25. $T_t = \frac{L}{3600 * V}$	hr.		+		+		+		=
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)	hr.								

APPENDIX D

Curve Number Computations

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
C	Woods Fair	73			11.41	832.70
D	Woods Fair	79			4.40	347.63
B	Open Space Good	55			1.36	74.74
C	Open Space Good	70			10.13	709.37
D	Open Space Good	80			0.23	18.45
C	Residential 4 acre	71			118.51	8414.47
D	Residential 4 acre	79			31.68	2502.33
B	Residential 2 acre	60			12.18	731.02
C	Residential 2 acre	73			64.16	4683.89
D	Residential 2 acre	80			23.05	1843.98
B	Rural ROW	89			1.28	114.31
C	Rural ROW	92			17.04	1567.53
D	Rural ROW	93			2.53	234.85
N/A	Water	98			10.69	1047.62
				Totals =	308.65	23122.89
					(0.48227	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{23122.89}{308.65}$$

Use CN = 75

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-02

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			13.71	753.80
C	Woods Good	70			0.14	10.00
D	Woods Good	77			25.76	1983.15
B	Woods Fair	60			5.65	339.00
C	Woods Fair	73			0.22	15.88
C	Open Space Good	70			9.70	678.97
D	Open Space Good	80			1.77	141.81
B	Residential 4 acre	58			11.22	650.48
C	Residential 4 acre	71			0.45	32.05
D	Residential 4 acre	79			4.83	381.76
B	Residential 2 acre	60			89.15	5349.23
C	Residential 2 acre	73			101.86	7435.83
D	Residential 2 acre	80			51.48	4118.74
B	Rural ROW	89			6.91	615.18
C	Rural ROW	92			6.73	619.52
D	Rural ROW	93			3.30	306.91
N//A	Water	98			0.51	50.34
				Totals =	333.40	23482.66
					(0.52094 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{23482.66}{333.40}$$

Use CN = 70

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-03

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			4.55	250.33
C	Woods Good	70			2.53	177.10
D	Woods Good	77			0.38	29.18
B	Woods Fair	60			1.00	60.19
C	Open Space Good	70			24.58	1720.37
B	Residential 4 acre	58			17.37	1007.29
C	Residential 4 acre	71			12.72	903.26
D	Residential 4 acre	79			14.74	1164.15
B	Residential 2 acre	60			109.00	6539.71
C	Residential 2 acre	73			49.88	3641.53
D	Residential 2 acre	80			25.64	2051.55
B	Rural ROW	89			7.59	675.60
C	Rural ROW	92			5.47	503.06
D	Rural ROW	93			2.53	235.30
N/A	Water	98			4.63	453.74
				Totals =	282.61	19412.37
					(0.44158 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{19412.37}{282.61}$$

Use CN = 69

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-04

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			2.22	66.75
B	Woods Good	55			23.23	1277.64
C	Woods Good	70			0.47	32.78
D	Woods Good	77			4.62	355.50
B	Residential 4 acre	58			1.64	95.12
C	Residential 4 acre	71			0.83	59.12
D	Residential 4 acre	79			0.01	0.43
A	Residential 2 acre	39			1.91	74.42
B	Residential 2 acre	60			36.73	2203.93
C	Residential 2 acre	73			21.89	1597.72
D	Residential 2 acre	80			16.41	1312.57
B	Residential 1 acre	61			0.01	0.75
B	Residential 1 acre	61			4.70	286.51
D	Residential 1 acre	80			0.01	0.57
D	Residential 1 acre	80			0.10	7.69
B	Residential 1 acre	61			0.02	0.99
D	Residential 1 acre	80			0.00	0.10
A	Rural ROW	83			0.15	12.21
B	Rural ROW	89			2.98	265.40
C	Rural ROW	92			1.50	138.29
D	Rural ROW	93			1.16	107.50
N/A	Water	98			0.82	80.36
				Totals =	121.39	7976.35
					(0.18967 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{7976.35}{121.39}$$

Use CN = **66**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-05

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			10.42	573.19
C	Woods Good	70			1.36	95.55
D	Woods Good	77			1.42	109.55
B	Woods Fair	60			0.49	29.15
B	Residential 2 acre	60			28.80	1727.88
C	Residential 2 acre	73			55.08	4020.48
D	Residential 2 acre	80			7.18	574.78
B	Residential 1 acre	61			124.18	7574.99
C	Residential 1 acre	74			45.68	3380.54
D	Residential 1 acre	80			6.28	502.71
B	Rural ROW	89			16.09	1431.81
C	Rural ROW	92			6.16	566.49
D	Rural ROW	93			1.40	129.95
N/A	Water	98			4.84	474.32
				Totals =	309.38	21191.40
					(0.48341	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{21191.40}{309.38}$$

Use CN = **68**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-06, sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			6.05	332.95
C	Woods Good	70			40.34	2823.89
D	Woods Good	77			37.26	2869.20
B	Woods Fair	60			0.67	40.20
B	Open Space Good	55			13.40	737.24
C	Open Space Good	71			30.15	2140.55
D	Open Space Good	80			20.41	1633.16
B	Open Space Poor	79			0.16	12.92
C	Open Space Poor	86			3.60	309.27
C	Residential 2 acre	73			40.90	2985.87
D	Residential 2 acre	80			9.55	764.33
B	Residential 1 acre	61			49.86	3041.43
C	Residential 1 acre	74			43.36	3208.38
D	Residential 1 acre	80			3.85	308.00
B	Residential 1/4 acre	67			1.23	82.31
C	Residential 1/4 acre	78			23.51	1833.43
				Totals =	324.31	23123.14
					(0.50674 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{23123.14}{324.31}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-06, sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
N/A	Total from Sheet MS-06, sheet 1				324.31	23123.14
D	Residential 1/4 acre	83			1.75	145.20
B	Newly Graded	86			5.44	467.76
C	Newly Graded	91			1.67	151.80
D	Newly Graded	94			0.02	2.05
B	Commercial and Business	92			9.04	831.81
C	Commercial and Business	94			9.64	906.04
D	Commercial and Business	95			1.41	134.41
B	Rural ROW	89			11.25	1001.40
C	Rural ROW	92			20.27	1865.01
D	Rural ROW	93			2.08	193.81
N/A	Impervious Paved	98			5.86	574.28
N/A	Water	98			4.39	430.22
				Totals =	397.14	29826.93
					(0.62053	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{29826.93}{397.14}$$

Use CN = 75

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-07

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			6.01	330.45
C	Woods Good	70			16.33	1143.15
D	Woods Good	77			3.38	260.39
B	Woods Fair	60			0.05	2.77
C	Woods Fair	73			0.01	0.98
B	Woods Poor	66			1.54	101.53
B	Open Space Good	55			2.39	131.26
B	Open Space Fair	69			4.28	295.56
B	Residential 4 acre	58			6.03	349.50
C	Residential 4 acre	71			0.52	36.74
D	Residential 4 acre	79			1.03	81.40
B	Residential 2 acre	60			20.12	1206.93
C	Residential 2 acre	73			15.63	1141.34
D	Residential 2 acre	80			5.18	414.71
B	Residential 1 acre	61			0.31	18.62
C	Residential 1 acre	74			1.92	141.94
B	Residential 1/2 acre	64			8.45	540.98
D	Residential 1/2 acre	82			2.96	242.65
B	Rural ROW	89			4.79	426.58
C	Rural ROW	92			4.61	424.21
D	Rural ROW	93			0.58	54.14
N/A	Impervious Paved	98			6.92	678.16
N/A	Water	98			12.77	1251.46
				Totals =	125.81	9275.47
					(0.19658	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{9275.47}{125.81}$$

Use CN = **74**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-08

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			1.05	57.51
D	Woods Good	77			1.19	91.31
A	Woods Fair	36			2.37	85.20
B	Woods Fair	60			4.06	243.84
D	Woods Fair	79			4.55	359.62
A	Open Space Fair	49			4.55	222.85
B	Open Space Fair	69			28.98	1999.46
D	Open Space Fair	84			7.53	632.67
A	Residential 1/2 acre	44			0.16	6.88
B	Residential 1/2 acre	64			5.40	345.61
D	Residential 1/2 acre	82			3.15	258.53
A	Commercial and Business	89			4.06	360.97
B	Commercial and Business	92			0.51	47.00
D	Commercial and Business	95			0.10	9.88
B	Rural ROW	89			0.24	21.72
D	Rural ROW	92			0.49	45.23
N/A	Water	98			5.69	557.62
				Totals =	74.08	5345.89
					(0.11575 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{5345.89}{74.08}$$

Use CN = 72

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-09

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			0.88	26.37
B	Woods Good	55			14.53	799.24
D	Woods Good	77			6.38	491.19
B	Woods Fair	60			2.22	133.00
B	Open Space Good	55			0.49	27.05
D	Open Space Good	80			0.00	0.01
B	Open Space Fair	69			20.69	1427.85
D	Open Space Fair	84			4.39	368.40
B	Residential 1 acre	61			2.19	133.34
B	Residential 1/2 acre	64			38.62	2471.74
D	Residential 1/2 acre	82			3.03	248.79
A	Residential 1/4 acre	49			0.00	0.01
B	Residential 1/4 acre	67			9.34	625.50
D	Residential 1/4 acre	83			1.79	148.76
A	Residential 1/8 acre	54			3.06	165.14
B	Residential 1/8 acre	70			7.96	557.20
D	Residential 1/8 acre	85			0.90	76.54
A	Rural ROW	83			1.27	105.02
B	Rural ROW	89			9.51	846.15
D	Rural ROW	92			0.23	21.22
N/A	Water	98			4.88	478.24
				Totals =	132.35	9150.78
					(0.20679 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{9150.78}{132.35}$$

Use CN = **69**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-10

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			0.13	7.34
D	Woods Good	77			0.07	5.38
B	Woods Poor	66			1.09	72.08
B	Open Space Fair	69			11.96	825.27
C	Open Space Fair	79			0.37	29.59
B	Open Space Poor	79			0.10	7.70
B	Residential 1/2 acre	64			0.28	17.82
C	Residential 1/2 acre	76			0.21	15.72
D	Residential 1/2 acre	82			0.02	1.53
B	Residential 1/3 acre	65			9.49	617.11
D	Residential 1/3 acre	82			0.08	6.93
B	Residential 1/4 acre	67			6.93	464.14
B	Residential 1/8 acre	70			18.54	1297.78
C	Residential 1/8 acre	80			3.83	306.56
D	Residential 1/8 acre	85			0.06	5.32
B	Commercial and Business	92			0.96	88.07
C	Commercial and Business	94			1.14	107.08
B	Industrial	88			0.47	41.40
C	Industrial	91			3.06	278.73
B	Rural ROW	89			7.13	634.66
C	Rural ROW	92			1.41	130.11
N/A	Water	98			1.16	113.68
				Totals =	68.51	5073.99
					(0.10704 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{5073.99}{68.51}$$

Use CN = 74

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-11, sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			0.17	5.25
B	Woods Good	55			0.63	34.62
C	Woods Good	70			2.61	182.70
C	Woods Poor	77			0.15	11.59
C	Open Space Good	70			1.10	76.71
A	Open Space Fair	49			0.01	0.27
B	Open Space Fair	69			33.64	2321.08
C	Open Space Fair	79			1.20	94.88
C	Residential 2 acre	73			6.03	440.07
C	Residential 1 acre	74			26.81	1983.94
D	Residential 1 acre	80			5.93	474.32
B	Residential 1/2 acre	64			1.68	107.58
C	Residential 1/2 acre	76			12.81	973.79
D	Residential 1/2 acre	82			0.12	10.03
A	Residential 1/3 acre	46			4.70	216.24
B	Residential 1/3 acre	65			8.01	520.78
C	Residential 1/3 acre	77			13.28	1022.56
B	Residential 1/4 acre	67			33.26	2228.27
C	Residential 1/4 acre	78			2.65	206.87
B	Residential 1/8 acre	70			58.70	4109.29
C	Residential 1/8 acre	80			27.05	2163.79
B	Commercial and Business	92			0.85	78.15
				Totals =	241.39	17262.76
					(0.37718 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{17262.76}{241.39}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-11, sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
N/A	Totals from MS-11, sheet 1	--			241.39	17262.76
C	Commercial and Business	94			23.00	2161.91
B	Industrial	88			0.08	6.74
C	Industrial	91			19.75	1797.61
A	Rural ROW	83			0.45	37.64
B	Rural ROW	89			26.04	2317.23
C	Rural ROW	92			18.61	1711.77
D	Rural ROW	93			0.40	37.12
N/A	Impervious Paved	98			5.66	554.68
N/A	Water	98			2.06	201.88
				Totals =	337.44	26089.34
					(0.52725 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{26089.34}{337.44}$$

Use CN = **77**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-12

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			3.51	193.23
C	Woods Good	70			1.09	76.13
D	Woods Good	77			1.33	102.34
B	Residential 1/8 acre	70			18.17	1271.89
C	Residential 1/8 acre	80			7.73	618.29
B	Commercial and Business	92			0.45	41.63
C	Commercial and Business	94			7.96	747.84
D	Commercial and Business	95			0.05	5.19
B	Urban ROW	98			6.29	616.32
C	Urban ROW	98			2.40	235.17
N/A	Water	98			1.81	177.38
					Totals =	50.79 / 4085.40
					(	0.07936 sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{4085.40}{50.79}$$

Use CN = **80**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-13, sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			2.22	66.54
B	Woods Good	55			6.17	339.08
D	Woods Good	77			4.51	347.22
B	Woods Fair	60			0.59	35.55
B	Woods Poor	66			0.76	50.44
C	Woods Poor	77			0.31	23.51
B	Open Space Good	55			3.09	169.81
B	Open Space Fair	69			6.33	436.95
C	Open Space Fair	79			1.67	132.03
D	Open Space Fair	84			5.53	464.79
B	Residential 2 acre	60			0.78	46.61
C	Residential 1 acre	74			4.95	366.42
D	Residential 1 acre	80			0.14	10.84
B	Residential 1/2 acre	64			0.05	3.28
C	Residential 1/2 acre	76			6.32	480.09
D	Residential 1/2 acre	82			0.04	3.00
A	Residential 1/3 acre	46			15.43	709.78
B	Residential 1/3 acre	65			29.27	1902.46
C	Residential 1/3 acre	77			4.66	359.04
D	Residential 1/3 acre	82			1.02	83.79
B	Residential 1/8 acre	70			29.14	2039.59
C	Residential 1/8 acre	80			6.89	551.24
				Totals =	129.86	8622.07
					(0.20290 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{8622.07}{129.86}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-13, sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
N/A	Totals from MS-13, sheet 1	--			129.86	8622.07
B	Commercial and Business	92			5.32	489.14
C	Commercial and Business	94			9.45	888.64
D	Commercial and Business	95			0.35	32.99
B	Industrial	88			5.46	480.78
C	Industrial	91			48.29	4394.41
D	Industrial	93			1.15	106.78
A	Urban ROW	98			3.49	341.97
B	Urban ROW	98			19.78	1938.25
C	Urban ROW	98			11.47	1123.58
D	Urban ROW	98			0.07	6.88
N/A	Impervious Paved	98			4.17	408.66
N/A	Water	98			10.48	1027.04
				Totals =	249.33	19861.18
					(0.38958 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{19861.18}{249.33}$$

Use CN = **80**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-14

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			2.13	63.97
B	Woods Good	55			0.10	5.52
B	Woods Fair	60			0.85	51.00
C	Woods Fair	73			0.38	27.80
B	Woods Poor	66			0.42	27.99
C	Residential 1 acre	74			8.83	653.09
B	Residential 1/2 acre	64			0.20	12.83
C	Residential 1/2 acre	76			11.77	894.70
A	Residential 1/3 acre	46			4.38	201.33
B	Residential 1/3 acre	65			15.10	981.26
C	Residential 1/3 acre	77			22.41	1725.76
A	Residential 1/4 acre	49			0.03	1.66
B	Residential 1/4 acre	67			0.56	37.29
B	Residential 1/8 acre	70			0.49	33.96
C	Residential 1/8 acre	80			0.07	5.70
A	Urban ROW	98			0.56	54.92
B	Urban ROW	98			5.99	587.33
C	Urban ROW	98			8.85	867.30
B	Water	98			0.27	26.46
				Totals =	83.39	6259.88
					(0.13030 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{6259.88}{83.39}$$

Use CN = **75**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-15

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			10.68	320.51
B	Woods Good	55			9.46	520.47
D	Woods Good	77			1.25	96.20
B	Woods Fair	60			1.44	86.67
A	Residential 1/3 acre	46			10.68	491.16
B	Residential 1/3 acre	65			28.91	1878.90
C	Residential 1/3 acre	77			0.81	62.75
D	Residential 1/3 acre	82			0.17	14.00
A	Residential 1/4 acre	49			0.12	5.70
B	Residential 1/4 acre	67			21.13	1415.45
D	Residential 1/4 acre	83			1.80	149.14
B	Residential 1/8 acre	70			24.86	1740.33
C	Residential 1/8 acre	80			5.61	448.90
D	Residential 1/8 acre	85			1.91	162.35
B	Industrial	88			0.54	47.88
C	Industrial	91			1.94	176.30
A	Rural ROW	83			3.06	254.21
B	Rural ROW	89			20.88	1858.56
C	Rural ROW	92			0.76	70.19
D	Rural ROW	93			0.27	24.73
N/A	Impervious Paved	98			4.25	416.50
N/A	Water	98			3.62	354.76
				Totals =	154.16	10595.66
					(0.24087	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{10595.66}{154.16}$$

Use CN = **69**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-16

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.]			Area (**Acres** circled) Sq. Ft. %	Product of CN x Area
		Table 2-2	Figure 2-3	Figure 2-4		
B	Woods Good	55			3.41	187.65
B	Residential 1/4 acre	67			7.42	497.07
B	Residential 1/8 acre	70			15.25	1067.61
C	Residential 1/8 acre	80			10.29	823.10
B	Industrial	88			10.29	905.12
C	Industrial	91			0.07	6.10
B	Urban ROW	98			7.85	769.11
C	Urban ROW	98			1.75	171.40
N/A	Water	98			1.91	187.18
				Totals =	58.23	4614.34

[1.] Use only one CN value source per line.

(0.09099 sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{4614.34}{58.23}$ Use CN = **79**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: MS-17

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			1.85	101.88
B	Woods Fair	60			3.38	202.67
B	Woods Poor	66			0.01	0.55
B	Open Space Fair	69			0.02	1.25
B	Open Space Poor	79			0.14	10.73
C	Open Space Poor	86			4.88	419.56
B	Residential 1/2 acre	64			1.19	76.17
B	Residential 1/3 acre	65			41.38	2689.97
B	Residential 1/8 acre	70			39.57	2769.86
C	Residential 1/8 acre	80			30.18	2414.44
B	Commercial and Business	92			16.37	1505.80
B	Urban ROW	98			41.92	4108.23
C	Urban ROW	98			6.42	628.87
N/A	Water	98			3.50	343.00
				Totals =	190.80	15273.00
					(0.29813 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{15273.00}{190.80}$$

Use CN = **80**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T1-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			35.59	1957.29
C	Woods Good	70			14.87	1040.98
D	Woods Good	77			25.28	1946.69
B	Woods Fair	60			7.86	471.86
C	Woods Fair	73			3.75	273.72
D	Woods Fair	79			4.10	323.66
C	Open Space Good	55			27.20	1496.00
D	Open Space Good	80			0.51	40.48
B	Residential 4 acre	58			3.83	222.28
C	Residential 4 acre	71			3.52	249.62
D	Residential 4 acre	79			3.31	261.79
B	Residential 2 acre	60			38.39	2303.49
C	Residential 2 acre	73			87.52	6388.86
D	Residential 2 acre	80			31.43	2514.40
C	Commercial and Business	92			18.63	1714.03
D	Commercial and Business	94			2.14	201.27
B	Rural ROW	89			3.00	267.29
C	Rural ROW	92			7.89	725.88
D	Rural ROW	93			1.71	159.03
N/A	Water	98			0.94	92.12
				Totals =	321.47	22650.75
					(0.50230 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{22650.75}{321.47}$$

Use CN = **70**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T2-01, sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			17.12	941.83
C	Woods Good	70			5.05	353.72
D	Woods Good	77			14.27	1098.47
B	Woods Fair	60			0.76	45.36
C	Woods Fair	73			0.75	54.58
D	Woods Fair	79			1.30	102.64
B	Open Space Good	55			7.72	424.72
C	Open Space Good	70			10.45	731.73
D	Open Space Good	80			1.98	158.74
B	Open Space Poor	79			7.72	610.02
C	Open Space Poor	86			4.16	358.14
D	Open Space Poor	89			2.06	183.38
B	Residential 4 acre	58			0.39	22.70
C	Residential 4 acre	71			12.03	854.35
D	Residential 4 acre	79			1.31	103.57
B	Residential 2 acre	60			13.90	834.00
C	Residential 2 acre	73			75.72	5527.38
D	Residential 2 acre	80			17.20	1376.02
B	Residential 1 acre	61			27.48	1676.56
C	Residential 1 acre	74			50.00	3700.33
D	Residential 1 acre	80			5.09	406.94
C	Residential 1/2 acre	76			5.23	397.56
				Totals =	281.71	19962.71
					(0.44018 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{19962.71}{281.71}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T2-01, sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
N/A	Totals from T2-01, sheet 1	--			281.71	19962.71
B	Residential 1/4 acre	67			11.81	791.37
C	Residential 1/4 acre	78			12.20	951.23
B	Residential 1/8 acre	70			12.40	867.65
C	Residential 1/8 acre	80			36.05	2883.99
D	Residential 1/8 acre	85			0.11	9.52
B	Commercial and Business	92			1.45	133.84
C	Commercial and Business	94			31.88	2996.39
B	Rural ROW	89			6.32	562.46
C	Rural ROW	92			33.48	3080.53
D	Rural ROW	93			2.14	199.06
N/A	Water	98			9.01	882.98
				Totals =	438.56	33321.73
					(0.68525 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{33321.73}{438.56}$$

Use CN = **76**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T2-02, sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			0.01	0.22
B	Woods Good	55			24.97	1373.47
C	Woods Good	70			9.63	673.88
D	Woods Good	77			23.31	1795.04
B	Woods Fair	60			0.53	31.59
C	Woods Fair	73			3.10	226.49
D	Woods Fair	79			4.48	354.02
B	Open Space Good	55			8.04	442.20
C	Open Space Good	70			25.61	1792.99
D	Open Space Good	80			2.24	179.28
C	Residential 4 acre	71			6.58	467.22
A	Residential 2 acre	39			1.97	77.01
B	Residential 2 acre	60			40.08	2404.90
C	Residential 2 acre	73			57.63	4206.95
D	Residential 2 acre	80			9.99	799.16
B	Residential 1 acre	61			24.33	1484.20
C	Residential 1 acre	74			82.67	6117.85
D	Residential 1 acre	80			0.67	53.48
C	Residential 1/2 acre	76			2.43	184.90
B	Residential 1/4 acre	67			4.34	291.04
C	Residential 1/4 acre	78			25.24	1968.68
B	Residential 1/8 acre	70			13.20	924.17
				Totals =	371.07	25848.73
					(0.57980 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{25848.73}{371.07}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T2-02, sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
N/A	Totals from T2-02, sheet 1	--			371.07	25848.73
C	Residential 1/8 acre	80			27.63	2210.60
D	Residential 1/8 acre	85			0.25	20.92
A	Rural ROW	83			0.15	12.28
B	Rural ROW	89			11.46	1019.50
C	Rural ROW	92			25.81	2374.74
D	Rural ROW	93			1.00	92.72
N/A	Water	98			4.97	487.06
				Totals =	442.33	32066.56
					(0.69114 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{32066.56}{442.33}$$

Use CN = **72**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T3-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			2.21	121.38
C	Woods Good	70			7.40	517.95
D	Woods Good	77			1.20	92.28
B	Woods Poor	66			0.12	7.87
A	Open Space Fair	49			3.05	149.39
B	Open Space Fair	69			7.01	483.55
D	Open Space Fair	84			0.82	69.10
C	Residential 4 acre	71			7.08	502.96
C	Residential 2 acre	73			20.15	1471.12
D	Residential 2 acre	80			2.96	236.94
A	Residential 1 acre	40			0.01	0.24
B	Residential 1 acre	61			37.18	2268.12
C	Residential 1 acre	74			67.10	4965.44
D	Residential 1 acre	80			16.45	1316.23
B	Residential 1/2 acre	64			0.01	0.81
B	Rural ROW	89			4.11	365.48
C	Rural ROW	92			10.91	1003.48
D	Rural ROW	93			1.91	178.02
N/A	Impervious Paved	98			1.05	102.90
N/A	Water	98			4.45	436.10
				Totals =	195.18	14289.37
					(0.30497 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{14289.37}{195.18}$$

Use CN = **73**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T4.01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			1.21	66.39
D	Woods Good	77			2.59	199.49
A	Woods Fair	36			0.25	9.17
B	Woods Fair	60			2.41	144.87
C	Woods Fair	73			1.86	135.49
D	Woods Fair	79			1.98	156.59
B	Open Space Fair	69			3.71	256.08
D	Open Space Fair	84			2.37	198.93
B	Residential 2 acre	60			1.65	99.03
C	Residential 2 acre	73			70.69	5160.31
D	Residential 2 acre	80			6.84	547.49
B	Residential 1/2 acre	64			22.37	1431.38
C	Residential 1/2 acre	76			7.35	558.72
D	Residential 1/2 acre	82			6.45	529.08
B	Rural ROW	89			5.28	469.66
C	Rural ROW	92			8.46	778.13
D	Rural ROW	93			2.86	266.38
				Totals =	148.34	11007.17
					(0.23178 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{11007.17}{148.34}$$

Use CN = **74**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T4-02

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
C	Woods Good	70			1.50	105.30
D	Woods Good	77			0.30	23.14
B	Open Space Fair	60			0.17	10.03
D	Open Space Fair	79			0.29	22.84
C	Residential 2 acre	73			54.22	3958.05
D	Residential 2 acre	80			15.39	1231.20
B	Residential 1/2 acre	64			1.38	88.10
C	Residential 1/2 acre	76			1.36	103.64
D	Residential 1/2 acre	82			0.45	36.76
B	Commercial and Business	92			0.00	0.04
B	Rural ROW	89			0.48	42.73
C	Rural ROW	92			5.85	537.77
D	Rural ROW	93			1.31	122.27
N/A	Water	98			0.05	4.90
				Totals =	82.75	6286.77
					(0.12930 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{6286.77}{82.75}$$

Use CN = **76**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T4-03, Sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			5.44	299.01
C	Woods Good	70			0.89	62.28
D	Woods Good	77			3.14	241.91
A	Woods Fair	36			0.02	0.84
B	Woods Fair	60			4.21	252.61
D	Woods Fair	79			0.40	31.62
A	Open Space Fair	49			0.75	36.59
B	Open Space Fair	69			19.36	1336.09
C	Open Space Fair	79			0.02	1.31
D	Open Space Fair	84			10.86	911.90
B	Residential 2 acre	60			3.64	218.16
C	Residential 2 acre	73			58.49	4269.85
D	Residential 2 acre	80			2.35	188.33
C	Residential 1 acre	74			2.14	158.00
B	Residential 1/2 acre	64			1.93	123.64
C	Residential 1/2 acre	76			5.39	409.94
D	Residential 1/2 acre	82			0.30	24.42
B	Commercial and Business	92			2.50	230.14
D	Commercial and Business	95			1.01	96.02
B	Rural ROW	89			1.99	177.13
C	Rural ROW	92			3.94	362.04
D	Rural ROW	93			0.91	84.19
				Totals =	129.67	9516.00
					(0.20261 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{9516.00}{129.67}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T4-03, Sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	CN Value [1.] Figure 2-3	CN Value [1.] Figure 2-4	Area (**Acres** / Sq. Ft. / %)	Product of CN x Area
N/A	Total from T4-03, Sheet 1	--			129.67	9516.00
N/A	Impervious Paved	98			3.69	361.62
N/A	Water	98			2.71	265.58
				Totals =	136.07	10143.20

(0.21261 sq mi)

1. Use only one CN value source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{10143.20}{136.07}$ Use CN = **75**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T5-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
C	Woods Good	70			1.14	79.85
C	Open Space Good	70			0.19	12.95
C	Residential 2 acre	73			58.34	4258.80
D	Residential 2 acre	80			15.63	1250.53
C	Residential 1 acre	74			16.06	1188.57
D	Residential 1 acre	80			2.89	231.34
C	Residential 1/2 acre	76			0.76	57.79
D	Residential 1/2 acre	82			0.01	0.94
C	Residential 1/3 acre	77			0.89	68.91
D	Residential 1/3 acre	82			0.11	8.90
C	Rural ROW	92			8.21	755.71
D	Rural ROW	93			1.15	107.12
				Totals =	105.39	8021.41
					(0.16468 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{8021.41}{105.39}$$

Use CN = **76**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T5-02, Sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			6.73	370.25
C	Woods Good	70			0.12	8.25
D	Woods Good	77			1.39	106.85
B	Woods Fair	60			1.18	70.63
B	Woods Poor	66			5.09	336.20
C	Woods Poor	77			1.72	132.80
B	Open Space Fair	69			0.17	11.58
D	Open Space Fair	84			0.13	10.83
B	Open Space Poor	79			6.58	519.70
B	Residential 2 acre	60			6.13	367.71
C	Residential 2 acre	73			22.59	1649.22
D	Residential 2 acre	80			1.29	103.58
B	Residential 1 acre	61			0.00	0.02
C	Residential 1 acre	74			0.38	28.33
B	Residential 1/2 acre	64			8.55	547.19
C	Residential 1/2 acre	76			8.19	622.20
D	Residential 1/2 acre	82			1.80	147.92
B	Residential 1/3 acre	65			2.24	145.71
C	Residential 1/3 acre	77			11.95	920.37
D	Residential 1/3 acre	82			0.10	8.36
B	Residential 1/4 acre	67			0.46	30.66
B	Rural ROW	89			6.11	544.15
				Totals =	92.92	6682.48
					(0.14518	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{6682.48}{92.92}$$

Use CN = **see sheet 2**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T5-02, Sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	CN Value [1.] Figure 2-3	CN Value [1.] Figure 2-4	Area **Acres** (circled) Sq. Ft. %	Product of CN x Area
N/A	Totals from T5-02, Sheet 1	--			92.92	6682.48
C	Rural ROW	92			4.55	418.80
D	Rural ROW	93			0.36	33.07
N/A	Water	98			0.28	27.44
					Totals = 98.10	7161.78

(0.15329 sq mi)

[1.] Use only one CN value source per line.

CN (weighted) = total product / total area = 7161.78 / 98.10 Use CN = **73**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T6-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			0.57	31.29
C	Woods Good	70			18.68	1307.91
D	Woods Good	77			25.47	1961.36
C	Woods Fair	73			2.11	154.04
D	Woods Fair	79			0.36	28.43
C	Open Space Good	70			1.65	115.78
D	Open Space Good	80			0.22	17.54
B	Residential 2 acre	60			1.14	68.14
C	Residential 2 acre	73			113.66	8297.21
D	Residential 2 acre	80			35.32	2825.76
B	Residential 1 acre	61			5.72	349.06
C	Residential 1 acre	74			20.00	1480.32
D	Residential 1 acre	80			2.15	172.29
B	Rural ROW	89			0.18	16.15
C	Rural ROW	92			14.35	1320.20
D	Rural ROW	93			1.37	127.33
N/A	Impervious Paved	98			3.14	307.72
N/A	Water	98			0.37	36.26
				Totals =	246.48	18616.79
					(0.38512 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{18616.79}{246.48}$$

Use CN = **76**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T6-02

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			4.87	267.70
C	Woods Good	70			2.25	157.23
D	Woods Good	77			1.42	109.61
B	Residential 4 acre	58			7.44	431.49
B	Residential 2 acre	60			8.74	524.62
C	Residential 2 acre	73			2.01	146.46
D	Residential 2 acre	80			0.47	37.77
B	Residential 1 acre	61			23.66	1443.38
C	Residential 1 acre	74			64.69	4787.09
D	Residential 1 acre	80			7.62	609.66
B	Rural ROW	89			4.32	384.28
C	Rural ROW	92			9.86	907.20
N/A	Impervious Paved	98			4.35	426.30
N/A	Water	98			0.28	27.44
				Totals =	141.98	10260.22
					(0.22184 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{10260.22}{141.98}$$

Use CN = 72

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T6-03, Sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			10.13	557.02
C	Woods Good	70			14.13	989.14
D	Woods Good	77			16.99	1307.94
A	Open Space Good	36			2.10	75.48
B	Open Space Good	55			31.80	1749.23
C	Open Space Good	70			12.94	905.78
D	Open Space Good	80			4.73	378.17
B	Residential 2 acre	60			1.49	89.49
C	Residential 2 acre	73			6.72	490.70
D	Residential 2 acre	80			5.65	452.27
B	Residential 1 acre	61			134.95	8231.97
C	Residential 1 acre	74			134.91	9983.36
D	Residential 1 acre	80			19.08	1526.73
A	Residential 1/2 acre	44			0.56	24.68
B	Residential 1/2 acre	64			48.41	3098.38
D	Residential 1/2 acre	82			7.04	577.05
B	Residential 1/4 acre	67			0.82	55.04
B	Commercial and Business	92			5.57	512.73
C	Commercial and Business	94			1.10	103.07
D	Commercial and Business	95			0.25	24.06
A	Rural ROW	83			0.14	11.47
B	Rural ROW	89			24.22	2155.74
				Totals =	483.74	33299.50
					(0.75584	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{33299.50}{483.74}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T6-03, Sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
N/A	Totals from T6-03, Sheet 1	--			483.74	33299.50
C	Rural ROW	92			14.39	1324.16
D	Rural ROW	93			2.18	202.61
N/A	Impervious Paved	98			4.27	418.46
N/A	Water	98			5.77	565.46
				Totals =	510.35	35810.19
					(0.79742 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{35810.19}{510.35}$$

Use CN = **70**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T6-03, Sheet 1

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			3.13	172.24
C	Woods Good	70			7.15	500.51
D	Woods Good	77			1.44	110.54
B	Open Space Good	55			19.39	1066.25
C	Open Space Good	70			40.53	2836.88
D	Open Space Good	80			6.61	528.78
C	Residential 1 acre	74			3.22	238.38
B	Residential 1/2 acre	64			11.72	750.32
C	Residential 1/2 acre	76			0.99	74.93
D	Residential 1/2 acre	82			5.51	452.16
A	Residential 1/4 acre	49			1.91	93.81
B	Residential 1/4 acre	67			42.97	2878.70
C	Residential 1/4 acre	78			3.00	233.96
D	Residential 1/4 acre	83			1.10	91.58
B	Residential 1/8 acre	70			45.75	3202.36
C	Residential 1/8 acre	80			8.99	718.97
B	Commercial and Business	92			0.62	56.79
C	Commercial and Business	94			12.05	1132.86
B	Industrial	88			5.46	480.61
C	Industrial	91			8.03	731.00
A	Rural ROW	83			0.43	35.76
B	Rural ROW	89			23.17	2062.01
				Totals =	253.17	18449.40
					(0.39557 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{18449.40}{253.17}$$

Use CN = see sheet 2

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: ______ Date: ______
Circle one: ***Present*** Developed Watershed: T6-04, Sheet 2

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.]			Area (Acres) Sq. Ft. %	Product of CN x Area
		Table 2-2	Figure 2-3	Figure 2-4		
N/A	Totals from T6-04, Sheet 1	--			253.17	18449.40
C	Rural ROW	92			6.92	636.59
D	Rural ROW	93			0.72	66.59
N/A	Impervious Paved	98			3.05	299.14
N/A	Water	98			2.97	290.57
				Totals =	266.82	19742.28

[1.] Use only one CN value source per line.

(0.41691 sq mi)

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{19742.28}{266.82}$$

Use CN = **74**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T7-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			1.83	100.85
D	Woods Good	77			11.34	873.56
B	Woods Fair	60			4.38	262.60
D	Woods Fair	79			0.35	28.00
C	Open Space Good	70			5.55	388.19
B	Residential 1 acre	61			13.39	817.02
C	Residential 1 acre	74			19.84	1467.89
D	Residential 1 acre	80			2.72	217.40
B	Residential 1/2 acre	64			9.81	627.72
C	Residential 1/2 acre	76			2.15	163.72
D	Residential 1/2 acre	82			1.13	92.52
B	Residential 1/4 acre	67			14.93	1000.38
C	Residential 1/4 acre	78			7.62	594.75
D	Residential 1/4 acre	83			0.32	26.85
B	Residential 1/8 acre	70			24.63	1723.92
C	Residential 1/8 acre	80			4.13	330.40
B	Commercial and Business	92			0.65	59.45
C	Commercial and Business	94			7.40	695.53
B	Rural ROW	89			15.25	1357.46
C	Rural ROW	92			7.44	684.85
D	Rural ROW	93			0.55	51.11
N/A	Water	98			6.25	612.50
				Totals =	161.67	12176.66
					(0.25261 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{12176.66}{161.67}$$

Use CN = 75

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T8-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			3.43	188.83
D	Woods Good	77			0.14	11.06
B	Residential 2 acre	60			4.08	244.53
C	Residential 2 acre	73			4.47	326.13
C	Residential 1 acre	61			30.41	1855.21
D	Residential 1 acre	80			0.23	18.55
B	Residential 1/2 acre	64			0.29	18.86
C	Residential 1/2 acre	76			17.68	1343.76
D	Residential 1/2 acre	82			1.52	124.44
A	Residential 1/3 acre	46			2.07	95.33
B	Residential 1/3 acre	65			5.78	375.66
C	Residential 1/3 acre	77			2.32	178.64
D	Residential 1/3 acre	82			0.01	0.60
A	Rural ROW	83			0.61	50.70
B	Rural ROW	89			1.82	162.19
C	Rural ROW	92			7.24	666.36
N/A	Water	98			4.07	398.86
				Totals =	86.18	6059.72
					(0.13466 sq mi)	

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{6059.72}{86.18}$$

Use CN = **70**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T9-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	Woods Good	30			0.44	13.24
B	Woods Good	55			20.88	1148.57
C	Woods Good	70			0.84	58.49
D	Woods Good	77			10.98	845.81
C	Woods Fair	73			0.36	26.58
D	Woods Fair	79			2.01	159.17
C	Residential 4 acre	71			7.00	497.24
D	Residential 4 acre	79			0.77	60.52
C	Residential 2 acre	73			7.68	560.60
B	Residential 1 acre	61			6.94	423.63
C	Residential 1 acre	74			44.93	3324.59
D	Residential 1 acre	80			12.73	1018.45
B	Residential 1/2 acre	64			1.71	109.74
C	Residential 1/2 acre	76			0.43	32.73
D	Residential 1/2 acre	82			0.65	53.25
B	Residential 1/3 acre	65			10.75	698.56
D	Residential 1/3 acre	82			1.21	99.39
B	Residential 1/4 acre	67			0.04	2.69
B	Rural ROW	89			5.15	457.94
C	Rural ROW	92			8.61	791.86
D	Rural ROW	93			1.63	151.19
				Totals =	145.75	10534.25
					(0.22773	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{10534.25}{145.75}$$

Use CN = 72

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T10-01

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			8.46	465.14
C	Woods Good	70			2.85	199.45
D	Woods Good	77			5.26	405.12
D	Woods Fair	79			0.10	7.81
C	Open Space Fair	79			2.41	190.57
C	Residential 4 acre	71			12.90	915.81
C	Residential 2 acre	73			6.41	467.76
B	Residential 1 acre	61			0.60	36.61
C	Residential 1 acre	74			43.78	3239.58
D	Residential 1 acre	80			14.99	1199.44
B	Residential 1/2 acre	64			5.58	357.01
C	Residential 1/2 acre	76			26.77	2034.73
D	Residential 1/2 acre	82			0.95	78.05
B	Residential 1/3 acre	65			11.54	750.17
C	Residential 1/3 acre	77			3.01	231.41
D	Residential 1/3 acre	82			1.39	114.29
B	Residential 1/4 acre	67			14.23	953.19
C	Residential 1/4 acre	78			10.57	824.18
C	Commercial and Business	94			0.32	30.49
B	Rural ROW	98			11.74	1150.99
C	Rural ROW	98			19.90	1949.87
D	Rural ROW	98			1.51	147.76
N/A	Impervious Paved	98			8.04	787.92
				Totals =	213.31	16537.36
					(0.33329	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{16537.36}{213.31}$$

Use CN = **78**

Worksheet 2: Runoff curve number and runoff

Project: Norton River Watershed (1581-04-3) By: JSC Date: 03/10/10
Location: Darien, Stamford, New Canaan, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: T10-02

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	Woods Good	55			6.36	349.54
B	Open Space Poor	79			3.11	245.96
B	Residential 1/4 acre	67			11.91	797.86
B	Commercial and Business	92			19.74	1815.68
B	Urban ROW	98			3.39	332.43
N/A	Water	98			2.18	213.54
				Totals =	46.68	3755.00
					(0.07294	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{3755.00}{46.68}$$

Use CN = **80**

APPENDIX E

Time of Concentration Computations

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.018		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.508	=	0.508

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	745		435					
12. Watercourse slope, s	ft./ft.	0.018		0.023					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.09		1.23		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.191	+	0.098	+	0.000	+	0.000	= 0.289

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	8.0		12.0		16.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.5		1.5			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	11.00		24.75		30.75		0.00	
19. Wetted perimeter, P_w	ft.	14.32		21.49		25.49		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.77		1.15		1.21		0.00	
21. Channel slope, s	ft./ft.	0.0476		0.0133		0.0076			
22. Manning's roughness coeff., n		0.040		0.040		0.040			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.82		4.72		3.68		0.00	
24. Flow length, L	ft.	315		1505		2875			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.013	+	0.089	+	0.217	+	0.000	= 0.318
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	1.116

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-02

Sheet flow (applicable to T_c only)

Segment ID		A-B		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.015		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.547	=	0.547

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		B-C		C-D					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	700		340					
12. Watercourse slope, s	ft./ft.	0.015		0.044					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.99		1.70		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.196	+	0.056	+	0.000	+	0.000	= 0.252

Channel flow

Segment ID		D-E		E-F		F-G		G-H	
15. Channel Bottom width, b	ft.	4.0		8.0		12.0		16.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0		3.0	
17. Depth of flow, d	ft.	1.0		1.0		1.5		1.5	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		24.75		30.75	
19. Wetted perimeter, P_w	ft.	10.32		14.32		21.49		25.49	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		1.15		1.21	
21. Channel slope, s	ft./ft.	0.0566		0.0952		0.0584		0.0098	
22. Manning's roughness coeff., n		0.040		0.040		0.040		0.040	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.84		9.64		9.89		4.18	
24. Flow length, L	ft.	265		420		685		3060	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.011	+	0.012	+	0.019	+	0.203	= 0.245
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 1.044

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-03

Sheet flow (applicable to T_c only)

Segment ID		A-B		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.017		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.520	=	0.520

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		B-C		C-D					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	255		305					
12. Watercourse slope, s	ft./ft.	0.017		0.039					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.05		1.60		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.067	+	0.053	+	0.000	+	0.000	= 0.120

Channel flow

Segment ID		D-E		E-F		F-G		G-H	
15. Channel Bottom width, b	ft.	8.0		12.0		16.0		16.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0		3.0	
17. Depth of flow, d	ft.	1.0		1.5		1.5		1.5	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	11.00		24.75		30.75		30.75	
19. Wetted perimeter, P_w	ft.	14.32		21.49		25.49		25.49	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.77		1.15		1.21		1.21	
21. Channel slope, s	ft./ft.	0.0413		0.0068		0.0086		0.0304	
22. Manning's roughness coeff., n		0.040		0.040		0.040		0.040	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.35		3.38		3.91		7.36	
24. Flow length, L	ft.	1150		2215		1160		2055	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.050	+	0.182	+	0.082	+	0.078	= 0.392
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	1.033

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-04

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.029		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.420	=	0.420

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	265		515					
12. Watercourse slope, s	ft./ft.	0.029		0.087					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.38		2.39		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.053	+	0.060	+	0.000	+	0.000	= 0.113

Channel flow

Segment ID		**D-E**		**E-F**					
15. Channel Bottom width, b	ft.	4.0		16.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0					
17. Depth of flow, d	ft.	1.0		1.5					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		30.75		0.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		25.49		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		1.21		0.00		0.00	
21. Channel slope, s	ft./ft.	0.0575		0.0072					
22. Manning's roughness coeff., n		0.040		0.040					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.89		3.58		0.00		0.00	
24. Flow length, L	ft.	435		2375					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.018	+	0.184	+	0.000	+	0.000	= 0.202

26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25) hr. 0.735

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-05

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.043		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.359	=	0.359

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		GRSS					
8. Manning's roughness coeff., n		0.100		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	245		685					
12. Watercourse slope, s	ft./ft.	0.043		0.015					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.68		1.24		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.041	+	0.154	+	0.000	+	0.000	= 0.194

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	4.0		8.0		16.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.0		1.5			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		30.75		0.00	
19. Wetted perimeter, P_w	ft.	10.32		14.32		25.49		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		1.21		0.00	
21. Channel slope, s	ft./ft.	0.0481		0.0348		0.0026			
22. Manning's roughness coeff., n		0.040		0.040		0.040			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.30		5.83		2.15		0.00	
24. Flow length, L	ft.	520		775		1955			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.023	+	0.037	+	0.252	+	0.000	= 0.312
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.865

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-06

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.024		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.360	=	0.360

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		GRSS					
8. Manning's roughness coeff., n		0.080		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	670		430					
12. Watercourse slope, s	ft./ft.	0.024		0.081					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.57		2.88		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.119	+	0.042	+	0.000	+	0.000	= 0.160

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	4.0		8.0		16.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.0		1.5			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		30.75		0.00	
19. Wetted perimeter, P_w	ft.	10.32		14.32		25.49		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		1.21		0.00	
21. Channel slope, s	ft./ft.	0.1145		0.0389		0.0247			
22. Manning's roughness coeff., n		0.040		0.040		0.040			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	9.73		6.16		6.63		0.00	
24. Flow length, L	ft.	1135		900		405			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.032	+	0.041	+	0.017	+	0.000	= 0.090
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.610

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-07

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.047		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.346	=	0.346

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	545		505					
12. Watercourse slope, s	ft./ft.	0.092		0.059					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	2.45		1.96		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.062	+	0.071	+	0.000	+	0.000	= 0.133

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	4.0		4.0		8.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.0		1.0			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		7.00		11.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		10.32		14.32		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.68		0.77		0.00	
21. Channel slope, s	ft./ft.	0.0800		0.0561		0.0762			
22. Manning's roughness coeff., n		0.040		0.040		0.040			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	8.13		6.81		8.62		0.00	
24. Flow length, L	ft.	375		535		525			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.013	+	0.022	+	0.017	+	0.000	= 0.052
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.531

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-08

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	90		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.005		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.564	=	0.564

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		GRSS					
8. Manning's roughness coeff., n		0.100		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	300		560					
12. Watercourse slope, s	ft./ft.	0.005		0.011					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.57		1.06		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.146	+	0.147	+	0.000	+	0.000	= 0.292

Channel flow

Segment ID		**D-E**							
15. Channel Bottom width, b	ft.	16.0							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0							
17. Depth of flow, d	ft.	1.5							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	30.75		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	25.49		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	1.21		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.	0.0030							
22. Manning's roughness coeff., n		0.040							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	2.31		0.00		0.00		0.00	
24. Flow length, L	ft.	1025							
25. $T_t = \frac{L}{3600 * V}$	hr.	0.123	+	0.000	+	0.000	+	0.000	= 0.123
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.980

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-09

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.022		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.469	=	0.469

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**		**E-F**		
7. Surface description		FRST		FRST		GRSS		IMPV		
8. Manning's roughness coeff., n		0.100		0.100		0.080		0.015		
9. Paved or unpaved		UNPVD		UNPVD		UNPVD		PVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40		0.20		
11. Flow Length, L	ft.	480		290		310		160		
12. Watercourse slope, s	ft./ft.	0.022		0.083		0.065		0.025		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.20		2.33		2.58		5.37		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.111	+	0.035	+	0.033	+	0.008	=	0.187

Channel flow

Segment ID		**F-G**		**G-H**						
15. Channel Bottom width, b	ft.	PIPE		16.0						
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0						
17. Depth of flow, d	ft.	---		1.5						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		30.75		0.00		0.00		
19. Wetted perimeter, P_w	ft.	---		25.49		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		1.21		0.00		0.00		
21. Channel slope, s	ft./ft.	---		0.0047						
22. Manning's roughness coeff., n		---		0.040						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		2.89		0.00		0.00		
24. Flow length, L	ft.	170		3920						
25. $T_t = \frac{L}{3600 * V}$	hr.	0.008	+	0.376	+	0.000	+	0.000	=	0.384
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.041

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-10

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	180		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.039		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.343	=	0.343

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**						
7. Surface description		IMPV						
8. Manning's roughness coeff., n		0.015						
9. Paved or unpaved		PVD						
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.20						
11. Flow Length, L	ft.	235						
12. Watercourse slope, s	ft./ft.	0.010						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	3.40	0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.019	+ 0.000	+	0.000	+	0.000	= 0.019

Channel flow

Segment ID		**C-D**	**D-E**					
15. Channel Bottom width, b	ft.	PIPE	20.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---	3.0					
17. Depth of flow, d	ft.	---	2.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---	52.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	---	32.65		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---	1.59		0.00		0.00	
21. Channel slope, s	ft./ft.	---	0.0039					
22. Manning's roughness coeff., n		---	0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00	3.63		0.00		0.00	
24. Flow length, L	ft.	1475	1030					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.068	+ 0.079	+	0.000	+	0.000	= 0.147
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)							hr.	0.509

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-11

Sheet flow (applicable to T_c only)

Segment ID		**A-B**	
1. Surface description (Table 3-1)		FRST	
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400	
3. Flow Length, L (< 300ft)	ft.	150	
4. Two-year 24-hr rainfall, P_2	in.	3.30	
5. Land slope, s	ft./ft.	0.016	
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.533	= 0.533

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**		**E-F**	
7. Surface description		FRST		GRSS		IMPV		IMPV	
8. Manning's roughness coeff., n		0.100		0.080		0.015		0.015	
9. Paved or unpaved		UNPVD		UNPVD		PVD		PVD	
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.20		0.20	
11. Flow Length, L	ft.	365		745		480		900	
12. Watercourse slope, s	ft./ft.	0.055		0.011		0.021		0.076	
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.90		1.06		4.92		9.37	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.053	+	0.195	+	0.027	+	0.027	= 0.302

Channel flow

Segment ID		**F-G**		**G-H**					
15. Channel Bottom width, b	ft.	PIPE		20.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0					
17. Depth of flow, d	ft.	---		2.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		52.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	---		32.65		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		1.59		0.00		0.00	
21. Channel slope, s	ft./ft.	---		0.0053					
22. Manning's roughness coeff., n		---		0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		4.23		0.00		0.00	
24. Flow length, L	ft.	4700		1790					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.218	+	0.118	+	0.000	+	0.000	= 0.335
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	1.171

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-12

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.040		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.369	=	0.369

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**				
7. Surface description		GRSS		FRST		IMPV				
8. Manning's roughness coeff., n		0.080		0.100		0.015				
9. Paved or unpaved		UNPVD		UNPVD		PVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.20				
11. Flow Length, L	ft.	385		215		345				
12. Watercourse slope, s	ft./ft.	0.047		0.158		0.043				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	2.19		3.22		7.04		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.049	+	0.019	+	0.014	+	0.000	=	0.081

Channel flow

Segment ID		**E-F**		**F-G**		**G-H**				
15. Channel Bottom width, b	ft.	PIPE		PIPE		20.0				
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		---		3.0				
17. Depth of flow, d	ft.	---		---		2.0				
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		---		52.00		0.00		
19. Wetted perimeter, P_w	ft.	---		---		32.65		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		---		1.59		0.00		
21. Channel slope, s	ft./ft.	---		---		0.0039				
22. Manning's roughness coeff., n		---		---		0.035				
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		6.00		3.63		0.00		
24. Flow length, L	ft.	735		255		515				
25. $T_t = \frac{L}{3600 * V}$	hr.	0.034	+	0.012	+	0.039	+	0.000	=	0.085
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.536

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-13

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.016		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.533	=	0.533

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**		**E-F**	
7. Surface description		FRST		IMPV		GRSS		IMPV	
8. Manning's roughness coeff., n		0.100		0.015		0.080		0.015	
9. Paved or unpaved		UNPVD		PVD		UNPVD		PVD	
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.20		0.40		0.20	
11. Flow Length, L	ft.	140		210		1010		520	
12. Watercourse slope, s	ft./ft.	0.064		0.010		0.093		0.023	
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	2.05		3.40		3.08		5.15	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.019	+	0.017	+	0.091	+	0.028	= 0.155

Channel flow

Segment ID		**F-G**		**G-H**		**H-I**			
15. Channel Bottom width, b	ft.	PIPE		8.0		20.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0		3.0			
17. Depth of flow, d	ft.	---		1.0		2.0			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		11.00		52.00		0.00	
19. Wetted perimeter, P_w	ft.	---		14.32		32.65		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.77		1.59		0.00	
21. Channel slope, s	ft./ft.	---		0.0256		0.0026			
22. Manning's roughness coeff., n		---		0.035		0.035			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		5.71		2.96		0.00	
24. Flow length, L	ft.	1195		340		1705			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.055	+	0.017	+	0.160	+	0.000	= 0.232
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.920

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-14

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.487	=	0.487

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		IMPV					
8. Manning's roughness coeff., n		0.080		0.015					
9. Paved or unpaved		UNPVD		PVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.20					
11. Flow Length, L	ft.	195		880					
12. Watercourse slope, s	ft./ft.	0.041		0.056					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	2.05		8.04		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.026	+	0.030	+	0.000	+	0.000	= 0.057

Channel flow

Segment ID		**D-E**							
15. Channel Bottom width, b	ft.	PIPE							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---							
17. Depth of flow, d	ft.	---							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	---		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.	---							
22. Manning's roughness coeff., n		---							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		0.00		0.00		0.00	
24. Flow length, L	ft.	2185							
25. $T_t = \frac{L}{3600 * V}$	hr.	0.101	+	0.000	+	0.000	+	0.000	= 0.101
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 0.645

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-15

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.016		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.533	=	0.533

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**		**E-F**		
7. Surface description		FRST		FRST		GRSS		IMPV		
8. Manning's roughness coeff., n		0.100		0.100		0.080		0.015		
9. Paved or unpaved		UNPVD		UNPVD		UNPVD		PVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40		0.20		
11. Flow Length, L	ft.	95		175		110		100		
12. Watercourse slope, s	ft./ft.	0.053		0.023		0.055		0.015		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.86		1.23		2.37		4.16		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.014	+	0.040	+	0.013	+	0.007	=	0.073

Channel flow

Segment ID		**F-G**		**G-H**		**H-I**				
15. Channel Bottom width, b	ft.	PIPE		4.0		24.0				
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0		3.0				
17. Depth of flow, d	ft.	---		1.0		2.0				
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		7.00		60.00		0.00		
19. Wetted perimeter, P_w	ft.	---		10.32		36.65		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.68		1.64		0.00		
21. Channel slope, s	ft./ft.	---		0.0086		0.0047				
22. Manning's roughness coeff., n		---		0.035		0.035				
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		3.05		4.05		0.00		
24. Flow length, L	ft.	2270		580		1180				
25. $T_t = \frac{L}{3600 * V}$	hr.	0.105	+	0.053	+	0.081	+	0.000	=	0.239
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.845

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-16

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.014		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.562	=	0.562

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**			
7. Surface description		FRST		GRSS		IMPV			
8. Manning's roughness coeff., n		0.100		0.080		0.015			
9. Paved or unpaved		UNPVD		UNPVD		PVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.20			
11. Flow Length, L	ft.	305		330		380			
12. Watercourse slope, s	ft./ft.	0.014		0.055		0.029			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.96		2.37		5.79		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.089	+	0.039	+	0.018	+	0.000	= 0.145

Channel flow

Segment ID		**E-F**		**F-G**					
15. Channel Bottom width, b	ft.	PIPE		24.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0					
17. Depth of flow, d	ft.	---		1.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		27.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	---		30.32		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.89		0.00		0.00	
21. Channel slope, s	ft./ft.	---		0.0026					
22. Manning's roughness coeff., n		---		0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		2.01		0.00		0.00	
24. Flow length, L	ft.	460		765					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.021	+	0.106	+	0.000	+	0.000	= 0.127
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.835

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: MS-17

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.487	=	0.487

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**				
7. Surface description		FRST		IMPV		FRST				
8. Manning's roughness coeff., n		0.100		0.015		0.100				
9. Paved or unpaved		UNPVD		PVD		UNPVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.20		0.40				
11. Flow Length, L	ft.	105		650		155				
12. Watercourse slope, s	ft./ft.	0.033		0.029		0.075				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.47		5.79		2.22		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.020	+	0.031	+	0.019	+	0.000	=	0.070

Channel flow

Segment ID		**E-F**		**F-G**		**G-H**		**H-I**		
15. Channel Bottom width, b	ft.	PIPE		4.0		PIPE		24.0		
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0		---		3.0		
17. Depth of flow, d	ft.	---		1.0		---		2.0		
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		7.00		---		60.00		
19. Wetted perimeter, P_w	ft.	---		10.32		---		36.65		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.68		---		1.64		
21. Channel slope, s	ft./ft.	---		0.0360		---		0.0032		
22. Manning's roughness coeff., n		---		0.035		---		0.035		
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		6.23		6.00		3.35		
24. Flow length, L	ft.	730		605		915		615		
25. $T_t = \frac{L}{3600 * V}$	hr.	0.034	+	0.027	+	0.042	+	0.051	=	0.154
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.712

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T1-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.028		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.426	=	0.426

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**			
7. Surface description		FRST		FRST		FRST			
8. Manning's roughness coeff., n		0.100		0.100		0.100			
9. Paved or unpaved		UNPVD		UNPVD		UNPVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40			
11. Flow Length, L	ft.	275		390		480			
12. Watercourse slope, s	ft./ft.	0.028		0.090		0.052			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.35		2.43		1.84		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.056	+	0.045	+	0.072	+	0.000	= 0.173

Channel flow

Segment ID		**E-F**		**F-G**		**G-H**		**H-I**	
15. Channel Bottom width, b	ft.	4.0		8.0		12.0		12.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0		3.0	
17. Depth of flow, d	ft.	1.0		1.0		1.5		1.5	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		24.75		24.75	
19. Wetted perimeter, P_w	ft.	10.32		14.32		21.49		21.49	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		1.15		1.15	
21. Channel slope, s	ft./ft.	0.0163		0.0245		0.0154		0.0231	
22. Manning's roughness coeff., n		0.040		0.040		0.040		0.040	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.67		4.89		5.08		6.22	
24. Flow length, L	ft.	920		1020		1300		1620	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.070	+	0.058	+	0.071	+	0.072	= 0.271
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 0.870

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T2-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.043		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.359	=	0.359

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		GRSS					
8. Manning's roughness coeff., n		0.100		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	250		865					
12. Watercourse slope, s	ft./ft.	0.043		0.046					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.68		2.17		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.041	+	0.111	+	0.000	+	0.000	= 0.152

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**		**G-H**	
15. Channel Bottom width, b	ft.	4.0		8.0		PIPE		12.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		---		3.0	
17. Depth of flow, d	ft.	1.0		1.0		---		1.5	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		---		24.75	
19. Wetted perimeter, P_w	ft.	10.32		14.32		---		21.49	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		---		1.15	
21. Channel slope, s	ft./ft.	0.0111		0.0145		---		0.0159	
22. Manning's roughness coeff., n		0.040		0.040		---		0.040	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.03		3.76		6.00		5.16	
24. Flow length, L	ft.	1800		2760		1195		440	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.165	+	0.204	+	0.055	+	0.024	= 0.448
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 0.959

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T2-02

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.017		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.413	=	0.413

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		GRSS					
8. Manning's roughness coeff., n		0.080		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	560		580					
12. Watercourse slope, s	ft./ft.	0.017		0.026					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.32		1.63		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.118	+	0.099	+	0.000	+	0.000	= 0.217

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**		**G-H**	
15. Channel Bottom width, b	ft.	4.0		4.0		8.0		12.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0		3.0	
17. Depth of flow, d	ft.	1.0		1.0		1.0		1.5	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		7.00		11.00		24.75	
19. Wetted perimeter, P_w	ft.	10.32		10.32		14.32		21.49	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.68		0.77		1.15	
21. Channel slope, s	ft./ft.	0.0161		0.0361		0.0294		0.0323	
22. Manning's roughness coeff., n		0.040		0.040		0.040		0.040	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.65		5.46		5.36		7.36	
24. Flow length, L	ft.	940		1800		1700		1700	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.072	+	0.092	+	0.088	+	0.064	= 0.315
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 0.946

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T3-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.058		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.318	=	0.318

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	565		795					
12. Watercourse slope, s	ft./ft.	0.058		0.025					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.95		1.28		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.081	+	0.173	+	0.000	+	0.000	= 0.253

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	4.0		4.0		4.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.0		1.0			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		7.00		7.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		10.32		10.32		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.68		0.68		0.00	
21. Channel slope, s	ft./ft.	0.0667		0.0818		0.0215			
22. Manning's roughness coeff., n		0.040		0.040		0.040			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	7.42		8.22		4.22		0.00	
24. Flow length, L	ft.	575		1345		930			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.022	+	0.045	+	0.061	+	0.000	= 0.128

26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25) hr. 0.700

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T4-01

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)		ft.	150		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.010		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.511	=	0.511

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			GRSS		GRSS		IMPV				
8. Manning's roughness coeff., n			0.080		0.080		0.015				
9. Paved or unpaved			UNPVD		UNPVD		PVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.20				
11. Flow Length, L		ft.	90		345		80				
12. Watercourse slope, s		ft./ft.	0.010		0.038		0.020				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.01		1.97		4.80		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.025	+	0.049	+	0.005	+	0.000	=	0.078

Channel flow

		Segment ID	E-F		F-G		G-H		H-I		
15. Channel Bottom width, b		ft.	PIPE		4.0		PIPE		8.0		
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		---		3.0		---		3.0		
17. Depth of flow, d		ft.	---		1.0		---		1.0		
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		---		7.00		---		11.00		
19. Wetted perimeter, P_w		ft.	---		10.32		---		14.32		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	---		0.68		---		0.77		
21. Channel slope, s		ft./ft.	---		0.0364		---		0.0102		
22. Manning's roughness coeff., n			---		0.035		---		0.035		
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	6.00		6.27		6.00		3.61		
24. Flow length, L		ft.	1400		1290		470		2060		
25. $T_t = \frac{L}{3600 * V}$		hr.	0.065	+	0.057	+	0.022	+	0.159	=	0.302
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.891

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T4-02

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.016		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.533	=	0.533

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**		**E-F**	
7. Surface description		FRST		GRSS		GRSS		GRSS	
8. Manning's roughness coeff., n		0.100		0.080		0.080		0.080	
9. Paved or unpaved		UNPVD		UNPVD		UNPVD		UNPVD	
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40		0.40	
11. Flow Length, L	ft.	220		440		240		285	
12. Watercourse slope, s	ft./ft.	0.016		0.020		0.067		0.025	
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.02		1.43		2.62		1.60	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.060	+	0.085	+	0.025	+	0.050	= 0.220

Channel flow

Segment ID		**F-G**		**G-H**		**H-I**			
15. Channel Bottom width, b	ft.	4.0		4.0		4.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.0		1.0			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		7.00		7.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		10.32		10.32		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.68		0.68		0.00	
21. Channel slope, s	ft./ft.	0.0264		0.0155		0.0320			
22. Manning's roughness coeff., n		0.035		0.035		0.035			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	5.34		4.09		5.88		0.00	
24. Flow length, L	ft.	265		1280		875			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.014	+	0.087	+	0.041	+	0.000	= 0.142
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.895

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T4-03

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	150		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.010		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.643	=	0.643

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E		E-F		
7. Surface description			FRST		FRST		IMPV		FRST		
8. Manning's roughness coeff., n			0.100		0.100		0.015		0.100		
9. Paved or unpaved			UNPVD		UNPVD		PVD		UNPVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.20		0.40		
11. Flow Length, L		ft.	215		520		630		565		
12. Watercourse slope, s		ft./ft.	0.033		0.008		0.019		0.069		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.47		0.72		4.68		2.12		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.041	+	0.200	+	0.037	+	0.074	=	0.352

Channel flow

		Segment ID	F-G		G-H		H-I				
15. Channel Bottom width, b		ft.	4.0		PIPE		8.0				
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.0		---		3.0				
17. Depth of flow, d		ft.	1.0		---		1.0				
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		7.00		---		11.00		0.00		
19. Wetted perimeter, P_w		ft.	10.32		---		14.32		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.68		---		0.77		0.00		
21. Channel slope, s		ft./ft.	0.0683		---		0.0412				
22. Manning's roughness coeff., n			0.035		---		0.035				
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	8.59		6.00		7.25		0.00		
24. Flow length, L		ft.	630		720		170				
25. $T_t = \frac{L}{3600 * V}$		hr.	0.020	+	0.033	+	0.007	+	0.000	=	0.060
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.055

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T5-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.012		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.598	=	0.598

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		GRSS					
8. Manning's roughness coeff., n		0.100		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	180		245					
12. Watercourse slope, s	ft./ft.	0.012		0.012					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.89		1.11		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.056	+	0.061	+	0.000	+	0.000	= 0.118

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	4.0		PIPE		4.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		---		3.0			
17. Depth of flow, d	ft.	1.0		---		1.0			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		---		7.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		---		10.32		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		---		0.68		0.00	
21. Channel slope, s	ft./ft.	0.0089		---		0.0072			
22. Manning's roughness coeff., n		0.035		---		0.035			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.10		6.00		2.79		0.00	
24. Flow length, L	ft.	1015		1065		555			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.091	+	0.049	+	0.055	+	0.000	= 0.196
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.911

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T5-02

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	150		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.047		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.346	=	0.346

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			FRST		IMPV		GRSS				
8. Manning's roughness coeff., n			0.100		0.015		0.080				
9. Paved or unpaved			UNPVD		PVD		UNPVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.20		0.40				
11. Flow Length, L		ft.	150		245		150				
12. Watercourse slope, s		ft./ft.	0.047		0.006		0.030				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.75		2.63		1.75		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.024	+	0.026	+	0.024	+	0.000	=	0.073

Channel flow

		Segment ID	E-F		F-G		G-H		H-I		
15. Channel Bottom width, b		ft.	4.0		4.0		PIPE		8.0		
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.0		3.0		---		3.0		
17. Depth of flow, d		ft.	1.0		1.0		---		1.0		
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		7.00		7.00		---		11.00		
19. Wetted perimeter, P_w		ft.	10.32		10.32		---		14.32		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.68		0.68		---		0.77		
21. Channel slope, s		ft./ft.	0.1310		0.0360		---		0.0114		
22. Manning's roughness coeff., n			0.035		0.035		---		0.035		
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	11.89		6.23		6.00		3.81		
24. Flow length, L		ft.	290		755		865		350		
25. $T_t = \frac{L}{3600 * V}$		hr.	0.007	+	0.034	+	0.040	+	0.026	=	0.106
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.526

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T6-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.014		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.562	=	0.562

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		FRST		FRST					
8. Manning's roughness coeff., n		0.100		0.100					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	705		610					
12. Watercourse slope, s	ft./ft.	0.014		0.008					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.96		0.72		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.205	+	0.234	+	0.000	+	0.000	= 0.439

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**			
15. Channel Bottom width, b	ft.	4.0		4.0		8.0			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		3.0			
17. Depth of flow, d	ft.	1.0		1.0		1.0			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		7.00		11.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		10.32		14.32		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.68		0.77		0.00	
21. Channel slope, s	ft./ft.	0.0148		0.0332		0.0285			
22. Manning's roughness coeff., n		0.040		0.040		0.040			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.50		5.24		5.27		0.00	
24. Flow length, L	ft.	1685		1205		1230			
25. $T_t = \frac{L}{3600 * V}$	hr.	0.134	+	0.064	+	0.065	+	0.000	= 0.263
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	1.264

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T6-02

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.019		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.395	=	0.395

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		GRSS					
8. Manning's roughness coeff., n		0.080		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	165		550					
12. Watercourse slope, s	ft./ft.	0.019		0.022					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.39		1.50		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.033	+	0.102	+	0.000	+	0.000	= 0.135

Channel flow

Segment ID		**D-E**		**E-F**					
15. Channel Bottom width, b	ft.	4.0		4.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0					
17. Depth of flow, d	ft.	1.0		1.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		7.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		10.32		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.68		0.00		0.00	
21. Channel slope, s	ft./ft.	0.0114		0.0259					
22. Manning's roughness coeff., n		0.035		0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.51		5.29		0.00		0.00	
24. Flow length, L	ft.	740		425					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.059	+	0.022	+	0.000	+	0.000	= 0.081
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.611

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T6-03

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.014		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.562	=	0.562

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**			
7. Surface description		FRST		GRSS		FRST			
8. Manning's roughness coeff., n		0.100		0.080		0.100			
9. Paved or unpaved		UNPVD		UNPVD		UNPVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40			
11. Flow Length, L	ft.	220		575		530			
12. Watercourse slope, s	ft./ft.	0.014		0.042		0.087			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.96		2.07		2.39		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.064	+	0.077	+	0.062	+	0.000	= 0.203

Channel flow

Segment ID		**E-F**		**F-G**					
15. Channel Bottom width, b	ft.	4.0		8.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0					
17. Depth of flow, d	ft.	1.0		1.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	10.32		14.32		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		0.00		0.00	
21. Channel slope, s	ft./ft.	0.0730		0.0128					
22. Manning's roughness coeff., n		0.035		0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	8.88		4.04		0.00		0.00	
24. Flow length, L	ft.	1150		1560					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.036	+	0.107	+	0.000	+	0.000	= 0.143
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.908

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T6-04

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.023		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.366	=	0.366

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		GRSS					
8. Manning's roughness coeff., n		0.080		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	690		270					
12. Watercourse slope, s	ft./ft.	0.023		0.067					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.53		2.62		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.125	+	0.029	+	0.000	+	0.000	= 0.154

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**		**G-H**	
15. Channel Bottom width, b	ft.	4.0		8.0		PIPE		16.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	3.0		3.0		---		3.0	
17. Depth of flow, d	ft.	1.0		1.0		---		1.5	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	7.00		11.00		---		30.75	
19. Wetted perimeter, P_w	ft.	10.32		14.32		---		25.49	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.68		0.77		---		1.21	
21. Channel slope, s	ft./ft.	0.0452		0.0082		---		0.0114	
22. Manning's roughness coeff., n		0.035		0.035		---		0.035	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.99		3.23		6.00		5.15	
24. Flow length, L	ft.	2480		490		685		2455	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.099	+	0.042	+	0.032	+	0.132	= 0.305
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.825

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T7-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.023		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.366	=	0.366

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		GRSS					
8. Manning's roughness coeff., n		0.080		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	195		655					
12. Watercourse slope, s	ft./ft.	0.023		0.046					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.53		2.17		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.035	+	0.084	+	0.000	+	0.000	= 0.119

Channel flow

Segment ID		**D-E**		**E-F**					
15. Channel Bottom width, b	ft.	PIPE		4.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0					
17. Depth of flow, d	ft.	---		1.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		7.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	---		10.32		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.68		0.00		0.00	
21. Channel slope, s	ft./ft.	---		0.0162					
22. Manning's roughness coeff., n		---		0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		4.18		0.00		0.00	
24. Flow length, L	ft.	1290		740					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.060	+	0.049	+	0.000	+	0.000	= 0.109
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 0.594

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T8-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.014		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.447	=	0.447

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**					
7. Surface description		GRSS		GRSS					
8. Manning's roughness coeff., n		0.080		0.080					
9. Paved or unpaved		UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	100		220					
12. Watercourse slope, s	ft./ft.	0.014		0.027					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.20		1.66		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.023	+	0.037	+	0.000	+	0.000	= 0.060

Channel flow

Segment ID		**D-E**		**E-F**		**F-G**		**G-H**	
15. Channel Bottom width, b	ft.	PIPE		4.0		PIPE		4.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0		---		3.0	
17. Depth of flow, d	ft.	---		1.0		---		1.0	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		7.00		---		7.00	
19. Wetted perimeter, P_w	ft.	---		10.32		---		10.32	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.68		---		0.68	
21. Channel slope, s	ft./ft.	---		0.0268		---		0.0382	
22. Manning's roughness coeff., n		---		0.035		---		0.035	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		5.38		6.00		6.42	
24. Flow length, L	ft.	835		1680		840		655	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.039	+	0.087	+	0.039	+	0.028	= 0.193
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.699

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T9-01

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.012		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.598	=	0.598

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**							
7. Surface description		FRST							
8. Manning's roughness coeff., n		0.100							
9. Paved or unpaved		UNPVD							
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	185							
12. Watercourse slope, s	ft./ft.	0.012							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.89		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.058	+	0.000	+	0.000	+	0.000	= 0.058

Channel flow

Segment ID		**C-D**		**D-E**		**E-F**		**F-G**	
15. Channel Bottom width, b	ft.	PIPE		4.0		4.0		4.0	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0		3.0		3.0	
17. Depth of flow, d	ft.	---		1.0		1.0		1.0	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		7.00		7.00		7.00	
19. Wetted perimeter, P_w	ft.	---		10.32		10.32		10.32	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.68		0.68		0.68	
21. Channel slope, s	ft./ft.	---		0.0231		0.0273		0.0092	
22. Manning's roughness coeff., n		---		0.040		0.035		0.035	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		4.37		5.43		3.15	
24. Flow length, L	ft.	785		2855		2750		870	
25. $T_t = \frac{L}{3600 * V}$	hr.	0.036	+	0.182	+	0.141	+	0.077	= 0.435
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr. 1.091

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T10-01

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)		ft.	150		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.010		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.511	=	0.511

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			GRSS		GRSS		GRSS				
8. Manning's roughness coeff., n			0.080		0.080		0.080				
9. Paved or unpaved			UNPVD		UNPVD		UNPVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.40				
11. Flow Length, L		ft.	80		400		355				
12. Watercourse slope, s		ft./ft.	0.010		0.035		0.025				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.01		1.89		1.60		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.022	+	0.059	+	0.062	+	0.000	=	0.142

Channel flow

		Segment ID	E-F		F-G		G-H		H-I		
15. Channel Bottom width, b		ft.	4.0		PIPE		4.0		4.0		
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.0		---		3.0		3.0		
17. Depth of flow, d		ft.	1.0		---		1.0		1.0		
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		7.00		---		7.00		7.00		
19. Wetted perimeter, P_w		ft.	10.32		---		10.32		10.32		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.68		---		0.68		0.68		
21. Channel slope, s		ft./ft.	0.0260		---		0.0151		0.0178		
22. Manning's roughness coeff., n			0.035		---		0.035		0.035		
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	5.30		6.00		4.04		4.38		
24. Flow length, L		ft.	500		335		2380		3150		
25. $T_t = \frac{L}{3600 * V}$		hr.	0.026	+	0.016	+	0.164	+	0.200	=	0.405
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.058

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River (1581-04-3) By: BMC Date:
Location: Darien, CT Checked: Date:
Circle one: ***Present*** Developed Watershed: Noroton River
Circle one: ***Tc*** T_t Subwatershed: T10-02

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	150		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.044		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.356	=	0.356

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**						
7. Surface description		FRST						
8. Manning's roughness coeff., n		0.100						
9. Paved or unpaved		UNPVD						
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40						
11. Flow Length, L	ft.	155						
12. Watercourse slope, s	ft./ft.	0.044						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.70		0.00		0.00		0.00
14. $T_t = \frac{L}{3600 * V}$	hr.	0.025	+	0.000	+	0.000	+	0.000	=	0.025

Channel flow

Segment ID		**C-D**		**D-E**					
15. Channel Bottom width, b	ft.	PIPE		4.0					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.	---		3.0					
17. Depth of flow, d	ft.	---		1.0					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	---		7.00					
19. Wetted perimeter, P_w	ft.	---		10.32		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	---		0.68		0.00		0.00	
21. Channel slope, s	ft./ft.	---		0.0299					
22. Manning's roughness coeff., n		---		0.035					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	6.00		5.68		0.00		0.00	
24. Flow length, L	ft.	950		1270					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.044	+	0.062	+	0.000	+	0.000	=	0.106
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.487

APPENDIX F

HEC-HMS Data Files

Project: NOROTON_03 Simulation Run: EX TP-40 002-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 002-YR
Compute Time: 23Apr2010, 13:29:31 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	242.6	11Mar2010, 13:00	1.00
J-MS-03	1.94709	415.7	11Mar2010, 13:00	0.93
J-MS-04	3.51316	797.8	11Mar2010, 13:00	0.98
J-MS-05	3.99658	837.7	11Mar2010, 13:00	0.95
J-MS-06	4.61712	954.2	11Mar2010, 13:00	0.98
J-MS-07	4.81369	990.4	11Mar2010, 13:00	0.98
J-MS-08	5.23439	917.8	11Mar2010, 13:30	0.93
J-MS-09A	5.80808	978.3	11Mar2010, 13:30	0.95
J-MS-09B	6.33283	1023.9	11Mar2010, 13:45	0.95
J-MS-10	8.26117	1276.9	11Mar2010, 13:30	0.96
J-MS-11A	8.51377	1286.0	11Mar2010, 13:45	0.96
J-MS-11B	9.17568	1369.8	11Mar2010, 13:45	0.98
J-MS-12	9.25503	1366.3	11Mar2010, 14:00	0.98
J-MS-13	9.64461	1411.0	11Mar2010, 14:00	0.99
J-MS-14	9.77491	1418.3	11Mar2010, 14:00	0.98
J-MS-15	10.24351	1447.5	11Mar2010, 14:00	0.98
J-MS-16	10.74072	1501.1	11Mar2010, 14:00	0.99
J-MS-17	11.03884	1522.3	11Mar2010, 14:00	1.00
J-T10-02	0.40623	147.3	11Mar2010, 12:45	1.41
J-T2-02	1.37640	392.5	11Mar2010, 12:45	1.09
J-T4-02	0.36108	113.9	11Mar2010, 12:45	1.14
J-T4-03	0.57369	175.8	11Mar2010, 12:45	1.14
J-T5-02	0.31796	100.6	11Mar2010, 12:30	1.13
J-T6-02	0.60697	165.1	11Mar2010, 12:45	1.13
J-T6-03	1.40439	335.6	11Mar2010, 12:45	0.98
J-T6-04	1.82129	429.8	11Mar2010, 12:45	1.01
MS-01	0.48227	138.3	11Mar2010, 12:45	1.15
MS-02	0.52094	111.6	11Mar2010, 12:45	0.88

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	88.2	11Mar2010, 12:45	0.83
MS-04	0.18967	33.9	11Mar2010, 12:45	0.69
MS-05	0.48342	97.8	11Mar2010, 12:45	0.78
MS-06	0.62054	235.8	11Mar2010, 12:30	1.16
MS-07	0.19657	72.9	11Mar2010, 12:30	1.10
MS-08	0.11574	29.7	11Mar2010, 12:45	0.98
MS-09	0.20679	41.1	11Mar2010, 12:45	0.83
MS-10	0.10705	39.9	11Mar2010, 12:30	1.10
MS-11	0.52725	164.5	11Mar2010, 12:45	1.27
MS-12	0.07935	40.3	11Mar2010, 12:30	1.47
MS-13	0.38958	161.6	11Mar2010, 12:45	1.47
MS-14	0.13030	48.6	11Mar2010, 12:30	1.16
MS-15	0.24087	53.0	11Mar2010, 12:45	0.83
MS-16	0.09098	36.7	11Mar2010, 12:30	1.40
MS-17	0.29812	140.1	11Mar2010, 12:30	1.47
P-MS-07	4.81369	876.7	11Mar2010, 13:30	0.93
P-MS-10	8.26117	1266.9	11Mar2010, 13:45	0.96
P-MS-11	9.17568	1359.0	11Mar2010, 14:00	0.97
P-MS-13	9.64461	1407.4	11Mar2010, 14:00	0.98
R-MS-02	0.48227	137.1	11Mar2010, 13:00	1.14
R-MS-03	1.00321	236.4	11Mar2010, 13:15	1.00
R-MS-04	1.94709	397.8	11Mar2010, 13:00	0.93
R-MS-05	3.51316	766.3	11Mar2010, 13:15	0.97
R-MS-06	3.99658	830.1	11Mar2010, 13:15	0.95
R-MS-08	4.81369	867.0	11Mar2010, 13:30	0.92
R-MS-09A	5.23439	893.1	11Mar2010, 13:45	0.93
R-MS-09B	5.80808	968.8	11Mar2010, 13:45	0.95
R-MS-10	6.33283	1022.2	11Mar2010, 13:45	0.95
R-MS-11A	8.26117	1259.4	11Mar2010, 13:45	0.96
R-MS-11B	0.25260	88.0	11Mar2010, 12:45	1.15
R-MS-11C	8.51377	1275.2	11Mar2010, 13:45	0.96
R-MS-13	9.25503	1363.8	11Mar2010, 14:00	0.97
R-MS-15	9.77491	1407.1	11Mar2010, 14:00	0.98

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	1439.6	11Mar2010, 14:00	0.97
R-MS-17	10.74072	1492.8	11Mar2010, 14:15	0.99
R-T10-02	0.33329	121.9	11Mar2010, 12:45	1.40
R-T2-02	0.68525	216.2	11Mar2010, 13:00	1.20
R-T4-03	0.36108	112.4	11Mar2010, 12:45	1.14
R-T5-02	0.16467	54.7	11Mar2010, 12:45	1.21
R-T6-03	0.60697	163.6	11Mar2010, 13:00	1.12
R-T6-04	1.40439	327.9	11Mar2010, 13:00	0.98
T10-01	0.33329	124.3	11Mar2010, 12:45	1.40
T10-02	0.07294	37.2	11Mar2010, 12:30	1.47
T1-01	0.50230	117.7	11Mar2010, 12:45	0.88
T2-01	0.68525	227.3	11Mar2010, 12:45	1.21
T2-02	0.69115	180.3	11Mar2010, 12:45	0.98
T3-01	0.30496	96.3	11Mar2010, 12:30	1.04
T4-01	0.23178	70.1	11Mar2010, 12:45	1.09
T4-02	0.12930	43.8	11Mar2010, 12:45	1.21
T4-03	0.21261	63.4	11Mar2010, 12:45	1.15
T5-01	0.16467	55.6	11Mar2010, 12:45	1.21
T5-02	0.15329	53.6	11Mar2010, 12:30	1.04
T6-01	0.38513	109.9	11Mar2010, 13:00	1.21
T6-02	0.22184	69.9	11Mar2010, 12:30	0.99
T6-03	0.79742	184.3	11Mar2010, 12:45	0.88
T6-04	0.41690	127.9	11Mar2010, 12:45	1.10
T7-01	0.25260	96.7	11Mar2010, 12:30	1.16
T8-01	0.13466	34.3	11Mar2010, 12:30	0.88
T9-01	0.22773	54.6	11Mar2010, 12:45	0.98

Project: NOROTON_03 Simulation Run: EX TP-40 010-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 010-YR
Compute Time: 23Apr2010, 13:33:00 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	556.8	11Mar2010, 12:45	2.21
J-MS-03	1.94709	991.7	11Mar2010, 13:00	2.10
J-MS-04	3.51316	1899.9	11Mar2010, 12:45	2.17
J-MS-05	3.99658	2075.3	11Mar2010, 13:00	2.12
J-MS-06	4.61712	2332.5	11Mar2010, 13:00	2.17
J-MS-07	4.81369	2406.5	11Mar2010, 13:00	2.17
J-MS-08	5.23439	2423.0	11Mar2010, 13:15	2.11
J-MS-09A	5.80808	2648.8	11Mar2010, 13:15	2.14
J-MS-09B	6.33283	2813.2	11Mar2010, 13:15	2.14
J-MS-10	8.26117	3581.3	11Mar2010, 13:15	2.16
J-MS-11A	8.51377	3234.4	11Mar2010, 13:30	2.16
J-MS-11B	9.17568	3442.9	11Mar2010, 13:30	2.18
J-MS-12	9.25503	3457.6	11Mar2010, 13:45	2.17
J-MS-13	9.64461	3547.3	11Mar2010, 13:45	2.20
J-MS-14	9.77491	3536.6	11Mar2010, 13:45	2.18
J-MS-15	10.24351	3606.5	11Mar2010, 13:45	2.17
J-MS-16	10.74072	3723.9	11Mar2010, 13:45	2.20
J-MS-17	11.03884	3770.8	11Mar2010, 14:00	2.21
J-T10-02	0.40623	296.0	11Mar2010, 12:45	2.80
J-T2-02	1.37640	888.5	11Mar2010, 12:45	2.34
J-T4-02	0.36108	247.4	11Mar2010, 12:45	2.41
J-T4-03	0.57369	385.9	11Mar2010, 12:45	2.41
J-T5-02	0.31796	226.6	11Mar2010, 12:30	2.40
J-T6-02	0.60697	364.0	11Mar2010, 12:45	2.39
J-T6-03	1.40439	807.4	11Mar2010, 12:45	2.18
J-T6-04	1.82129	1049.2	11Mar2010, 12:45	2.21
MS-01	0.48227	306.3	11Mar2010, 12:45	2.42
MS-02	0.52094	280.5	11Mar2010, 12:45	2.02

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	228.6	11Mar2010, 12:45	1.94
MS-04	0.18967	97.8	11Mar2010, 12:30	1.72
MS-05	0.48342	253.9	11Mar2010, 12:45	1.86
MS-06	0.62054	512.5	11Mar2010, 12:30	2.44
MS-07	0.19657	159.7	11Mar2010, 12:30	2.36
MS-08	0.11574	69.8	11Mar2010, 12:45	2.18
MS-09	0.20679	106.6	11Mar2010, 12:45	1.94
MS-10	0.10705	87.1	11Mar2010, 12:30	2.36
MS-11	0.52725	349.9	11Mar2010, 12:45	2.60
MS-12	0.07935	78.4	11Mar2010, 12:30	2.88
MS-13	0.38958	316.8	11Mar2010, 12:45	2.87
MS-14	0.13030	106.1	11Mar2010, 12:30	2.44
MS-15	0.24087	132.7	11Mar2010, 12:45	1.94
MS-16	0.09098	75.1	11Mar2010, 12:30	2.78
MS-17	0.29812	278.0	11Mar2010, 12:30	2.88
P-MS-07	4.81369	2320.8	11Mar2010, 13:00	2.11
P-MS-10	8.26117	3190.4	11Mar2010, 13:30	2.15
P-MS-11	9.17568	3442.5	11Mar2010, 13:45	2.16
P-MS-13	9.64461	3512.2	11Mar2010, 13:45	2.18
R-MS-02	0.48227	294.7	11Mar2010, 13:00	2.42
R-MS-03	1.00321	556.6	11Mar2010, 13:00	2.20
R-MS-04	1.94709	991.0	11Mar2010, 13:00	2.09
R-MS-05	3.51316	1871.5	11Mar2010, 13:00	2.16
R-MS-06	3.99658	2063.8	11Mar2010, 13:00	2.12
R-MS-08	4.81369	2282.7	11Mar2010, 13:15	2.10
R-MS-09A	5.23439	2399.8	11Mar2010, 13:15	2.11
R-MS-09B	5.80808	2625.1	11Mar2010, 13:15	2.14
R-MS-10	6.33283	2770.8	11Mar2010, 13:15	2.14
R-MS-11A	8.26117	3169.2	11Mar2010, 13:30	2.15
R-MS-11B	0.25260	193.0	11Mar2010, 12:30	2.43
R-MS-11C	8.51377	3213.6	11Mar2010, 13:45	2.15
R-MS-13	9.25503	3442.0	11Mar2010, 13:45	2.17
R-MS-15	9.77491	3519.7	11Mar2010, 14:00	2.18

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	3603.0	11Mar2010, 14:00	2.17
R-MS-17	10.74072	3715.2	11Mar2010, 14:00	2.19
R-T10-02	0.33329	247.9	11Mar2010, 12:45	2.78
R-T2-02	0.68525	466.8	11Mar2010, 12:45	2.51
R-T4-03	0.36108	246.5	11Mar2010, 12:45	2.41
R-T5-02	0.16467	117.0	11Mar2010, 12:45	2.52
R-T6-03	0.60697	354.1	11Mar2010, 12:45	2.38
R-T6-04	1.40439	769.4	11Mar2010, 12:45	2.17
T10-01	0.33329	251.1	11Mar2010, 12:45	2.78
T10-02	0.07294	72.0	11Mar2010, 12:30	2.89
T1-01	0.50230	287.5	11Mar2010, 12:45	2.02
T2-01	0.68525	483.9	11Mar2010, 12:45	2.52
T2-02	0.69115	421.7	11Mar2010, 12:45	2.18
T3-01	0.30496	222.9	11Mar2010, 12:30	2.27
T4-01	0.23178	154.8	11Mar2010, 12:45	2.35
T4-02	0.12930	92.7	11Mar2010, 12:45	2.52
T4-03	0.21261	139.4	11Mar2010, 12:45	2.43
T5-01	0.16467	117.7	11Mar2010, 12:45	2.52
T5-02	0.15329	120.2	11Mar2010, 12:30	2.27
T6-01	0.38513	233.6	11Mar2010, 13:00	2.51
T6-02	0.22184	163.4	11Mar2010, 12:30	2.19
T6-03	0.79742	453.3	11Mar2010, 12:45	2.02
T6-04	0.41690	288.4	11Mar2010, 12:30	2.35
T7-01	0.25260	209.7	11Mar2010, 12:30	2.44
T8-01	0.13466	86.7	11Mar2010, 12:30	2.02
T9-01	0.22773	130.2	11Mar2010, 12:45	2.18

Project: NOROTON_03 Simulation Run: EX TP-40 025-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 025-yr
Compute Time: 23Apr2010, 13:33:44 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	703.8	11Mar2010, 12:45	2.76
J-MS-03	1.94709	1270.5	11Mar2010, 12:45	2.63
J-MS-04	3.51316	2421.6	11Mar2010, 12:45	2.72
J-MS-05	3.99658	2624.7	11Mar2010, 13:00	2.67
J-MS-06	4.61712	2946.2	11Mar2010, 12:45	2.71
J-MS-07	4.81369	3087.5	11Mar2010, 12:45	2.72
J-MS-08	5.23439	3128.0	11Mar2010, 13:00	2.66
J-MS-09A	5.80808	3382.1	11Mar2010, 13:15	2.68
J-MS-09B	6.33283	3609.6	11Mar2010, 13:15	2.69
J-MS-10	8.26117	4665.7	11Mar2010, 13:00	2.70
J-MS-11A	8.51377	4301.5	11Mar2010, 13:30	2.70
J-MS-11B	9.17568	4555.3	11Mar2010, 13:30	2.73
J-MS-12	9.25503	4478.8	11Mar2010, 13:30	2.72
J-MS-13	9.64461	4587.8	11Mar2010, 13:45	2.74
J-MS-14	9.77491	4594.9	11Mar2010, 13:45	2.73
J-MS-15	10.24351	4679.1	11Mar2010, 13:45	2.72
J-MS-16	10.74072	4813.5	11Mar2010, 13:45	2.75
J-MS-17	11.03884	4851.3	11Mar2010, 13:45	2.76
J-T10-02	0.40623	360.0	11Mar2010, 12:45	3.41
J-T2-02	1.37640	1109.8	11Mar2010, 12:45	2.91
J-T4-02	0.36108	306.4	11Mar2010, 12:45	2.98
J-T4-03	0.57369	478.7	11Mar2010, 12:45	2.99
J-T5-02	0.31796	282.6	11Mar2010, 12:30	2.97
J-T6-02	0.60697	452.2	11Mar2010, 12:45	2.96
J-T6-03	1.40439	1020.4	11Mar2010, 12:45	2.72
J-T6-04	1.82129	1327.9	11Mar2010, 12:45	2.76
MS-01	0.48227	380.9	11Mar2010, 12:45	3.00
MS-02	0.52094	358.0	11Mar2010, 12:45	2.54

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	293.5	11Mar2010, 12:45	2.46
MS-04	0.18967	128.8	11Mar2010, 12:30	2.21
MS-05	0.48342	326.0	11Mar2010, 12:45	2.37
MS-06	0.62054	634.5	11Mar2010, 12:30	3.02
MS-07	0.19657	198.1	11Mar2010, 12:30	2.92
MS-08	0.11574	87.8	11Mar2010, 12:45	2.73
MS-09	0.20679	136.9	11Mar2010, 12:45	2.46
MS-10	0.10705	107.9	11Mar2010, 12:30	2.93
MS-11	0.52725	431.2	11Mar2010, 12:45	3.19
MS-12	0.07935	94.7	11Mar2010, 12:30	3.50
MS-13	0.38958	383.2	11Mar2010, 12:45	3.49
MS-14	0.13030	131.5	11Mar2010, 12:30	3.01
MS-15	0.24087	169.5	11Mar2010, 12:30	2.46
MS-16	0.09098	91.8	11Mar2010, 12:30	3.39
MS-17	0.29812	337.2	11Mar2010, 12:30	3.50
P-MS-07	4.81369	3004.6	11Mar2010, 13:00	2.65
P-MS-10	8.26117	4246.8	11Mar2010, 13:30	2.69
P-MS-11	9.17568	4457.2	11Mar2010, 13:30	2.71
P-MS-13	9.64461	4565.6	11Mar2010, 13:45	2.72
R-MS-02	0.48227	370.2	11Mar2010, 13:00	2.99
R-MS-03	1.00321	701.4	11Mar2010, 13:00	2.75
R-MS-04	1.94709	1256.6	11Mar2010, 13:00	2.63
R-MS-05	3.51316	2365.6	11Mar2010, 13:00	2.71
R-MS-06	3.99658	2615.5	11Mar2010, 13:00	2.67
R-MS-08	4.81369	2885.3	11Mar2010, 13:00	2.64
R-MS-09A	5.23439	3077.6	11Mar2010, 13:15	2.65
R-MS-09B	5.80808	3377.4	11Mar2010, 13:15	2.68
R-MS-10	6.33283	3601.8	11Mar2010, 13:15	2.68
R-MS-11A	8.26117	4223.0	11Mar2010, 13:30	2.69
R-MS-11B	0.25260	240.5	11Mar2010, 12:30	3.01
R-MS-11C	8.51377	4266.3	11Mar2010, 13:30	2.70
R-MS-13	9.25503	4462.5	11Mar2010, 13:45	2.71
R-MS-15	9.77491	4552.0	11Mar2010, 13:45	2.72

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	4647.2	11Mar2010, 13:45	2.71
R-MS-17	10.74072	4772.7	11Mar2010, 13:45	2.74
R-T10-02	0.33329	302.4	11Mar2010, 12:45	3.38
R-T2-02	0.68525	579.5	11Mar2010, 12:45	3.09
R-T4-03	0.36108	305.6	11Mar2010, 12:45	2.98
R-T5-02	0.16467	144.3	11Mar2010, 12:45	3.10
R-T6-03	0.60697	444.5	11Mar2010, 12:45	2.95
R-T6-04	1.40439	980.9	11Mar2010, 12:45	2.72
T10-01	0.33329	305.8	11Mar2010, 12:45	3.38
T10-02	0.07294	87.6	11Mar2010, 12:15	3.50
T1-01	0.50230	364.8	11Mar2010, 12:45	2.55
T2-01	0.68525	596.5	11Mar2010, 12:45	3.10
T2-02	0.69115	530.4	11Mar2010, 12:45	2.73
T3-01	0.30496	279.7	11Mar2010, 12:30	2.83
T4-01	0.23178	192.3	11Mar2010, 12:45	2.91
T4-02	0.12930	114.1	11Mar2010, 12:45	3.10
T4-03	0.21261	173.1	11Mar2010, 12:45	3.00
T5-01	0.16467	145.0	11Mar2010, 12:45	3.10
T5-02	0.15329	149.7	11Mar2010, 12:30	2.83
T6-01	0.38513	289.1	11Mar2010, 12:45	3.09
T6-02	0.22184	205.6	11Mar2010, 12:30	2.74
T6-03	0.79742	575.9	11Mar2010, 12:45	2.55
T6-04	0.41690	361.4	11Mar2010, 12:30	2.92
T7-01	0.25260	259.4	11Mar2010, 12:30	3.02
T8-01	0.13466	110.7	11Mar2010, 12:30	2.56
T9-01	0.22773	164.4	11Mar2010, 12:45	2.72

Project: NOROTON_03 Simulation Run: EX TP-40 050-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 050-YR
Compute Time: 23Apr2010, 13:34:18 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	860.8	11Mar2010, 12:45	3.33
J-MS-03	1.94709	1572.2	11Mar2010, 12:45	3.19
J-MS-04	3.51316	2968.8	11Mar2010, 12:45	3.28
J-MS-05	3.99658	3196.8	11Mar2010, 13:00	3.23
J-MS-06	4.61712	3630.3	11Mar2010, 12:45	3.28
J-MS-07	4.81369	3798.4	11Mar2010, 12:45	3.29
J-MS-08	5.23439	3882.4	11Mar2010, 13:00	3.22
J-MS-09A	5.80808	4216.5	11Mar2010, 13:00	3.25
J-MS-09B	6.33283	4492.6	11Mar2010, 13:00	3.26
J-MS-10	8.26117	5823.3	11Mar2010, 13:00	3.27
J-MS-11A	8.51377	5392.9	11Mar2010, 13:30	3.27
J-MS-11B	9.17568	5724.9	11Mar2010, 13:30	3.30
J-MS-12	9.25503	5736.1	11Mar2010, 13:30	3.29
J-MS-13	9.64461	5842.8	11Mar2010, 13:30	3.32
J-MS-14	9.77491	5854.8	11Mar2010, 13:45	3.30
J-MS-15	10.24351	5964.5	11Mar2010, 13:45	3.29
J-MS-16	10.74072	6118.3	11Mar2010, 13:45	3.32
J-MS-17	11.03884	6159.2	11Mar2010, 13:45	3.34
J-T10-02	0.40623	424.9	11Mar2010, 12:45	4.03
J-T2-02	1.37640	1336.2	11Mar2010, 12:45	3.49
J-T4-02	0.36108	366.6	11Mar2010, 12:45	3.57
J-T4-03	0.57369	573.6	11Mar2010, 12:45	3.58
J-T5-02	0.31796	339.7	11Mar2010, 12:30	3.56
J-T6-02	0.60697	542.4	11Mar2010, 12:45	3.55
J-T6-03	1.40439	1238.4	11Mar2010, 12:45	3.29
J-T6-04	1.82129	1614.1	11Mar2010, 12:45	3.34
MS-01	0.48227	457.3	11Mar2010, 12:45	3.59
MS-02	0.52094	438.4	11Mar2010, 12:45	3.10

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	361.1	11Mar2010, 12:45	3.00
MS-04	0.18967	161.3	11Mar2010, 12:30	2.72
MS-05	0.48342	401.0	11Mar2010, 12:45	2.91
MS-06	0.62054	759.2	11Mar2010, 12:30	3.61
MS-07	0.19657	237.4	11Mar2010, 12:30	3.51
MS-08	0.11574	106.4	11Mar2010, 12:45	3.30
MS-09	0.20679	168.5	11Mar2010, 12:45	3.00
MS-10	0.10705	129.2	11Mar2010, 12:30	3.51
MS-11	0.52725	514.1	11Mar2010, 12:45	3.79
MS-12	0.07935	111.1	11Mar2010, 12:30	4.13
MS-13	0.38958	450.2	11Mar2010, 12:45	4.12
MS-14	0.13030	157.5	11Mar2010, 12:30	3.61
MS-15	0.24087	209.6	11Mar2010, 12:30	3.01
MS-16	0.09098	108.8	11Mar2010, 12:30	4.02
MS-17	0.29812	397.0	11Mar2010, 12:30	4.13
P-MS-07	4.81369	3701.2	11Mar2010, 13:00	3.21
P-MS-10	8.26117	5305.6	11Mar2010, 13:15	3.27
P-MS-11	9.17568	5711.1	11Mar2010, 13:30	3.28
P-MS-13	9.64461	5820.4	11Mar2010, 13:45	3.30
R-MS-02	0.48227	439.5	11Mar2010, 13:00	3.58
R-MS-03	1.00321	845.7	11Mar2010, 13:00	3.32
R-MS-04	1.94709	1530.2	11Mar2010, 13:00	3.19
R-MS-05	3.51316	2880.6	11Mar2010, 13:00	3.27
R-MS-06	3.99658	3189.7	11Mar2010, 13:00	3.23
R-MS-08	4.81369	3592.0	11Mar2010, 13:00	3.21
R-MS-09A	5.23439	3771.4	11Mar2010, 13:15	3.22
R-MS-09B	5.80808	4144.0	11Mar2010, 13:15	3.25
R-MS-10	6.33283	4433.3	11Mar2010, 13:15	3.25
R-MS-11A	8.26117	5300.8	11Mar2010, 13:30	3.26
R-MS-11B	0.25260	289.1	11Mar2010, 12:30	3.60
R-MS-11C	8.51377	5383.9	11Mar2010, 13:30	3.27
R-MS-13	9.25503	5653.9	11Mar2010, 13:30	3.29
R-MS-15	9.77491	5812.8	11Mar2010, 13:45	3.30

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	5924.9	11Mar2010, 13:45	3.29
R-MS-17	10.74072	6068.3	11Mar2010, 13:45	3.32
R-T10-02	0.33329	357.7	11Mar2010, 12:45	4.01
R-T2-02	0.68525	693.9	11Mar2010, 12:45	3.69
R-T4-03	0.36108	366.1	11Mar2010, 12:45	3.57
R-T5-02	0.16467	172.1	11Mar2010, 12:45	3.70
R-T6-03	0.60697	535.6	11Mar2010, 12:45	3.54
R-T6-04	1.40439	1198.4	11Mar2010, 12:45	3.29
T10-01	0.33329	361.3	11Mar2010, 12:45	4.01
T10-02	0.07294	103.5	11Mar2010, 12:15	4.13
T1-01	0.50230	444.7	11Mar2010, 12:45	3.10
T2-01	0.68525	711.2	11Mar2010, 12:45	3.70
T2-02	0.69115	642.3	11Mar2010, 12:45	3.30
T3-01	0.30496	338.1	11Mar2010, 12:30	3.41
T4-01	0.23178	230.7	11Mar2010, 12:45	3.50
T4-02	0.12930	135.8	11Mar2010, 12:45	3.70
T4-03	0.21261	207.6	11Mar2010, 12:45	3.59
T5-01	0.16467	172.7	11Mar2010, 12:45	3.70
T5-02	0.15329	180.0	11Mar2010, 12:30	3.41
T6-01	0.38513	346.5	11Mar2010, 12:45	3.69
T6-02	0.22184	248.9	11Mar2010, 12:30	3.31
T6-03	0.79742	702.8	11Mar2010, 12:45	3.10
T6-04	0.41690	436.4	11Mar2010, 12:30	3.50
T7-01	0.25260	310.3	11Mar2010, 12:30	3.61
T8-01	0.13466	135.7	11Mar2010, 12:30	3.11
T9-01	0.22773	199.7	11Mar2010, 12:45	3.29

Project: NOROTON_03 Simulation Run: EX TP-40 100-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 100-YR
Compute Time: 23Apr2010, 13:34:48 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	1041.0	11Mar2010, 12:45	4.00
J-MS-03	1.94709	1918.3	11Mar2010, 12:45	3.85
J-MS-04	3.51316	3606.3	11Mar2010, 12:45	3.95
J-MS-05	3.99658	3856.1	11Mar2010, 13:00	3.89
J-MS-06	4.61712	4441.7	11Mar2010, 12:45	3.95
J-MS-07	4.81369	4640.8	11Mar2010, 12:45	3.96
J-MS-08	5.23439	4736.9	11Mar2010, 13:00	3.88
J-MS-09A	5.80808	5173.3	11Mar2010, 13:00	3.92
J-MS-09B	6.33283	5525.2	11Mar2010, 13:00	3.92
J-MS-10	8.26117	7157.7	11Mar2010, 13:00	3.94
J-MS-11A	8.51377	6738.1	11Mar2010, 13:15	3.94
J-MS-11B	9.17568	7170.3	11Mar2010, 13:15	3.97
J-MS-12	9.25503	7064.5	11Mar2010, 13:30	3.96
J-MS-13	9.64461	7231.4	11Mar2010, 13:30	3.99
J-MS-14	9.77491	7117.9	11Mar2010, 13:30	3.97
J-MS-15	10.24351	7294.2	11Mar2010, 13:45	3.96
J-MS-16	10.74072	7501.3	11Mar2010, 13:45	3.99
J-MS-17	11.03884	7581.1	11Mar2010, 13:45	4.01
J-T10-02	0.40623	499.6	11Mar2010, 12:45	4.76
J-T2-02	1.37640	1600.1	11Mar2010, 12:45	4.18
J-T4-02	0.36108	436.5	11Mar2010, 12:45	4.27
J-T4-03	0.57369	683.9	11Mar2010, 12:45	4.28
J-T5-02	0.31796	406.2	11Mar2010, 12:30	4.26
J-T6-02	0.60697	647.3	11Mar2010, 12:45	4.24
J-T6-03	1.40439	1492.2	11Mar2010, 12:45	3.96
J-T6-04	1.82129	1947.9	11Mar2010, 12:45	4.01
MS-01	0.48227	546.1	11Mar2010, 12:45	4.29
MS-02	0.52094	532.9	11Mar2010, 12:45	3.75

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	440.6	11Mar2010, 12:45	3.65
MS-04	0.18967	199.9	11Mar2010, 12:30	3.34
MS-05	0.48342	489.6	11Mar2010, 12:30	3.55
MS-06	0.62054	903.8	11Mar2010, 12:30	4.31
MS-07	0.19657	282.9	11Mar2010, 12:30	4.20
MS-08	0.11574	128.2	11Mar2010, 12:45	3.97
MS-09	0.20679	205.6	11Mar2010, 12:45	3.65
MS-10	0.10705	153.9	11Mar2010, 12:30	4.21
MS-11	0.52725	610.2	11Mar2010, 12:45	4.50
MS-12	0.07935	129.9	11Mar2010, 12:30	4.87
MS-13	0.38958	527.3	11Mar2010, 12:45	4.85
MS-14	0.13030	187.7	11Mar2010, 12:30	4.31
MS-15	0.24087	257.0	11Mar2010, 12:30	3.65
MS-16	0.09098	128.3	11Mar2010, 12:30	4.74
MS-17	0.29812	465.9	11Mar2010, 12:30	4.86
P-MS-07	4.81369	4506.6	11Mar2010, 13:00	3.88
P-MS-10	8.26117	6658.4	11Mar2010, 13:15	3.93
P-MS-11	9.17568	7035.7	11Mar2010, 13:30	3.95
P-MS-13	9.64461	7073.9	11Mar2010, 13:45	3.97
R-MS-02	0.48227	522.3	11Mar2010, 13:00	4.27
R-MS-03	1.00321	1016.5	11Mar2010, 13:00	3.99
R-MS-04	1.94709	1848.8	11Mar2010, 13:00	3.85
R-MS-05	3.51316	3472.8	11Mar2010, 13:00	3.94
R-MS-06	3.99658	3852.3	11Mar2010, 13:00	3.89
R-MS-08	4.81369	4391.4	11Mar2010, 13:00	3.87
R-MS-09A	5.23439	4600.7	11Mar2010, 13:00	3.88
R-MS-09B	5.80808	5078.2	11Mar2010, 13:00	3.92
R-MS-10	6.33283	5370.8	11Mar2010, 13:15	3.92
R-MS-11A	8.26117	6586.1	11Mar2010, 13:15	3.93
R-MS-11B	0.25260	345.7	11Mar2010, 12:30	4.30
R-MS-11C	8.51377	6641.2	11Mar2010, 13:15	3.94
R-MS-13	9.25503	7012.2	11Mar2010, 13:30	3.96
R-MS-15	9.77491	7113.9	11Mar2010, 13:45	3.97

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	7276.7	11Mar2010, 13:45	3.96
R-MS-17	10.74072	7476.1	11Mar2010, 13:45	3.99
R-T10-02	0.33329	421.4	11Mar2010, 12:45	4.73
R-T2-02	0.68525	827.1	11Mar2010, 12:45	4.39
R-T4-03	0.36108	436.3	11Mar2010, 12:45	4.27
R-T5-02	0.16467	204.3	11Mar2010, 12:45	4.40
R-T6-03	0.60697	640.5	11Mar2010, 12:45	4.23
R-T6-04	1.40439	1452.4	11Mar2010, 12:45	3.96
T10-01	0.33329	425.3	11Mar2010, 12:45	4.73
T10-02	0.07294	121.8	11Mar2010, 12:15	4.87
T1-01	0.50230	539.8	11Mar2010, 12:30	3.76
T2-01	0.68525	844.1	11Mar2010, 12:45	4.40
T2-02	0.69115	773.0	11Mar2010, 12:45	3.97
T3-01	0.30496	406.3	11Mar2010, 12:30	4.09
T4-01	0.23178	275.4	11Mar2010, 12:45	4.19
T4-02	0.12930	161.1	11Mar2010, 12:30	4.41
T4-03	0.21261	247.6	11Mar2010, 12:45	4.29
T5-01	0.16467	204.8	11Mar2010, 12:45	4.41
T5-02	0.15329	215.3	11Mar2010, 12:30	4.10
T6-01	0.38513	413.3	11Mar2010, 12:45	4.39
T6-02	0.22184	299.6	11Mar2010, 12:30	3.98
T6-03	0.79742	851.7	11Mar2010, 12:45	3.76
T6-04	0.41690	523.9	11Mar2010, 12:30	4.19
T7-01	0.25260	369.2	11Mar2010, 12:30	4.31
T8-01	0.13466	165.0	11Mar2010, 12:30	3.77
T9-01	0.22773	241.1	11Mar2010, 12:45	3.96

Project: NOROTON_03 Simulation Run: EX UCONN 002-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 002-YR
Compute Time: 23Apr2010, 13:35:42 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	285.5	11Mar2010, 13:00	1.17
J-MS-03	1.94709	492.9	11Mar2010, 13:00	1.08
J-MS-04	3.51316	942.7	11Mar2010, 13:00	1.14
J-MS-05	3.99658	1006.1	11Mar2010, 13:00	1.11
J-MS-06	4.61712	1142.0	11Mar2010, 13:00	1.14
J-MS-07	4.81369	1183.5	11Mar2010, 13:00	1.14
J-MS-08	5.23439	1109.0	11Mar2010, 13:30	1.09
J-MS-09A	5.80808	1200.1	11Mar2010, 13:30	1.11
J-MS-09B	6.33283	1261.3	11Mar2010, 13:30	1.11
J-MS-10	8.26117	1579.4	11Mar2010, 13:30	1.12
J-MS-11A	8.51377	1576.8	11Mar2010, 13:45	1.12
J-MS-11B	9.17568	1679.8	11Mar2010, 13:45	1.14
J-MS-12	9.25503	1705.3	11Mar2010, 13:45	1.14
J-MS-13	9.64461	1744.2	11Mar2010, 13:45	1.15
J-MS-14	9.77491	1736.2	11Mar2010, 14:00	1.14
J-MS-15	10.24351	1775.7	11Mar2010, 14:00	1.14
J-MS-16	10.74072	1836.4	11Mar2010, 14:00	1.16
J-MS-17	11.03884	1861.7	11Mar2010, 14:00	1.17
J-T10-02	0.40623	168.2	11Mar2010, 12:45	1.60
J-T2-02	1.37640	460.0	11Mar2010, 12:45	1.26
J-T4-02	0.36108	132.3	11Mar2010, 12:45	1.31
J-T4-03	0.57369	204.7	11Mar2010, 12:45	1.31
J-T5-02	0.31796	117.8	11Mar2010, 12:30	1.30
J-T6-02	0.60697	192.4	11Mar2010, 12:45	1.30
J-T6-03	1.40439	400.8	11Mar2010, 12:45	1.14
J-T6-04	1.82129	514.7	11Mar2010, 12:45	1.17
MS-01	0.48227	161.4	11Mar2010, 12:45	1.32
MS-02	0.52094	134.0	11Mar2010, 12:45	1.03

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	106.7	11Mar2010, 12:45	0.97
MS-04	0.18967	41.4	11Mar2010, 12:45	0.82
MS-05	0.48342	118.4	11Mar2010, 12:45	0.92
MS-06	0.62054	273.9	11Mar2010, 12:30	1.33
MS-07	0.19657	84.9	11Mar2010, 12:30	1.27
MS-08	0.11574	35.1	11Mar2010, 12:45	1.14
MS-09	0.20679	49.7	11Mar2010, 12:45	0.97
MS-10	0.10705	46.4	11Mar2010, 12:30	1.27
MS-11	0.52725	190.1	11Mar2010, 12:45	1.45
MS-12	0.07935	45.7	11Mar2010, 12:30	1.67
MS-13	0.38958	183.5	11Mar2010, 12:45	1.66
MS-14	0.13030	56.5	11Mar2010, 12:30	1.33
MS-15	0.24087	63.6	11Mar2010, 12:45	0.98
MS-16	0.09098	42.1	11Mar2010, 12:30	1.59
MS-17	0.29812	159.5	11Mar2010, 12:30	1.67
P-MS-07	4.81369	1063.5	11Mar2010, 13:15	1.09
P-MS-10	8.26117	1549.6	11Mar2010, 13:45	1.12
P-MS-11	9.17568	1695.9	11Mar2010, 13:45	1.13
P-MS-13	9.64461	1723.8	11Mar2010, 14:00	1.14
R-MS-02	0.48227	160.2	11Mar2010, 13:00	1.32
R-MS-03	1.00321	276.9	11Mar2010, 13:00	1.16
R-MS-04	1.94709	478.4	11Mar2010, 13:00	1.08
R-MS-05	3.51316	907.1	11Mar2010, 13:00	1.13
R-MS-06	3.99658	990.6	11Mar2010, 13:00	1.11
R-MS-08	4.81369	1050.6	11Mar2010, 13:30	1.08
R-MS-09A	5.23439	1094.4	11Mar2010, 13:30	1.09
R-MS-09B	5.80808	1183.0	11Mar2010, 13:30	1.11
R-MS-10	6.33283	1233.8	11Mar2010, 13:45	1.11
R-MS-11A	8.26117	1546.7	11Mar2010, 13:45	1.12
R-MS-11B	0.25260	101.4	11Mar2010, 12:45	1.33
R-MS-11C	8.51377	1572.2	11Mar2010, 13:45	1.12
R-MS-13	9.25503	1679.9	11Mar2010, 13:45	1.13
R-MS-15	9.77491	1729.2	11Mar2010, 14:00	1.14

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	1767.4	11Mar2010, 14:00	1.13
R-MS-17	10.74072	1827.1	11Mar2010, 14:00	1.15
R-T10-02	0.33329	139.5	11Mar2010, 12:45	1.59
R-T2-02	0.68525	248.4	11Mar2010, 13:00	1.38
R-T4-03	0.36108	130.9	11Mar2010, 12:45	1.31
R-T5-02	0.16467	63.3	11Mar2010, 12:45	1.39
R-T6-03	0.60697	190.4	11Mar2010, 13:00	1.29
R-T6-04	1.40439	387.1	11Mar2010, 13:00	1.14
T10-01	0.33329	142.1	11Mar2010, 12:45	1.59
T10-02	0.07294	42.1	11Mar2010, 12:30	1.67
T1-01	0.50230	140.5	11Mar2010, 12:45	1.03
T2-01	0.68525	262.9	11Mar2010, 12:45	1.39
T2-02	0.69115	213.0	11Mar2010, 12:45	1.14
T3-01	0.30496	113.5	11Mar2010, 12:30	1.21
T4-01	0.23178	81.7	11Mar2010, 12:45	1.26
T4-02	0.12930	50.6	11Mar2010, 12:45	1.39
T4-03	0.21261	73.8	11Mar2010, 12:45	1.32
T5-01	0.16467	64.2	11Mar2010, 12:45	1.39
T5-02	0.15329	62.7	11Mar2010, 12:30	1.21
T6-01	0.38513	127.0	11Mar2010, 13:00	1.38
T6-02	0.22184	82.5	11Mar2010, 12:30	1.15
T6-03	0.79742	220.3	11Mar2010, 12:45	1.03
T6-04	0.41690	148.8	11Mar2010, 12:45	1.26
T7-01	0.25260	112.3	11Mar2010, 12:30	1.33
T8-01	0.13466	41.3	11Mar2010, 12:30	1.03
T9-01	0.22773	64.7	11Mar2010, 12:45	1.14

Project: NOROTON_03 Simulation Run: EX UCONN 010-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 010-YR
Compute Time: 23Apr2010, 13:36:12 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	598.1	11Mar2010, 12:45	2.36
J-MS-03	1.94709	1068.9	11Mar2010, 12:45	2.25
J-MS-04	3.51316	2046.4	11Mar2010, 12:45	2.32
J-MS-05	3.99658	2226.2	11Mar2010, 13:00	2.27
J-MS-06	4.61712	2501.0	11Mar2010, 13:00	2.32
J-MS-07	4.81369	2590.2	11Mar2010, 12:45	2.33
J-MS-08	5.23439	2600.2	11Mar2010, 13:15	2.27
J-MS-09A	5.80808	2859.2	11Mar2010, 13:15	2.29
J-MS-09B	6.33283	3041.5	11Mar2010, 13:15	2.30
J-MS-10	8.26117	3873.6	11Mar2010, 13:15	2.31
J-MS-11A	8.51377	3483.3	11Mar2010, 13:30	2.31
J-MS-11B	9.17568	3703.7	11Mar2010, 13:30	2.33
J-MS-12	9.25503	3714.4	11Mar2010, 13:45	2.32
J-MS-13	9.64461	3807.4	11Mar2010, 13:45	2.35
J-MS-14	9.77491	3798.1	11Mar2010, 13:45	2.33
J-MS-15	10.24351	3873.8	11Mar2010, 13:45	2.32
J-MS-16	10.74072	3996.9	11Mar2010, 13:45	2.35
J-MS-17	11.03884	4039.1	11Mar2010, 14:00	2.37
J-T10-02	0.40623	314.2	11Mar2010, 12:45	2.97
J-T2-02	1.37640	951.6	11Mar2010, 12:45	2.50
J-T4-02	0.36108	264.1	11Mar2010, 12:45	2.57
J-T4-03	0.57369	412.2	11Mar2010, 12:45	2.58
J-T5-02	0.31796	242.4	11Mar2010, 12:30	2.56
J-T6-02	0.60697	389.0	11Mar2010, 12:45	2.55
J-T6-03	1.40439	866.1	11Mar2010, 12:45	2.33
J-T6-04	1.82129	1126.8	11Mar2010, 12:45	2.37
MS-01	0.48227	327.4	11Mar2010, 12:45	2.59
MS-02	0.52094	302.3	11Mar2010, 12:45	2.16

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	246.9	11Mar2010, 12:45	2.08
MS-04	0.18967	106.5	11Mar2010, 12:30	1.85
MS-05	0.48342	274.1	11Mar2010, 12:45	2.01
MS-06	0.62054	547.0	11Mar2010, 12:30	2.60
MS-07	0.19657	170.6	11Mar2010, 12:30	2.52
MS-08	0.11574	74.9	11Mar2010, 12:45	2.33
MS-09	0.20679	115.1	11Mar2010, 12:45	2.08
MS-10	0.10705	93.0	11Mar2010, 12:30	2.52
MS-11	0.52725	372.9	11Mar2010, 12:45	2.76
MS-12	0.07935	83.1	11Mar2010, 12:30	3.06
MS-13	0.38958	335.7	11Mar2010, 12:45	3.05
MS-14	0.13030	113.3	11Mar2010, 12:30	2.60
MS-15	0.24087	142.9	11Mar2010, 12:45	2.09
MS-16	0.09098	79.9	11Mar2010, 12:30	2.96
MS-17	0.29812	294.8	11Mar2010, 12:30	3.05
P-MS-07	4.81369	2510.0	11Mar2010, 13:00	2.26
P-MS-10	8.26117	3436.3	11Mar2010, 13:30	2.30
P-MS-11	9.17568	3698.5	11Mar2010, 13:45	2.32
P-MS-13	9.64461	3772.3	11Mar2010, 13:45	2.33
R-MS-02	0.48227	315.6	11Mar2010, 13:00	2.58
R-MS-03	1.00321	589.3	11Mar2010, 13:00	2.36
R-MS-04	1.94709	1060.4	11Mar2010, 13:00	2.24
R-MS-05	3.51316	2006.8	11Mar2010, 13:00	2.31
R-MS-06	3.99658	2215.5	11Mar2010, 13:00	2.27
R-MS-08	4.81369	2450.7	11Mar2010, 13:15	2.25
R-MS-09A	5.23439	2594.5	11Mar2010, 13:15	2.26
R-MS-09B	5.80808	2840.8	11Mar2010, 13:15	2.29
R-MS-10	6.33283	3009.5	11Mar2010, 13:15	2.29
R-MS-11A	8.26117	3414.4	11Mar2010, 13:30	2.30
R-MS-11B	0.25260	206.5	11Mar2010, 12:30	2.60
R-MS-11C	8.51377	3451.4	11Mar2010, 13:30	2.30
R-MS-13	9.25503	3696.4	11Mar2010, 13:45	2.32
R-MS-15	9.77491	3770.8	11Mar2010, 14:00	2.33

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	3860.5	11Mar2010, 14:00	2.32
R-MS-17	10.74072	3980.6	11Mar2010, 14:00	2.35
R-T10-02	0.33329	263.4	11Mar2010, 12:45	2.95
R-T2-02	0.68525	499.3	11Mar2010, 12:45	2.67
R-T4-03	0.36108	263.2	11Mar2010, 12:45	2.57
R-T5-02	0.16467	124.7	11Mar2010, 12:45	2.68
R-T6-03	0.60697	378.3	11Mar2010, 12:45	2.54
R-T6-04	1.40439	828.0	11Mar2010, 12:45	2.33
T10-01	0.33329	266.6	11Mar2010, 12:45	2.95
T10-02	0.07294	76.3	11Mar2010, 12:15	3.06
T1-01	0.50230	309.2	11Mar2010, 12:45	2.17
T2-01	0.68525	515.8	11Mar2010, 12:45	2.68
T2-02	0.69115	452.3	11Mar2010, 12:45	2.33
T3-01	0.30496	238.9	11Mar2010, 12:30	2.43
T4-01	0.23178	165.4	11Mar2010, 12:45	2.51
T4-02	0.12930	98.7	11Mar2010, 12:45	2.68
T4-03	0.21261	148.9	11Mar2010, 12:45	2.59
T5-01	0.16467	125.5	11Mar2010, 12:45	2.68
T5-02	0.15329	128.5	11Mar2010, 12:30	2.43
T6-01	0.38513	249.0	11Mar2010, 13:00	2.67
T6-02	0.22184	175.3	11Mar2010, 12:30	2.34
T6-03	0.79742	487.8	11Mar2010, 12:45	2.17
T6-04	0.41690	309.0	11Mar2010, 12:30	2.51
T7-01	0.25260	223.8	11Mar2010, 12:30	2.60
T8-01	0.13466	93.5	11Mar2010, 12:30	2.17
T9-01	0.22773	139.8	11Mar2010, 12:45	2.33

Project: NOROTON_03 Simulation Run: EX UCONN 025-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 025-YR
Compute Time: 23Apr2010, 14:07:13 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	883.1	11Mar2010, 12:45	3.41
J-MS-03	1.94709	1615.1	11Mar2010, 12:45	3.27
J-MS-04	3.51316	3047.7	11Mar2010, 12:45	3.36
J-MS-05	3.99658	3275.1	11Mar2010, 13:00	3.31
J-MS-06	4.61712	3733.8	11Mar2010, 12:45	3.36
J-MS-07	4.81369	3905.7	11Mar2010, 12:45	3.37
J-MS-08	5.23439	3976.7	11Mar2010, 13:00	3.30
J-MS-09A	5.80808	4326.6	11Mar2010, 13:00	3.33
J-MS-09B	6.33283	4614.0	11Mar2010, 13:00	3.34
J-MS-10	8.26117	5983.7	11Mar2010, 13:00	3.36
J-MS-11A	8.51377	5534.8	11Mar2010, 13:30	3.36
J-MS-11B	9.17568	5880.8	11Mar2010, 13:30	3.38
J-MS-12	9.25503	5901.3	11Mar2010, 13:30	3.37
J-MS-13	9.64461	6011.8	11Mar2010, 13:30	3.40
J-MS-14	9.77491	6012.3	11Mar2010, 13:45	3.39
J-MS-15	10.24351	6129.2	11Mar2010, 13:45	3.37
J-MS-16	10.74072	6292.2	11Mar2010, 13:45	3.41
J-MS-17	11.03884	6336.7	11Mar2010, 13:45	3.42
J-T10-02	0.40623	434.2	11Mar2010, 12:45	4.12
J-T2-02	1.37640	1369.0	11Mar2010, 12:45	3.58
J-T4-02	0.36108	375.3	11Mar2010, 12:45	3.66
J-T4-03	0.57369	587.3	11Mar2010, 12:45	3.67
J-T5-02	0.31796	347.9	11Mar2010, 12:30	3.65
J-T6-02	0.60697	555.5	11Mar2010, 12:45	3.64
J-T6-03	1.40439	1270.1	11Mar2010, 12:45	3.37
J-T6-04	1.82129	1655.8	11Mar2010, 12:45	3.42
MS-01	0.48227	468.3	11Mar2010, 12:45	3.68
MS-02	0.52094	450.1	11Mar2010, 12:45	3.18

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	370.9	11Mar2010, 12:45	3.08
MS-04	0.18967	166.0	11Mar2010, 12:30	2.80
MS-05	0.48342	411.9	11Mar2010, 12:45	2.99
MS-06	0.62054	777.1	11Mar2010, 12:30	3.70
MS-07	0.19657	243.0	11Mar2010, 12:30	3.60
MS-08	0.11574	109.1	11Mar2010, 12:45	3.38
MS-09	0.20679	173.1	11Mar2010, 12:45	3.08
MS-10	0.10705	132.3	11Mar2010, 12:30	3.60
MS-11	0.52725	526.1	11Mar2010, 12:45	3.88
MS-12	0.07935	113.4	11Mar2010, 12:30	4.22
MS-13	0.38958	459.9	11Mar2010, 12:45	4.21
MS-14	0.13030	161.3	11Mar2010, 12:30	3.70
MS-15	0.24087	215.4	11Mar2010, 12:30	3.09
MS-16	0.09098	111.2	11Mar2010, 12:30	4.11
MS-17	0.29812	405.6	11Mar2010, 12:30	4.22
P-MS-07	4.81369	3801.7	11Mar2010, 13:00	3.30
P-MS-10	8.26117	5467.3	11Mar2010, 13:15	3.35
P-MS-11	9.17568	5875.8	11Mar2010, 13:30	3.37
P-MS-13	9.64461	5977.2	11Mar2010, 13:45	3.38
R-MS-02	0.48227	449.9	11Mar2010, 13:00	3.66
R-MS-03	1.00321	866.8	11Mar2010, 13:00	3.40
R-MS-04	1.94709	1569.7	11Mar2010, 13:00	3.27
R-MS-05	3.51316	2950.7	11Mar2010, 13:00	3.35
R-MS-06	3.99658	3268.8	11Mar2010, 13:00	3.31
R-MS-08	4.81369	3679.5	11Mar2010, 13:00	3.29
R-MS-09A	5.23439	3860.4	11Mar2010, 13:15	3.30
R-MS-09B	5.80808	4240.4	11Mar2010, 13:15	3.33
R-MS-10	6.33283	4542.2	11Mar2010, 13:15	3.33
R-MS-11A	8.26117	5440.7	11Mar2010, 13:30	3.35
R-MS-11B	0.25260	296.1	11Mar2010, 12:30	3.69
R-MS-11C	8.51377	5532.4	11Mar2010, 13:30	3.35
R-MS-13	9.25503	5819.1	11Mar2010, 13:30	3.37
R-MS-15	9.77491	5973.9	11Mar2010, 13:45	3.38

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	6094.8	11Mar2010, 13:45	3.37
R-MS-17	10.74072	6244.0	11Mar2010, 13:45	3.40
R-T10-02	0.33329	365.6	11Mar2010, 12:45	4.10
R-T2-02	0.68525	710.5	11Mar2010, 12:45	3.78
R-T4-03	0.36108	374.8	11Mar2010, 12:45	3.66
R-T5-02	0.16467	176.1	11Mar2010, 12:45	3.79
R-T6-03	0.60697	548.9	11Mar2010, 12:45	3.62
R-T6-04	1.40439	1230.1	11Mar2010, 12:45	3.37
T10-01	0.33329	369.3	11Mar2010, 12:45	4.10
T10-02	0.07294	105.8	11Mar2010, 12:15	4.22
T1-01	0.50230	456.3	11Mar2010, 12:45	3.18
T2-01	0.68525	727.7	11Mar2010, 12:45	3.79
T2-02	0.69115	658.5	11Mar2010, 12:45	3.38
T3-01	0.30496	346.6	11Mar2010, 12:30	3.49
T4-01	0.23178	236.3	11Mar2010, 12:45	3.59
T4-02	0.12930	139.0	11Mar2010, 12:45	3.79
T4-03	0.21261	212.5	11Mar2010, 12:45	3.68
T5-01	0.16467	176.7	11Mar2010, 12:45	3.79
T5-02	0.15329	184.4	11Mar2010, 12:30	3.50
T6-01	0.38513	354.8	11Mar2010, 12:45	3.77
T6-02	0.22184	255.2	11Mar2010, 12:30	3.39
T6-03	0.79742	721.2	11Mar2010, 12:45	3.18
T6-04	0.41690	447.2	11Mar2010, 12:30	3.59
T7-01	0.25260	317.6	11Mar2010, 12:30	3.70
T8-01	0.13466	139.3	11Mar2010, 12:30	3.19
T9-01	0.22773	204.9	11Mar2010, 12:45	3.38

Project: NOROTON_03 Simulation Run: EX UCONN 050-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 050-YR
Compute Time: 23Apr2010, 13:36:50 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	1110.0	11Mar2010, 12:45	4.26
J-MS-03	1.94709	2050.8	11Mar2010, 12:45	4.11
J-MS-04	3.51316	3848.6	11Mar2010, 12:45	4.21
J-MS-05	3.99658	4104.3	11Mar2010, 13:00	4.15
J-MS-06	4.61712	4751.1	11Mar2010, 12:45	4.20
J-MS-07	4.81369	4961.8	11Mar2010, 12:45	4.21
J-MS-08	5.23439	5066.6	11Mar2010, 13:00	4.14
J-MS-09A	5.80808	5540.1	11Mar2010, 13:00	4.17
J-MS-09B	6.33283	5925.3	11Mar2010, 13:00	4.18
J-MS-10	8.26117	7662.1	11Mar2010, 13:00	4.20
J-MS-11A	8.51377	7252.6	11Mar2010, 13:15	4.20
J-MS-11B	9.17568	7721.3	11Mar2010, 13:15	4.23
J-MS-12	9.25503	7756.5	11Mar2010, 13:30	4.23
J-MS-13	9.64461	7921.3	11Mar2010, 13:30	4.26
J-MS-14	9.77491	7754.9	11Mar2010, 13:30	4.24
J-MS-15	10.24351	7898.7	11Mar2010, 13:45	4.22
J-MS-16	10.74072	8124.2	11Mar2010, 13:45	4.26
J-MS-17	11.03884	8210.1	11Mar2010, 13:45	4.28
J-T10-02	0.40623	527.7	11Mar2010, 12:45	5.03
J-T2-02	1.37640	1700.2	11Mar2010, 12:45	4.44
J-T4-02	0.36108	462.9	11Mar2010, 12:30	4.53
J-T4-03	0.57369	725.5	11Mar2010, 12:45	4.54
J-T5-02	0.31796	431.3	11Mar2010, 12:30	4.52
J-T6-02	0.60697	687.0	11Mar2010, 12:45	4.51
J-T6-03	1.40439	1587.1	11Mar2010, 12:45	4.22
J-T6-04	1.82129	2073.2	11Mar2010, 12:45	4.27
MS-01	0.48227	579.7	11Mar2010, 12:45	4.55
MS-02	0.52094	568.9	11Mar2010, 12:45	4.00

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	470.9	11Mar2010, 12:45	3.89
MS-04	0.18967	214.7	11Mar2010, 12:30	3.58
MS-05	0.48342	525.0	11Mar2010, 12:30	3.79
MS-06	0.62054	958.4	11Mar2010, 12:30	4.58
MS-07	0.19657	300.1	11Mar2010, 12:30	4.47
MS-08	0.11574	136.4	11Mar2010, 12:45	4.23
MS-09	0.20679	219.8	11Mar2010, 12:45	3.89
MS-10	0.10705	163.3	11Mar2010, 12:30	4.47
MS-11	0.52725	646.5	11Mar2010, 12:45	4.77
MS-12	0.07935	137.0	11Mar2010, 12:30	5.14
MS-13	0.38958	556.3	11Mar2010, 12:45	5.13
MS-14	0.13030	199.1	11Mar2010, 12:30	4.57
MS-15	0.24087	275.1	11Mar2010, 12:30	3.90
MS-16	0.09098	135.7	11Mar2010, 12:30	5.02
MS-17	0.29812	491.8	11Mar2010, 12:30	5.14
P-MS-07	4.81369	4811.7	11Mar2010, 13:00	4.13
P-MS-10	8.26117	7161.0	11Mar2010, 13:15	4.19
P-MS-11	9.17568	7726.2	11Mar2010, 13:30	4.22
P-MS-13	9.64461	7702.1	11Mar2010, 13:30	4.23
R-MS-02	0.48227	554.2	11Mar2010, 13:00	4.54
R-MS-03	1.00321	1082.7	11Mar2010, 13:00	4.25
R-MS-04	1.94709	1970.8	11Mar2010, 13:00	4.10
R-MS-05	3.51316	3695.6	11Mar2010, 13:00	4.19
R-MS-06	3.99658	4102.0	11Mar2010, 13:00	4.15
R-MS-08	4.81369	4700.2	11Mar2010, 13:00	4.12
R-MS-09A	5.23439	4933.8	11Mar2010, 13:00	4.13
R-MS-09B	5.80808	5450.9	11Mar2010, 13:00	4.17
R-MS-10	6.33283	5761.8	11Mar2010, 13:00	4.17
R-MS-11A	8.26117	7092.0	11Mar2010, 13:15	4.19
R-MS-11B	0.25260	367.0	11Mar2010, 12:30	4.57
R-MS-11C	8.51377	7161.8	11Mar2010, 13:15	4.20
R-MS-13	9.25503	7690.6	11Mar2010, 13:30	4.22
R-MS-15	9.77491	7707.6	11Mar2010, 13:45	4.23

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	7888.0	11Mar2010, 13:45	4.22
R-MS-17	10.74072	8099.8	11Mar2010, 13:45	4.25
R-T10-02	0.33329	445.4	11Mar2010, 12:45	5.01
R-T2-02	0.68525	877.6	11Mar2010, 12:45	4.66
R-T4-03	0.36108	462.8	11Mar2010, 12:45	4.53
R-T5-02	0.16467	216.5	11Mar2010, 12:45	4.67
R-T6-03	0.60697	678.8	11Mar2010, 12:45	4.50
R-T6-04	1.40439	1547.6	11Mar2010, 12:45	4.22
T10-01	0.33329	449.4	11Mar2010, 12:45	5.01
T10-02	0.07294	128.7	11Mar2010, 12:15	5.15
T1-01	0.50230	577.1	11Mar2010, 12:30	4.01
T2-01	0.68525	894.3	11Mar2010, 12:45	4.67
T2-02	0.69115	822.6	11Mar2010, 12:45	4.23
T3-01	0.30496	432.2	11Mar2010, 12:30	4.35
T4-01	0.23178	292.3	11Mar2010, 12:45	4.45
T4-02	0.12930	170.9	11Mar2010, 12:30	4.68
T4-03	0.21261	262.7	11Mar2010, 12:45	4.56
T5-01	0.16467	216.9	11Mar2010, 12:45	4.67
T5-02	0.15329	228.6	11Mar2010, 12:30	4.36
T6-01	0.38513	438.6	11Mar2010, 12:45	4.66
T6-02	0.22184	318.8	11Mar2010, 12:30	4.24
T6-03	0.79742	908.4	11Mar2010, 12:45	4.01
T6-04	0.41690	557.1	11Mar2010, 12:30	4.45
T7-01	0.25260	391.5	11Mar2010, 12:30	4.58
T8-01	0.13466	176.1	11Mar2010, 12:30	4.02
T9-01	0.22773	256.8	11Mar2010, 12:45	4.22

Project: NOROTON_03 Simulation Run: EX UCONN 100-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_EX
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 100-YR
Compute Time: 23Apr2010, 13:37:35 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	1410.5	11Mar2010, 12:45	5.40
J-MS-03	1.94709	2631.0	11Mar2010, 12:45	5.23
J-MS-04	3.51316	4913.0	11Mar2010, 12:45	5.34
J-MS-05	3.99658	5258.8	11Mar2010, 12:45	5.27
J-MS-06	4.61712	6110.5	11Mar2010, 12:45	5.34
J-MS-07	4.81369	6372.3	11Mar2010, 12:45	5.35
J-MS-08	5.23439	6515.1	11Mar2010, 13:00	5.27
J-MS-09A	5.80808	7144.5	11Mar2010, 13:00	5.31
J-MS-09B	6.33283	7650.6	11Mar2010, 13:00	5.31
J-MS-10	8.26117	9889.2	11Mar2010, 13:00	5.33
J-MS-11A	8.51377	9429.3	11Mar2010, 13:15	5.33
J-MS-11B	9.17568	10045.7	11Mar2010, 13:15	5.37
J-MS-12	9.25503	9825.8	11Mar2010, 13:15	5.35
J-MS-13	9.64461	10084.7	11Mar2010, 13:30	5.39
J-MS-14	9.77491	10081.9	11Mar2010, 13:30	5.36
J-MS-15	10.24351	10258.2	11Mar2010, 13:30	5.35
J-MS-16	10.74072	10530.2	11Mar2010, 13:30	5.39
J-MS-17	11.03884	10574.6	11Mar2010, 13:30	5.41
J-T10-02	0.40623	649.8	11Mar2010, 12:45	6.24
J-T2-02	1.37640	2137.1	11Mar2010, 12:45	5.60
J-T4-02	0.36108	582.9	11Mar2010, 12:30	5.70
J-T4-03	0.57369	907.6	11Mar2010, 12:45	5.71
J-T5-02	0.31796	541.4	11Mar2010, 12:30	5.69
J-T6-02	0.60697	860.4	11Mar2010, 12:45	5.67
J-T6-03	1.40439	2007.8	11Mar2010, 12:45	5.35
J-T6-04	1.82129	2626.3	11Mar2010, 12:45	5.41
MS-01	0.48227	726.5	11Mar2010, 12:45	5.72
MS-02	0.52094	727.4	11Mar2010, 12:45	5.12

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	604.8	11Mar2010, 12:45	5.00
MS-04	0.18967	280.5	11Mar2010, 12:30	4.65
MS-05	0.48342	681.8	11Mar2010, 12:30	4.88
MS-06	0.62054	1197.0	11Mar2010, 12:30	5.75
MS-07	0.19657	375.3	11Mar2010, 12:30	5.63
MS-08	0.11574	172.7	11Mar2010, 12:45	5.36
MS-09	0.20679	282.3	11Mar2010, 12:45	5.00
MS-10	0.10705	204.0	11Mar2010, 12:30	5.63
MS-11	0.52725	804.7	11Mar2010, 12:45	5.96
MS-12	0.07935	167.7	11Mar2010, 12:30	6.36
MS-13	0.38958	682.1	11Mar2010, 12:30	6.34
MS-14	0.13030	248.9	11Mar2010, 12:30	5.75
MS-15	0.24087	355.2	11Mar2010, 12:30	5.01
MS-16	0.09098	167.7	11Mar2010, 12:30	6.22
MS-17	0.29812	604.2	11Mar2010, 12:30	6.35
P-MS-07	4.81369	6148.1	11Mar2010, 13:00	5.26
P-MS-10	8.26117	9287.8	11Mar2010, 13:15	5.32
P-MS-11	9.17568	9776.9	11Mar2010, 13:15	5.34
P-MS-13	9.64461	10017.2	11Mar2010, 13:30	5.36
R-MS-02	0.48227	690.7	11Mar2010, 13:00	5.70
R-MS-03	1.00321	1366.2	11Mar2010, 13:00	5.38
R-MS-04	1.94709	2527.7	11Mar2010, 12:45	5.23
R-MS-05	3.51316	4679.1	11Mar2010, 13:00	5.33
R-MS-06	3.99658	5203.4	11Mar2010, 13:00	5.27
R-MS-08	4.81369	6057.6	11Mar2010, 13:00	5.25
R-MS-09A	5.23439	6391.3	11Mar2010, 13:00	5.26
R-MS-09B	5.80808	7056.0	11Mar2010, 13:00	5.30
R-MS-10	6.33283	7505.3	11Mar2010, 13:00	5.31
R-MS-11A	8.26117	9231.6	11Mar2010, 13:15	5.32
R-MS-11B	0.25260	460.6	11Mar2010, 12:30	5.74
R-MS-11C	8.51377	9354.6	11Mar2010, 13:15	5.33
R-MS-13	9.25503	9804.8	11Mar2010, 13:30	5.35
R-MS-15	9.77491	9951.7	11Mar2010, 13:30	5.36

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	10159.6	11Mar2010, 13:30	5.34
R-MS-17	10.74072	10404.5	11Mar2010, 13:30	5.38
R-T10-02	0.33329	549.8	11Mar2010, 12:45	6.21
R-T2-02	0.68525	1096.9	11Mar2010, 12:45	5.84
R-T4-03	0.36108	578.6	11Mar2010, 12:45	5.70
R-T5-02	0.16467	269.6	11Mar2010, 12:45	5.85
R-T6-03	0.60697	850.3	11Mar2010, 12:45	5.66
R-T6-04	1.40439	1969.0	11Mar2010, 12:45	5.35
T10-01	0.33329	554.1	11Mar2010, 12:45	6.21
T10-02	0.07294	158.7	11Mar2010, 12:15	6.36
T1-01	0.50230	742.1	11Mar2010, 12:30	5.13
T2-01	0.68525	1113.1	11Mar2010, 12:45	5.85
T2-02	0.69115	1040.2	11Mar2010, 12:45	5.37
T3-01	0.30496	545.5	11Mar2010, 12:30	5.50
T4-01	0.23178	368.8	11Mar2010, 12:30	5.61
T4-02	0.12930	214.1	11Mar2010, 12:30	5.86
T4-03	0.21261	328.9	11Mar2010, 12:45	5.72
T5-01	0.16467	269.8	11Mar2010, 12:45	5.85
T5-02	0.15329	287.0	11Mar2010, 12:30	5.51
T6-01	0.38513	549.0	11Mar2010, 12:45	5.83
T6-02	0.22184	403.0	11Mar2010, 12:30	5.38
T6-03	0.79742	1157.5	11Mar2010, 12:45	5.12
T6-04	0.41690	702.4	11Mar2010, 12:30	5.62
T7-01	0.25260	488.6	11Mar2010, 12:30	5.75
T8-01	0.13466	225.3	11Mar2010, 12:30	5.14
T9-01	0.22773	325.8	11Mar2010, 12:45	5.36

Project: NOROTON_03 Simulation Run: PR TP-40 002-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 002-YR
Compute Time: 23Apr2010, 13:47:42 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	242.6	11Mar2010, 13:00	1.00
J-MS-03	1.94709	415.7	11Mar2010, 13:00	0.93
J-MS-04	3.51316	797.8	11Mar2010, 13:00	0.98
J-MS-05	3.99658	837.7	11Mar2010, 13:00	0.95
J-MS-06	4.61712	954.2	11Mar2010, 13:00	0.98
J-MS-07	4.81369	990.4	11Mar2010, 13:00	0.98
J-MS-08	5.23439	917.8	11Mar2010, 13:30	0.93
J-MS-09A	5.80808	978.3	11Mar2010, 13:30	0.95
J-MS-09B	6.33283	1023.9	11Mar2010, 13:45	0.95
J-MS-10	8.26117	1276.9	11Mar2010, 13:30	0.96
J-MS-11A	8.51377	1294.2	11Mar2010, 13:45	0.96
J-MS-11B	9.17568	1379.0	11Mar2010, 13:45	0.98
J-MS-12	9.25503	1369.0	11Mar2010, 13:45	0.98
J-MS-13	9.64461	1415.1	11Mar2010, 14:00	0.99
J-MS-14	9.77491	1425.0	11Mar2010, 14:00	0.98
J-MS-15	10.24351	1454.2	11Mar2010, 14:00	0.98
J-MS-16	10.74072	1507.1	11Mar2010, 14:00	0.99
J-MS-17	11.03884	1528.0	11Mar2010, 14:00	1.01
J-T10-02	0.40623	147.3	11Mar2010, 12:45	1.41
J-T2-02	1.37640	392.5	11Mar2010, 12:45	1.09
J-T4-02	0.36108	113.9	11Mar2010, 12:45	1.14
J-T4-03	0.57369	175.8	11Mar2010, 12:45	1.14
J-T5-02	0.31796	100.6	11Mar2010, 12:30	1.13
J-T6-02	0.60697	165.1	11Mar2010, 12:45	1.13
J-T6-03	1.40439	335.6	11Mar2010, 12:45	0.98
J-T6-04	1.82129	429.8	11Mar2010, 12:45	1.01
MS-01	0.48227	138.3	11Mar2010, 12:45	1.15
MS-02	0.52094	111.6	11Mar2010, 12:45	0.88

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	88.2	11Mar2010, 12:45	0.83
MS-04	0.18967	33.9	11Mar2010, 12:45	0.69
MS-05	0.48342	97.8	11Mar2010, 12:45	0.78
MS-06	0.62054	235.8	11Mar2010, 12:30	1.16
MS-07	0.19657	72.9	11Mar2010, 12:30	1.10
MS-08	0.11574	29.7	11Mar2010, 12:45	0.98
MS-09	0.20679	41.1	11Mar2010, 12:45	0.83
MS-10	0.10705	39.9	11Mar2010, 12:30	1.10
MS-11	0.52725	164.5	11Mar2010, 12:45	1.27
MS-12	0.07935	40.3	11Mar2010, 12:30	1.47
MS-13	0.38958	161.6	11Mar2010, 12:45	1.47
MS-14	0.13030	48.6	11Mar2010, 12:30	1.16
MS-15	0.24087	53.0	11Mar2010, 12:45	0.83
MS-16	0.09098	36.7	11Mar2010, 12:30	1.40
MS-17	0.29812	140.1	11Mar2010, 12:30	1.47
P-MS-07	4.81369	876.7	11Mar2010, 13:30	0.93
P-MS-10	8.26117	1274.0	11Mar2010, 13:45	0.96
P-MS-11	9.17568	1360.6	11Mar2010, 14:00	0.97
P-MS-13	9.64461	1414.0	11Mar2010, 14:00	0.98
R-MS-02	0.48227	137.1	11Mar2010, 13:00	1.14
R-MS-03	1.00321	236.4	11Mar2010, 13:15	1.00
R-MS-04	1.94709	397.8	11Mar2010, 13:00	0.93
R-MS-05	3.51316	766.3	11Mar2010, 13:15	0.97
R-MS-06	3.99658	830.1	11Mar2010, 13:15	0.95
R-MS-08	4.81369	867.0	11Mar2010, 13:30	0.92
R-MS-09A	5.23439	893.1	11Mar2010, 13:45	0.93
R-MS-09B	5.80808	968.8	11Mar2010, 13:45	0.95
R-MS-10	6.33283	1022.2	11Mar2010, 13:45	0.95
R-MS-11A	8.26117	1267.5	11Mar2010, 13:45	0.96
R-MS-11B	0.25260	88.0	11Mar2010, 12:45	1.15
R-MS-11C	8.51377	1284.4	11Mar2010, 13:45	0.96
R-MS-13	9.25503	1367.9	11Mar2010, 14:00	0.97
R-MS-15	9.77491	1413.8	11Mar2010, 14:00	0.98

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	1445.5	11Mar2010, 14:00	0.97
R-MS-17	10.74072	1497.0	11Mar2010, 14:00	0.99
R-T10-02	0.33329	121.9	11Mar2010, 12:45	1.40
R-T2-02	0.68525	216.2	11Mar2010, 13:00	1.20
R-T4-03	0.36108	112.4	11Mar2010, 12:45	1.14
R-T5-02	0.16467	54.7	11Mar2010, 12:45	1.21
R-T6-03	0.60697	163.6	11Mar2010, 13:00	1.12
R-T6-04	1.40439	327.9	11Mar2010, 13:00	0.98
T10-01	0.33329	124.3	11Mar2010, 12:45	1.40
T10-02	0.07294	37.2	11Mar2010, 12:30	1.47
T1-01	0.50230	117.7	11Mar2010, 12:45	0.88
T2-01	0.68525	227.3	11Mar2010, 12:45	1.21
T2-02	0.69115	180.3	11Mar2010, 12:45	0.98
T3-01	0.30496	96.3	11Mar2010, 12:30	1.04
T4-01	0.23178	70.1	11Mar2010, 12:45	1.09
T4-02	0.12930	43.8	11Mar2010, 12:45	1.21
T4-03	0.21261	63.4	11Mar2010, 12:45	1.15
T5-01	0.16467	55.6	11Mar2010, 12:45	1.21
T5-02	0.15329	53.6	11Mar2010, 12:30	1.04
T6-01	0.38513	109.9	11Mar2010, 13:00	1.21
T6-02	0.22184	69.9	11Mar2010, 12:30	0.99
T6-03	0.79742	184.3	11Mar2010, 12:45	0.88
T6-04	0.41690	127.9	11Mar2010, 12:45	1.10
T7-01	0.25260	96.7	11Mar2010, 12:30	1.16
T8-01	0.13466	34.3	11Mar2010, 12:30	0.88
T9-01	0.22773	54.6	11Mar2010, 12:45	0.98

Project: NOROTON_03 Simulation Run: PR TP-40 010-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 010-YR
Compute Time: 23Apr2010, 13:49:51 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	556.8	11Mar2010, 12:45	2.21
J-MS-03	1.94709	991.7	11Mar2010, 13:00	2.10
J-MS-04	3.51316	1899.9	11Mar2010, 12:45	2.17
J-MS-05	3.99658	2075.3	11Mar2010, 13:00	2.12
J-MS-06	4.61712	2332.5	11Mar2010, 13:00	2.17
J-MS-07	4.81369	2406.5	11Mar2010, 13:00	2.17
J-MS-08	5.23439	2423.0	11Mar2010, 13:15	2.11
J-MS-09A	5.80808	2648.8	11Mar2010, 13:15	2.14
J-MS-09B	6.33283	2813.2	11Mar2010, 13:15	2.14
J-MS-10	8.26117	3581.3	11Mar2010, 13:15	2.16
J-MS-11A	8.51377	3462.2	11Mar2010, 13:30	2.16
J-MS-11B	9.17568	3687.4	11Mar2010, 13:30	2.18
J-MS-12	9.25503	3687.0	11Mar2010, 13:30	2.17
J-MS-13	9.64461	3786.5	11Mar2010, 13:30	2.19
J-MS-14	9.77491	3779.1	11Mar2010, 13:45	2.18
J-MS-15	10.24351	3865.3	11Mar2010, 13:45	2.17
J-MS-16	10.74072	3987.4	11Mar2010, 13:45	2.20
J-MS-17	11.03884	4028.8	11Mar2010, 13:45	2.21
J-T10-02	0.40623	296.0	11Mar2010, 12:45	2.80
J-T2-02	1.37640	888.5	11Mar2010, 12:45	2.34
J-T4-02	0.36108	247.4	11Mar2010, 12:45	2.41
J-T4-03	0.57369	385.9	11Mar2010, 12:45	2.41
J-T5-02	0.31796	226.6	11Mar2010, 12:30	2.40
J-T6-02	0.60697	364.0	11Mar2010, 12:45	2.39
J-T6-03	1.40439	807.4	11Mar2010, 12:45	2.18
J-T6-04	1.82129	1049.2	11Mar2010, 12:45	2.21
MS-01	0.48227	306.3	11Mar2010, 12:45	2.42
MS-02	0.52094	280.5	11Mar2010, 12:45	2.02

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	228.6	11Mar2010, 12:45	1.94
MS-04	0.18967	97.8	11Mar2010, 12:30	1.72
MS-05	0.48342	253.9	11Mar2010, 12:45	1.86
MS-06	0.62054	512.5	11Mar2010, 12:30	2.44
MS-07	0.19657	159.7	11Mar2010, 12:30	2.36
MS-08	0.11574	69.8	11Mar2010, 12:45	2.18
MS-09	0.20679	106.6	11Mar2010, 12:45	1.94
MS-10	0.10705	87.1	11Mar2010, 12:30	2.36
MS-11	0.52725	349.9	11Mar2010, 12:45	2.60
MS-12	0.07935	78.4	11Mar2010, 12:30	2.88
MS-13	0.38958	316.8	11Mar2010, 12:45	2.87
MS-14	0.13030	106.1	11Mar2010, 12:30	2.44
MS-15	0.24087	132.7	11Mar2010, 12:45	1.94
MS-16	0.09098	75.1	11Mar2010, 12:30	2.78
MS-17	0.29812	278.0	11Mar2010, 12:30	2.88
P-MS-07	4.81369	2320.8	11Mar2010, 13:00	2.11
P-MS-10	8.26117	3405.3	11Mar2010, 13:30	2.15
P-MS-11	9.17568	3668.8	11Mar2010, 13:30	2.16
P-MS-13	9.64461	3754.7	11Mar2010, 13:45	2.17
R-MS-02	0.48227	294.7	11Mar2010, 13:00	2.42
R-MS-03	1.00321	556.6	11Mar2010, 13:00	2.20
R-MS-04	1.94709	991.0	11Mar2010, 13:00	2.09
R-MS-05	3.51316	1871.5	11Mar2010, 13:00	2.16
R-MS-06	3.99658	2063.8	11Mar2010, 13:00	2.12
R-MS-08	4.81369	2282.7	11Mar2010, 13:15	2.10
R-MS-09A	5.23439	2399.8	11Mar2010, 13:15	2.11
R-MS-09B	5.80808	2625.1	11Mar2010, 13:15	2.14
R-MS-10	6.33283	2770.8	11Mar2010, 13:15	2.14
R-MS-11A	8.26117	3397.1	11Mar2010, 13:30	2.15
R-MS-11B	0.25260	193.0	11Mar2010, 12:30	2.43
R-MS-11C	8.51377	3449.7	11Mar2010, 13:30	2.15
R-MS-13	9.25503	3650.6	11Mar2010, 13:30	2.16
R-MS-15	9.77491	3762.3	11Mar2010, 13:45	2.18

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	3848.2	11Mar2010, 13:45	2.17
R-MS-17	10.74072	3962.6	11Mar2010, 13:45	2.19
R-T10-02	0.33329	247.9	11Mar2010, 12:45	2.78
R-T2-02	0.68525	466.8	11Mar2010, 12:45	2.51
R-T4-03	0.36108	246.5	11Mar2010, 12:45	2.41
R-T5-02	0.16467	117.0	11Mar2010, 12:45	2.52
R-T6-03	0.60697	354.1	11Mar2010, 12:45	2.38
R-T6-04	1.40439	769.4	11Mar2010, 12:45	2.17
T10-01	0.33329	251.1	11Mar2010, 12:45	2.78
T10-02	0.07294	72.0	11Mar2010, 12:30	2.89
T1-01	0.50230	287.5	11Mar2010, 12:45	2.02
T2-01	0.68525	483.9	11Mar2010, 12:45	2.52
T2-02	0.69115	421.7	11Mar2010, 12:45	2.18
T3-01	0.30496	222.9	11Mar2010, 12:30	2.27
T4-01	0.23178	154.8	11Mar2010, 12:45	2.35
T4-02	0.12930	92.7	11Mar2010, 12:45	2.52
T4-03	0.21261	139.4	11Mar2010, 12:45	2.43
T5-01	0.16467	117.7	11Mar2010, 12:45	2.52
T5-02	0.15329	120.2	11Mar2010, 12:30	2.27
T6-01	0.38513	233.6	11Mar2010, 13:00	2.51
T6-02	0.22184	163.4	11Mar2010, 12:30	2.19
T6-03	0.79742	453.3	11Mar2010, 12:45	2.02
T6-04	0.41690	288.4	11Mar2010, 12:30	2.35
T7-01	0.25260	209.7	11Mar2010, 12:30	2.44
T8-01	0.13466	86.7	11Mar2010, 12:30	2.02
T9-01	0.22773	130.2	11Mar2010, 12:45	2.18

Project: NOROTON_03 Simulation Run: PR TP-40 025-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 025-yr
Compute Time: 23Apr2010, 13:50:29 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	703.8	11Mar2010, 12:45	2.76
J-MS-03	1.94709	1270.5	11Mar2010, 12:45	2.63
J-MS-04	3.51316	2421.6	11Mar2010, 12:45	2.72
J-MS-05	3.99658	2624.7	11Mar2010, 13:00	2.67
J-MS-06	4.61712	2946.2	11Mar2010, 12:45	2.71
J-MS-07	4.81369	3087.5	11Mar2010, 12:45	2.72
J-MS-08	5.23439	3128.0	11Mar2010, 13:00	2.66
J-MS-09A	5.80808	3382.1	11Mar2010, 13:15	2.68
J-MS-09B	6.33283	3609.6	11Mar2010, 13:15	2.69
J-MS-10	8.26117	4665.7	11Mar2010, 13:00	2.70
J-MS-11A	8.51377	4390.5	11Mar2010, 13:30	2.70
J-MS-11B	9.17568	4668.7	11Mar2010, 13:30	2.73
J-MS-12	9.25503	4666.8	11Mar2010, 13:30	2.72
J-MS-13	9.64461	4790.9	11Mar2010, 13:30	2.74
J-MS-14	9.77491	4764.0	11Mar2010, 13:45	2.73
J-MS-15	10.24351	4882.7	11Mar2010, 13:45	2.72
J-MS-16	10.74072	5035.2	11Mar2010, 13:45	2.75
J-MS-17	11.03884	5099.5	11Mar2010, 13:45	2.76
J-T10-02	0.40623	360.0	11Mar2010, 12:45	3.41
J-T2-02	1.37640	1109.8	11Mar2010, 12:45	2.91
J-T4-02	0.36108	306.4	11Mar2010, 12:45	2.98
J-T4-03	0.57369	478.7	11Mar2010, 12:45	2.99
J-T5-02	0.31796	282.6	11Mar2010, 12:30	2.97
J-T6-02	0.60697	452.2	11Mar2010, 12:45	2.96
J-T6-03	1.40439	1020.4	11Mar2010, 12:45	2.72
J-T6-04	1.82129	1327.9	11Mar2010, 12:45	2.76
MS-01	0.48227	380.9	11Mar2010, 12:45	3.00
MS-02	0.52094	358.0	11Mar2010, 12:45	2.54

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	293.5	11Mar2010, 12:45	2.46
MS-04	0.18967	128.8	11Mar2010, 12:30	2.21
MS-05	0.48342	326.0	11Mar2010, 12:45	2.37
MS-06	0.62054	634.5	11Mar2010, 12:30	3.02
MS-07	0.19657	198.1	11Mar2010, 12:30	2.92
MS-08	0.11574	87.8	11Mar2010, 12:45	2.73
MS-09	0.20679	136.9	11Mar2010, 12:45	2.46
MS-10	0.10705	107.9	11Mar2010, 12:30	2.93
MS-11	0.52725	431.2	11Mar2010, 12:45	3.19
MS-12	0.07935	94.7	11Mar2010, 12:30	3.50
MS-13	0.38958	383.2	11Mar2010, 12:45	3.49
MS-14	0.13030	131.5	11Mar2010, 12:30	3.01
MS-15	0.24087	169.5	11Mar2010, 12:30	2.46
MS-16	0.09098	91.8	11Mar2010, 12:30	3.39
MS-17	0.29812	337.2	11Mar2010, 12:30	3.50
P-MS-07	4.81369	3004.6	11Mar2010, 13:00	2.65
P-MS-10	8.26117	4319.0	11Mar2010, 13:30	2.70
P-MS-11	9.17568	4645.2	11Mar2010, 13:30	2.71
P-MS-13	9.64461	4734.6	11Mar2010, 13:45	2.72
R-MS-02	0.48227	370.2	11Mar2010, 13:00	2.99
R-MS-03	1.00321	701.4	11Mar2010, 13:00	2.75
R-MS-04	1.94709	1256.6	11Mar2010, 13:00	2.63
R-MS-05	3.51316	2365.6	11Mar2010, 13:00	2.71
R-MS-06	3.99658	2615.5	11Mar2010, 13:00	2.67
R-MS-08	4.81369	2885.3	11Mar2010, 13:00	2.64
R-MS-09A	5.23439	3077.6	11Mar2010, 13:15	2.65
R-MS-09B	5.80808	3377.4	11Mar2010, 13:15	2.68
R-MS-10	6.33283	3601.8	11Mar2010, 13:15	2.68
R-MS-11A	8.26117	4312.1	11Mar2010, 13:30	2.69
R-MS-11B	0.25260	240.5	11Mar2010, 12:30	3.01
R-MS-11C	8.51377	4379.7	11Mar2010, 13:30	2.70
R-MS-13	9.25503	4628.5	11Mar2010, 13:30	2.71
R-MS-15	9.77491	4755.6	11Mar2010, 13:45	2.72

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	4868.9	11Mar2010, 13:45	2.71
R-MS-17	10.74072	5020.9	11Mar2010, 13:45	2.74
R-T10-02	0.33329	302.4	11Mar2010, 12:45	3.38
R-T2-02	0.68525	579.5	11Mar2010, 12:45	3.09
R-T4-03	0.36108	305.6	11Mar2010, 12:45	2.98
R-T5-02	0.16467	144.3	11Mar2010, 12:45	3.10
R-T6-03	0.60697	444.5	11Mar2010, 12:45	2.95
R-T6-04	1.40439	980.9	11Mar2010, 12:45	2.72
T10-01	0.33329	305.8	11Mar2010, 12:45	3.38
T10-02	0.07294	87.6	11Mar2010, 12:15	3.50
T1-01	0.50230	364.8	11Mar2010, 12:45	2.55
T2-01	0.68525	596.5	11Mar2010, 12:45	3.10
T2-02	0.69115	530.4	11Mar2010, 12:45	2.73
T3-01	0.30496	279.7	11Mar2010, 12:30	2.83
T4-01	0.23178	192.3	11Mar2010, 12:45	2.91
T4-02	0.12930	114.1	11Mar2010, 12:45	3.10
T4-03	0.21261	173.1	11Mar2010, 12:45	3.00
T5-01	0.16467	145.0	11Mar2010, 12:45	3.10
T5-02	0.15329	149.7	11Mar2010, 12:30	2.83
T6-01	0.38513	289.1	11Mar2010, 12:45	3.09
T6-02	0.22184	205.6	11Mar2010, 12:30	2.74
T6-03	0.79742	575.9	11Mar2010, 12:45	2.55
T6-04	0.41690	361.4	11Mar2010, 12:30	2.92
T7-01	0.25260	259.4	11Mar2010, 12:30	3.02
T8-01	0.13466	110.7	11Mar2010, 12:30	2.56
T9-01	0.22773	164.4	11Mar2010, 12:45	2.72

Project: NOROTON_03 Simulation Run: PR TP-40 050-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 050-YR
Compute Time: 23Apr2010, 13:52:51 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	860.8	11Mar2010, 12:45	3.33
J-MS-03	1.94709	1572.2	11Mar2010, 12:45	3.19
J-MS-04	3.51316	2968.8	11Mar2010, 12:45	3.28
J-MS-05	3.99658	3196.8	11Mar2010, 13:00	3.23
J-MS-06	4.61712	3630.3	11Mar2010, 12:45	3.28
J-MS-07	4.81369	3798.4	11Mar2010, 12:45	3.29
J-MS-08	5.23439	3882.4	11Mar2010, 13:00	3.22
J-MS-09A	5.80808	4216.5	11Mar2010, 13:00	3.25
J-MS-09B	6.33283	4492.6	11Mar2010, 13:00	3.26
J-MS-10	8.26117	5823.3	11Mar2010, 13:00	3.27
J-MS-11A	8.51377	5387.4	11Mar2010, 13:30	3.27
J-MS-11B	9.17568	5732.6	11Mar2010, 13:15	3.30
J-MS-12	9.25503	5752.1	11Mar2010, 13:30	3.29
J-MS-13	9.64461	5889.9	11Mar2010, 13:30	3.32
J-MS-14	9.77491	5865.1	11Mar2010, 13:45	3.30
J-MS-15	10.24351	6002.2	11Mar2010, 13:45	3.29
J-MS-16	10.74072	6179.5	11Mar2010, 13:45	3.32
J-MS-17	11.03884	6250.5	11Mar2010, 13:45	3.34
J-T10-02	0.40623	424.9	11Mar2010, 12:45	4.03
J-T2-02	1.37640	1336.2	11Mar2010, 12:45	3.49
J-T4-02	0.36108	366.6	11Mar2010, 12:45	3.57
J-T4-03	0.57369	573.6	11Mar2010, 12:45	3.58
J-T5-02	0.31796	339.7	11Mar2010, 12:30	3.56
J-T6-02	0.60697	542.4	11Mar2010, 12:45	3.55
J-T6-03	1.40439	1238.4	11Mar2010, 12:45	3.29
J-T6-04	1.82129	1614.1	11Mar2010, 12:45	3.34
MS-01	0.48227	457.3	11Mar2010, 12:45	3.59
MS-02	0.52094	438.4	11Mar2010, 12:45	3.10

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	361.1	11Mar2010, 12:45	3.00
MS-04	0.18967	161.3	11Mar2010, 12:30	2.72
MS-05	0.48342	401.0	11Mar2010, 12:45	2.91
MS-06	0.62054	759.2	11Mar2010, 12:30	3.61
MS-07	0.19657	237.4	11Mar2010, 12:30	3.51
MS-08	0.11574	106.4	11Mar2010, 12:45	3.30
MS-09	0.20679	168.5	11Mar2010, 12:45	3.00
MS-10	0.10705	129.2	11Mar2010, 12:30	3.51
MS-11	0.52725	514.1	11Mar2010, 12:45	3.79
MS-12	0.07935	111.1	11Mar2010, 12:30	4.13
MS-13	0.38958	450.2	11Mar2010, 12:45	4.12
MS-14	0.13030	157.5	11Mar2010, 12:30	3.61
MS-15	0.24087	209.6	11Mar2010, 12:30	3.01
MS-16	0.09098	108.8	11Mar2010, 12:30	4.02
MS-17	0.29812	397.0	11Mar2010, 12:30	4.13
P-MS-07	4.81369	3701.2	11Mar2010, 13:00	3.21
P-MS-10	8.26117	5299.9	11Mar2010, 13:30	3.26
P-MS-11	9.17568	5727.1	11Mar2010, 13:30	3.28
P-MS-13	9.64461	5830.8	11Mar2010, 13:45	3.30
R-MS-02	0.48227	439.5	11Mar2010, 13:00	3.58
R-MS-03	1.00321	845.7	11Mar2010, 13:00	3.32
R-MS-04	1.94709	1530.2	11Mar2010, 13:00	3.19
R-MS-05	3.51316	2880.6	11Mar2010, 13:00	3.27
R-MS-06	3.99658	3189.7	11Mar2010, 13:00	3.23
R-MS-08	4.81369	3592.0	11Mar2010, 13:00	3.21
R-MS-09A	5.23439	3771.4	11Mar2010, 13:15	3.22
R-MS-09B	5.80808	4144.0	11Mar2010, 13:15	3.25
R-MS-10	6.33283	4433.3	11Mar2010, 13:15	3.25
R-MS-11A	8.26117	5295.3	11Mar2010, 13:30	3.26
R-MS-11B	0.25260	289.1	11Mar2010, 12:30	3.60
R-MS-11C	8.51377	5380.3	11Mar2010, 13:30	3.27
R-MS-13	9.25503	5701.0	11Mar2010, 13:30	3.29
R-MS-15	9.77491	5850.5	11Mar2010, 13:45	3.30

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	5986.0	11Mar2010, 13:45	3.29
R-MS-17	10.74072	6159.5	11Mar2010, 13:45	3.32
R-T10-02	0.33329	357.7	11Mar2010, 12:45	4.01
R-T2-02	0.68525	693.9	11Mar2010, 12:45	3.69
R-T4-03	0.36108	366.1	11Mar2010, 12:45	3.57
R-T5-02	0.16467	172.1	11Mar2010, 12:45	3.70
R-T6-03	0.60697	535.6	11Mar2010, 12:45	3.54
R-T6-04	1.40439	1198.4	11Mar2010, 12:45	3.29
T10-01	0.33329	361.3	11Mar2010, 12:45	4.01
T10-02	0.07294	103.5	11Mar2010, 12:15	4.13
T1-01	0.50230	444.7	11Mar2010, 12:45	3.10
T2-01	0.68525	711.2	11Mar2010, 12:45	3.70
T2-02	0.69115	642.3	11Mar2010, 12:45	3.30
T3-01	0.30496	338.1	11Mar2010, 12:30	3.41
T4-01	0.23178	230.7	11Mar2010, 12:45	3.50
T4-02	0.12930	135.8	11Mar2010, 12:45	3.70
T4-03	0.21261	207.6	11Mar2010, 12:45	3.59
T5-01	0.16467	172.7	11Mar2010, 12:45	3.70
T5-02	0.15329	180.0	11Mar2010, 12:30	3.41
T6-01	0.38513	346.5	11Mar2010, 12:45	3.69
T6-02	0.22184	248.9	11Mar2010, 12:30	3.31
T6-03	0.79742	702.8	11Mar2010, 12:45	3.10
T6-04	0.41690	436.4	11Mar2010, 12:30	3.50
T7-01	0.25260	310.3	11Mar2010, 12:30	3.61
T8-01	0.13466	135.7	11Mar2010, 12:30	3.11
T9-01	0.22773	199.7	11Mar2010, 12:45	3.29

Project: NOROTON_03 Simulation Run: PR TP-40 100-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: TP-40 100-YR
Compute Time: 23Apr2010, 13:53:24 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	1041.0	11Mar2010, 12:45	4.00
J-MS-03	1.94709	1918.3	11Mar2010, 12:45	3.85
J-MS-04	3.51316	3606.3	11Mar2010, 12:45	3.95
J-MS-05	3.99658	3856.1	11Mar2010, 13:00	3.89
J-MS-06	4.61712	4441.7	11Mar2010, 12:45	3.95
J-MS-07	4.81369	4640.8	11Mar2010, 12:45	3.96
J-MS-08	5.23439	4736.9	11Mar2010, 13:00	3.88
J-MS-09A	5.80808	5173.3	11Mar2010, 13:00	3.92
J-MS-09B	6.33283	5525.2	11Mar2010, 13:00	3.92
J-MS-10	8.26117	7157.7	11Mar2010, 13:00	3.94
J-MS-11A	8.51377	6791.0	11Mar2010, 13:15	3.94
J-MS-11B	9.17568	7221.5	11Mar2010, 13:15	3.97
J-MS-12	9.25503	7269.3	11Mar2010, 13:30	3.97
J-MS-13	9.64461	7418.1	11Mar2010, 13:30	4.00
J-MS-14	9.77491	7279.7	11Mar2010, 13:30	3.98
J-MS-15	10.24351	7406.5	11Mar2010, 13:45	3.96
J-MS-16	10.74072	7623.1	11Mar2010, 13:45	4.00
J-MS-17	11.03884	7713.9	11Mar2010, 13:45	4.02
J-T10-02	0.40623	499.6	11Mar2010, 12:45	4.76
J-T2-02	1.37640	1600.1	11Mar2010, 12:45	4.18
J-T4-02	0.36108	436.5	11Mar2010, 12:45	4.27
J-T4-03	0.57369	683.9	11Mar2010, 12:45	4.28
J-T5-02	0.31796	406.2	11Mar2010, 12:30	4.26
J-T6-02	0.60697	647.3	11Mar2010, 12:45	4.24
J-T6-03	1.40439	1492.2	11Mar2010, 12:45	3.96
J-T6-04	1.82129	1947.9	11Mar2010, 12:45	4.01
MS-01	0.48227	546.1	11Mar2010, 12:45	4.29
MS-02	0.52094	532.9	11Mar2010, 12:45	3.75

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	440.6	11Mar2010, 12:45	3.65
MS-04	0.18967	199.9	11Mar2010, 12:30	3.34
MS-05	0.48342	489.6	11Mar2010, 12:30	3.55
MS-06	0.62054	903.8	11Mar2010, 12:30	4.31
MS-07	0.19657	282.9	11Mar2010, 12:30	4.20
MS-08	0.11574	128.2	11Mar2010, 12:45	3.97
MS-09	0.20679	205.6	11Mar2010, 12:45	3.65
MS-10	0.10705	153.9	11Mar2010, 12:30	4.21
MS-11	0.52725	610.2	11Mar2010, 12:45	4.50
MS-12	0.07935	129.9	11Mar2010, 12:30	4.87
MS-13	0.38958	527.3	11Mar2010, 12:45	4.85
MS-14	0.13030	187.7	11Mar2010, 12:30	4.31
MS-15	0.24087	257.0	11Mar2010, 12:30	3.65
MS-16	0.09098	128.3	11Mar2010, 12:30	4.74
MS-17	0.29812	465.9	11Mar2010, 12:30	4.86
P-MS-07	4.81369	4506.6	11Mar2010, 13:00	3.88
P-MS-10	8.26117	6706.9	11Mar2010, 13:15	3.93
P-MS-11	9.17568	7240.4	11Mar2010, 13:30	3.96
P-MS-13	9.64461	7229.7	11Mar2010, 13:30	3.97
R-MS-02	0.48227	522.3	11Mar2010, 13:00	4.27
R-MS-03	1.00321	1016.5	11Mar2010, 13:00	3.99
R-MS-04	1.94709	1848.8	11Mar2010, 13:00	3.85
R-MS-05	3.51316	3472.8	11Mar2010, 13:00	3.94
R-MS-06	3.99658	3852.3	11Mar2010, 13:00	3.89
R-MS-08	4.81369	4391.4	11Mar2010, 13:00	3.87
R-MS-09A	5.23439	4600.7	11Mar2010, 13:00	3.88
R-MS-09B	5.80808	5078.2	11Mar2010, 13:00	3.92
R-MS-10	6.33283	5370.8	11Mar2010, 13:15	3.92
R-MS-11A	8.26117	6639.0	11Mar2010, 13:15	3.93
R-MS-11B	0.25260	345.7	11Mar2010, 12:30	4.30
R-MS-11C	8.51377	6692.3	11Mar2010, 13:15	3.94
R-MS-13	9.25503	7198.8	11Mar2010, 13:30	3.96
R-MS-15	9.77491	7226.2	11Mar2010, 13:45	3.97

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	7398.5	11Mar2010, 13:45	3.96
R-MS-17	10.74072	7608.8	11Mar2010, 13:45	3.99
R-T10-02	0.33329	421.4	11Mar2010, 12:45	4.73
R-T2-02	0.68525	827.1	11Mar2010, 12:45	4.39
R-T4-03	0.36108	436.3	11Mar2010, 12:45	4.27
R-T5-02	0.16467	204.3	11Mar2010, 12:45	4.40
R-T6-03	0.60697	640.5	11Mar2010, 12:45	4.23
R-T6-04	1.40439	1452.4	11Mar2010, 12:45	3.96
T10-01	0.33329	425.3	11Mar2010, 12:45	4.73
T10-02	0.07294	121.8	11Mar2010, 12:15	4.87
T1-01	0.50230	539.8	11Mar2010, 12:30	3.76
T2-01	0.68525	844.1	11Mar2010, 12:45	4.40
T2-02	0.69115	773.0	11Mar2010, 12:45	3.97
T3-01	0.30496	406.3	11Mar2010, 12:30	4.09
T4-01	0.23178	275.4	11Mar2010, 12:45	4.19
T4-02	0.12930	161.1	11Mar2010, 12:30	4.41
T4-03	0.21261	247.6	11Mar2010, 12:45	4.29
T5-01	0.16467	204.8	11Mar2010, 12:45	4.41
T5-02	0.15329	215.3	11Mar2010, 12:30	4.10
T6-01	0.38513	413.3	11Mar2010, 12:45	4.39
T6-02	0.22184	299.6	11Mar2010, 12:30	3.98
T6-03	0.79742	851.7	11Mar2010, 12:45	3.76
T6-04	0.41690	523.9	11Mar2010, 12:30	4.19
T7-01	0.25260	369.2	11Mar2010, 12:30	4.31
T8-01	0.13466	165.0	11Mar2010, 12:30	3.77
T9-01	0.22773	241.1	11Mar2010, 12:45	3.96

Project: NOROTON_03 Simulation Run: PR UCONN 002-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 002-YR
Compute Time: 23Apr2010, 13:53:54 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	285.5	11Mar2010, 13:00	1.17
J-MS-03	1.94709	492.9	11Mar2010, 13:00	1.08
J-MS-04	3.51316	942.7	11Mar2010, 13:00	1.14
J-MS-05	3.99658	1006.1	11Mar2010, 13:00	1.11
J-MS-06	4.61712	1142.0	11Mar2010, 13:00	1.14
J-MS-07	4.81369	1183.5	11Mar2010, 13:00	1.14
J-MS-08	5.23439	1109.0	11Mar2010, 13:30	1.09
J-MS-09A	5.80808	1200.1	11Mar2010, 13:30	1.11
J-MS-09B	6.33283	1261.3	11Mar2010, 13:30	1.11
J-MS-10	8.26117	1579.4	11Mar2010, 13:30	1.12
J-MS-11A	8.51377	1578.1	11Mar2010, 13:45	1.13
J-MS-11B	9.17568	1684.2	11Mar2010, 13:45	1.14
J-MS-12	9.25503	1712.7	11Mar2010, 13:45	1.14
J-MS-13	9.64461	1756.4	11Mar2010, 13:45	1.16
J-MS-14	9.77491	1751.0	11Mar2010, 14:00	1.14
J-MS-15	10.24351	1791.3	11Mar2010, 14:00	1.14
J-MS-16	10.74072	1853.5	11Mar2010, 14:00	1.16
J-MS-17	11.03884	1877.9	11Mar2010, 14:00	1.17
J-T10-02	0.40623	168.2	11Mar2010, 12:45	1.60
J-T2-02	1.37640	460.0	11Mar2010, 12:45	1.26
J-T4-02	0.36108	132.3	11Mar2010, 12:45	1.31
J-T4-03	0.57369	204.7	11Mar2010, 12:45	1.31
J-T5-02	0.31796	117.8	11Mar2010, 12:30	1.30
J-T6-02	0.60697	192.4	11Mar2010, 12:45	1.30
J-T6-03	1.40439	400.8	11Mar2010, 12:45	1.14
J-T6-04	1.82129	514.7	11Mar2010, 12:45	1.17
MS-01	0.48227	161.4	11Mar2010, 12:45	1.32
MS-02	0.52094	134.0	11Mar2010, 12:45	1.03

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	106.7	11Mar2010, 12:45	0.97
MS-04	0.18967	41.4	11Mar2010, 12:45	0.82
MS-05	0.48342	118.4	11Mar2010, 12:45	0.92
MS-06	0.62054	273.9	11Mar2010, 12:30	1.33
MS-07	0.19657	84.9	11Mar2010, 12:30	1.27
MS-08	0.11574	35.1	11Mar2010, 12:45	1.14
MS-09	0.20679	49.7	11Mar2010, 12:45	0.97
MS-10	0.10705	46.4	11Mar2010, 12:30	1.27
MS-11	0.52725	190.1	11Mar2010, 12:45	1.45
MS-12	0.07935	45.7	11Mar2010, 12:30	1.67
MS-13	0.38958	183.5	11Mar2010, 12:45	1.66
MS-14	0.13030	56.5	11Mar2010, 12:30	1.33
MS-15	0.24087	63.6	11Mar2010, 12:45	0.98
MS-16	0.09098	42.1	11Mar2010, 12:30	1.59
MS-17	0.29812	159.5	11Mar2010, 12:30	1.67
P-MS-07	4.81369	1063.5	11Mar2010, 13:15	1.09
P-MS-10	8.26117	1549.7	11Mar2010, 13:30	1.12
P-MS-11	9.17568	1703.3	11Mar2010, 13:45	1.13
P-MS-13	9.64461	1738.6	11Mar2010, 14:00	1.14
R-MS-02	0.48227	160.2	11Mar2010, 13:00	1.32
R-MS-03	1.00321	276.9	11Mar2010, 13:00	1.16
R-MS-04	1.94709	478.4	11Mar2010, 13:00	1.08
R-MS-05	3.51316	907.1	11Mar2010, 13:00	1.13
R-MS-06	3.99658	990.6	11Mar2010, 13:00	1.11
R-MS-08	4.81369	1050.6	11Mar2010, 13:30	1.08
R-MS-09A	5.23439	1094.4	11Mar2010, 13:30	1.09
R-MS-09B	5.80808	1183.0	11Mar2010, 13:30	1.11
R-MS-10	6.33283	1233.8	11Mar2010, 13:45	1.11
R-MS-11A	8.26117	1548.0	11Mar2010, 13:45	1.12
R-MS-11B	0.25260	101.4	11Mar2010, 12:45	1.33
R-MS-11C	8.51377	1576.6	11Mar2010, 13:45	1.12
R-MS-13	9.25503	1692.1	11Mar2010, 13:45	1.13
R-MS-15	9.77491	1744.7	11Mar2010, 14:00	1.14

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	1784.5	11Mar2010, 14:00	1.14
R-MS-17	10.74072	1843.3	11Mar2010, 14:00	1.16
R-T10-02	0.33329	139.5	11Mar2010, 12:45	1.59
R-T2-02	0.68525	248.4	11Mar2010, 13:00	1.38
R-T4-03	0.36108	130.9	11Mar2010, 12:45	1.31
R-T5-02	0.16467	63.3	11Mar2010, 12:45	1.39
R-T6-03	0.60697	190.4	11Mar2010, 13:00	1.29
R-T6-04	1.40439	387.1	11Mar2010, 13:00	1.14
T10-01	0.33329	142.1	11Mar2010, 12:45	1.59
T10-02	0.07294	42.1	11Mar2010, 12:30	1.67
T1-01	0.50230	140.5	11Mar2010, 12:45	1.03
T2-01	0.68525	262.9	11Mar2010, 12:45	1.39
T2-02	0.69115	213.0	11Mar2010, 12:45	1.14
T3-01	0.30496	113.5	11Mar2010, 12:30	1.21
T4-01	0.23178	81.7	11Mar2010, 12:45	1.26
T4-02	0.12930	50.6	11Mar2010, 12:45	1.39
T4-03	0.21261	73.8	11Mar2010, 12:45	1.32
T5-01	0.16467	64.2	11Mar2010, 12:45	1.39
T5-02	0.15329	62.7	11Mar2010, 12:30	1.21
T6-01	0.38513	127.0	11Mar2010, 13:00	1.38
T6-02	0.22184	82.5	11Mar2010, 12:30	1.15
T6-03	0.79742	220.3	11Mar2010, 12:45	1.03
T6-04	0.41690	148.8	11Mar2010, 12:45	1.26
T7-01	0.25260	112.3	11Mar2010, 12:30	1.33
T8-01	0.13466	41.3	11Mar2010, 12:30	1.03
T9-01	0.22773	64.7	11Mar2010, 12:45	1.14

Project: NOROTON_03 Simulation Run: PR UCONN 010-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 010-YR
Compute Time: 23Apr2010, 13:55:14 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	598.1	11Mar2010, 12:45	2.36
J-MS-03	1.94709	1068.9	11Mar2010, 12:45	2.25
J-MS-04	3.51316	2046.4	11Mar2010, 12:45	2.32
J-MS-05	3.99658	2226.2	11Mar2010, 13:00	2.27
J-MS-06	4.61712	2501.0	11Mar2010, 13:00	2.32
J-MS-07	4.81369	2590.2	11Mar2010, 12:45	2.33
J-MS-08	5.23439	2600.2	11Mar2010, 13:15	2.27
J-MS-09A	5.80808	2859.2	11Mar2010, 13:15	2.29
J-MS-09B	6.33283	3041.5	11Mar2010, 13:15	2.30
J-MS-10	8.26117	3873.6	11Mar2010, 13:15	2.31
J-MS-11A	8.51377	3734.8	11Mar2010, 13:30	2.31
J-MS-11B	9.17568	3973.0	11Mar2010, 13:30	2.33
J-MS-12	9.25503	3974.4	11Mar2010, 13:30	2.32
J-MS-13	9.64461	4073.7	11Mar2010, 13:30	2.35
J-MS-14	9.77491	4061.3	11Mar2010, 13:45	2.33
J-MS-15	10.24351	4155.6	11Mar2010, 13:45	2.32
J-MS-16	10.74072	4283.9	11Mar2010, 13:45	2.35
J-MS-17	11.03884	4329.8	11Mar2010, 13:45	2.36
J-T10-02	0.40623	314.2	11Mar2010, 12:45	2.97
J-T2-02	1.37640	951.6	11Mar2010, 12:45	2.50
J-T4-02	0.36108	264.1	11Mar2010, 12:45	2.57
J-T4-03	0.57369	412.2	11Mar2010, 12:45	2.58
J-T5-02	0.31796	242.4	11Mar2010, 12:30	2.56
J-T6-02	0.60697	389.0	11Mar2010, 12:45	2.55
J-T6-03	1.40439	866.1	11Mar2010, 12:45	2.33
J-T6-04	1.82129	1126.8	11Mar2010, 12:45	2.37
MS-01	0.48227	327.4	11Mar2010, 12:45	2.59
MS-02	0.52094	302.3	11Mar2010, 12:45	2.16

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	246.9	11Mar2010, 12:45	2.08
MS-04	0.18967	106.5	11Mar2010, 12:30	1.85
MS-05	0.48342	274.1	11Mar2010, 12:45	2.01
MS-06	0.62054	547.0	11Mar2010, 12:30	2.60
MS-07	0.19657	170.6	11Mar2010, 12:30	2.52
MS-08	0.11574	74.9	11Mar2010, 12:45	2.33
MS-09	0.20679	115.1	11Mar2010, 12:45	2.08
MS-10	0.10705	93.0	11Mar2010, 12:30	2.52
MS-11	0.52725	372.9	11Mar2010, 12:45	2.76
MS-12	0.07935	83.1	11Mar2010, 12:30	3.06
MS-13	0.38958	335.7	11Mar2010, 12:45	3.05
MS-14	0.13030	113.3	11Mar2010, 12:30	2.60
MS-15	0.24087	142.9	11Mar2010, 12:45	2.09
MS-16	0.09098	79.9	11Mar2010, 12:30	2.96
MS-17	0.29812	294.8	11Mar2010, 12:30	3.05
P-MS-07	4.81369	2510.0	11Mar2010, 13:00	2.26
P-MS-10	8.26117	3674.2	11Mar2010, 13:30	2.30
P-MS-11	9.17568	3955.2	11Mar2010, 13:30	2.31
P-MS-13	9.64461	4035.5	11Mar2010, 13:45	2.33
R-MS-02	0.48227	315.6	11Mar2010, 13:00	2.58
R-MS-03	1.00321	589.3	11Mar2010, 13:00	2.36
R-MS-04	1.94709	1060.4	11Mar2010, 13:00	2.24
R-MS-05	3.51316	2006.8	11Mar2010, 13:00	2.31
R-MS-06	3.99658	2215.5	11Mar2010, 13:00	2.27
R-MS-08	4.81369	2450.7	11Mar2010, 13:15	2.25
R-MS-09A	5.23439	2594.5	11Mar2010, 13:15	2.26
R-MS-09B	5.80808	2840.8	11Mar2010, 13:15	2.29
R-MS-10	6.33283	3009.5	11Mar2010, 13:15	2.29
R-MS-11A	8.26117	3665.9	11Mar2010, 13:30	2.30
R-MS-11B	0.25260	206.5	11Mar2010, 12:30	2.60
R-MS-11C	8.51377	3720.7	11Mar2010, 13:30	2.30
R-MS-13	9.25503	3930.3	11Mar2010, 13:30	2.32
R-MS-15	9.77491	4045.8	11Mar2010, 13:45	2.33

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	4136.9	11Mar2010, 13:45	2.32
R-MS-17	10.74072	4260.0	11Mar2010, 13:45	2.35
R-T10-02	0.33329	263.4	11Mar2010, 12:45	2.95
R-T2-02	0.68525	499.3	11Mar2010, 12:45	2.67
R-T4-03	0.36108	263.2	11Mar2010, 12:45	2.57
R-T5-02	0.16467	124.7	11Mar2010, 12:45	2.68
R-T6-03	0.60697	378.3	11Mar2010, 12:45	2.54
R-T6-04	1.40439	828.0	11Mar2010, 12:45	2.33
T10-01	0.33329	266.6	11Mar2010, 12:45	2.95
T10-02	0.07294	76.3	11Mar2010, 12:15	3.06
T1-01	0.50230	309.2	11Mar2010, 12:45	2.17
T2-01	0.68525	515.8	11Mar2010, 12:45	2.68
T2-02	0.69115	452.3	11Mar2010, 12:45	2.33
T3-01	0.30496	238.9	11Mar2010, 12:30	2.43
T4-01	0.23178	165.4	11Mar2010, 12:45	2.51
T4-02	0.12930	98.7	11Mar2010, 12:45	2.68
T4-03	0.21261	148.9	11Mar2010, 12:45	2.59
T5-01	0.16467	125.5	11Mar2010, 12:45	2.68
T5-02	0.15329	128.5	11Mar2010, 12:30	2.43
T6-01	0.38513	249.0	11Mar2010, 13:00	2.67
T6-02	0.22184	175.3	11Mar2010, 12:30	2.34
T6-03	0.79742	487.8	11Mar2010, 12:45	2.17
T6-04	0.41690	309.0	11Mar2010, 12:30	2.51
T7-01	0.25260	223.8	11Mar2010, 12:30	2.60
T8-01	0.13466	93.5	11Mar2010, 12:30	2.17
T9-01	0.22773	139.8	11Mar2010, 12:45	2.33

Project: NOROTON_03 Simulation Run: PR UCONN 025-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 025-YR
Compute Time: 23Apr2010, 14:09:22 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	883.1	11Mar2010, 12:45	3.41
J-MS-03	1.94709	1615.1	11Mar2010, 12:45	3.27
J-MS-04	3.51316	3047.7	11Mar2010, 12:45	3.36
J-MS-05	3.99658	3275.1	11Mar2010, 13:00	3.31
J-MS-06	4.61712	3733.8	11Mar2010, 12:45	3.36
J-MS-07	4.81369	3905.7	11Mar2010, 12:45	3.37
J-MS-08	5.23439	3976.7	11Mar2010, 13:00	3.30
J-MS-09A	5.80808	4326.6	11Mar2010, 13:00	3.33
J-MS-09B	6.33283	4614.0	11Mar2010, 13:00	3.34
J-MS-10	8.26117	5983.7	11Mar2010, 13:00	3.36
J-MS-11A	8.51377	5533.2	11Mar2010, 13:30	3.35
J-MS-11B	9.17568	5900.7	11Mar2010, 13:15	3.38
J-MS-12	9.25503	5916.3	11Mar2010, 13:30	3.37
J-MS-13	9.64461	6052.2	11Mar2010, 13:30	3.40
J-MS-14	9.77491	6006.9	11Mar2010, 13:45	3.38
J-MS-15	10.24351	6150.9	11Mar2010, 13:45	3.37
J-MS-16	10.74072	6330.7	11Mar2010, 13:45	3.40
J-MS-17	11.03884	6404.2	11Mar2010, 13:45	3.42
J-T10-02	0.40623	434.2	11Mar2010, 12:45	4.12
J-T2-02	1.37640	1369.0	11Mar2010, 12:45	3.58
J-T4-02	0.36108	375.3	11Mar2010, 12:45	3.66
J-T4-03	0.57369	587.3	11Mar2010, 12:45	3.67
J-T5-02	0.31796	347.9	11Mar2010, 12:30	3.65
J-T6-02	0.60697	555.5	11Mar2010, 12:45	3.64
J-T6-03	1.40439	1270.1	11Mar2010, 12:45	3.37
J-T6-04	1.82129	1655.8	11Mar2010, 12:45	3.42
MS-01	0.48227	468.3	11Mar2010, 12:45	3.68
MS-02	0.52094	450.1	11Mar2010, 12:45	3.18

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	370.9	11Mar2010, 12:45	3.08
MS-04	0.18967	166.0	11Mar2010, 12:30	2.80
MS-05	0.48342	411.9	11Mar2010, 12:45	2.99
MS-06	0.62054	777.1	11Mar2010, 12:30	3.70
MS-07	0.19657	243.0	11Mar2010, 12:30	3.60
MS-08	0.11574	109.1	11Mar2010, 12:45	3.38
MS-09	0.20679	173.1	11Mar2010, 12:45	3.08
MS-10	0.10705	132.3	11Mar2010, 12:30	3.60
MS-11	0.52725	526.1	11Mar2010, 12:45	3.88
MS-12	0.07935	113.4	11Mar2010, 12:30	4.22
MS-13	0.38958	459.9	11Mar2010, 12:45	4.21
MS-14	0.13030	161.3	11Mar2010, 12:30	3.70
MS-15	0.24087	215.4	11Mar2010, 12:30	3.09
MS-16	0.09098	111.2	11Mar2010, 12:30	4.11
MS-17	0.29812	405.6	11Mar2010, 12:30	4.22
P-MS-07	4.81369	3801.7	11Mar2010, 13:00	3.30
P-MS-10	8.26117	5462.9	11Mar2010, 13:15	3.34
P-MS-11	9.17568	5890.8	11Mar2010, 13:30	3.36
P-MS-13	9.64461	5971.8	11Mar2010, 13:45	3.38
R-MS-02	0.48227	449.9	11Mar2010, 13:00	3.66
R-MS-03	1.00321	866.8	11Mar2010, 13:00	3.40
R-MS-04	1.94709	1569.7	11Mar2010, 13:00	3.27
R-MS-05	3.51316	2950.7	11Mar2010, 13:00	3.35
R-MS-06	3.99658	3268.8	11Mar2010, 13:00	3.31
R-MS-08	4.81369	3679.5	11Mar2010, 13:00	3.29
R-MS-09A	5.23439	3860.4	11Mar2010, 13:15	3.30
R-MS-09B	5.80808	4240.4	11Mar2010, 13:15	3.33
R-MS-10	6.33283	4542.2	11Mar2010, 13:15	3.33
R-MS-11A	8.26117	5439.1	11Mar2010, 13:30	3.34
R-MS-11B	0.25260	296.1	11Mar2010, 12:30	3.69
R-MS-11C	8.51377	5532.1	11Mar2010, 13:30	3.35
R-MS-13	9.25503	5859.5	11Mar2010, 13:30	3.37
R-MS-15	9.77491	5995.7	11Mar2010, 13:45	3.38

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	6133.3	11Mar2010, 13:45	3.37
R-MS-17	10.74072	6311.5	11Mar2010, 13:45	3.40
R-T10-02	0.33329	365.6	11Mar2010, 12:45	4.10
R-T2-02	0.68525	710.5	11Mar2010, 12:45	3.78
R-T4-03	0.36108	374.8	11Mar2010, 12:45	3.66
R-T5-02	0.16467	176.1	11Mar2010, 12:45	3.79
R-T6-03	0.60697	548.9	11Mar2010, 12:45	3.62
R-T6-04	1.40439	1230.1	11Mar2010, 12:45	3.37
T10-01	0.33329	369.3	11Mar2010, 12:45	4.10
T10-02	0.07294	105.8	11Mar2010, 12:15	4.22
T1-01	0.50230	456.3	11Mar2010, 12:45	3.18
T2-01	0.68525	727.7	11Mar2010, 12:45	3.79
T2-02	0.69115	658.5	11Mar2010, 12:45	3.38
T3-01	0.30496	346.6	11Mar2010, 12:30	3.49
T4-01	0.23178	236.3	11Mar2010, 12:45	3.59
T4-02	0.12930	139.0	11Mar2010, 12:45	3.79
T4-03	0.21261	212.5	11Mar2010, 12:45	3.68
T5-01	0.16467	176.7	11Mar2010, 12:45	3.79
T5-02	0.15329	184.4	11Mar2010, 12:30	3.50
T6-01	0.38513	354.8	11Mar2010, 12:45	3.77
T6-02	0.22184	255.2	11Mar2010, 12:30	3.39
T6-03	0.79742	721.2	11Mar2010, 12:45	3.18
T6-04	0.41690	447.2	11Mar2010, 12:30	3.59
T7-01	0.25260	317.6	11Mar2010, 12:30	3.70
T8-01	0.13466	139.3	11Mar2010, 12:30	3.19
T9-01	0.22773	204.9	11Mar2010, 12:45	3.38

Project: NOROTON_03 Simulation Run: PR UCONN 050-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 050-YR
Compute Time: 23Apr2010, 13:55:50 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	1110.0	11Mar2010, 12:45	4.26
J-MS-03	1.94709	2050.8	11Mar2010, 12:45	4.11
J-MS-04	3.51316	3848.6	11Mar2010, 12:45	4.21
J-MS-05	3.99658	4104.3	11Mar2010, 13:00	4.15
J-MS-06	4.61712	4751.1	11Mar2010, 12:45	4.20
J-MS-07	4.81369	4961.8	11Mar2010, 12:45	4.21
J-MS-08	5.23439	5066.6	11Mar2010, 13:00	4.14
J-MS-09A	5.80808	5540.1	11Mar2010, 13:00	4.17
J-MS-09B	6.33283	5925.3	11Mar2010, 13:00	4.18
J-MS-10	8.26117	7662.1	11Mar2010, 13:00	4.20
J-MS-11A	8.51377	7298.0	11Mar2010, 13:15	4.20
J-MS-11B	9.17568	7778.0	11Mar2010, 13:15	4.22
J-MS-12	9.25503	7758.6	11Mar2010, 13:30	4.22
J-MS-13	9.64461	7942.0	11Mar2010, 13:30	4.25
J-MS-14	9.77491	7827.5	11Mar2010, 13:30	4.23
J-MS-15	10.24351	7939.3	11Mar2010, 13:30	4.22
J-MS-16	10.74072	8158.6	11Mar2010, 13:30	4.25
J-MS-17	11.03884	8244.7	11Mar2010, 13:45	4.27
J-T10-02	0.40623	527.7	11Mar2010, 12:45	5.03
J-T2-02	1.37640	1700.2	11Mar2010, 12:45	4.44
J-T4-02	0.36108	462.9	11Mar2010, 12:30	4.53
J-T4-03	0.57369	725.5	11Mar2010, 12:45	4.54
J-T5-02	0.31796	431.3	11Mar2010, 12:30	4.52
J-T6-02	0.60697	687.0	11Mar2010, 12:45	4.51
J-T6-03	1.40439	1587.1	11Mar2010, 12:45	4.22
J-T6-04	1.82129	2073.2	11Mar2010, 12:45	4.27
MS-01	0.48227	579.7	11Mar2010, 12:45	4.55
MS-02	0.52094	568.9	11Mar2010, 12:45	4.00

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	470.9	11Mar2010, 12:45	3.89
MS-04	0.18967	214.7	11Mar2010, 12:30	3.58
MS-05	0.48342	525.0	11Mar2010, 12:30	3.79
MS-06	0.62054	958.4	11Mar2010, 12:30	4.58
MS-07	0.19657	300.1	11Mar2010, 12:30	4.47
MS-08	0.11574	136.4	11Mar2010, 12:45	4.23
MS-09	0.20679	219.8	11Mar2010, 12:45	3.89
MS-10	0.10705	163.3	11Mar2010, 12:30	4.47
MS-11	0.52725	646.5	11Mar2010, 12:45	4.77
MS-12	0.07935	137.0	11Mar2010, 12:30	5.14
MS-13	0.38958	556.3	11Mar2010, 12:45	5.13
MS-14	0.13030	199.1	11Mar2010, 12:30	4.57
MS-15	0.24087	275.1	11Mar2010, 12:30	3.90
MS-16	0.09098	135.7	11Mar2010, 12:30	5.02
MS-17	0.29812	491.8	11Mar2010, 12:30	5.14
P-MS-07	4.81369	4811.7	11Mar2010, 13:00	4.13
P-MS-10	8.26117	7189.9	11Mar2010, 13:15	4.18
P-MS-11	9.17568	7728.3	11Mar2010, 13:30	4.21
P-MS-13	9.64461	7774.7	11Mar2010, 13:30	4.22
R-MS-02	0.48227	554.2	11Mar2010, 13:00	4.54
R-MS-03	1.00321	1082.7	11Mar2010, 13:00	4.25
R-MS-04	1.94709	1970.8	11Mar2010, 13:00	4.10
R-MS-05	3.51316	3695.6	11Mar2010, 13:00	4.19
R-MS-06	3.99658	4102.0	11Mar2010, 13:00	4.15
R-MS-08	4.81369	4700.2	11Mar2010, 13:00	4.12
R-MS-09A	5.23439	4933.8	11Mar2010, 13:00	4.13
R-MS-09B	5.80808	5450.9	11Mar2010, 13:00	4.17
R-MS-10	6.33283	5761.8	11Mar2010, 13:00	4.17
R-MS-11A	8.26117	7137.5	11Mar2010, 13:15	4.18
R-MS-11B	0.25260	367.0	11Mar2010, 12:30	4.57
R-MS-11C	8.51377	7218.6	11Mar2010, 13:15	4.19
R-MS-13	9.25503	7711.3	11Mar2010, 13:30	4.21
R-MS-15	9.77491	7717.4	11Mar2010, 13:45	4.22

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	7904.0	11Mar2010, 13:45	4.21
R-MS-17	10.74072	8134.4	11Mar2010, 13:45	4.25
R-T10-02	0.33329	445.4	11Mar2010, 12:45	5.01
R-T2-02	0.68525	877.6	11Mar2010, 12:45	4.66
R-T4-03	0.36108	462.8	11Mar2010, 12:45	4.53
R-T5-02	0.16467	216.5	11Mar2010, 12:45	4.67
R-T6-03	0.60697	678.8	11Mar2010, 12:45	4.50
R-T6-04	1.40439	1547.6	11Mar2010, 12:45	4.22
T10-01	0.33329	449.4	11Mar2010, 12:45	5.01
T10-02	0.07294	128.7	11Mar2010, 12:15	5.15
T1-01	0.50230	577.1	11Mar2010, 12:30	4.01
T2-01	0.68525	894.3	11Mar2010, 12:45	4.67
T2-02	0.69115	822.6	11Mar2010, 12:45	4.23
T3-01	0.30496	432.2	11Mar2010, 12:30	4.35
T4-01	0.23178	292.3	11Mar2010, 12:45	4.45
T4-02	0.12930	170.9	11Mar2010, 12:30	4.68
T4-03	0.21261	262.7	11Mar2010, 12:45	4.56
T5-01	0.16467	216.9	11Mar2010, 12:45	4.67
T5-02	0.15329	228.6	11Mar2010, 12:30	4.36
T6-01	0.38513	438.6	11Mar2010, 12:45	4.66
T6-02	0.22184	318.8	11Mar2010, 12:30	4.24
T6-03	0.79742	908.4	11Mar2010, 12:45	4.01
T6-04	0.41690	557.1	11Mar2010, 12:30	4.45
T7-01	0.25260	391.5	11Mar2010, 12:30	4.58
T8-01	0.13466	176.1	11Mar2010, 12:30	4.02
T9-01	0.22773	256.8	11Mar2010, 12:45	4.22

Project: NOROTON_03 Simulation Run: PR UCONN 100-YR RUN

Start of Run: 11Mar2010, 00:00 Basin Model: NR_Basin_PR
End of Run: 12Mar2010, 00:15 Meteorologic Model: UCONN 100-YR
Compute Time: 23Apr2010, 13:56:26 Control Specifications: 24 HR STORM

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
J-MS-02	1.00321	1410.5	11Mar2010, 12:45	5.40
J-MS-03	1.94709	2631.0	11Mar2010, 12:45	5.23
J-MS-04	3.51316	4913.0	11Mar2010, 12:45	5.34
J-MS-05	3.99658	5258.8	11Mar2010, 12:45	5.27
J-MS-06	4.61712	6110.5	11Mar2010, 12:45	5.34
J-MS-07	4.81369	6372.3	11Mar2010, 12:45	5.35
J-MS-08	5.23439	6515.1	11Mar2010, 13:00	5.27
J-MS-09A	5.80808	7144.5	11Mar2010, 13:00	5.31
J-MS-09B	6.33283	7650.6	11Mar2010, 13:00	5.31
J-MS-10	8.26117	9889.2	11Mar2010, 13:00	5.33
J-MS-11A	8.51377	9503.3	11Mar2010, 13:15	5.33
J-MS-11B	9.17568	10134.2	11Mar2010, 13:15	5.36
J-MS-12	9.25503	9949.3	11Mar2010, 13:15	5.35
J-MS-13	9.64461	10109.0	11Mar2010, 13:15	5.39
J-MS-14	9.77491	10159.2	11Mar2010, 13:30	5.36
J-MS-15	10.24351	10357.0	11Mar2010, 13:30	5.35
J-MS-16	10.74072	10648.4	11Mar2010, 13:30	5.39
J-MS-17	11.03884	10705.3	11Mar2010, 13:30	5.41
J-T10-02	0.40623	649.8	11Mar2010, 12:45	6.24
J-T2-02	1.37640	2137.1	11Mar2010, 12:45	5.60
J-T4-02	0.36108	582.9	11Mar2010, 12:30	5.70
J-T4-03	0.57369	907.6	11Mar2010, 12:45	5.71
J-T5-02	0.31796	541.4	11Mar2010, 12:30	5.69
J-T6-02	0.60697	860.4	11Mar2010, 12:45	5.67
J-T6-03	1.40439	2007.8	11Mar2010, 12:45	5.35
J-T6-04	1.82129	2626.3	11Mar2010, 12:45	5.41
MS-01	0.48227	726.5	11Mar2010, 12:45	5.72
MS-02	0.52094	727.4	11Mar2010, 12:45	5.12

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
MS-03	0.44158	604.8	11Mar2010, 12:45	5.00
MS-04	0.18967	280.5	11Mar2010, 12:30	4.65
MS-05	0.48342	681.8	11Mar2010, 12:30	4.88
MS-06	0.62054	1197.0	11Mar2010, 12:30	5.75
MS-07	0.19657	375.3	11Mar2010, 12:30	5.63
MS-08	0.11574	172.7	11Mar2010, 12:45	5.36
MS-09	0.20679	282.3	11Mar2010, 12:45	5.00
MS-10	0.10705	204.0	11Mar2010, 12:30	5.63
MS-11	0.52725	804.7	11Mar2010, 12:45	5.96
MS-12	0.07935	167.7	11Mar2010, 12:30	6.36
MS-13	0.38958	682.1	11Mar2010, 12:30	6.34
MS-14	0.13030	248.9	11Mar2010, 12:30	5.75
MS-15	0.24087	355.2	11Mar2010, 12:30	5.01
MS-16	0.09098	167.7	11Mar2010, 12:30	6.22
MS-17	0.29812	604.2	11Mar2010, 12:30	6.35
P-MS-07	4.81369	6148.1	11Mar2010, 13:00	5.26
P-MS-10	8.26117	9351.0	11Mar2010, 13:15	5.32
P-MS-11	9.17568	9900.4	11Mar2010, 13:15	5.34
P-MS-13	9.64461	10094.5	11Mar2010, 13:30	5.36
R-MS-02	0.48227	690.7	11Mar2010, 13:00	5.70
R-MS-03	1.00321	1366.2	11Mar2010, 13:00	5.38
R-MS-04	1.94709	2527.7	11Mar2010, 12:45	5.23
R-MS-05	3.51316	4679.1	11Mar2010, 13:00	5.33
R-MS-06	3.99658	5203.4	11Mar2010, 13:00	5.27
R-MS-08	4.81369	6057.6	11Mar2010, 13:00	5.25
R-MS-09A	5.23439	6391.3	11Mar2010, 13:00	5.26
R-MS-09B	5.80808	7056.0	11Mar2010, 13:00	5.30
R-MS-10	6.33283	7505.3	11Mar2010, 13:00	5.31
R-MS-11A	8.26117	9305.6	11Mar2010, 13:15	5.32
R-MS-11B	0.25260	460.6	11Mar2010, 12:30	5.74
R-MS-11C	8.51377	9443.0	11Mar2010, 13:15	5.33
R-MS-13	9.25503	9821.4	11Mar2010, 13:30	5.35
R-MS-15	9.77491	10050.5	11Mar2010, 13:30	5.36

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
R-MS-16	10.24351	10277.8	11Mar2010, 13:30	5.35
R-MS-17	10.74072	10535.2	11Mar2010, 13:30	5.38
R-T10-02	0.33329	549.8	11Mar2010, 12:45	6.21
R-T2-02	0.68525	1096.9	11Mar2010, 12:45	5.84
R-T4-03	0.36108	578.6	11Mar2010, 12:45	5.70
R-T5-02	0.16467	269.6	11Mar2010, 12:45	5.85
R-T6-03	0.60697	850.3	11Mar2010, 12:45	5.66
R-T6-04	1.40439	1969.0	11Mar2010, 12:45	5.35
T10-01	0.33329	554.1	11Mar2010, 12:45	6.21
T10-02	0.07294	158.7	11Mar2010, 12:15	6.36
T1-01	0.50230	742.1	11Mar2010, 12:30	5.13
T2-01	0.68525	1113.1	11Mar2010, 12:45	5.85
T2-02	0.69115	1040.2	11Mar2010, 12:45	5.37
T3-01	0.30496	545.5	11Mar2010, 12:30	5.50
T4-01	0.23178	368.8	11Mar2010, 12:30	5.61
T4-02	0.12930	214.1	11Mar2010, 12:30	5.86
T4-03	0.21261	328.9	11Mar2010, 12:45	5.72
T5-01	0.16467	269.8	11Mar2010, 12:45	5.85
T5-02	0.15329	287.0	11Mar2010, 12:30	5.51
T6-01	0.38513	549.0	11Mar2010, 12:45	5.83
T6-02	0.22184	403.0	11Mar2010, 12:30	5.38
T6-03	0.79742	1157.5	11Mar2010, 12:45	5.12
T6-04	0.41690	702.4	11Mar2010, 12:30	5.62
T7-01	0.25260	488.6	11Mar2010, 12:30	5.75
T8-01	0.13466	225.3	11Mar2010, 12:30	5.14
T9-01	0.22773	325.8	11Mar2010, 12:45	5.36

APPENDIX G

Effective Model Provided by FEMA and River Stationing Differences

APPENDIX G
COMPARISON OF RIVER STATIONS BETWEEN
FEMA 1993 FIS AND FEMA EFFECTIVE MODEL

1993 FIS Table 5		HEC-2 Model Information			
Cross Section	FIS River Distance	HEC-2 Section Number	Center Channel Distance	River Distance Summation	Plus 1 foot at each bridge
		190	0	190	190
		400	210	400	400
A	580	580	180	580	580
		689	109	689	689
Interstate 95		Bridge #1		689	689
		990	300	989	990
		1100	110	1099	1100
		1300	200	1299	1300
B	1500	1500	200	1499	1500
		1750	250	1749	1750
		2000	250	1999	2000
		2250	250	2249	2250
		2500	250	2499	2500
		2750	250	2749	2750
		2950	200	2949	2950
C	3100	3100	150	3099	3100
		3300	200	3299	3300
D	3539	3570	220	3519	3520
		3680	160	3679	3680
		3681	1	3680	3681
Conrail		Bridge #2		3680	3681
		3778	97	3777	3778
		3779	1	3778	3779
		3870	91	3869	3870
E	4100	4100	230	4099	4100
		4375	275	4374	4375
		4475	105	4479	4480
West Avenue / Maple Tree Avenue		Bridge #3		4479	4480
		4528	53	4532	4533
		4630	95	4627	4628
F	4850	4850	220	4847	4848
		5100	250	5097	5098
		5300	200	5297	5298
		5500	200	5497	5498
G	5700	5700	200	5697	5698
		5900	200	5897	5898
		6100	200	6097	6098
		6330	230	6327	6328
		6435	105	6432	6433
Middlesex Road / Glenbrook Avenue		Bridge #4		6432	6433
		6488	53	6485	6486
H	6580	6580	102	6587	6588
		6800	220	6807	6808

APPENDIX G
COMPARISON OF RIVER STATIONS BETWEEN
FEMA 1993 FIS AND FEMA EFFECTIVE MODEL

1993 FIS Table 5		HEC-2 Model Information			
Cross Section	FIS River Distance	HEC-2 Section Number	Center Channel Distance	River Distance Summation	Plus 1 foot at each bridge
		7000	200	7007	7008
		7200	200	7207	7208
		7400	200	7407	7408
		7600	200	7607	7608
		7800	200	7807	7808
		8000	200	8007	8008
I	8250	8250	250	8257	8258
		8500	250	8507	8508
		8750	250	8757	8758
		9000	250	9007	9008
		9250	250	9257	9258
		9500	250	9507	9508
		9750	250	9757	9758
		10000	250	10007	10008
		10794	50	10057	10058
		60	60	10117	10118
		110	50	10167	10168
		250	140	10307	10308
		390	140	10447	10448
		480	90	10537	10538
		575	95	10632	10633
		667	92	10724	10725
		767	100	10824	10825
		787	20	10844	10845
		800	60	10904	10905
		11720	79	10983	10984
		11150	255	11238	11239
		11400	250	11488	11489
		11570	170	11658	11659
		11700	130	11788	11789
		11900	200	11988	11989
J	12150	12100	200	12188	12189
		12500	400	12588	12589
		12800	300	12888	12889
K	13100	13000	200	13088	13089
		13120	120	13208	13209
Dam		Bridge #5		13208	13209
		13122	2	13210	13211
		13170	48	13258	13259
		13350	180	13438	13439
		13550	200	13638	13639
L	13820	13730	180	13818	13819
		13834	104	13922	13923

APPENDIX G
COMPARISON OF RIVER STATIONS BETWEEN
FEMA 1993 FIS AND FEMA EFFECTIVE MODEL

1993 FIS Table 5		HEC-2 Model Information			
Cross Section	FIS River Distance	HEC-2 Section Number	Center Channel Distance	River Distance Summation	Plus 1 foot at each bridge
Conrail		Bridge #6		13922	13923
		13846	12	13934	13935
		13950	104	14038	14039
		14250	300	14338	14339
		14500	250	14588	14589
M	14840	14750	250	14838	14839
		14837	87	14925	14926
Camp Avenue		Bridge #7		14925	14926
		14883	46	14971	14972
		14950	67	15038	15039
N	15300	15200	250	15288	15289
		15430	230	15518	15519
		15700	270	15788	15789
		15950	250	16038	16039
		16250	300	16338	16339
O	16600	16500	250	16588	16589
		16850	350	16938	16939
		17050	200	17138	17139
		17200	150	17288	17289
		17450	250	17538	17539
		17650	200	17738	17739
		17870	220	17958	17959
P	18200	18100	230	18188	18189
		18199	99	18287	18288
Woodway Road		Bridge #8		18287	18288
		18241	42	18329	18330
		18330	89	18418	18419
Q	18600	18500	170	18588	18589
		18750	250	18838	18839
		19000	250	19088	19089
		19300	300	19388	19389
R	19650	19550	250	19638	19639
		19850	300	19938	19939
		20050	200	20138	20139
		20200	150	20288	20289
S	20700	20600	400	20688	20689
		20750	150	20838	20839
		20919	169	21007	21008
		20920	1	21008	21009
#3		Bridge #9		21008	21009
		20932	12	21020	21021
		20933	1	21021	21022
T	21100	21000	67	21088	21089

APPENDIX G
COMPARISON OF RIVER STATIONS BETWEEN
FEMA 1993 FIS AND FEMA EFFECTIVE MODEL

1993 FIS Table 5		HEC-2 Model Information			
Cross Section	FIS River Distance	HEC-2 Section Number	Center Channel Distance	River Distance Summation	Plus 1 foot at each bridge
		21250	250	21338	21339
U	21650	21550	300	21638	21639
		21740	190	21828	21829
		21789	49	21877	21878
		21790	1	21878	21879
#7		Bridge #10		21878	21879
		21800	10	21888	21889
		21801	1	21889	21890
V	21950	21850	49	21938	21939
		22200	350	22288	22289
		22239	39	22327	22328
		22240	1	22328	22329
#10		Bridge #11		22328	22329
		22257	17	22345	22346
		22258	1	22346	22347
		22310	52	22398	22399
W	22700	22600	290	22688	22689
		22900	300	22988	22989
		23170	270	23258	23259
X	23650	23550	380	23638	23639
		23590	40	23678	23679
		23631	41	23719	23720
		23632	1	23720	23721
#13		Bridge #12		23720	23721
		23647	15	23735	23736
		23648	1	23736	23737
		23690	42	23778	23779
Y	24020	23920	230	24008	24009

EFFECTIVE MODEL PROVIDED BY FEMA, NRTNM.DAT

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T1      CITY OF STAMFORD, CONNECTICUT
T2      TYPE 19 FLOOD INSURANCE STUDY
T3      NOROTON RIVER - 100 YEAR FLOOD
J1          2       4.7
J2          1        -1
J3        200       115
J5        -10       -10
QT          2      5300      5300
NC       0.07      0.07     0.034       0.1       0.3
ET       10.4
X1        190         9      4951    5049.1
GR      16.44      4951      3.54    4951.1      2.14      4957      1.14      4982      1.64      4993
GR       2.24      5020      2.94      5049      9.34    5049.1     10.64      5097         0         0
ET        9.1      4961      5040
NH          4        10      4961      0.07      4977     0.034      5022      0.07      5720
X1        400        39      4977      5022       210       210       210
X2         15
GR         44      4059      32.4      4122      24.2      4203      22.8      4292      21.5      4417
GR       24.7      4506      29.5      4545      30.9      4586      28.6      4600      22.1      4623
GR       21.8      4635      27.9      4663      26.4      4738      18.8      4786       9.6      4858
GR        9.7      4891       9.1      4899       7.7      4961       2.7      4977      2.05      4982
GR       1.95      4992      2.65      5004       2.8      5022       9.5      5035      11.5      5088
GR       29.6      5106      29.6      5205      29.1      5305      30.8      5404      31.5      5444
GR       35.7      5497      36.6      5538      39.7      5540      40.1      5591      39.2      5620
GR       39.7      5663      42.9      5683      44.7      5696      48.7      5720         0         0
NC       0.07      0.07     0.048
ET        9.1      4925      5075
X1        580        46      4986      5014       220       155       180
GR       49.8      3887      41.5      3905      34.1      4027      31.9      4129      30.8      4261
GR       28.4      4358        31      4399        33      4428      32.9      4470      30.4      4485
GR       17.8      4520      19.6      4626      18.3      4666      13.5      4734      11.2      4749
GR       10.4      4799       9.2      4819       9.7      4867       9.4      4870       6.9      4970
GR        4.6      4978       3.2      4986       2.7      4994       2.4      5006       3.1      5014
GR        3.7      5022       7.6      5031       9.5      5064      14.7      5074      29.5      5111
GR       31.6      5142      31.4      5245      29.5      5261      29.8      5292      31.7      5300
GR       32.5      5349      35.3      5426        38      5447      41.5      5495      43.4      5561
GR       42.9      5574      39.5      5616      39.8      5665      45.3      5681      48.9      5699
GR       54.3      5755         0         0         0         0         0         0         0         0
NC        0.3       0.5
ET        9.1      4974      5026
X1        689        30      4974      5026       120        80       109         0
X3         10      16.8        45
GR         49      3376      43.1      3537        39      3678      33.9      3888      29.9      4047
GR         29      4240      29.9      4371      33.7      4534     37.55    4712.4      16.7    4712.5
GR       16.7    4777.5     38.95    4777.6      41.3      4887      42.5      4946     12.91      4974
GR        3.7    4974.1       3.5      4990       3.5    4990.1       3.9    4991.5       3.9    4991.6
GR       3.11    5008.5      3.11    5008.6      3.51      5010      3.51    5010.1      3.31      5026
GR       12.6    5026.1      45.4      5053      49.4      5222      54.3      5428      58.3      5604
NC      0.073     0.064     0.048         0         0
ET        9.1      4974      5026
SB       1.25     1.787       2.6         0        42         3       273         0      9.27      3.11
X1        990        33      4974    5026.1       300       300       300         0
X2          0         0         1     16.23        18         0         0         0         0         0
X3         10        18      48.6
BT         33      3376        49        49      3537      43.1      43.1      3678        39        39
BT       3888      33.9      33.9      4047      29.9      29.9      4240        29        29      4371
BT       29.9      29.9      4534      33.7      33.7    4682.4     35.13     35.13    4682.5        18
BT         18    4747.5        18        18    4747.6     40.52     40.52      4887      41.3      41.3
BT       4941        42      24.2      4956        43        20      4974        44     16.34    4974.1
BT         44     16.23      4990        45     16.23    4990.1        45     16.23    4991.5        45
BT      16.23    4991.6        45     16.23    5008.5        46     16.23    5008.6        46     16.23
BT       5010      46.5     16.23    5010.1      46.5     16.23      5026        47     16.23    5026.1
BT         47     16.23      5038      47.5      19.6      5054        48      19.6      5072      48.6
BT       19.8      5222      49.4      49.4      5428      54.3      54.3      5604      58.3      58.3
GR         49      3376      43.1      3537        39      3678      33.9      3888      29.9      4047
GR         29      4240      29.9      4371      33.7      4534     35.13    4682.4        18    4682.5
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GR	18	4747.5	40.52	4747.6	41.3	4887	24.2	4941	20	4956
GR	16.34	4974	9.2	4974.1	8.8	4990	8.8	4990.1	8.5	4991.5
GR	8.5	4991.6	8.3	5008.5	8.3	5008.6	8.6	5010	8.6	5010.1
GR	8.6	5026	16	5026.1	19.6	5038	19.6	5054	19.8	5072
GR	49.4	5222	54.3	5428	58.3	5604				
ET	9.1	4955	5075							
X1	1100	64	4983	5017	65	150	110			
GR	53.2	3299	36.4	3406	33.5	3448	33.2	3495	34.8	3567
GR	34.5	3644	32.9	3711	43	3743	44.1	3781	42.3	3797
GR	27.9	3834	28.2	3899	27.2	4078	24.7	4212	25.2	4296
GR	27	4329	29.6	4437	33.9	4527	34.2	4551	28.1	4567
GR	29.3	4585	28.9	4609	24.3	4624	23.5	4640	27.1	4658
GR	25.5	4684	19.4	4701	18.3	4744	18.8	4789	17.8	4824
GR	22.8	4851	25	4882	25.4	4911	24.5	4927	23	4947
GR	12.1	4976	10.5	4983	9.6	4984	8.9	4990	7.9	5005
GR	9.5	5017	18.2	5033	19.6	5058	19.5	5075	25.8	5095
GR	38.2	5111	42.1	5128	41.9	5139	40.8	5202	39	5252
GR	31	5305	31.1	5331	32.5	5341	32.7	5365	31.6	5413
GR	30.2	5463	30.7	5499	32.1	5557	36.3	5595	40.4	5639
GR	40.8	5676	43.8	5686	45.8	5706	48.1	5821	0	0
NC	0.065	0.06	0.025	0.1	0.3					
NH	4	0.065	4989	0.025	5010	0.06	5110	10	5953	
ET	9.1	4885	5110							
X1	1300	57	4989	5010	110	220	200			
GR	48.8	3473	34.8	3565	33.9	3612	34.4	3694	33.4	3893
GR	43	3923	44	3964	44.7	4001	35.5	4037	31.7	4051
GR	31.4	4223	31.7	4338	31.3	4428	31.7	4450	31.9	4462
GR	31.1	4598	33.2	4633	32.2	4674	27.3	4703	28.6	4736
GR	28.1	4782	27.4	4811	25.6	4836	18.8	4857	19.5	4900
GR	19.4	4915	18.2	4928	18	4946	18.9	4955	18.3	4973
GR	11	4989	9.53	4990	8.83	4994	7.83	5003	11	5010
GR	18.3	5043	18.3	5080	20.3	5135	24.3	5165	27.8	5186
GR	28.3	5196	29.7	5271	30.2	5382	30.1	5410	31.5	5433
GR	31.5	5490	35.3	5526	37.4	5598	40.5	5627	41.5	5640
GR	41.7	5681	39.9	5729	40.2	5766	42	5779	44.2	5857
GR	45.6	5934	52.3	5953	0	0	0	0	0	0
ET	9.1	4900	5080							
X1	1500	58	4978	5021	190	210	200			
GR	47.4	3608	34.9	3688	34.2	3734	34.7	3832	33.3	4032
GR	42.5	4057	42.1	4087	41	4090	37.3	4110	36.9	4139
GR	34.5	4149	31.8	4162	31	4378	31	4500	31.4	4586
GR	31.4	4613	31.2	4662	34	4691	33.3	4713	25.6	4736
GR	24.2	4751	24.9	4780	22.9	4853	20.6	4879	20.3	4918
GR	19.9	4928	14.4	4968	10.6	4978	8.16	4987	7.76	5004
GR	10.6	5021	17.2	5045	17.9	5062	25.7	5103	29.6	5146
GR	35.3	5161	37	5177	37.5	5216	35.3	5288	34.4	5344
GR	35.1	5423	36.3	5466	36.6	5495	36.4	5554	35.1	5614
GR	34.2	5671	34.9	5770	39.3	5774	40.3	5794	40.5	5820
GR	40.9	5858	42.2	5868	43.3	5902	45	5914	46	5949
GR	47.5	5963	49.4	5970	50.4	6000	0	0	0	0
NC	0.07	0.06	0.025							
ET	9.1	4920	5090							
X1	1750	56	4978.5	5021.5	250	250	250			
GR	45	3736	34	3802	33.3	3920	34.1	4173	39.1	4187
GR	39.1	4213	32.8	4241	31.9	4270	29.1	4287	30	4463
GR	29.6	4500	28.5	4610	28.4	4739	28.9	4764	29.3	4792
GR	29.3	4812	22.1	4890	22.6	4903	22.82	4906.5	22.77	4932.5
GR	22.67	4936.5	17.97	4951.5	13.97	4973.5	10.77	4978.5	8.07	4987.5
GR	7.67	5004.5	10.77	5021.5	18.17	5036.5	18.37	5059.5	19.2	5079
GR	25.5	5100	36.1	5144	44.8	5196	52.5	5224	54.4	5245
GR	57.2	5273	58.5	5290	59.9	5337	58.4	5361	58.8	5395
GR	60	5405	60.4	5448	61.3	5509	55.2	5539	45.9	5589
GR	44.2	5631	44	5659	41.3	5666	38.6	5715	36.6	5763
GR	37.5	5800	40.5	5826	42.8	5850	45.2	5909	47.7	5986
GR	58.4	6034	0	0	0	0	0	0	0	0
ET	9.1	4850	5140							

X1	2000	41	4967	5032	260	230	250			
GR	43.2	4069	37.4	4339	30.9	4620	30.2	4690	28.5	4724
GR	15.7	4781	16.4	4820	17.8	4848	14.7	4872	13.9	4893
GR	17.3	4905	14.8	4918	13.7	4954	10.6	4967	8.92	4981
GR	8.52	5007	10.6	5032	18.9	5070	17.1	5111	18.9	5132
GR	27.3	5168	40	5203	47.3	5240	52.3	5274	59.6	5328
GR	62.9	5359	63.1	5395	64.4	5432	65.1	5525	61	5571
GR	59	5608	59	5626	51.3	5646	41.1	5677	37.7	5743
GR	37.5	5782	39	5808	42.2	5886	47.3	5979	52.3	6029
GR	61.4	6055	0	0	0	0	0	0	0	0
ET	9.1	4720	5095							
X1	2250	52	4974	5025	260	230	250			
GR	36.4	3968	39.6	4021	46.5	4066	43.4	4148	26.2	4244
GR	23.2	4292	21.2	4426	21	4467	22.3	4478	18	4537
GR	15.3	4585	13.6	4649	16.1	4671	16	4696	13.9	4714
GR	14.1	4730	15.4	4744	14.9	4771	11.5	4781	10.8	4800
GR	10.8	4899	18.5	4920	18	4956	10.5	4974	9.77	4985
GR	9.37	5005	10.5	5025	18	5044	17.9	5074	33.5	5131
GR	42.7	5184	48.3	5201	50.4	5226	54	5264	55.1	5302
GR	55.7	5327	55	5353	52.7	5396	47.9	5457	44.1	5498
GR	40.8	5561	38.8	5659	38.9	5708	39.5	5740	41.1	5803
GR	42.8	5836	46.4	5860	48.9	5904	50.5	5925	55.8	5955
GR	60	5975	61.3	5980	0	0	0	0	0	0
NC	0.069	0.074	0.039							
ET	9.1	4630	5109							
X1	2500	59	4985	5014	240	260	250			
GR	43.3	3329	42.6	3363	39.8	3385	40	3526	33.7	3563
GR	29.1	3720	33.4	3743	33.6	3760	30.5	3785	27.5	3834
GR	25.6	3920	26.7	3963	24.7	4042	21.1	4072	20.9	4098
GR	18.3	4153	17.8	4239	17.5	4317	20.7	4335	23.2	4403
GR	21.9	4419	17.8	4453	17.1	4470	20.4	4479	17.8	4541
GR	18.2	4561	14.9	4580	17.5	4606	15.2	4629	12.4	4643
GR	18.6	4660	18.4	4669	11.1	4680	11.1	4899	15.8	4917
GR	15.3	4924	13.1	4952	13.9	4965	13.4	4979	10.9	4985
GR	10.52	4997	10.22	5006	10.9	5014	20.8	5045	21.5	5098
GR	25.2	5117	32.4	5135	35.6	5159	34.8	5223	34.2	5233
GR	34.7	5299	35.1	5412	35.7	5445	39.2	5520	39.4	5549
GR	43.8	5596	44.3	5617	50.5	5626	58.9	5673	0	0
NH	4	10	4696	0.069	4985	0.039	5014	0.074	5746	
ET	9.1	4696	5100							
X1	2750	58	4985	5014	210	255	250			
GR	46.3	3571	41.1	3618	41.1	3639	35.2	3677	33.4	3751
GR	33	3780	31	3788	32.1	3796	33.2	3840	33.1	3914
GR	30.2	4031	25.6	4083	24.4	4158	25.3	4182	23.5	4263
GR	20.6	4338	19.2	4459	19.5	4522	19.8	4567	17.6	4607
GR	15.7	4667	19.8	4696	18.9	4720	18.1	4743	18.6	4816
GR	18.8	4825	18.5	4855	21.1	4873	21.1	4917	18.4	4933
GR	17.6	4973	11.2	4985	11.37	4997	11.07	5006	11.2	5014
GR	20.4	5038	21.6	5099	25.6	5108	27.8	5146	30.6	5160
GR	35.9	5198	36.7	5240	36.5	5275	37.8	5310	38.7	5368
GR	39.6	5406	40	5510	39	5517	39.1	5548	43.4	5566
GR	44.3	5583	42	5623	41.6	5640	47.9	5654	50	5687
GR	56.3	5720	57.7	5743	61.6	5746	0	0	0	0
NH	5	10	4892	0.069	4984	0.039	5015	0.074	5035	10
NH	5786									
ET	9.1	4890	5035							
X1	2950	57	4958	5035	190	190	200			
GR	45.5	3927	41.4	3949	41.1	3964	32.5	4020	33	4072
GR	32.1	4122	34.7	4140	41.9	4156	41.7	4161	27.6	4184
GR	27.3	4206	27.3	4243	27.3	4418	27.3	4449	27.3	4482
GR	27.3	4531	27.3	4606	27.3	4662	27.3	4703	27.3	4722
GR	27.3	4758	27.3	4768	27.3	4823	27.3	4833	27.3	4841
GR	27.3	4850	26.8	4877	22.1	4892	20.4	4923	24.4	4941
GR	22.4	4958	11.85	4984	11.75	4997	11.75	5006	11.85	5015
GR	21.7	5035	22.7	5050	25.6	5122	26.7	5135.5	27.8	5149
GR	35.1	5180	34.8	5231	34.3	5237	34.5	5269	36.5	5286

GR	38.2	5359	38.8	5421	43.1	5478	43.7	5504	43.5	5544
GR	42.8	5578	39.8	5613	39.5	5657	39.3	5690	42	5721
GR	48.1	5752	58.9	5786	0	0	0	0	0	0
NC	0.085	0.079	0.061							
ET	9.1	4970	5035							
X1	3100	49	4980	5020	100	150	150			
GR	44	4083	41.7	4101	41.4	4142	44.8	4169	45.3	4188
GR	43	4202	34.2	4349	33	4395	25.7	4408	25.7	4474
GR	25.7	4546	25.6	4572	25.9	4616	25.8	4661	25.6	4688
GR	25.7	4714	34.6	4746	34.2	4844	29.9	4862	29.7	4909
GR	27	4930	27.8	4947	29	4961	16.46	4974	13.26	4980
GR	12.56	4997	12.26	5009	13.26	5020	14.46	5020.1	15.06	5027
GR	17.96	5027.1	22.36	5040	29.76	5041	27.36	5041.1	28.59	5058
GR	29.01	5099	30.94	5161	36.26	5292	40.1	5355	45.9	5476
GR	46.9	5538	47.8	5587	46.8	5628	48.5	5719	51.8	5734
GR	52.5	5769	56.1	5785	60.5	5810	60.7	5835	0	0
ET	9.1	4960	5035							
X1	3300	48	4987	5012	180	210	200			
GR	42.7	4171	40.9	4214	42.7	4231	39.9	4276	36.1	4320
GR	32.7	4449	30.6	4500	28.7	4514	27.9	4553	27.2	4603
GR	27.2	4685	27	4723	26.9	4784	26.8	4819	26.7	4845
GR	26.8	4860	26.8	4875	27	4889	27.8	4896	25.6	4958
GR	13.1	4987	13.36	4998	13.06	5006	13.1	5012	27.3	5040
GR	28.3	5064	28	5071	28.4	5125	28.7	5142	29.2	5251
GR	29.9	5278	36.1	5292	36.3	5324	39.8	5351	41.2	5401
GR	45.9	5433	46	5472	47.4	5484	49	5531	49.3	5583
GR	47.8	5601	47.8	5624	48.4	5707	50.3	5757	52.6	5802
GR	56.7	5862	60.7	5929	66.2	5984	0	0	0	0
NH	4	0.085	4985	0.061	5015	0.079	5094	10	6053	
ET	9.1	4970	5050							
X1	3570	35	4985	5015	230	195	220			
GR	43.8	4237	39	4329	36.3	4381	35.3	4453	32.9	4558
GR	33	4603	32.7	4648	32.7	4712	32.7	4816	32.7	4842
GR	31.05	4905	29.85	4958	20.15	4973	15.25	4985	14.15	4995
GR	14.25	5003	15.25	5015	18.35	5025	23.65	5037	27.65	5046
GR	26.55	5052	26.45	5055	27.25	5094	28.05	5165	27.7	5291
GR	26.9	5411	38.1	5434	40.7	5530	41.5	5651	43.2	5884
GR	48.1	5954	54.9	5982	63.8	5992	65.5	6031	67.3	6053
NC	0.3	0.5								
ET	9.1	4987	5013							
X1	3680	22	4987	5013	125	175	160			
X3	10	50	50							
GR	60	4217	58.2	4578	57.4	4846	38.78	4963	21.18	4984
GR	20.28	4987	20.28	4987.1	18.68	4991	17.28	4998	19.08	5006
GR	19.98	5010	21.48	5013	21.48	5013.1	21.68	5016	25.68	5054
GR	55.3	5292	54.8	5387	53.7	5620	53.8	5633	53.7	5852
GR	53.2	6030	53.5	6114	0	0	0	0	0	0
NC	0.015									
ET	9.1	4987	5013							
X1	3681	0	0	0	1	1	1			
X3	10	54	52							
ET	9.11	4987	5013							
SB	1	1.6	2.5	26	600	0	16	17.8		
X1	3778	25	4987	5013	97	97	97			
X2	1	39.37	53.5							
X3	10	56.1	53.5							
BT	24	4217	60	60	4578	58.2	58.2	4846	57.4	57.4
BT4954.0	56	28.02	4954.1	56	23.02	4983.5	56.1	22.42	4987	
BT	56.1	22.92	4987.1	56.1	26.5	4989	56.1	33.46	4996	56.1
BT	38.89	5002	56.1	39.37	5009	56.1	35.91	5013	56.1	24.5
BT5013.1	56.1	23.72	5016.5	56.1	26.92	5031	56.1	32.72	5100	
BT	56	27.82	5292	55.3	55.3	5387	54.8	54.8	5620	53.7
BT	53.7	5633	53.8	53.8	5852	53.7	53.7	6030	53.2	53.2
BT6114.0	53.5	53.5								
GR	60	4217	58.2	4578	57.4	4846	28.02	4954	23.02	4954.1
GR	22.42	4983.5	22.92	4987	22.92	4987.1	16.92	4989	15.72	4996

GR	15.32	5000	15.12	5002	16.72	5009	23.72	5013	23.72	5013.1
GR	26.92	5016.5	32.72	5031	27.82	5100	55.3	5292	54.8	5387
GR	53.7	5620	53.8	5633	53.7	5852	53.2	6030	53.5	6114
NC	0.063	0.046	0.039							
ET	9.1	4960	5018							
X1	3779	0	0	0	1	1	1			
X3	10	56.1	53.5							
ET	9.1	4960	5050							
X1	3870	24	4990	5010	140	70	91			
GR	48.5	4505	41.9	4645	42	4675	43.6	4747	41	4768
GR	38.8	4851	38.61	4918	36.71	4955	34.71	4965	20.51	4990
GR	19.91	4997	20.11	5003	20.51	5010	21.31	5021	26.21	5030
GR	30.51	5047	37.91	5058	47.8	5085	55.1	5114	55.9	5135
GR	54.9	5409	54.7	5600	54.4	5787	53.3	6110	0	0
ET	9.1	4880	5075							
NC	0.063	0.046	0.039	0.1	0.3					
X1	4100	29	4989	5010	180	225	230			
GR	48.5	4326	43.2	4587	42.8	4652	41.4	4810	38.7	4849
GR	34.9	4870	25.3	4896	27.6	4929	27.8	4954	20.1	4989
GR	20.09	4996	20.29	5002	20.1	5010	25.5	5019	25.5	5024
GR	25.5	5070	25.5	5107	35.7	5115	36.3	5141	40.4	5190
GR	43.9	5236	46	5567	47.7	5979	48.4	6099	49.5	6249
GR	49.5	6298	52.4	6362	66.6	6481	66.7	6502	0	0
ET	9.1	4950	5085							
X1	4375	22	4982	5018	210	280	275			
GR	48.5	4540	42.3	4900	40.7	4925	33.9	4953	30.9	4969
GR	23.3	4982	22.4	4991	20.3	5008	23.1	5018	27.2	5031
GR	31.2	5090	32.7	5135	40.3	5172	40.6	5232	41.3	5278
GR	43.1	5303	43.2	5332	45.7	5348	46.8	5386	46.4	5426
GR	48.1	5440	51	5445	0	0	0	0	0	0
ET	9.1	4982	5019							
NC	0.063	0.046	0.039	0.3	0.5					
X1	4475	18	4982	5018.1	95	105	105			
X3	10	38	38							
GR	48.5	4590	42.8	4863	40.93	4960	40.93	4982	23.8	4982.1
GR	23.1	4991	22.9	5000	23	5009	23.8	5018	40.58	5018.1
GR	40.2	5040	40.8	5263	42.7	5452	43.4	5643	44.2	5860
GR	45.7	6088	46.7	6299	50	6305	0	0	0	0
ET	9.11	4975	5018.1							
SB	1	1.6	2.6	0	36	462	23.6	23.2		
X1	4528	19	4982	5018.1	53	53	53			
X2	1	36.31	40.58							
X3	10	40.88	39.5							
BT	19	4590	48.5	48.5	4863	42.8	42.8	4921	40.72	40.72
BT4982.0	40.88	40.88	4982.1	40.88	36.31	4991	40.87	36.31	5000	
BT	40.86	36.31	5009	40.78	36.31	5013	40.74	36.31	5018	40.58
BT	35.78	5018.1	40.58	40.58	5076	39.5	39.5	5263	40.8	40.8
BT5452.0	42.7	42.7	5643	43.4	43.4	5860	44.2	44.2	6088	
BT	45.7	45.7	6299	46.7	46.7	6305	50	50		
GR	48.5	4590	42.8	4863	40.72	4921	40.88	4982	23.9	4982.1
GR	23.3	4991	23.4	5000	23.5	5009	24.4	5013	25.5	5018
GR	40.58	5018.1	39.5	5076	40.8	5263	42.7	5452	43.4	5643
GR	44.2	5860	45.7	6088	46.7	6299	50	6305	0	0
NC	0.068	0.035	0.039							
NH	4	0.068	4962	0.035	5041	10	5260	0.068	6300	
ET	9.1	4930	5050							
X1	4630	40	4962	5041	108	80	95			
GR	48.5	4598	48.5	4655	45.5	4659	44.8	4704	45.5	4730
GR	43.9	4798	39	4895	39.8	4917	39.7	4919	37.5	4962
GR	30.5	4976	25.4	4978	24.9	4992	25.2	5012	24.9	5022
GR	33.9	5041	33.9	5064	34.7	5141	40.7	5178	41.7	5254
GR	44.5	5260	46.1	5333	45.7	5364	45.3	5406	45.1	5448
GR	42.6	5456	42.2	5578	42.8	5691	43	5785	43.5	5813
GR	45.1	5839	45.8	5882	45.1	5977	45.3	6026	46.5	6039
GR	46.3	6088	45.7	6096	45.8	6160	47	6291	50	6300
NC	0.063	0.086	0.045	0.1	0.3					

NH	5	10	4900	0.063	4987	0.045	5012	0.086	5055	10
NH	5361									
ET	9.1	4900	5055							
X1	4850	30	4987	5012	290	170	220			
X4	2	34.2	4900	30.8	5055					
GR	48.5	3420	43.8	4091	41.4	4177	41.4	4212	40.4	4239
GR	37.3	4409	37.3	4443	37.6	4472	38.2	4487	36.8	4573
GR	36.5	4594	36.7	4640	35.7	4738	35.7	4778	35.7	4872
GR	33.1	4941	31.4	4972	25.3	4987	25.2	4995	25.2	5006
GR	25.3	5012	29.9	5028	31.2	5069	36.5	5072	39.1	5146
GR	43.8	5187	45	5203	46.1	5304	46.1	5320	45.9	5361
NH	5	10	4880	0.063	4986	0.045	5013	0.086	5051	10
NH	5605									
ET	9.1	4880	5051							
X1	5100	45	4986	5013	225	210	250			
X4	1	28.1	4880							
GR	48.5	3425	41.5	3780	43.1	3842	43.8	3962	42.3	3977
GR	42.3	4011	42.1	4067	39.7	4174	39.7	4226	38.5	4299
GR	36.6	4333	36.9	4368	36.8	4447	36.5	4485	32.6	4542
GR	30.3	4626	27.6	4709	27.2	4788	28.2	4914	30.8	4937
GR	31.4	4951	30.8	4968	25.6	4986	25.55	4995	25.55	5004
GR	25.6	5013	32.2	5020	39.5	5051	44.6	5104	45.3	5137
GR	44.2	5193	44.7	5200	44.8	5286	44.2	5287	44.3	5311
GR	44.9	5344	44.1	5375	44.8	5414	44.7	5439	43.7	5498
GR	43	5524	42.2	5536	42.3	5563	43.1	5591	54.9	5605
NH	5	10	4925	0.063	4986	0.045	5013	0.086	5050	10
NH	5581									
ET	9.1	4925	5050							
X1	5300	44	4986	5013	190	230	200			
X4	2	31.2	4925	31.9	5050					
GR	43.3	4059	42	4135	41	4163	40.3	4266	40.1	4312
GR	37.2	4371	32.4	4420	31.7	4492	32.1	4554	32.4	4585
GR	33.5	4646	30.4	4704	30	4750	33.7	4785	34	4809
GR	33.9	4847	31.6	4880	31.4	4905	30.8	4961	29.3	4974
GR	26.4	4986	25.82	4995	26.42	5004	26.4	5013	29.1	5024
GR	31.8	5047	33.1	5074	33.8	5104	38.8	5122	41.2	5170
GR	42.2	5241	41.7	5275	42	5296	42	5324	42.6	5336
GR	44.4	5341	48	5381	52.5	5455	52.2	5485	56.5	5509
GR	57.3	5523	55.6	5534	54.7	5551	57.8	5581		
NH	5	10	4920	0.063	4985	0.045	5015	0.086	5110	10
NH	5940									
ET	9.1	4920	5110							
X1	5500	55	4985	5015	185	210	200			
X4	2	34.47	4920	38.92	5110					
GR	51.7	3515	53.5	3561	53	3605	51.5	3625	51.4	3678
GR	49.5	3697	49.2	3780	49.5	3818	49.2	3857	49.9	3881
GR	49.6	3915	49.7	3986	49.5	4032	49.9	4063	48.4	4125
GR	47	4162	44.8	4175	44.8	4217	42.9	4330	42.6	4403
GR	42.5	4419	41.8	4447	41.5	4507	42.1	4605	42.5	4648
GR	41.4	4690	38.6	4754	36.1	4785	35.1	4822	34.4	4904
GR	34.6	4949	32.6	4951	32.3	4979	27.6	4985	26.1	4995
GR	26.7	5005	27.2	5015	34.2	5029	38.2	5073	39.1	5119
GR	37.8	5205	37.5	5233	43.2	5317	47.4	5418	48.1	5476
GR	46.3	5532	44.3	5669	44	5712	41.1	5766	41.7	5829
GR	42.1	5848	45.5	5850	48.1	5872	48.1	5935	50	5940
NH	5	10	4913	0.063	4981	0.045	5018	0.086	5113	10
NH	5305									
ET	9.1	4913	5113							
X1	5700	30	4981	5018	160	215	200			
X4	1	33.6	5113							
GR	44.7	4599	43.1	4682	42.2	4697	42.3	4742	43.7	4777
GR	44.7	4795	47.5	4809	48.4	4832	50.5	4847	50.3	4867
GR	46.1	4878	42.5	4899	38.1	4913	34.5	4930	33.9	4936
GR	34.6	4967	27.4	4981	26.37	4993	26.97	5005	27.4	5018
GR	37.3	5037	37.4	5049	33.9	5095	33	5160	31.5	5199
GR	31.6	5226	32.4	5233	32.7	5248	32.8	5300	52.6	5305

NH	5	10	4930	0.063	4978	0.045	5021	0.086	5185	10
NH	5317									
ET	9.1	4930	5185							
X1	5900	20	4978	5021	150	200	200			
X4	2	37.5	4930	34.4	5185					
GR	42.5	4558	43.4	4612	42	4682	41.7	4726	43.5	4781
GR	44.9	4824	44.9	4847	38.7	4878	36.8	4958	27.3	4978
GR	26.63	4992	27.23	5006	27.3	5021	35.2	5040	35.9	5053
GR	34.7	5091	34.4	5091	34.4	5207	32.4	5300	52.4	5317
NC	0.074	0.069	0.033	0	0					
NH	5	10	4910	0.074	4978	0.033	5021	0.069	5080	10
NH	5340									
ET	9.1	4910	5080							
X1	6100	34	4978	5021	210	190	200			
GR	57.5	4202	54.3	4266	50.1	4316	50.4	4358	51.1	4375
GR	50.2	4500	49.6	4539	47	4586	46.2	4626	43.5	4690
GR	43	4729	43	4760	43.7	4797	44.2	4853	42.2	4910
GR	40.2	4948	27.3	4978	27.8	4991	27.1	5004	27.3	5021
GR	36.1	5039	37.8	5080	39.1	5120	37.7	5158	37.8	5207
GR	42.9	5226	44.2	5237	44.4	5253	44.1	5258	44	5277
GR	46.5	5290	46.5	5290	48.2	5335	50	5340	0	0
NH	5	10	4900	0.074	4977	0.033	5023	0.069	5050	10
NH	5244									
ET	9.1	4900	5050							
X1	6330	25	4977	5023	240	180	230			
X4	2	45.87	4900	36.8	5050					
GR	57.4	4265	57.9	4304	56.1	4351	52.7	4423	50.1	4539
GR	51	4609	52.3	4685	48.3	4729	48.5	4755	49.7	4786
GR	48.3	4845	48.4	4847	44.3	4933	30.6	4962	28.1	4977
GR	27.4	4992	27.2	5011	28.2	5023	36.3	5041	36.8	5049
GR	37.3	5105	38.4	5155	43.8	5169	51.9	5218	52.4	5244
NC	0.074	0.069	0.033	0.3	0.5					
ET	9.1	4929	5062							
X1	6435	27	4929	5062	105	95	105			
X3	10	45.14	48.14							
GR	53	4548	51.1	4607	47.4	4751	45.7	4891	45.74	4900
GR	45.14	4929	36.44	4950	28.44	4968	27.94	4984	27.84	5000
GR	27.84	5011	28.24	5022	31.24	5033	36.74	5045	44.24	5061
GR	48.14	5062	48.14	5090	50.2	5156	53.8	5244	55.3	5343
GR	54.6	5405	55.2	5477	53.4	5587	52.6	5709	52.3	5753
GR	51.2	5827	51	5854						
ET	9.11	4941	5060							
SB	0.9	1.56	2.63	0	54	2	1312	2.5	27.84	27.54
X1	6488	27	4941	5060	53	53	53			
X2	1	42.93	45.94	1.33						
X3	10	45.94	48.14							
BT	33	4548	53	53	4607	51.1	51.1	4751	47.4	47.4
BT4875.0	45.94	45.94	4900	46.04	46.04	4904	49.64	39.04	4930	
BT	49.64	37.92	4930.1	51.28	37.91	4936	51.28	37.66	4936.1	48.79
BT	37.65	4941	48.84	37.44	4941.1	48.85	42.18	4992	49.35	42.83
BT5000.0	49.44	42.93	5008	49.6	43.03	5022	49.73	43.21	5036	
BT	49.89	43.39	5060	49.98	43.69	5060.1	49.99	42.14	5063	50.5
BT	42.65	5077	50.29	45.07	5077.1	48.14	45.09	5100	48.94	48.94
BT5156.0	50.2	50.2	5244	53.8	53.8	5343	55.3	55.3	5405	
BT	54.6	54.6	5477	55.2	55.2	5587	53.4	53.4	5709	52.6
BT	52.6	5753	52.3	52.3	5827	51.2	51.2	5854	51	51
GR	53	4548	51.1	4607	47.4	4751	45.94	4875	39.04	4904
GR	37.44	4941	33.34	4958	28.44	4968	27.94	4977	27.74	4992
GR	27.54	5000	28.14	5008	28.44	5022	31.14	5036	42.14	5060
GR	42.14	5060.1	48.94	5100	50.2	5156	53.8	5244	55.3	5343
GR	54.6	5405	55.2	5477	53.4	5587	52.6	5709	52.3	5753
GR	51.2	5827	51	5854						
NC	0.054	0.064	0.039							
ET	9.1	4935	5055							
X1	6580	61	4975	5025	105	105	102			
GR	61.2	4426	60.4	4460	53.8	4480	53.8	4498	55.1	4509

GR	55.5	4552	51.2	4626	48.6	4700	42.6	4724	40.4	4827
GR	39.3	4875	39.54	4913	38.94	4954	32.34	4966	29.14	4975
GR	29.34	4997	30.14	5004	29.44	5008	30.04	5025	31.44	5039
GR	37.94	5050	43.34	5061	42.54	5084	50.2	5087	53.3	5149
GR	55.6	5187	55.6	5232	55.9	5287	54.8	5379	56	5428
GR	56.5	5495	53.5	5505	53.5	5571	54.3	5616	52.1	5671
GR	52	5686	52	5910	52.9	6032	52.1	6101	52.3	6155
GR	52.5	6182	52.9	6292	52.3	6354	52.8	6449	52.1	6482
GR	52.8	6503	52.7	6571	52.8	6648	52.2	6668	52.6	6739
GR	52.3	6803	52	6868	59.2	6930	52.9	6948	52.5	6958
GR	52.2	7001	52.9	7038	52.5	7092	52.1	7139	52.7	7195
GR	52.6	7212								
NC	0.054	0.064	0.039	0.1	0.3					
ET	9.1	4875	5120							
X1	6800	65	4892	5107	120	240	220			
GR	62.4	4317	61.8	4383	52.9	4403	52.5	4421	56.9	4435
GR	56.5	4443	54.5	4457	52.2	4470	44.7	4512	43.7	4555
GR	43.8	4643	43.7	4677	44.3	4755	42.6	4801	42.1	4847
GR	41.3	4873	31.9	4892	29.47	4987	30.27	5017	29.57	5034
GR	31.9	5107	39.9	5125	41	5165	45.7	5198	55.3	5260
GR	55.3	5291	55.2	5309	51	5330	49.1	5413	53.5	5467
GR	54.3	5493	56.6	5531	54.4	5581	54.5	5613	52.4	5904
GR	52.5	5949	52.6	5973	52.6	6028	52.7	6100	52.4	6140
GR	52.5	6144	52.4	6164	53.8	6198	52.3	6242	52.8	6262
GR	52.8	6287	52.5	6315	52.9	6327	52	6340	52	6361
GR	52	6490	52	6545	52.2	6576	53.3	6645	52.6	6735
GR	52.1	6806	52.1	6833	52.7	6859	52.9	6923	53.8	7027
GR	54.3	7076	54.5	7132	56.4	7151	55.8	7203	53.1	7266
ET	9.1	4830	5170							
X1	7000	12	4850	5149	180	220	200			
GR	41.8	4759	40.6	4834	31.9	4850	29.59	4982	30.39	5024
GR	29.69	5048	31.9	5149	39.6	5170	40.9	5213	41.3	5435
GR	41.9	5504	42.2	5630						
ET	9.1	4840	5160							
X1	7200	48	4857	5142	210	200	200			
GR	56.7	4401	60.5	4415	58.3	4435	42	4491	42	4627
GR	42	4701	42	4730	42	4780	40.8	4840	31.8	4857
GR	29.72	4982	30.52	5022	29.82	5045	31.8	5142	42.7	5166
GR	42.7	5179	42.7	5333	42.7	5407	42.7	5463	42.7	5516
GR	42.7	5642	43.3	5735	43.3	5883	43.3	5989	43.5	6010
GR	44.7	6099	53.1	6131	53.4	6147	52.6	6153	50.3	6160
GR	51.2	6200	55.1	6212	56.3	6229	54.3	6236	55.3	6272
GR	54	6431	52.5	6496	54.5	6577	55.9	6633	60.3	6661
GR	59.9	6679	60	6724	63.5	6741	65.6	6781	65.6	6862
GR	66.5	6943	64.8	6968	64.8	7024	0	0	0	0
ET	9.1	4870	5120							
X1	7400	41	4898	5101	200	200	200			
GR	60.1	4344	50.1	4412	48.2	4443	50.6	4514	58.2	4551
GR	58.9	4634	63	4686	60.6	4751	58.2	4793	41.5	4853
GR	41.2	4876	31.9	4898	29.64	4925	30.94	4964	30.84	5012
GR	30.54	5048	31.9	5101	39.7	5118	40.4	5178	42.4	5253
GR	42.4	5592	42.4	5745	42.4	5810	42.4	5872	43.4	5942
GR	47.9	6084	53.9	6101	58.9	6126	59.2	6133	58.4	6140
GR	58.4	6160	57.2	6166	57.8	6219	56.6	6382	57.9	6564
GR	62.1	6579	62.6	6642	69	6647	73.1	6666	77.5	6685
GR	77.6	6708	0	0	0	0	0	0	0	0
NC	0.073	0.068	0.033							
ET	9.1	4885	5060							
X1	7600	62	4950	5049	140	240	200			
GR	59	4232	56.4	4267	51.2	4303	49.9	4335	58.6	4380
GR	62	4404	59.5	4436	56.3	4519	53.7	4555	50.1	4560
GR	50.1	4598	54.4	4617	57.9	4647	59.1	4686	57.6	4717
GR	53.8	4750	50.7	4805	47.8	4809	46.9	4825	45.3	4827
GR	44.5	4839	42.6	4845	42.5	4857	41.8	4875	38.8	4924
GR	33.5	4932	33.2	4945	31.8	4950	29.76	4963	31.06	4982
GR	30.96	5005	30.66	5022	31.8	5049	41.8	5064	43.8	5104

GR	43.8	5108	43.8	5132	44.8	5135	45.7	5156	49.2	5181
GR	48.9	5262	46.6	5303	44.9	5352	46	5430	47.9	5455
GR	48	5462	45.4	5469	45.9	5577	46.8	5614	49.6	5654
GR	49.5	5775	50.4	5817	49.9	5878	50.8	5911	53.7	5938
GR	55.3	5947	55.5	5971	58.2	5988	59.2	6009	61	6017
GR	68.5	6032	68.8	6067	0	0	0	0	0	0
ET	9.1	4905	5068							
X1	7800	55	4950	5049	200	195	200			
GR	59.3	4286	52.6	4332	52.2	4362	52.2	4388	57.1	4434
GR	64	4465	65.1	4485	64.1	4529	53.2	4556	52.8	4601
GR	49.1	4651	45.8	4692	45.8	4710	45.8	4739	45.8	4768
GR	45.8	4790	45.8	4798	45.8	4826	45.2	4848	43	4855
GR	42.1	4878	38.5	4930	31.9	4950	29.88	4963	31.18	4982
GR	31.08	5005	30.78	5022	31.9	5049	42.9	5073	42.9	5084
GR	43.8	5139	45.8	5216	50.4	5297	49.4	5311	50.2	5339
GR	51	5350	48.8	5386	45.6	5417	44	5504	42.8	5571
GR	43.5	5586	43.5	5647	44.2	5685	45.1	5719	47	5746
GR	47.3	5809	44.8	5823	45.1	5853	47.2	5878	49.6	5946
GR	55.5	5962	57.8	5981	58.9	6001	67.9	6029	70.3	6067
NC	0.088	0.088	0.033							
ET	9.1	4880	5045							
X1	8000	52	4966	5034	285	160	200			
GR	61.9	4116	45.5	4154	43.8	4243	46.5	4311	48.1	4349
GR	47.8	4354	43.7	4390	44.3	4404	43.5	4455	43.1	4554
GR	44.8	4581	44.1	4656	43.4	4690	46	4723	45.4	4777
GR	41.4	4826	41.2	4834	41.2	4857	36.5	4914	35.8	4951
GR	31.9	4966	30	4975	31.3	4988	31.2	5004	30.9	5016
GR	31.9	5034	41.8	5048	42.7	5063	44.1	5136	44.4	5222
GR	46.6	5243	47.6	5282	50.3	5291	50.2	5350	47.2	5359
GR	46.5	5422	43.8	5479	43.5	5598	43.8	5685	43.1	5800
GR	45.2	5816	45.8	5874	45.9	5912	51.1	5924	54.1	5929
GR	54.7	5943	57.8	5952	58.6	5969	58.3	5981	58.6	6029
GR	69.6	6055	72.8	6073	0	0	0	0	0	0
ET	9.1	4900	5045							
X1	8250	47	4966	5034	220	210	250			
GR	65.9	4008	58.5	4036	43.9	4098	43.3	4150	44.1	4197
GR	47.7	4221	49.2	4254	46.2	4280	43.5	4292	43.1	4323
GR	43.2	4394	43	4458	43	4573	43.6	4614	40.5	4730
GR	40.5	4796	40	4843	40.3	4854	40.3	4884	36.5	4914
GR	35.8	4951	31.9	4966	30	4975	31.3	4988	31.2	5004
GR	30.9	5016	31.9	5034	41.8	5048	42.7	5063	44.1	5136
GR	41.9	5185	43.1	5239	44.5	5290	44.8	5327	45.5	5344
GR	43	5493	43.2	5675	44.8	5712	45.9	5749	53.8	5765
GR	53.7	5782	58.3	5793	58.3	5813	57.4	5834	58.4	5936
GR	59.1	5963	63.8	5997	0	0	0	0	0	0
NC	0.07	0.075	0.035							
ET	9.1	4925	5058							
X1	8500	45	4990	5009	140	290	250			
GR	68.4	3843	49.9	3951	49.9	3979	49.4	4001	44	4031
GR	43.8	4079	48	4105	47	4165	43.5	4197	43.8	4206
GR	43.8	4339	43.9	4362	43.7	4429	43	4444	43	4728
GR	40.2	4760	40.4	4802	43.3	4856	43.7	4899	41.1	4941
GR	38.8	4978	32.3	4990	31.13	4993	31.43	4997	31.33	5001
GR	32.03	5004	32.3	5009	33.6	5018	33.5	5028	32.4	5041
GR	43.1	5063	44.8	5107	45	5171	44.6	5272	44.4	5497
GR	45.5	5563	58.2	5590	59.3	5596	58.8	5602	57	5608
GR	57.4	5622	52.8	5636	54	5663	57.9	5717	67.6	5802
NH	5	10	4925	0.073	4990	0.033	5009	0.068	5070	10
NH	5912									
ET	9.1	4925	5070							
X1	8750	52	4990	5009	160	290	250			
X4	2	41.4	4925	43.35	5070					
GR	59.1	3582	54	3634	55.9	3666	55.7	3696	53.1	3735
GR	55.4	3766	57	3792	55.3	3828	54.1	3867	54.9	3869
GR	49.5	3918	48	3982	44.4	4052	44.5	4121	44.7	4211
GR	44.1	4240	44.2	4315	44.8	4352	44.3	4372	44.7	4474

GR	44	4562	41.4	4664	40.3	4724	41	4791	41.6	4843
GR	42.4	4920	41.9	4922	40.5	4968	32.5	4990	31.7	4993
GR	32	4997	31.9	5001	32.4	5004	32.5	5009	42.9	5030
GR	43.3	5057	43.6	5176	43.6	5247	43.6	5355	43.6	5466
GR	45.6	5618	56.7	5638	56.8	5651	53.8	5657	53.8	5664
GR	59.2	5678	59.1	5692	62.4	5717	62.6	5801	65.3	5853
GR	65.7	5902	69.2	5912	0	0	0	0	0	0
NH	5	10	4850	0.073	4982	0.033	5017	0.068	5140	10
NH	5947									
ET	9.1	4850	5140							
X1	9000	41	4982	5017	260	160	250			
X4	2	38.33	4850	44.49	5140					
GR	57.7	3776	48.2	3902	45.9	3966	45.9	4095	45.7	4170
GR	43.4	4235	43.6	4327	42.8	4400	38.2	4490	36.7	4576
GR	36.6	4612	38.1	4663	38.5	4756	38.3	4865	39.1	4918
GR	39.1	4974	32.8	4982	32.27	4988	32.47	4994	32.37	4999
GR	33.07	5008	32.37	5014	32.7	5017	41.2	5036	42.7	5061
GR	44.5	5141	44.7	5215	45	5289	45.1	5357	45	5408
GR	45.2	5600	47.9	5659	48.7	5686	57	5748	57.3	5787
GR	61	5797	60.9	5805	59.6	5814	60.6	5828	60.9	5875
GR	67.6	5947	0	0	0	0	0	0	0	0
NH	5	10	4810	0.075	4981	0.049	5018	0.075	5160	10
NH	5893									
ET	9.1	4810	5160							
X1	9250	37	4981	5018	260	250	250			
X4	2	40.4	4810	43.98	5160					
GR	56.6	4092	55.4	4210	57.1	4245	48.7	4260	48.3	4301
GR	44.3	4314	43.1	4358	40.5	4381	39.3	4453	40	4549
GR	40.4	4680	40.4	4824	38.6	4903	37.1	4954	36.6	4971
GR	33.8	4981	32.83	4987	34.03	4993	34.93	4998	33.63	5008
GR	32.93	5014	33.8	5018	42.2	5068	42	5155	44	5162
GR	44.3	5177	43.6	5319	44	5489	45	5607	47.3	5697
GR	58.5	5729	58.5	5755	57.4	5763	61.3	5781	61.7	5803
GR	63.3	5819	65.7	5893	0	0	0	0	0	0
NC	0.07	0.075	0.039							
ET	9.1	4780	5180							
X1	9500	43	4985	5015	240	240	250			
GR	57.5	4145	54.5	4206	51.5	4224	51.7	4246	52.1	4259
GR	51.1	4288	45.5	4337	45.4	4340	45.2	4394	42.7	4450
GR	41.9	4507	41.8	4524	42.3	4543	41.2	4566	42.9	4620
GR	44.6	4709	44.4	4837	42.1	4870	38.7	4893	41	4936
GR	37.3	4946	37.2	4976	34.7	4985	33.5	4988	34.2	4993
GR	35.5	5001	34.6	5005	33.4	5010	34.2	5015	38.5	5018
GR	40.3	5037	41.6	5086	44.7	5185	45.3	5230	45	5300
GR	47	5577	51.7	5640	60.8	5704	62.8	5726	63	5734
GR	65.5	5764	71.6	5825	76.9	5869	0	0	0	0
ET	9.1	4800	5180							
X1	9750	43	4983	5016	195	265	250			
GR	63.3	4065	57.9	4103	54.9	4184	53.3	4266	54	4325
GR	51	4360	51	4382	51	4417	45.2	4466	44.5	4509
GR	44.1	4586	44.7	4633	43	4668	43.3	4899	41.8	4959
GR	38.3	4968	38.7	4978	36.1	4983	34.93	4986	35.63	4992
GR	36.93	5001	36.03	5005	34.83	5011	36.1	5016	42	5035
GR	43.1	5056	42.3	5074	43.2	5148	44.2	5166	44.2	5176
GR	44.2	5303	44	5401	44.8	5480	45.7	5572	46.2	5611
GR	50.9	5645	57.2	5677	58.3	5706	64.5	5742	63.8	5750
GR	64.1	5767	76.8	5788	77.9	5816	0	0	0	0
NC	0.075	0.075	0.056							
ET	9.1	4800	5180							
X1	10000	38	4990	5009	310	210	250			
GR	64.3	4280	61.1	4343	55.3	4401	51.9	4464	51.8	4495
GR	55	4533	57.1	4561	56	4572	45.6	4599	42.6	4631
GR	42.1	4702	44	4822	43.7	4957	43.5	4958	36.7	4990
GR	36.36	4992	37.06	4995	37.36	5000	37.46	5003	36.26	5006
GR	36.8	5009	44.4	5035	44	5061	43.3	5166	46.6	5183
GR	46.8	5219	45.6	5255	45.2	5279	46.2	5367	46.5	5503

GR	47	5632	49	5732	67.8	5808	67.4	5816	64.9	5821
GR	64.9	5834	80	5859	80	5867	0	0	0	0
NC	0.07	0.07	0.028	0.1	0.3					
ET	6.4									
X1	10794	21	4984	5067	55	20	50			
GR	66.35	4170	61.35	4210	56.35	4220	51.35	4440	46.35	4730
GR	47.55	4804	44.35	4914	44.05	4984	37.85	4991	37.05	5000
GR	38.25	5012	39.75	5036	45.85	5047	48.45	5067	43.35	5086
GR	43.45	5202	45.05	5370	50.05	5540	55.05	5660	60.05	5720
GR	65.05	5760								
NC	0.07	0.07	0.05	0.1	0.3					
QT	2	3447	3447							
ET	20.4									
X1	60	18	4975	5030	60	60	60			
GR	66.35	4190	56.35	4240	51.35	4460	46.35	4750	44.65	4774
GR	47.25	4803	45.45	4812	44.05	4826	48.85	4842	46.95	4861
GR	43.55	4891	43.55	4950	44.25	4975	39.25	4988	38.75	5000
GR	38.75	5020	44.35	5030	44.25	5050				
X1	110	16	4832	4906	50	50	50	1		
GR	66.35	4128	61.25	4168	56.35	4180	51.35	4400	46.35	4689
GR	44.35	4720	43.05	4743	56.95	4767	56.65	4778	53.65	4789
GR	47.85	4820	48.45	4832	39.35	4853	38.95	4870	39.05	4881
GR	48.05	4906								
ET	9.1	4800	5050							
X1	250	15	4979	5047	120	130	140	1		
GR	66.35	4390	56.35	4440	51.35	4654	44.75	4850	43.95	4933
GR	44.75	4979	42.85	4989	39.35	4990	38.65	5000	39.55	5011
GR	41.75	5023	41.05	5037	42.45	5041	42.55	5047	52.35	5075
ET	9.1	4500	4700							
X1	390	13	4630	4685	170	120	140	1		
GR	66.35	4110	61.35	4130	56.35	4160	51.35	4300	44.85	4484
GR	44.95	4580	45.35	4630	40.65	4637	41.05	4640	41.45	4671
GR	46.85	4685	47.35	4698	49.25	4703				
ET	9.1	4460	4700							
X1	480	16	4593	4658	130	80	90	1		
GR	71.35	4050	66.35	4060	61.35	4122	56.35	4140	51.35	4180
GR	48.85	4450	46.55	4522	44.45	4543	44.75	4570	47.95	4593
GR	41.25	4606	40.75	4610	41.25	4612	43.55	4647	46.55	4658
GR	47.05	4680								
ET	9.1	4500	4700							
X1	575	26	4576	4642	110	80	95	1		
GR	71.35	3756	66.35	3795	63.35	3980	63.35	4180	61.35	4190
GR	56.35	4214	50.25	4330	48.45	4360	48.95	4371	48.75	4409
GR	46.95	4415	46.05	4484	46.05	4546	43.15	4548	43.05	4552
GR	49.15	4560	48.55	4576	41.25	4591	40.85	4600	41.55	4604
GR	41.95	4610	43.45	4614	42.05	4626	42.15	4632	46.75	4642
GR	47.85	4656								
ET	9.1	4460	4590							
X1	667	19	4511	4577	120	90	92	1		
GR	65.35	3780	65.35	3820	61.35	3880	56.35	3901	57.35	4080
GR	56.35	4235	51.65	4285	50.05	4345	47.45	4387	47.75	4432
GR	43.85	4465	45.85	4485	49.85	4496	47.15	4511	43.55	4520
GR	42.15	4522	42.15	4535	43.05	4557	48.65	4577		
ET	9.1	4940	5040							
X1	767	15	4980	5036	90	100	100	1		
GR	66.35	4210	61.35	4508	57.05	4778	50.55	4791	49.95	4818
GR	46.25	4943	48.65	4949	48.85	4970	47.35	4980	44.85	4990
GR	43.55	4992	43.55	5000	43.35	5010	41.75	5018	49.15	5036
ET	9.1	4920	5035							
X1	787	17	4967	5030	25	20	20	1		
GR	66.35	4130	65.35	4252	71.35	4252	71.35	4450	61.35	4450
GR	58.85	4745	50.65	4755	50.75	4780	50.15	4810	47.85	4840
GR	46.65	4940	47.25	4967	44.75	4977	43.55	4987	43.75	5000
GR	42.85	5018	47.75	5030						
ET	9.1	4820	5045							
X1	800	12	4855	5040	40	75	60			

GR	71.35	4445	61.35	4446	57.5	4735	51.75	4745	51.15	4790
GR	50.25	4812	48	4855	47.55	4955	43	4980	42.85	4995
GR	43.45	5020	48.05	5040						
NC	0.055	0.06	0.028	0.1	0.3					
QT	2	5300	5300							
ET	9.1	4950	5070							
X1	11720	20	4976	5060	50	90	79	1		
GR	71.35	4440	61.35	4441	56.35	4725	52.85	4735	51.85	4795
GR	50.35	4815	48.15	4875	48.55	4976	42.85	4990	42.45	5000
GR	42.85	5010	43.45	5012	44.25	5035	48.05	5060	49.95	5140
GR	50.95	5215	51.85	5290	53.05	5540	60.05	5600	65.05	5610
ET	9.1	4960	5150							
X1	11150	48	4985	5014	230	170	255			
GR	73.9	4096	73.4	4145	72.6	4192	69.9	4289	68.4	4374
GR	67.1	4478	66	4548	63.8	4609	61.4	4637	60	4721
GR	58	4758	55.2	4798	54.5	4837	54.9	4844	53.6	4860
GR	52.7	4923	53.5	4943	52.8	4955	51.9	4964	47.5	4978
GR	44.6	4985	42.85	4995	43.05	5007	44.6	5014	49.4	5025
GR	49.4	5031	46.6	5034	46.8	5038	49.1	5049	50.7	5098
GR	52.5	5152	53.5	5186	53.3	5232	56.2	5489	59.4	5547
GR	61.1	5564	60.7	5747	59.8	5803	60.5	5858	61.5	5862
GR	66.8	5871	68.4	5874	68.4	5884	67.6	5890	68.2	5896
GR	70.7	5904	73.6	5908	76.6	6017	0	0	0	0
ET	9.1	4965	5215							
X1	11400	49	4992	5007	260	280	250			
GR	74.2	4202	69.7	4397	67.3	4498	65.3	4568	61.5	4691
GR	60.1	4727	58.8	4781	58.6	4816	58.4	4873	58.3	4932
GR	55.6	4958	54.3	4969	51.3	4978	48.8	4987	48.3	4990
GR	46.6	4992	44.28	4997	44.48	5003	46.6	5007	47.3	5019
GR	49.6	5046	50.7	5063	50.5	5113	51	5130	52.7	5180
GR	54.4	5210	54.6	5237	55.3	5278	57.6	5476	59.8	5558
GR	61.4	5583	61.5	5623	60.8	5728	62.3	5793	62.3	5831
GR	62.4	5887	64.7	5894	67.5	5902	68.3	5905	68.2	5916
GR	66.8	5921	67.5	5929	69.7	5938	72	5992	74.9	6055
GR	76.8	6098	76.4	6104	76.4	6155	79.4	6159	0	0
ET	9.1	4860	5180							
X1	11570	52	4988	5011	200	240	170			
GR	74.7	4237	75.1	4281	76.1	4350	75.1	4417	72.6	4486
GR	70.2	4526	64.4	4588	61.6	4650	61	4702	61.5	4736
GR	59.9	4777	58	4828	55.8	4850	53.8	4946	53.7	4967
GR	48.7	4974	47.3	4982	47.1	4985	46.8	4988	45.26	4996
GR	45.46	5006	46.7	5011	53.5	5023	54.6	5029	53.6	5051
GR	52	5085	51.4	5097	54.5	5116	55.5	5127	55.8	5137
GR	55	5138	55	5181	56.8	5195	58	5213	57.8	5220
GR	56.5	5221	57.9	5367	61	5485	63	5847	63.9	5870
GR	66.2	5882	67.1	5895	69.6	5906	69.6	5917	68.4	5920
GR	72.5	5941	74	5968	75.4	6070	75.3	6090	75.6	6140
GR	79.7	6144	79.9	6156	0	0	0	0	0	0
NC	0.063	0.055	0.034							
NH	4	0.063	4988	0.034	5012	0.055	5130	10	6166	
ET	9.1	4905	5130							
X1	11700	48	4988	5012	120	140	130			
GR	78.3	4306	78.5	4325	76.3	4338	75.3	4343	75.8	4381
GR	74.6	4391	74.8	4439	72.5	4477	71	4487	62.9	4599
GR	61.7	4673	61.1	4764	59.2	4832	58	4865	54.9	4936
GR	52.4	4980	47.4	4983	46.8	4988	46.2	4994	46	5004
GR	46.8	5012	49.4	5025	55	5034	55.3	5135	58.2	5321
GR	63.2	5536	64	5568	64	5634	66.9	5703	68.2	5714
GR	68	5868	67.7	5885	69.5	5903	70.1	5910	70.8	5914
GR	70.8	5921	70.1	5924	71.9	5929	72.3	5932	74.6	6016
GR	75.5	6065	76.3	6078	76.1	6085	75.7	6088	75.8	6127
GR	76.5	6132	77.1	6146	78.2	6166	0	0	0	0
NH	5	10	4940	0.063	4989	0.034	5010	0.055	5028	10
NH	6141									
ET	9.1	4940	5028							
X1	11900	56	4989	5010	220	190	200			

X2	15									
X4	1	56.09	4940							
GR	83.8	4323	82.3	4355	79.3	4380	75	4394	72.6	4399
GR	72.5	4428	73.4	4450	72.4	4479	70.8	4502	64.8	4546
GR	60.8	4608	57.4	4694	56.9	4756	56.4	4814	55.9	4833
GR	55.9	4861	56.8	4901	56.1	4938	56	4970	54.1	4976
GR	49.9	4982	49.5	4987	48.9	4989	47.02	4994	46.82	5003
GR	48.9	5010	50.4	5017	53.5	5023	58	5028	59.2	5049
GR	59.4	5230	61.2	5243	63.7	5257	63.7	5465	65.7	5537
GR	65.8	5553	65.5	5555	67	5642	67.7	5706	70	5855
GR	70	5896	70.7	5900	71.5	5903	71.5	5912	73.1	5921
GR	73	5946	74.3	6012	75.6	6042	77	6051	77	6056
GR	75.1	6059	75.2	6062	75.8	6100	76.3	6103	77.1	6120
GR	78.4	6141	0	0	0	0	0	0	0	0
NH	5	10	4940	0.084	4993	0.034	5006	0.079	5070	10
NH	6113									
ET	9.1	4940	5070							
X1	12100	65	4993	5006	230	140	200			
X2	15									
X4	2	56.22	4940	57.77	5070					
GR	79.1	4104	78	4123	75.5	4187	72.9	4261	73.6	4323
GR	73.6	4337	72.6	4346	72.4	4351	72.4	4381	71.8	4397
GR	71.3	4430	70	4457	68.1	4478	66.3	4525	63.3	4541
GR	61.6	4599	60.3	4626	59.9	4694	59.7	4775	58.4	4838
GR	56.9	4874	56.2	4941	55.5	4977	54.2	4985	52.5	4989
GR	50.4	4991	49.8	4993	47.83	4996	47.63	5001	49.7	5006
GR	50.6	5008	51.2	5015	51.5	5032	52.9	5037	57.7	5044
GR	58	5045	57.6	5090	60.1	5207	61.3	5226	61.3	5238
GR	62.8	5430	65.4	5502	66.4	5520	66.4	5533	66.2	5534
GR	66.6	5574	68.3	5655	68.9	5675	69.5	5680	70	5834
GR	69.9	5858	71.1	5870	71.5	5882	71.9	5883	71.9	5890
GR	72.2	5898	73.8	5972	75.1	6002	76.2	6011	76.2	6019
GR	75.6	6022	75.6	6062	75.9	6066	76.3	6103	76.4	6113
NH	5	10	4730	0.084	4994	0.034	5005	0.079	5030	10
NH	5797									
ET	9.1	4600	5019							
X1	12500	53	4994	5005	440	300	400			
X4	2	61.1	4730	64.64	5030					
GR	79.9	3883	78.8	3914	76.1	3938	74.7	3952	74.8	3961
GR	75.1	3983	75.7	3987	74.1	3991	72.3	4006	69.5	4116
GR	66.2	4239	63.1	4467	62.4	4475	62.4	4494	62.1	4656
GR	61.5	4720	59.3	4856	58.4	4949	58.6	4963	54.1	4970
GR	52.2	4980	51.8	4989	51.4	4992	50.7	4994	49.26	4997
GR	49.36	5001	50.7	5005	57	5014	62.7	5019	64.5	5025
GR	64.9	5039	65.7	5145	68	5184	68.3	5228	69.9	5342
GR	71.5	5448	71.2	5503	72.6	5512	73	5521	73	5536
GR	74.4	5543	74.9	5574	74.5	5612	75.4	5621	75.4	5626
GR	74.1	5628	74.7	5686	76	5690	75.4	5716	74.9	5731
GR	75.4	5746	77.8	5791	77.9	5797	0	0	0	0
NC	0.069	0.049	0.029							
NH	5	10	4688	0.069	4987	0.029	5012	0.049	5160	10
NH	5762									
ET	9.1	4720	5160							
X1	12800	40	4987	5012	130	360	300			
GR	80.5	4053	80.4	4064	76	4073	76	4092	76.7	4097
GR	75.4	4103	73.1	4113	70.7	4185	66.9	4338	66.8	4432
GR	66	4520	65.2	4578	64	4688	62.1	4924	62.1	4935
GR	62	4971	61.3	4981	58.5	4985	53.2	4987	50.48	4994
GR	50.58	5003	53.2	5012	62.5	5014	62.6	5050	63.2	5136
GR	67.2	5261	67.9	5489	68.6	5508	73.9	5510	74.1	5526
GR	74.5	5528	74.5	5534	74.2	5539	75	5548	74.6	5612
GR	75	5650	77.4	5725	78.2	5743	77.9	5745	77.9	5762
NH	5	10	4828	0.069	4987	0.029	5013	0.049	5130	10
NH	5675									
ET	9.1	4828	5130							
X1	13000	49	4987	5013	170	200	200			

GR	85.7	4105	83.7	4114	84.8	4127	83.3	4136	80.3	4143
GR	76.6	4144	76.6	4163	77.4	4167	77.5	4172	75.5	4183
GR	71.2	4235	68.3	4334	66.2	4455	65.8	4549	66.3	4626
GR	65.6	4653	64.9	4656	64	4662	63.4	4682	63.8	4689
GR	64.5	4770	64.5	4828	63.5	4911	62.1	4931	61.1	4975
GR	53.8	4987	51.3	4994	51.4	5003	53.4	5013	55.3	5016
GR	62.6	5017	62.6	5019	61.8	5019.1	61.9	5042	64.4	5261
GR	68.8	5486	69.4	5511	75.8	5512	73.9	5514	73.4	5521
GR	74.1	5528	74.6	5529	74.6	5550	74.3	5564	75.3	5565
GR	72.6	5567	73.3	5622	74.6	5675	74.9	5675	0	0
NC	0.3	0.5								
ET	9.11	4927	5076							
X1	13120	51	4987	5020	120	120	120			
X3	10	61.91	63.8							
GR	77.6	4171	77.6	4196	78.4	4201	77.2	4208	76.2	4255
GR	74.9	4303	73.3	4328	72.6	4395	71.5	4490	70.9	4496
GR	69.7	4545	66.7	4595	66	4672	66.1	4702	66.4	4721
GR	66.8	4800	66.2	4872	65.91	4920	64.11	4972	52.23	4987
GR	50.49	5020	64.88	5020.1	64.2	5034	66	5045	67.1	5049
GR	63.9	5051	63.8	5073	66.6	5079	67.9	5089	65.5	5111
GR	68.5	5247	71.1	5255	68.3	5261	67.1	5267	67	5292
GR	70.5	5297	70.7	5355	67	5355	68.1	5449	68.6	5477
GR	75.1	5482	73.3	5483	73.3	5492	74.5	5498	74.5	5506
GR	74.2	5510	75.1	5521	74.9	5524	74.5	5567	76.3	5586
GR	76.7	5654	0	0	0	0	0	0	0	0
NC	0.069	0.059	0.05							
ET	9.11	4860	5140							
SB	1	1.6	2.6	0	33	0.1	56.06	50.49		
X1	13122	54	4987	5036	2	2	2			
X2	1	56.06	58.99							
X3	10	61.91	63.8							
X4	3	60.34	4976.8	56.16	4987.1	56.56	5020.1			
BT	49	4201	78.4	0	4208	77.2	0	4255	76.2	0
BT4303.0	74.9	0	4328	73.3	0	4395	72.6	0	4490	
BT	71.5	0	4496	70.9	0	4545	69.7	0	4595	66.7
BT	0	4672	66	0	4702	66.1	0	4721	66.4	0
BT4800.0	66.8	0	4872	66.2	0	4920	65.91	0	4972	
BT	64.11	0	4973	61.91	0	4976.8	61.96	0	4987	61.93
BT	0	4987.1	59.06	0	5013	58.99	0	5020	58.99	0
BT5020.1	64.88	0	5036	64.88	0	5045	66	0	5049	
BT	67.1	0	5051	63.9	0	5073	63.8	0	5079	66.6
BT	0	5089	67.9	0	5111	65.5	0	5247	68.5	0
BT5255.0	71.1	0	5261	68.3	0	5267	67.1	0	5292	
BT	67	0	5297	70.5	0	5355	70.7	0	5355	67
BT	0	5449	68.1	0	5477	68.6	0	5482	75.1	0
BT5483.0	73.3	0	5492	73.3	0	5498	74.5	0	5506	
BT	74.5	0	5510	74.2	0	5521	75.1	0		
GR	77.6	4171	77.6	4196	78.4	4201	77.2	4208	76.2	4255
GR	74.9	4303	73.3	4328	72.6	4395	71.5	4490	70.9	4496
GR	69.7	4545	66.7	4595	66	4672	66.1	4702	66.4	4721
GR	66.8	4800	66.2	4872	65.91	4920	64.11	4972	61.91	4973
GR	56.14	4987	56.64	5000	56.06	5013	56.54	5020	57.63	5036
GR	64.88	5036.1	66	5045	67.1	5049	63.9	5051	63.8	5073
GR	66.6	5079	67.9	5089	65.5	5111	68.5	5247	71.1	5255
GR	68.3	5261	67.1	5267	67	5292	70.5	5297	70.7	5355
GR	67	5355	68.1	5449	68.6	5477	75.1	5482	73.3	5483
GR	73.3	5492	74.5	5498	74.5	5506	74.2	5510	75.1	5521
GR	74.9	5524	74.5	5567	76.3	5586	76.7	5654	0	0
ET	9.1	4920	5130							
X1	13170	60	4974	5026	48	48	48			
GR	77.2	4184	77.2	4196	78.1	4201	76.6	4205	76.3	4232
GR	75.6	4269	73	4315	72.4	4337	71.5	4361	71	4413
GR	69.9	4466	68.5	4534	65.1	4595	64	4667	64.4	4691
GR	64.8	4709	64.8	4727	65	4795	65	4841	66.5	4878
GR	67.1	4904	66.6	4919	65.7	4922	63.9	4958	59.2	4974
GR	58.1	4979	57.7	4993	57.1	4996	55.8	5006	57.7	5009

GR	58.3	5026	65.2	5029	65.2	5031	62.8	5031.1	65	5087
GR	63.9	5121	68.5	5133	72.4	5138	72.8	5151	71.3	5166
GR	68.7	5174	65.7	5177	66.3	5274	70.6	5282	70.4	5322
GR	71.8	5428	68.1	5429	68.1	5450	75.8	5453	73.9	5454
GR	72.9	5465	75.2	5471	75.2	5478	74.2	5482	73.8	5492
GR	74.8	5501	74.8	5566	76.5	5579	77	5622	78.6	5654
NC	0.1	0.3								
ET	9.1	4950	5140							
X1	13350	52	4956	5043	170	150	180			
GR	77.6	4205	77.6	4221	78.1	4227	76.4	4232	72.3	4316
GR	72	4325	71.1	4347	70.1	4424	66.3	4553	65.9	4660
GR	65.9	4766	66	4786	65.6	4815	63.6	4851	62.3	4930
GR	62	4949	60.8	4954	59	4956	58.16	4964	57.76	4987
GR	57.16	4992	55.86	5009	57.76	5014	59	5043	64.8	5045
GR	61.9	5046	63.3	5123	67.5	5139	77.2	5153	79.1	5172
GR	71	5206	64.9	5215	63.4	5217	64	5243	66.7	5289
GR	69.6	5318	70.8	5348	68.4	5384	67.8	5406	74.8	5407
GR	69.3	5409	71.5	5414	73.8	5420	75.6	5424	75.6	5434
GR	74.6	5441	73.3	5465	73.2	5490	74.1	5535	75.9	5563
GR	77.6	5586	81.5	5616	0	0	0	0	0	0
ET	9.1	4960	5075							
X1	13550	56	4985	5014	300	140	200			
GR	79.6	4492	78.6	4534	76.8	4576	73.7	4605	71.1	4626
GR	69.4	4698	67.6	4743	66.7	4776	65.8	4789	65.6	4805
GR	63.8	4836	62.9	4888	62.5	4890	62	4976	61.5	4982
GR	59.5	4985	56.64	4989	55.94	4994	56.54	5000	57.74	5008
GR	59.5	5014	60.5	5017	61.6	5026	62.8	5031	64	5064
GR	68.3	5073	69.6	5079	66.6	5086	68.4	5091	71.1	5098
GR	70.8	5110	68.6	5117	69	5128	66.7	5132	66.2	5159
GR	65.8	5181	65.8	5242	72.6	5246	71.3	5281	70	5309
GR	70.5	5321	73.7	5326	74.3	5339	74.7	5347	75.5	5350
GR	75.6	5360	74.9	5368	71.7	5381	70.8	5424	70.6	5433
GR	70.6	5476	72.8	5502	74.7	5523	75.2	5556	79.9	5573
GR	81.1	5588	0	0	0	0	0	0	0	0
ET	9.1	4940	5050							
X1	13730	57	4988	5012	280	100	180			
GR	79.9	4381	79.8	4439	80.1	4509	80.9	4561	80.4	4610
GR	79.7	4624	80.3	4667	80.9	4687	79.2	4701	79	4744
GR	78.5	4784	76.6	4793	73.6	4806	73.3	4871	70.8	4922
GR	64.9	4936	68	4943	67.7	4977	59.4	4988	56.7	4991
GR	56	4995	56.6	5000	57.8	5007	59.6	5012	61.7	5015
GR	66.9	5015.1	64.4	5017	64.8	5049	87.6	5051	80	5069
GR	78.1	5074	75.7	5085	74.6	5102	71.8	5109	65.1	5119
GR	64.8	5169	65.6	5170	65.7	5179	69.3	5187	71.9	5200
GR	73	5203	73	5223	72.7	5240	74.6	5251	75.1	5254
GR	74.7	5268	74	5290	74	5317	74	5344	74	5371
GR	74	5444	74	5467	75.1	5520	75.5	5541	79.9	5556
GR	80.8	5560	80.8	5568	0	0	0	0	0	0
NC	0.3	0.5								
ET	9.1	4965	5024							
X1	13834	39	4986	5014	110	70	104			
X3	10	73	73							
GR	82	4200	77.5	4402	77.5	4422	77.2	4430	77.3	4450
GR	76.6	4509	76.5	4577	76.8	4660	76.1	4689	75.9	4733
GR	75.1	4775	74	4823	74.8	4877	76	4909	76.5	4950
GR	71.3	4986	60	4986.1	59.5	4993	59.4	5000	59.1	5007
GR	58.9	5012	60.4	5012.1	60.5	5014	71.3	5014.1	76	5050
GR	75.2	5218	75.1	5245	74.7	5255	74.3	5269	74.2	5288
GR	74.2	5305	74.3	5324	74.5	5336	75	5475	75.9	5520
GR	75.9	5546	79.2	5555	81.6	5562	81.4	5573	0	0
NC	0.069	0.079	0.034							
ET	7.11	9.11	4909	5218	4965	5024				
SB	1	1.6	2.6	28	331	59.5	59.3			
X1	13846	39	4986	5014	12	12	12			
X2	1	71.3	76							
X3	10	74	74.2							

BT	32	4200	82	82	4402	77.5	77.5	4422	77.5	77.5
BT4430.0	77.2	77.2	4450	77.3	77.3	4509	76.6	76.6	4577	
BT	76.5	76.5	4660	76.8	76.8	4689	76.1	76.1	4733	75.9
BT	75.9	4775	75.1	75.1	4823	74	74	4877	74.8	74.8
BT4909.0	76	76	4950	76.4	76.4	4986	76.4	71.3	5014	
BT	76.3	71.3	5050	76	76	5218	75.2	75.2	5245	75.1
BT	75.1	5255	74.7	74.7	5269	74.3	74.3	5288	74.2	74.2
BT5305.0	74.2	74.2	5324	74.3	74.3	5336	74.5	74.5	5475	
BT	75	75	5520	75.9	75.9	5546	75.9	75.9	5555	79.2
BT	79.2	5562	81.6	81.6	5573	81.4	81.4			
GR	82	4200	77.5	4402	77.5	4422	77.2	4430	77.3	4450
GR	76.6	4509	76.5	4577	76.8	4660	76.1	4689	75.9	4733
GR	75.1	4775	74	4823	74.8	4877	76	4909	76.4	4950
GR	71.3	4986	60	4986.1	59.9	4993	59.7	5000	59	5007
GR	58.6	5012	60.4	5012.1	60.4	5014	71.3	5014.1	76	5050
GR	75.2	5218	75.1	5245	74.7	5255	74.3	5269	74.2	5288
GR	74.2	5305	74.3	5324	74.5	5336	75	5475	75.9	5520
GR	75.9	5546	79.2	5555	81.6	5562	81.4	5573	0	0
NH	5	10	4891	0.069	4990	0.034	5010	0.079	5084	10
NH	5518									
ET	9.1	4891	5084							
X1	13950	33	4990	5010	90	120	104			
X2	15									
GR	82	4200	77.7	4433	76.9	4439	76.3	4460	75.4	4509
GR	73.9	4604	73.7	4639	70.6	4719	68.9	4801	68	4891
GR	67.2	4946	66.8	4968	66.9	4970	65.2	4977	61.7	4983
GR	59.9	4990	59.7	4994	59.1	5008	60.2	5010	64.6	5018
GR	66	5084	64.9	5110	67.5	5139	68.2	5158	67.4	5198
GR	67.6	5267	67.7	5307	68.1	5391	75.7	5455	75.7	5475
GR	80.3	5483	82.2	5487	81.6	5518	0	0	0	0
NC	0.054	0.04	0.039	0.1	0.3					
ET	9.1	4955	5090							
X1	14250	48	4988	5011	200	380	300			
GR	82	4333	70.5	4594	67.5	4678	67.1	4681	67.1	4705
GR	67.6	4707	66.8	4780	66.3	4862	66.9	4924	67	4939
GR	66.6	4944	66.5	4962	66.1	4984	65.6	4986	61.2	4988
GR	60.63	4993	60.03	5009	61.2	5011	61.5	5016	61.9	5021
GR	64.7	5026	65.2	5044	65.7	5080	66.9	5132	68.8	5151
GR	69.8	5278	76.7	5288	78	5292	71.7	5296	70.7	5303
GR	70.2	5355	70.2	5365	75.6	5379	76.8	5403	76.8	5406
GR	76.8	5417	77.6	5423	79	5426	78.3	5438	82.5	5449
GR	83.5	5452	73.4	5461	73	5465	80.7	5473	87.1	5535
GR	86.6	5594	87.1	5652	87	5698	0	0	0	0
ET	9.1	4955	5090							
X1	14500	64	4989	5010	220	210	250			
GR	89.7	3814	89	3835	84.6	3838	82.5	3930	81.3	3987
GR	81.3	4014	81.8	4024	81.2	4035	80.7	4040	80.7	4052
GR	81.5	4062	81.1	4088	80	4124	80.3	4138	80.3	4175
GR	80.9	4209	80.7	4241	80.8	4263	80.1	4297	80.4	4328
GR	80	4345	80	4352	80	4367	80	4377	80.7	4384
GR	79	4387	79	4396	78.6	4400	78.6	4407	78.3	4422
GR	73.5	4541	70.5	4610	70.5	4628	70.4	4639	68.1	4727
GR	67.2	4918	67.2	4935	67.3	4946	67.1	4972	66.8	4986
GR	60.9	4989	60.8	4989.1	60.8	5002	60.9	5010	61.6	5012
GR	66.2	5023	67.7	5029	67.8	5073	94.2	5135	83.9	5168
GR	82.9	5178	89.1	5201	90	5213	71.8	5263	87.8	5315
GR	93.7	5355	95.7	5361	72.6	5394	72.5	5397	86	5426
GR	89.4	5439	84.7	5454	85	5469	85	5485	0	0
NC	0.035	0.059	0.039							
QT	2	4150	4150							
ET	9.1	4965	5090							
X1	14750	58	4992	5008	210	270	250			
GR	87.1	4067	86.6	4092	84.4	4104	81.5	4111	81.5	4136
GR	82.8	4144	82.7	4161	82.2	4202	81.3	4224	81.3	4261
GR	81.4	4284	81.3	4367	81.3	4384	81.3	4403	81.3	4413
GR	81.3	4419	81.3	4429	80.2	4432	81.2	4441	80.6	4521

GR	76.6	4683	75.9	4690	76.1	4706	75.1	4731	70.18	4882
GR	69.18	4992	62.38	4992.1	61.58	5002	62.98	5008	70.08	5022
GR	70.22	5030	70.3	5044	70.3	5083	72.6	5089	80.4	5099
GR	81.8	5106	81.8	5119	79	5122	69.9	5143	67.9	5152
GR	68.5	5189	68.9	5252	69.6	5254	69.6	5269	71.9	5414
GR	70.9	5461	70.1	5469	70.1	5479	80.3	5503	85.4	5513
GR	86.1	5527	86.7	5600	87.1	5617	85.1	5622	85.1	5653
GR	85.6	5654	85.6	5664	87.2	5831	0	0	0	0
NC	0.3	0.5								
NH	5	10	4975	0.035	4988	0.039	5012	0.059	5090	10
NH	5782									
ET	9.11	4975	5090							
X1	14837	37	4988	5012	87	87	87			
X3	10	70	70.15							
X4	2	70.84	4975	72	5090					
GR	88.2	4141	87.7	4159	84.5	4163	83.8	4189	83.7	4249
GR	83.5	4420	83.1	4523	82.7	4596	81.5	4649	79.4	4708
GR	76.4	4767	73.7	4841	72	4899	71.58	4914	70.78	4986.5
GR	63.68	4988	63.88	5000	64.28	5012	68.98	5013.5	70.98	5027
GR	71.68	5062	72.2	5102	73.1	5226	74	5317	74.4	5437
GR	74.9	5524	77.1	5565	73.4	5571	73.2	5574	73.2	5578
GR	73.2	5585	77.8	5586	79.3	5606	82.4	5644	85	5688
GR	86.5	5739	87.8	5782	0	0	0	0	0	0
SB	1	1.6	2.4	24	129	64.1	63.9			
NH	5	10	4800	0.035	4988	0.039	5012	0.059	5100	10
NH	5782									
ET	9.11	4800	5100							
X1	14883	46	4988	5012	46	46	46			
X2	1	69.98	71.48							
X3	10	71.48	71.78							
X4	2	75	4800	72.1	5100					
BT	45	4141	88.2	88.2	4159	87.7	87.7	4163	84.5	84.5
BT4189.0	83.8	83.8	4249	83.7	83.7	4420	83.5	83.5	4523	
BT	83.1	83.1	4596	82.7	82.7	4649	81.5	81.5	4708	79.4
BT	79.4	4767	76.4	76.4	4841	73.7	73.7	4899	72	72
BT4924.0	71.68	71.68	4973	71.48	71.48	4973.5	74.14	71.48	4985	
BT	74.72	71.67	4985.1	76.18	71.67	4987.5	76.18	71.72	4988	76.18
BT	64.18	4988.1	75.28	68.43	5000	76.25	69.98	5012	75.4	68.38
BT5012.1	76.23	64.18	5015	76.23	64.7	5015.1	74.76	64.7	5026.5	
BT	74.35	71.78	5027	71.78	71.78	5073	71.31	71.31	5102	72.2
BT	72.2	5226	73.1	73.1	5317	74	74	5437	74.4	74.4
BT5524.0	74.9	74.9	5565	77.1	77.1	5571	73.4	73.4	5574	
BT	73.2	73.2	5578	73.2	73.2	5585	73.2	73.2	5586	77.8
BT	77.8	5606	79.3	79.3	5644	82.4	82.4	5688	85	85
BT5739.0	86.5	86.5	5782	87.8	87.8					
GR	88.2	4141	87.7	4159	84.5	4163	83.8	4189	83.7	4249
GR	83.5	4420	83.1	4523	82.7	4596	81.5	4649	79.4	4708
GR	76.4	4767	73.7	4841	72	4899	71.68	4924	71.48	4973
GR	71.48	4973.5	71.67	4985	71.67	4985.1	71.72	4987.5	64.18	4988
GR	64.18	4988.1	64.08	5000	64.18	5006	64.18	5012	64.18	5012.1
GR	64.7	5015	64.7	5015.1	71.78	5026.5	71.78	5027	71.31	5073
GR	72.2	5102	73.1	5226	74	5317	74.4	5437	74.9	5524
GR	77.1	5565	73.4	5571	73.2	5574	73.2	5578	73.2	5585
GR	77.8	5586	79.3	5606	82.4	5644	85	5688	86.5	5739
GR	87.8	5782	0	0	0	0	0	0	0	0
NH	5	10	4965	0.035	4991	0.039	5009	0.059	5060	10
NH	5727									
ET	9.1	4965	5060							
X1	14950	70	4991	5009	67	67	67			
X4	2	69.03	4965	70.5	5060					
GR	92.2	4155	92.2	4184	90.9	4194	84.7	4200	84.7	4226
GR	85.4	4239	86.5	4280	84.1	4351	84.6	4378	85.3	4389
GR	83.9	4401	83.2	4407	83.6	4410	83.6	4421	82.8	4430
GR	83.4	4437	84.1	4447	84.5	4495	84.9	4544	83.6	4574
GR	82.7	4602	82.8	4607	82.8	4631	83	4662	84.6	4679
GR	85.1	4688	85	4728	84.4	4746	78.3	4756	76.7	4779

GR	76.8	4796	73.3	4805	72.8	4830	72.3	4848	68.6	4858
GR	69.1	4925	69.02	4972.5	68.32	4986	67.02	4988	64.82	4991
GR	64.12	5000	64.62	5009	66.12	5010	66.42	5013.5	69.02	5018
GR	69.13	5022.5	68.56	5022.6	68.97	5051	69.54	5051.1	70.92	5070
GR	73.1	5110	72.8	5173	73	5257	74.8	5323	75.2	5393
GR	74.4	5412	74.7	5447	75.2	5466	75.8	5580	74.7	5594
GR	71.4	5596	71.4	5607	71.4	5610	72	5631	72.9	5637
GR	83	5661	85.4	5671	86.6	5689	87.7	5702	88.1	5727
NC	0.1	0.3								
NH	5	10	4920	0.035	4984	0.039	5015	0.059	5045	10
NH	5389									
ET	9.1	4920	5045							
X1	15200	52	4981	5019	150	360	250			
X4	2	74.5	4920	74.2	5045					
GR101.90	4249	100	4262	96.6	4306	94.3	4317	87.3	4327	
GR	85.6	4334	85.6	4362	86.4	4372	86.3	4440	86.3	4463
GR	85.1	4474	85.2	4480	85.3	4491	84.1	4500	85.1	4506
GR	86.4	4517	87.5	4527	84.5	4538	84.7	4592	84.5	4676
GR	84.2	4701	84.2	4728	82.6	4802	82.8	4843	82.7	4856
GR	81.2	4883	80.1	4887	79	4906	71.6	4936	69.1	4954
GR	69.2	4973	68.2	4981	65.4	4984	65.37	5000	65.4	5015
GR	71.5	5019	71.9	5027	72.8	5031	75.3	5054	78.1	5086
GR	80.7	5105	83.9	5163	83.8	5201	86.2	5240	89.9	5267
GR	91.1	5278	93.3	5306	94.3	5311	94.8	5332	95.6	5351
GR	97.8	5365	98.6	5389	0	0	0	0	0	0
NH	5	10	4980	0.035	4993	0.039	5006	0.059	5045	10
NH	5379									
ET	9.1	4980	5045							
X1	15430	55	4993	5006	260	140	230			
X4	2	71.4	4980	76.5	5045					
GR100.70	4372	96.7	4399	94.4	4441	89.7	4446	88.8	4457	
GR	87.5	4463	88	4479	87.8	4494	88	4507	87	4518
GR	87.7	4524	87.7	4535	86.9	4541	85.8	4546	87.6	4557
GR	88.8	4577	89.6	4606	89.5	4625	88.3	4635	87.4	4638
GR	87.6	4651	85.1	4655	85.1	4697	86.3	4717	86.6	4756
GR	86.4	4779	86.6	4784	86.6	4810	86.7	4834	86	4886
GR	83.9	4914	82.9	4945	82.9	4960	82.2	4965	72.6	4976
GR	70.2	4987	68.3	4991	66.6	4993	66.53	5000	66.6	5006
GR	71.8	5013	73.8	5020	76.8	5047	82.7	5082	83.6	5157
GR	84.8	5163	85	5207	92.6	5213	94.1	5224	95.7	5282
GR	95.3	5300	95.6	5326	96.3	5345	98.9	5360	99.4	5379
NC	0.035	0.059	0.039							
ET	9.1	4940	5075							
X1	15700	44	4990	5009	260	280	270			
GR	95.7	4418	93.2	4446	92	4477	90.9	4487	90.4	4491
GR	90.7	4508	90.6	4524	89.9	4531	88.9	4537	90.6	4545
GR	90.6	4556	89.2	4560	90.9	4567	92.5	4577	91.8	4612
GR	91	4647	89.8	4671	88.4	4674	87.7	4731	86.8	4767
GR	86.6	4776	86.6	4804	87.3	4812	87.9	4851	86.6	4884
GR	85.4	4902	84.5	4913	78.9	4922	76.4	4941	73.5	4987
GR	69.4	4990	67.88	5000	69.4	5009	73.3	5014	74.2	5018
GR	75.4	5070	80	5072	81.2	5120	87.3	5161	89.7	5192
GR	95.3	5235	100.2	5249	101.4	5261	101.2	5268	0	0
ET	9.1	4930	5030							
X1	15950	53	4990	5009	190	270	250			
GR107.60	4394	104.8	4411	101.9	4439	101.5	4454	92.5	4459	
GR	92.2	4469	92.6	4486	92.2	4500	92.2	4505	92.6	4508
GR	92.6	4517	92.1	4522	93.6	4529	93.4	4538	89.9	4554
GR	88.3	4595	88.2	4660	87.8	4721	86.6	4732	86.8	4759
GR	87.6	4766	89.1	4774	87.8	4781	87.5	4811	84.8	4871
GR	81.6	4907	76.8	4931	74	4942	74.1	4968	74	4981
GR	72.5	4986	70.9	4990	69.14	4998	69.74	5004	70.14	5009
GR	70.9	5009.1	71.8	5013	73.7	5019	74.5	5023	79.6	5023
GR	82.3	5075	78.4	5079	80.3	5083	80.9	5087	84.8	5091
GR	88.5	5147	95	5185	96.6	5204	95.6	5211	95.2	5213
GR	95.2	5241	96.7	5250	100.8	5260	0	0	0	0

NC	0.06	0.06	0.045							
ET	9.1	4930	5060							
X1	16250	49	4989	5010	390	280	300			
GR120.90	4406	120.3	4412	115.9	4417	109.3	4428	98.2	4440	
GR	97.2	4451	97.6	4456	97.6	4471	96.1	4480	95.2	4488
GR	94.7	4491	95	4508	94.8	4523	93.7	4549	90.2	4599
GR	88.6	4635	89.2	4675	88.3	4682	87.9	4686	87.9	4721
GR	89	4728	89.6	4746	87.8	4787	81.4	4836	79.3	4854
GR	77.6	4911	77.5	4931	75.8	4945	75.8	4977	75.3	4985
GR	71.4	4989	70.64	4997	71.24	5004	71.64	5010	71.4	5010.1
GR	74.3	5015	75.8	5021	76.6	5038	77.8	5075	79.5	5096
GR	80.6	5108	82.1	5122	84.3	5138	90.4	5168	92.6	5181
GR	93.1	5188	93	5218	99.5	5256	100.9	5265	0	0
NH	4	0.06	4972	0.045	5027	0.06	5035	10	5201	
ET	9.1	4920	5030							
X1	16500	44	4972	5027	190	270	250			
GR106.40	4408	106.5	4415	102.8	4426	99.7	4437	98.5	4449	
GR	98.5	4455	99.1	4457	99.1	4467	95.3	4476	93.5	4493
GR	94	4507	93.8	4522	94.3	4531	93.1	4563	92.2	4597
GR	89.8	4621	89.2	4674	88.1	4685	88.1	4719	88.3	4749
GR	89.5	4779	88.9	4822	86.9	4847	83.7	4877	79.7	4914
GR	77.8	4950	76.5	4966	75	4970	73.3	4972	71.89	4994
GR	72.49	5012	72.89	5027	73.2	5027.1	75.8	5035	78.5	5040
GR	80.2	5045	83	5062	94	5090	95.2	5123	98.6	5155
GR103.40	5170	105.9	5185	107.5	5192	107.5	5201	0	0	
NH	5	10	4945	0.075	4985	0.049	5015	0.068	5030	10
NH	5327									
ET	9.1	4966	5030							
X1	16850	46	4985	5015	310	300	350			
X4	2	89.65	4945	80.82	5030					
GR	91.4	4464	102.1	4482	102.9	4489	102.8	4503	100.1	4509
GR	88.7	4526	85.9	4544	85.9	4582	85.8	4612	85.8	4620
GR	84.1	4635	84.1	4656	84.9	4671	85.4	4687	85.4	4726
GR	84.8	4774	84.2	4809	87.1	4848	88.1	4868	89.7	4892
GR	89.7	4907	89.85	4927	89.55	4954	79.25	4971	74.65	4985
GR	73.65	4997	74.25	5007	74.65	5015	80.45	5015.1	80.95	5035
GR	81.1	5065	81.6	5122	81.2	5170	82.1	5176	83.5	5200
GR	84.7	5217	86.6	5220	88.7	5239	90.6	5253	92.4	5266
GR	94.5	5268	97.8	5305	97.8	5314	104.1	5319	105.7	5325
GR106.20	5327	0	0	0	0	0	0	0	0	
NH	5	10	4880	0.075	4990	0.049	5009	0.068	5025	10
NH	5347									
ET	9.1	4880	5025							
X1	17050	41	4990	5009	160	190	200			
X2	15									
X4	2	82.1	4880	82.37	5025					
GR	94.9	4460	95.9	4468	101.9	4480	103.6	4487	104.4	4494
GR104.40	4504	103.2	4508	95.1	4519	92.5	4535	88.1	4557	
GR	85.7	4576	84.5	4614	83.4	4633	82.1	4644	82.6	4661
GR	82.8	4681	83.8	4715	84.6	4770	82.7	4792	82.8	4828
GR	82	4890	80.6	4922	78.8	4955	78.2	4978	77.3	4984
GR	75.1	4990	74.66	4998	75.26	5004	75.66	5009	75.1	5009.1
GR	79.4	5015	82.3	5023	83.9	5040	84	5067	84	5149
GR	86.8	5194	91.1	5259	94.5	5289	97.9	5314	100.5	5327
GR100.80	5347	0	0	0	0	0	0	0	0	
NC	0.075	0.068	0.049	0.1	0.3					
NH	5	10	4833	0.075	4992	0.049	5007	0.068	5031	10
NH	5402									
ET	9.1	4850	5030							
X1	17200	43	4992	5007	140	160	150			
GR106.10	4452	106.7	4454	106.7	4466	105.7	4473	105.6	4496	
GR103.70	4515	98.4	4531	91.7	4550	89.9	4564	89.1	4608	
GR	87.6	4634	85.3	4647	83.7	4658	83.9	4675	83.9	4691
GR	84.5	4699	85.4	4741	86.5	4773	86.8	4787	83.2	4833
GR	82.7	4900	80.2	4946	79.8	4977	79.8	4986	78	4989
GR	76.6	4992	75.41	4998	76.01	5003	76.41	5007	76.6	5007.1

GR	80.4	5017	84	5031	86.1	5053	88.3	5097	89.9	5130
GR	88.7	5175	88	5202	92	5239	94.6	5265	96.9	5322
GR	99.1	5341	100	5373	102.9	5402	0	0	0	0
NH	4	0.075	4985	0.049	5014	0.068	5060	10	5373	
ET	9.1	4920	5060							
X1	17450	41	4985	5014	240	250	250			
GR125.60	4470	121.3	4485	104.5	4527	96.5	4544	90.9	4559	
GR	89.8	4576	90.6	4617	90.1	4645	88	4680	85.6	4710
GR	85.7	4713	84.7	4715	85.1	4730	85.1	4747	85.5	4753
GR	84.5	4765	84.8	4809	85.3	4868	83.8	4921	81.2	4945
GR	80.5	4980	77.8	4985	76.67	4997	77.27	5007	77.8	5014
GR	78.3	5015	80.2	5019	82.4	5032	83.5	5060	85.8	5108
GR	86.6	5129	85.9	5136	85.5	5137	85.5	5166	85.9	5168
GR	87.4	5205	90.5	5248	95.1	5282	98.3	5317	101.4	5364
GR101.50	5373	0	0	0	0	0	0	0	0	
NC	0.069	0.081	0.061							
ET	9.1	4940	5095							
X1	17650	46	4993	5006	210	180	200			
GR115.40	4467	114	4499	112.8	4532	104	4572	99.8	4585	
GR	98.5	4613	97.5	4623	93.9	4626	91.7	4649	90.2	4658
GR	89.2	4667	89.8	4682	89.3	4698	90.1	4706	89.9	4721
GR	87.8	4750	88.2	4781	88.2	4828	86.7	4880	83.2	4923
GR	82.3	4933	82.9	4955	82.2	4982	80.9	4990	77.9	4993
GR	77.88	4997	77.68	5004	77.9	5006	78.9	5010	82	5020
GR	82.7	5053	84.7	5079	85.6	5101	88.4	5132	87.8	5152
GR	86.2	5167	85.7	5168	85.7	5198	86.7	5208	91.8	5243
GR	94.7	5279	95.5	5293	97.7	5320	100	5342	101.1	5360
GR102.30	5401	0	0	0	0	0	0	0	0	
ET	9.1	4870	5020							
X1	17870	43	4994	5005	170	140	220			
GR112.10	4238	112.3	4279	111.5	4322	108.8	4349	107.1	4355	
GR104.30	4360	102.9	4382	103.3	4387	100	4407	97.8	4437	
GR	97.8	4447	97.1	4451	97.6	4466	97.5	4486	96.5	4504
GR	95.2	4528	92.2	4549	90.3	4586	88.7	4637	88.3	4697
GR	86.4	4726	85.1	4751	83.9	4796	82.1	4874	81.8	4937
GR	82.4	4975	82.7	4988	80.7	4994	78.99	4997	78.79	5003
GR	80.7	5005	82.4	5009	86.5	5021	89.1	5035	92.5	5078
GR	92.4	5092	91.7	5094	92.8	5131	95.4	5155	100.1	5174
GR101.20	5184	103.2	5228	104.8	5249	0	0	0	0	
NH	5	10	4900	0.069	4992	0.061	5008	0.081	5045	10
NH	5464									
ET	9.1	4900	5045							
X1	18100	51	4992	5008	140	170	230			
X4	2	85.58	4900	84.4	5045					
GR116.10	4295	118.9	4319	119.4	4323	112	4331	110.8	4344	
GR107.80	4348	106.6	4378	103.3	4391	102.4	4423	103.6	4438	
GR103.60	4455	104.4	4460	102.9	4481	100.5	4508	99.1	4524	
GR	98.6	4529	98.9	4548	98.8	4566	99.9	4571	100.3	4578
GR	97.5	4587	90.9	4636	90.2	4687	90.2	4741	89.9	4790
GR	87.9	4845	86.35	4876	82.75	4989	81.25	4992	80.15	4997
GR	79.95	5005	81.15	5008	83.35	5019	84.85	5056	84.7	5095
GR	85.3	5117	86.8	5150	86	5161	86	5180	88.5	5187
GR	89.3	5204	90.9	5225	92.8	5237	94.6	5267	96	5297
GR	96.9	5313	98.2	5349	99.9	5386	102	5403	103.2	5413
GR105.90	5464	0	0	0	0	0	0	0	0	
NH	5	10	4830	0.069	4988	0.03	5012	0.081	5050	10
NH	5490									
ET	9.11	4830	5050							
X1	18199	36	4988	5012	110	90	99			
X3	10	89.6	85.5							
X4	2	87.7	4830	87.4	5050					
GR102.90	3925	102.6	4057	102.5	4155	102.5	4175	102	4270	
GR101.50	4307	101.1	4414	101.1	4436	100.7	4512	98.7	4565	
GR	95.4	4612	93.1	4662	90.7	4731	89.1	4819	87.25	4900
GR	87.55	4950	86.85	4986	89.35	4986.1	89.35	4988	79.75	4988.1
GR	79.65	4994	79.55	5000	79.75	5006	79.65	5012	89.25	5012.1

GR	89.25	5014	87.55	5014.1	87.35	5089	87	5132	87.3	5143
GR	87.9	5201	91.2	5256	95.1	5312	95.4	5320	105.8	5484
GR105.90	5490	0	0	0	0	0	0	0	0	
SB	0	1.6	2.4	23.5	120	79.4	79.55			
NH	5	10	4830	0.069	4988.2	0.03	5011.8	0.081	5050	10
NH	5490									
ET	7.11	9.11	4830	5050	4830	5050				
X1	18241	33	4988.2	5011.8	42	42	42			
X2	1	84.95	87.9							
X3	10	91.25	87.9							
X4	2	91.15	4830	88.3	5050					
BT	31	3925	102.9	102.9	4057	102.6	102.6	4155	102.5	102.5
BT4175.0	102.5	102.5	4270	102	102	4307	101.5	101.5	4414	
BT101.10	101.1	4436	101.1	101.1	4512	100.7	100.7	4565	98.7	
BT	98.7	4612	95.4	95.4	4662	93.1	93.1	4700	92.34	92.34
BT4800.0	91.05	91.05	4900	91.25	91.25	4950	91.25	91.25	4971	
BT	91.75	80.25	4988.2	91.45	79.05	4988.3	91.45	83.55	5000	92.25
BT	84.95	5011.7	91.45	83.25	5011.8	91.45	79.45	5022	91.45	88.05
BT5022.1	88.05	88.05	5150	89.05	89.05	5201	87.9	87.9	5256	
BT	91.2	91.2	5312	95.1	95.1	5320	95.4	95.4	5484	105.8
BT105.80	5490	105.9	105.9							
GR102.90	3925	102.6	4057	102.5	4155	102.5	4175	102	4270	
GR101.50	4307	101.1	4414	101.1	4436	100.7	4512	98.7	4565	
GR	95.4	4612	93.1	4662	92.34	4700	91.05	4800	91.25	4900
GR	91.25	4950	80.25	4971	79.05	4988.2	79.05	4988.3	79.35	4994
GR	79.35	5000	79.95	5006	79.45	5011.7	79.45	5011.8	88.05	5022
GR	88.05	5022.1	89.05	5150	87.9	5201	91.2	5256	95.1	5312
GR	95.4	5320	105.8	5484	105.9	5490	0	0	0	0
NH	5	10	4850	0.045	4988	0.033	5012	0.035	5150	10
NH	5321									
ET	9.1	4850	5150							
X1	18330	49	4988	5012	89	89	89			
X4	2	86.2	4850	83.2	5150					
GR106.90	3895	105.3	3961	101.5	3985	101.4	4017	102.3	4044	
GR101.70	4048	100.3	4052	99.9	4073	101	4080	100.1	4091	
GR	99.3	4140	98.8	4223	98.9	4299	99.3	4376	98.1	4420
GR	97.4	4470	94.7	4520	91	4560	88.7	4621	89	4666
GR	88.6	4689	87.9	4696	88.8	4717	89.4	4764	89	4809
GR	87	4841	86.65	4843	84.15	4934	82.95	4987	81.05	4988
GR	81.35	4994	82.45	4998	82.45	5003	81.55	5009	82.05	5012
GR	86.25	5018	87.95	5025	87.55	5070	85.5	5085	84.2	5098
GR	84	5127	82.8	5172	82.7	5191	85.8	5214	92.3	5238
GR	99.8	5275	104.6	5304	107.8	5314	108.1	5321	0	0
NC	0.1	0.3								
NH	5	10	4850	0.045	4991	0.033	5008	0.035	5190	10
NH	5284									
ET	9.1	4850	5190							
X1	18500	43	4991	5008	170	170	170			
X4	2	82.5	4850	86.7	5190					
GR114.10	4152	107.9	4174	103.4	4202	100.9	4223	100.9	4276	
GR100.40	4334	100.8	4394	99.7	4460	99.1	4520	97.6	4560	
GR	95.8	4636	96	4668	97.3	4715	98.3	4744	98.3	4770
GR	96.2	4782	92.6	4801	86.7	4823	84.1	4838	83.4	4845
GR	82.5	4846	82.5	4965	83.3	4967	84.2	4974	84.7	4983
GR	84	4989	81.8	4991	81.73	4995	82.83	4998	81.83	5002
GR	81.93	5006	81.8	5008	81.8	5010	83.8	5019	84.7	5033
GR	84.6	5068	85	5127	84.6	5157	84.8	5178	86.7	5191
GR107.50	5247	112.4	5265	114.8	5284	0	0	0	0	
NC	0.045	0.035	0.033							
ET	6.4									
X1	18750	44	4992	5007	290	230	250			
GR120.90	4482	110.3	4512	107.9	4521	106.3	4549	104.5	4580	
GR102.70	4602	101.9	4618	100.3	4651	100.8	4696	102.8	4749	
GR103.50	4789	103.7	4813	102	4822	99.6	4838	92.1	4865	
GR	86.3	4884	83.5	4898	82.5	4901	82.3	4903	82.3	4958
GR	82.7	4961	84.8	4970	85.6	4981	84.6	4988	83	4990

GR	82.3	4992	82.28	4996	83.38	4999	83.13	5002	82.48	5006
GR	82.3	5007	82.4	5011	84.2	5018	86	5031	85.5	5036
GR	87.3	5097	88.8	5146	89.5	5166	94.5	5191	99.4	5223
GR101.90	5248	110.1	5279	113.6	5296	112.7	5306	0	0	
X1	19000	41	4987	5012	300	210	250			
GR123.20	4543	123.1	4562	122.4	4581	118.8	4594	115.4	4613	
GR108.70	4636	104.2	4657	101.6	4683	100	4714	99.1	4778	
GR	98.5	4798	94.9	4817	91.8	4838	89.9	4848	86.6	4855
GR	84.3	4858	84.3	4903	87.3	4906	88.3	4924	87.8	4944
GR	85.9	4963	84.8	4979	84.6	4984	83.5	4987	82.84	4993
GR	83.94	4997	83.14	5002	83.04	5008	83.5	5012	85.9	5018
GR	87.9	5021	92	5043	93.5	5062	95	5091	96	5121
GR	97.3	5159	99.2	5194	102.1	5222	106.4	5261	110.7	5293
GR112.90	5307	0	0	0	0	0	0	0	0	
NC	0.055	0.06	0.051							
ET	9.1	4850	5015							
X1	19300	40	4989	5010	320	200	300			
GR112.20	4338	108.8	4364	107.7	4392	105	4407	100.6	4482	
GR100.60	4554	101	4590	100.2	4623	98.6	4652	94.8	4669	
GR	90.8	4681	89.3	4686	87.8	4689	87.7	4770	89.4	4776
GR	93.5	4790	94.4	4795	94.6	4810	94.4	4852	90.1	4863
GR	88.1	4869	85.7	4877	85.5	4919	86.2	4943	87.5	4959
GR	87.3	4973	85.8	4985	84.3	4989	83.79	4990	84.09	5000
GR	83.49	5006	84.3	5010	86.8	5015	92.7	5037	95.8	5058
GR	97.5	5073	102.2	5105	108.8	5131	113.2	5160	115.8	5176
ET	9.1	4880	5070							
X1	19550	49	4990	5011	220	220	250			
GR113.00	3866	109	3898	107.7	3923	106	3987	104.5	4085	
GR104.20	4195	104.2	4293	101.1	4345	100.2	4376	101.5	4410	
GR103.10	4466	103.3	4542	102.1	4547	102.1	4562	103.3	4570	
GR101.70	4576	101.9	4594	102.5	4600	101.7	4612	101.7	4632	
GR102.80	4658	101.9	4677	99.1	4685	95.1	4707	90.2	4727	
GR	87.8	4745	86.6	4748	86.6	4751	87.5	4753	88	4772
GR	88.8	4810	89.1	4868	88.3	4943	87.7	4960	86.7	4984
GR	85.9	4989	84.3	4990	84.14	4991	84.54	5001	84.04	5007
GR	84.3	5011	84.9	5015	86.6	5041	90.5	5069	97.3	5098
GR100.30	5113	102.5	5146	108.4	5216	116.4	5304	0	0	
ET	9.1	4935	5065							
X1	19850	42	4991	5009	120	330	300			
GR111.90	4075	110.6	4108	107.7	4133	105.5	4186	104.4	4280	
GR104.70	4381	104.7	4439	105.1	4507	104.6	4600	103.8	4710	
GR103.50	4788	103.6	4854	104.3	4866	105.1	4878	100	4891	
GR	92.9	4923	90.7	4941	89.4	4946	88.6	4948	88.6	4951
GR	89.7	4953	91.1	4963	91.4	4976	89.9	4984	87	4987
GR	85.3	4991	85	4992	84.75	5000	84.7	5005	85.3	5009
GR	87	5015	91.2	5023	92.4	5047	93.9	5067	92.6	5108
GR	92.7	5145	94.9	5161	100.8	5182	103.1	5213	109.8	5220
GR112.70	5232	116.8	5250	0	0	0	0	0	0	
NC	0.06	0.045	0.024							
ET	6.4									
X1	20050	51	4992	5009	140	250	200			
GR114.20	4175	115.2	4190	112.2	4212	108.1	4243	105.1	4370	
GR104.50	4417	104.6	4463	105.6	4496	105.4	4525	105.1	4576	
GR104.60	4680	104.2	4737	103.8	4813	103	4839	101.2	4843	
GR	98.8	4867	94.1	4882	91.3	4905	89.8	4920	89.3	4926
GR	88.4	4928	88.3	4931	88.9	4933	90.1	4943	91	4963
GR	89.8	4980	89.2	4990	87.5	4992	87.2	4993	87.4	5001
GR	86.9	5006	87.5	5009	88.9	5012	90.1	5031	90.8	5056
GR	88.3	5062	87.5	5062	87.5	5068	89.1	5082	91.4	5082
GR	94.3	5102	96.8	5126	98.9	5149	100.7	5198	102.5	5238
GR103.70	5309	105.5	5356	106.3	5376	112.4	5444	113.1	5489	
GR114.30	5510	0	0	0	0	0	0	0	0	
NC	0.06	0.069	0.034							
X1	20200	43	4984	5016	160	140	150			
GR112.70	4264	112	4287	108.8	4308	106.3	4357	104.7	4439	
GR105.00	4548	104.1	4554	104.2	4576	105	4586	106.6	4594	

GR105.70	4601	105.2	4624	105.9	4671	104.4	4732	103.6	4759	
GR102.90	4782	101.75	4798	95.25	4828	95.05	4836	90.85	4847	
GR	91.65	4891	91.65	4937	91.05	4982	89.45	4984	88.85	4986
GR	89.15	5001	88.55	5010	89.15	5016	96.95	5031	100.45	5046
GR101.95	5083	101.8	5088	101.9	5153	101.1	5193	100.6	5194	
GR100.70	5221	101	5227	101.7	5256	104.1	5295	104.4	5350	
GR105.70	5376	108.6	5403	115.7	5436	0	0	0	0	
NC	0.06	0.04	0.044							
X1	20600	38	4992	5008	300	300	400			
GR111.60	4434	106.4	4495	105.3	4549	103.6	4567	102.2	4591	
GR103.60	4619	103.1	4621	104.8	4659	104.4	4709	102.7	4728	
GR	97.5	4768	94.3	4807	93.4	4852	92	4886	90.5	4887
GR	90.5	4890	93	4896	92.4	4923	92.2	4975	91.4	4988
GR	90.6	4992	89.13	4997	89.73	5004	89.6	5008	90.8	5011
GR	94.3	5025	97.7	5049	99.6	5096	100	5152	100.5	5192
GR100.10	5196	100.1	5224	101.4	5231	102.8	5263	104.6	5312	
GR105.60	5367	108.7	5411	114.4	5446	0	0	0	0	
X1	20750	30	4985	5015	120	330	150			
GR109.50	4593	108.7	4604	106.3	4657	104.2	4697	104.4	4739	
GR102.90	4771	99	4800	96.9	4822	94.4	4895	94.5	4940	
GR	95.15	4947	95.05	4968	90.95	4985	89.35	4994	89.95	5008
GR	90.75	5015	92.55	5018	93.65	5033	95.95	5049	96.7	5052
GR	96.8	5106	97.4	5187	98	5237	101	5287	103.9	5329
GR105.70	5357	105.9	5389	106.9	5411	113.1	5456	116.3	5476	
NC	0.3	0.5								
X1	20919	48	4992	5008	199	139	169			
X3	10	94	95							
GR115.80	4568	111.5	4620	108.6	4681	107.9	4723	106.5	4750	
GR105.20	4771	101.6	4804	96.7	4843	93.2	4887	94.4	4914	
GR	95.5	4950	95.05	4968	91.95	4986	91.45	4992	91.45	4992.1
GR	91.05	4996	90.75	5000	90.95	5004	91.75	5008	91.75	5008.1
GR	94.55	5018	94.45	5031	99.3	5037	99.3	5045	103.3	5056
GR104.30	5059	104.7	5064	103.4	5070	103.8	5144	105	5159	
GR104.70	5160	106	5188	107	5196	105	5210	105.9	5235	
GR105.20	5258	107.3	5285	106.2	5315	106.1	5355	104.2	5371	
GR104.20	5392	106.4	5421	107.6	5448	108.4	5480	108.9	5512	
GR109.50	5567	112.6	5591	115.8	5614	0	0	0	0	
X1	20920	0	0	0	1	1	1			
BT	45	4568	115.8	115.8	4620	111.5	111.5	4681	108.6	108.6
BT4723.0	107.9	107.9	4750	106.5	106.5	4771	105.2	105.2	4804	
BT101.60	101.6	4843	96.7	96.7	4887	93.2	93.2	4914	94.4	
BT	94.4	4950	95.5	95.5	4968	95.05	95.05	4986	95.65	91.95
BT4992.0	96.45	91.45	4992.1	96.45	95.65	5008	96.45	95.65	5008.1	
BT	96.45	91.75	5018	94.55	94.55	5031	94.45	94.45	5037	99.3
BT	99.3	5045	99.3	99.3	5056	103.3	103.3	5059	104.3	104.3
BT5064.0	104.7	104.7	5070	103.4	103.4	5144	103.8	103.8	5159	
BT105.00	105	5160	104.7	104.7	5188	106	106	5196	107	
BT107.00	5210	105	105	5235	105.9	105.9	5258	105.2	105.2	
BT5285.0	107.3	107.3	5315	106.2	106.2	5355	106.1	106.1	5371	
BT104.20	104.2	5392	104.2	104.2	5421	106.4	106.4	5448	107.6	
BT107.60	5480	108.4	108.4	5512	108.9	108.9	5567	109.5	109.5	
BT5591.0	112.6	112.6	5614	115.8	115.8					
X1	20932	43	4992	5008	12	12	12			
BT	40	4568	115.8	115.8	4620	111.5	111.5	4681	108.6	108.6
BT4723.0	107.9	107.9	4750	106.5	106.5	4771	105.2	105.2	4804	
BT101.60	101.6	4843	96.7	96.7	4887	93.2	93.2	4914	94.4	
BT	94.4	4938	94.85	94.85	4963	94.75	94.75	4967	96.25	94.05
BT4992.0	96.45	91.85	4992.1	96.45	95.55	5008	96.45	95.65	5008.1	
BT	96.45	89.65	5033	96.45	94.45	5049	96.45	96.45	5074	98.85
BT	98.85	5144	103.8	103.8	5159	105	105	5160	104.7	104.7
BT5188.0	106	106	5196	107	107	5210	105	105	5235	
BT105.90	105.9	5258	105.2	105.2	5285	107.3	107.3	5315	106.2	
BT106.20	5355	106.1	106.1	5371	104.2	104.2	5392	104.2	104.2	
BT5421.0	106.4	106.4	5448	107.6	107.6	5480	108.4	108.4	5512	
BT108.90	108.9	5567	109.5	109.5	5591	112.6	112.6	5614	115.8	
BT115.80										

GR115.80	4568	111.5	4620	108.6	4681	107.9	4723	106.5	4750	
GR105.20	4771	101.6	4804	96.7	4843	93.2	4887	94.4	4914	
GR	94.85	4938	94.75	4963	94.05	4967	91.85	4992	91.85	4992.1
GR	91.15	4996	90.25	5000	89.85	5004	89.65	5008	89.65	5008.1
GR	94.45	5033	96.45	5049	98.85	5074	103.8	5144	105	5159
GR104.70	5160	106	5188	107	5196	105	5210	105.9	5235	
GR105.20	5258	107.3	5285	106.2	5315	106.1	5355	104.2	5371	
GR104.20	5392	106.4	5421	107.6	5448	108.4	5480	108.9	5512	
GR109.50	5567	112.6	5591	115.8	5614	0	0	0	0	
X1	20933	0	0	0	1	1	1			
X3	10	94.75	96.45							
NC	0.052	0.052	0.044							
ET	9.1	4845	5035							
X1	21000	46	4993	5007	49	69	67			
GR115.80	4568	111.5	4620	108.6	4681	107.9	4723	106.5	4750	
GR105.20	4771	101.6	4804	96.7	4843	93.2	4887	94.4	4914	
GR	94.85	4924	94.95	4968	93.55	4991	92.05	4993	91.65	4996
GR	91.65	5002	92.15	5007	93.35	5008	95.25	5019	98.85	5035
GR	99.3	5037	99.3	5045	103.3	5056	104.3	5059	104.7	5064
GR103.40	5070	103.8	5144	105	5159	104.7	5160	106	5188	
GR107.00	5196	105	5210	105.9	5235	105.2	5258	107.3	5285	
GR106.20	5315	106.1	5355	104.2	5371	104.2	5392	106.4	5421	
GR107.60	5448	108.4	5480	108.9	5512	109.5	5567	112.6	5591	
GR115.80	5614	0	0	0	0	0	0	0	0	
NC	0.1	0.3								
ET	9.1	4940	5180							
X1	21250	54	4990	5009	190	230	250			
GR115.30	4713	108.8	4826	106	4875	105	4896	100.5	4922	
GR	96.9	4951	95.8	4977	95.1	4988	92.8	4990	92.09	4994
GR	92.09	5002	92.8	5009	94.4	5010	95.4	5030	94.8	5055
GR	94	5066	92.8	5067	92.8	5076	94.2	5085	95.9	5104
GR	97.6	5144	96.8	5160	96.8	5181	94.4	5183	94.4	5357
GR	95.7	5358	97.5	5373	101.1	5409	104.9	5453	107.4	5485
GR110.40	5514	111.8	5530	111.3	5548	109.8	5567	106.2	5602	
GR105.90	5623	107.9	5648	109.2	5671	107.6	5689	103.5	5707	
GR102.30	5747	102.7	5761	104.7	5778	106.9	5813	108.2	5845	
GR108.10	5856	107.8	5864	108	5893	108.4	5898	107.9	5911	
GR106.10	5943	107.7	5984	110.4	6008	112.2	6039	0	0	
ET	9.1	4940	5095							
X1	21550	40	4994	5005	220	320	300			
GR115.40	4670	115.4	4710	110.1	4790	109.5	4833	108	4842	
GR107.00	4868	101	4901	97.8	4930	96.7	4967	96.6	4984	
GR	95.9	4989	94.2	4994	93.22	4996	92.62	5000	92.82	5002
GR	94.1	5005	95.5	5008	96.3	5020	97.4	5036	98.2	5111
GR	98.6	5162	99.1	5171	97.9	5174	98.4	5190	99.4	5192
GR100.00	5219	99.9	5280	100.8	5296	102.1	5308	109.3	5327	
GR111.20	5334	112.7	5356	112.9	5390	113.1	5454	113.4	5543	
GR114.60	5609	114.9	5687	115.9	5757	116.6	5843	116	5860	
ET	7.4									
X1	21740	28	4991	5009	180	160	190			
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	97.45	4917	97.25	4933
GR	95.95	4960	97.05	4987	94.25	4991	93.55	4995	92.95	5001
GR	93.15	5005	94.05	5009	96.15	5011	96.65	5030	99.25	5048
GR112.10	5078	112.2	5122	112.7	5200	113.4	5282	114.7	5377	
GR114.80	5504	116.8	5577	116.1	5629	0	0	0	0	
NC	0.3	0.5								
X1	21789	28	4990	5010	49	49	49			
X3	10	98.2	98.9							
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	98.25	4949	98.25	4982
GR	94.75	4990	94.75	4990.1	93.65	4995	93.75	5000	94.05	5005
GR	94.55	5010	94.55	5010.1	97.65	5015	99.95	5040	112.3	5042
GR112.10	5078	112.2	5122	112.7	5200	113.4	5282	114.7	5377	
GR114.80	5504	116.8	5577	116.1	5629	0	0	0	0	
X1	21790	0	0	0	1	1	1			

BT	24	4586	115.5	115.5	4632	112.7	112.7	4679	109.8	109.8
BT4710.0	106.3	106.3	4747	100.3	100.3	4773	97.9	97.9	4816	
BT	97.3	97.3	4907	97.6	97.6	4949	98.25	98.25	4982	98.25
BT	98.25	4990	98.85	94.75	4990.1	98.85	97.85	5010	98.95	97.85
BT5010.1	98.95	94.55	5040	99.95	99.95	5042	112.3	112.3	5078	
BT112.10	112.1	5122	112.2	112.2	5200	112.7	112.7	5282	113.4	
BT113.40	5377	114.7	114.7	5504	114.8	114.8	5577	116.8	116.8	
BT5629.0	116.1	116.1								
X1	21800	28	4988.5	5011.5	10	10	10			
BT	25	4586	115.5	115.5	4632	112.7	112.7	4679	109.8	109.8
BT4710.0	106.3	106.3	4747	100.3	100.3	4773	97.9	97.9	4816	
BT	97.3	97.3	4907	97.6	97.6	4951	98.45	98.45	4972	98.65
BT	98.65	4988.5	98.85	94.45	4988.6	98.85	97.85	5011.5	98.95	97.95
BT5011.6	98.95	94.45	5031	101.35	101.35	5034	111	111	5042	
BT112.30	112.3	5078	112.1	112.1	5122	112.2	112.2	5200	112.7	
BT112.70	5282	113.4	113.4	5377	114.7	114.7	5504	114.8	114.8	
BT5577.0	116.8	116.8	5629	116.1	116.1					
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	98.45	4951	98.65	4972
GR	94.45	4988.5	94.45	4988.6	92.95	5000	93.95	5005	94.45	5011.5
GR	94.45	5011.6	97.65	5015	101.35	5031	111	5034	112.3	5042
GR112.10	5078	112.2	5122	112.7	5200	113.4	5282	114.7	5377	
GR114.80	5504	116.8	5577	116.1	5629	0	0	0	0	
X1	21801	0	0	0	1	1	1			
X3	10	98.4	98.9							
X1	21850	27	4994	5006	49	49	49			
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	96.95	4927	96.25	4964
GR	97.25	4986	95.35	4992	94.65	4994	93.95	4997	94.15	5000
GR	94.75	5006	97.05	5036	111.75	5038	111.75	5065	112.1	5078
GR112.20	5122	112.7	5200	113.4	5282	114.7	5377	114.8	5504	
GR116.80	5577	116.1	5629	0	0	0	0	0	0	
NC	0.1	0.3								
X1	22200	46	4991	5009	200	300	350			
GR117.20	4794	113.4	4816	111.2	4861	111.4	4903	111.1	4927	
GR105.90	4940	99.9	4958	98.55	4969	98.85	4984	98.05	4990	
GR	96.05	4991	95.55	4994	95.75	5001	96.15	5009	98.95	5012
GR	99.75	5030	100.3	5035	98.7	5057	98.8	5115	99.2	5197
GR	99.9	5249	99.9	5324	100.3	5365	101.8	5382	103.1	5399
GR109.00	5429	112.9	5447	113.4	5467	113.3	5481	113.1	5486	
GR111.90	5489	113.4	5495	114.8	5499	115.7	5501	115.6	5515	
GR115.60	5547	116.6	5566	114.6	5585	112.2	5599	112.9	5625	
GR112.60	5661	112.8	5715	113.9	5777	115.5	5834	116.1	5888	
GR116.10	5922	0	0	0	0	0	0	0	0	
NC	0.3	0.5								
X1	22239	49	4990.5	5009.5	39	39	39			
X3	10	100.4	100.1							
GR117.20	4794	113.4	4816	111.2	4861	111.4	4903	111.1	4927	
GR105.90	4940	99.9	4958	100.85	4960	100.45	4977	100.45	4987	
GR	96.15	4987.1	95.65	4990.5	95.65	4990.6	95.45	4995	95.25	5000
GR	95.35	5005	95.75	5009.5	95.75	5009.6	99.65	5013	100.15	5040
GR	98.7	5057	98.8	5115	99.2	5197	99.9	5249	99.9	5324
GR100.30	5365	101.8	5382	103.1	5399	109	5429	112.9	5447	
GR113.40	5467	113.3	5481	113.1	5486	111.9	5489	113.4	5495	
GR114.80	5499	115.7	5501	115.6	5515	115.6	5547	116.6	5566	
GR114.60	5585	112.2	5599	112.9	5625	112.6	5661	112.8	5715	
GR113.90	5777	115.5	5834	116.1	5888	116.1	5922	0	0	
X1	22240	0	0	0	1	1	1			
BT	45	4794	117.2	117.2	4816	113.4	113.4	4861	111.2	111.2
BT4903.0	111.4	111.4	4927	111.1	111.1	4940	105.9	105.9	4958	
BT	99.9	99.9	4960	100.85	100.85	4977	100.45	100.45	4987	100.45
BT100.45	4987.1	100.45	96.15	4990.5	100.75	95.65	4990.6	100.75	99.55	
BT5009.5	100.75	99.45	5009.6	100.75	95.75	5040	100.15	100.15	5057	
BT	98.7	98.7	5115	98.8	98.8	5197	99.2	99.2	5249	99.9
BT	99.9	5324	99.9	99.9	5365	100.3	100.3	5382	101.8	101.8
BT5399.0	103.1	103.1	5429	109	109	5447	112.9	112.9	5467	

BT113.40	113.4	5481	113.3	113.3	5486	113.1	113.1	5489	111.9	
BT111.90	5495	113.4	113.4	5499	114.8	114.8	5501	115.7	115.7	
BT5515.0	115.6	115.6	5547	115.6	115.6	5566	116.6	116.6	5585	
BT114.60	114.6	5599	112.2	112.2	5625	112.9	112.9	5661	112.6	
BT112.60	5715	112.8	112.8	5777	113.9	113.9	5834	115.5	115.5	
BT5888.0	116.1	116.1	5922	116.1	116.1					
X1	22257	0	0	0	17	17	17			
X2	1									
NC	0.039	0.039	0.044							
X1	22258	0	0	0	1	1	1			
X3	10	100.7	99.9							
X1	22310	45	4991	5009	52	52	52			
GR117.20	4794	113.4	4816	111.2	4861	111.4	4903	111.1	4927	
GR105.90	4940	99.9	4958	98.45	4960	98.45	4988	96.65	4991	
GR	95.55	4996	95.75	5005	96.65	5009	97.85	5015	99.35	5026
GR	99.25	5036	98.7	5057	98.8	5115	99.2	5197	99.9	5249
GR	99.9	5324	100.3	5365	101.8	5382	103.1	5399	109	5429
GR112.90	5447	113.4	5467	113.3	5481	113.1	5486	111.9	5489	
GR113.40	5495	114.8	5499	115.7	5501	115.6	5515	115.6	5547	
GR116.60	5566	114.6	5585	112.2	5599	112.9	5625	112.6	5661	
GR112.80	5715	113.9	5777	115.5	5834	116.1	5888	116.1	5922	
NC	0.1	0.3								
ET	9.1	4780	5250							
X1	22600	37	4989	5010	400	200	290			
GR119.20	4698	119.2	4720	119.2	4743	116.3	4755	108.2	4767	
GR102.00	4784	99.8	4817	99.5	4848	99.8	4910	100	4958	
GR	99.3	4978	98.8	4985	98.6	4988	96.62	4989	96.61	4995
GR	96.61	5006	96.62	5010	97.5	5013	98.9	5027	100.2	5061
GR101.40	5100	102.9	5133	103.2	5144	101.2	5149	98.1	5154	
GR	98.1	5323	100.5	5329	104.1	5348	108.5	5373	110.4	5380
GR110.40	5397	112.4	5414	113.4	5453	114.4	5530	115.1	5578	
GR116.10	5664	115.6	5711	0	0	0	0	0	0	
ET	9.1	4950	5300							
X1	22900	81	4992	5007	280	310	300			
GR124.30	3658	123.6	3669	120.6	3678	120.1	3683	120.1	3710	
GR120.10	3716	118.7	3732	117.8	3762	115.5	3803	113.5	3833	
GR112.60	3885	111.1	3923	111.5	3941	110.1	3943	110.1	3950	
GR111.10	3953	112.6	3967	113.3	3982	113.1	4063	111.6	4131	
GR111.60	4195	112.1	4281	112.7	4324	116.6	4363	118.7	4387	
GR122.30	4410	122.3	4418	121.6	4424	124.4	4431	126.5	4437	
GR128.00	4451	129.1	4466	128.5	4467	128.3	4481	127	4499	
GR127.00	4509	122.4	4521	124	4529	124.1	4538	121	4541	
GR123.70	4550	125.2	4562	125.4	4570	122.4	4575	121.1	4592	
GR119.40	4614	119.8	4662	121.1	4700	121.7	4736	122.1	4778	
GR122.40	4804	123.8	4819	123.6	4831	121.5	4850	122.1	4861	
GR118.10	4871	108.9	4897	101.4	4953	100.4	4976	99.5	4987	
GR	97.75	4992	97.72	4996	97.72	5004	97.75	5007	99.4	5010
GR101.10	5020	102.3	5051	103.6	5070	103	5082	101.7	5091	
GR100.60	5093	98.2	5096	98.2	5396	100	5399	104.7	5416	
GR108.50	5435	108.7	5453	111.6	5474	115	5504	117.3	5564	
GR116.60	5627	0	0	0	0	0	0	0	0	
ET	9.1	4940	5090							
X1	23170	86	4989	5010	330	260	270			
GR118.30	4015	118.4	4026	118.8	4030	119.1	4055	119.5	4062	
GR122.90	4069	123.3	4086	123.1	4140	121.4	4148	121.5	4193	
GR120.80	4248	119.9	4268	120.7	4299	121.7	4329	121.4	4355	
GR122.10	4379	121.2	4391	112.7	4401	112.8	4415	114.6	4442	
GR113.90	4467	115.7	4486	116.1	4502	114.3	4515	113.4	4528	
GR112.10	4543	112	4564	113.9	4574	117.1	4589	118.5	4596	
GR117.60	4607	116.3	4623	114.9	4634	111.8	4645	111.8	4664	
GR114.70	4696	119.8	4714	121.8	4732	123.3	4746	123.4	4777	
GR120.70	4814	115.5	4836	112.1	4869	106.6	4900	101.5	4922	
GR	99.9	4941	99.8	4972	100.2	4988	99.1	4989	98.91	4997
GR	98.71	5002	99.11	5005	99	5010	99.9	5012	101.1	5029
GR103.00	5057	103.5	5083	104.8	5109	106.9	5140	110.5	5166	
GR114.00	5188	113.9	5190	116.4	5215	120.2	5233	121.4	5267	

GR118.80	5296	113.1	5325	110	5350	109.9	5402	110.9	5431	
GR113.40	5454	113.8	5459	112.3	5461	111.4	5477	112.9	5485	
GR114.70	5493	115.3	5499	113.4	5515	111.8	5529	110.9	5567	
GR111.20	5594	113.5	5619	116.2	5647	118	5687	119	5746	
GR119.40	5847	0	0	0	0	0	0	0	0	
ET	9.1	4910	5050							
X1	23550	37	4991	5008	310	290	380			
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	102.6	4938	102.6	4977	102.6	4988	100.3	4991	
GR100.30	4997	100.1	5001	100.5	5003	100.3	5008	101.9	5012	
GR104.40	5020	104.9	5044	107.7	5068	112.6	5091	114.8	5114	
GR115.90	5156	115.1	5201	112.8	5238	110.7	5271	111.4	5291	
GR112.00	5327	114.8	5368	116.3	5425	118.4	5525	119.9	5574	
GR120.50	5621	121.1	5626	120.1	5630	121.9	5641	123.7	5647	
GR124.90	5673	126.3	5688	0	0	0	0	0	0	
ET	9.1	4910	5050							
X1	23590	37	4992	5008	40	40	40			
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	102.6	4938	103.85	4972	103.35	4991	101.85	4992	
GR100.45	4998	100.25	5002	100.65	5004	102.15	5008	104.25	5012	
GR105.05	5017	105.15	5057	107.7	5068	112.6	5091	114.8	5114	
GR115.90	5156	115.1	5201	112.8	5238	110.7	5271	111.4	5291	
GR112.00	5327	114.8	5368	116.3	5425	118.4	5525	119.9	5574	
GR120.50	5621	121.1	5626	120.1	5630	121.9	5641	123.7	5647	
GR124.90	5673	126.3	5688	0	0	0	0	0	0	
NC	0.3	0.5								
ET	9.1	4900	5050							
X1	23631	38	4995.5	5004.5	41	41	41			
X3	10	105.5	105.3							
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	102.6	4938	105.55	4946	104.65	4992	102.85	4995.5	
GR102.85	4995.6	102.35	4997	101.25	5000	101.55	5003	101.85	5004.5	
GR101.85	5004.6	102.55	5012	106.15	5019	105.35	5079	112.6	5091	
GR114.80	5114	115.9	5156	115.1	5201	112.8	5238	110.7	5271	
GR111.40	5291	112	5327	114.8	5368	116.3	5425	118.4	5525	
GR119.90	5574	120.5	5621	121.1	5626	120.1	5630	121.9	5641	
GR123.70	5647	124.9	5673	126.3	5688	0	0	0	0	
ET	9.1	4900	5050							
X1	23632	0	0	0	1	1	1			
BT	34	4754	125.9	125.9	4783	125.7	125.7	4802	125.1	125.1
BT4825.0	120.9	120.9	4856	111.7	111.7	4893	104.6	104.6	4938	
BT102.60	102.6	4946	105.55	105.55	4995.5	106.65	102.85	4995.6	106.65	
BT105.65	5004.5	106.65	105.65	5004.6	106.65	101.85	5012	106.15	102.55	
BT5019.0	106.15	106.15	5079	105.35	105.35	5091	112.6	112.6	5114	
BT114.80	114.8	5156	115.9	115.9	5201	115.1	115.1	5238	112.8	
BT112.80	5271	110.7	110.7	5291	111.4	111.4	5327	112	112	
BT5368.0	114.8	114.8	5425	116.3	116.3	5525	118.4	118.4	5574	
BT119.90	119.9	5621	120.5	120.5	5626	121.1	121.1	5630	120.1	
BT120.10	5641	121.9	121.9	5647	123.7	123.7	5673	124.9	124.9	
BT5688.0	126.3	126.3								
ET	9.1	4900	5050							
X1	23647	37	4994.5	5005.5	15	15	15			
BT	32	4754	125.9	125.9	4783	123.7	123.7	4802	125.1	125.1
BT4825.0	120.9	120.9	4856	111.7	111.7	4893	104.6	104.6	4938	
BT104.60	104.6	4946	106.75	106.75	4994.5	106.85	102.05	4994.6	106.85	
BT105.55	5005.5	106.85	105.65	5005.6	106.85	101.55	5085	105.45	105.45	
BT5091.0	112.6	112.6	5114	114.8	114.8	5156	115.9	115.9	5201	
BT115.10	115.1	5238	112.8	112.8	5271	110.7	110.7	5291	111.4	
BT111.40	5327	112	112	5368	114.8	114.8	5425	116.3	116.3	
BT5525.0	118.4	118.4	5574	119.9	119.9	5621	120.5	120.5	5626	
BT121.10	121.1	5630	120.1	120.1	5641	121.9	121.9	5647	123.7	
BT123.70	5673	124.9	124.9	5688	126.3	126.3				
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	104.6	4938	106.75	4946	104.65	4992	102.05	4994.5	
GR102.05	4994.6	101.85	4997	101.15	5000	101.25	5003	101.55	5005.5	
GR101.55	5005.6	104.85	5009	105.45	5085	112.6	5091	114.8	5114	

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GR115.90        5156      115.1      5201      112.8      5238      110.7      5271      111.4      5291
GR112.00        5327      114.8      5368      116.3      5425      118.4      5525      119.9      5574
GR120.50        5621      121.1      5626      120.1      5630      121.9      5641      123.7      5647
GR124.90        5673      126.3      5688          0         0          0         0          0         0
ET                9.1       4900      5050
X1              23648          0         0         0         1          1         1
X3                 10      106.7     105.4
ET                9.1       4900      5050
X1              23690         34      4992      5008        42         42        42
GR125.90        4754      125.7      4783      125.1      4802      120.9      4825      111.7      4856
GR106.25        4893     106.25      4927     104.85      4981     103.75      4988     102.45      4992
GR102.25        4994     102.15      5006     102.45      5008     105.65      5014     105.65      5069
GR112.60        5091      114.8      5114      115.9      5156      115.1      5201      115.8      5238
GR115.70        5271      115.4      5291        115      5327      115.8      5368      116.3      5425
GR118.40        5525      119.9      5574      120.5      5621      121.1      5626      120.1      5630
GR121.90        5641      123.7      5647      124.9      5673      126.3      5688          0         0
NC                0.1        0.3
ET                9.1       4920      5065
X1              23920         50      4985      5015       280        200       230
GR129.10        4264      126.1      4280      123.9      4298        122      4305        121      4315
GR121.70        4339      121.8      4343      118.5      4348      116.4      4368      115.4      4398
GR114.50        4443      113.2      4457        109      4480        109      4495        109      4551
GR109.00        4569        109      4581      109.3      4601      110.6      4656      111.2      4692
GR109.30        4748      107.9      4806     106.25      4890     106.25      4935     106.45      4970
GR104.25        4985     103.05      4993     102.35      5004     103.15      5010     104.25      5015
GR107.35        5027     109.25      5056      114.4      5094      118.2      5111      118.4      5125
GR116.90        5174      114.7      5208      113.6      5227      115.7      5244      116.3      5267
GR112.50        5294      112.4      5323      112.3      5343      113.3      5380      115.5      5424
GR117.30        5468      119.9      5521      121.8      5562        124      5595      128.2      5628
EJ
T1          STAMFORD,CT
T2          TYPE                19 FLOOD      INSURANCI STUDY
T3          NOROTON   RIVER       FLOODWAY
J1                -10          4        4.7
J2                 15         -1


ER
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T1      CITY OF STAMFORD, CONNECTICUT
T2      TYPE 19 FLOOD INSURANCE STUDY
T3      NOROTON RIVER - 100 YEAR FLOOD
J1          2       4.7
J2          1        -1
J3        200       115
J5        -10       -10
QT          2      5300      5300
NC       0.07      0.07     0.034       0.1       0.3
ET       10.4
X1        190         9      4951    5049.1
GR      16.44      4951      3.54    4951.1      2.14      4957      1.14      4982      1.64      4993
GR       2.24      5020      2.94      5049      9.34    5049.1     10.64      5097         0         0
ET        9.1      4961      5040
NH          4        10      4961      0.07      4977     0.034      5022      0.07      5720
X1        400        39      4977      5022       210       210       210
X2         15
GR         44      4059      32.4      4122      24.2      4203      22.8      4292      21.5      4417
GR       24.7      4506      29.5      4545      30.9      4586      28.6      4600      22.1      4623
GR       21.8      4635      27.9      4663      26.4      4738      18.8      4786       9.6      4858
GR        9.7      4891       9.1      4899       7.7      4961       2.7      4977      2.05      4982
GR       1.95      4992      2.65      5004       2.8      5022       9.5      5035      11.5      5088
GR       29.6      5106      29.6      5205      29.1      5305      30.8      5404      31.5      5444
GR       35.7      5497      36.6      5538      39.7      5540      40.1      5591      39.2      5620
GR       39.7      5663      42.9      5683      44.7      5696      48.7      5720         0         0
NC       0.07      0.07     0.048
ET        9.1      4925      5075
X1        580        46      4986      5014       220       155       180
GR       49.8      3887      41.5      3905      34.1      4027      31.9      4129      30.8      4261
GR       28.4      4358        31      4399        33      4428      32.9      4470      30.4      4485
GR       17.8      4520      19.6      4626      18.3      4666      13.5      4734      11.2      4749
GR       10.4      4799       9.2      4819       9.7      4867       9.4      4870       6.9      4970
GR        4.6      4978       3.2      4986       2.7      4994       2.4      5006       3.1      5014
GR        3.7      5022       7.6      5031       9.5      5064      14.7      5074      29.5      5111
GR       31.6      5142      31.4      5245      29.5      5261      29.8      5292      31.7      5300
GR       32.5      5349      35.3      5426        38      5447      41.5      5495      43.4      5561
GR       42.9      5574      39.5      5616      39.8      5665      45.3      5681      48.9      5699
GR       54.3      5755         0         0         0         0         0         0         0         0
NC        0.3       0.5
ET        9.1      4974      5026
X1        689        30      4974      5026       120        80       109         0
X3         10      16.8        45
GR         49      3376      43.1      3537        39      3678      33.9      3888      29.9      4047
GR         29      4240      29.9      4371      33.7      4534     37.55    4712.4      16.7    4712.5
GR       16.7    4777.5     38.95    4777.6      41.3      4887      42.5      4946     12.91      4974
GR        3.7    4974.1       3.5      4990       3.5    4990.1       3.9    4991.5       3.9    4991.6
GR       3.11    5008.5      3.11    5008.6      3.51      5010      3.51    5010.1      3.31      5026
GR       12.6    5026.1      45.4      5053      49.4      5222      54.3      5428      58.3      5604
NC      0.073     0.064     0.048         0         0
ET        9.1      4974      5026
SB       1.25     1.787       2.6         0        42         3       273         0      9.27      3.11
X1        990        33      4974    5026.1       300       300       300         0
X2          0         0         1     16.23        18         0         0         0         0         0
X3         10        18      48.6
BT         33      3376        49        49      3537      43.1      43.1      3678        39        39
BT       3888      33.9      33.9      4047      29.9      29.9      4240        29        29      4371
BT       29.9      29.9      4534      33.7      33.7    4682.4     35.13     35.13    4682.5        18
BT         18    4747.5        18        18    4747.6     40.52     40.52      4887      41.3      41.3
BT       4941        42      24.2      4956        43        20      4974        44     16.34    4974.1
BT         44     16.23      4990        45     16.23    4990.1        45     16.23    4991.5        45
BT      16.23    4991.6        45     16.23    5008.5        46     16.23    5008.6        46     16.23
BT       5010      46.5     16.23    5010.1      46.5     16.23      5026        47     16.23    5026.1
BT         47     16.23      5038      47.5      19.6      5054        48      19.6      5072      48.6
BT       19.8      5222      49.4      49.4      5428      54.3      54.3      5604      58.3      58.3
GR         49      3376      43.1      3537        39      3678      33.9      3888      29.9      4047
GR         29      4240      29.9      4371      33.7      4534     35.13    4682.4        18    4682.5
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GR	18	4747.5	40.52	4747.6	41.3	4887	24.2	4941	20	4956
GR	16.34	4974	9.2	4974.1	8.8	4990	8.8	4990.1	8.5	4991.5
GR	8.5	4991.6	8.3	5008.5	8.3	5008.6	8.6	5010	8.6	5010.1
GR	8.6	5026	16	5026.1	19.6	5038	19.6	5054	19.8	5072
GR	49.4	5222	54.3	5428	58.3	5604				
ET	9.1	4955	5075							
X1	1100	64	4983	5017	65	150	110			
GR	53.2	3299	36.4	3406	33.5	3448	33.2	3495	34.8	3567
GR	34.5	3644	32.9	3711	43	3743	44.1	3781	42.3	3797
GR	27.9	3834	28.2	3899	27.2	4078	24.7	4212	25.2	4296
GR	27	4329	29.6	4437	33.9	4527	34.2	4551	28.1	4567
GR	29.3	4585	28.9	4609	24.3	4624	23.5	4640	27.1	4658
GR	25.5	4684	19.4	4701	18.3	4744	18.8	4789	17.8	4824
GR	22.8	4851	25	4882	25.4	4911	24.5	4927	23	4947
GR	12.1	4976	10.5	4983	9.6	4984	8.9	4990	7.9	5005
GR	9.5	5017	18.2	5033	19.6	5058	19.5	5075	25.8	5095
GR	38.2	5111	42.1	5128	41.9	5139	40.8	5202	39	5252
GR	31	5305	31.1	5331	32.5	5341	32.7	5365	31.6	5413
GR	30.2	5463	30.7	5499	32.1	5557	36.3	5595	40.4	5639
GR	40.8	5676	43.8	5686	45.8	5706	48.1	5821	0	0
NC	0.065	0.06	0.025	0.1	0.3					
NH	4	0.065	4989	0.025	5010	0.06	5110	10	5953	
ET	9.1	4885	5110							
X1	1300	57	4989	5010	110	220	200			
GR	48.8	3473	34.8	3565	33.9	3612	34.4	3694	33.4	3893
GR	43	3923	44	3964	44.7	4001	35.5	4037	31.7	4051
GR	31.4	4223	31.7	4338	31.3	4428	31.7	4450	31.9	4462
GR	31.1	4598	33.2	4633	32.2	4674	27.3	4703	28.6	4736
GR	28.1	4782	27.4	4811	25.6	4836	18.8	4857	19.5	4900
GR	19.4	4915	18.2	4928	18	4946	18.9	4955	18.3	4973
GR	11	4989	9.53	4990	8.83	4994	7.83	5003	11	5010
GR	18.3	5043	18.3	5080	20.3	5135	24.3	5165	27.8	5186
GR	28.3	5196	29.7	5271	30.2	5382	30.1	5410	31.5	5433
GR	31.5	5490	35.3	5526	37.4	5598	40.5	5627	41.5	5640
GR	41.7	5681	39.9	5729	40.2	5766	42	5779	44.2	5857
GR	45.6	5934	52.3	5953	0	0	0	0	0	0
ET	9.1	4900	5080							
X1	1500	58	4978	5021	190	210	200			
GR	47.4	3608	34.9	3688	34.2	3734	34.7	3832	33.3	4032
GR	42.5	4057	42.1	4087	41	4090	37.3	4110	36.9	4139
GR	34.5	4149	31.8	4162	31	4378	31	4500	31.4	4586
GR	31.4	4613	31.2	4662	34	4691	33.3	4713	25.6	4736
GR	24.2	4751	24.9	4780	22.9	4853	20.6	4879	20.3	4918
GR	19.9	4928	14.4	4968	10.6	4978	8.16	4987	7.76	5004
GR	10.6	5021	17.2	5045	17.9	5062	25.7	5103	29.6	5146
GR	35.3	5161	37	5177	37.5	5216	35.3	5288	34.4	5344
GR	35.1	5423	36.3	5466	36.6	5495	36.4	5554	35.1	5614
GR	34.2	5671	34.9	5770	39.3	5774	40.3	5794	40.5	5820
GR	40.9	5858	42.2	5868	43.3	5902	45	5914	46	5949
GR	47.5	5963	49.4	5970	50.4	6000	0	0	0	0
NC	0.07	0.06	0.025							
ET	9.1	4920	5090							
X1	1750	56	4978.5	5021.5	250	250	250			
GR	45	3736	34	3802	33.3	3920	34.1	4173	39.1	4187
GR	39.1	4213	32.8	4241	31.9	4270	29.1	4287	30	4463
GR	29.6	4500	28.5	4610	28.4	4739	28.9	4764	29.3	4792
GR	29.3	4812	22.1	4890	22.6	4903	22.82	4906.5	22.77	4932.5
GR	22.67	4936.5	17.97	4951.5	13.97	4973.5	10.77	4978.5	8.07	4987.5
GR	7.67	5004.5	10.77	5021.5	18.17	5036.5	18.37	5059.5	19.2	5079
GR	25.5	5100	36.1	5144	44.8	5196	52.5	5224	54.4	5245
GR	57.2	5273	58.5	5290	59.9	5337	58.4	5361	58.8	5395
GR	60	5405	60.4	5448	61.3	5509	55.2	5539	45.9	5589
GR	44.2	5631	44	5659	41.3	5666	38.6	5715	36.6	5763
GR	37.5	5800	40.5	5826	42.8	5850	45.2	5909	47.7	5986
GR	58.4	6034	0	0	0	0	0	0	0	0
ET	9.1	4850	5140							

X1	2000	41	4967	5032	260	230	250			
GR	43.2	4069	37.4	4339	30.9	4620	30.2	4690	28.5	4724
GR	15.7	4781	16.4	4820	17.8	4848	14.7	4872	13.9	4893
GR	17.3	4905	14.8	4918	13.7	4954	10.6	4967	8.92	4981
GR	8.52	5007	10.6	5032	18.9	5070	17.1	5111	18.9	5132
GR	27.3	5168	40	5203	47.3	5240	52.3	5274	59.6	5328
GR	62.9	5359	63.1	5395	64.4	5432	65.1	5525	61	5571
GR	59	5608	59	5626	51.3	5646	41.1	5677	37.7	5743
GR	37.5	5782	39	5808	42.2	5886	47.3	5979	52.3	6029
GR	61.4	6055	0	0	0	0	0	0	0	0
ET	9.1	4720	5095							
X1	2250	52	4974	5025	260	230	250			
GR	36.4	3968	39.6	4021	46.5	4066	43.4	4148	26.2	4244
GR	23.2	4292	21.2	4426	21	4467	22.3	4478	18	4537
GR	15.3	4585	13.6	4649	16.1	4671	16	4696	13.9	4714
GR	14.1	4730	15.4	4744	14.9	4771	11.5	4781	10.8	4800
GR	10.8	4899	18.5	4920	18	4956	10.5	4974	9.77	4985
GR	9.37	5005	10.5	5025	18	5044	17.9	5074	33.5	5131
GR	42.7	5184	48.3	5201	50.4	5226	54	5264	55.1	5302
GR	55.7	5327	55	5353	52.7	5396	47.9	5457	44.1	5498
GR	40.8	5561	38.8	5659	38.9	5708	39.5	5740	41.1	5803
GR	42.8	5836	46.4	5860	48.9	5904	50.5	5925	55.8	5955
GR	60	5975	61.3	5980	0	0	0	0	0	0
NC	0.069	0.074	0.039							
ET	9.1	4630	5109							
X1	2500	59	4985	5014	240	260	250			
GR	43.3	3329	42.6	3363	39.8	3385	40	3526	33.7	3563
GR	29.1	3720	33.4	3743	33.6	3760	30.5	3785	27.5	3834
GR	25.6	3920	26.7	3963	24.7	4042	21.1	4072	20.9	4098
GR	18.3	4153	17.8	4239	17.5	4317	20.7	4335	23.2	4403
GR	21.9	4419	17.8	4453	17.1	4470	20.4	4479	17.8	4541
GR	18.2	4561	14.9	4580	17.5	4606	15.2	4629	12.4	4643
GR	18.6	4660	18.4	4669	11.1	4680	11.1	4899	15.8	4917
GR	15.3	4924	13.1	4952	13.9	4965	13.4	4979	10.9	4985
GR	10.52	4997	10.22	5006	10.9	5014	20.8	5045	21.5	5098
GR	25.2	5117	32.4	5135	35.6	5159	34.8	5223	34.2	5233
GR	34.7	5299	35.1	5412	35.7	5445	39.2	5520	39.4	5549
GR	43.8	5596	44.3	5617	50.5	5626	58.9	5673	0	0
NH	4	10	4696	0.069	4985	0.039	5014	0.074	5746	
ET	9.1	4696	5100							
X1	2750	58	4985	5014	210	255	250			
GR	46.3	3571	41.1	3618	41.1	3639	35.2	3677	33.4	3751
GR	33	3780	31	3788	32.1	3796	33.2	3840	33.1	3914
GR	30.2	4031	25.6	4083	24.4	4158	25.3	4182	23.5	4263
GR	20.6	4338	19.2	4459	19.5	4522	19.8	4567	17.6	4607
GR	15.7	4667	19.8	4696	18.9	4720	18.1	4743	18.6	4816
GR	18.8	4825	18.5	4855	21.1	4873	21.1	4917	18.4	4933
GR	17.6	4973	11.2	4985	11.37	4997	11.07	5006	11.2	5014
GR	20.4	5038	21.6	5099	25.6	5108	27.8	5146	30.6	5160
GR	35.9	5198	36.7	5240	36.5	5275	37.8	5310	38.7	5368
GR	39.6	5406	40	5510	39	5517	39.1	5548	43.4	5566
GR	44.3	5583	42	5623	41.6	5640	47.9	5654	50	5687
GR	56.3	5720	57.7	5743	61.6	5746	0	0	0	0
NH	5	10	4892	0.069	4984	0.039	5015	0.074	5035	10
NH	5786									
ET	9.1	4890	5035							
X1	2950	57	4958	5035	190	190	200			
GR	45.5	3927	41.4	3949	41.1	3964	32.5	4020	33	4072
GR	32.1	4122	34.7	4140	41.9	4156	41.7	4161	27.6	4184
GR	27.3	4206	27.3	4243	27.3	4418	27.3	4449	27.3	4482
GR	27.3	4531	27.3	4606	27.3	4662	27.3	4703	27.3	4722
GR	27.3	4758	27.3	4768	27.3	4823	27.3	4833	27.3	4841
GR	27.3	4850	26.8	4877	22.1	4892	20.4	4923	24.4	4941
GR	22.4	4958	11.85	4984	11.75	4997	11.75	5006	11.85	5015
GR	21.7	5035	22.7	5050	25.6	5122	26.7	5135.5	27.8	5149
GR	35.1	5180	34.8	5231	34.3	5237	34.5	5269	36.5	5286

GR	38.2	5359	38.8	5421	43.1	5478	43.7	5504	43.5	5544
GR	42.8	5578	39.8	5613	39.5	5657	39.3	5690	42	5721
GR	48.1	5752	58.9	5786	0	0	0	0	0	0
NC	0.085	0.079	0.061							
ET	9.1	4970	5035							
X1	3100	49	4980	5020	100	150	150			
GR	44	4083	41.7	4101	41.4	4142	44.8	4169	45.3	4188
GR	43	4202	34.2	4349	33	4395	25.7	4408	25.7	4474
GR	25.7	4546	25.6	4572	25.9	4616	25.8	4661	25.6	4688
GR	25.7	4714	34.6	4746	34.2	4844	29.9	4862	29.7	4909
GR	27	4930	27.8	4947	29	4961	16.46	4974	13.26	4980
GR	12.56	4997	12.26	5009	13.26	5020	14.46	5020.1	15.06	5027
GR	17.96	5027.1	22.36	5040	29.76	5041	27.36	5041.1	28.59	5058
GR	29.01	5099	30.94	5161	36.26	5292	40.1	5355	45.9	5476
GR	46.9	5538	47.8	5587	46.8	5628	48.5	5719	51.8	5734
GR	52.5	5769	56.1	5785	60.5	5810	60.7	5835	0	0
ET	9.1	4960	5035							
X1	3300	48	4987	5012	180	210	200			
GR	42.7	4171	40.9	4214	42.7	4231	39.9	4276	36.1	4320
GR	32.7	4449	30.6	4500	28.7	4514	27.9	4553	27.2	4603
GR	27.2	4685	27	4723	26.9	4784	26.8	4819	26.7	4845
GR	26.8	4860	26.8	4875	27	4889	27.8	4896	25.6	4958
GR	13.1	4987	13.36	4998	13.06	5006	13.1	5012	27.3	5040
GR	28.3	5064	28	5071	28.4	5125	28.7	5142	29.2	5251
GR	29.9	5278	36.1	5292	36.3	5324	39.8	5351	41.2	5401
GR	45.9	5433	46	5472	47.4	5484	49	5531	49.3	5583
GR	47.8	5601	47.8	5624	48.4	5707	50.3	5757	52.6	5802
GR	56.7	5862	60.7	5929	66.2	5984	0	0	0	0
NH	4	0.085	4985	0.061	5015	0.079	5094	10	6053	
ET	9.1	4970	5050							
X1	3570	35	4985	5015	230	195	220			
GR	43.8	4237	39	4329	36.3	4381	35.3	4453	32.9	4558
GR	33	4603	32.7	4648	32.7	4712	32.7	4816	32.7	4842
GR	31.05	4905	29.85	4958	20.15	4973	15.25	4985	14.15	4995
GR	14.25	5003	15.25	5015	18.35	5025	23.65	5037	27.65	5046
GR	26.55	5052	26.45	5055	27.25	5094	28.05	5165	27.7	5291
GR	26.9	5411	38.1	5434	40.7	5530	41.5	5651	43.2	5884
GR	48.1	5954	54.9	5982	63.8	5992	65.5	6031	67.3	6053
NC	0.3	0.5								
ET	9.1	4987	5013							
X1	3680	22	4987	5013	125	175	160			
X3	10	50	50							
GR	60	4217	58.2	4578	57.4	4846	38.78	4963	21.18	4984
GR	20.28	4987	20.28	4987.1	18.68	4991	17.28	4998	19.08	5006
GR	19.98	5010	21.48	5013	21.48	5013.1	21.68	5016	25.68	5054
GR	55.3	5292	54.8	5387	53.7	5620	53.8	5633	53.7	5852
GR	53.2	6030	53.5	6114	0	0	0	0	0	0
NC	0.015									
ET	9.1	4987	5013							
X1	3681	0	0	0	1	1	1			
X3	10	54	52							
ET	9.11	4987	5013							
SB	1	1.6	2.5	26	600	0	16	17.8		
X1	3778	25	4987	5013	97	97	97			
X2	1	39.37	53.5							
X3	10	56.1	53.5							
BT	24	4217	60	60	4578	58.2	58.2	4846	57.4	57.4
BT4954.0	56	28.02	4954.1	56	23.02	4983.5	56.1	22.42	4987	
BT	56.1	22.92	4987.1	56.1	26.5	4989	56.1	33.46	4996	56.1
BT	38.89	5002	56.1	39.37	5009	56.1	35.91	5013	56.1	24.5
BT5013.1	56.1	23.72	5016.5	56.1	26.92	5031	56.1	32.72	5100	
BT	56	27.82	5292	55.3	55.3	5387	54.8	54.8	5620	53.7
BT	53.7	5633	53.8	53.8	5852	53.7	53.7	6030	53.2	53.2
BT6114.0	53.5	53.5								
GR	60	4217	58.2	4578	57.4	4846	28.02	4954	23.02	4954.1
GR	22.42	4983.5	22.92	4987	22.92	4987.1	16.92	4989	15.72	4996

GR	15.32	5000	15.12	5002	16.72	5009	23.72	5013	23.72	5013.1
GR	26.92	5016.5	32.72	5031	27.82	5100	55.3	5292	54.8	5387
GR	53.7	5620	53.8	5633	53.7	5852	53.2	6030	53.5	6114
NC	0.063	0.046	0.039							
ET	9.1	4960	5018							
X1	3779	0	0	0	1	1	1			
X3	10	56.1	53.5							
ET	9.1	4960	5050							
X1	3870	24	4990	5010	140	70	91			
GR	48.5	4505	41.9	4645	42	4675	43.6	4747	41	4768
GR	38.8	4851	38.61	4918	36.71	4955	34.71	4965	20.51	4990
GR	19.91	4997	20.11	5003	20.51	5010	21.31	5021	26.21	5030
GR	30.51	5047	37.91	5058	47.8	5085	55.1	5114	55.9	5135
GR	54.9	5409	54.7	5600	54.4	5787	53.3	6110	0	0
ET	9.1	4880	5075							
NC	0.063	0.046	0.039	0.1	0.3					
X1	4100	29	4989	5010	180	225	230			
GR	48.5	4326	43.2	4587	42.8	4652	41.4	4810	38.7	4849
GR	34.9	4870	25.3	4896	27.6	4929	27.8	4954	20.1	4989
GR	20.09	4996	20.29	5002	20.1	5010	25.5	5019	25.5	5024
GR	25.5	5070	25.5	5107	35.7	5115	36.3	5141	40.4	5190
GR	43.9	5236	46	5567	47.7	5979	48.4	6099	49.5	6249
GR	49.5	6298	52.4	6362	66.6	6481	66.7	6502	0	0
ET	9.1	4950	5085							
X1	4375	22	4982	5018	210	280	275			
GR	48.5	4540	42.3	4900	40.7	4925	33.9	4953	30.9	4969
GR	23.3	4982	22.4	4991	20.3	5008	23.1	5018	27.2	5031
GR	31.2	5090	32.7	5135	40.3	5172	40.6	5232	41.3	5278
GR	43.1	5303	43.2	5332	45.7	5348	46.8	5386	46.4	5426
GR	48.1	5440	51	5445	0	0	0	0	0	0
ET	9.1	4982	5019							
NC	0.063	0.046	0.039	0.3	0.5					
X1	4475	18	4982	5018.1	95	105	105			
X3	10	38	38							
GR	48.5	4590	42.8	4863	40.93	4960	40.93	4982	23.8	4982.1
GR	23.1	4991	22.9	5000	23	5009	23.8	5018	40.58	5018.1
GR	40.2	5040	40.8	5263	42.7	5452	43.4	5643	44.2	5860
GR	45.7	6088	46.7	6299	50	6305	0	0	0	0
ET	9.11	4975	5018.1							
SB	1	1.6	2.6	0	36	462	23.6	23.2		
X1	4528	19	4982	5018.1	53	53	53			
X2	1	36.31	40.58							
X3	10	40.88	39.5							
BT	19	4590	48.5	48.5	4863	42.8	42.8	4921	40.72	40.72
BT4982.0	40.88	40.88	4982.1	40.88	36.31	4991	40.87	36.31	5000	
BT	40.86	36.31	5009	40.78	36.31	5013	40.74	36.31	5018	40.58
BT	35.78	5018.1	40.58	40.58	5076	39.5	39.5	5263	40.8	40.8
BT5452.0	42.7	42.7	5643	43.4	43.4	5860	44.2	44.2	6088	
BT	45.7	45.7	6299	46.7	46.7	6305	50	50		
GR	48.5	4590	42.8	4863	40.72	4921	40.88	4982	23.9	4982.1
GR	23.3	4991	23.4	5000	23.5	5009	24.4	5013	25.5	5018
GR	40.58	5018.1	39.5	5076	40.8	5263	42.7	5452	43.4	5643
GR	44.2	5860	45.7	6088	46.7	6299	50	6305	0	0
NC	0.068	0.035	0.039							
NH	4	0.068	4962	0.035	5041	10	5260	0.068	6300	
ET	9.1	4930	5050							
X1	4630	40	4962	5041	108	80	95			
GR	48.5	4598	48.5	4655	45.5	4659	44.8	4704	45.5	4730
GR	43.9	4798	39	4895	39.8	4917	39.7	4919	37.5	4962
GR	30.5	4976	25.4	4978	24.9	4992	25.2	5012	24.9	5022
GR	33.9	5041	33.9	5064	34.7	5141	40.7	5178	41.7	5254
GR	44.5	5260	46.1	5333	45.7	5364	45.3	5406	45.1	5448
GR	42.6	5456	42.2	5578	42.8	5691	43	5785	43.5	5813
GR	45.1	5839	45.8	5882	45.1	5977	45.3	6026	46.5	6039
GR	46.3	6088	45.7	6096	45.8	6160	47	6291	50	6300
NC	0.063	0.086	0.045	0.1	0.3					

NH	5	10	4900	0.063	4987	0.045	5012	0.086	5055	10
NH	5361									
ET	9.1	4900	5055							
X1	4850	30	4987	5012	290	170	220			
X4	2	34.2	4900	30.8	5055					
GR	48.5	3420	43.8	4091	41.4	4177	41.4	4212	40.4	4239
GR	37.3	4409	37.3	4443	37.6	4472	38.2	4487	36.8	4573
GR	36.5	4594	36.7	4640	35.7	4738	35.7	4778	35.7	4872
GR	33.1	4941	31.4	4972	25.3	4987	25.2	4995	25.2	5006
GR	25.3	5012	29.9	5028	31.2	5069	36.5	5072	39.1	5146
GR	43.8	5187	45	5203	46.1	5304	46.1	5320	45.9	5361
NH	5	10	4880	0.063	4986	0.045	5013	0.086	5051	10
NH	5605									
ET	9.1	4880	5051							
X1	5100	45	4986	5013	225	210	250			
X4	1	28.1	4880							
GR	48.5	3425	41.5	3780	43.1	3842	43.8	3962	42.3	3977
GR	42.3	4011	42.1	4067	39.7	4174	39.7	4226	38.5	4299
GR	36.6	4333	36.9	4368	36.8	4447	36.5	4485	32.6	4542
GR	30.3	4626	27.6	4709	27.2	4788	28.2	4914	30.8	4937
GR	31.4	4951	30.8	4968	25.6	4986	25.55	4995	25.55	5004
GR	25.6	5013	32.2	5020	39.5	5051	44.6	5104	45.3	5137
GR	44.2	5193	44.7	5200	44.8	5286	44.2	5287	44.3	5311
GR	44.9	5344	44.1	5375	44.8	5414	44.7	5439	43.7	5498
GR	43	5524	42.2	5536	42.3	5563	43.1	5591	54.9	5605
NH	5	10	4925	0.063	4986	0.045	5013	0.086	5050	10
NH	5581									
ET	9.1	4925	5050							
X1	5300	44	4986	5013	190	230	200			
X4	2	31.2	4925	31.9	5050					
GR	43.3	4059	42	4135	41	4163	40.3	4266	40.1	4312
GR	37.2	4371	32.4	4420	31.7	4492	32.1	4554	32.4	4585
GR	33.5	4646	30.4	4704	30	4750	33.7	4785	34	4809
GR	33.9	4847	31.6	4880	31.4	4905	30.8	4961	29.3	4974
GR	26.4	4986	25.82	4995	26.42	5004	26.4	5013	29.1	5024
GR	31.8	5047	33.1	5074	33.8	5104	38.8	5122	41.2	5170
GR	42.2	5241	41.7	5275	42	5296	42	5324	42.6	5336
GR	44.4	5341	48	5381	52.5	5455	52.2	5485	56.5	5509
GR	57.3	5523	55.6	5534	54.7	5551	57.8	5581		
NH	5	10	4920	0.063	4985	0.045	5015	0.086	5110	10
NH	5940									
ET	9.1	4920	5110							
X1	5500	55	4985	5015	185	210	200			
X4	2	34.47	4920	38.92	5110					
GR	51.7	3515	53.5	3561	53	3605	51.5	3625	51.4	3678
GR	49.5	3697	49.2	3780	49.5	3818	49.2	3857	49.9	3881
GR	49.6	3915	49.7	3986	49.5	4032	49.9	4063	48.4	4125
GR	47	4162	44.8	4175	44.8	4217	42.9	4330	42.6	4403
GR	42.5	4419	41.8	4447	41.5	4507	42.1	4605	42.5	4648
GR	41.4	4690	38.6	4754	36.1	4785	35.1	4822	34.4	4904
GR	34.6	4949	32.6	4951	32.3	4979	27.6	4985	26.1	4995
GR	26.7	5005	27.2	5015	34.2	5029	38.2	5073	39.1	5119
GR	37.8	5205	37.5	5233	43.2	5317	47.4	5418	48.1	5476
GR	46.3	5532	44.3	5669	44	5712	41.1	5766	41.7	5829
GR	42.1	5848	45.5	5850	48.1	5872	48.1	5935	50	5940
NH	5	10	4913	0.063	4981	0.045	5018	0.086	5113	10
NH	5305									
ET	9.1	4913	5113							
X1	5700	30	4981	5018	160	215	200			
X4	1	33.6	5113							
GR	44.7	4599	43.1	4682	42.2	4697	42.3	4742	43.7	4777
GR	44.7	4795	47.5	4809	48.4	4832	50.5	4847	50.3	4867
GR	46.1	4878	42.5	4899	38.1	4913	34.5	4930	33.9	4936
GR	34.6	4967	27.4	4981	26.37	4993	26.97	5005	27.4	5018
GR	37.3	5037	37.4	5049	33.9	5095	33	5160	31.5	5199
GR	31.6	5226	32.4	5233	32.7	5248	32.8	5300	52.6	5305

NH	5	10	4930	0.063	4978	0.045	5021	0.086	5185	10
NH	5317									
ET	9.1	4930	5185							
X1	5900	20	4978	5021	150	200	200			
X4	2	37.5	4930	34.4	5185					
GR	42.5	4558	43.4	4612	42	4682	41.7	4726	43.5	4781
GR	44.9	4824	44.9	4847	38.7	4878	36.8	4958	27.3	4978
GR	26.63	4992	27.23	5006	27.3	5021	35.2	5040	35.9	5053
GR	34.7	5091	34.4	5091	34.4	5207	32.4	5300	52.4	5317
NC	0.074	0.069	0.033	0	0					
NH	5	10	4910	0.074	4978	0.033	5021	0.069	5080	10
NH	5340									
ET	9.1	4910	5080							
X1	6100	34	4978	5021	210	190	200			
GR	57.5	4202	54.3	4266	50.1	4316	50.4	4358	51.1	4375
GR	50.2	4500	49.6	4539	47	4586	46.2	4626	43.5	4690
GR	43	4729	43	4760	43.7	4797	44.2	4853	42.2	4910
GR	40.2	4948	27.3	4978	27.8	4991	27.1	5004	27.3	5021
GR	36.1	5039	37.8	5080	39.1	5120	37.7	5158	37.8	5207
GR	42.9	5226	44.2	5237	44.4	5253	44.1	5258	44	5277
GR	46.5	5290	46.5	5290	48.2	5335	50	5340	0	0
NH	5	10	4900	0.074	4977	0.033	5023	0.069	5050	10
NH	5244									
ET	9.1	4900	5050							
X1	6330	25	4977	5023	240	180	230			
X4	2	45.87	4900	36.8	5050					
GR	57.4	4265	57.9	4304	56.1	4351	52.7	4423	50.1	4539
GR	51	4609	52.3	4685	48.3	4729	48.5	4755	49.7	4786
GR	48.3	4845	48.4	4847	44.3	4933	30.6	4962	28.1	4977
GR	27.4	4992	27.2	5011	28.2	5023	36.3	5041	36.8	5049
GR	37.3	5105	38.4	5155	43.8	5169	51.9	5218	52.4	5244
NC	0.074	0.069	0.033	0.3	0.5					
ET	9.1	4929	5062							
X1	6435	27	4929	5062	105	95	105			
X3	10	45.14	48.14							
GR	53	4548	51.1	4607	47.4	4751	45.7	4891	45.74	4900
GR	45.14	4929	36.44	4950	28.44	4968	27.94	4984	27.84	5000
GR	27.84	5011	28.24	5022	31.24	5033	36.74	5045	44.24	5061
GR	48.14	5062	48.14	5090	50.2	5156	53.8	5244	55.3	5343
GR	54.6	5405	55.2	5477	53.4	5587	52.6	5709	52.3	5753
GR	51.2	5827	51	5854						
ET	9.11	4941	5060							
SB	0.9	1.56	2.63	0	54	2	1312	2.5	27.84	27.54
X1	6488	27	4941	5060	53	53	53			
X2	1	42.93	45.94	1.33						
X3	10	45.94	48.14							
BT	33	4548	53	53	4607	51.1	51.1	4751	47.4	47.4
BT4875.0	45.94	45.94	4900	46.04	46.04	4904	49.64	39.04	4930	
BT	49.64	37.92	4930.1	51.28	37.91	4936	51.28	37.66	4936.1	48.79
BT	37.65	4941	48.84	37.44	4941.1	48.85	42.18	4992	49.35	42.83
BT5000.0	49.44	42.93	5008	49.6	43.03	5022	49.73	43.21	5036	
BT	49.89	43.39	5060	49.98	43.69	5060.1	49.99	42.14	5063	50.5
BT	42.65	5077	50.29	45.07	5077.1	48.14	45.09	5100	48.94	48.94
BT5156.0	50.2	50.2	5244	53.8	53.8	5343	55.3	55.3	5405	
BT	54.6	54.6	5477	55.2	55.2	5587	53.4	53.4	5709	52.6
BT	52.6	5753	52.3	52.3	5827	51.2	51.2	5854	51	51
GR	53	4548	51.1	4607	47.4	4751	45.94	4875	39.04	4904
GR	37.44	4941	33.34	4958	28.44	4968	27.94	4977	27.74	4992
GR	27.54	5000	28.14	5008	28.44	5022	31.14	5036	42.14	5060
GR	42.14	5060.1	48.94	5100	50.2	5156	53.8	5244	55.3	5343
GR	54.6	5405	55.2	5477	53.4	5587	52.6	5709	52.3	5753
GR	51.2	5827	51	5854						
NC	0.054	0.064	0.039							
ET	9.1	4935	5055							
X1	6580	61	4975	5025	105	105	102			
GR	61.2	4426	60.4	4460	53.8	4480	53.8	4498	55.1	4509

GR	55.5	4552	51.2	4626	48.6	4700	42.6	4724	40.4	4827
GR	39.3	4875	39.54	4913	38.94	4954	32.34	4966	29.14	4975
GR	29.34	4997	30.14	5004	29.44	5008	30.04	5025	31.44	5039
GR	37.94	5050	43.34	5061	42.54	5084	50.2	5087	53.3	5149
GR	55.6	5187	55.6	5232	55.9	5287	54.8	5379	56	5428
GR	56.5	5495	53.5	5505	53.5	5571	54.3	5616	52.1	5671
GR	52	5686	52	5910	52.9	6032	52.1	6101	52.3	6155
GR	52.5	6182	52.9	6292	52.3	6354	52.8	6449	52.1	6482
GR	52.8	6503	52.7	6571	52.8	6648	52.2	6668	52.6	6739
GR	52.3	6803	52	6868	59.2	6930	52.9	6948	52.5	6958
GR	52.2	7001	52.9	7038	52.5	7092	52.1	7139	52.7	7195
GR	52.6	7212								
NC	0.054	0.064	0.039	0.1	0.3					
ET	9.1	4875	5120							
X1	6800	65	4892	5107	120	240	220			
GR	62.4	4317	61.8	4383	52.9	4403	52.5	4421	56.9	4435
GR	56.5	4443	54.5	4457	52.2	4470	44.7	4512	43.7	4555
GR	43.8	4643	43.7	4677	44.3	4755	42.6	4801	42.1	4847
GR	41.3	4873	31.9	4892	29.47	4987	30.27	5017	29.57	5034
GR	31.9	5107	39.9	5125	41	5165	45.7	5198	55.3	5260
GR	55.3	5291	55.2	5309	51	5330	49.1	5413	53.5	5467
GR	54.3	5493	56.6	5531	54.4	5581	54.5	5613	52.4	5904
GR	52.5	5949	52.6	5973	52.6	6028	52.7	6100	52.4	6140
GR	52.5	6144	52.4	6164	53.8	6198	52.3	6242	52.8	6262
GR	52.8	6287	52.5	6315	52.9	6327	52	6340	52	6361
GR	52	6490	52	6545	52.2	6576	53.3	6645	52.6	6735
GR	52.1	6806	52.1	6833	52.7	6859	52.9	6923	53.8	7027
GR	54.3	7076	54.5	7132	56.4	7151	55.8	7203	53.1	7266
ET	9.1	4830	5170							
X1	7000	12	4850	5149	180	220	200			
GR	41.8	4759	40.6	4834	31.9	4850	29.59	4982	30.39	5024
GR	29.69	5048	31.9	5149	39.6	5170	40.9	5213	41.3	5435
GR	41.9	5504	42.2	5630						
ET	9.1	4840	5160							
X1	7200	48	4857	5142	210	200	200			
GR	56.7	4401	60.5	4415	58.3	4435	42	4491	42	4627
GR	42	4701	42	4730	42	4780	40.8	4840	31.8	4857
GR	29.72	4982	30.52	5022	29.82	5045	31.8	5142	42.7	5166
GR	42.7	5179	42.7	5333	42.7	5407	42.7	5463	42.7	5516
GR	42.7	5642	43.3	5735	43.3	5883	43.3	5989	43.5	6010
GR	44.7	6099	53.1	6131	53.4	6147	52.6	6153	50.3	6160
GR	51.2	6200	55.1	6212	56.3	6229	54.3	6236	55.3	6272
GR	54	6431	52.5	6496	54.5	6577	55.9	6633	60.3	6661
GR	59.9	6679	60	6724	63.5	6741	65.6	6781	65.6	6862
GR	66.5	6943	64.8	6968	64.8	7024	0	0	0	0
ET	9.1	4870	5120							
X1	7400	41	4898	5101	200	200	200			
GR	60.1	4344	50.1	4412	48.2	4443	50.6	4514	58.2	4551
GR	58.9	4634	63	4686	60.6	4751	58.2	4793	41.5	4853
GR	41.2	4876	31.9	4898	29.64	4925	30.94	4964	30.84	5012
GR	30.54	5048	31.9	5101	39.7	5118	40.4	5178	42.4	5253
GR	42.4	5592	42.4	5745	42.4	5810	42.4	5872	43.4	5942
GR	47.9	6084	53.9	6101	58.9	6126	59.2	6133	58.4	6140
GR	58.4	6160	57.2	6166	57.8	6219	56.6	6382	57.9	6564
GR	62.1	6579	62.6	6642	69	6647	73.1	6666	77.5	6685
GR	77.6	6708	0	0	0	0	0	0	0	0
NC	0.073	0.068	0.033							
ET	9.1	4885	5060							
X1	7600	62	4950	5049	140	240	200			
GR	59	4232	56.4	4267	51.2	4303	49.9	4335	58.6	4380
GR	62	4404	59.5	4436	56.3	4519	53.7	4555	50.1	4560
GR	50.1	4598	54.4	4617	57.9	4647	59.1	4686	57.6	4717
GR	53.8	4750	50.7	4805	47.8	4809	46.9	4825	45.3	4827
GR	44.5	4839	42.6	4845	42.5	4857	41.8	4875	38.8	4924
GR	33.5	4932	33.2	4945	31.8	4950	29.76	4963	31.06	4982
GR	30.96	5005	30.66	5022	31.8	5049	41.8	5064	43.8	5104

GR	43.8	5108	43.8	5132	44.8	5135	45.7	5156	49.2	5181
GR	48.9	5262	46.6	5303	44.9	5352	46	5430	47.9	5455
GR	48	5462	45.4	5469	45.9	5577	46.8	5614	49.6	5654
GR	49.5	5775	50.4	5817	49.9	5878	50.8	5911	53.7	5938
GR	55.3	5947	55.5	5971	58.2	5988	59.2	6009	61	6017
GR	68.5	6032	68.8	6067	0	0	0	0	0	0
ET	9.1	4905	5068							
X1	7800	55	4950	5049	200	195	200			
GR	59.3	4286	52.6	4332	52.2	4362	52.2	4388	57.1	4434
GR	64	4465	65.1	4485	64.1	4529	53.2	4556	52.8	4601
GR	49.1	4651	45.8	4692	45.8	4710	45.8	4739	45.8	4768
GR	45.8	4790	45.8	4798	45.8	4826	45.2	4848	43	4855
GR	42.1	4878	38.5	4930	31.9	4950	29.88	4963	31.18	4982
GR	31.08	5005	30.78	5022	31.9	5049	42.9	5073	42.9	5084
GR	43.8	5139	45.8	5216	50.4	5297	49.4	5311	50.2	5339
GR	51	5350	48.8	5386	45.6	5417	44	5504	42.8	5571
GR	43.5	5586	43.5	5647	44.2	5685	45.1	5719	47	5746
GR	47.3	5809	44.8	5823	45.1	5853	47.2	5878	49.6	5946
GR	55.5	5962	57.8	5981	58.9	6001	67.9	6029	70.3	6067
NC	0.088	0.088	0.033							
ET	9.1	4880	5045							
X1	8000	52	4966	5034	285	160	200			
GR	61.9	4116	45.5	4154	43.8	4243	46.5	4311	48.1	4349
GR	47.8	4354	43.7	4390	44.3	4404	43.5	4455	43.1	4554
GR	44.8	4581	44.1	4656	43.4	4690	46	4723	45.4	4777
GR	41.4	4826	41.2	4834	41.2	4857	36.5	4914	35.8	4951
GR	31.9	4966	30	4975	31.3	4988	31.2	5004	30.9	5016
GR	31.9	5034	41.8	5048	42.7	5063	44.1	5136	44.4	5222
GR	46.6	5243	47.6	5282	50.3	5291	50.2	5350	47.2	5359
GR	46.5	5422	43.8	5479	43.5	5598	43.8	5685	43.1	5800
GR	45.2	5816	45.8	5874	45.9	5912	51.1	5924	54.1	5929
GR	54.7	5943	57.8	5952	58.6	5969	58.3	5981	58.6	6029
GR	69.6	6055	72.8	6073	0	0	0	0	0	0
ET	9.1	4900	5045							
X1	8250	47	4966	5034	220	210	250			
GR	65.9	4008	58.5	4036	43.9	4098	43.3	4150	44.1	4197
GR	47.7	4221	49.2	4254	46.2	4280	43.5	4292	43.1	4323
GR	43.2	4394	43	4458	43	4573	43.6	4614	40.5	4730
GR	40.5	4796	40	4843	40.3	4854	40.3	4884	36.5	4914
GR	35.8	4951	31.9	4966	30	4975	31.3	4988	31.2	5004
GR	30.9	5016	31.9	5034	41.8	5048	42.7	5063	44.1	5136
GR	41.9	5185	43.1	5239	44.5	5290	44.8	5327	45.5	5344
GR	43	5493	43.2	5675	44.8	5712	45.9	5749	53.8	5765
GR	53.7	5782	58.3	5793	58.3	5813	57.4	5834	58.4	5936
GR	59.1	5963	63.8	5997	0	0	0	0	0	0
NC	0.07	0.075	0.035							
ET	9.1	4925	5058							
X1	8500	45	4990	5009	140	290	250			
GR	68.4	3843	49.9	3951	49.9	3979	49.4	4001	44	4031
GR	43.8	4079	48	4105	47	4165	43.5	4197	43.8	4206
GR	43.8	4339	43.9	4362	43.7	4429	43	4444	43	4728
GR	40.2	4760	40.4	4802	43.3	4856	43.7	4899	41.1	4941
GR	38.8	4978	32.3	4990	31.13	4993	31.43	4997	31.33	5001
GR	32.03	5004	32.3	5009	33.6	5018	33.5	5028	32.4	5041
GR	43.1	5063	44.8	5107	45	5171	44.6	5272	44.4	5497
GR	45.5	5563	58.2	5590	59.3	5596	58.8	5602	57	5608
GR	57.4	5622	52.8	5636	54	5663	57.9	5717	67.6	5802
NH	5	10	4925	0.073	4990	0.033	5009	0.068	5070	10
NH	5912									
ET	9.1	4925	5070							
X1	8750	52	4990	5009	160	290	250			
X4	2	41.4	4925	43.35	5070					
GR	59.1	3582	54	3634	55.9	3666	55.7	3696	53.1	3735
GR	55.4	3766	57	3792	55.3	3828	54.1	3867	54.9	3869
GR	49.5	3918	48	3982	44.4	4052	44.5	4121	44.7	4211
GR	44.1	4240	44.2	4315	44.8	4352	44.3	4372	44.7	4474

GR	44	4562	41.4	4664	40.3	4724	41	4791	41.6	4843
GR	42.4	4920	41.9	4922	40.5	4968	32.5	4990	31.7	4993
GR	32	4997	31.9	5001	32.4	5004	32.5	5009	42.9	5030
GR	43.3	5057	43.6	5176	43.6	5247	43.6	5355	43.6	5466
GR	45.6	5618	56.7	5638	56.8	5651	53.8	5657	53.8	5664
GR	59.2	5678	59.1	5692	62.4	5717	62.6	5801	65.3	5853
GR	65.7	5902	69.2	5912	0	0	0	0	0	0
NH	5	10	4850	0.073	4982	0.033	5017	0.068	5140	10
NH	5947									
ET	9.1	4850	5140							
X1	9000	41	4982	5017	260	160	250			
X4	2	38.33	4850	44.49	5140					
GR	57.7	3776	48.2	3902	45.9	3966	45.9	4095	45.7	4170
GR	43.4	4235	43.6	4327	42.8	4400	38.2	4490	36.7	4576
GR	36.6	4612	38.1	4663	38.5	4756	38.3	4865	39.1	4918
GR	39.1	4974	32.8	4982	32.27	4988	32.47	4994	32.37	4999
GR	33.07	5008	32.37	5014	32.7	5017	41.2	5036	42.7	5061
GR	44.5	5141	44.7	5215	45	5289	45.1	5357	45	5408
GR	45.2	5600	47.9	5659	48.7	5686	57	5748	57.3	5787
GR	61	5797	60.9	5805	59.6	5814	60.6	5828	60.9	5875
GR	67.6	5947	0	0	0	0	0	0	0	0
NH	5	10	4810	0.075	4981	0.049	5018	0.075	5160	10
NH	5893									
ET	9.1	4810	5160							
X1	9250	37	4981	5018	260	250	250			
X4	2	40.4	4810	43.98	5160					
GR	56.6	4092	55.4	4210	57.1	4245	48.7	4260	48.3	4301
GR	44.3	4314	43.1	4358	40.5	4381	39.3	4453	40	4549
GR	40.4	4680	40.4	4824	38.6	4903	37.1	4954	36.6	4971
GR	33.8	4981	32.83	4987	34.03	4993	34.93	4998	33.63	5008
GR	32.93	5014	33.8	5018	42.2	5068	42	5155	44	5162
GR	44.3	5177	43.6	5319	44	5489	45	5607	47.3	5697
GR	58.5	5729	58.5	5755	57.4	5763	61.3	5781	61.7	5803
GR	63.3	5819	65.7	5893	0	0	0	0	0	0
NC	0.07	0.075	0.039							
ET	9.1	4780	5180							
X1	9500	43	4985	5015	240	240	250			
GR	57.5	4145	54.5	4206	51.5	4224	51.7	4246	52.1	4259
GR	51.1	4288	45.5	4337	45.4	4340	45.2	4394	42.7	4450
GR	41.9	4507	41.8	4524	42.3	4543	41.2	4566	42.9	4620
GR	44.6	4709	44.4	4837	42.1	4870	38.7	4893	41	4936
GR	37.3	4946	37.2	4976	34.7	4985	33.5	4988	34.2	4993
GR	35.5	5001	34.6	5005	33.4	5010	34.2	5015	38.5	5018
GR	40.3	5037	41.6	5086	44.7	5185	45.3	5230	45	5300
GR	47	5577	51.7	5640	60.8	5704	62.8	5726	63	5734
GR	65.5	5764	71.6	5825	76.9	5869	0	0	0	0
ET	9.1	4800	5180							
X1	9750	43	4983	5016	195	265	250			
GR	63.3	4065	57.9	4103	54.9	4184	53.3	4266	54	4325
GR	51	4360	51	4382	51	4417	45.2	4466	44.5	4509
GR	44.1	4586	44.7	4633	43	4668	43.3	4899	41.8	4959
GR	38.3	4968	38.7	4978	36.1	4983	34.93	4986	35.63	4992
GR	36.93	5001	36.03	5005	34.83	5011	36.1	5016	42	5035
GR	43.1	5056	42.3	5074	43.2	5148	44.2	5166	44.2	5176
GR	44.2	5303	44	5401	44.8	5480	45.7	5572	46.2	5611
GR	50.9	5645	57.2	5677	58.3	5706	64.5	5742	63.8	5750
GR	64.1	5767	76.8	5788	77.9	5816	0	0	0	0
NC	0.075	0.075	0.056							
ET	9.1	4800	5180							
X1	10000	38	4990	5009	310	210	250			
GR	64.3	4280	61.1	4343	55.3	4401	51.9	4464	51.8	4495
GR	55	4533	57.1	4561	56	4572	45.6	4599	42.6	4631
GR	42.1	4702	44	4822	43.7	4957	43.5	4958	36.7	4990
GR	36.36	4992	37.06	4995	37.36	5000	37.46	5003	36.26	5006
GR	36.8	5009	44.4	5035	44	5061	43.3	5166	46.6	5183
GR	46.8	5219	45.6	5255	45.2	5279	46.2	5367	46.5	5503

GR	47	5632	49	5732	67.8	5808	67.4	5816	64.9	5821
GR	64.9	5834	80	5859	80	5867	0	0	0	0
NC	0.07	0.07	0.028	0.1	0.3					
ET	6.4									
X1	10794	21	4984	5067	55	20	50			
GR	66.35	4170	61.35	4210	56.35	4220	51.35	4440	46.35	4730
GR	47.55	4804	44.35	4914	44.05	4984	37.85	4991	37.05	5000
GR	38.25	5012	39.75	5036	45.85	5047	48.45	5067	43.35	5086
GR	43.45	5202	45.05	5370	50.05	5540	55.05	5660	60.05	5720
GR	65.05	5760								
NC	0.07	0.07	0.05	0.1	0.3					
QT	2	3447	3447							
ET	20.4									
X1	60	18	4975	5030	60	60	60			
GR	66.35	4190	56.35	4240	51.35	4460	46.35	4750	44.65	4774
GR	47.25	4803	45.45	4812	44.05	4826	48.85	4842	46.95	4861
GR	43.55	4891	43.55	4950	44.25	4975	39.25	4988	38.75	5000
GR	38.75	5020	44.35	5030	44.25	5050				
X1	110	16	4832	4906	50	50	50	1		
GR	66.35	4128	61.25	4168	56.35	4180	51.35	4400	46.35	4689
GR	44.35	4720	43.05	4743	56.95	4767	56.65	4778	53.65	4789
GR	47.85	4820	48.45	4832	39.35	4853	38.95	4870	39.05	4881
GR	48.05	4906								
ET	9.1	4800	5050							
X1	250	15	4979	5047	120	130	140	1		
GR	66.35	4390	56.35	4440	51.35	4654	44.75	4850	43.95	4933
GR	44.75	4979	42.85	4989	39.35	4990	38.65	5000	39.55	5011
GR	41.75	5023	41.05	5037	42.45	5041	42.55	5047	52.35	5075
ET	9.1	4500	4700							
X1	390	13	4630	4685	170	120	140	1		
GR	66.35	4110	61.35	4130	56.35	4160	51.35	4300	44.85	4484
GR	44.95	4580	45.35	4630	40.65	4637	41.05	4640	41.45	4671
GR	46.85	4685	47.35	4698	49.25	4703				
ET	9.1	4460	4700							
X1	480	16	4593	4658	130	80	90	1		
GR	71.35	4050	66.35	4060	61.35	4122	56.35	4140	51.35	4180
GR	48.85	4450	46.55	4522	44.45	4543	44.75	4570	47.95	4593
GR	41.25	4606	40.75	4610	41.25	4612	43.55	4647	46.55	4658
GR	47.05	4680								
ET	9.1	4500	4700							
X1	575	26	4576	4642	110	80	95	1		
GR	71.35	3756	66.35	3795	63.35	3980	63.35	4180	61.35	4190
GR	56.35	4214	50.25	4330	48.45	4360	48.95	4371	48.75	4409
GR	46.95	4415	46.05	4484	46.05	4546	43.15	4548	43.05	4552
GR	49.15	4560	48.55	4576	41.25	4591	40.85	4600	41.55	4604
GR	41.95	4610	43.45	4614	42.05	4626	42.15	4632	46.75	4642
GR	47.85	4656								
ET	9.1	4460	4590							
X1	667	19	4511	4577	120	90	92	1		
GR	65.35	3780	65.35	3820	61.35	3880	56.35	3901	57.35	4080
GR	56.35	4235	51.65	4285	50.05	4345	47.45	4387	47.75	4432
GR	43.85	4465	45.85	4485	49.85	4496	47.15	4511	43.55	4520
GR	42.15	4522	42.15	4535	43.05	4557	48.65	4577		
ET	9.1	4940	5040							
X1	767	15	4980	5036	90	100	100	1		
GR	66.35	4210	61.35	4508	57.05	4778	50.55	4791	49.95	4818
GR	46.25	4943	48.65	4949	48.85	4970	47.35	4980	44.85	4990
GR	43.55	4992	43.55	5000	43.35	5010	41.75	5018	49.15	5036
ET	9.1	4920	5035							
X1	787	17	4967	5030	25	20	20	1		
GR	66.35	4130	65.35	4252	71.35	4252	71.35	4450	61.35	4450
GR	58.85	4745	50.65	4755	50.75	4780	50.15	4810	47.85	4840
GR	46.65	4940	47.25	4967	44.75	4977	43.55	4987	43.75	5000
GR	42.85	5018	47.75	5030						
ET	9.1	4820	5045							
X1	800	12	4855	5040	40	75	60			

GR	71.35	4445	61.35	4446	57.5	4735	51.75	4745	51.15	4790
GR	50.25	4812	48	4855	47.55	4955	43	4980	42.85	4995
GR	43.45	5020	48.05	5040						
NC	0.055	0.06	0.028	0.1	0.3					
QT	2	5300	5300							
ET	9.1	4950	5070							
X1	11720	20	4976	5060	50	90	79	1		
GR	71.35	4440	61.35	4441	56.35	4725	52.85	4735	51.85	4795
GR	50.35	4815	48.15	4875	48.55	4976	42.85	4990	42.45	5000
GR	42.85	5010	43.45	5012	44.25	5035	48.05	5060	49.95	5140
GR	50.95	5215	51.85	5290	53.05	5540	60.05	5600	65.05	5610
ET	9.1	4960	5150							
X1	11150	48	4985	5014	230	170	255			
GR	73.9	4096	73.4	4145	72.6	4192	69.9	4289	68.4	4374
GR	67.1	4478	66	4548	63.8	4609	61.4	4637	60	4721
GR	58	4758	55.2	4798	54.5	4837	54.9	4844	53.6	4860
GR	52.7	4923	53.5	4943	52.8	4955	51.9	4964	47.5	4978
GR	44.6	4985	42.85	4995	43.05	5007	44.6	5014	49.4	5025
GR	49.4	5031	46.6	5034	46.8	5038	49.1	5049	50.7	5098
GR	52.5	5152	53.5	5186	53.3	5232	56.2	5489	59.4	5547
GR	61.1	5564	60.7	5747	59.8	5803	60.5	5858	61.5	5862
GR	66.8	5871	68.4	5874	68.4	5884	67.6	5890	68.2	5896
GR	70.7	5904	73.6	5908	76.6	6017	0	0	0	0
ET	9.1	4965	5215							
X1	11400	49	4992	5007	260	280	250			
GR	74.2	4202	69.7	4397	67.3	4498	65.3	4568	61.5	4691
GR	60.1	4727	58.8	4781	58.6	4816	58.4	4873	58.3	4932
GR	55.6	4958	54.3	4969	51.3	4978	48.8	4987	48.3	4990
GR	46.6	4992	44.28	4997	44.48	5003	46.6	5007	47.3	5019
GR	49.6	5046	50.7	5063	50.5	5113	51	5130	52.7	5180
GR	54.4	5210	54.6	5237	55.3	5278	57.6	5476	59.8	5558
GR	61.4	5583	61.5	5623	60.8	5728	62.3	5793	62.3	5831
GR	62.4	5887	64.7	5894	67.5	5902	68.3	5905	68.2	5916
GR	66.8	5921	67.5	5929	69.7	5938	72	5992	74.9	6055
GR	76.8	6098	76.4	6104	76.4	6155	79.4	6159	0	0
ET	9.1	4860	5180							
X1	11570	52	4988	5011	200	240	170			
GR	74.7	4237	75.1	4281	76.1	4350	75.1	4417	72.6	4486
GR	70.2	4526	64.4	4588	61.6	4650	61	4702	61.5	4736
GR	59.9	4777	58	4828	55.8	4850	53.8	4946	53.7	4967
GR	48.7	4974	47.3	4982	47.1	4985	46.8	4988	45.26	4996
GR	45.46	5006	46.7	5011	53.5	5023	54.6	5029	53.6	5051
GR	52	5085	51.4	5097	54.5	5116	55.5	5127	55.8	5137
GR	55	5138	55	5181	56.8	5195	58	5213	57.8	5220
GR	56.5	5221	57.9	5367	61	5485	63	5847	63.9	5870
GR	66.2	5882	67.1	5895	69.6	5906	69.6	5917	68.4	5920
GR	72.5	5941	74	5968	75.4	6070	75.3	6090	75.6	6140
GR	79.7	6144	79.9	6156	0	0	0	0	0	0
NC	0.063	0.055	0.034							
NH	4	0.063	4988	0.034	5012	0.055	5130	10	6166	
ET	9.1	4905	5130							
X1	11700	48	4988	5012	120	140	130			
GR	78.3	4306	78.5	4325	76.3	4338	75.3	4343	75.8	4381
GR	74.6	4391	74.8	4439	72.5	4477	71	4487	62.9	4599
GR	61.7	4673	61.1	4764	59.2	4832	58	4865	54.9	4936
GR	52.4	4980	47.4	4983	46.8	4988	46.2	4994	46	5004
GR	46.8	5012	49.4	5025	55	5034	55.3	5135	58.2	5321
GR	63.2	5536	64	5568	64	5634	66.9	5703	68.2	5714
GR	68	5868	67.7	5885	69.5	5903	70.1	5910	70.8	5914
GR	70.8	5921	70.1	5924	71.9	5929	72.3	5932	74.6	6016
GR	75.5	6065	76.3	6078	76.1	6085	75.7	6088	75.8	6127
GR	76.5	6132	77.1	6146	78.2	6166	0	0	0	0
NH	5	10	4940	0.063	4989	0.034	5010	0.055	5028	10
NH	6141									
ET	9.1	4940	5028							
X1	11900	56	4989	5010	220	190	200			

X2	15									
X4	1	56.09	4940							
GR	83.8	4323	82.3	4355	79.3	4380	75	4394	72.6	4399
GR	72.5	4428	73.4	4450	72.4	4479	70.8	4502	64.8	4546
GR	60.8	4608	57.4	4694	56.9	4756	56.4	4814	55.9	4833
GR	55.9	4861	56.8	4901	56.1	4938	56	4970	54.1	4976
GR	49.9	4982	49.5	4987	48.9	4989	47.02	4994	46.82	5003
GR	48.9	5010	50.4	5017	53.5	5023	58	5028	59.2	5049
GR	59.4	5230	61.2	5243	63.7	5257	63.7	5465	65.7	5537
GR	65.8	5553	65.5	5555	67	5642	67.7	5706	70	5855
GR	70	5896	70.7	5900	71.5	5903	71.5	5912	73.1	5921
GR	73	5946	74.3	6012	75.6	6042	77	6051	77	6056
GR	75.1	6059	75.2	6062	75.8	6100	76.3	6103	77.1	6120
GR	78.4	6141	0	0	0	0	0	0	0	0
NH	5	10	4940	0.084	4993	0.034	5006	0.079	5070	10
NH	6113									
ET	9.1	4940	5070							
X1	12100	65	4993	5006	230	140	200			
X2	15									
X4	2	56.22	4940	57.77	5070					
GR	79.1	4104	78	4123	75.5	4187	72.9	4261	73.6	4323
GR	73.6	4337	72.6	4346	72.4	4351	72.4	4381	71.8	4397
GR	71.3	4430	70	4457	68.1	4478	66.3	4525	63.3	4541
GR	61.6	4599	60.3	4626	59.9	4694	59.7	4775	58.4	4838
GR	56.9	4874	56.2	4941	55.5	4977	54.2	4985	52.5	4989
GR	50.4	4991	49.8	4993	47.83	4996	47.63	5001	49.7	5006
GR	50.6	5008	51.2	5015	51.5	5032	52.9	5037	57.7	5044
GR	58	5045	57.6	5090	60.1	5207	61.3	5226	61.3	5238
GR	62.8	5430	65.4	5502	66.4	5520	66.4	5533	66.2	5534
GR	66.6	5574	68.3	5655	68.9	5675	69.5	5680	70	5834
GR	69.9	5858	71.1	5870	71.5	5882	71.9	5883	71.9	5890
GR	72.2	5898	73.8	5972	75.1	6002	76.2	6011	76.2	6019
GR	75.6	6022	75.6	6062	75.9	6066	76.3	6103	76.4	6113
NH	5	10	4730	0.084	4994	0.034	5005	0.079	5030	10
NH	5797									
ET	9.1	4600	5019							
X1	12500	53	4994	5005	440	300	400			
X4	2	61.1	4730	64.64	5030					
GR	79.9	3883	78.8	3914	76.1	3938	74.7	3952	74.8	3961
GR	75.1	3983	75.7	3987	74.1	3991	72.3	4006	69.5	4116
GR	66.2	4239	63.1	4467	62.4	4475	62.4	4494	62.1	4656
GR	61.5	4720	59.3	4856	58.4	4949	58.6	4963	54.1	4970
GR	52.2	4980	51.8	4989	51.4	4992	50.7	4994	49.26	4997
GR	49.36	5001	50.7	5005	57	5014	62.7	5019	64.5	5025
GR	64.9	5039	65.7	5145	68	5184	68.3	5228	69.9	5342
GR	71.5	5448	71.2	5503	72.6	5512	73	5521	73	5536
GR	74.4	5543	74.9	5574	74.5	5612	75.4	5621	75.4	5626
GR	74.1	5628	74.7	5686	76	5690	75.4	5716	74.9	5731
GR	75.4	5746	77.8	5791	77.9	5797	0	0	0	0
NC	0.069	0.049	0.029							
NH	5	10	4688	0.069	4987	0.029	5012	0.049	5160	10
NH	5762									
ET	9.1	4720	5160							
X1	12800	40	4987	5012	130	360	300			
GR	80.5	4053	80.4	4064	76	4073	76	4092	76.7	4097
GR	75.4	4103	73.1	4113	70.7	4185	66.9	4338	66.8	4432
GR	66	4520	65.2	4578	64	4688	62.1	4924	62.1	4935
GR	62	4971	61.3	4981	58.5	4985	53.2	4987	50.48	4994
GR	50.58	5003	53.2	5012	62.5	5014	62.6	5050	63.2	5136
GR	67.2	5261	67.9	5489	68.6	5508	73.9	5510	74.1	5526
GR	74.5	5528	74.5	5534	74.2	5539	75	5548	74.6	5612
GR	75	5650	77.4	5725	78.2	5743	77.9	5745	77.9	5762
NH	5	10	4828	0.069	4987	0.029	5013	0.049	5130	10
NH	5675									
ET	9.1	4828	5130							
X1	13000	49	4987	5013	170	200	200			

GR	85.7	4105	83.7	4114	84.8	4127	83.3	4136	80.3	4143
GR	76.6	4144	76.6	4163	77.4	4167	77.5	4172	75.5	4183
GR	71.2	4235	68.3	4334	66.2	4455	65.8	4549	66.3	4626
GR	65.6	4653	64.9	4656	64	4662	63.4	4682	63.8	4689
GR	64.5	4770	64.5	4828	63.5	4911	62.1	4931	61.1	4975
GR	53.8	4987	51.3	4994	51.4	5003	53.4	5013	55.3	5016
GR	62.6	5017	62.6	5019	61.8	5019.1	61.9	5042	64.4	5261
GR	68.8	5486	69.4	5511	75.8	5512	73.9	5514	73.4	5521
GR	74.1	5528	74.6	5529	74.6	5550	74.3	5564	75.3	5565
GR	72.6	5567	73.3	5622	74.6	5675	74.9	5675	0	0
NC	0.3	0.5								
ET	9.11	4927	5076							
X1	13120	51	4987	5020	120	120	120			
X3	10	61.91	63.8							
GR	77.6	4171	77.6	4196	78.4	4201	77.2	4208	76.2	4255
GR	74.9	4303	73.3	4328	72.6	4395	71.5	4490	70.9	4496
GR	69.7	4545	66.7	4595	66	4672	66.1	4702	66.4	4721
GR	66.8	4800	66.2	4872	65.91	4920	64.11	4972	52.23	4987
GR	50.49	5020	64.88	5020.1	64.2	5034	66	5045	67.1	5049
GR	63.9	5051	63.8	5073	66.6	5079	67.9	5089	65.5	5111
GR	68.5	5247	71.1	5255	68.3	5261	67.1	5267	67	5292
GR	70.5	5297	70.7	5355	67	5355	68.1	5449	68.6	5477
GR	75.1	5482	73.3	5483	73.3	5492	74.5	5498	74.5	5506
GR	74.2	5510	75.1	5521	74.9	5524	74.5	5567	76.3	5586
GR	76.7	5654	0	0	0	0	0	0	0	0
NC	0.069	0.059	0.05							
ET	9.11	4860	5140							
SB	1	1.6	2.6	0	33	0.1	56.06	50.49		
X1	13122	54	4987	5036	2	2	2			
X2	1	56.06	58.99							
X3	10	61.91	63.8							
X4	3	60.34	4976.8	56.16	4987.1	56.56	5020.1			
BT	49	4201	78.4	0	4208	77.2	0	4255	76.2	0
BT4303.0	74.9	0	4328	73.3	0	4395	72.6	0	4490	
BT	71.5	0	4496	70.9	0	4545	69.7	0	4595	66.7
BT	0	4672	66	0	4702	66.1	0	4721	66.4	0
BT4800.0	66.8	0	4872	66.2	0	4920	65.91	0	4972	
BT	64.11	0	4973	61.91	0	4976.8	61.96	0	4987	61.93
BT	0	4987.1	59.06	0	5013	58.99	0	5020	58.99	0
BT5020.1	64.88	0	5036	64.88	0	5045	66	0	5049	
BT	67.1	0	5051	63.9	0	5073	63.8	0	5079	66.6
BT	0	5089	67.9	0	5111	65.5	0	5247	68.5	0
BT5255.0	71.1	0	5261	68.3	0	5267	67.1	0	5292	
BT	67	0	5297	70.5	0	5355	70.7	0	5355	67
BT	0	5449	68.1	0	5477	68.6	0	5482	75.1	0
BT5483.0	73.3	0	5492	73.3	0	5498	74.5	0	5506	
BT	74.5	0	5510	74.2	0	5521	75.1	0		
GR	77.6	4171	77.6	4196	78.4	4201	77.2	4208	76.2	4255
GR	74.9	4303	73.3	4328	72.6	4395	71.5	4490	70.9	4496
GR	69.7	4545	66.7	4595	66	4672	66.1	4702	66.4	4721
GR	66.8	4800	66.2	4872	65.91	4920	64.11	4972	61.91	4973
GR	56.14	4987	56.64	5000	56.06	5013	56.54	5020	57.63	5036
GR	64.88	5036.1	66	5045	67.1	5049	63.9	5051	63.8	5073
GR	66.6	5079	67.9	5089	65.5	5111	68.5	5247	71.1	5255
GR	68.3	5261	67.1	5267	67	5292	70.5	5297	70.7	5355
GR	67	5355	68.1	5449	68.6	5477	75.1	5482	73.3	5483
GR	73.3	5492	74.5	5498	74.5	5506	74.2	5510	75.1	5521
GR	74.9	5524	74.5	5567	76.3	5586	76.7	5654	0	0
ET	9.1	4920	5130							
X1	13170	60	4974	5026	48	48	48			
GR	77.2	4184	77.2	4196	78.1	4201	76.6	4205	76.3	4232
GR	75.6	4269	73	4315	72.4	4337	71.5	4361	71	4413
GR	69.9	4466	68.5	4534	65.1	4595	64	4667	64.4	4691
GR	64.8	4709	64.8	4727	65	4795	65	4841	66.5	4878
GR	67.1	4904	66.6	4919	65.7	4922	63.9	4958	59.2	4974
GR	58.1	4979	57.7	4993	57.1	4996	55.8	5006	57.7	5009

GR	58.3	5026	65.2	5029	65.2	5031	62.8	5031.1	65	5087
GR	63.9	5121	68.5	5133	72.4	5138	72.8	5151	71.3	5166
GR	68.7	5174	65.7	5177	66.3	5274	70.6	5282	70.4	5322
GR	71.8	5428	68.1	5429	68.1	5450	75.8	5453	73.9	5454
GR	72.9	5465	75.2	5471	75.2	5478	74.2	5482	73.8	5492
GR	74.8	5501	74.8	5566	76.5	5579	77	5622	78.6	5654
NC	0.1	0.3								
ET	9.1	4950	5140							
X1	13350	52	4956	5043	170	150	180			
GR	77.6	4205	77.6	4221	78.1	4227	76.4	4232	72.3	4316
GR	72	4325	71.1	4347	70.1	4424	66.3	4553	65.9	4660
GR	65.9	4766	66	4786	65.6	4815	63.6	4851	62.3	4930
GR	62	4949	60.8	4954	59	4956	58.16	4964	57.76	4987
GR	57.16	4992	55.86	5009	57.76	5014	59	5043	64.8	5045
GR	61.9	5046	63.3	5123	67.5	5139	77.2	5153	79.1	5172
GR	71	5206	64.9	5215	63.4	5217	64	5243	66.7	5289
GR	69.6	5318	70.8	5348	68.4	5384	67.8	5406	74.8	5407
GR	69.3	5409	71.5	5414	73.8	5420	75.6	5424	75.6	5434
GR	74.6	5441	73.3	5465	73.2	5490	74.1	5535	75.9	5563
GR	77.6	5586	81.5	5616	0	0	0	0	0	0
ET	9.1	4960	5075							
X1	13550	56	4985	5014	300	140	200			
GR	79.6	4492	78.6	4534	76.8	4576	73.7	4605	71.1	4626
GR	69.4	4698	67.6	4743	66.7	4776	65.8	4789	65.6	4805
GR	63.8	4836	62.9	4888	62.5	4890	62	4976	61.5	4982
GR	59.5	4985	56.64	4989	55.94	4994	56.54	5000	57.74	5008
GR	59.5	5014	60.5	5017	61.6	5026	62.8	5031	64	5064
GR	68.3	5073	69.6	5079	66.6	5086	68.4	5091	71.1	5098
GR	70.8	5110	68.6	5117	69	5128	66.7	5132	66.2	5159
GR	65.8	5181	65.8	5242	72.6	5246	71.3	5281	70	5309
GR	70.5	5321	73.7	5326	74.3	5339	74.7	5347	75.5	5350
GR	75.6	5360	74.9	5368	71.7	5381	70.8	5424	70.6	5433
GR	70.6	5476	72.8	5502	74.7	5523	75.2	5556	79.9	5573
GR	81.1	5588	0	0	0	0	0	0	0	0
ET	9.1	4940	5050							
X1	13730	57	4988	5012	280	100	180			
GR	79.9	4381	79.8	4439	80.1	4509	80.9	4561	80.4	4610
GR	79.7	4624	80.3	4667	80.9	4687	79.2	4701	79	4744
GR	78.5	4784	76.6	4793	73.6	4806	73.3	4871	70.8	4922
GR	64.9	4936	68	4943	67.7	4977	59.4	4988	56.7	4991
GR	56	4995	56.6	5000	57.8	5007	59.6	5012	61.7	5015
GR	66.9	5015.1	64.4	5017	64.8	5049	87.6	5051	80	5069
GR	78.1	5074	75.7	5085	74.6	5102	71.8	5109	65.1	5119
GR	64.8	5169	65.6	5170	65.7	5179	69.3	5187	71.9	5200
GR	73	5203	73	5223	72.7	5240	74.6	5251	75.1	5254
GR	74.7	5268	74	5290	74	5317	74	5344	74	5371
GR	74	5444	74	5467	75.1	5520	75.5	5541	79.9	5556
GR	80.8	5560	80.8	5568	0	0	0	0	0	0
NC	0.3	0.5								
ET	9.1	4965	5024							
X1	13834	39	4986	5014	110	70	104			
X3	10	73	73							
GR	82	4200	77.5	4402	77.5	4422	77.2	4430	77.3	4450
GR	76.6	4509	76.5	4577	76.8	4660	76.1	4689	75.9	4733
GR	75.1	4775	74	4823	74.8	4877	76	4909	76.5	4950
GR	71.3	4986	60	4986.1	59.5	4993	59.4	5000	59.1	5007
GR	58.9	5012	60.4	5012.1	60.5	5014	71.3	5014.1	76	5050
GR	75.2	5218	75.1	5245	74.7	5255	74.3	5269	74.2	5288
GR	74.2	5305	74.3	5324	74.5	5336	75	5475	75.9	5520
GR	75.9	5546	79.2	5555	81.6	5562	81.4	5573	0	0
NC	0.069	0.079	0.034							
ET	7.11	9.11	4909	5218	4965	5024				
SB	1	1.6	2.6	28	331	59.5	59.3			
X1	13846	39	4986	5014	12	12	12			
X2	1	71.3	76							
X3	10	74	74.2							

BT	32	4200	82	82	4402	77.5	77.5	4422	77.5	77.5
BT4430.0	77.2	77.2	4450	77.3	77.3	4509	76.6	76.6	4577	
BT	76.5	76.5	4660	76.8	76.8	4689	76.1	76.1	4733	75.9
BT	75.9	4775	75.1	75.1	4823	74	74	4877	74.8	74.8
BT4909.0	76	76	4950	76.4	76.4	4986	76.4	71.3	5014	
BT	76.3	71.3	5050	76	76	5218	75.2	75.2	5245	75.1
BT	75.1	5255	74.7	74.7	5269	74.3	74.3	5288	74.2	74.2
BT5305.0	74.2	74.2	5324	74.3	74.3	5336	74.5	74.5	5475	
BT	75	75	5520	75.9	75.9	5546	75.9	75.9	5555	79.2
BT	79.2	5562	81.6	81.6	5573	81.4	81.4			
GR	82	4200	77.5	4402	77.5	4422	77.2	4430	77.3	4450
GR	76.6	4509	76.5	4577	76.8	4660	76.1	4689	75.9	4733
GR	75.1	4775	74	4823	74.8	4877	76	4909	76.4	4950
GR	71.3	4986	60	4986.1	59.9	4993	59.7	5000	59	5007
GR	58.6	5012	60.4	5012.1	60.4	5014	71.3	5014.1	76	5050
GR	75.2	5218	75.1	5245	74.7	5255	74.3	5269	74.2	5288
GR	74.2	5305	74.3	5324	74.5	5336	75	5475	75.9	5520
GR	75.9	5546	79.2	5555	81.6	5562	81.4	5573	0	0
NH	5	10	4891	0.069	4990	0.034	5010	0.079	5084	10
NH	5518									
ET	9.1	4891	5084							
X1	13950	33	4990	5010	90	120	104			
X2	15									
GR	82	4200	77.7	4433	76.9	4439	76.3	4460	75.4	4509
GR	73.9	4604	73.7	4639	70.6	4719	68.9	4801	68	4891
GR	67.2	4946	66.8	4968	66.9	4970	65.2	4977	61.7	4983
GR	59.9	4990	59.7	4994	59.1	5008	60.2	5010	64.6	5018
GR	66	5084	64.9	5110	67.5	5139	68.2	5158	67.4	5198
GR	67.6	5267	67.7	5307	68.1	5391	75.7	5455	75.7	5475
GR	80.3	5483	82.2	5487	81.6	5518	0	0	0	0
NC	0.054	0.04	0.039	0.1	0.3					
ET	9.1	4955	5090							
X1	14250	48	4988	5011	200	380	300			
GR	82	4333	70.5	4594	67.5	4678	67.1	4681	67.1	4705
GR	67.6	4707	66.8	4780	66.3	4862	66.9	4924	67	4939
GR	66.6	4944	66.5	4962	66.1	4984	65.6	4986	61.2	4988
GR	60.63	4993	60.03	5009	61.2	5011	61.5	5016	61.9	5021
GR	64.7	5026	65.2	5044	65.7	5080	66.9	5132	68.8	5151
GR	69.8	5278	76.7	5288	78	5292	71.7	5296	70.7	5303
GR	70.2	5355	70.2	5365	75.6	5379	76.8	5403	76.8	5406
GR	76.8	5417	77.6	5423	79	5426	78.3	5438	82.5	5449
GR	83.5	5452	73.4	5461	73	5465	80.7	5473	87.1	5535
GR	86.6	5594	87.1	5652	87	5698	0	0	0	0
ET	9.1	4955	5090							
X1	14500	64	4989	5010	220	210	250			
GR	89.7	3814	89	3835	84.6	3838	82.5	3930	81.3	3987
GR	81.3	4014	81.8	4024	81.2	4035	80.7	4040	80.7	4052
GR	81.5	4062	81.1	4088	80	4124	80.3	4138	80.3	4175
GR	80.9	4209	80.7	4241	80.8	4263	80.1	4297	80.4	4328
GR	80	4345	80	4352	80	4367	80	4377	80.7	4384
GR	79	4387	79	4396	78.6	4400	78.6	4407	78.3	4422
GR	73.5	4541	70.5	4610	70.5	4628	70.4	4639	68.1	4727
GR	67.2	4918	67.2	4935	67.3	4946	67.1	4972	66.8	4986
GR	60.9	4989	60.8	4989.1	60.8	5002	60.9	5010	61.6	5012
GR	66.2	5023	67.7	5029	67.8	5073	94.2	5135	83.9	5168
GR	82.9	5178	89.1	5201	90	5213	71.8	5263	87.8	5315
GR	93.7	5355	95.7	5361	72.6	5394	72.5	5397	86	5426
GR	89.4	5439	84.7	5454	85	5469	85	5485	0	0
NC	0.035	0.059	0.039							
QT	2	4150	4150							
ET	9.1	4965	5090							
X1	14750	58	4992	5008	210	270	250			
GR	87.1	4067	86.6	4092	84.4	4104	81.5	4111	81.5	4136
GR	82.8	4144	82.7	4161	82.2	4202	81.3	4224	81.3	4261
GR	81.4	4284	81.3	4367	81.3	4384	81.3	4403	81.3	4413
GR	81.3	4419	81.3	4429	80.2	4432	81.2	4441	80.6	4521

GR	76.6	4683	75.9	4690	76.1	4706	75.1	4731	70.18	4882
GR	69.18	4992	62.38	4992.1	61.58	5002	62.98	5008	70.08	5022
GR	70.22	5030	70.3	5044	70.3	5083	72.6	5089	80.4	5099
GR	81.8	5106	81.8	5119	79	5122	69.9	5143	67.9	5152
GR	68.5	5189	68.9	5252	69.6	5254	69.6	5269	71.9	5414
GR	70.9	5461	70.1	5469	70.1	5479	80.3	5503	85.4	5513
GR	86.1	5527	86.7	5600	87.1	5617	85.1	5622	85.1	5653
GR	85.6	5654	85.6	5664	87.2	5831	0	0	0	0
NC	0.3	0.5								
NH	5	10	4975	0.035	4988	0.039	5012	0.059	5090	10
NH	5782									
ET	9.11	4975	5090							
X1	14837	37	4988	5012	87	87	87			
X3	10	70	70.15							
X4	2	70.84	4975	72	5090					
GR	88.2	4141	87.7	4159	84.5	4163	83.8	4189	83.7	4249
GR	83.5	4420	83.1	4523	82.7	4596	81.5	4649	79.4	4708
GR	76.4	4767	73.7	4841	72	4899	71.58	4914	70.78	4986.5
GR	63.68	4988	63.88	5000	64.28	5012	68.98	5013.5	70.98	5027
GR	71.68	5062	72.2	5102	73.1	5226	74	5317	74.4	5437
GR	74.9	5524	77.1	5565	73.4	5571	73.2	5574	73.2	5578
GR	73.2	5585	77.8	5586	79.3	5606	82.4	5644	85	5688
GR	86.5	5739	87.8	5782	0	0	0	0	0	0
SB	1	1.6	2.4	24	129	64.1	63.9			
NH	5	10	4800	0.035	4988	0.039	5012	0.059	5100	10
NH	5782									
ET	9.11	4800	5100							
X1	14883	46	4988	5012	46	46	46			
X2	1	69.98	71.48							
X3	10	71.48	71.78							
X4	2	75	4800	72.1	5100					
BT	45	4141	88.2	88.2	4159	87.7	87.7	4163	84.5	84.5
BT4189.0	83.8	83.8	4249	83.7	83.7	4420	83.5	83.5	4523	
BT	83.1	83.1	4596	82.7	82.7	4649	81.5	81.5	4708	79.4
BT	79.4	4767	76.4	76.4	4841	73.7	73.7	4899	72	72
BT4924.0	71.68	71.68	4973	71.48	71.48	4973.5	74.14	71.48	4985	
BT	74.72	71.67	4985.1	76.18	71.67	4987.5	76.18	71.72	4988	76.18
BT	64.18	4988.1	75.28	68.43	5000	76.25	69.98	5012	75.4	68.38
BT5012.1	76.23	64.18	5015	76.23	64.7	5015.1	74.76	64.7	5026.5	
BT	74.35	71.78	5027	71.78	71.78	5073	71.31	71.31	5102	72.2
BT	72.2	5226	73.1	73.1	5317	74	74	5437	74.4	74.4
BT5524.0	74.9	74.9	5565	77.1	77.1	5571	73.4	73.4	5574	
BT	73.2	73.2	5578	73.2	73.2	5585	73.2	73.2	5586	77.8
BT	77.8	5606	79.3	79.3	5644	82.4	82.4	5688	85	85
BT5739.0	86.5	86.5	5782	87.8	87.8					
GR	88.2	4141	87.7	4159	84.5	4163	83.8	4189	83.7	4249
GR	83.5	4420	83.1	4523	82.7	4596	81.5	4649	79.4	4708
GR	76.4	4767	73.7	4841	72	4899	71.68	4924	71.48	4973
GR	71.48	4973.5	71.67	4985	71.67	4985.1	71.72	4987.5	64.18	4988
GR	64.18	4988.1	64.08	5000	64.18	5006	64.18	5012	64.18	5012.1
GR	64.7	5015	64.7	5015.1	71.78	5026.5	71.78	5027	71.31	5073
GR	72.2	5102	73.1	5226	74	5317	74.4	5437	74.9	5524
GR	77.1	5565	73.4	5571	73.2	5574	73.2	5578	73.2	5585
GR	77.8	5586	79.3	5606	82.4	5644	85	5688	86.5	5739
GR	87.8	5782	0	0	0	0	0	0	0	0
NH	5	10	4965	0.035	4991	0.039	5009	0.059	5060	10
NH	5727									
ET	9.1	4965	5060							
X1	14950	70	4991	5009	67	67	67			
X4	2	69.03	4965	70.5	5060					
GR	92.2	4155	92.2	4184	90.9	4194	84.7	4200	84.7	4226
GR	85.4	4239	86.5	4280	84.1	4351	84.6	4378	85.3	4389
GR	83.9	4401	83.2	4407	83.6	4410	83.6	4421	82.8	4430
GR	83.4	4437	84.1	4447	84.5	4495	84.9	4544	83.6	4574
GR	82.7	4602	82.8	4607	82.8	4631	83	4662	84.6	4679
GR	85.1	4688	85	4728	84.4	4746	78.3	4756	76.7	4779

GR	76.8	4796	73.3	4805	72.8	4830	72.3	4848	68.6	4858
GR	69.1	4925	69.02	4972.5	68.32	4986	67.02	4988	64.82	4991
GR	64.12	5000	64.62	5009	66.12	5010	66.42	5013.5	69.02	5018
GR	69.13	5022.5	68.56	5022.6	68.97	5051	69.54	5051.1	70.92	5070
GR	73.1	5110	72.8	5173	73	5257	74.8	5323	75.2	5393
GR	74.4	5412	74.7	5447	75.2	5466	75.8	5580	74.7	5594
GR	71.4	5596	71.4	5607	71.4	5610	72	5631	72.9	5637
GR	83	5661	85.4	5671	86.6	5689	87.7	5702	88.1	5727
NC	0.1	0.3								
NH	5	10	4920	0.035	4984	0.039	5015	0.059	5045	10
NH	5389									
ET	9.1	4920	5045							
X1	15200	52	4981	5019	150	360	250			
X4	2	74.5	4920	74.2	5045					
GR101.90	4249	100	4262	96.6	4306	94.3	4317	87.3	4327	
GR	85.6	4334	85.6	4362	86.4	4372	86.3	4440	86.3	4463
GR	85.1	4474	85.2	4480	85.3	4491	84.1	4500	85.1	4506
GR	86.4	4517	87.5	4527	84.5	4538	84.7	4592	84.5	4676
GR	84.2	4701	84.2	4728	82.6	4802	82.8	4843	82.7	4856
GR	81.2	4883	80.1	4887	79	4906	71.6	4936	69.1	4954
GR	69.2	4973	68.2	4981	65.4	4984	65.37	5000	65.4	5015
GR	71.5	5019	71.9	5027	72.8	5031	75.3	5054	78.1	5086
GR	80.7	5105	83.9	5163	83.8	5201	86.2	5240	89.9	5267
GR	91.1	5278	93.3	5306	94.3	5311	94.8	5332	95.6	5351
GR	97.8	5365	98.6	5389	0	0	0	0	0	0
NH	5	10	4980	0.035	4993	0.039	5006	0.059	5045	10
NH	5379									
ET	9.1	4980	5045							
X1	15430	55	4993	5006	260	140	230			
X4	2	71.4	4980	76.5	5045					
GR100.70	4372	96.7	4399	94.4	4441	89.7	4446	88.8	4457	
GR	87.5	4463	88	4479	87.8	4494	88	4507	87	4518
GR	87.7	4524	87.7	4535	86.9	4541	85.8	4546	87.6	4557
GR	88.8	4577	89.6	4606	89.5	4625	88.3	4635	87.4	4638
GR	87.6	4651	85.1	4655	85.1	4697	86.3	4717	86.6	4756
GR	86.4	4779	86.6	4784	86.6	4810	86.7	4834	86	4886
GR	83.9	4914	82.9	4945	82.9	4960	82.2	4965	72.6	4976
GR	70.2	4987	68.3	4991	66.6	4993	66.53	5000	66.6	5006
GR	71.8	5013	73.8	5020	76.8	5047	82.7	5082	83.6	5157
GR	84.8	5163	85	5207	92.6	5213	94.1	5224	95.7	5282
GR	95.3	5300	95.6	5326	96.3	5345	98.9	5360	99.4	5379
NC	0.035	0.059	0.039							
ET	9.1	4940	5075							
X1	15700	44	4990	5009	260	280	270			
GR	95.7	4418	93.2	4446	92	4477	90.9	4487	90.4	4491
GR	90.7	4508	90.6	4524	89.9	4531	88.9	4537	90.6	4545
GR	90.6	4556	89.2	4560	90.9	4567	92.5	4577	91.8	4612
GR	91	4647	89.8	4671	88.4	4674	87.7	4731	86.8	4767
GR	86.6	4776	86.6	4804	87.3	4812	87.9	4851	86.6	4884
GR	85.4	4902	84.5	4913	78.9	4922	76.4	4941	73.5	4987
GR	69.4	4990	67.88	5000	69.4	5009	73.3	5014	74.2	5018
GR	75.4	5070	80	5072	81.2	5120	87.3	5161	89.7	5192
GR	95.3	5235	100.2	5249	101.4	5261	101.2	5268	0	0
ET	9.1	4930	5030							
X1	15950	53	4990	5009	190	270	250			
GR107.60	4394	104.8	4411	101.9	4439	101.5	4454	92.5	4459	
GR	92.2	4469	92.6	4486	92.2	4500	92.2	4505	92.6	4508
GR	92.6	4517	92.1	4522	93.6	4529	93.4	4538	89.9	4554
GR	88.3	4595	88.2	4660	87.8	4721	86.6	4732	86.8	4759
GR	87.6	4766	89.1	4774	87.8	4781	87.5	4811	84.8	4871
GR	81.6	4907	76.8	4931	74	4942	74.1	4968	74	4981
GR	72.5	4986	70.9	4990	69.14	4998	69.74	5004	70.14	5009
GR	70.9	5009.1	71.8	5013	73.7	5019	74.5	5023	79.6	5023
GR	82.3	5075	78.4	5079	80.3	5083	80.9	5087	84.8	5091
GR	88.5	5147	95	5185	96.6	5204	95.6	5211	95.2	5213
GR	95.2	5241	96.7	5250	100.8	5260	0	0	0	0

NC	0.06	0.06	0.045							
ET	9.1	4930	5060							
X1	16250	49	4989	5010	390	280	300			
GR120.90	4406	120.3	4412	115.9	4417	109.3	4428	98.2	4440	
GR	97.2	4451	97.6	4456	97.6	4471	96.1	4480	95.2	4488
GR	94.7	4491	95	4508	94.8	4523	93.7	4549	90.2	4599
GR	88.6	4635	89.2	4675	88.3	4682	87.9	4686	87.9	4721
GR	89	4728	89.6	4746	87.8	4787	81.4	4836	79.3	4854
GR	77.6	4911	77.5	4931	75.8	4945	75.8	4977	75.3	4985
GR	71.4	4989	70.64	4997	71.24	5004	71.64	5010	71.4	5010.1
GR	74.3	5015	75.8	5021	76.6	5038	77.8	5075	79.5	5096
GR	80.6	5108	82.1	5122	84.3	5138	90.4	5168	92.6	5181
GR	93.1	5188	93	5218	99.5	5256	100.9	5265	0	0
NH	4	0.06	4972	0.045	5027	0.06	5035	10	5201	
ET	9.1	4920	5030							
X1	16500	44	4972	5027	190	270	250			
GR106.40	4408	106.5	4415	102.8	4426	99.7	4437	98.5	4449	
GR	98.5	4455	99.1	4457	99.1	4467	95.3	4476	93.5	4493
GR	94	4507	93.8	4522	94.3	4531	93.1	4563	92.2	4597
GR	89.8	4621	89.2	4674	88.1	4685	88.1	4719	88.3	4749
GR	89.5	4779	88.9	4822	86.9	4847	83.7	4877	79.7	4914
GR	77.8	4950	76.5	4966	75	4970	73.3	4972	71.89	4994
GR	72.49	5012	72.89	5027	73.2	5027.1	75.8	5035	78.5	5040
GR	80.2	5045	83	5062	94	5090	95.2	5123	98.6	5155
GR103.40	5170	105.9	5185	107.5	5192	107.5	5201	0	0	
NH	5	10	4945	0.075	4985	0.049	5015	0.068	5030	10
NH	5327									
ET	9.1	4966	5030							
X1	16850	46	4985	5015	310	300	350			
X4	2	89.65	4945	80.82	5030					
GR	91.4	4464	102.1	4482	102.9	4489	102.8	4503	100.1	4509
GR	88.7	4526	85.9	4544	85.9	4582	85.8	4612	85.8	4620
GR	84.1	4635	84.1	4656	84.9	4671	85.4	4687	85.4	4726
GR	84.8	4774	84.2	4809	87.1	4848	88.1	4868	89.7	4892
GR	89.7	4907	89.85	4927	89.55	4954	79.25	4971	74.65	4985
GR	73.65	4997	74.25	5007	74.65	5015	80.45	5015.1	80.95	5035
GR	81.1	5065	81.6	5122	81.2	5170	82.1	5176	83.5	5200
GR	84.7	5217	86.6	5220	88.7	5239	90.6	5253	92.4	5266
GR	94.5	5268	97.8	5305	97.8	5314	104.1	5319	105.7	5325
GR106.20	5327	0	0	0	0	0	0	0	0	
NH	5	10	4880	0.075	4990	0.049	5009	0.068	5025	10
NH	5347									
ET	9.1	4880	5025							
X1	17050	41	4990	5009	160	190	200			
X2	15									
X4	2	82.1	4880	82.37	5025					
GR	94.9	4460	95.9	4468	101.9	4480	103.6	4487	104.4	4494
GR104.40	4504	103.2	4508	95.1	4519	92.5	4535	88.1	4557	
GR	85.7	4576	84.5	4614	83.4	4633	82.1	4644	82.6	4661
GR	82.8	4681	83.8	4715	84.6	4770	82.7	4792	82.8	4828
GR	82	4890	80.6	4922	78.8	4955	78.2	4978	77.3	4984
GR	75.1	4990	74.66	4998	75.26	5004	75.66	5009	75.1	5009.1
GR	79.4	5015	82.3	5023	83.9	5040	84	5067	84	5149
GR	86.8	5194	91.1	5259	94.5	5289	97.9	5314	100.5	5327
GR100.80	5347	0	0	0	0	0	0	0	0	
NC	0.075	0.068	0.049	0.1	0.3					
NH	5	10	4833	0.075	4992	0.049	5007	0.068	5031	10
NH	5402									
ET	9.1	4850	5030							
X1	17200	43	4992	5007	140	160	150			
GR106.10	4452	106.7	4454	106.7	4466	105.7	4473	105.6	4496	
GR103.70	4515	98.4	4531	91.7	4550	89.9	4564	89.1	4608	
GR	87.6	4634	85.3	4647	83.7	4658	83.9	4675	83.9	4691
GR	84.5	4699	85.4	4741	86.5	4773	86.8	4787	83.2	4833
GR	82.7	4900	80.2	4946	79.8	4977	79.8	4986	78	4989
GR	76.6	4992	75.41	4998	76.01	5003	76.41	5007	76.6	5007.1

GR	80.4	5017	84	5031	86.1	5053	88.3	5097	89.9	5130
GR	88.7	5175	88	5202	92	5239	94.6	5265	96.9	5322
GR	99.1	5341	100	5373	102.9	5402	0	0	0	0
NH	4	0.075	4985	0.049	5014	0.068	5060	10	5373	
ET	9.1	4920	5060							
X1	17450	41	4985	5014	240	250	250			
GR125.60	4470	121.3	4485	104.5	4527	96.5	4544	90.9	4559	
GR	89.8	4576	90.6	4617	90.1	4645	88	4680	85.6	4710
GR	85.7	4713	84.7	4715	85.1	4730	85.1	4747	85.5	4753
GR	84.5	4765	84.8	4809	85.3	4868	83.8	4921	81.2	4945
GR	80.5	4980	77.8	4985	76.67	4997	77.27	5007	77.8	5014
GR	78.3	5015	80.2	5019	82.4	5032	83.5	5060	85.8	5108
GR	86.6	5129	85.9	5136	85.5	5137	85.5	5166	85.9	5168
GR	87.4	5205	90.5	5248	95.1	5282	98.3	5317	101.4	5364
GR101.50	5373	0	0	0	0	0	0	0	0	
NC	0.069	0.081	0.061							
ET	9.1	4940	5095							
X1	17650	46	4993	5006	210	180	200			
GR115.40	4467	114	4499	112.8	4532	104	4572	99.8	4585	
GR	98.5	4613	97.5	4623	93.9	4626	91.7	4649	90.2	4658
GR	89.2	4667	89.8	4682	89.3	4698	90.1	4706	89.9	4721
GR	87.8	4750	88.2	4781	88.2	4828	86.7	4880	83.2	4923
GR	82.3	4933	82.9	4955	82.2	4982	80.9	4990	77.9	4993
GR	77.88	4997	77.68	5004	77.9	5006	78.9	5010	82	5020
GR	82.7	5053	84.7	5079	85.6	5101	88.4	5132	87.8	5152
GR	86.2	5167	85.7	5168	85.7	5198	86.7	5208	91.8	5243
GR	94.7	5279	95.5	5293	97.7	5320	100	5342	101.1	5360
GR102.30	5401	0	0	0	0	0	0	0	0	
ET	9.1	4870	5020							
X1	17870	43	4994	5005	170	140	220			
GR112.10	4238	112.3	4279	111.5	4322	108.8	4349	107.1	4355	
GR104.30	4360	102.9	4382	103.3	4387	100	4407	97.8	4437	
GR	97.8	4447	97.1	4451	97.6	4466	97.5	4486	96.5	4504
GR	95.2	4528	92.2	4549	90.3	4586	88.7	4637	88.3	4697
GR	86.4	4726	85.1	4751	83.9	4796	82.1	4874	81.8	4937
GR	82.4	4975	82.7	4988	80.7	4994	78.99	4997	78.79	5003
GR	80.7	5005	82.4	5009	86.5	5021	89.1	5035	92.5	5078
GR	92.4	5092	91.7	5094	92.8	5131	95.4	5155	100.1	5174
GR101.20	5184	103.2	5228	104.8	5249	0	0	0	0	
NH	5	10	4900	0.069	4992	0.061	5008	0.081	5045	10
NH	5464									
ET	9.1	4900	5045							
X1	18100	51	4992	5008	140	170	230			
X4	2	85.58	4900	84.4	5045					
GR116.10	4295	118.9	4319	119.4	4323	112	4331	110.8	4344	
GR107.80	4348	106.6	4378	103.3	4391	102.4	4423	103.6	4438	
GR103.60	4455	104.4	4460	102.9	4481	100.5	4508	99.1	4524	
GR	98.6	4529	98.9	4548	98.8	4566	99.9	4571	100.3	4578
GR	97.5	4587	90.9	4636	90.2	4687	90.2	4741	89.9	4790
GR	87.9	4845	86.35	4876	82.75	4989	81.25	4992	80.15	4997
GR	79.95	5005	81.15	5008	83.35	5019	84.85	5056	84.7	5095
GR	85.3	5117	86.8	5150	86	5161	86	5180	88.5	5187
GR	89.3	5204	90.9	5225	92.8	5237	94.6	5267	96	5297
GR	96.9	5313	98.2	5349	99.9	5386	102	5403	103.2	5413
GR105.90	5464	0	0	0	0	0	0	0	0	
NH	5	10	4830	0.069	4988	0.03	5012	0.081	5050	10
NH	5490									
ET	9.11	4830	5050							
X1	18199	36	4988	5012	110	90	99			
X3	10	89.6	85.5							
X4	2	87.7	4830	87.4	5050					
GR102.90	3925	102.6	4057	102.5	4155	102.5	4175	102	4270	
GR101.50	4307	101.1	4414	101.1	4436	100.7	4512	98.7	4565	
GR	95.4	4612	93.1	4662	90.7	4731	89.1	4819	87.25	4900
GR	87.55	4950	86.85	4986	89.35	4986.1	89.35	4988	79.75	4988.1
GR	79.65	4994	79.55	5000	79.75	5006	79.65	5012	89.25	5012.1

GR	89.25	5014	87.55	5014.1	87.35	5089	87	5132	87.3	5143
GR	87.9	5201	91.2	5256	95.1	5312	95.4	5320	105.8	5484
GR105.90	5490	0	0	0	0	0	0	0	0	
SB	0	1.6	2.4	23.5	120	79.4	79.55			
NH	5	10	4830	0.069	4988.2	0.03	5011.8	0.081	5050	10
NH	5490									
ET	7.11	9.11	4830	5050	4830	5050				
X1	18241	33	4988.2	5011.8	42	42	42			
X2	1	84.95	87.9							
X3	10	91.25	87.9							
X4	2	91.15	4830	88.3	5050					
BT	31	3925	102.9	102.9	4057	102.6	102.6	4155	102.5	102.5
BT4175.0	102.5	102.5	4270	102	102	4307	101.5	101.5	4414	
BT101.10	101.1	4436	101.1	101.1	4512	100.7	100.7	4565	98.7	
BT	98.7	4612	95.4	95.4	4662	93.1	93.1	4700	92.34	92.34
BT4800.0	91.05	91.05	4900	91.25	91.25	4950	91.25	91.25	4971	
BT	91.75	80.25	4988.2	91.45	79.05	4988.3	91.45	83.55	5000	92.25
BT	84.95	5011.7	91.45	83.25	5011.8	91.45	79.45	5022	91.45	88.05
BT5022.1	88.05	88.05	5150	89.05	89.05	5201	87.9	87.9	5256	
BT	91.2	91.2	5312	95.1	95.1	5320	95.4	95.4	5484	105.8
BT105.80	5490	105.9	105.9							
GR102.90	3925	102.6	4057	102.5	4155	102.5	4175	102	4270	
GR101.50	4307	101.1	4414	101.1	4436	100.7	4512	98.7	4565	
GR	95.4	4612	93.1	4662	92.34	4700	91.05	4800	91.25	4900
GR	91.25	4950	80.25	4971	79.05	4988.2	79.05	4988.3	79.35	4994
GR	79.35	5000	79.95	5006	79.45	5011.7	79.45	5011.8	88.05	5022
GR	88.05	5022.1	89.05	5150	87.9	5201	91.2	5256	95.1	5312
GR	95.4	5320	105.8	5484	105.9	5490	0	0	0	0
NH	5	10	4850	0.045	4988	0.033	5012	0.035	5150	10
NH	5321									
ET	9.1	4850	5150							
X1	18330	49	4988	5012	89	89	89			
X4	2	86.2	4850	83.2	5150					
GR106.90	3895	105.3	3961	101.5	3985	101.4	4017	102.3	4044	
GR101.70	4048	100.3	4052	99.9	4073	101	4080	100.1	4091	
GR	99.3	4140	98.8	4223	98.9	4299	99.3	4376	98.1	4420
GR	97.4	4470	94.7	4520	91	4560	88.7	4621	89	4666
GR	88.6	4689	87.9	4696	88.8	4717	89.4	4764	89	4809
GR	87	4841	86.65	4843	84.15	4934	82.95	4987	81.05	4988
GR	81.35	4994	82.45	4998	82.45	5003	81.55	5009	82.05	5012
GR	86.25	5018	87.95	5025	87.55	5070	85.5	5085	84.2	5098
GR	84	5127	82.8	5172	82.7	5191	85.8	5214	92.3	5238
GR	99.8	5275	104.6	5304	107.8	5314	108.1	5321	0	0
NC	0.1	0.3								
NH	5	10	4850	0.045	4991	0.033	5008	0.035	5190	10
NH	5284									
ET	9.1	4850	5190							
X1	18500	43	4991	5008	170	170	170			
X4	2	82.5	4850	86.7	5190					
GR114.10	4152	107.9	4174	103.4	4202	100.9	4223	100.9	4276	
GR100.40	4334	100.8	4394	99.7	4460	99.1	4520	97.6	4560	
GR	95.8	4636	96	4668	97.3	4715	98.3	4744	98.3	4770
GR	96.2	4782	92.6	4801	86.7	4823	84.1	4838	83.4	4845
GR	82.5	4846	82.5	4965	83.3	4967	84.2	4974	84.7	4983
GR	84	4989	81.8	4991	81.73	4995	82.83	4998	81.83	5002
GR	81.93	5006	81.8	5008	81.8	5010	83.8	5019	84.7	5033
GR	84.6	5068	85	5127	84.6	5157	84.8	5178	86.7	5191
GR107.50	5247	112.4	5265	114.8	5284	0	0	0	0	
NC	0.045	0.035	0.033							
ET	6.4									
X1	18750	44	4992	5007	290	230	250			
GR120.90	4482	110.3	4512	107.9	4521	106.3	4549	104.5	4580	
GR102.70	4602	101.9	4618	100.3	4651	100.8	4696	102.8	4749	
GR103.50	4789	103.7	4813	102	4822	99.6	4838	92.1	4865	
GR	86.3	4884	83.5	4898	82.5	4901	82.3	4903	82.3	4958
GR	82.7	4961	84.8	4970	85.6	4981	84.6	4988	83	4990

GR	82.3	4992	82.28	4996	83.38	4999	83.13	5002	82.48	5006
GR	82.3	5007	82.4	5011	84.2	5018	86	5031	85.5	5036
GR	87.3	5097	88.8	5146	89.5	5166	94.5	5191	99.4	5223
GR101.90	5248	110.1	5279	113.6	5296	112.7	5306	0	0	
X1	19000	41	4987	5012	300	210	250			
GR123.20	4543	123.1	4562	122.4	4581	118.8	4594	115.4	4613	
GR108.70	4636	104.2	4657	101.6	4683	100	4714	99.1	4778	
GR	98.5	4798	94.9	4817	91.8	4838	89.9	4848	86.6	4855
GR	84.3	4858	84.3	4903	87.3	4906	88.3	4924	87.8	4944
GR	85.9	4963	84.8	4979	84.6	4984	83.5	4987	82.84	4993
GR	83.94	4997	83.14	5002	83.04	5008	83.5	5012	85.9	5018
GR	87.9	5021	92	5043	93.5	5062	95	5091	96	5121
GR	97.3	5159	99.2	5194	102.1	5222	106.4	5261	110.7	5293
GR112.90	5307	0	0	0	0	0	0	0	0	
NC	0.055	0.06	0.051							
ET	9.1	4850	5015							
X1	19300	40	4989	5010	320	200	300			
GR112.20	4338	108.8	4364	107.7	4392	105	4407	100.6	4482	
GR100.60	4554	101	4590	100.2	4623	98.6	4652	94.8	4669	
GR	90.8	4681	89.3	4686	87.8	4689	87.7	4770	89.4	4776
GR	93.5	4790	94.4	4795	94.6	4810	94.4	4852	90.1	4863
GR	88.1	4869	85.7	4877	85.5	4919	86.2	4943	87.5	4959
GR	87.3	4973	85.8	4985	84.3	4989	83.79	4990	84.09	5000
GR	83.49	5006	84.3	5010	86.8	5015	92.7	5037	95.8	5058
GR	97.5	5073	102.2	5105	108.8	5131	113.2	5160	115.8	5176
ET	9.1	4880	5070							
X1	19550	49	4990	5011	220	220	250			
GR113.00	3866	109	3898	107.7	3923	106	3987	104.5	4085	
GR104.20	4195	104.2	4293	101.1	4345	100.2	4376	101.5	4410	
GR103.10	4466	103.3	4542	102.1	4547	102.1	4562	103.3	4570	
GR101.70	4576	101.9	4594	102.5	4600	101.7	4612	101.7	4632	
GR102.80	4658	101.9	4677	99.1	4685	95.1	4707	90.2	4727	
GR	87.8	4745	86.6	4748	86.6	4751	87.5	4753	88	4772
GR	88.8	4810	89.1	4868	88.3	4943	87.7	4960	86.7	4984
GR	85.9	4989	84.3	4990	84.14	4991	84.54	5001	84.04	5007
GR	84.3	5011	84.9	5015	86.6	5041	90.5	5069	97.3	5098
GR100.30	5113	102.5	5146	108.4	5216	116.4	5304	0	0	
ET	9.1	4935	5065							
X1	19850	42	4991	5009	120	330	300			
GR111.90	4075	110.6	4108	107.7	4133	105.5	4186	104.4	4280	
GR104.70	4381	104.7	4439	105.1	4507	104.6	4600	103.8	4710	
GR103.50	4788	103.6	4854	104.3	4866	105.1	4878	100	4891	
GR	92.9	4923	90.7	4941	89.4	4946	88.6	4948	88.6	4951
GR	89.7	4953	91.1	4963	91.4	4976	89.9	4984	87	4987
GR	85.3	4991	85	4992	84.75	5000	84.7	5005	85.3	5009
GR	87	5015	91.2	5023	92.4	5047	93.9	5067	92.6	5108
GR	92.7	5145	94.9	5161	100.8	5182	103.1	5213	109.8	5220
GR112.70	5232	116.8	5250	0	0	0	0	0	0	
NC	0.06	0.045	0.024							
ET	6.4									
X1	20050	51	4992	5009	140	250	200			
GR114.20	4175	115.2	4190	112.2	4212	108.1	4243	105.1	4370	
GR104.50	4417	104.6	4463	105.6	4496	105.4	4525	105.1	4576	
GR104.60	4680	104.2	4737	103.8	4813	103	4839	101.2	4843	
GR	98.8	4867	94.1	4882	91.3	4905	89.8	4920	89.3	4926
GR	88.4	4928	88.3	4931	88.9	4933	90.1	4943	91	4963
GR	89.8	4980	89.2	4990	87.5	4992	87.2	4993	87.4	5001
GR	86.9	5006	87.5	5009	88.9	5012	90.1	5031	90.8	5056
GR	88.3	5062	87.5	5062	87.5	5068	89.1	5082	91.4	5082
GR	94.3	5102	96.8	5126	98.9	5149	100.7	5198	102.5	5238
GR103.70	5309	105.5	5356	106.3	5376	112.4	5444	113.1	5489	
GR114.30	5510	0	0	0	0	0	0	0	0	
NC	0.06	0.069	0.034							
X1	20200	43	4984	5016	160	140	150			
GR112.70	4264	112	4287	108.8	4308	106.3	4357	104.7	4439	
GR105.00	4548	104.1	4554	104.2	4576	105	4586	106.6	4594	

GR105.70	4601	105.2	4624	105.9	4671	104.4	4732	103.6	4759	
GR102.90	4782	101.75	4798	95.25	4828	95.05	4836	90.85	4847	
GR	91.65	4891	91.65	4937	91.05	4982	89.45	4984	88.85	4986
GR	89.15	5001	88.55	5010	89.15	5016	96.95	5031	100.45	5046
GR101.95	5083	101.8	5088	101.9	5153	101.1	5193	100.6	5194	
GR100.70	5221	101	5227	101.7	5256	104.1	5295	104.4	5350	
GR105.70	5376	108.6	5403	115.7	5436	0	0	0	0	
NC	0.06	0.04	0.044							
X1	20600	38	4992	5008	300	300	400			
GR111.60	4434	106.4	4495	105.3	4549	103.6	4567	102.2	4591	
GR103.60	4619	103.1	4621	104.8	4659	104.4	4709	102.7	4728	
GR	97.5	4768	94.3	4807	93.4	4852	92	4886	90.5	4887
GR	90.5	4890	93	4896	92.4	4923	92.2	4975	91.4	4988
GR	90.6	4992	89.13	4997	89.73	5004	89.6	5008	90.8	5011
GR	94.3	5025	97.7	5049	99.6	5096	100	5152	100.5	5192
GR100.10	5196	100.1	5224	101.4	5231	102.8	5263	104.6	5312	
GR105.60	5367	108.7	5411	114.4	5446	0	0	0	0	
X1	20750	30	4985	5015	120	330	150			
GR109.50	4593	108.7	4604	106.3	4657	104.2	4697	104.4	4739	
GR102.90	4771	99	4800	96.9	4822	94.4	4895	94.5	4940	
GR	95.15	4947	95.05	4968	90.95	4985	89.35	4994	89.95	5008
GR	90.75	5015	92.55	5018	93.65	5033	95.95	5049	96.7	5052
GR	96.8	5106	97.4	5187	98	5237	101	5287	103.9	5329
GR105.70	5357	105.9	5389	106.9	5411	113.1	5456	116.3	5476	
NC	0.3	0.5								
X1	20919	48	4992	5008	199	139	169			
X3	10	94	95							
GR115.80	4568	111.5	4620	108.6	4681	107.9	4723	106.5	4750	
GR105.20	4771	101.6	4804	96.7	4843	93.2	4887	94.4	4914	
GR	95.5	4950	95.05	4968	91.95	4986	91.45	4992	91.45	4992.1
GR	91.05	4996	90.75	5000	90.95	5004	91.75	5008	91.75	5008.1
GR	94.55	5018	94.45	5031	99.3	5037	99.3	5045	103.3	5056
GR104.30	5059	104.7	5064	103.4	5070	103.8	5144	105	5159	
GR104.70	5160	106	5188	107	5196	105	5210	105.9	5235	
GR105.20	5258	107.3	5285	106.2	5315	106.1	5355	104.2	5371	
GR104.20	5392	106.4	5421	107.6	5448	108.4	5480	108.9	5512	
GR109.50	5567	112.6	5591	115.8	5614	0	0	0	0	
X1	20920	0	0	0	1	1	1			
BT	45	4568	115.8	115.8	4620	111.5	111.5	4681	108.6	108.6
BT4723.0	107.9	107.9	4750	106.5	106.5	4771	105.2	105.2	4804	
BT101.60	101.6	4843	96.7	96.7	4887	93.2	93.2	4914	94.4	
BT	94.4	4950	95.5	95.5	4968	95.05	95.05	4986	95.65	91.95
BT4992.0	96.45	91.45	4992.1	96.45	95.65	5008	96.45	95.65	5008.1	
BT	96.45	91.75	5018	94.55	94.55	5031	94.45	94.45	5037	99.3
BT	99.3	5045	99.3	99.3	5056	103.3	103.3	5059	104.3	104.3
BT5064.0	104.7	104.7	5070	103.4	103.4	5144	103.8	103.8	5159	
BT105.00	105	5160	104.7	104.7	5188	106	106	5196	107	
BT107.00	5210	105	105	5235	105.9	105.9	5258	105.2	105.2	
BT5285.0	107.3	107.3	5315	106.2	106.2	5355	106.1	106.1	5371	
BT104.20	104.2	5392	104.2	104.2	5421	106.4	106.4	5448	107.6	
BT107.60	5480	108.4	108.4	5512	108.9	108.9	5567	109.5	109.5	
BT5591.0	112.6	112.6	5614	115.8	115.8					
X1	20932	43	4992	5008	12	12	12			
BT	40	4568	115.8	115.8	4620	111.5	111.5	4681	108.6	108.6
BT4723.0	107.9	107.9	4750	106.5	106.5	4771	105.2	105.2	4804	
BT101.60	101.6	4843	96.7	96.7	4887	93.2	93.2	4914	94.4	
BT	94.4	4938	94.85	94.85	4963	94.75	94.75	4967	96.25	94.05
BT4992.0	96.45	91.85	4992.1	96.45	95.55	5008	96.45	95.65	5008.1	
BT	96.45	89.65	5033	96.45	94.45	5049	96.45	96.45	5074	98.85
BT	98.85	5144	103.8	103.8	5159	105	105	5160	104.7	104.7
BT5188.0	106	106	5196	107	107	5210	105	105	5235	
BT105.90	105.9	5258	105.2	105.2	5285	107.3	107.3	5315	106.2	
BT106.20	5355	106.1	106.1	5371	104.2	104.2	5392	104.2	104.2	
BT5421.0	106.4	106.4	5448	107.6	107.6	5480	108.4	108.4	5512	
BT108.90	108.9	5567	109.5	109.5	5591	112.6	112.6	5614	115.8	
BT115.80										

GR115.80	4568	111.5	4620	108.6	4681	107.9	4723	106.5	4750	
GR105.20	4771	101.6	4804	96.7	4843	93.2	4887	94.4	4914	
GR	94.85	4938	94.75	4963	94.05	4967	91.85	4992	91.85	4992.1
GR	91.15	4996	90.25	5000	89.85	5004	89.65	5008	89.65	5008.1
GR	94.45	5033	96.45	5049	98.85	5074	103.8	5144	105	5159
GR104.70	5160	106	5188	107	5196	105	5210	105.9	5235	
GR105.20	5258	107.3	5285	106.2	5315	106.1	5355	104.2	5371	
GR104.20	5392	106.4	5421	107.6	5448	108.4	5480	108.9	5512	
GR109.50	5567	112.6	5591	115.8	5614	0	0	0	0	
X1	20933	0	0	0	1	1	1			
X3	10	94.75	96.45							
NC	0.052	0.052	0.044							
ET	9.1	4845	5035							
X1	21000	46	4993	5007	49	69	67			
GR115.80	4568	111.5	4620	108.6	4681	107.9	4723	106.5	4750	
GR105.20	4771	101.6	4804	96.7	4843	93.2	4887	94.4	4914	
GR	94.85	4924	94.95	4968	93.55	4991	92.05	4993	91.65	4996
GR	91.65	5002	92.15	5007	93.35	5008	95.25	5019	98.85	5035
GR	99.3	5037	99.3	5045	103.3	5056	104.3	5059	104.7	5064
GR103.40	5070	103.8	5144	105	5159	104.7	5160	106	5188	
GR107.00	5196	105	5210	105.9	5235	105.2	5258	107.3	5285	
GR106.20	5315	106.1	5355	104.2	5371	104.2	5392	106.4	5421	
GR107.60	5448	108.4	5480	108.9	5512	109.5	5567	112.6	5591	
GR115.80	5614	0	0	0	0	0	0	0	0	
NC	0.1	0.3								
ET	9.1	4940	5180							
X1	21250	54	4990	5009	190	230	250			
GR115.30	4713	108.8	4826	106	4875	105	4896	100.5	4922	
GR	96.9	4951	95.8	4977	95.1	4988	92.8	4990	92.09	4994
GR	92.09	5002	92.8	5009	94.4	5010	95.4	5030	94.8	5055
GR	94	5066	92.8	5067	92.8	5076	94.2	5085	95.9	5104
GR	97.6	5144	96.8	5160	96.8	5181	94.4	5183	94.4	5357
GR	95.7	5358	97.5	5373	101.1	5409	104.9	5453	107.4	5485
GR110.40	5514	111.8	5530	111.3	5548	109.8	5567	106.2	5602	
GR105.90	5623	107.9	5648	109.2	5671	107.6	5689	103.5	5707	
GR102.30	5747	102.7	5761	104.7	5778	106.9	5813	108.2	5845	
GR108.10	5856	107.8	5864	108	5893	108.4	5898	107.9	5911	
GR106.10	5943	107.7	5984	110.4	6008	112.2	6039	0	0	
ET	9.1	4940	5095							
X1	21550	40	4994	5005	220	320	300			
GR115.40	4670	115.4	4710	110.1	4790	109.5	4833	108	4842	
GR107.00	4868	101	4901	97.8	4930	96.7	4967	96.6	4984	
GR	95.9	4989	94.2	4994	93.22	4996	92.62	5000	92.82	5002
GR	94.1	5005	95.5	5008	96.3	5020	97.4	5036	98.2	5111
GR	98.6	5162	99.1	5171	97.9	5174	98.4	5190	99.4	5192
GR100.00	5219	99.9	5280	100.8	5296	102.1	5308	109.3	5327	
GR111.20	5334	112.7	5356	112.9	5390	113.1	5454	113.4	5543	
GR114.60	5609	114.9	5687	115.9	5757	116.6	5843	116	5860	
ET	7.4									
X1	21740	28	4991	5009	180	160	190			
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	97.45	4917	97.25	4933
GR	95.95	4960	97.05	4987	94.25	4991	93.55	4995	92.95	5001
GR	93.15	5005	94.05	5009	96.15	5011	96.65	5030	99.25	5048
GR112.10	5078	112.2	5122	112.7	5200	113.4	5282	114.7	5377	
GR114.80	5504	116.8	5577	116.1	5629	0	0	0	0	
NC	0.3	0.5								
X1	21789	28	4990	5010	49	49	49			
X3	10	98.2	98.9							
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	98.25	4949	98.25	4982
GR	94.75	4990	94.75	4990.1	93.65	4995	93.75	5000	94.05	5005
GR	94.55	5010	94.55	5010.1	97.65	5015	99.95	5040	112.3	5042
GR112.10	5078	112.2	5122	112.7	5200	113.4	5282	114.7	5377	
GR114.80	5504	116.8	5577	116.1	5629	0	0	0	0	
X1	21790	0	0	0	1	1	1			

BT	24	4586	115.5	115.5	4632	112.7	112.7	4679	109.8	109.8
BT4710.0	106.3	106.3	4747	100.3	100.3	4773	97.9	97.9	4816	
BT	97.3	97.3	4907	97.6	97.6	4949	98.25	98.25	4982	98.25
BT	98.25	4990	98.85	94.75	4990.1	98.85	97.85	5010	98.95	97.85
BT5010.1	98.95	94.55	5040	99.95	99.95	5042	112.3	112.3	5078	
BT112.10	112.1	5122	112.2	112.2	5200	112.7	112.7	5282	113.4	
BT113.40	5377	114.7	114.7	5504	114.8	114.8	5577	116.8	116.8	
BT5629.0	116.1	116.1								
X1	21800	28	4988.5	5011.5	10	10	10			
BT	25	4586	115.5	115.5	4632	112.7	112.7	4679	109.8	109.8
BT4710.0	106.3	106.3	4747	100.3	100.3	4773	97.9	97.9	4816	
BT	97.3	97.3	4907	97.6	97.6	4951	98.45	98.45	4972	98.65
BT	98.65	4988.5	98.85	94.45	4988.6	98.85	97.85	5011.5	98.95	97.95
BT5011.6	98.95	94.45	5031	101.35	101.35	5034	111	111	5042	
BT112.30	112.3	5078	112.1	112.1	5122	112.2	112.2	5200	112.7	
BT112.70	5282	113.4	113.4	5377	114.7	114.7	5504	114.8	114.8	
BT5577.0	116.8	116.8	5629	116.1	116.1					
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	98.45	4951	98.65	4972
GR	94.45	4988.5	94.45	4988.6	92.95	5000	93.95	5005	94.45	5011.5
GR	94.45	5011.6	97.65	5015	101.35	5031	111	5034	112.3	5042
GR112.10	5078	112.2	5122	112.7	5200	113.4	5282	114.7	5377	
GR114.80	5504	116.8	5577	116.1	5629	0	0	0	0	
X1	21801	0	0	0	1	1	1			
X3	10	98.4	98.9							
X1	21850	27	4994	5006	49	49	49			
GR115.50	4586	112.7	4632	109.8	4679	106.3	4710	100.3	4747	
GR	97.9	4773	97.3	4816	97.6	4907	96.95	4927	96.25	4964
GR	97.25	4986	95.35	4992	94.65	4994	93.95	4997	94.15	5000
GR	94.75	5006	97.05	5036	111.75	5038	111.75	5065	112.1	5078
GR112.20	5122	112.7	5200	113.4	5282	114.7	5377	114.8	5504	
GR116.80	5577	116.1	5629	0	0	0	0	0	0	
NC	0.1	0.3								
X1	22200	46	4991	5009	200	300	350			
GR117.20	4794	113.4	4816	111.2	4861	111.4	4903	111.1	4927	
GR105.90	4940	99.9	4958	98.55	4969	98.85	4984	98.05	4990	
GR	96.05	4991	95.55	4994	95.75	5001	96.15	5009	98.95	5012
GR	99.75	5030	100.3	5035	98.7	5057	98.8	5115	99.2	5197
GR	99.9	5249	99.9	5324	100.3	5365	101.8	5382	103.1	5399
GR109.00	5429	112.9	5447	113.4	5467	113.3	5481	113.1	5486	
GR111.90	5489	113.4	5495	114.8	5499	115.7	5501	115.6	5515	
GR115.60	5547	116.6	5566	114.6	5585	112.2	5599	112.9	5625	
GR112.60	5661	112.8	5715	113.9	5777	115.5	5834	116.1	5888	
GR116.10	5922	0	0	0	0	0	0	0	0	
NC	0.3	0.5								
X1	22239	49	4990.5	5009.5	39	39	39			
X3	10	100.4	100.1							
GR117.20	4794	113.4	4816	111.2	4861	111.4	4903	111.1	4927	
GR105.90	4940	99.9	4958	100.85	4960	100.45	4977	100.45	4987	
GR	96.15	4987.1	95.65	4990.5	95.65	4990.6	95.45	4995	95.25	5000
GR	95.35	5005	95.75	5009.5	95.75	5009.6	99.65	5013	100.15	5040
GR	98.7	5057	98.8	5115	99.2	5197	99.9	5249	99.9	5324
GR100.30	5365	101.8	5382	103.1	5399	109	5429	112.9	5447	
GR113.40	5467	113.3	5481	113.1	5486	111.9	5489	113.4	5495	
GR114.80	5499	115.7	5501	115.6	5515	115.6	5547	116.6	5566	
GR114.60	5585	112.2	5599	112.9	5625	112.6	5661	112.8	5715	
GR113.90	5777	115.5	5834	116.1	5888	116.1	5922	0	0	
X1	22240	0	0	0	1	1	1			
BT	45	4794	117.2	117.2	4816	113.4	113.4	4861	111.2	111.2
BT4903.0	111.4	111.4	4927	111.1	111.1	4940	105.9	105.9	4958	
BT	99.9	99.9	4960	100.85	100.85	4977	100.45	100.45	4987	100.45
BT100.45	4987.1	100.45	96.15	4990.5	100.75	95.65	4990.6	100.75	99.55	
BT5009.5	100.75	99.45	5009.6	100.75	95.75	5040	100.15	100.15	5057	
BT	98.7	98.7	5115	98.8	98.8	5197	99.2	99.2	5249	99.9
BT	99.9	5324	99.9	99.9	5365	100.3	100.3	5382	101.8	101.8
BT5399.0	103.1	103.1	5429	109	109	5447	112.9	112.9	5467	

BT113.40	113.4	5481	113.3	113.3	5486	113.1	113.1	5489	111.9	
BT111.90	5495	113.4	113.4	5499	114.8	114.8	5501	115.7	115.7	
BT5515.0	115.6	115.6	5547	115.6	115.6	5566	116.6	116.6	5585	
BT114.60	114.6	5599	112.2	112.2	5625	112.9	112.9	5661	112.6	
BT112.60	5715	112.8	112.8	5777	113.9	113.9	5834	115.5	115.5	
BT5888.0	116.1	116.1	5922	116.1	116.1					
X1	22257	0	0	0	17	17	17			
X2	1									
NC	0.039	0.039	0.044							
X1	22258	0	0	0	1	1	1			
X3	10	100.7	99.9							
X1	22310	45	4991	5009	52	52	52			
GR117.20	4794	113.4	4816	111.2	4861	111.4	4903	111.1	4927	
GR105.90	4940	99.9	4958	98.45	4960	98.45	4988	96.65	4991	
GR	95.55	4996	95.75	5005	96.65	5009	97.85	5015	99.35	5026
GR	99.25	5036	98.7	5057	98.8	5115	99.2	5197	99.9	5249
GR	99.9	5324	100.3	5365	101.8	5382	103.1	5399	109	5429
GR112.90	5447	113.4	5467	113.3	5481	113.1	5486	111.9	5489	
GR113.40	5495	114.8	5499	115.7	5501	115.6	5515	115.6	5547	
GR116.60	5566	114.6	5585	112.2	5599	112.9	5625	112.6	5661	
GR112.80	5715	113.9	5777	115.5	5834	116.1	5888	116.1	5922	
NC	0.1	0.3								
ET	9.1	4780	5250							
X1	22600	37	4989	5010	400	200	290			
GR119.20	4698	119.2	4720	119.2	4743	116.3	4755	108.2	4767	
GR102.00	4784	99.8	4817	99.5	4848	99.8	4910	100	4958	
GR	99.3	4978	98.8	4985	98.6	4988	96.62	4989	96.61	4995
GR	96.61	5006	96.62	5010	97.5	5013	98.9	5027	100.2	5061
GR101.40	5100	102.9	5133	103.2	5144	101.2	5149	98.1	5154	
GR	98.1	5323	100.5	5329	104.1	5348	108.5	5373	110.4	5380
GR110.40	5397	112.4	5414	113.4	5453	114.4	5530	115.1	5578	
GR116.10	5664	115.6	5711	0	0	0	0	0	0	
ET	9.1	4950	5300							
X1	22900	81	4992	5007	280	310	300			
GR124.30	3658	123.6	3669	120.6	3678	120.1	3683	120.1	3710	
GR120.10	3716	118.7	3732	117.8	3762	115.5	3803	113.5	3833	
GR112.60	3885	111.1	3923	111.5	3941	110.1	3943	110.1	3950	
GR111.10	3953	112.6	3967	113.3	3982	113.1	4063	111.6	4131	
GR111.60	4195	112.1	4281	112.7	4324	116.6	4363	118.7	4387	
GR122.30	4410	122.3	4418	121.6	4424	124.4	4431	126.5	4437	
GR128.00	4451	129.1	4466	128.5	4467	128.3	4481	127	4499	
GR127.00	4509	122.4	4521	124	4529	124.1	4538	121	4541	
GR123.70	4550	125.2	4562	125.4	4570	122.4	4575	121.1	4592	
GR119.40	4614	119.8	4662	121.1	4700	121.7	4736	122.1	4778	
GR122.40	4804	123.8	4819	123.6	4831	121.5	4850	122.1	4861	
GR118.10	4871	108.9	4897	101.4	4953	100.4	4976	99.5	4987	
GR	97.75	4992	97.72	4996	97.72	5004	97.75	5007	99.4	5010
GR101.10	5020	102.3	5051	103.6	5070	103	5082	101.7	5091	
GR100.60	5093	98.2	5096	98.2	5396	100	5399	104.7	5416	
GR108.50	5435	108.7	5453	111.6	5474	115	5504	117.3	5564	
GR116.60	5627	0	0	0	0	0	0	0	0	
ET	9.1	4940	5090							
X1	23170	86	4989	5010	330	260	270			
GR118.30	4015	118.4	4026	118.8	4030	119.1	4055	119.5	4062	
GR122.90	4069	123.3	4086	123.1	4140	121.4	4148	121.5	4193	
GR120.80	4248	119.9	4268	120.7	4299	121.7	4329	121.4	4355	
GR122.10	4379	121.2	4391	112.7	4401	112.8	4415	114.6	4442	
GR113.90	4467	115.7	4486	116.1	4502	114.3	4515	113.4	4528	
GR112.10	4543	112	4564	113.9	4574	117.1	4589	118.5	4596	
GR117.60	4607	116.3	4623	114.9	4634	111.8	4645	111.8	4664	
GR114.70	4696	119.8	4714	121.8	4732	123.3	4746	123.4	4777	
GR120.70	4814	115.5	4836	112.1	4869	106.6	4900	101.5	4922	
GR	99.9	4941	99.8	4972	100.2	4988	99.1	4989	98.91	4997
GR	98.71	5002	99.11	5005	99	5010	99.9	5012	101.1	5029
GR103.00	5057	103.5	5083	104.8	5109	106.9	5140	110.5	5166	
GR114.00	5188	113.9	5190	116.4	5215	120.2	5233	121.4	5267	

GR118.80	5296	113.1	5325	110	5350	109.9	5402	110.9	5431	
GR113.40	5454	113.8	5459	112.3	5461	111.4	5477	112.9	5485	
GR114.70	5493	115.3	5499	113.4	5515	111.8	5529	110.9	5567	
GR111.20	5594	113.5	5619	116.2	5647	118	5687	119	5746	
GR119.40	5847	0	0	0	0	0	0	0	0	
ET	9.1	4910	5050							
X1	23550	37	4991	5008	310	290	380			
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	102.6	4938	102.6	4977	102.6	4988	100.3	4991	
GR100.30	4997	100.1	5001	100.5	5003	100.3	5008	101.9	5012	
GR104.40	5020	104.9	5044	107.7	5068	112.6	5091	114.8	5114	
GR115.90	5156	115.1	5201	112.8	5238	110.7	5271	111.4	5291	
GR112.00	5327	114.8	5368	116.3	5425	118.4	5525	119.9	5574	
GR120.50	5621	121.1	5626	120.1	5630	121.9	5641	123.7	5647	
GR124.90	5673	126.3	5688	0	0	0	0	0	0	
ET	9.1	4910	5050							
X1	23590	37	4992	5008	40	40	40			
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	102.6	4938	103.85	4972	103.35	4991	101.85	4992	
GR100.45	4998	100.25	5002	100.65	5004	102.15	5008	104.25	5012	
GR105.05	5017	105.15	5057	107.7	5068	112.6	5091	114.8	5114	
GR115.90	5156	115.1	5201	112.8	5238	110.7	5271	111.4	5291	
GR112.00	5327	114.8	5368	116.3	5425	118.4	5525	119.9	5574	
GR120.50	5621	121.1	5626	120.1	5630	121.9	5641	123.7	5647	
GR124.90	5673	126.3	5688	0	0	0	0	0	0	
NC	0.3	0.5								
ET	9.1	4900	5050							
X1	23631	38	4995.5	5004.5	41	41	41			
X3	10	105.5	105.3							
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	102.6	4938	105.55	4946	104.65	4992	102.85	4995.5	
GR102.85	4995.6	102.35	4997	101.25	5000	101.55	5003	101.85	5004.5	
GR101.85	5004.6	102.55	5012	106.15	5019	105.35	5079	112.6	5091	
GR114.80	5114	115.9	5156	115.1	5201	112.8	5238	110.7	5271	
GR111.40	5291	112	5327	114.8	5368	116.3	5425	118.4	5525	
GR119.90	5574	120.5	5621	121.1	5626	120.1	5630	121.9	5641	
GR123.70	5647	124.9	5673	126.3	5688	0	0	0	0	
ET	9.1	4900	5050							
X1	23632	0	0	0	1	1	1			
BT	34	4754	125.9	125.9	4783	125.7	125.7	4802	125.1	125.1
BT4825.0	120.9	120.9	4856	111.7	111.7	4893	104.6	104.6	4938	
BT102.60	102.6	4946	105.55	105.55	4995.5	106.65	102.85	4995.6	106.65	
BT105.65	5004.5	106.65	105.65	5004.6	106.65	101.85	5012	106.15	102.55	
BT5019.0	106.15	106.15	5079	105.35	105.35	5091	112.6	112.6	5114	
BT114.80	114.8	5156	115.9	115.9	5201	115.1	115.1	5238	112.8	
BT112.80	5271	110.7	110.7	5291	111.4	111.4	5327	112	112	
BT5368.0	114.8	114.8	5425	116.3	116.3	5525	118.4	118.4	5574	
BT119.90	119.9	5621	120.5	120.5	5626	121.1	121.1	5630	120.1	
BT120.10	5641	121.9	121.9	5647	123.7	123.7	5673	124.9	124.9	
BT5688.0	126.3	126.3								
ET	9.1	4900	5050							
X1	23647	37	4994.5	5005.5	15	15	15			
BT	32	4754	125.9	125.9	4783	123.7	123.7	4802	125.1	125.1
BT4825.0	120.9	120.9	4856	111.7	111.7	4893	104.6	104.6	4938	
BT104.60	104.6	4946	106.75	106.75	4994.5	106.85	102.05	4994.6	106.85	
BT105.55	5005.5	106.85	105.65	5005.6	106.85	101.55	5085	105.45	105.45	
BT5091.0	112.6	112.6	5114	114.8	114.8	5156	115.9	115.9	5201	
BT115.10	115.1	5238	112.8	112.8	5271	110.7	110.7	5291	111.4	
BT111.40	5327	112	112	5368	114.8	114.8	5425	116.3	116.3	
BT5525.0	118.4	118.4	5574	119.9	119.9	5621	120.5	120.5	5626	
BT121.10	121.1	5630	120.1	120.1	5641	121.9	121.9	5647	123.7	
BT123.70	5673	124.9	124.9	5688	126.3	126.3				
GR125.90	4754	125.7	4783	125.1	4802	120.9	4825	111.7	4856	
GR104.60	4893	104.6	4938	106.75	4946	104.65	4992	102.05	4994.5	
GR102.05	4994.6	101.85	4997	101.15	5000	101.25	5003	101.55	5005.5	
GR101.55	5005.6	104.85	5009	105.45	5085	112.6	5091	114.8	5114	

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GR115.90        5156      115.1      5201      112.8      5238      110.7      5271      111.4      5291
GR112.00        5327      114.8      5368      116.3      5425      118.4      5525      119.9      5574
GR120.50        5621      121.1      5626      120.1      5630      121.9      5641      123.7      5647
GR124.90        5673      126.3      5688          0         0          0         0          0         0
ET                9.1       4900      5050
X1              23648          0         0         0         1          1         1
X3                 10      106.7     105.4
ET                9.1       4900      5050
X1              23690         34      4992      5008        42         42        42
GR125.90        4754      125.7      4783      125.1      4802      120.9      4825      111.7      4856
GR106.25        4893     106.25      4927     104.85      4981     103.75      4988     102.45      4992
GR102.25        4994     102.15      5006     102.45      5008     105.65      5014     105.65      5069
GR112.60        5091      114.8      5114      115.9      5156      115.1      5201      115.8      5238
GR115.70        5271      115.4      5291        115      5327      115.8      5368      116.3      5425
GR118.40        5525      119.9      5574      120.5      5621      121.1      5626      120.1      5630
GR121.90        5641      123.7      5647      124.9      5673      126.3      5688          0         0
NC                0.1        0.3
ET                9.1       4920      5065
X1              23920         50      4985      5015       280        200       230
GR129.10        4264      126.1      4280      123.9      4298        122      4305        121      4315
GR121.70        4339      121.8      4343      118.5      4348      116.4      4368      115.4      4398
GR114.50        4443      113.2      4457        109      4480        109      4495        109      4551
GR109.00        4569        109      4581      109.3      4601      110.6      4656      111.2      4692
GR109.30        4748      107.9      4806     106.25      4890     106.25      4935     106.45      4970
GR104.25        4985     103.05      4993     102.35      5004     103.15      5010     104.25      5015
GR107.35        5027     109.25      5056      114.4      5094      118.2      5111      118.4      5125
GR116.90        5174      114.7      5208      113.6      5227      115.7      5244      116.3      5267
GR112.50        5294      112.4      5323      112.3      5343      113.3      5380      115.5      5424
GR117.30        5468      119.9      5521      121.8      5562        124      5595      128.2      5628
EJ
T1          STAMFORD,CT
T2          TYPE                19 FLOOD      INSURANCI STUDY
T3          NOROTON   RIVER       FLOODWAY
J1                -10          4         4.7
J2                 15         -1


ER
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1********** ****************************************
          *         HEC-2     WATER   SURFACE    PROFILES *          *          U.S.       ARMY     CORPS    OF
          *         *         *       HYDROLOGI ENGINEEF CENTER *
          *         Version   4.6.2;  May                1991 *          *                609 SECOND  STREET,  SUITE
          *         *         *       DAVIS,    CALIFORN 95616-468 *
          *         RUN       DATE        11-Sep-08 TIME       11:18:48 *          *                -916 756-1104  *
          ********** ****************************************

          X         X         XXXXXX XXXXX      XXXXX
          X         X         X      X          X         X          X
          X         X         X      X          X
          XXXXXX XXXX         X      XXXXX      XXXXX
          X         X         X      X          X
          X         X         X      X          X         X
          X         X         XXXXXX XXXXX      XXXXXXX
        1
          ########  11:18:48 PAGE                1

          THIS      RUN       EXECUTI     11-Sep-08    11:18:48
          ****************************************
          HEC-2     WATER     SURFACI PROFILES

          Version   4.6.2;     May                1991
          ****************************************


          T1        CITY      OF        STAMFORD, CONNECTICUT
          T2        TYPE            19 FLOOD      INSURAN( STUDY    STAMFOI WITH      SPLIT
          T3        NOROTO RIVER        -                10 YEAR     FLOOD   FLOWS

          J1        ICHECK    INQ       NINV       IDIR       STRT       METRIC  HVINS     Q          WSEL       FQ

                  0         2         4.7

          J2        NPROF     IPLOT     PRFVS      XSECV      XSECH      FN      ALLDC     IBW        CHNIM      ITRACE

                 -1       -0.5


          J3        VARIABI CODES       FOR        SUMMAR\ PRINTOUT

               150       100

          J5        LPRNT     NUMSEC ********REQ SECTION  NUMBERS********

               -10       -10

          NC             0.07      0.07      0.034      0.1       0.3
          QT                4      1900       3900      5300      9700
          NC             0.07      0.07      0.034      0.1       0.3
          X1              190         9      4951    5049.1
          GR            16.44      4951       3.54    4951.1      2.14      4957      1.14      4982      1.64      4993
          GR             2.24      5020       2.94      5049      9.34    5049.1     10.64      5097         0         0

          NH                4        10      4961      0.07      4977     0.034      5022      0.07      5720
          X1              400        39      4977      5022       210       210       210
          X2               15
          GR               44      4059      32.4      4122      24.2      4203      22.8      4292      21.5      4417
          GR             24.7      4506      29.5      4545      30.9      4586      28.6      4600      22.1      4623
          GR             21.8      4635      27.9      4663      26.4      4738      18.8      4786       9.6      4858
          GR              9.7      4891       9.1      4899       7.7      4961       2.7      4977      2.05      4982
          GR             1.95      4992      2.65      5004       2.8      5022       9.5      5035      11.5      5088
          GR             29.6      5106      29.6      5205      29.1      5305      30.8      5404      31.5      5444
          GR             35.7      5497      36.6      5538      39.7      5540      40.1      5591      39.2      5620
          GR             39.7      5663      42.9      5683      44.7      5696      48.7      5720         0         0

          NC             0.07      0.07     0.048
          X1              580        46      4986      5014       220       155       180
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GR          49.8     3887        41.5     3905      34.1     4027      31.9     4129      30.8     4261
GR          28.4     4358        31       4399      33       4428      32.9     4470      30.4     4485
GR          17.8     4520        19.6     4626      18.3     4666      13.5     4734      11.2     4749
GR          10.4     4799        9.2      4819      9.7      4867      9.4      4870      6.9      4970
GR          4.6      4978        3.2      4986      2.7      4994      2.4      5006      3.1      5014
1
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GR          3.7      5022        7.6      5031      9.5      5064      14.7     5074      29.5     5111
GR          31.6     5142        31.4     5245      29.5     5261      29.8     5292      31.7     5300
GR          32.5     5349        35.3     5426      38       5447      41.5     5495      43.4     5561
GR          42.9     5574        39.5     5616      39.8     5665      45.3     5681      48.9     5699
GR          54.3     5755        0        0         0        0         0        0         0        0

NC          0.3      0.5
X1          689      30          4974     5026      120      80        109      0
X3          10       16.8        45
GR          49       3376        43.1     3537      39       3678      33.9     3888      29.9     4047
GR          29       4240        29.9     4371      33.7     4534      37.55    4712.4    16.7     4712.5
GR          16.7     4777.5      38.95    4777.6    41.3     4887      42.5     4946      12.91    4974
GR          3.7      4974.1      3.5      4990      3.5      4990.1    3.9      4991.5    3.9      4991.6
GR          3.11     5008.5      3.11     5008.6    3.51     5010      3.51     5010.1    3.31     5026
GR          12.6     5026.1      45.4     5053      49.4     5222      54.3     5428      58.3     5604

NC          0.073    0.064       0.048    0         0
SB          1.25     1.787       2.6      0         42       3         273      0         9.27     3.11
X1          990      33          4974     5026.1    300      300       300      0
X2          0        0           1        16.23     18       0         0        0         0        0
X3          10       18          48.6
BT          33       3376        49       49        3537     43.1      43.1     3678      39       39
BT          3888     33.9        33.9     4047      29.9     29.9      4240     29        29       4371
BT          29.9     29.9        4534     33.7      33.7     4682.4    35.13    35.13     4682.5   18
BT          18       4747.5      18       18        4747.6   40.52     40.52    4887      41.3     41.3
BT          4941     42          24.2     4956      43       20        4974     44        16.34    4974.1
BT          44       16.23       4990     45        16.23    4990.1    45       16.23     4991.5   45
BT          16.23    4991.6      45       16.23     5008.5   46        16.23    5008.6    46       16.23
BT          5010     46.5        16.23    5010.1    46.5     16.23     5026     47        16.23    5026.1
BT          47       16.23       5038     47.5      19.6     5054      48       19.6      5072     48.6
BT          19.8     5222        49.4     49.4      5428     54.3      54.3     5604      58.3     58.3
GR          49       3376        43.1     3537      39       3678      33.9     3888      29.9     4047
GR          29       4240        29.9     4371      33.7     4534      35.13    4682.4    18       4682.5
GR          18       4747.5      40.52    4747.6    41.3     4887      24.2     4941      20       4956
GR          16.34    4974        9.2      4974.1    8.8      4990      8.8      4990.1    8.5      4991.5
GR          8.5      4991.6      8.3      5008.5    8.3      5008.6    8.6      5010      8.6      5010.1
GR          8.6      5026        16       5026.1    19.6     5038      19.6     5054      19.8     5072
GR          49.4     5222        54.3     5428      58.3     5604

X1          1100     64          4983     5017      65       150       110
GR          53.2     3299        36.4     3406      33.5     3448      33.2     3495      34.8     3567
GR          34.5     3644        32.9     3711      43       3743      44.1     3781      42.3     3797
GR          27.9     3834        28.2     3899      27.2     4078      24.7     4212      25.2     4296
GR          27       4329        29.6     4437      33.9     4527      34.2     4551      28.1     4567
GR          29.3     4585        28.9     4609      24.3     4624      23.5     4640      27.1     4658
GR          25.5     4684        19.4     4701      18.3     4744      18.8     4789      17.8     4824
GR          22.8     4851        25       4882      25.4     4911      24.5     4927      23       4947
GR          12.1     4976        10.5     4983      9.6      4984      8.9      4990      7.9      5005
GR          9.5      5017        18.2     5033      19.6     5058      19.5     5075      25.8     5095
GR          38.2     5111        42.1     5128      41.9     5139      40.8     5202      39       5252
GR          31       5305        31.1     5331      32.5     5341      32.7     5365      31.6     5413
GR          30.2     5463        30.7     5499      32.1     5557      36.3     5595      40.4     5639
GR          40.8     5676        43.8     5686      45.8     5706      48.1     5821      0        0
1
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NC          0.065    0.06        0.025    0.1       0.3
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NH          4     0.065     4989     0.025     5010     0.06     5110     10     5953
X1       1300        57     4989      5010      110      220      200
GR       48.8      3473     34.8      3565     33.9      3612     34.4     3694     33.4     3893
GR         43      3923       44      3964     44.7      4001     35.5     4037     31.7     4051
GR       31.4      4223     31.7      4338     31.3      4428     31.7     4450     31.9     4462
GR       31.1      4598     33.2      4633     32.2      4674     27.3     4703     28.6     4736
GR       28.1      4782     27.4      4811     25.6      4836     18.8     4857     19.5     4900
GR       19.4      4915     18.2      4928       18      4946     18.9     4955     18.3     4973
GR         11      4989     9.53      4990     8.83      4994     7.83     5003       11     5010
GR       18.3      5043     18.3      5080     20.3      5135     24.3     5165     27.8     5186
GR       28.3      5196     29.7      5271     30.2      5382     30.1     5410     31.5     5433
GR       31.5      5490     35.3      5526     37.4      5598     40.5     5627     41.5     5640
GR       41.7      5681     39.9      5729     40.2      5766       42     5779     44.2     5857
GR       45.6      5934     52.3      5953        0         0        0        0        0        0

X1       1500        58     4978      5021      190      210      200
GR       47.4      3608     34.9      3688     34.2      3734     34.7     3832     33.3     4032
GR       42.5      4057     42.1      4087       41      4090     37.3     4110     36.9     4139
GR       34.5      4149     31.8      4162       31      4378       31     4500     31.4     4586
GR       31.4      4613     31.2      4662       34      4691     33.3     4713     25.6     4736
GR       24.2      4751     24.9      4780     22.9      4853     20.6     4879     20.3     4918
GR       19.9      4928     14.4      4968     10.6      4978     8.16     4987     7.76     5004
GR       10.6      5021     17.2      5045     17.9      5062     25.7     5103     29.6     5146
GR       35.3      5161       37      5177     37.5      5216     35.3     5288     34.4     5344
GR       35.1      5423     36.3      5466     36.6      5495     36.4     5554     35.1     5614
GR       34.2      5671     34.9      5770     39.3      5774     40.3     5794     40.5     5820
GR       40.9      5858     42.2      5868     43.3      5902       45     5914       46     5949
GR       47.5      5963     49.4      5970     50.4      6000        0        0        0        0

NC       0.07      0.06    0.025
X1       1750        56   4978.5    5021.5      250      250      250
GR         45      3736       34      3802     33.3      3920     34.1     4173     39.1     4187
GR       39.1      4213     32.8      4241     31.9      4270     29.1     4287       30     4463
GR       29.6      4500     28.5      4610     28.4      4739     28.9     4764     29.3     4792
GR       29.3      4812     22.1      4890     22.6      4903    22.82   4906.5    22.77   4932.5
GR      22.67    4936.5    17.97    4951.5    13.97    4973.5    10.77   4978.5     8.07   4987.5
GR       7.67    5004.5    10.77    5021.5    18.17    5036.5    18.37   5059.5     19.2     5079
GR       25.5      5100     36.1      5144     44.8      5196     52.5     5224     54.4     5245
GR       57.2      5273     58.5      5290     59.9      5337     58.4     5361     58.8     5395
GR         60      5405     60.4      5448     61.3      5509     55.2     5539     45.9     5589
GR       44.2      5631       44      5659     41.3      5666     38.6     5715     36.6     5763
GR       37.5      5800     40.5      5826     42.8      5850     45.2     5909     47.7     5986
GR       58.4      6034        0         0        0         0        0        0        0        0

X1       2000        41     4967      5032      260      230      250
GR       43.2      4069     37.4      4339     30.9      4620     30.2     4690     28.5     4724
GR       15.7      4781     16.4      4820     17.8      4848     14.7     4872     13.9     4893
GR       17.3      4905     14.8      4918     13.7      4954     10.6     4967     8.92     4981
GR       8.52      5007     10.6      5032     18.9      5070     17.1     5111     18.9     5132
GR       27.3      5168       40      5203     47.3      5240     52.3     5274     59.6     5328
GR       62.9      5359     63.1      5395     64.4      5432     65.1     5525       61     5571
GR         59      5608       59      5626     51.3      5646     41.1     5677     37.7     5743
1
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GR       37.5      5782       39      5808     42.2      5886     47.3     5979     52.3     6029
GR       61.4      6055        0         0        0         0        0        0        0        0

X1       2250        52     4974      5025      260      230      250
GR       36.4      3968     39.6      4021     46.5      4066     43.4     4148     26.2     4244
GR       23.2      4292     21.2      4426       21      4467     22.3     4478       18     4537
GR       15.3      4585     13.6      4649     16.1      4671       16     4696     13.9     4714
GR       14.1      4730     15.4      4744     14.9      4771     11.5     4781     10.8     4800
GR       10.8      4899     18.5      4920       18      4956     10.5     4974     9.77     4985
GR       9.37      5005     10.5      5025       18      5044     17.9     5074     33.5     5131
GR       42.7      5184     48.3      5201     50.4      5226       54     5264     55.1     5302
GR       55.7      5327       55      5353     52.7      5396     47.9     5457     44.1     5498
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GR          40.8     5561        38.8     5659     38.9     5708     39.5     5740     41.1     5803
GR          42.8     5836        46.4     5860     48.9     5904     50.5     5925     55.8     5955
GR            60     5975        61.3     5980        0        0        0        0        0        0

NC         0.069    0.074       0.039
X1          2500       59        4985     5014      240      260      250
GR          43.3     3329        42.6     3363     39.8     3385       40     3526     33.7     3563
GR          29.1     3720        33.4     3743     33.6     3760     30.5     3785     27.5     3834
GR          25.6     3920        26.7     3963     24.7     4042     21.1     4072     20.9     4098
GR          18.3     4153        17.8     4239     17.5     4317     20.7     4335     23.2     4403
GR          21.9     4419        17.8     4453     17.1     4470     20.4     4479     17.8     4541
GR          18.2     4561        14.9     4580     17.5     4606     15.2     4629     12.4     4643
GR          18.6     4660        18.4     4669     11.1     4680     11.1     4899     15.8     4917
GR          15.3     4924        13.1     4952     13.9     4965     13.4     4979     10.9     4985
GR         10.52     4997       10.22     5006     10.9     5014     20.8     5045     21.5     5098
GR          25.2     5117        32.4     5135     35.6     5159     34.8     5223     34.2     5233
GR          34.7     5299        35.1     5412     35.7     5445     39.2     5520     39.4     5549
GR          43.8     5596        44.3     5617     50.5     5626     58.9     5673        0        0

NH             4       10        4696    0.069     4985    0.039     5014    0.074     5746
X1          2750       58        4985     5014      210      255      250
GR          46.3     3571        41.1     3618     41.1     3639     35.2     3677     33.4     3751
GR            33     3780          31     3788     32.1     3796     33.2     3840     33.1     3914
GR          30.2     4031        25.6     4083     24.4     4158     25.3     4182     23.5     4263
GR          20.6     4338        19.2     4459     19.5     4522     19.8     4567     17.6     4607
GR          15.7     4667        19.8     4696     18.9     4720     18.1     4743     18.6     4816
GR          18.8     4825        18.5     4855     21.1     4873     21.1     4917     18.4     4933
GR          17.6     4973        11.2     4985    11.37     4997    11.07     5006     11.2     5014
GR          20.4     5038        21.6     5099     25.6     5108     27.8     5146     30.6     5160
GR          35.9     5198        36.7     5240     36.5     5275     37.8     5310     38.7     5368
GR          39.6     5406          40     5510       39     5517     39.1     5548     43.4     5566
GR          44.3     5583          42     5623     41.6     5640     47.9     5654       50     5687
GR          56.3     5720        57.7     5743     61.6     5746        0        0        0        0

NH             5       10        4892    0.069     4984    0.039     5015    0.074     5035       10
NH          5786
X1          2950       57        4958     5035      190      190      200
GR          45.5     3927        41.4     3949     41.1     3964     32.5     4020       33     4072
GR          32.1     4122        34.7     4140     41.9     4156     41.7     4161     27.6     4184
GR          27.3     4206        27.3     4243     27.3     4418     27.3     4449     27.3     4482
GR          27.3     4531        27.3     4606     27.3     4662     27.3     4703     27.3     4722
GR          27.3     4758        27.3     4768     27.3     4823     27.3     4833     27.3     4841
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GR          27.3     4850        26.8     4877     22.1     4892     20.4     4923     24.4     4941
GR          22.4     4958       11.85     4984    11.75     4997    11.75     5006    11.85     5015
GR          21.7     5035        22.7     5050     25.6     5122     26.7   5135.5     27.8     5149
GR          35.1     5180        34.8     5231     34.3     5237     34.5     5269     36.5     5286
GR          38.2     5359        38.8     5421     43.1     5478     43.7     5504     43.5     5544
GR          42.8     5578        39.8     5613     39.5     5657     39.3     5690       42     5721
GR          48.1     5752        58.9     5786        0        0        0        0        0        0

NC         0.085    0.079       0.061
X1          3100       49        4980     5020      100      150      150
GR            44     4083        41.7     4101     41.4     4142     44.8     4169     45.3     4188
GR            43     4202        34.2     4349       33     4395     25.7     4408     25.7     4474
GR          25.7     4546        25.6     4572     25.9     4616     25.8     4661     25.6     4688
GR          25.7     4714        34.6     4746     34.2     4844     29.9     4862     29.7     4909
GR            27     4930        27.8     4947       29     4961    16.46     4974    13.26     4980
GR         12.56     4997       12.26     5009    13.26     5020    14.46   5020.1    15.06     5027
GR         17.96   5027.1       22.36     5040    29.76     5041    27.36   5041.1    28.59     5058
GR         29.01     5099       30.94     5161    36.26     5292     40.1     5355     45.9     5476
GR          46.9     5538        47.8     5587     46.8     5628     48.5     5719     51.8     5734
GR          52.5     5769        56.1     5785     60.5     5810     60.7     5835        0        0

X1          3300       48        4987     5012      180      210      200
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GR        42.7    4171      40.9    4214      42.7    4231      39.9    4276      36.1    4320
GR        32.7    4449      30.6    4500      28.7    4514      27.9    4553      27.2    4603
GR        27.2    4685      27      4723      26.9    4784      26.8    4819      26.7    4845
GR        26.8    4860      26.8    4875      27      4889      27.8    4896      25.6    4958
GR        13.1    4987      13.36   4998      13.06   5006      13.1    5012      27.3    5040
GR        28.3    5064      28      5071      28.4    5125      28.7    5142      29.2    5251
GR        29.9    5278      36.1    5292      36.3    5324      39.8    5351      41.2    5401
GR        45.9    5433      46      5472      47.4    5484      49      5531      49.3    5583
GR        47.8    5601      47.8    5624      48.4    5707      50.3    5757      52.6    5802
GR        56.7    5862      60.7    5929      66.2    5984      0       0         0       0

NH        4       0.085     4985    0.061     5015    0.079     5094    10        6053
X1        3570    35        4985    5015      230     195       220
GR        43.8    4237      39      4329      36.3    4381      35.3    4453      32.9    4558
GR        33      4603      32.7    4648      32.7    4712      32.7    4816      32.7    4842
GR        31.05   4905      29.85   4958      20.15   4973      15.25   4985      14.15   4995
GR        14.25   5003      15.25   5015      18.35   5025      23.65   5037      27.65   5046
GR        26.55   5052      26.45   5055      27.25   5094      28.05   5165      27.7    5291
GR        26.9    5411      38.1    5434      40.7    5530      41.5    5651      43.2    5884
GR        48.1    5954      54.9    5982      63.8    5992      65.5    6031      67.3    6053

NC        0.3     0.5
X1        3680    22        4987    5013      125     175       160
X3        10      50        50
GR        60      4217      58.2    4578      57.4    4846      38.78   4963      21.18   4984
GR        20.28   4987      20.28   4987.1    18.68   4991      17.28   4998      19.08   5006
GR        19.98   5010      21.48   5013      21.48   5013.1    21.68   5016      25.68   5054
GR        55.3    5292      54.8    5387      53.7    5620      53.8    5633      53.7    5852
GR        53.2    6030      53.5    6114      0       0         0       0         0       0
1
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NC        0.015
X1        3681    0         0       0         1       1         1
X3        10      54        52

SB        1       1.6       2.5     26        600     0         16      17.8
X1        3778    25        4987    5013      97      97        97
X2        1       39.37     53.5
X3        10      56.1      53.5
BT        24      4217      60      60        4578    58.2      58.2    4846      57.4    57.4
BT        4954    56        28.02   4954.1    56      23.02     4983.5  56.1      22.42   4987
BT        56.1    22.92     4987.1  56.1      26.5    4989      56.1    33.46     4996    56.1
BT        38.89   5002      56.1    39.37     5009    56.1      35.91   5013      56.1    24.5
BT        5013.1  56.1      23.72   5016.5    56.1    26.92     5031    56.1      32.72   5100
BT        56      27.82     5292    55.3      55.3    5387      54.8    54.8      5620    53.7

BT        53.7    5633      53.8    53.8      5852    53.7      53.7    6030      53.2    53.2
BT        6114    53.5      53.5
GR        60      4217      58.2    4578      57.4    4846      28.02   4954      23.02   4954.1
GR        22.42   4983.5    22.92   4987      22.92   4987.1    16.92   4989      15.72   4996
GR        15.32   5000      15.12   5002      16.72   5009      23.72   5013      23.72   5013.1
GR        26.92   5016.5    32.72   5031      27.82   5100      55.3    5292      54.8    5387
GR        53.7    5620      53.8    5633      53.7    5852      53.2    6030      53.5    6114

NC        0.063   0.046     0.039
X1        3779    0         0       0         1       1         1
X3        10      56.1      53.5

X1        3870    24        4990    5010      140     70        91
GR        48.5    4505      41.9    4645      42      4675      43.6    4747      41      4768
GR        38.8    4851      38.61   4918      36.71   4955      34.71   4965      20.51   4990
GR        19.91   4997      20.11   5003      20.51   5010      21.31   5021      26.21   5030
GR        30.51   5047      37.91   5058      47.8    5085      55.1    5114      55.9    5135
GR        54.9    5409      54.7    5600      54.4    5787      53.3    6110      0       0
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NC        0.063    0.046    0.039    0.1      0.3
X1        4100     29       4989     5010     180      225      230
GR        48.5     4326     43.2     4587     42.8     4652     41.4     4810     38.7     4849
GR        34.9     4870     25.3     4896     27.6     4929     27.8     4954     20.1     4989
GR        20.09    4996     20.29    5002     20.1     5010     25.5     5019     25.5     5024
GR        25.5     5070     25.5     5107     35.7     5115     36.3     5141     40.4     5190
GR        43.9     5236     46       5567     47.7     5979     48.4     6099     49.5     6249
GR        49.5     6298     52.4     6362     66.6     6481     66.7     6502     0        0

X1        4375     22       4982     5018     210      280      275
GR        48.5     4540     42.3     4900     40.7     4925     33.9     4953     30.9     4969
GR        23.3     4982     22.4     4991     20.3     5008     23.1     5018     27.2     5031
GR        31.2     5090     32.7     5135     40.3     5172     40.6     5232     41.3     5278
GR        43.1     5303     43.2     5332     45.7     5348     46.8     5386     46.4     5426
GR        48.1     5440     51       5445     0        0        0        0        0        0
1
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NC        0.063    0.046    0.039    0.3      0.5
X1        4475     18       4982     5018.1   95       105      105
X3        10       38       38
GR        48.5     4590     42.8     4863     40.93    4960     40.93    4982     23.8     4982.1
GR        23.1     4991     22.9     5000     23       5009     23.8     5018     40.58    5018.1
GR        40.2     5040     40.8     5263     42.7     5452     43.4     5643     44.2     5860
GR        45.7     6088     46.7     6299     50       6305     0        0        0        0

SB        1        1.6      2.6      0        36       462      23.6     23.2
X1        4528     19       4982     5018.1   53       53       53
X2        1        36.31    40.58
X3        10       40.88    39.5
BT        19       4590     48.5     48.5     4863     42.8     42.8     4921     40.72    40.72
BT        4982     40.88    40.88    4982.1   40.88    36.31    4991     40.87    36.31    5000
BT        40.86    36.31    5009     40.78    36.31    5013     40.74    36.31    5018     40.58
BT        35.78    5018.1   40.58    40.58    5076     39.5     39.5     5263     40.8     40.8
BT        5452     42.7     42.7     5643     43.4     43.4     5860     44.2     44.2     6088
BT        45.7     45.7     6299     46.7     46.7     6305     50       50
GR        48.5     4590     42.8     4863     40.72    4921     40.88    4982     23.9     4982.1
GR        23.3     4991     23.4     5000     23.5     5009     24.4     5013     25.5     5018
GR        40.58    5018.1   39.5     5076     40.8     5263     42.7     5452     43.4     5643
GR        44.2     5860     45.7     6088     46.7     6299     50       6305     0        0

NC        0.068    0.035    0.039
NH        4        0.068    4962     0.035    5041     10       5260     0.068    6300
X1        4630     40       4962     5041     108      80       95
GR        48.5     4598     48.5     4655     45.5     4659     44.8     4704     45.5     4730
GR        43.9     4798     39       4895     39.8     4917     39.7     4919     37.5     4962
GR        30.5     4976     25.4     4978     24.9     4992     25.2     5012     24.9     5022
GR        33.9     5041     33.9     5064     34.7     5141     40.7     5178     41.7     5254
GR        44.5     5260     46.1     5333     45.7     5364     45.3     5406     45.1     5448
GR        42.6     5456     42.2     5578     42.8     5691     43       5785     43.5     5813
GR        45.1     5839     45.8     5882     45.1     5977     45.3     6026     46.5     6039
GR        46.3     6088     45.7     6096     45.8     6160     47       6291     50       6300

NC        0.063    0.086    0.045    0.1      0.3
NH        5        10       4900     0.063    4987     0.045    5012     0.086    5055     10
NH        5361
X1        4850     30       4987     5012     290      170      220
X4        2        34.2     4900     30.8     5055
GR        48.5     3420     43.8     4091     41.4     4177     41.4     4212     40.4     4239
GR        37.3     4409     37.3     4443     37.6     4472     38.2     4487     36.8     4573
GR        36.5     4594     36.7     4640     35.7     4738     35.7     4778     35.7     4872
GR        33.1     4941     31.4     4972     25.3     4987     25.2     4995     25.2     5006
GR        25.3     5012     29.9     5028     31.2     5069     36.5     5072     39.1     5146
GR        43.8     5187     45       5203     46.1     5304     46.1     5320     45.9     5361

NH        5        10       4880     0.063    4986     0.045    5013     0.086    5051     10
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NH          5605
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X1          5100      45      4986      5013      225      210      250
X4             1    28.1      4880
GR          48.5    3425      41.5      3780     43.1     3842     43.8     3962     42.3     3977
GR          42.3    4011      42.1      4067     39.7     4174     39.7     4226     38.5     4299
GR          36.6    4333      36.9      4368     36.8     4447     36.5     4485     32.6     4542
GR          30.3    4626      27.6      4709     27.2     4788     28.2     4914     30.8     4937
GR          31.4    4951      30.8      4968     25.6     4986    25.55     4995    25.55     5004
GR          25.6    5013      32.2      5020     39.5     5051     44.6     5104     45.3     5137
GR          44.2    5193      44.7      5200     44.8     5286     44.2     5287     44.3     5311
GR          44.9    5344      44.1      5375     44.8     5414     44.7     5439     43.7     5498
GR            43    5524      42.2      5536     42.3     5563     43.1     5591     54.9     5605

NH             5      10      4925     0.063     4986    0.045     5013    0.086     5050       10
NH          5581
X1          5300      44      4986      5013      190      230      200
X4             2    31.2      4925      31.9     5050
GR          43.3    4059        42      4135       41     4163     40.3     4266     40.1     4312
GR          37.2    4371      32.4      4420     31.7     4492     32.1     4554     32.4     4585
GR          33.5    4646      30.4      4704       30     4750     33.7     4785       34     4809
GR          33.9    4847      31.6      4880     31.4     4905     30.8     4961     29.3     4974
GR          26.4    4986     25.82      4995    26.42     5004     26.4     5013     29.1     5024
GR          31.8    5047      33.1      5074     33.8     5104     38.8     5122     41.2     5170
GR          42.2    5241      41.7      5275       42     5296       42     5324     42.6     5336
GR          44.4    5341        48      5381     52.5     5455     52.2     5485     56.5     5509
GR          57.3    5523      55.6      5534     54.7     5551     57.8     5581

NH             5      10      4920     0.063     4985    0.045     5015    0.086     5110       10
NH          5940
X1          5500      55      4985      5015      185      210      200
X4             2   34.47      4920     38.92     5110
GR          51.7    3515      53.5      3561       53     3605     51.5     3625     51.4     3678
GR          49.5    3697      49.2      3780     49.5     3818     49.2     3857     49.9     3881
GR          49.6    3915      49.7      3986     49.5     4032     49.9     4063     48.4     4125
GR            47    4162      44.8      4175     44.8     4217     42.9     4330     42.6     4403
GR          42.5    4419      41.8      4447     41.5     4507     42.1     4605     42.5     4648
GR          41.4    4690      38.6      4754     36.1     4785     35.1     4822     34.4     4904
GR          34.6    4949      32.6      4951     32.3     4979     27.6     4985     26.1     4995
GR          26.7    5005      27.2      5015     34.2     5029     38.2     5073     39.1     5119
GR          37.8    5205      37.5      5233     43.2     5317     47.4     5418     48.1     5476
GR          46.3    5532      44.3      5669       44     5712     41.1     5766     41.7     5829
GR          42.1    5848      45.5      5850     48.1     5872     48.1     5935       50     5940

NH             5      10      4913     0.063     4981    0.045     5018    0.086     5113       10
NH          5305
X1          5700      30      4981      5018      160      215      200
X4             1    33.6      5113
GR          44.7    4599      43.1      4682     42.2     4697     42.3     4742     43.7     4777
GR          44.7    4795      47.5      4809     48.4     4832     50.5     4847     50.3     4867
GR          46.1    4878      42.5      4899     38.1     4913     34.5     4930     33.9     4936
GR          34.6    4967      27.4      4981    26.37     4993    26.97     5005     27.4     5018
GR          37.3    5037      37.4      5049     33.9     5095       33     5160     31.5     5199
GR          31.6    5226      32.4      5233     32.7     5248     32.8     5300     52.6     5305
1
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NH             5      10      4930     0.063     4978    0.045     5021    0.086     5185       10
NH          5317
X1          5900      20      4978      5021      150      200      200
X4             2    37.5      4930      34.4     5185
GR          42.5    4558      43.4      4612       42     4682     41.7     4726     43.5     4781
GR          44.9    4824      44.9      4847     38.7     4878     36.8     4958     27.3     4978
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GR        26.63    4992     27.23    5006     27.3     5021     35.2     5040     35.9     5053
GR         34.7    5091     34.4     5091     34.4     5207     32.4     5300     52.4     5317

NC        0.074    0.069    0.033    0        0
NH            5       10     4910    0.074    4978     0.033    5021     0.069    5080       10
NH         5340
X1         6100       34     4978    5021     210      190      200
GR         57.5     4202     54.3    4266     50.1     4316     50.4     4358     51.1     4375
GR         50.2     4500     49.6    4539     47       4586     46.2     4626     43.5     4690
GR           43     4729     43      4760     43.7     4797     44.2     4853     42.2     4910
GR         40.2     4948     27.3    4978     27.8     4991     27.1     5004     27.3     5021
GR         36.1     5039     37.8    5080     39.1     5120     37.7     5158     37.8     5207
GR         42.9     5226     44.2    5237     44.4     5253     44.1     5258     44       5277
GR         46.5     5290     46.5    5290     48.2     5335     50       5340     0        0

NH            5       10     4900    0.074    4977     0.033    5023     0.069    5050       10
NH         5244
X1         6330       25     4977    5023     240      180      230
X4            2    45.87     4900    36.8     5050
GR         57.4     4265     57.9    4304     56.1     4351     52.7     4423     50.1     4539
GR           51     4609     52.3    4685     48.3     4729     48.5     4755     49.7     4786
GR         48.3     4845     48.4    4847     44.3     4933     30.6     4962     28.1     4977
GR         27.4     4992     27.2    5011     28.2     5023     36.3     5041     36.8     5049
GR         37.3     5105     38.4    5155     43.8     5169     51.9     5218     52.4     5244

NC        0.074    0.069    0.033    0.3      0.5
X1         6435       27     4929    5062     105      95       105
X3           10    45.14     48.14
GR           53     4548     51.1    4607     47.4     4751     45.7     4891     45.74    4900
GR        45.14     4929     36.44   4950     28.44    4968     27.94    4984     27.84    5000
GR        27.84     5011     28.24   5022     31.24    5033     36.74    5045     44.24    5061
GR        48.14     5062     48.14   5090     50.2     5156     53.8     5244     55.3     5343
GR         54.6     5405     55.2    5477     53.4     5587     52.6     5709     52.3     5753
GR         51.2     5827     51      5854

SB          0.9     1.56     2.63    0        54       2        1312     2.5      27.84    27.54
X1         6488       27     4941    5060     53       53       53
X2            1    42.93     45.94   1.33
X3           10    45.94     48.14
BT           33     4548     53      53       4607     51.1     51.1     4751     47.4     47.4
BT         4875    45.94     45.94   4900     46.04    46.04    4904     49.64    39.04    4930
BT        49.64    37.92     4930.1  51.28    37.91    4936     51.28    37.66    4936.1   48.79
BT        37.65     4941     48.84   37.44    4941.1   48.85    42.18    4992     49.35    42.83
BT         5000    49.44     42.93   5008     49.6     43.03    5022     49.73    43.21    5036
BT        49.89    43.39     5060    49.98    43.69    5060.1   49.99    42.14    5063     50.5
BT        42.65     5077     50.29   45.07    5077.1   48.14    45.09    5100     48.94    48.94
BT         5156     50.2     50.2    5244     53.8     53.8     5343     55.3     55.3     5405
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BT         54.6     54.6     5477    55.2     55.2     5587     53.4     53.4     5709     52.6
BT         52.6     5753     52.3    52.3     5827     51.2     51.2     5854     51       51
GR           53     4548     51.1    4607     47.4     4751     45.94    4875     39.04    4904
GR        37.44     4941     33.34   4958     28.44    4968     27.94    4977     27.74    4992
GR        27.54     5000     28.14   5008     28.44    5022     31.14    5036     42.14    5060
GR        42.14    5060.1    48.94   5100     50.2     5156     53.8     5244     55.3     5343
GR         54.6     5405     55.2    5477     53.4     5587     52.6     5709     52.3     5753
GR         51.2     5827     51      5854

NC        0.054    0.064    0.039
X1         6580       61     4975    5025     105      105      102
GR         61.2     4426     60.4    4460     53.8     4480     53.8     4498     55.1     4509
GR         55.5     4552     51.2    4626     48.6     4700     42.6     4724     40.4     4827
GR         39.3     4875     39.54   4913     38.94    4954     32.34    4966     29.14    4975
GR        29.34     4997     30.14   5004     29.44    5008     30.04    5025     31.44    5039
GR        37.94     5050     43.34   5061     42.54    5084     50.2     5087     53.3     5149
GR         55.6     5187     55.6    5232     55.9     5287     54.8     5379     56       5428
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GR          56.5    5495      53.5    5505    53.5    5571    54.3    5616    52.1    5671
GR            52    5686        52    5910    52.9    6032    52.1    6101    52.3    6155
GR          52.5    6182      52.9    6292    52.3    6354    52.8    6449    52.1    6482
GR          52.8    6503      52.7    6571    52.8    6648    52.2    6668    52.6    6739
GR          52.3    6803        52    6868    59.2    6930    52.9    6948    52.5    6958
GR          52.2    7001      52.9    7038    52.5    7092    52.1    7139    52.7    7195
GR          52.6    7212

NC         0.054   0.064     0.039     0.1     0.3
X1          6800      65      4892    5107     120     240     220
GR          62.4    4317      61.8    4383    52.9    4403    52.5    4421    56.9    4435
GR          56.5    4443      54.5    4457    52.2    4470    44.7    4512    43.7    4555
GR          43.8    4643      43.7    4677    44.3    4755    42.6    4801    42.1    4847
GR          41.3    4873      31.9    4892   29.47    4987   30.27    5017   29.57    5034
GR          31.9    5107      39.9    5125      41    5165    45.7    5198    55.3    5260
GR          55.3    5291      55.2    5309      51    5330    49.1    5413    53.5    5467
GR          54.3    5493      56.6    5531    54.4    5581    54.5    5613    52.4    5904
GR          52.5    5949      52.6    5973    52.6    6028    52.7    6100    52.4    6140
GR          52.5    6144      52.4    6164    53.8    6198    52.3    6242    52.8    6262
GR          52.8    6287      52.5    6315    52.9    6327      52    6340      52    6361
GR            52    6490        52    6545    52.2    6576    53.3    6645    52.6    6735
GR          52.1    6806      52.1    6833    52.7    6859    52.9    6923    53.8    7027
GR          54.3    7076      54.5    7132    56.4    7151    55.8    7203    53.1    7266

X1          7000      12      4850    5149     180     220     200
GR          41.8    4759      40.6    4834    31.9    4850   29.59    4982   30.39    5024
GR         29.69    5048      31.9    5149    39.6    5170    40.9    5213    41.3    5435
GR          41.9    5504      42.2    5630

X1          7200      48      4857    5142     210     200     200
GR          56.7    4401      60.5    4415    58.3    4435      42    4491      42    4627
GR            42    4701        42    4730      42    4780    40.8    4840    31.8    4857
GR         29.72    4982     30.52    5022   29.82    5045    31.8    5142    42.7    5166
GR          42.7    5179      42.7    5333    42.7    5407    42.7    5463    42.7    5516
GR          42.7    5642      43.3    5735    43.3    5883    43.3    5989    43.5    6010
GR          44.7    6099      53.1    6131    53.4    6147    52.6    6153    50.3    6160
GR          51.2    6200      55.1    6212    56.3    6229    54.3    6236    55.3    6272
1
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GR            54    6431      52.5    6496    54.5    6577    55.9    6633    60.3    6661
GR          59.9    6679        60    6724    63.5    6741    65.6    6781    65.6    6862
GR          66.5    6943      64.8    6968    64.8    7024       0       0       0       0

X1          7400      41      4898    5101     200     200     200
GR          60.1    4344      50.1    4412    48.2    4443    50.6    4514    58.2    4551
GR          58.9    4634        63    4686    60.6    4751    58.2    4793    41.5    4853
GR          41.2    4876      31.9    4898   29.64    4925   30.94    4964   30.84    5012
GR         30.54    5048      31.9    5101    39.7    5118    40.4    5178    42.4    5253
GR          42.4    5592      42.4    5745    42.4    5810    42.4    5872    43.4    5942
GR          47.9    6084      53.9    6101    58.9    6126    59.2    6133    58.4    6140
GR          58.4    6160      57.2    6166    57.8    6219    56.6    6382    57.9    6564
GR          62.1    6579      62.6    6642      69    6647    73.1    6666    77.5    6685
GR          77.6    6708         0       0       0       0       0       0       0       0

NC         0.073   0.068     0.033
X1          7600      62      4950    5049     140     240     200
GR            59    4232      56.4    4267    51.2    4303    49.9    4335    58.6    4380
GR            62    4404      59.5    4436    56.3    4519    53.7    4555    50.1    4560
GR          50.1    4598      54.4    4617    57.9    4647    59.1    4686    57.6    4717
GR          53.8    4750      50.7    4805    47.8    4809    46.9    4825    45.3    4827
GR          44.5    4839      42.6    4845    42.5    4857    41.8    4875    38.8    4924
GR          33.5    4932      33.2    4945    31.8    4950   29.76    4963   31.06    4982
GR         30.96    5005     30.66    5022    31.8    5049    41.8    5064    43.8    5104
GR          43.8    5108      43.8    5132    44.8    5135    45.7    5156    49.2    5181
GR          48.9    5262      46.6    5303    44.9    5352      46    5430    47.9    5455
GR            48    5462      45.4    5469    45.9    5577    46.8    5614    49.6    5654
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GR          49.5    5775      50.4    5817    49.9    5878    50.8    5911    53.7    5938
GR          55.3    5947      55.5    5971    58.2    5988    59.2    6009      61    6017
GR          68.5    6032      68.8    6067       0       0       0       0       0       0

X1          7800      55      4950    5049     200     195     200
GR          59.3    4286      52.6    4332    52.2    4362    52.2    4388    57.1    4434
GR            64    4465      65.1    4485    64.1    4529    53.2    4556    52.8    4601
GR          49.1    4651      45.8    4692    45.8    4710    45.8    4739    45.8    4768
GR          45.8    4790      45.8    4798    45.8    4826    45.2    4848      43    4855
GR          42.1    4878      38.5    4930    31.9    4950   29.88    4963   31.18    4982
GR         31.08    5005     30.78    5022    31.9    5049    42.9    5073    42.9    5084
GR          43.8    5139      45.8    5216    50.4    5297    49.4    5311    50.2    5339
GR            51    5350      48.8    5386    45.6    5417      44    5504    42.8    5571
GR          43.5    5586      43.5    5647    44.2    5685    45.1    5719      47    5746
GR          47.3    5809      44.8    5823    45.1    5853    47.2    5878    49.6    5946
GR          55.5    5962      57.8    5981    58.9    6001    67.9    6029    70.3    6067

NC         0.088   0.088     0.033
X1          8000      52      4966    5034     285     160     200
GR          61.9    4116      45.5    4154    43.8    4243    46.5    4311    48.1    4349
GR          47.8    4354      43.7    4390    44.3    4404    43.5    4455    43.1    4554
GR          44.8    4581      44.1    4656    43.4    4690      46    4723    45.4    4777
GR          41.4    4826      41.2    4834    41.2    4857    36.5    4914    35.8    4951
GR          31.9    4966        30    4975    31.3    4988    31.2    5004    30.9    5016
GR          31.9    5034      41.8    5048    42.7    5063    44.1    5136    44.4    5222
GR          46.6    5243      47.6    5282    50.3    5291    50.2    5350    47.2    5359
GR          46.5    5422      43.8    5479    43.5    5598    43.8    5685    43.1    5800
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GR          45.2    5816      45.8    5874    45.9    5912    51.1    5924    54.1    5929
GR          54.7    5943      57.8    5952    58.6    5969    58.3    5981    58.6    6029
GR          69.6    6055      72.8    6073       0       0       0       0       0       0

X1          8250      47      4966    5034     220     210     250
GR          65.9    4008      58.5    4036    43.9    4098    43.3    4150    44.1    4197
GR          47.7    4221      49.2    4254    46.2    4280    43.5    4292    43.1    4323
GR          43.2    4394        43    4458      43    4573    43.6    4614    40.5    4730
GR          40.5    4796        40    4843    40.3    4854    40.3    4884    36.5    4914
GR          35.8    4951      31.9    4966      30    4975    31.3    4988    31.2    5004
GR          30.9    5016      31.9    5034    41.8    5048    42.7    5063    44.1    5136
GR          41.9    5185      43.1    5239    44.5    5290    44.8    5327    45.5    5344
GR            43    5493      43.2    5675    44.8    5712    45.9    5749    53.8    5765
GR          53.7    5782      58.3    5793    58.3    5813    57.4    5834    58.4    5936
GR          59.1    5963      63.8    5997       0       0       0       0       0       0

NC          0.07   0.075     0.035
X1          8500      45      4990    5009     140     290     250
GR          68.4    3843      49.9    3951    49.9    3979    49.4    4001      44    4031
GR          43.8    4079        48    4105      47    4165    43.5    4197    43.8    4206
GR          43.8    4339      43.9    4362    43.7    4429      43    4444      43    4728
GR          40.2    4760      40.4    4802    43.3    4856    43.7    4899    41.1    4941
GR          38.8    4978      32.3    4990   31.13    4993   31.43    4997   31.33    5001
GR         32.03    5004      32.3    5009    33.6    5018    33.5    5028    32.4    5041
GR          43.1    5063      44.8    5107      45    5171    44.6    5272    44.4    5497
GR          45.5    5563      58.2    5590    59.3    5596    58.8    5602      57    5608
GR          57.4    5622      52.8    5636      54    5663    57.9    5717    67.6    5802

NH             5      10      4925   0.073    4990   0.033    5009   0.068    5070      10
NH          5912
X1          8750      52      4990    5009     160     290     250
X4             2    41.4      4925   43.35    5070
GR          59.1    3582        54    3634    55.9    3666    55.7    3696    53.1    3735
GR          55.4    3766        57    3792    55.3    3828    54.1    3867    54.9    3869
GR          49.5    3918        48    3982    44.4    4052    44.5    4121    44.7    4211
GR          44.1    4240      44.2    4315    44.8    4352    44.3    4372    44.7    4474
GR            44    4562      41.4    4664    40.3    4724      41    4791    41.6    4843
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GR          42.4    4920      41.9    4922     40.5    4968     32.5    4990     31.7    4993
GR            32    4997      31.9    5001     32.4    5004     32.5    5009     42.9    5030
GR          43.3    5057      43.6    5176     43.6    5247     43.6    5355     43.6    5466
GR          45.6    5618      56.7    5638     56.8    5651     53.8    5657     53.8    5664
GR          59.2    5678      59.1    5692     62.4    5717     62.6    5801     65.3    5853
GR          65.7    5902      69.2    5912        0       0        0       0        0       0

NH             5      10      4850   0.073     4982   0.033     5017   0.068     5140      10
NH          5947
X1          9000      41      4982    5017      260     160      250
X4             2   38.33      4850   44.49     5140
GR          57.7    3776      48.2    3902     45.9    3966     45.9    4095     45.7    4170
GR          43.4    4235      43.6    4327     42.8    4400     38.2    4490     36.7    4576
GR          36.6    4612      38.1    4663     38.5    4756     38.3    4865     39.1    4918
GR          39.1    4974      32.8    4982    32.27    4988    32.47    4994    32.37    4999
GR         33.07    5008     32.37    5014     32.7    5017     41.2    5036     42.7    5061
GR          44.5    5141      44.7    5215       45    5289     45.1    5357       45    5408
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GR          45.2    5600      47.9    5659     48.7    5686       57    5748     57.3    5787
GR            61    5797      60.9    5805     59.6    5814     60.6    5828     60.9    5875
GR          67.6    5947         0       0        0       0        0       0        0       0

NH             5      10      4810   0.075     4981   0.049     5018   0.075     5160      10
NH          5893
X1          9250      37      4981    5018      260     250      250
X4             2    40.4      4810   43.98     5160
GR          56.6    4092      55.4    4210     57.1    4245     48.7    4260     48.3    4301
GR          44.3    4314      43.1    4358     40.5    4381     39.3    4453       40    4549
GR          40.4    4680      40.4    4824     38.6    4903     37.1    4954     36.6    4971
GR          33.8    4981     32.83    4987    34.03    4993    34.93    4998    33.63    5008
GR         32.93    5014      33.8    5018     42.2    5068       42    5155       44    5162
GR          44.3    5177      43.6    5319       44    5489       45    5607     47.3    5697
GR          58.5    5729      58.5    5755     57.4    5763     61.3    5781     61.7    5803
GR          63.3    5819      65.7    5893        0       0        0       0        0       0

NC          0.07   0.075     0.039
X1          9500      43      4985    5015      240     240      250
GR          57.5    4145      54.5    4206     51.5    4224     51.7    4246     52.1    4259
GR          51.1    4288      45.5    4337     45.4    4340     45.2    4394     42.7    4450
GR          41.9    4507      41.8    4524     42.3    4543     41.2    4566     42.9    4620
GR          44.6    4709      44.4    4837     42.1    4870     38.7    4893       41    4936
GR          37.3    4946      37.2    4976     34.7    4985     33.5    4988     34.2    4993
GR          35.5    5001      34.6    5005     33.4    5010     34.2    5015     38.5    5018
GR          40.3    5037      41.6    5086     44.7    5185     45.3    5230       45    5300
GR            47    5577      51.7    5640     60.8    5704     62.8    5726       63    5734
GR          65.5    5764      71.6    5825     76.9    5869        0       0        0       0

X1          9750      43      4983    5016      195     265      250
GR          63.3    4065      57.9    4103     54.9    4184     53.3    4266       54    4325
GR            51    4360        51    4382       51    4417     45.2    4466     44.5    4509
GR          44.1    4586      44.7    4633       43    4668     43.3    4899     41.8    4959
GR          38.3    4968      38.7    4978     36.1    4983    34.93    4986    35.63    4992
GR         36.93    5001     36.03    5005    34.83    5011     36.1    5016       42    5035
GR          43.1    5056      42.3    5074     43.2    5148     44.2    5166     44.2    5176
GR          44.2    5303        44    5401     44.8    5480     45.7    5572     46.2    5611
GR          50.9    5645      57.2    5677     58.3    5706     64.5    5742     63.8    5750
GR          64.1    5767      76.8    5788     77.9    5816        0       0        0       0

NC         0.075   0.075     0.056
X1         10000      38      4990    5009      310     210      250
GR          64.3    4280      61.1    4343     55.3    4401     51.9    4464     51.8    4495
GR            55    4533      57.1    4561       56    4572     45.6    4599     42.6    4631
GR          42.1    4702        44    4822     43.7    4957     43.5    4958     36.7    4990
GR         36.36    4992     37.06    4995    37.36    5000    37.46    5003    36.26    5006
GR          36.8    5009      44.4    5035       44    5061     43.3    5166     46.6    5183
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GR          46.8     5219        45.6     5255     45.2     5279     46.2     5367     46.5     5503
GR            47     5632          49     5732     67.8     5808     67.4     5816     64.9     5821
GR          64.9     5834          80     5859       80     5867        0        0        0        0
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NC          0.07     0.07       0.028      0.1      0.3
X1         10794       21        4984     5067       55       20       50
GR         66.35     4170       61.35     4210    56.35     4220    51.35     4440    46.35     4730
GR         47.55     4804       44.35     4914    44.05     4984    37.85     4991    37.05     5000
GR         38.25     5012       39.75     5036    45.85     5047    48.45     5067    43.35     5086
GR         43.45     5202       45.05     5370    50.05     5540    55.05     5660    60.05     5720
GR         65.05     5760

NC          0.07     0.07        0.05      0.1      0.3
QT             4     1286        2549     3447     6104
X1            60       18        4975     5030       60       60       60
GR         66.35     4190       56.35     4240    51.35     4460    46.35     4750    44.65     4774
GR         47.25     4803       45.45     4812    44.05     4826    48.85     4842    46.95     4861
GR         43.55     4891       43.55     4950    44.25     4975    39.25     4988    38.75     5000
GR         38.75     5020       44.35     5030    44.25     5050

X1           110       16        4832     4906       50       50       50        1
GR         66.35     4128       61.25     4168    56.35     4180    51.35     4400    46.35     4689
GR         44.35     4720       43.05     4743    56.95     4767    56.65     4778    53.65     4789
GR         47.85     4820       48.45     4832    39.35     4853    38.95     4870    39.05     4881
GR         48.05     4906

X1           250       15        4979     5047      120      130      140        1
GR         66.35     4390       56.35     4440    51.35     4654    44.75     4850    43.95     4933
GR         44.75     4979       42.85     4989    39.35     4990    38.65     5000    39.55     5011
GR         41.75     5023       41.05     5037    42.45     5041    42.55     5047    52.35     5075

X1           390       13        4630     4685      170      120      140        1
GR         66.35     4110       61.35     4130    56.35     4160    51.35     4300    44.85     4484
GR         44.95     4580       45.35     4630    40.65     4637    41.05     4640    41.45     4671
GR         46.85     4685       47.35     4698    49.25     4703

X1           480       16        4593     4658      130       80       90        1
GR         71.35     4050       66.35     4060    61.35     4122    56.35     4140    51.35     4180
GR         48.85     4450       46.55     4522    44.45     4543    44.75     4570    47.95     4593
GR         41.25     4606       40.75     4610    41.25     4612    43.55     4647    46.55     4658
GR         47.05     4680

X1           575       26        4576     4642      110       80       95        1
GR         71.35     3756       66.35     3795    63.35     3980    63.35     4180    61.35     4190
GR         56.35     4214       50.25     4330    48.45     4360    48.95     4371    48.75     4409
GR         46.95     4415       46.05     4484    46.05     4546    43.15     4548    43.05     4552
GR         49.15     4560       48.55     4576    41.25     4591    40.85     4600    41.55     4604
GR         41.95     4610       43.45     4614    42.05     4626    42.15     4632    46.75     4642
GR         47.85     4656

X1           667       19        4511     4577      120       90       92        1
GR         65.35     3780       65.35     3820    61.35     3880    56.35     3901    57.35     4080
GR         56.35     4235       51.65     4285    50.05     4345    47.45     4387    47.75     4432
GR         43.85     4465       45.85     4485    49.85     4496    47.15     4511    43.55     4520
GR         42.15     4522       42.15     4535    43.05     4557    48.65     4577
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X1           767       15        4980     5036       90      100      100        1
GR         66.35     4210       61.35     4508    57.05     4778    50.55     4791    49.95     4818
GR         46.25     4943       48.65     4949    48.85     4970    47.35     4980    44.85     4990
GR         43.55     4992       43.55     5000    43.35     5010    41.75     5018    49.15     5036
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X1          787      17      4967     5030     25       20       20       1
GR          66.35    4130    65.35    4252     71.35    4252     71.35    4450     61.35    4450
GR          58.85    4745    50.65    4755     50.75    4780     50.15    4810     47.85    4840
GR          46.65    4940    47.25    4967     44.75    4977     43.55    4987     43.75    5000
GR          42.85    5018    47.75    5030

X1          800      12      4855     5040     40       75       60
GR          71.35    4445    61.35    4446     57.5     4735     51.75    4745     51.15    4790
GR          50.25    4812    48       4855     47.55    4955     43       4980     42.85    4995
GR          43.45    5020    48.05    5040

NC          0.055    0.06    0.028    0.1      0.3
QT          4        1900    3900     5300     9700
X1          11720    20      4976     5060     50       90       79       1
GR          71.35    4440    61.35    4441     56.35    4725     52.85    4735     51.85    4795
GR          50.35    4815    48.15    4875     48.55    4976     42.85    4990     42.45    5000
GR          42.85    5010    43.45    5012     44.25    5035     48.05    5060     49.95    5140
GR          50.95    5215    51.85    5290     53.05    5540     60.05    5600     65.05    5610

X1          11150    48      4985     5014     230      170      255
GR          73.9     4096    73.4     4145     72.6     4192     69.9     4289     68.4     4374
GR          67.1     4478    66       4548     63.8     4609     61.4     4637     60       4721
GR          58       4758    55.2     4798     54.5     4837     54.9     4844     53.6     4860
GR          52.7     4923    53.5     4943     52.8     4955     51.9     4964     47.5     4978
GR          44.6     4985    42.85    4995     43.05    5007     44.6     5014     49.4     5025
GR          49.4     5031    46.6     5034     46.8     5038     49.1     5049     50.7     5098
GR          52.5     5152    53.5     5186     53.3     5232     56.2     5489     59.4     5547
GR          61.1     5564    60.7     5747     59.8     5803     60.5     5858     61.5     5862
GR          66.8     5871    68.4     5874     68.4     5884     67.6     5890     68.2     5896
GR          70.7     5904    73.6     5908     76.6     6017     0        0        0        0

X1          11400    49      4992     5007     260      280      250
GR          74.2     4202    69.7     4397     67.3     4498     65.3     4568     61.5     4691
GR          60.1     4727    58.8     4781     58.6     4816     58.4     4873     58.3     4932
GR          55.6     4958    54.3     4969     51.3     4978     48.8     4987     48.3     4990
GR          46.6     4992    44.28    4997     44.48    5003     46.6     5007     47.3     5019
GR          49.6     5046    50.7     5063     50.5     5113     51       5130     52.7     5180
GR          54.4     5210    54.6     5237     55.3     5278     57.6     5476     59.8     5558
GR          61.4     5583    61.5     5623     60.8     5728     62.3     5793     62.3     5831
GR          62.4     5887    64.7     5894     67.5     5902     68.3     5905     68.2     5916
GR          66.8     5921    67.5     5929     69.7     5938     72       5992     74.9     6055
GR          76.8     6098    76.4     6104     76.4     6155     79.4     6159     0        0
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X1          11570    52      4988     5011     200      240      170
GR          74.7     4237    75.1     4281     76.1     4350     75.1     4417     72.6     4486
GR          70.2     4526    64.4     4588     61.6     4650     61       4702     61.5     4736
GR          59.9     4777    58       4828     55.8     4850     53.8     4946     53.7     4967
GR          48.7     4974    47.3     4982     47.1     4985     46.8     4988     45.26    4996
GR          45.46    5006    46.7     5011     53.5     5023     54.6     5029     53.6     5051
GR          52       5085    51.4     5097     54.5     5116     55.5     5127     55.8     5137
GR          55       5138    55       5181     56.8     5195     58       5213     57.8     5220
GR          56.5     5221    57.9     5367     61       5485     63       5847     63.9     5870
GR          66.2     5882    67.1     5895     69.6     5906     69.6     5917     68.4     5920
GR          72.5     5941    74       5968     75.4     6070     75.3     6090     75.6     6140
GR          79.7     6144    79.9     6156     0        0        0        0        0        0

NC          0.063    0.055   0.034
NH          4        0.063   4988     0.034    5012     0.055    5130     10       6166
X1          11700    48      4988     5012     120      140      130
GR          78.3     4306    78.5     4325     76.3     4338     75.3     4343     75.8     4381
GR          74.6     4391    74.8     4439     72.5     4477     71       4487     62.9     4599
GR          61.7     4673    61.1     4764     59.2     4832     58       4865     54.9     4936
GR          52.4     4980    47.4     4983     46.8     4988     46.2     4994     46       5004
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GR          46.8    5012      49.4    5025      55      5034      55.3    5135      58.2    5321
GR          63.2    5536      64      5568      64      5634      66.9    5703      68.2    5714
GR          68      5868      67.7    5885      69.5    5903      70.1    5910      70.8    5914
GR          70.8    5921      70.1    5924      71.9    5929      72.3    5932      74.6    6016
GR          75.5    6065      76.3    6078      76.1    6085      75.7    6088      75.8    6127
GR          76.5    6132      77.1    6146      78.2    6166      0       0         0       0

NH          5       10        4940    0.063     4989    0.034     5010    0.055     5028    10
NH          6141
X1          11900   56        4989    5010      220     190       200
X2          15
X4          1       56.09     4940
GR          83.8    4323      82.3    4355      79.3    4380      75      4394      72.6    4399
GR          72.5    4428      73.4    4450      72.4    4479      70.8    4502      64.8    4546
GR          60.8    4608      57.4    4694      56.9    4756      56.4    4814      55.9    4833
GR          55.9    4861      56.8    4901      56.1    4938      56      4970      54.1    4976
GR          49.9    4982      49.5    4987      48.9    4989      47.02   4994      46.82   5003
GR          48.9    5010      50.4    5017      53.5    5023      58      5028      59.2    5049
GR          59.4    5230      61.2    5243      63.7    5257      63.7    5465      65.7    5537
GR          65.8    5553      65.5    5555      67      5642      67.7    5706      70      5855
GR          70      5896      70.7    5900      71.5    5903      71.5    5912      73.1    5921
GR          73      5946      74.3    6012      75.6    6042      77      6051      77      6056
GR          75.1    6059      75.2    6062      75.8    6100      76.3    6103      77.1    6120
GR          78.4    6141      0       0         0       0         0       0         0       0

NH          5       10        4940    0.084     4993    0.034     5006    0.079     5070    10
NH          6113
X1          12100   65        4993    5006      230     140       200
X2          15
X4          2       56.22     4940    57.77     5070
GR          79.1    4104      78      4123      75.5    4187      72.9    4261      73.6    4323
GR          73.6    4337      72.6    4346      72.4    4351      72.4    4381      71.8    4397
GR          71.3    4430      70      4457      68.1    4478      66.3    4525      63.3    4541
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GR          61.6    4599      60.3    4626      59.9    4694      59.7    4775      58.4    4838
GR          56.9    4874      56.2    4941      55.5    4977      54.2    4985      52.5    4989
GR          50.4    4991      49.8    4993      47.83   4996      47.63   5001      49.7    5006
GR          50.6    5008      51.2    5015      51.5    5032      52.9    5037      57.7    5044
GR          58      5045      57.6    5090      60.1    5207      61.3    5226      61.3    5238
GR          62.8    5430      65.4    5502      66.4    5520      66.4    5533      66.2    5534
GR          66.6    5574      68.3    5655      68.9    5675      69.5    5680      70      5834
GR          69.9    5858      71.1    5870      71.5    5882      71.9    5883      71.9    5890
GR          72.2    5898      73.8    5972      75.1    6002      76.2    6011      76.2    6019
GR          75.6    6022      75.6    6062      75.9    6066      76.3    6103      76.4    6113

NH          5       10        4730    0.084     4994    0.034     5005    0.079     5030    10
NH          5797
X1          12500   53        4994    5005      440     300       400
X4          2       61.1      4730    64.64     5030
GR          79.9    3883      78.8    3914      76.1    3938      74.7    3952      74.8    3961
GR          75.1    3983      75.7    3987      74.1    3991      72.3    4006      69.5    4116
GR          66.2    4239      63.1    4467      62.4    4475      62.4    4494      62.1    4656
GR          61.5    4720      59.3    4856      58.4    4949      58.6    4963      54.1    4970
GR          52.2    4980      51.8    4989      51.4    4992      50.7    4994      49.26   4997
GR          49.36   5001      50.7    5005      57      5014      62.7    5019      64.5    5025
GR          64.9    5039      65.7    5145      68      5184      68.3    5228      69.9    5342
GR          71.5    5448      71.2    5503      72.6    5512      73      5521      73      5536
GR          74.4    5543      74.9    5574      74.5    5612      75.4    5621      75.4    5626
GR          74.1    5628      74.7    5686      76      5690      75.4    5716      74.9    5731
GR          75.4    5746      77.8    5791      77.9    5797      0       0         0       0

NC          0.069   0.049     0.029
NH          5       10        4688    0.069     4987    0.029     5012    0.049     5160    10
NH          5762
X1          12800   40        4987    5012      130     360       300
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GR          80.5     4053       80.4     4064      76     4073      76     4092     76.7     4097
GR          75.4     4103       73.1     4113    70.7     4185    66.9     4338     66.8     4432
GR            66     4520       65.2     4578      64     4688    62.1     4924     62.1     4935
GR            62     4971       61.3     4981    58.5     4985    53.2     4987    50.48     4994
GR         50.58     5003       53.2     5012    62.5     5014    62.6     5050     63.2     5136
GR          67.2     5261       67.9     5489    68.6     5508    73.9     5510     74.1     5526
GR          74.5     5528       74.5     5534    74.2     5539      75     5548     74.6     5612
GR            75     5650       77.4     5725    78.2     5743    77.9     5745     77.9     5762

NH             5       10       4828    0.069    4987    0.029    5013    0.049     5130       10
NH          5675
X1         13000       49       4987     5013     170      200     200
GR          85.7     4105       83.7     4114    84.8     4127    83.3     4136     80.3     4143
GR          76.6     4144       76.6     4163    77.4     4167    77.5     4172     75.5     4183
GR          71.2     4235       68.3     4334    66.2     4455    65.8     4549     66.3     4626
GR          65.6     4653       64.9     4656      64     4662    63.4     4682     63.8     4689
GR          64.5     4770       64.5     4828    63.5     4911    62.1     4931     61.1     4975
GR          53.8     4987       51.3     4994    51.4     5003    53.4     5013     55.3     5016
GR          62.6     5017       62.6     5019    61.8   5019.1    61.9     5042     64.4     5261
GR          68.8     5486       69.4     5511    75.8     5512    73.9     5514     73.4     5521
GR          74.1     5528       74.6     5529    74.6     5550    74.3     5564     75.3     5565
GR          72.6     5567       73.3     5622    74.6     5675    74.9     5675        0        0
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NC           0.3      0.5
X1         13120       51       4987     5020     120      120     120
X3            10    61.91       63.8
GR          77.6     4171       77.6     4196    78.4     4201    77.2     4208     76.2     4255
GR          74.9     4303       73.3     4328    72.6     4395    71.5     4490     70.9     4496
GR          69.7     4545       66.7     4595      66     4672    66.1     4702     66.4     4721
GR          66.8     4800       66.2     4872   65.91     4920   64.11     4972    52.23     4987
GR         50.49     5020      64.88   5020.1    64.2     5034      66     5045     67.1     5049
GR          63.9     5051       63.8     5073    66.6     5079    67.9     5089     65.5     5111
GR          68.5     5247       71.1     5255    68.3     5261    67.1     5267       67     5292
GR          70.5     5297       70.7     5355      67     5355    68.1     5449     68.6     5477
GR          75.1     5482       73.3     5483    73.3     5492    74.5     5498     74.5     5506
GR          74.2     5510       75.1     5521    74.9     5524    74.5     5567     76.3     5586
GR          76.7     5654          0        0       0        0       0        0        0        0

NC         0.069    0.059       0.05
SB             1      1.6        2.6        0      33      0.1   56.06    50.49
X1         13122       54       4987     5036       2        2       2
X2             1    56.06      58.99
X3            10    61.91       63.8
X4             3    60.34     4976.8    56.16   4987.1    56.56  5020.1
BT            49     4201       78.4        0     4208    77.2       0     4255     76.2        0
BT          4303     74.9          0     4328    73.3       0    4395     72.6        0     4490
BT          71.5        0       4496     70.9       0     4545    69.7       0     4595     66.7
BT             0     4672         66        0     4702    66.1       0     4721     66.4        0
BT          4800     66.8          0     4872    66.2       0    4920    65.91        0     4972
BT         64.11        0       4973    61.91       0   4976.8   61.96       0     4987    61.93
BT             0   4987.1      59.06        0     5013   58.99       0     5020    58.99        0
BT        5020.1    64.88          0     5036   64.88       0    5045       66        0     5049
BT          67.1        0       5051     63.9       0     5073    63.8       0     5079     66.6
BT             0     5089       67.9        0     5111    65.5       0     5247     68.5        0
BT          5255     71.1          0     5261    68.3       0    5267     67.1        0     5292
BT            67        0       5297     70.5       0     5355    70.7       0     5355       67
BT             0     5449       68.1        0     5477    68.6       0     5482     75.1        0
BT          5483     73.3          0     5492    73.3       0    5498     74.5        0     5506
BT          74.5        0       5510     74.2       0     5521    75.1       0
GR          77.6     4171       77.6     4196    78.4     4201    77.2     4208     76.2     4255
GR          74.9     4303       73.3     4328    72.6     4395    71.5     4490     70.9     4496
GR          69.7     4545       66.7     4595      66     4672    66.1     4702     66.4     4721
GR          66.8     4800       66.2     4872   65.91     4920   64.11     4972    61.91     4973
GR         56.14     4987      56.64     5000   56.06     5013   56.54     5020    57.63     5036
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GR          64.88    5036.1        66      5045      67.1      5049      63.9      5051      63.8      5073
GR           66.6      5079      67.9      5089      65.5      5111      68.5      5247      71.1      5255
GR           68.3      5261      67.1      5267        67      5292      70.5      5297      70.7      5355
GR             67      5355      68.1      5449      68.6      5477      75.1      5482      73.3      5483
GR           73.3      5492      74.5      5498      74.5      5506      74.2      5510      75.1      5521
GR           74.9      5524      74.5      5567      76.3      5586      76.7      5654         0         0
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X1          13170        60      4974      5026        48        48        48
GR           77.2      4184      77.2      4196      78.1      4201      76.6      4205      76.3      4232
GR           75.6      4269        73      4315      72.4      4337      71.5      4361        71      4413
GR           69.9      4466      68.5      4534      65.1      4595        64      4667      64.4      4691
GR           64.8      4709      64.8      4727        65      4795        65      4841      66.5      4878
GR           67.1      4904      66.6      4919      65.7      4922      63.9      4958      59.2      4974
GR           58.1      4979      57.7      4993      57.1      4996      55.8      5006      57.7      5009
GR           58.3      5026      65.2      5029      65.2      5031      62.8    5031.1        65      5087
GR           63.9      5121      68.5      5133      72.4      5138      72.8      5151      71.3      5166
GR           68.7      5174      65.7      5177      66.3      5274      70.6      5282      70.4      5322
GR           71.8      5428      68.1      5429      68.1      5450      75.8      5453      73.9      5454
GR           72.9      5465      75.2      5471      75.2      5478      74.2      5482      73.8      5492
GR           74.8      5501      74.8      5566      76.5      5579        77      5622      78.6      5654

NC            0.1       0.3
X1          13350        52      4956      5043       170       150       180
GR           77.6      4205      77.6      4221      78.1      4227      76.4      4232      72.3      4316
GR             72      4325      71.1      4347      70.1      4424      66.3      4553      65.9      4660
GR           65.9      4766        66      4786      65.6      4815      63.6      4851      62.3      4930
GR             62      4949      60.8      4954        59      4956     58.16      4964     57.76      4987
GR          57.16      4992     55.86      5009     57.76      5014        59      5043      64.8      5045
GR           61.9      5046      63.3      5123      67.5      5139      77.2      5153      79.1      5172
GR             71      5206      64.9      5215      63.4      5217        64      5243      66.7      5289
GR           69.6      5318      70.8      5348      68.4      5384      67.8      5406      74.8      5407
GR           69.3      5409      71.5      5414      73.8      5420      75.6      5424      75.6      5434
GR           74.6      5441      73.3      5465      73.2      5490      74.1      5535      75.9      5563
GR           77.6      5586      81.5      5616         0         0         0         0         0         0

X1          13550        56      4985      5014       300       140       200
GR           79.6      4492      78.6      4534      76.8      4576      73.7      4605      71.1      4626
GR           69.4      4698      67.6      4743      66.7      4776      65.8      4789      65.6      4805
GR           63.8      4836      62.9      4888      62.5      4890        62      4976      61.5      4982
GR           59.5      4985     56.64      4989     55.94      4994     56.54      5000     57.74      5008
GR           59.5      5014      60.5      5017      61.6      5026      62.8      5031        64      5064
GR           68.3      5073      69.6      5079      66.6      5086      68.4      5091      71.1      5098
GR           70.8      5110      68.6      5117        69      5128      66.7      5132      66.2      5159
GR           65.8      5181      65.8      5242      72.6      5246      71.3      5281        70      5309
GR           70.5      5321      73.7      5326      74.3      5339      74.7      5347      75.5      5350
GR           75.6      5360      74.9      5368      71.7      5381      70.8      5424      70.6      5433
GR           70.6      5476      72.8      5502      74.7      5523      75.2      5556      79.9      5573
GR           81.1      5588         0         0         0         0         0         0         0         0

X1          13730        57      4988      5012       280       100       180
GR           79.9      4381      79.8      4439      80.1      4509      80.9      4561      80.4      4610
GR           79.7      4624      80.3      4667      80.9      4687      79.2      4701        79      4744
GR           78.5      4784      76.6      4793      73.6      4806      73.3      4871      70.8      4922
GR           64.9      4936        68      4943      67.7      4977      59.4      4988      56.7      4991
GR             56      4995      56.6      5000      57.8      5007      59.6      5012      61.7      5015
GR           66.9    5015.1      64.4      5017      64.8      5049      87.6      5051        80      5069
GR           78.1      5074      75.7      5085      74.6      5102      71.8      5109      65.1      5119
GR           64.8      5169      65.6      5170      65.7      5179      69.3      5187      71.9      5200
GR             73      5203        73      5223      72.7      5240      74.6      5251      75.1      5254
GR           74.7      5268        74      5290        74      5317        74      5344        74      5371
1
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GR          74      5444        74      5467      75.1      5520      75.5      5541      79.9      5556
GR        80.8      5560      80.8      5568         0         0         0         0         0         0

NC         0.3       0.5
X1       13834        39      4986      5014       110        70       104
X3          10        73        73
GR          82      4200      77.5      4402      77.5      4422      77.2      4430      77.3      4450
GR        76.6      4509      76.5      4577      76.8      4660      76.1      4689      75.9      4733
GR        75.1      4775        74      4823      74.8      4877        76      4909      76.5      4950
GR        71.3      4986        60    4986.1      59.5      4993      59.4      5000      59.1      5007
GR        58.9      5012      60.4    5012.1      60.5      5014      71.3    5014.1        76      5050
GR        75.2      5218      75.1      5245      74.7      5255      74.3      5269      74.2      5288
GR        74.2      5305      74.3      5324      74.5      5336        75      5475      75.9      5520
GR        75.9      5546      79.2      5555      81.6      5562      81.4      5573         0         0

NC       0.069     0.079     0.034
SB           1       1.6       2.6        28       331      59.5      59.3
X1       13846        39      4986      5014        12        12        12
X2           1      71.3        76
X3          10        74      74.2
BT          32      4200        82        82      4402      77.5      77.5      4422      77.5      77.5
BT        4430      77.2      77.2      4450      77.3      77.3      4509      76.6      76.6      4577
BT        76.5      76.5      4660      76.8      76.8      4689      76.1      76.1      4733      75.9
BT        75.9      4775      75.1      75.1      4823        74        74      4877      74.8      74.8
BT        4909        76        76      4950      76.4      76.4      4986      76.4      71.3      5014
BT        76.3      71.3      5050        76        76      5218      75.2      75.2      5245      75.1
BT        75.1      5255      74.7      74.7      5269      74.3      74.3      5288      74.2      74.2
BT        5305      74.2      74.2      5324      74.3      74.3      5336      74.5      74.5      5475
BT          75        75      5520      75.9      75.9      5546      75.9      75.9      5555      79.2
BT        79.2      5562      81.6      81.6      5573      81.4      81.4
GR          82      4200      77.5      4402      77.5      4422      77.2      4430      77.3      4450
GR        76.6      4509      76.5      4577      76.8      4660      76.1      4689      75.9      4733
GR        75.1      4775        74      4823      74.8      4877        76      4909      76.4      4950
GR        71.3      4986        60    4986.1      59.9      4993      59.7      5000        59      5007
GR        58.6      5012      60.4    5012.1      60.4      5014      71.3    5014.1        76      5050
GR        75.2      5218      75.1      5245      74.7      5255      74.3      5269      74.2      5288
GR        74.2      5305      74.3      5324      74.5      5336        75      5475      75.9      5520
GR        75.9      5546      79.2      5555      81.6      5562      81.4      5573         0         0

NH           5        10      4891     0.069      4990     0.034      5010     0.079      5084        10
NH        5518
X1       13950        33      4990      5010        90       120       104
X2          15
GR          82      4200      77.7      4433      76.9      4439      76.3      4460      75.4      4509
GR        73.9      4604      73.7      4639      70.6      4719      68.9      4801        68      4891
GR        67.2      4946      66.8      4968      66.9      4970      65.2      4977      61.7      4983
GR        59.9      4990      59.7      4994      59.1      5008      60.2      5010      64.6      5018
GR          66      5084      64.9      5110      67.5      5139      68.2      5158      67.4      5198
GR        67.6      5267      67.7      5307      68.1      5391      75.7      5455      75.7      5475
GR        80.3      5483      82.2      5487      81.6      5518         0         0         0         0
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NC       0.054      0.04     0.039       0.1       0.3
X1       14250        48      4988      5011       200       380       300
GR          82      4333      70.5      4594      67.5      4678      67.1      4681      67.1      4705
GR        67.6      4707      66.8      4780      66.3      4862      66.9      4924        67      4939
GR        66.6      4944      66.5      4962      66.1      4984      65.6      4986      61.2      4988
GR       60.63      4993     60.03      5009      61.2      5011      61.5      5016      61.9      5021
GR        64.7      5026      65.2      5044      65.7      5080      66.9      5132      68.8      5151
GR        69.8      5278      76.7      5288        78      5292      71.7      5296      70.7      5303
GR        70.2      5355      70.2      5365      75.6      5379      76.8      5403      76.8      5406
GR        76.8      5417      77.6      5423        79      5426      78.3      5438      82.5      5449
GR        83.5      5452      73.4      5461        73      5465      80.7      5473      87.1      5535
GR        86.6      5594      87.1      5652        87      5698         0         0         0         0
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X1        14500     64      4989     5010     220     210     250
GR         89.7   3814        89     3835    84.6    3838    82.5    3930    81.3    3987
GR         81.3   4014      81.8     4024    81.2    4035    80.7    4040    80.7    4052
GR         81.5   4062      81.1     4088      80    4124    80.3    4138    80.3    4175
GR         80.9   4209      80.7     4241    80.8    4263    80.1    4297    80.4    4328
GR           80   4345        80     4352      80    4367      80    4377    80.7    4384
GR           79   4387        79     4396    78.6    4400    78.6    4407    78.3    4422
GR         73.5   4541      70.5     4610    70.5    4628    70.4    4639    68.1    4727
GR         67.2   4918      67.2     4935    67.3    4946    67.1    4972    66.8    4986
GR         60.9   4989      60.8   4989.1    60.8    5002    60.9    5010    61.6    5012
GR         66.2   5023      67.7     5029    67.8    5073    94.2    5135    83.9    5168
GR         82.9   5178      89.1     5201      90    5213    71.8    5263    87.8    5315
GR         93.7   5355      95.7     5361    72.6    5394    72.5    5397      86    5426
GR         89.4   5439      84.7     5454      85    5469      85    5485       0       0

NC        0.035  0.059     0.039
QT            4   1400      2975     4150    7800
X1        14750     58      4992     5008     210     270     250
GR         87.1   4067      86.6     4092    84.4    4104    81.5    4111    81.5    4136
GR         82.8   4144      82.7     4161    82.2    4202    81.3    4224    81.3    4261
GR         81.4   4284      81.3     4367    81.3    4384    81.3    4403    81.3    4413
GR         81.3   4419      81.3     4429    80.2    4432    81.2    4441    80.6    4521
GR         76.6   4683      75.9     4690    76.1    4706    75.1    4731   70.18    4882
GR        69.18   4992     62.38   4992.1   61.58    5002   62.98    5008   70.08    5022
GR        70.22   5030      70.3     5044    70.3    5083    72.6    5089    80.4    5099
GR         81.8   5106      81.8     5119      79    5122    69.9    5143    67.9    5152
GR         68.5   5189      68.9     5252    69.6    5254    69.6    5269    71.9    5414
GR         70.9   5461      70.1     5469    70.1    5479    80.3    5503    85.4    5513
GR         86.1   5527      86.7     5600    87.1    5617    85.1    5622    85.1    5653
GR         85.6   5654      85.6     5664    87.2    5831       0       0       0       0

NC          0.3    0.5
NH            5     10      4975    0.035    4988   0.039    5012   0.059    5090      10
NH         5782
X1        14837     37      4988     5012      87      87      87
X3           10     70     70.15
X4            2  70.84      4975       72    5090
GR         88.2   4141      87.7     4159    84.5    4163    83.8    4189    83.7    4249
GR         83.5   4420      83.1     4523    82.7    4596    81.5    4649    79.4    4708
GR         76.4   4767      73.7     4841      72    4899   71.58    4914   70.78  4986.5
1
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GR        63.68   4988     63.88     5000   64.28    5012   68.98  5013.5   70.98    5027
GR        71.68   5062      72.2     5102    73.1    5226      74    5317    74.4    5437
GR         74.9   5524      77.1     5565    73.4    5571    73.2    5574    73.2    5578
GR         73.2   5585      77.8     5586    79.3    5606    82.4    5644      85    5688
GR         86.5   5739      87.8     5782       0       0       0       0       0       0

SB            1    1.6       2.4       24     129    64.1    63.9
NH            5     10      4800    0.035    4988   0.039    5012   0.059    5100      10
NH         5782
X1        14883     46      4988     5012      46      46      46
X2            1  69.98     71.48
X3           10  71.48     71.78
X4            2     75      4800     72.1    5100
BT           45   4141      88.2     88.2    4159    87.7    87.7    4163    84.5    84.5
BT         4189   83.8      83.8     4249    83.7    83.7    4420    83.5    83.5    4523
BT         83.1   83.1      4596     82.7    82.7    4649    81.5    81.5    4708    79.4
BT         79.4   4767      76.4     76.4    4841    73.7    73.7    4899      72      72
BT         4924  71.68     71.68     4973   71.48   71.48  4973.5   74.14   71.48    4985
BT        74.72  71.67    4985.1    76.18   71.67  4987.5   76.18   71.72    4988   76.18
BT        64.18 4988.1     75.28    68.43    5000   76.25   69.98    5012    75.4   68.38
BT       5012.1  76.23     64.18     5015   76.23    64.7  5015.1   74.76    64.7  5026.5
BT        74.35  71.78      5027    71.78   71.78    5073   71.31   71.31    5102    72.2
BT         72.2   5226      73.1     73.1    5317      74      74    5437    74.4    74.4
BT         5524   74.9      74.9     5565    77.1    77.1    5571    73.4    73.4    5574
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BT          73.2     73.2     5578     73.2     73.2     5585     73.2     73.2     5586     77.8
BT          77.8     5606     79.3     79.3     5644     82.4     82.4     5688     85       85
BT          5739     86.5     86.5     5782     87.8     87.8
GR          88.2     4141     87.7     4159     84.5     4163     83.8     4189     83.7     4249
GR          83.5     4420     83.1     4523     82.7     4596     81.5     4649     79.4     4708
GR          76.4     4767     73.7     4841     72       4899     71.68    4924     71.48    4973
GR          71.48    4973.5   71.67    4985     71.67    4985.1   71.72    4987.5   64.18    4988
GR          64.18    4988.1   64.08    5000     64.18    5006     64.18    5012     64.18    5012.1
GR          64.7     5015     64.7     5015.1   71.78    5026.5   71.78    5027     71.31    5073
GR          72.2     5102     73.1     5226     74       5317     74.4     5437     74.9     5524
GR          77.1     5565     73.4     5571     73.2     5574     73.2     5578     73.2     5585
GR          77.8     5586     79.3     5606     82.4     5644     85       5688     86.5     5739
GR          87.8     5782     0        0        0        0        0        0        0        0

NH          5        10       4965     0.035    4991     0.039    5009     0.059    5060     10
NH          5727
X1          14950    70       4991     5009     67       67       67
X4          2        69.03    4965     70.5     5060
GR          92.2     4155     92.2     4184     90.9     4194     84.7     4200     84.7     4226
GR          85.4     4239     86.5     4280     84.1     4351     84.6     4378     85.3     4389
GR          83.9     4401     83.2     4407     83.6     4410     83.6     4421     82.8     4430
GR          83.4     4437     84.1     4447     84.5     4495     84.9     4544     83.6     4574
GR          82.7     4602     82.8     4607     82.8     4631     83       4662     84.6     4679
GR          85.1     4688     85       4728     84.4     4746     78.3     4756     76.7     4779
GR          76.8     4796     73.3     4805     72.8     4830     72.3     4848     68.6     4858
GR          69.1     4925     69.02    4972.5   68.32    4986     67.02    4988     64.82    4991
GR          64.12    5000     64.62    5009     66.12    5010     66.42    5013.5   69.02    5018
GR          69.13    5022.5   68.56    5022.6   68.97    5051     69.54    5051.1   70.92    5070
GR          73.1     5110     72.8     5173     73       5257     74.8     5323     75.2     5393
GR          74.4     5412     74.7     5447     75.2     5466     75.8     5580     74.7     5594
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GR          71.4     5596     71.4     5607     71.4     5610     72       5631     72.9     5637
GR          83       5661     85.4     5671     86.6     5689     87.7     5702     88.1     5727

NC          0.1      0.3
NH          5        10       4920     0.035    4984     0.039    5015     0.059    5045     10
NH          5389
X1          15200    52       4981     5019     150      360      250
X4          2        74.5     4920     74.2     5045
GR          101.9    4249     100      4262     96.6     4306     94.3     4317     87.3     4327
GR          85.6     4334     85.6     4362     86.4     4372     86.3     4440     86.3     4463
GR          85.1     4474     85.2     4480     85.3     4491     84.1     4500     85.1     4506
GR          86.4     4517     87.5     4527     84.5     4538     84.7     4592     84.5     4676
GR          84.2     4701     84.2     4728     82.6     4802     82.8     4843     82.7     4856
GR          81.2     4883     80.1     4887     79       4906     71.6     4936     69.1     4954
GR          69.2     4973     68.2     4981     65.4     4984     65.37    5000     65.4     5015
GR          71.5     5019     71.9     5027     72.8     5031     75.3     5054     78.1     5086
GR          80.7     5105     83.9     5163     83.8     5201     86.2     5240     89.9     5267
GR          91.1     5278     93.3     5306     94.3     5311     94.8     5332     95.6     5351
GR          97.8     5365     98.6     5389     0        0        0        0        0        0

NH          5        10       4980     0.035    4993     0.039    5006     0.059    5045     10
NH          5379
X1          15430    55       4993     5006     260      140      230
X4          2        71.4     4980     76.5     5045
GR          100.7    4372     96.7     4399     94.4     4441     89.7     4446     88.8     4457
GR          87.5     4463     88       4479     87.8     4494     88       4507     87       4518
GR          87.7     4524     87.7     4535     86.9     4541     85.8     4546     87.6     4557
GR          88.8     4577     89.6     4606     89.5     4625     88.3     4635     87.4     4638
GR          87.6     4651     85.1     4655     85.1     4697     86.3     4717     86.6     4756
GR          86.4     4779     86.6     4784     86.6     4810     86.7     4834     86       4886
GR          83.9     4914     82.9     4945     82.9     4960     82.2     4965     72.6     4976
GR          70.2     4987     68.3     4991     66.6     4993     66.53    5000     66.6     5006
GR          71.8     5013     73.8     5020     76.8     5047     82.7     5082     83.6     5157
GR          84.8     5163     85       5207     92.6     5213     94.1     5224     95.7     5282
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GR          95.3     5300       95.6     5326      96.3     5345      98.9     5360      99.4     5379

NC         0.035    0.059      0.039
X1         15700       44       4990     5009       260      280      270
GR          95.7     4418       93.2     4446        92     4477     90.9     4487      90.4     4491
GR          90.7     4508       90.6     4524      89.9     4531     88.9     4537      90.6     4545
GR          90.6     4556       89.2     4560      90.9     4567     92.5     4577      91.8     4612
GR            91     4647       89.8     4671      88.4     4674     87.7     4731      86.8     4767
GR          86.6     4776       86.6     4804      87.3     4812     87.9     4851      86.6     4884
GR          85.4     4902       84.5     4913      78.9     4922     76.4     4941      73.5     4987
GR          69.4     4990      67.88     5000      69.4     5009     73.3     5014      74.2     5018
GR          75.4     5070         80     5072      81.2     5120     87.3     5161      89.7     5192
GR          95.3     5235      100.2     5249     101.4     5261    101.2     5268         0        0

X1         15950       53       4990     5009       190      270      250
GR         107.6     4394      104.8     4411     101.9     4439    101.5     4454      92.5     4459
GR          92.2     4469       92.6     4486      92.2     4500     92.2     4505      92.6     4508
GR          92.6     4517       92.1     4522      93.6     4529     93.4     4538      89.9     4554
GR          88.3     4595       88.2     4660      87.8     4721     86.6     4732      86.8     4759
GR          87.6     4766       89.1     4774      87.8     4781     87.5     4811      84.8     4871
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GR          81.6     4907       76.8     4931        74     4942     74.1     4968        74     4981
GR          72.5     4986       70.9     4990     69.14     4998    69.74     5004     70.14     5009
GR          70.9   5009.1       71.8     5013      73.7     5019     74.5     5023      79.6     5023
GR          82.3     5075       78.4     5079      80.3     5083     80.9     5087      84.8     5091
GR          88.5     5147         95     5185      96.6     5204     95.6     5211      95.2     5213
GR          95.2     5241       96.7     5250     100.8     5260        0        0         0        0

NC          0.06     0.06      0.045
X1         16250       49       4989     5010       390      280      300
GR         120.9     4406      120.3     4412     115.9     4417    109.3     4428      98.2     4440
GR          97.2     4451       97.6     4456      97.6     4471     96.1     4480      95.2     4488
GR          94.7     4491         95     4508      94.8     4523     93.7     4549      90.2     4599
GR          88.6     4635       89.2     4675      88.3     4682     87.9     4686      87.9     4721
GR            89     4728       89.6     4746      87.8     4787     81.4     4836      79.3     4854
GR          77.6     4911       77.5     4931      75.8     4945     75.8     4977      75.3     4985
GR          71.4     4989      70.64     4997     71.24     5004    71.64     5010      71.4   5010.1
GR          74.3     5015       75.8     5021      76.6     5038     77.8     5075      79.5     5096
GR          80.6     5108       82.1     5122      84.3     5138     90.4     5168      92.6     5181
GR          93.1     5188         93     5218      99.5     5256    100.9     5265         0        0

NH             4     0.06       4972    0.045      5027     0.06     5035       10     5201
X1         16500       44       4972     5027       190      270      250
GR         106.4     4408      106.5     4415     102.8     4426     99.7     4437      98.5     4449
GR          98.5     4455       99.1     4457      99.1     4467     95.3     4476      93.5     4493
GR            94     4507       93.8     4522      94.3     4531     93.1     4563      92.2     4597
GR          89.8     4621       89.2     4674      88.1     4685     88.1     4719      88.3     4749
GR          89.5     4779       88.9     4822      86.9     4847     83.7     4877      79.7     4914
GR          77.8     4950       76.5     4966        75     4970     73.3     4972     71.89     4994
GR         72.49     5012      72.89     5027      73.2   5027.1     75.8     5035      78.5     5040
GR          80.2     5045         83     5062        94     5090     95.2     5123      98.6     5155
GR         103.4     5170      105.9     5185     107.5     5192    107.5     5201         0        0

NH             5       10       4945    0.075      4985    0.049     5015    0.068     5030       10
NH          5327
X1         16850       46       4985     5015       310      300      350
X4             2    89.65       4945    80.82      5030
GR          91.4     4464      102.1     4482     102.9     4489    102.8     4503     100.1     4509
GR          88.7     4526       85.9     4544      85.9     4582     85.8     4612      85.8     4620
GR          84.1     4635       84.1     4656      84.9     4671     85.4     4687      85.4     4726
GR          84.8     4774       84.2     4809      87.1     4848     88.1     4868      89.7     4892
GR          89.7     4907      89.85     4927     89.55     4954    79.25     4971     74.65     4985
GR         73.65     4997      74.25     5007     74.65     5015    80.45   5015.1     80.95     5035
GR          81.1     5065       81.6     5122      81.2     5170     82.1     5176      83.5     5200
GR          84.7     5217       86.6     5220      88.7     5239     90.6     5253      92.4     5266
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GR          94.5     5268       97.8     5305     97.8     5314     104.1    5319     105.7    5325
GR         106.2     5327          0        0        0        0         0       0         0       0

NH             5       10       4880    0.075     4990    0.049     5009    0.068     5025      10
NH          5347
X1         17050       41       4990     5009      160      190      200
X2            15
X4             2     82.1       4880    82.37     5025
GR          94.9     4460       95.9     4468    101.9     4480     103.6    4487     104.4    4494
GR         104.4     4504      103.2     4508     95.1     4519      92.5    4535      88.1    4557
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GR          85.7     4576       84.5     4614     83.4     4633      82.1    4644      82.6    4661
GR          82.8     4681       83.8     4715     84.6     4770      82.7    4792      82.8    4828
GR            82     4890       80.6     4922     78.8     4955      78.2    4978      77.3    4984
GR          75.1     4990      74.66     4998    75.26     5004     75.66    5009      75.1  5009.1
GR          79.4     5015       82.3     5023     83.9     5040        84    5067        84    5149
GR          86.8     5194       91.1     5259     94.5     5289      97.9    5314     100.5    5327
GR         100.8     5347          0        0        0        0         0       0         0       0

NC         0.075    0.068      0.049      0.1      0.3
NH             5       10       4833    0.075     4992    0.049     5007    0.068     5031      10
NH          5402
X1         17200       43       4992     5007      140      160      150
GR         106.1     4452      106.7     4454    106.7     4466     105.7    4473     105.6    4496
GR         103.7     4515       98.4     4531     91.7     4550      89.9    4564      89.1    4608
GR          87.6     4634       85.3     4647     83.7     4658      83.9    4675      83.9    4691
GR          84.5     4699       85.4     4741     86.5     4773      86.8    4787      83.2    4833
GR          82.7     4900       80.2     4946     79.8     4977      79.8    4986        78    4989
GR          76.6     4992      75.41     4998    76.01     5003     76.41    5007      76.6  5007.1
GR          80.4     5017         84     5031     86.1     5053      88.3    5097      89.9    5130
GR          88.7     5175         88     5202       92     5239      94.6    5265      96.9    5322
GR          99.1     5341        100     5373    102.9     5402         0       0         0       0

NH             4    0.075       4985    0.049     5014    0.068     5060       10      5373
X1         17450       41       4985     5014      240      250      250
GR         125.6     4470      121.3     4485    104.5     4527      96.5    4544      90.9    4559
GR          89.8     4576       90.6     4617     90.1     4645        88    4680      85.6    4710
GR          85.7     4713       84.7     4715     85.1     4730      85.1    4747      85.5    4753
GR          84.5     4765       84.8     4809     85.3     4868      83.8    4921      81.2    4945
GR          80.5     4980       77.8     4985    76.67     4997     77.27    5007      77.8    5014
GR          78.3     5015       80.2     5019     82.4     5032      83.5    5060      85.8    5108
GR          86.6     5129       85.9     5136     85.5     5137      85.5    5166      85.9    5168
GR          87.4     5205       90.5     5248     95.1     5282      98.3    5317     101.4    5364
GR         101.5     5373          0        0        0        0         0       0         0       0

NC         0.069    0.081      0.061
X1         17650       46       4993     5006      210      180      200
GR         115.4     4467        114     4499    112.8     4532       104    4572      99.8    4585
GR          98.5     4613       97.5     4623     93.9     4626      91.7    4649      90.2    4658
GR          89.2     4667       89.8     4682     89.3     4698      90.1    4706      89.9    4721
GR          87.8     4750       88.2     4781     88.2     4828      86.7    4880      83.2    4923
GR          82.3     4933       82.9     4955     82.2     4982      80.9    4990      77.9    4993
GR         77.88     4997      77.68     5004     77.9     5006      78.9    5010        82    5020
GR          82.7     5053       84.7     5079     85.6     5101      88.4    5132      87.8    5152
GR          86.2     5167       85.7     5168     85.7     5198      86.7    5208      91.8    5243
GR          94.7     5279       95.5     5293     97.7     5320       100    5342     101.1    5360
GR         102.3     5401          0        0        0        0         0       0         0       0

X1         17870       43       4994     5005      170      140      220
GR         112.1     4238      112.3     4279    111.5     4322     108.8    4349     107.1    4355
GR         104.3     4360      102.9     4382    103.3     4387       100    4407      97.8    4437
GR          97.8     4447       97.1     4451     97.6     4466      97.5    4486      96.5    4504
GR          95.2     4528       92.2     4549     90.3     4586      88.7    4637      88.3    4697
GR          86.4     4726       85.1     4751     83.9     4796      82.1    4874      81.8    4937
GR          82.4     4975       82.7     4988     80.7     4994     78.99    4997     78.79    5003
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 GR          80.7     5005        82.4     5009     86.5     5021     89.1     5035     92.5     5078
 GR          92.4     5092        91.7     5094     92.8     5131     95.4     5155    100.1     5174
 GR         101.2     5184       103.2     5228    104.8     5249        0        0        0        0

 NH             5       10        4900    0.069     4992    0.061     5008    0.081     5045       10
 NH          5464
 X1         18100       51        4992     5008      140      170      230
 X4             2    85.58        4900     84.4     5045
 GR         116.1     4295       118.9     4319    119.4     4323      112     4331    110.8     4344
 GR         107.8     4348       106.6     4378    103.3     4391    102.4     4423    103.6     4438
 GR         103.6     4455       104.4     4460    102.9     4481    100.5     4508     99.1     4524
 GR          98.6     4529        98.9     4548     98.8     4566     99.9     4571    100.3     4578
 GR          97.5     4587        90.9     4636     90.2     4687     90.2     4741     89.9     4790
 GR          87.9     4845       86.35     4876    82.75     4989    81.25     4992    80.15     4997
 GR         79.95     5005       81.15     5008    83.35     5019    84.85     5056     84.7     5095
 GR          85.3     5117        86.8     5150       86     5161       86     5180     88.5     5187
 GR          89.3     5204        90.9     5225     92.8     5237     94.6     5267       96     5297
 GR          96.9     5313        98.2     5349     99.9     5386      102     5403    103.2     5413
 GR         105.9     5464           0        0        0        0        0        0        0        0

 NH             5       10        4830    0.069     4988     0.03     5012    0.081     5050       10
 NH          5490
 X1         18199       36        4988     5012      110       90       99
 X3            10     89.6        85.5
 X4             2     87.7        4830     87.4     5050
 GR         102.9     3925       102.6     4057    102.5     4155    102.5     4175      102     4270
 GR         101.5     4307       101.1     4414    101.1     4436    100.7     4512     98.7     4565
 GR          95.4     4612        93.1     4662     90.7     4731     89.1     4819    87.25     4900
 GR         87.55     4950       86.85     4986    89.35    4986.1    89.35     4988    79.75    4988.1
 GR         79.65     4994       79.55     5000    79.75     5006    79.65     5012    89.25    5012.1
 GR         89.25     5014       87.55    5014.1    87.35     5089       87     5132     87.3     5143
 GR          87.9     5201        91.2     5256     95.1     5312     95.4     5320    105.8     5484
 GR         105.9     5490           0        0        0        0        0        0        0        0

 SB             0      1.6         2.4     23.5      120     79.4    79.55
 NH             5       10        4830    0.069    4988.2     0.03   5011.8    0.081     5050       10
 NH          5490
 ET          7.11     7.11        7.11     7.11     4830     5050
 X1         18241       33      4988.2   5011.8       42       42       42
 X2             1    84.95        87.9
 X3            10    91.25        87.9
 X4             2    91.15        4830     88.3     5050
 BT            31     3925       102.9    102.9     4057    102.6    102.6     4155    102.5    102.5
 BT          4175    102.5       102.5     4270      102      102     4307    101.5    101.5     4414
 BT         101.1    101.1        4436    101.1    101.1     4512    100.7    100.7     4565     98.7
 BT          98.7     4612        95.4     95.4     4662     93.1     93.1     4700    92.34    92.34
 BT          4800    91.05       91.05     4900    91.25    91.25     4950    91.25    91.25     4971
 BT         91.75    80.25      4988.2    91.45    79.05    4988.3    91.45    83.55     5000    92.25
 BT         84.95   5011.7       91.45    83.25   5011.8    91.45    79.45     5022    91.45    88.05
 BT        5022.1    88.05       88.05     5150    89.05    89.05     5201     87.9     87.9     5256
 BT          91.2     91.2        5312     95.1     95.1     5320     95.4     95.4     5484    105.8
 BT         105.8     5490       105.9    105.9
 GR         102.9     3925       102.6     4057    102.5     4155    102.5     4175      102     4270
 GR         101.5     4307       101.1     4414    101.1     4436    100.7     4512     98.7     4565
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 GR          95.4     4612        93.1     4662    92.34     4700    91.05     4800    91.25     4900
 GR         91.25     4950       80.25     4971    79.05    4988.2    79.05    4988.3    79.35     4994
 GR         79.35     5000       79.95     5006    79.45    5011.7    79.45    5011.8    88.05     5022
 GR         88.05   5022.1       89.05     5150     87.9     5201     91.2     5256     95.1     5312
 GR          95.4     5320       105.8     5484    105.9     5490        0        0        0        0
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NH          5       10     4850    0.045    4988    0.033    5012    0.035    5150      10
NH       5321
X1      18330       49     4988     5012       89       89       89
X4          2     86.2     4850     83.2     5150
GR      106.9     3895    105.3     3961    101.5     3985    101.4     4017    102.3     4044
GR      101.7     4048    100.3     4052     99.9     4073      101     4080    100.1     4091
GR       99.3     4140     98.8     4223     98.9     4299     99.3     4376     98.1     4420
GR       97.4     4470     94.7     4520       91     4560     88.7     4621       89     4666
GR       88.6     4689     87.9     4696     88.8     4717     89.4     4764       89     4809
GR         87     4841    86.65     4843    84.15     4934    82.95     4987    81.05     4988
GR      81.35     4994    82.45     4998    82.45     5003    81.55     5009    82.05     5012
GR      86.25     5018    87.95     5025    87.55     5070     85.5     5085     84.2     5098
GR         84     5127     82.8     5172     82.7     5191     85.8     5214     92.3     5238
GR       99.8     5275    104.6     5304    107.8     5314    108.1     5321        0        0

NC        0.1      0.3
NH          5       10     4850    0.045    4991    0.033    5008    0.035    5190      10
NH       5284
X1      18500       43     4991     5008      170      170      170
X4          2     82.5     4850     86.7     5190
GR      114.1     4152    107.9     4174    103.4     4202    100.9     4223    100.9     4276
GR      100.4     4334    100.8     4394     99.7     4460     99.1     4520     97.6     4560
GR       95.8     4636       96     4668     97.3     4715     98.3     4744     98.3     4770
GR       96.2     4782     92.6     4801     86.7     4823     84.1     4838     83.4     4845
GR       82.5     4846     82.5     4965     83.3     4967     84.2     4974     84.7     4983
GR         84     4989     81.8     4991    81.73     4995    82.83     4998    81.83     5002
GR      81.93     5006     81.8     5008     81.8     5010     83.8     5019     84.7     5033
GR       84.6     5068       85     5127     84.6     5157     84.8     5178     86.7     5191
GR      107.5     5247    112.4     5265    114.8     5284        0        0        0        0

NC      0.045    0.035    0.033
X1      18750       44     4992     5007      290      230      250
GR      120.9     4482    110.3     4512    107.9     4521    106.3     4549    104.5     4580
GR      102.7     4602    101.9     4618    100.3     4651    100.8     4696    102.8     4749
GR      103.5     4789    103.7     4813      102     4822     99.6     4838     92.1     4865
GR       86.3     4884     83.5     4898     82.5     4901     82.3     4903     82.3     4958
GR       82.7     4961     84.8     4970     85.6     4981     84.6     4988       83     4990
GR       82.3     4992    82.28     4996    83.38     4999    83.13     5002    82.48     5006
GR       82.3     5007     82.4     5011     84.2     5018       86     5031     85.5     5036
GR       87.3     5097     88.8     5146     89.5     5166     94.5     5191     99.4     5223
GR      101.9     5248    110.1     5279    113.6     5296    112.7     5306        0        0

X1      19000       41     4987     5012      300      210      250
GR      123.2     4543    123.1     4562    122.4     4581    118.8     4594    115.4     4613
GR      108.7     4636    104.2     4657    101.6     4683      100     4714     99.1     4778
GR       98.5     4798     94.9     4817     91.8     4838     89.9     4848     86.6     4855
GR       84.3     4858     84.3     4903     87.3     4906     88.3     4924     87.8     4944
GR       85.9     4963     84.8     4979     84.6     4984     83.5     4987    82.84     4993
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GR      83.94     4997    83.14     5002    83.04     5008     83.5     5012     85.9     5018
GR       87.9     5021       92     5043     93.5     5062       95     5091       96     5121
GR       97.3     5159     99.2     5194    102.1     5222    106.4     5261    110.7     5293
GR      112.9     5307        0        0        0        0        0        0        0        0

NC      0.055     0.06    0.051
X1      19300       40     4989     5010      320      200      300
GR      112.2     4338    108.8     4364    107.7     4392      105     4407    100.6     4482
GR      100.6     4554      101     4590    100.2     4623     98.6     4652     94.8     4669
GR       90.8     4681     89.3     4686     87.8     4689     87.7     4770     89.4     4776
GR       93.5     4790     94.4     4795     94.6     4810     94.4     4852     90.1     4863
GR       88.1     4869     85.7     4877     85.5     4919     86.2     4943     87.5     4959
GR       87.3     4973     85.8     4985     84.3     4989    83.79     4990    84.09     5000
GR      83.49     5006     84.3     5010     86.8     5015     92.7     5037     95.8     5058
GR       97.5     5073    102.2     5105    108.8     5131    113.2     5160    115.8     5176
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X1        19550     49      4990      5011      220      220      250
GR          113   3866       109      3898    107.7     3923      106     3987     104.5     4085
GR        104.2   4195     104.2      4293    101.1     4345    100.2     4376     101.5     4410
GR        103.1   4466     103.3      4542    102.1     4547    102.1     4562     103.3     4570
GR        101.7   4576     101.9      4594    102.5     4600    101.7     4612     101.7     4632
GR        102.8   4658     101.9      4677     99.1     4685     95.1     4707      90.2     4727
GR         87.8   4745      86.6      4748     86.6     4751     87.5     4753        88     4772
GR         88.8   4810      89.1      4868     88.3     4943     87.7     4960      86.7     4984
GR         85.9   4989      84.3      4990    84.14     4991    84.54     5001     84.04     5007
GR         84.3   5011      84.9      5015     86.6     5041     90.5     5069      97.3     5098
GR        100.3   5113     102.5      5146    108.4     5216    116.4     5304         0        0

X1        19850     42      4991      5009      120      330      300
GR        111.9   4075     110.6      4108    107.7     4133    105.5     4186     104.4     4280
GR        104.7   4381     104.7      4439    105.1     4507    104.6     4600     103.8     4710
GR        103.5   4788     103.6      4854    104.3     4866    105.1     4878       100     4891
GR         92.9   4923      90.7      4941     89.4     4946     88.6     4948      88.6     4951
GR         89.7   4953      91.1      4963     91.4     4976     89.9     4984        87     4987
GR         85.3   4991        85      4992    84.75     5000     84.7     5005      85.3     5009
GR           87   5015      91.2      5023     92.4     5047     93.9     5067      92.6     5108
GR         92.7   5145      94.9      5161    100.8     5182    103.1     5213     109.8     5220
GR        112.7   5232     116.8      5250        0        0        0        0         0        0

NC         0.06  0.045     0.024
X1        20050     51      4992      5009      140      250      200
GR        114.2   4175     115.2      4190    112.2     4212    108.1     4243     105.1     4370
GR        104.5   4417     104.6      4463    105.6     4496    105.4     4525     105.1     4576
GR        104.6   4680     104.2      4737    103.8     4813      103     4839     101.2     4843
GR         98.8   4867      94.1      4882     91.3     4905     89.8     4920      89.3     4926
GR         88.4   4928      88.3      4931     88.9     4933     90.1     4943        91     4963
GR         89.8   4980      89.2      4990     87.5     4992     87.2     4993      87.4     5001
GR         86.9   5006      87.5      5009     88.9     5012     90.1     5031      90.8     5056
GR         88.3   5062      87.5      5062     87.5     5068     89.1     5082      91.4     5082
GR         94.3   5102      96.8      5126     98.9     5149    100.7     5198     102.5     5238
GR        103.7   5309     105.5      5356    106.3     5376    112.4     5444     113.1     5489
GR        114.3   5510         0         0        0        0        0        0         0        0
1
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NC         0.06  0.069     0.034
X1        20200     43      4984      5016      160      140      150
GR        112.7   4264       112      4287    108.8     4308    106.3     4357     104.7     4439
GR          105   4548     104.1      4554    104.2     4576      105     4586     106.6     4594
GR        105.7   4601     105.2      4624    105.9     4671    104.4     4732     103.6     4759
GR        102.9   4782    101.75      4798    95.25     4828    95.05     4836     90.85     4847
GR        91.65   4891     91.65      4937    91.05     4982    89.45     4984     88.85     4986
GR        89.15   5001     88.55      5010    89.15     5016    96.95     5031    100.45     5046
GR       101.95   5083     101.8      5088    101.9     5153    101.1     5193     100.6     5194
GR        100.7   5221       101      5227    101.7     5256    104.1     5295     104.4     5350
GR        105.7   5376     108.6      5403    115.7     5436        0        0         0        0

NC         0.06   0.04     0.044
X1        20600     38      4992      5008      300      300      400
GR        111.6   4434     106.4      4495    105.3     4549    103.6     4567     102.2     4591
GR        103.6   4619     103.1      4621    104.8     4659    104.4     4709     102.7     4728
GR         97.5   4768      94.3      4807     93.4     4852       92     4886      90.5     4887
GR         90.5   4890        93      4896     92.4     4923     92.2     4975      91.4     4988
GR         90.6   4992     89.13      4997    89.73     5004     89.6     5008      90.8     5011
GR         94.3   5025      97.7      5049     99.6     5096      100     5152     100.5     5192
GR        100.1   5196     100.1      5224    101.4     5231    102.8     5263     104.6     5312
GR        105.6   5367     108.7      5411    114.4     5446        0        0         0        0

X1        20750     30      4985      5015      120      330      150
GR        109.5   4593     108.7      4604    106.3     4657    104.2     4697     104.4     4739
GR        102.9   4771        99      4800     96.9     4822     94.4     4895      94.5     4940
GR        95.15   4947     95.05      4968    90.95     4985    89.35     4994     89.95     5008
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GR        90.75     5015      92.55     5018      93.65     5033      95.95     5049      96.7      5052
GR        96.8      5106      97.4      5187      98        5237      101       5287      103.9     5329
GR        105.7     5357      105.9     5389      106.9     5411      113.1     5456      116.3     5476

NC        0.3       0.5
X1        20919     48        4992      5008      199       139       169
X3        10        94        95
GR        115.8     4568      111.5     4620      108.6     4681      107.9     4723      106.5     4750
GR        105.2     4771      101.6     4804      96.7      4843      93.2      4887      94.4      4914
GR        95.5      4950      95.05     4968      91.95     4986      91.45     4992      91.45     4992.1
GR        91.05     4996      90.75     5000      90.95     5004      91.75     5008      91.75     5008.1
GR        94.55     5018      94.45     5031      99.3      5037      99.3      5045      103.3     5056
GR        104.3     5059      104.7     5064      103.4     5070      103.8     5144      105       5159
GR        104.7     5160      106       5188      107       5196      105       5210      105.9     5235
GR        105.2     5258      107.3     5285      106.2     5315      106.1     5355      104.2     5371
GR        104.2     5392      106.4     5421      107.6     5448      108.4     5480      108.9     5512
GR        109.5     5567      112.6     5591      115.8     5614      0         0         0         0

X1        20920     0         0         0         1         1         1
BT        45        4568      115.8     115.8     4620      111.5     111.5     4681      108.6     108.6
BT        4723      107.9     107.9     4750      106.5     106.5     4771      105.2     105.2     4804
BT        101.6     101.6     4843      96.7      96.7      4887      93.2      93.2      4914      94.4
BT        94.4      4950      95.5      95.5      4968      95.05     95.05     4986      95.65     91.95
BT        4992      96.45     91.45     4992.1    96.45     95.65     5008      96.45     95.65     5008.1
BT        96.45     91.75     5018      94.55     94.55     5031      94.45     94.45     5037      99.3
BT        99.3      5045      99.3      99.3      5056      103.3     103.3     5059      104.3     104.3
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BT        5064      104.7     104.7     5070      103.4     103.4     5144      103.8     103.8     5159
BT        105       105       5160      104.7     104.7     5188      106       106       5196      107
BT        107       5210      105       105       5235      105.9     105.9     5258      105.2     105.2
BT        5285      107.3     107.3     5315      106.2     106.2     5355      106.1     106.1     5371
BT        104.2     104.2     5392      104.2     104.2     5421      106.4     106.4     5448      107.6
BT        107.6     5480      108.4     108.4     5512      108.9     108.9     5567      109.5     109.5
BT        5591      112.6     112.6     5614      115.8     115.8

X1        20932     43        4992      5008      12        12        12
BT        40        4568      115.8     115.8     4620      111.5     111.5     4681      108.6     108.6
BT        4723      107.9     107.9     4750      106.5     106.5     4771      105.2     105.2     4804
BT        101.6     101.6     4843      96.7      96.7      4887      93.2      93.2      4914      94.4
BT        94.4      4938      94.85     94.85     4963      94.75     94.75     4967      96.25     94.05
BT        4992      96.45     91.85     4992.1    96.45     95.55     5008      96.45     95.65     5008.1
BT        96.45     89.65     5033      96.45     94.45     5049      96.45     96.45     5074      98.85
BT        98.85     5144      103.8     103.8     5159      105       105       5160      104.7     104.7
BT        5188      106       106       5196      107       107       5210      105       105       5235
BT        105.9     105.9     5258      105.2     105.2     5285      107.3     107.3     5315      106.2
BT        106.2     5355      106.1     106.1     5371      104.2     104.2     5392      104.2     104.2
BT        5421      106.4     106.4     5448      107.6     107.6     5480      108.4     108.4     5512
BT        108.9     108.9     5567      109.5     109.5     5591      112.6     112.6     5614      115.8
BT        115.8
GR        115.8     4568      111.5     4620      108.6     4681      107.9     4723      106.5     4750
GR        105.2     4771      101.6     4804      96.7      4843      93.2      4887      94.4      4914
GR        94.85     4938      94.75     4963      94.05     4967      91.85     4992      91.85     4992.1
GR        91.15     4996      90.25     5000      89.85     5004      89.65     5008      89.65     5008.1
GR        94.45     5033      96.45     5049      98.85     5074      103.8     5144      105       5159
GR        104.7     5160      106       5188      107       5196      105       5210      105.9     5235
GR        105.2     5258      107.3     5285      106.2     5315      106.1     5355      104.2     5371
GR        104.2     5392      106.4     5421      107.6     5448      108.4     5480      108.9     5512
GR        109.5     5567      112.6     5591      115.8     5614      0         0         0         0

X1        20933     0         0         0         1         1         1
X3        10        94.75     96.45

NC        0.052     0.052     0.044
X1        21000     46        4993      5007      49        69        67
GR        115.8     4568      111.5     4620      108.6     4681      107.9     4723      106.5     4750
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GR        105.2     4771      101.6     4804      96.7      4843      93.2      4887      94.4      4914
GR        94.85     4924      94.95     4968      93.55     4991      92.05     4993      91.65     4996
GR        91.65     5002      92.15     5007      93.35     5008      95.25     5019      98.85     5035
GR        99.3      5037      99.3      5045      103.3     5056      104.3     5059      104.7     5064
GR        103.4     5070      103.8     5144      105       5159      104.7     5160      106       5188
GR        107       5196      105       5210      105.9     5235      105.2     5258      107.3     5285
GR        106.2     5315      106.1     5355      104.2     5371      104.2     5392      106.4     5421
GR        107.6     5448      108.4     5480      108.9     5512      109.5     5567      112.6     5591
GR        115.8     5614      0         0         0         0         0         0         0         0

NC        0.1       0.3
X1        21250     54        4990      5009      190       230       250
GR        115.3     4713      108.8     4826      106       4875      105       4896      100.5     4922
GR        96.9      4951      95.8      4977      95.1      4988      92.8      4990      92.09     4994
GR        92.09     5002      92.8      5009      94.4      5010      95.4      5030      94.8      5055
GR        94        5066      92.8      5067      92.8      5076      94.2      5085      95.9      5104
1
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GR        97.6      5144      96.8      5160      96.8      5181      94.4      5183      94.4      5357
GR        95.7      5358      97.5      5373      101.1     5409      104.9     5453      107.4     5485
GR        110.4     5514      111.8     5530      111.3     5548      109.8     5567      106.2     5602
GR        105.9     5623      107.9     5648      109.2     5671      107.6     5689      103.5     5707
GR        102.3     5747      102.7     5761      104.7     5778      106.9     5813      108.2     5845
GR        108.1     5856      107.8     5864      108       5893      108.4     5898      107.9     5911
GR        106.1     5943      107.7     5984      110.4     6008      112.2     6039      0         0

X1        21550     40        4994      5005      220       320       300
GR        115.4     4670      115.4     4710      110.1     4790      109.5     4833      108       4842
GR        107       4868      101       4901      97.8      4930      96.7      4967      96.6      4984
GR        95.9      4989      94.2      4994      93.22     4996      92.62     5000      92.82     5002
GR        94.1      5005      95.5      5008      96.3      5020      97.4      5036      98.2      5111
GR        98.6      5162      99.1      5171      97.9      5174      98.4      5190      99.4      5192
GR        100       5219      99.9      5280      100.8     5296      102.1     5308      109.3     5327
GR        111.2     5334      112.7     5356      112.9     5390      113.1     5454      113.4     5543
GR        114.6     5609      114.9     5687      115.9     5757      116.6     5843      116       5860

X1        21740     28        4991      5009      180       160       190
GR        115.5     4586      112.7     4632      109.8     4679      106.3     4710      100.3     4747
GR        97.9      4773      97.3      4816      97.6      4907      97.45     4917      97.25     4933
GR        95.95     4960      97.05     4987      94.25     4991      93.55     4995      92.95     5001
GR        93.15     5005      94.05     5009      96.15     5011      96.65     5030      99.25     5048
GR        112.1     5078      112.2     5122      112.7     5200      113.4     5282      114.7     5377
GR        114.8     5504      116.8     5577      116.1     5629      0         0         0         0

NC        0.3       0.5
X1        21789     28        4990      5010      49        49        49
X3        10        98.2      98.9
GR        115.5     4586      112.7     4632      109.8     4679      106.3     4710      100.3     4747
GR        97.9      4773      97.3      4816      97.6      4907      98.25     4949      98.25     4982
GR        94.75     4990      94.75     4990.1    93.65     4995      93.75     5000      94.05     5005
GR        94.55     5010      94.55     5010.1    97.65     5015      99.95     5040      112.3     5042
GR        112.1     5078      112.2     5122      112.7     5200      113.4     5282      114.7     5377
GR        114.8     5504      116.8     5577      116.1     5629      0         0         0         0

X1        21790     0         0         0         1         1         1
BT        24        4586      115.5     115.5     4632      112.7     112.7     4679      109.8     109.8
BT        4710      106.3     106.3     4747      100.3     100.3     4773      97.9      97.9      4816
BT        97.3      97.3      4907      97.6      97.6      4949      98.25     98.25     4982      98.25
BT        98.25     4990      98.85     94.75     4990.1    98.85     97.85     5010      98.95     97.85
BT        5010.1    98.95     94.55     5040      99.95     99.95     5042      112.3     112.3     5078
BT        112.1     112.1     5122      112.2     112.2     5200      112.7     112.7     5282      113.4
BT        113.4     5377      114.7     114.7     5504      114.8     114.8     5577      116.8     116.8
BT        5629      116.1     116.1

X1        21800     28        4988.5    5011.5    10        10        10
BT        25        4586      115.5     115.5     4632      112.7     112.7     4679      109.8     109.8
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BT          4710     106.3     106.3     4747     100.3     100.3     4773     97.9     97.9     4816
BT          97.3     97.3      4907      97.6     97.6      4951      98.45    98.45    4972     98.65
BT          98.65    4988.5    98.85     94.45    4988.6    98.85     97.85    5011.5   98.95    97.95
BT          5011.6   98.95     94.45     5031     101.35    101.35    5034     111      111      5042
BT          112.3    112.3     5078      112.1    112.1     5122      112.2    112.2    5200     112.7
BT          112.7    5282      113.4     113.4    5377      114.7     114.7    5504     114.8    114.8
1
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BT          5577     116.8     116.8     5629     116.1     116.1
GR          115.5    4586      112.7     4632     109.8     4679      106.3    4710     100.3    4747
GR          97.9     4773      97.3      4816     97.6      4907      98.45    4951     98.65    4972
GR          94.45    4988.5    94.45     4988.6   92.95     5000      93.95    5005     94.45    5011.5
GR          94.45    5011.6    97.65     5015     101.35    5031      111      5034     112.3    5042
GR          112.1    5078      112.2     5122     112.7     5200      113.4    5282     114.7    5377
GR          114.8    5504      116.8     5577     116.1     5629      0        0        0        0

X1          21801    0         0         0        1         1         1
X3          10       98.4      98.9

X1          21850    27        4994      5006     49        49        49
GR          115.5    4586      112.7     4632     109.8     4679      106.3    4710     100.3    4747
GR          97.9     4773      97.3      4816     97.6      4907      96.95    4927     96.25    4964
GR          97.25    4986      95.35     4992     94.65     4994      93.95    4997     94.15    5000
GR          94.75    5006      97.05     5036     111.75    5038      111.75   5065     112.1    5078
GR          112.2    5122      112.7     5200     113.4     5282      114.7    5377     114.8    5504
GR          116.8    5577      116.1     5629     0         0         0        0        0        0

NC          0.1      0.3
X1          22200    46        4991      5009     200       300       350
GR          117.2    4794      113.4     4816     111.2     4861      111.4    4903     111.1    4927
GR          105.9    4940      99.9      4958     98.55     4969      98.85    4984     98.05    4990
GR          96.05    4991      95.55     4994     95.75     5001      96.15    5009     98.95    5012
GR          99.75    5030      100.3     5035     98.7      5057      98.8     5115     99.2     5197
GR          99.9     5249      99.9      5324     100.3     5365      101.8    5382     103.1    5399
GR          109      5429      112.9     5447     113.4     5467      113.3    5481     113.1    5486
GR          111.9    5489      113.4     5495     114.8     5499      115.7    5501     115.6    5515
GR          115.6    5547      116.6     5566     114.6     5585      112.2    5599     112.9    5625
GR          112.6    5661      112.8     5715     113.9     5777      115.5    5834     116.1    5888
GR          116.1    5922      0         0        0         0         0        0        0        0

NC          0.3      0.5
X1          22239    49        4990.5    5009.5   39        39        39
X3          10       100.4     100.1
GR          117.2    4794      113.4     4816     111.2     4861      111.4    4903     111.1    4927
GR          105.9    4940      99.9      4958     100.85    4960      100.45   4977     100.45   4987
GR          96.15    4987.1    95.65     4990.5   95.65     4990.6    95.45    4995     95.25    5000
GR          95.35    5005      95.75     5009.5   95.75     5009.6    99.65    5013     100.15   5040
GR          98.7     5057      98.8      5115     99.2      5197      99.9     5249     99.9     5324
GR          100.3    5365      101.8     5382     103.1     5399      109      5429     112.9    5447
GR          113.4    5467      113.3     5481     113.1     5486      111.9    5489     113.4    5495
GR          114.8    5499      115.7     5501     115.6     5515      115.6    5547     116.6    5566
GR          114.6    5585      112.2     5599     112.9     5625      112.6    5661     112.8    5715
GR          113.9    5777      115.5     5834     116.1     5888      116.1    5922     0        0

X1          22240    0         0         0        1         1         1
BT          45       4794      117.2     117.2    4816      113.4     113.4    4861     111.2    111.2
BT          4903     111.4     111.4     4927     111.1     111.1     4940     105.9    105.9    4958
BT          99.9     99.9      4960      100.85   100.85    4977      100.45   100.45   4987     100.45
BT          100.45   4987.1    100.45    96.15    4990.5    100.75    95.65    4990.6   100.75   99.55
BT          5009.5   100.75    99.45     5009.6   100.75    95.75     5040     100.15   100.15   5057
BT          98.7     98.7      5115      98.8     98.8      5197      99.2     99.2     5249     99.9
BT          99.9     5324      99.9      99.9     5365      100.3     100.3    5382     101.8    101.8
1
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BT        5399    103.1    103.1    5429     109     109    5447    112.9    112.9    5467
BT       113.4    113.4     5481   113.3   113.3    5486   113.1    113.1     5489   111.9
BT       111.9     5495    113.4   113.4    5499   114.8   114.8     5501    115.7   115.7
BT        5515    115.6    115.6    5547   115.6   115.6    5566    116.6    116.6    5585
BT       114.6    114.6     5599   112.2   112.2    5625   112.9    112.9     5661   112.6
BT       112.6     5715    112.8   112.8    5777   113.9   113.9     5834    115.5   115.5
BT        5888    116.1    116.1    5922   116.1   116.1

X1       22257        0        0        0       17      17      17
X2           1

NC       0.039    0.039    0.044
X1       22258        0        0        0        1       1       1
X3          10    100.7     99.9

X1       22310       45     4991     5009       52      52      52
GR       117.2     4794    113.4     4816   111.2    4861   111.4     4903    111.1    4927
GR       105.9     4940     99.9     4958   98.45    4960   98.45     4988    96.65    4991
GR       95.55     4996    95.75     5005   96.65    5009   97.85     5015    99.35    5026
GR       99.25     5036     98.7     5057    98.8    5115    99.2     5197     99.9    5249
GR        99.9     5324    100.3     5365   101.8    5382   103.1     5399      109    5429
GR       112.9     5447    113.4     5467   113.3    5481   113.1     5486    111.9    5489
GR       113.4     5495    114.8     5499   115.7    5501   115.6     5515    115.6    5547
GR       116.6     5566    114.6     5585   112.2    5599   112.9     5625    112.6    5661
GR       112.8     5715    113.9     5777   115.5    5834   116.1     5888    116.1    5922

NC         0.1      0.3
X1       22600       37     4989     5010      400     200     290
GR       119.2     4698    119.2     4720   119.2    4743   116.3     4755    108.2    4767
GR         102     4784     99.8     4817    99.5    4848    99.8     4910      100    4958
GR        99.3     4978     98.8     4985    98.6    4988   96.62     4989    96.61    4995
GR       96.61     5006    96.62     5010    97.5    5013    98.9     5027    100.2    5061
GR       101.4     5100    102.9     5133   103.2    5144   101.2     5149     98.1    5154
GR        98.1     5323    100.5     5329   104.1    5348   108.5     5373    110.4    5380
GR       110.4     5397    112.4     5414   113.4    5453   114.4     5530    115.1    5578
GR       116.1     5664    115.6     5711       0       0       0        0        0       0

X1       22900       81     4992     5007      280     310     300
GR       124.3     3658    123.6     3669   120.6    3678   120.1     3683    120.1    3710
GR       120.1     3716    118.7     3732   117.8    3762   115.5     3803    113.5    3833
GR       112.6     3885    111.1     3923   111.5    3941   110.1     3943    110.1    3950
GR       111.1     3953    112.6     3967   113.3    3982   113.1     4063    111.6    4131
GR       111.6     4195    112.1     4281   112.7    4324   116.6     4363    118.7    4387
GR       122.3     4410    122.3     4418   121.6    4424   124.4     4431    126.5    4437
GR         128     4451    129.1     4466   128.5    4467   128.3     4481      127    4499
GR         127     4509    122.4     4521     124    4529   124.1     4538      121    4541
GR       123.7     4550    125.2     4562   125.4    4570   122.4     4575    121.1    4592
GR       119.4     4614    119.8     4662   121.1    4700   121.7     4736    122.1    4778
GR       122.4     4804    123.8     4819   123.6    4831   121.5     4850    122.1    4861
GR       118.1     4871    108.9     4897   101.4    4953   100.4     4976     99.5    4987
GR       97.75     4992    97.72     4996   97.72    5004   97.75     5007     99.4    5010
GR       101.1     5020    102.3     5051   103.6    5070     103     5082    101.7    5091
GR       100.6     5093     98.2     5096    98.2    5396     100     5399    104.7    5416
GR       108.5     5435    108.7     5453   111.6    5474     115     5504    117.3    5564
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GR       116.6     5627        0        0       0       0       0        0        0       0

X1       23170       86     4989     5010      330     260     270
GR       118.3     4015    118.4     4026   118.8    4030   119.1     4055    119.5    4062
GR       122.9     4069    123.3     4086   123.1    4140   121.4     4148    121.5    4193
GR       120.8     4248    119.9     4268   120.7    4299   121.7     4329    121.4    4355
GR       122.1     4379    121.2     4391   112.7    4401   112.8     4415    114.6    4442
GR       113.9     4467    115.7     4486   116.1    4502   114.3     4515    113.4    4528
GR       112.1     4543      112     4564   113.9    4574   117.1     4589    118.5    4596
GR       117.6     4607    116.3     4623   114.9    4634   111.8     4645    111.8    4664
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GR        114.7     4696      119.8     4714      121.8     4732      123.3     4746      123.4     4777
GR        120.7     4814      115.5     4836      112.1     4869      106.6     4900      101.5     4922
GR         99.9     4941       99.8     4972      100.2     4988       99.1     4989      98.91     4997
GR        98.71     5002      99.11     5005       99       5010       99.9     5012      101.1     5029
GR          103     5057      103.5     5083      104.8     5109      106.9     5140      110.5     5166
GR          114     5188      113.9     5190      116.4     5215      120.2     5233      121.4     5267
GR        118.8     5296      113.1     5325      110       5350      109.9     5402      110.9     5431
GR        113.4     5454      113.8     5459      112.3     5461      111.4     5477      112.9     5485
GR        114.7     5493      115.3     5499      113.4     5515      111.8     5529      110.9     5567
GR        111.2     5594      113.5     5619      116.2     5647      118       5687      119       5746
GR        119.4     5847        0         0         0         0         0         0         0         0

X1        23550     37        4991      5008      310       290       380
GR        125.9     4754      125.7     4783      125.1     4802      120.9     4825      111.7     4856
GR        104.6     4893      102.6     4938      102.6     4977      102.6     4988      100.3     4991
GR        100.3     4997      100.1     5001      100.5     5003      100.3     5008      101.9     5012
GR        104.4     5020      104.9     5044      107.7     5068      112.6     5091      114.8     5114
GR        115.9     5156      115.1     5201      112.8     5238      110.7     5271      111.4     5291
GR          112     5327      114.8     5368      116.3     5425      118.4     5525      119.9     5574
GR        120.5     5621      121.1     5626      120.1     5630      121.9     5641      123.7     5647
GR        124.9     5673      126.3     5688        0         0         0         0         0         0

X1        23590     37        4992      5008      40        40        40
GR        125.9     4754      125.7     4783      125.1     4802      120.9     4825      111.7     4856
GR        104.6     4893      102.6     4938      103.85    4972      103.35    4991      101.85    4992
GR       100.45     4998      100.25    5002      100.65    5004      102.15    5008      104.25    5012
GR       105.05     5017      105.15    5057      107.7     5068      112.6     5091      114.8     5114
GR        115.9     5156      115.1     5201      112.8     5238      110.7     5271      111.4     5291
GR          112     5327      114.8     5368      116.3     5425      118.4     5525      119.9     5574
GR        120.5     5621      121.1     5626      120.1     5630      121.9     5641      123.7     5647
GR        124.9     5673      126.3     5688        0         0         0         0         0         0

NC          0.3     0.5
X1        23631     38        4995.5    5004.5    41        41        41
X3           10     105.5     105.3
GR        125.9     4754      125.7     4783      125.1     4802      120.9     4825      111.7     4856
GR        104.6     4893      102.6     4938      105.55    4946      104.65    4992      102.85    4995.5
GR       102.85     4995.6    102.35    4997      101.25    5000      101.55    5003      101.85    5004.5
GR       101.85     5004.6    102.55    5012      106.15    5019      105.35    5079      112.6     5091
GR        114.8     5114      115.9     5156      115.1     5201      112.8     5238      110.7     5271
GR        111.4     5291      112       5327      114.8     5368      116.3     5425      118.4     5525
GR        119.9     5574      120.5     5621      121.1     5626      120.1     5630      121.9     5641
GR        123.7     5647      124.9     5673      126.3     5688        0         0         0         0
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X1        23632     0         0         0         1         1         1
BT           34     4754      125.9     125.9     4783      125.7     125.7     4802      125.1     125.1
BT         4825     120.9     120.9     4856      111.7     111.7     4893      104.6     104.6     4938
BT        102.6     102.6     4946      105.55    105.55    4995.5    106.65    102.85    4995.6    106.65
BT       105.65     5004.5    106.65    105.65    5004.6    106.65    101.85    5012      106.15    102.55
BT         5019     106.15    106.15    5079      105.35    105.35    5091      112.6     112.6     5114
BT        114.8     114.8     5156      115.9     115.9     5201      115.1     115.1     5238      112.8
BT        112.8     5271      110.7     110.7     5291      111.4     111.4     5327      112       112
BT         5368     114.8     114.8     5425      116.3     116.3     5525      118.4     118.4     5574
BT        119.9     119.9     5621      120.5     120.5     5626      121.1     121.1     5630      120.1
BT        120.1     5641      121.9     121.9     5647      123.7     123.7     5673      124.9     124.9
BT         5688     126.3     126.3

X1        23647     37        4994.5    5005.5    15        15        15
BT           32     4754      125.9     125.9     4783      123.7     123.7     4802      125.1     125.1
BT         4825     120.9     120.9     4856      111.7     111.7     4893      104.6     104.6     4938
BT        104.6     104.6     4946      106.75    106.75    4994.5    106.85    102.05    4994.6    106.85
BT       105.55     5005.5    106.85    105.65    5005.6    106.85    101.55    5085      105.45    105.45
BT         5091     112.6     112.6     5114      114.8     114.8     5156      115.9     115.9     5201
BT        115.1     115.1     5238      112.8     112.8     5271      110.7     110.7     5291      111.4
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BT          111.4     5327        112       112     5368     114.8     114.8     5425     116.3     116.3
BT           5525    118.4      118.4      5574    119.9     119.9      5621    120.5     120.5      5626
BT          121.1    121.1       5630     120.1    120.1      5641     121.9    121.9      5647     123.7
BT          123.7     5673      124.9     124.9     5688     126.3     126.3
GR          125.9     4754      125.7     4783     125.1     4802     120.9     4825     111.7     4856
GR          104.6     4893      104.6     4938    106.75     4946    104.65     4992    102.05    4994.5
GR         102.05   4994.6     101.85     4997    101.15     5000    101.25     5003    101.55    5005.5
GR         101.55   5005.6     104.85     5009    105.45     5085     112.6     5091     114.8     5114
GR          115.9     5156      115.1     5201     112.8     5238     110.7     5271     111.4     5291
GR            112     5327      114.8     5368     116.3     5425     118.4     5525     119.9     5574
GR          120.5     5621      121.1     5626     120.1     5630     121.9     5641     123.7     5647
GR          124.9     5673      126.3     5688         0        0         0        0         0        0

X1          23648        0          0        0         1        1         1
X3             10    106.7      105.4

X1          23690       34       4992     5008        42       42        42
GR          125.9     4754      125.7     4783     125.1     4802     120.9     4825     111.7     4856
GR         106.25     4893     106.25     4927    104.85     4981    103.75     4988    102.45     4992
GR         102.25     4994     102.15     5006    102.45     5008    105.65     5014    105.65     5069
GR          112.6     5091      114.8     5114     115.9     5156     115.1     5201     115.8     5238
GR          115.7     5271      115.4     5291       115     5327     115.8     5368     116.3     5425
GR          118.4     5525      119.9     5574     120.5     5621     121.1     5626     120.1     5630
GR          121.9     5641      123.7     5647     124.9     5673     126.3     5688         0        0

NC            0.1      0.3
X1          23920       50       4985     5015       280      200       230
GR          129.1     4264      126.1     4280     123.9     4298       122     4305       121     4315
GR          121.7     4339      121.8     4343     118.5     4348     116.4     4368     115.4     4398
GR          114.5     4443      113.2     4457       109     4480       109     4495       109     4551
GR            109     4569        109     4581     109.3     4601     110.6     4656     111.2     4692
GR          109.3     4748      107.9     4806    106.25     4890    106.25     4935    106.45     4970
GR         104.25     4985     103.05     4993    102.35     5004    103.15     5010    104.25     5015
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GR         107.35     5027     109.25     5056     114.4     5094     118.2     5111     118.4     5125
GR          116.9     5174      114.7     5208     113.6     5227     115.7     5244     116.3     5267
GR          112.5     5294      112.4     5323     112.3     5343     113.3     5380     115.5     5424
GR          117.3     5468      119.9     5521     121.8     5562       124     5595     128.2     5628
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SECNO    DEPTH    CWSEL    CRIWS      WSELK    EG       HV       HL       OLOSS    L-BANK   ELEV
Q        QLOB     QCH      QROB       ALOB     ACH      AROB     VOL      TWA      R-BANK   ELEV
TIME     VLOB     VCH      VROB       XNL      XNCH     XNR      WTN      ELMIN    SSTA
SLOPE    XLOBL    XLCH     XLOBR      ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST


FLOW     DISTRIBU FOR      SECNO=          400 CWSEL=     6.13

STA=        4966     4977       5022     5028
PER      Q=             3       95.4      1.6
AREA=       18.9    167.5       10.8
VEL=           3     10.8        2.8
DEPTH=       1.7      3.7        1.7

FLOW     DISTRIBU FOR      SECNO=        11900 CWSEL=    53.27

STA=        4977     4982       4987     4989     5010     5017     5023
PER      Q=             1.2        4.8      2.3     82.6      7.8      1.2
AREA=        8.1     17.8        8.1    121.5     25.3        8
VEL=         2.7      5.1        5.5     12.9      5.9        3
DEPTH=       1.7      3.6        4.1      5.8      3.6      1.4

FLOW     DISTRIBU FOR      SECNO=        12100 CWSEL=    55.28
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STA=        4978    4985    4989    4991    4993    5006    5008    5015    5032    5037
PER    Q=            0.2       1     1.3     2.6    66.3     2.6     7.5    15.2     2.9
AREA=       3.6     7.7     7.7    10.4    90.3    10.3    30.7    66.9    15.4     4.1
VEL=        1.1     2.4     3.1     4.7      14     4.9     4.6     4.3     3.6     1.7
DEPTH=      0.5     1.9     3.8     5.2     6.9     5.1     4.4     3.9     3.1     1.2

FLOW   DISTRIBU FOR    SECNO=        13950 CWSEL=    67.79

STA=        4906    4983    4990    5010    5018    5084    5325
PER    Q=            5.1     8.7    67.8     5.3    13.1     0.1
AREA=      69.2    48.9   165.6    43.1   164.2   137.8
VEL=        1.4     3.4     7.8     2.3     1.5       0
DEPTH=      0.9       7     8.3     5.4     2.5     0.6

FLOW   DISTRIBU FOR    SECNO=        17050 CWSEL=    81.14

STA=        4910    4922    4955    4978    4984    4990    5009    5009    5015    5020
PER    Q=            0.1     6.3    12.2     4.8     8.7    61.7     0.1     5.7     0.4
AREA=       3.3    47.4    60.6    20.3    29.6   115.5     0.6    22.9     4.2
VEL=        0.6     1.9     2.8     3.3     4.1     7.5     1.6     3.5     1.4
DEPTH=      0.3     1.4     2.6     3.4     4.9     6.1     5.8     3.9     0.9

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T1     THE     CITY    OF      STAMFORD,CT.
T2     TYPE          19 FLOOD  INSURAN( STUDY-STA
T3     NOROTO RIVER-50 YEAR    FLOOD

J1     ICHECK  INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ

     -10     3     4.7

J2     NPROF   IPLOT  PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE

       2    -1    -0.5

FLOW   DISTRIBU FOR    SECNO=          400 CWSEL=     8.37

STA=        4931    4977    5022    5033
PER    Q=            5.4    91.8     2.8
AREA=      60.6     268    30.1
VEL=        3.5    13.4     3.6
DEPTH=      1.3       6     2.8

FLOW   DISTRIBU FOR    SECNO=        11900 CWSEL=    56.47

STA=        4806    4982    4987    4989    5010    5017    5023    5026
PER    Q=            4       6     2.6    73.5     9.6     3.9     0.3
AREA=      81.5    33.8    14.5   188.7    47.7    27.1     4.9
VEL=        1.9     6.9     7.1    15.2     7.9     5.6     2.4
DEPTH=      0.5     6.8     7.3       9     6.8     4.5     1.5

FLOW   DISTRIBU FOR    SECNO=        12100 CWSEL=    58.64

STA=        4826    4977    4989    4993    5006    5015    5032    5037    5139
PER    Q=            7       4.6     3.8    51.2    10.1      17       4     2.3
AREA=     275.4    51.4    31.4   133.9    71.1   123.9    32.2    87.2
VEL=          1     3.5     4.7    14.9     5.6     5.4     4.8       1
DEPTH=      1.8     4.3     7.9    10.3     7.9     7.3     6.4     0.9

FLOW   DISTRIBU FOR    SECNO=        13950 CWSEL=    73.43

STA=        4646    4946    4968    4983    4990    5010    5018    5084    5436
PER    Q=           13.1     6.1     6.1     5.8    40.3     4.4    23.6     0.6
AREA=    1174.5   141.5   124.7    88.4   278.5    88.3   536.7  1973.6
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VEL=          0.4      1.7        1.9       2.6       5.6       1.9       1.7       0
DEPTH=        3.9      6.4        8.3      12.6      13.9        11       8.1       5.6

FLOW    DISTRIBU FOR     SECNO=          17050 CWSEL=      84.26

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SECNO   DEPTH    CWSEL    CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK  ELEV
Q       QLOB     QCH      QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK  ELEV
TIME    VLOB     VCH      VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE   XLOBL    XLCH     XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


STA=        4618     4922       4955      4978      4984      4990      5009      5015      5153
PER     Q=             8.4       14.8      15.3       4.8       6.7      42.1       5.2       2.6
AREA=      405.6    150.4      132.4      39.1      48.4     174.8      42.2      78.1
VEL=          0.6      2.9        3.4       3.7       4.1       7.2       3.7         1
DEPTH=        1.3      4.6        5.8       6.5       8.1       9.2         7       0.6

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T1      THE      CITY     OF        STAMFOR CT.
T2      TYPE          19  FLOOD     INSURAN STUDY-S SIDE      OF        SPLIT     FLOW
T3      NOROTO RIVER-10   YEAR      FLOOD

J1      ICHECK   INQ      NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10       4      4.7

J2      NPROF    IPLOT    PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

        3      -1     -0.5

FLOW    DISTRIBU FOR     SECNO=            400 CWSEL=       9.61

STA=        4858     4961       4977      5022      5035      5038
PER     Q=             0        6.7      89.9       3.4         0
AREA=         77     70.6      324.1        45       0.2
VEL=           0        5       14.7       4.1       0.3
DEPTH=        0.7      4.4        7.2       3.5       0.1

FLOW    DISTRIBU FOR     SECNO=          11900 CWSEL=      57.96

STA=        4680     4970       4982      4987      4989      5010      5017      5023      5028
PER     Q=             3.3       4.9         6       2.6      68.4       9.6       4.5       0.6
AREA=      402.9     53.2      41.3      17.5       220      58.2        36        11
VEL=          0.4      4.9       7.7       7.8      16.5       8.8       6.6         3
DEPTH=        1.4      4.4       8.3       8.8      10.5       8.3         6       2.2

FLOW    DISTRIBU FOR     SECNO=          12100 CWSEL=       60.6

STA=        4620     4977       4985      4991      4993      5006      5015      5032      5037      5070
PER     Q=            11.2       3.2       3.7       2.2      44.2       9.5      16.4         4       5.6
AREA=         744       46      47.3        21     159.4      88.8     157.2        42     107.7     264.7
VEL=          0.8      3.7       4.1       5.5      14.7       5.7       5.5         5       2.7         0
DEPTH=        2.1      5.7       7.9      10.5      12.3       9.9       9.2       8.4       3.3       1.8

FLOW    DISTRIBU FOR     SECNO=          13950 CWSEL=      76.49

STA=        4453     4946       4968      4977      4983      4990      5010      5018      5084      5476
PER     Q=            16.6       7.2       3.3         3       5.2      34.9       4.1        25       0.7
AREA=      2413.3    208.8      92.4      78.2     109.8     339.7     112.7     738.6    3103.3
VEL=          0.4      1.8       1.9       2.1       2.5       5.4       1.9       1.8         0
DEPTH=        4.9      9.5      10.3        13      15.7        17      14.1      11.2       7.9
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FLOW     DISTRIBU FOR     SECNO=          17050 CWSEL=     85.96

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SECNO    DEPTH    CWSEL    CRIWS     WSELK    EG       HV       HL       OLOSS    L-BANK   ELEV
Q        QLOB     QCH      QROB      ALOB     ACH      AROB     VOL      TWA      R-BANK   ELEV
TIME     VLOB     VCH      VROB      XNL      XNCH     XNR      WTN      ELMIN    SSTA
SLOPE    XLOBL    XLCH     XLOBR     ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST


STA=          4574     4922      4955     4978     4984     4990     5009     5015     5023     5180
PER      Q=             12.3      16.5     15.4      4.7        6     36.6      4.9        3      0.5
AREA=        956.5    206.5     171.5     49.3     58.6    207.1     52.4     40.9    295.2
VEL=           0.5      3.3       3.7      3.9      4.3      7.3      3.9      3.1      0.1
DEPTH=         2.7      6.3       7.5      8.2      9.8     10.9      8.7      5.1      1.9

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T1       THE      CITY     OF       STAMFORD,CT.
T2       TYPE          19 FLOOD    INSURAN STUDY-STAM
T3       NOROTO RIVER-50 YEAR      FLOOD

J1       ICHECK   INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -10       5      4.7

J2       NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      15      -1     -0.5



FLOW     DISTRIBU FOR     SECNO=            400 CWSEL=     12.98

STA=          4832     4891      4961     4977     5022     5035     5088     5089
PER      Q=                0       0.1      8.3     82.2      5.2      4.2        0
AREA=        154.4    312.4     124.4    475.4     88.8    131.3      1.1
VEL=           0        0        6.4     16.8      5.6      3.1      1.1
DEPTH=         2.6      4.5       7.8     10.6      6.8      2.5      0.7

FLOW     DISTRIBU FOR     SECNO=          11900 CWSEL=     61.04

STA=          4604     4970      4982     4987     4989     5010     5017     5023     5242
PER      Q=              9.3       6.5      5.8      2.4     59.9      9.3      5.1      1.6
AREA=       1416.4     90.2      56.7     23.7    284.7     79.7     54.5    402.2
VEL=           0.6        7        10       10     20.4     11.3      9.1      0.4
DEPTH=         3.9      7.5      11.3     11.8     13.6     11.4      9.1      1.8

FLOW     DISTRIBU FOR     SECNO=          12100 CWSEL=     64.59

STA=          4534     4977      4985     4991     4993     5006     5015     5032     5037     5044
PER      Q=             16.1         4      3.7      1.9       36      8.5     15.1      3.9        3
AREA=         2369     77.9      71.2       29    211.2    124.6      225     61.9       65    174.2
VEL=           0.7        5         5      6.3     16.5      6.6      6.5      6.1      4.5      4.1
DEPTH=         5.3      9.7      11.9     14.5     16.2     13.8     13.2     12.4      9.3      6.7

FLOW     DISTRIBU FOR     SECNO=          13950 CWSEL=     78.77

STA=          4375     4946      4968     4977     4990     5010     5018     5084     5480
PER      Q=             18.3       7.8      3.5      7.9     32.3      3.9     25.5      0.8
AREA=       3610.2    259.1     112.9    217.8    385.4      131    889.5   4004.7
VEL=           0.5      2.9         3      3.5      8.1      2.9      2.8        0
```

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DEPTH=        6.3      11.8       12.5       16.8       19.3       16.4       13.5       10.1

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SECNO    DEPTH    CWSEL    CRIWS      WSELK    EG       HV       HL       OLOSS    L-BANK   ELEV
Q        QLOB     QCH      QROB       ALOB     ACH      AROB     VOL      TWA      R-BANK   ELEV
TIME     VLOB     VCH      VROB       XNL      XNCH     XNR      WTN      ELMIN    SSTA
SLOPE    XLOBL    XLCH     XLOBR      ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST


FLOW     DISTRIBU FOR      SECNO=          17050 CWSEL=     90.02

STA=          4547     4890       4922       4955       4978       4984       4990       5009       5015       5023
PER      Q=             4.2       13.4       18.3       15.3        4.4        5.2       29.9        4.5        3.9
AREA=         2150    278.9      340.4      264.9       73.6       82.9      284.2       76.8       73.3     1061.6
VEL=           0.2      3.7        4.2        4.5        4.7        4.9        8.2        4.6        4.1        0.1
DEPTH=         6.3      8.7       10.3       11.5       12.3       13.8         15       12.8        9.2        4.8

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THIS     RUN      EXECUTI  11-Sep-08  11:18:49
****************************************
HEC-2    WATER    SURFACI PROFILES

Version  4.6.2;   May              1991
****************************************


NOTE-    ASTERISI (*)      AT         LEFT       OF         CROSS-SI NUMBER INDICATI MESSAGI IN


NOROTO RIVER      -                 10 YEAR

SUMMAF PRINTOU TABLE            100


SECNO    EGLWC    ELLC     EGPRS      ELTRD      QPR        QWEIR    CLASS    H3       DEPTH    CWSEL

*            990    43.09      16.23       10.6         18     1900        0       10     0.19      3.95
*            990       19      16.23         19         18  4481.71   169.01       30     1.54      9.71
*            990    21.85      16.23      23.26         18  4585.69   720.54       30        0     11.08
*            990    28.96      16.23      50.68         18  5427.52  4280.15       30        0     17.46

*           3778    27.32      39.37          0       53.5     1900        0       59        0     11.75
     3778   32.55    39.37          0       53.5     3900        0       59        0    16.08      31.2
     3778   35.66    39.37          0       53.5     5300        0       59        0    18.41     33.53
     3778   44.02    39.37      44.84       53.5     9700        0       10        0    26.06     41.18

     4528   30.64    36.31          0      40.58     1900        0       59        0     5.74     29.04
     4528   35.53    36.31          0      40.58     3900        0       59        0    10.03     33.33
     4528   38.77    36.31      39.36      40.58     5300        0       10        0    14.32     37.62
     4528   46.75    36.31      56.89      40.58   499.17  9201.39       30        0    22.65     45.95

     6488   35.91    42.93          0      45.94     1900        0        1        0     8.19     35.73
     6488   39.25    42.93          0      45.94     3900        0        1     0.01    11.41     38.95
     6488   41.78    42.93          0      45.94     5300        0        1     0.01    13.92     41.46
     6488   47.61    42.93      48.53      45.94  8754.51   933.64       30     0.01    20.45     47.99

    13122   67.02 56.068969      58.99       1.37   1902.9       30        0     9.25    65.31      3.89
*           13122    71.45 56.06*******      58.99       0.93  3927.34       30        0    10.39     66.45
*           13122    72.61 56.06*******      58.99       0.93  5306.84       30        0    10.43     66.49
    13122   76.26 56.06****      58.99       0.18  9781.02       30        0    14.42    70.48      5.39
```

*	13846	68.05	71.3	0	76	1900	0	59	0	7.49
*	13846	72.31	71.3	71.37	76	3900	0	59	0	11.18
*	13846	75.18	71.3	76.21	76	4854.97	449.74	30	0	11.88
*	13846	78.62	71.3	98.26	76	1623.21	8077.37	30	0	18.92
*	14883	71.57	69.98	72.57	71.48	1283.35	112.47	30	0	3.47
*	14883	74.62	69.98	86.2	71.48	849.24	2132.38	30	0	10.21
*	14883	77.06	69.98	102.12	71.48	127.32	4058.99	30	0	12.85
*	14883	79.77	69.98	169.51	71.48	134.19	7636.1	30	0	15.54

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SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL
*	18241	87.14	84.95	89.05	87.9	1358.33	38.58	30	0	9.17
*	18241	91.38	84.95	103.37	87.9	1631.59	1356.25	30	0	13.25
*	18241	91.39	84.95	119.62	87.9	1503.19	2655.84	30	0	14.19
*	18241	93.68	84.95	196.71	87.9	1586.95	6233.93	30	0	15.81

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NOROTO RIVER - 10 YEAR

SUMMAF PRINTOU TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
190	0	0	0	1.14	1900	4.7	4.31	5.53	79.65	7.32
*	190	0	0	0	1.14	3900	5.69	5.69	7.55	119.05
*	190	0	0	0	1.14	5300	6.55	6.55	8.79	111.69
*	190	0	0	0	1.14	9700	8.75	8.75	12.14	104.63
*	400	210	0	0	1.95	1900	6.13	6.13	7.87	106.42
*	400	210	0	0	1.95	3900	8.37	8.37	10.93	86.74
*	400	210	0	0	1.95	5300	9.61	9.61	12.64	81.45
*	400	210	0	0	1.95	9700	12.98	12.98	16.6	63.66
580	180	0	0	2.4	1900	8.69	7.15	9.33	54.59	7.53
*	580	180	0	0	2.4	3900	11.59	9.72	11.95	25.67
*	580	180	0	0	2.4	5300	13.25	10.49	13.52	16.96
*	580	180	0	0	2.4	9700	17.11	12.02	17.33	10.2
689	109	0	0	3.11	1900	9.25	6.97	9.88	47.12	6.37
*	689	109	0	0	3.11	3900	11.52	9.08	12.88	68.77
*	689	109	0	0	3.11	5300	12.8	10.35	14.67	79.9
*	689	109	0	0	3.11	9700	15.65	13.74	19.32	109.8
*	990	300	18	16.23	8.3	1900	12.25	12.12	13.86	231.52
*	990	300	18	16.23	8.3	3900	18.01	0	19	46.82
*	990	300	18	16.23	8.3	5300	19.38	0	20.63	51.04
*	990	300	18	16.23	8.3	9700	25.76	0	26.62	22.64
*	1100	110	0	0	7.9	1900	14.28	13.25	15.47	89.27
1100	110	0	0	7.9	3900	18.41	15.73	19.64	48.08	9.67
1100	110	0	0	7.9	5300	19.89	17.11	21.15	45.32	10.31
*	1100	110	0	0	7.9	9700	26.66	21.26	26.93	8.41
*	1300	200	0	0	7.83	1900	15.23	15.23	17.72	46.86
*	1300	200	0	0	7.83	3900	19.53	19.53	21.65	23.9
*	1300	200	0	0	7.83	5300	20.78	20.78	22.93	23.62
1300	200	0	0	7.83	9700	26.32	23.1	27.28	9.27	11.57

*		1500	200	0	0	7.76	1900	18.08	12.71	18.28	8.46
*		1500	200	0	0	7.76	3900	21.85	15.08	22.09	7.53
*		1500	200	0	0	7.76	5300	23.1	16.35	23.39	8.75
	1500	200	0	0	7.76	9700	27.23	19.58	27.51	7.14	5.6
*		1750	250	0	0	7.67	1900	18.13	12.66	18.42	2.85
*		1750	250	0	0	7.67	3900	21.81	15.11	22.28	3.29
*		1750	250	0	0	7.67	5300	22.99	16.52	23.65	4.26
	1750	250	0	0	7.67	9700	26.93	20.58	27.85	4.83	8.94

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
*		2000	250	0	0	8.52	1900	18.4	12.26	18.48	1
*		2000	250	0	0	8.52	3900	22.26	14.12	22.35	0.84
*		2000	250	0	0	8.52	5300	23.63	15.31	23.75	0.99
*		2000	250	0	0	8.52	9700	27.81	18.07	27.97	1.08
	2250	250	0	0	9.37	1900	18.48	12.64	18.51	0.64	2
	2250	250	0	0	9.37	3900	22.34	13.9	22.38	0.49	2.25
	2250	250	0	0	9.37	5300	23.73	14.72	23.77	0.56	2.56
*		2250	250	0	0	9.37	9700	27.96	16.59	28	0.53
	2500	250	0	0	10.22	1900	18.52	12.48	18.53	0.8	1.35
	2500	250	0	0	10.22	3900	22.38	13.26	22.39	0.5	1.39
	2500	250	0	0	10.22	5300	23.78	13.74	23.79	0.52	1.54
	2500	250	0	0	10.22	9700	28.01	14.91	28.02	0.44	1.71
*		2750	250	0	0	11.07	1900	17.93	16.02	18.86	37.9
*		2750	250	0	0	11.07	3900	22.22	19.71	22.5	10.03
*		2750	250	0	0	11.07	5300	23.66	20.58	23.89	8.39
*		2750	250	0	0	11.07	9700	27.93	22.28	28.08	5
	2950	200	0	0	11.75	1900	19.3	16.16	19.74	46.12	5.31
*		2950	200	0	0	11.75	3900	22.33	18.48	23.01	53.81
*		2950	200	0	0	11.75	5300	23.57	19.75	24.41	55.86
*		2950	200	0	0	11.75	9700	27.62	23.19	28.52	40.51
	3100	150	0	0	12.26	1900	19.92	16.77	20.41	41.79	5.87
	3100	150	0	0	12.26	3900	22.95	19.04	23.83	49.47	8.07
	3100	150	0	0	12.26	5300	24.15	20.37	25.39	60.56	9.61
	3100	150	0	0	12.26	9700	28.04	23.8	29.23	48.3	10.44
	3300	200	0	0	13.06	1900	20.77	18.26	21.53	67.63	7.74
	3300	200	0	0	13.06	3900	23.89	20.97	25.16	76.33	10.33
	3300	200	0	0	13.06	5300	25.29	22.49	26.94	86.84	11.96
	3300	200	0	0	13.06	9700	29.19	28.56	30.24	54.46	11.42
	3570	220	0	0	14.15	1900	22.23	19.32	22.77	47.1	6.47
	3570	220	0	0	14.15	3900	25.65	21.77	26.48	47.12	8.28
	3570	220	0	0	14.15	5300	27.4	23.05	28.39	48.45	9.26
	3570	220	0	0	14.15	9700	30.17	27.52	31.68	66.37	12.36
*		3680	160	0	0	17.28	1900	24.32	24.32	27.07	325.4
*		3680	160	0	0	17.28	3900	27.7	27.7	32.14	277.63
*		3680	160	0	0	17.28	5300	29.71	29.71	35.16	259.17
*		3680	160	0	0	17.28	9700	35.08	35.08	43.27	228.32
*		3681	1	0	0	17.28	1900	25.4	24.3	27.32	10.83
*		3681	1	0	0	17.28	3900	29.44	27.66	32.55	9.23
*		3681	1	0	0	17.28	5300	31.84	29.67	35.66	8.64
*		3681	1	0	0	17.28	9700	38.35	35.07	44.02	7.49

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
*	3778	97	53.5	39.37	15.12	1900	26.87	22.25	27.71	4.78
3778	97	53.5	39.37	15.12	3900	31.2	25.68	33.02	8.64	10.82
3778	97	53.5	39.37	15.12	5300	33.53	27.6	36.12	11.7	12.91
3778	97	53.5	39.37	15.12	9700	41.18	0	44.84	5.03	15.36
*	3779	1	0	0	15.12	1900	26.89	22.28	27.72	25.25
*	3779	1	0	0	15.12	3900	31.41	25.73	33.07	30.58
*	3779	1	0	0	15.12	5300	34.05	27.78	36.24	32.33
*	3779	1	0	0	15.12	9700	41.18	33.18	44.84	34.05
3870	91	0	0	19.91	1900	27.13	25.21	28.03	38.58	8.6
*	3870	91	0	0	19.91	3900	32.87	27.89	33.55	14.69
*	3870	91	0	0	19.91	5300	36.26	29.35	36.86	10.01
*	3870	91	0	0	19.91	9700	45.73	32.79	45.94	2.73
*	4100	230	0	0	20.09	1900	28.29	26.18	28.5	10.43
*	4100	230	0	0	20.09	3900	33.63	27.73	33.72	2.57
*	4100	230	0	0	20.09	5300	36.92	28.41	36.99	1.64
*	4100	230	0	0	20.09	9700	45.95	29.95	45.98	0.59
*	4375	275	0	0	20.3	1900	28.37	26.23	29.09	29.22
*	4375	275	0	0	20.3	3900	33.53	28.9	33.92	9.29
*	4375	275	0	0	20.3	5300	36.87	30.27	37.11	4.63
4375	275	0	0	20.3	9700	45.93	33.28	46.02	1.19	3.43
*	4475	105	0	0	22.9	1900	28.47	27.61	30.03	102.94
*	4475	105	0	0	22.9	3900	32.99	30.33	34.89	70.02
*	4475	105	0	0	22.9	5300	36.09	31.95	38.12	59.49
*	4475	105	0	0	22.9	9700	45.94	36.33	46.05	4.29
4528	53	40.58	36.31	23.3	1900	29.04	28.16	30.58	99.01	9.96
4528	53	40.58	36.31	23.3	3900	33.33	30.85	35.31	73	11.3
4528	53	40.58	36.31	23.3	5300	37.62	0	39.36	47.91	10.61
4528	53	40.58	36.31	23.3	9700	45.95	0	46.05	3.94	3.91
*	4630	95	0	0	24.9	1900	30.65	28.79	31.34	33.11
*	4630	95	0	0	24.9	3900	35.34	30.95	35.99	16.1
*	4630	95	0	0	24.9	5300	39.37	32.23	39.89	7.85
4630	95	0	0	24.9	9700	45.88	35.34	46.19	3.45	5.13
*	4850	220	0	0	25.2	1900	31.39	30.41	32.5	73.11
4850	220	0	0	25.2	3900	35.88	32.97	36.44	24.01	7.84
4850	220	0	0	25.2	5300	39.85	34.26	40.11	9.52	6.09
4850	220	0	0	25.2	9700	46.08	36.6	46.31	6.53	6.4
*	5100	250	0	0	25.55	1900	33.07	30.16	33.24	13.78
*	5100	250	0	0	25.55	3900	36.65	31.89	36.82	9.75
5100	250	0	0	25.55	5300	40.17	32.65	40.29	5.51	4.63
5100	250	0	0	25.55	9700	46.31	34.44	46.44	4.32	5.18

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
5300	200	0	0	25.82	1900	33.31	31.07	33.64	23.14	5.86
5300	200	0	0	25.82	3900	36.8	32.99	37.1	16.1	6.38
5300	200	0	0	25.82	5300	40.23	33.79	40.46	9.17	5.81
5300	200	0	0	25.82	9700	46.33	35.8	46.59	7.34	6.61
*	5500	200	0	0	26.1	1900	33.52	31.6	34.47	48.92
*	5500	200	0	0	26.1	3900	36.81	34.89	37.75	35.52
5500	200	0	0	26.1	5300	40.28	36.14	40.76	15.29	7.32

	5500	200	0	0	26.1	9700	46.44	38.76	46.76	8.32	6.93
*	5700	200	0	0	26.37	1900	34.64	31.17	35.11	20.52	
	5700	200	0	0	26.37	3900	37.72	33.61	38.27	18.45	6.92
	5700	200	0	0	26.37	5300	40.66	35.65	41.01	10.25	6.06
	5700	200	0	0	26.37	9700	46.63	38.39	46.9	6.38	6.08
	5900	200	0	0	26.63	1900	35.14	30.87	35.44	12.46	4.69
	5900	200	0	0	26.63	3900	38.24	33.1	38.56	10.93	5.46
	5900	200	0	0	26.63	5300	40.96	35	41.18	6.73	4.95
	5900	200	0	0	26.63	9700	46.83	37.82	47.01	4.35	5.03
	6100	200	0	0	27.1	1900	35.3	31.18	35.65	7.87	5.02
	6100	200	0	0	27.1	3900	38.2	33.42	38.89	10.56	7.15
	6100	200	0	0	27.1	5300	40.8	34.72	41.46	8.29	7.32
	6100	200	0	0	27.1	9700	46.58	38.53	47.26	6.15	8
	6330	230	0	0	27.2	1900	35.54	31.23	35.82	6.23	4.49
	6330	230	0	0	27.2	3900	38.59	33.27	39.11	8.09	6.34
	6330	230	0	0	27.2	5300	41.07	34.48	41.65	7.05	6.78
	6330	230	0	0	27.2	9700	46.65	37.67	47.44	6.47	8.18
	6435	105	0	0	27.84	1900	35.73	31.23	35.91	5.1	3.36
	6435	105	0	0	27.84	3900	38.95	33.02	39.25	6.02	4.42
	6435	105	0	0	27.84	5300	41.46	34.03	41.78	5.11	4.56
	6435	105	0	0	27.84	9700	47.21	36.67	47.61	4	5.08
	6488	53	45.94	42.93	27.54	1900	35.73	0	35.91	4.97	3.25
	6488	53	45.94	42.93	27.54	3900	38.95	0	39.25	5.41	4.2
	6488	53	45.94	42.93	27.54	5300	41.46	0	41.78	4.34	4.35
	6488	53	45.94	42.93	27.54	9700	47.99	0	48.29	2.44	4.5
*	6580	102	0	0	29.14	1900	35.74	32.82	36.07	14.94	
*	6580	102	0	0	29.14	3900	38.93	34.6	39.46	14.26	
*	6580	102	0	0	29.14	5300	41.48	35.66	41.92	9.56	
	6580	102	0	0	29.14	9700	48.17	38.36	48.35	2.93	4.58
*	6800	220	0	0	29.47	1900	36.15	31.86	36.18	1.67	
*	6800	220	0	0	29.47	3900	39.52	32.69	39.58	1.43	
*	6800	220	0	0	29.47	5300	41.95	33.19	42.01	1.16	
*	6800	220	0	0	29.47	9700	48.33	34.51	48.38	0.62	

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
	7000	200	0	0	29.59	1900	36.19	31.63	36.21	0.88	1.13
	7000	200	0	0	29.59	3900	39.57	32.33	39.6	0.75	1.43
	7000	200	0	0	29.59	5300	42	32.72	42.03	0.6	1.5
*	7000	200	0	0	29.59	9700	48.37	33.78	48.39	0.3	
	7200	200	0	0	29.72	1900	36.21	31.75	36.23	0.98	1.19
	7200	200	0	0	29.72	3900	39.59	32.43	39.62	0.84	1.5
	7200	200	0	0	29.72	5300	42.01	32.83	42.04	0.68	1.59
	7200	200	0	0	29.72	9700	48.38	33.93	48.4	0.25	1.29
*	7400	200	0	0	29.64	1900	36.22	32.2	36.26	2.11	
*	7400	200	0	0	29.64	3900	39.59	33.07	39.65	1.72	
	7400	200	0	0	29.64	5300	42	33.56	42.07	1.35	2.21
	7400	200	0	0	29.64	9700	48.38	34.93	48.41	0.47	1.76
*	7600	200	0	0	29.76	1900	36.19	33.14	36.37	6.46	
*	7600	200	0	0	29.76	3900	39.5	34.52	39.77	5.13	
*	7600	200	0	0	29.76	5300	41.9	35.3	42.18	3.99	
*	7600	200	0	0	29.76	9700	48.26	37.4	48.48	2.02	

7800	200	0	0	29.88	1900	36.32	33.26	36.51	6.65	3.53
7800	200	0	0	29.88	3900	39.59	34.62	39.88	5.37	4.37
7800	200	0	0	29.88	5300	41.97	35.45	42.27	4.18	4.54
7800	200	0	0	29.88	9700	48.37	37.62	48.53	1.61	3.83
*	8000	200	0	0	30	1900	36.36	33.99	36.76	14.36
8000	200	0	0	30	3900	39.58	35.74	40.1	10.58	6.07
8000	200	0	0	30	5300	41.95	36.91	42.44	7.63	6.08
8000	200	0	0	30	9700	48.45	39.54	48.57	1.72	3.95
8250	250	0	0	30	1900	36.74	33.99	37.08	11.22	4.77
8250	250	0	0	30	3900	39.87	35.74	40.35	9.42	5.86
8250	250	0	0	30	5300	42.19	36.9	42.62	6.65	5.76
8250	250	0	0	30	9700	48.53	39.49	48.6	1.23	3.34
*	8500	250	0	0	31.13	1900	36.67	36.67	38.47	110.89
*	8500	250	0	0	31.13	3900	39.02	39.02	41.65	105.22
*	8500	250	0	0	31.13	5300	41.53	40.77	43.41	56.59
8500	250	0	0	31.13	9700	48.58	44.53	48.64	2.41	4.29
8750	250	0	0	31.7	1900	38.56	38.33	40.8	70.37	13.01
*	8750	250	0	0	31.7	3900	42.07	42.07	44.75	53.79
*	8750	250	0	0	31.7	5300	43.85	43.85	46.38	46.08
*	8750	250	0	0	31.7	9700	46.62	46.62	49.77	52.24
*	9000	250	0	0	32.27	1900	41.1	36.96	41.39	6.84
*	9000	250	0	0	32.27	3900	45.03	40.22	45.26	4.46
*	9000	250	0	0	32.27	5300	46.62	41.29	46.86	4.46
*	9000	250	0	0	32.27	9700	50.01	43.57	50.33	5.15

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
9250	250	0	0	32.83	1900	41.49	37.79	41.6	8.58	3.45
9250	250	0	0	32.83	3900	45.33	39.67	45.39	4.2	3.15
9250	250	0	0	32.83	5300	46.93	40.58	46.99	4.02	3.36
9250	250	0	0	32.83	9700	50.4	42.26	50.48	4.41	4.12
9500	250	0	0	33.4	1900	41.62	39.08	41.94	15.44	5.55
9500	250	0	0	33.4	3900	45.41	41.34	45.5	4.41	3.92
9500	250	0	0	33.4	5300	47.01	42.45	47.07	2.79	3.41
*	9500	250	0	0	33.4	9700	50.51	44.13	50.54	1.52
*	9750	250	0	0	34.83	1900	41.84	40.25	42.64	39.38
9750	250	0	0	34.83	3900	45.49	43.7	45.67	8.9	5.1
9750	250	0	0	34.83	5300	47.08	44.58	47.15	4.24	3.9
9750	250	0	0	34.83	9700	50.54	45.58	50.58	1.99	3.19
10000	250	0	0	36.26	1900	43.47	42.03	44.03	74.14	7.88
*	10000	250	0	0	36.26	3900	45.89	44.44	46.03	21.33
*	10000	250	0	0	36.26	5300	47.25	44.83	47.33	11.69
*	10000	250	0	0	36.26	9700	50.61	45.71	50.65	4.2
*	10794	50	0	0	37.05	1900	43.5	42.04	44.31	26.36
10794	50	0	0	37.05	3900	45.51	44.98	46.33	22.19	8.07
10794	50	0	0	37.05	5300	47.05	45.72	47.49	13.42	6.69
10794	50	0	0	37.05	9700	50.54	47.17	50.71	4.95	5.04
*	60	60	0	0	38.75	1286	44.08	42.28	44.55	56.58
*	60	60	0	0	38.75	2549	46.14	44.58	46.53	34.03
*	60	60	0	0	38.75	3447	47.28	45.28	47.61	25.93
*	60	60	0	0	38.75	6104	50.59	46.69	50.75	10.22
110	50	0	0	38.95	1286	44.34	42.71	44.87	65.99	5.9
*	110	50	0	0	38.95	2549	46.13	44.7	46.87	71.92

*	110	50	0	0	38.95	3447	47.17	45.62	47.94	67.48
*	110	50	0	0	38.95	6104	50.5	47.68	50.9	27.02
*	250	140	0	0	38.65	1286	45.25	43.02	45.47	27.94
*	250	140	0	0	38.65	2549	47.17	45	47.37	18.54
*	250	140	0	0	38.65	3447	48.19	45.62	48.39	16.31
*	250	140	0	0	38.65	6104	50.96	46.8	51.14	10.87
*	390	140	0	0	40.65	1286	45.68	44.48	46.15	70.25
390	140	0	0	40.65	2549	47.49	46.29	47.78	35.98	5.26
390	140	0	0	40.65	3447	48.47	46.73	48.73	28.02	5.2
390	140	0	0	40.65	6104	51.14	47.77	51.35	15.65	4.92
480	90	0	0	40.75	1286	46.4	45.3	46.78	61.92	5.26
480	90	0	0	40.75	2549	47.8	46.6	48.33	63.39	6.46
480	90	0	0	40.75	3447	48.67	47.3	49.21	54.98	6.73
480	90	0	0	40.75	6104	51.25	48.71	51.62	28	6.2

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
575	95	0	0	40.85	1286	46.96	44.83	47.22	32.62	4.29
*	575	95	0	0	40.85	2549	48.48	46.73	48.78	31.48
575	95	0	0	40.85	3447	49.31	47.44	49.62	29.75	5.36
575	95	0	0	40.85	6104	51.58	48.64	51.87	21	5.53
667	92	0	0	42.15	1286	47.3	45.69	47.59	43.13	4.62
667	92	0	0	42.15	2549	48.79	47.03	49.18	45.8	5.69
667	92	0	0	42.15	3447	49.59	47.89	50.03	44.57	6.16
667	92	0	0	42.15	6104	51.74	49.24	52.2	34.81	6.6
*	767	100	0	0	41.75	1286	47.66	46.84	48.33	103.76
*	767	100	0	0	41.75	2549	49.09	48.57	49.98	104.42
*	767	100	0	0	41.75	3447	49.87	49.33	50.78	95.73
767	100	0	0	41.75	6104	51.99	50.76	52.71	59.76	8.31
*	787	20	0	0	42.85	1286	48.22	46.54	48.5	38.73
*	787	20	0	0	42.85	2549	49.86	48.26	50.15	31.05
*	787	20	0	0	42.85	3447	50.61	48.77	50.95	31.97
787	20	0	0	42.85	6104	52.42	49.93	52.83	31.63	6.35
800	60	0	0	42.85	1286	48.58	45.91	48.71	30.63	2.92
800	60	0	0	42.85	2549	50.12	47.3	50.31	22.25	3.45
800	60	0	0	42.85	3447	50.88	48.41	51.11	22.01	3.85
800	60	0	0	42.85	6104	52.66	49.45	52.98	21.7	4.71
*	11720	79	0	0	42.45	1900	48.5	46.81	49	18.72
*	11720	79	0	0	42.45	3900	49.81	49.01	50.7	25.06
11720	79	0	0	42.45	5300	50.49	49.91	51.55	26.92	8.94
*	11720	79	0	0	42.45	9700	52.2	51.68	53.45	26.85
*	11150	255	0	0	42.85	1900	48.56	48.56	50.55	56.42
*	11150	255	0	0	42.85	3900	51.42	51.42	53.53	38.62
*	11150	255	0	0	42.85	5300	52.7	52.7	54.81	34.99
*	11150	255	0	0	42.85	9700	55.3	55.3	56.96	26.89
*	11400	250	0	0	44.28	1900	51.6	51.6	52.83	40.91
*	11400	250	0	0	44.28	3900	53.26	53.26	54.71	45.19
11400	250	0	0	44.28	5300	54.71	54	55.79	31.8	12.99
11400	250	0	0	44.28	9700	56.48	55.91	57.84	38.3	15.94
11570	170	0	0	45.26	1900	52.16	51.15	53.57	32.96	10.43
*	11570	170	0	0	45.26	3900	54.69	54.69	56.57	33.18
*	11570	170	0	0	45.26	5300	56	56	57.62	27.88
*	11570	170	0	0	45.26	9700	57.94	57.94	59.63	29.62

11700	130	0	0	46	1900	53.04	51.32	54.04	32.76	8.91
11700	130	0	0	46	3900	55.19	54.16	57.08	46.76	12.8
*	11700	130	0	0	46	5300	55.97	55.97	58.5	59.81
*	11700	130	0	0	46	9700	58.91	58.91	61.77	56.96

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
*	11900	200	0	0	46.82	1900	53.27	53.27	55.47	87.58
*	11900	200	0	0	46.82	3900	56.47	56.47	59.23	67.33
*	11900	200	0	0	46.82	5300	57.96	57.96	60.98	64.63
*	11900	200	0	0	46.82	9700	61.04	61.04	64.94	70.14
*	12100	200	0	0	47.63	1900	55.28	55.28	57.38	85.06
12100	200	0	0	47.63	3900	58.64	58.3	60.5	57.31	14.9
12100	200	0	0	47.63	5300	60.6	59.46	62.14	44.26	14.71
12100	200	0	0	47.63	9700	64.59	61.95	66.14	38.42	16.54
12500	400	0	0	49.26	1900	58.36	57.18	59.88	48.04	12.31
*	12500	400	0	0	49.26	3900	61.04	61.04	62.69	47.61
12500	400	0	0	49.26	5300	62.53	62.01	63.76	37.14	14.1
12500	400	0	0	49.26	9700	66.69	63.79	67.31	20.11	12.51
*	12800	300	0	0	50.48	1900	59.39	57.03	60.76	22.08
12800	300	0	0	50.48	3900	60.52	60.48	64.91	59.59	16.9
*	12800	300	0	0	50.48	5300	64.82	64.82	66.35	16.76
*	12800	300	0	0	50.48	9700	66.47	66.47	68.31	22.25
13000	200	0	0	51.3	1900	60.12	57.52	61.18	17.61	8.5
*	13000	200	0	0	51.3	3900	64.53	60.63	65.71	12.8
13000	200	0	0	51.3	5300	64.96	62.89	66.8	19.79	12.33
*	13000	200	0	0	51.3	9700	66.98	66.98	69.88	29.87
*	13120	120	0	0	50.49	1900	60.89	56.05	61.45	6.89
13120	120	0	0	50.49	3900	64.87	58.93	65.88	8.11	8.27
13120	120	0	0	50.49	5300	65.37	61.94	67.04	12.97	10.72
*	13120	120	0	0	50.49	9700	70.02	68.33	70.69	5.83
13122	2	58.99	56.06	56.06	1900	65.31	0	65.53	9.55	3.89
*	13122	2	58.99	56.06	56.06	3900	66.45	0	67.02	23.53
*	13122	2	58.99	56.06	56.06	5300	66.49	0	67.52	42.64
13122	2	58.99	56.06	56.06	9700	70.48	0	70.69	9.86	5.39
13170	48	0	0	55.8	1900	65.39	61.08	65.58	11.17	3.85
*	13170	48	0	0	55.8	3900	67.02	63.22	67.21	11.94
*	13170	48	0	0	55.8	5300	67.66	65.68	67.87	13.3
13170	48	0	0	55.8	9700	70.63	66.99	70.75	6.97	4.29
*	13350	180	0	0	55.86	1900	65.64	60.23	65.69	2.97
*	13350	180	0	0	55.86	3900	67.26	61.74	67.34	4.34
*	13350	180	0	0	55.86	5300	67.92	63.17	68.02	5.33
13350	180	0	0	55.86	9700	70.76	65.1	70.84	4.03	3.28
*	13550	200	0	0	55.94	1900	65.69	63.06	65.82	9.98
*	13550	200	0	0	55.94	3900	67.35	64.64	67.52	12.62
*	13550	200	0	0	55.94	5300	68.03	65.25	68.24	14.92
*	13550	200	0	0	55.94	9700	70.83	66.75	71.01	10.88

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH

*	13730	180	0	0	56	1900	65.39	63.07	66.49	58.79
*	13730	180	0	0	56	3900	67.05	67.05	68.8	87.37
*	13730	180	0	0	56	5300	68.06	68.06	69.9	88.98
*	13730	180	0	0	56	9700	70.02	70.02	72.34	105.05
*	13834	104	0	0	58.9	1900	65.99	64.7	67.68	137.92
*	13834	104	0	0	58.9	3900	67.92	67.92	72.15	262.38
*	13834	104	0	0	58.9	5300	69.84	69.84	75.03	261.96
*	13834	104	0	0	58.9	9700	76.92	76.92	78.02	49.94
*	13846	12	76	71.3	58.6	1900	66.09	64.8	67.79	65.35
*	13846	12	76	71.3	58.6	3900	69.78	68.05	72.69	70.25
*	13846	12	76	71.3	58.6	5300	70.48	0	75.19	106.34
*	13846	12	76	71.3	58.6	9700	77.52	77.43	78.73	24.08
*	13950	104	0	0	59.1	1900	67.79	65.9	68.44	19.27
*	13950	104	0	0	59.1	3900	73.43	68.53	73.64	5.08
*	13950	104	0	0	59.1	5300	76.49	69.49	76.66	3.62
*	13950	104	0	0	59.1	9700	78.77	71.52	79.11	6.83
*	14250	300	0	0	60.03	1900	68.67	66	68.74	4.34
*	14250	300	0	0	60.03	3900	73.68	67.76	73.69	0.49
*	14250	300	0	0	60.03	5300	76.68	68.19	76.69	0.25
*	14250	300	0	0	60.03	9700	79.15	69.25	79.17	0.37
*	14500	250	0	0	60.8	1900	68.59	68.07	69.04	20.53
*	14500	250	0	0	60.8	3900	73.68	69.21	73.72	1.61
*	14500	250	0	0	60.8	5300	76.68	69.68	76.7	0.76
*	14500	250	0	0	60.8	9700	79.15	70.79	79.19	1.07
*	14750	250	0	0	61.58	1400	69.29	69.29	70.38	70.78
*	14750	250	0	0	61.58	2975	73.73	70.77	73.76	2.47
14750	250	0	0	61.58	4150	76.71	71.21	76.72	0.72	1.52
14750	250	0	0	61.58	7800	79.19	72.02	79.21	0.82	1.8
14837	87	0	0	63.68	1400	69.64	68.64	71.26	70.44	10.21
*	14837	87	0	0	63.68	2975	72.98	72.76	74.62	46.56
*	14837	87	0	0	63.68	4150	76.4	73.89	77.06	16.6
*	14837	87	0	0	63.68	7800	78.67	76.1	79.77	25.48
*	14883	46	71.48	69.98	64.08	1400	67.55	0	72.1	393.07
*	14883	46	71.48	69.98	64.08	2975	74.29	0	74.62	12.12
*	14883	46	71.48	69.98	64.08	4150	76.93	0	77.06	4.14
*	14883	46	71.48	69.98	64.08	7800	79.62	0	79.77	4.26
*	14950	67	0	0	64.12	1400	73.44	69.92	73.55	5.38
14950	67	0	0	64.12	2975	74.41	71.49	74.72	14.91	6.82
*	14950	67	0	0	64.12	4150	76.91	72.27	77.17	10.52
*	14950	67	0	0	64.12	7800	79.51	74.13	79.97	16.47

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
15200	250	0	0	65.37	1400	73.56	69.58	73.68	5.75	3.06
15200	250	0	0	65.37	2975	74.71	71.37	75.07	13.63	5.16
15200	250	0	0	65.37	4150	77.09	72.31	77.41	8.74	4.84
15200	250	0	0	65.37	7800	79.76	74.6	80.34	12.04	6.55
*	15430	230	0	0	66.53	1400	72.72	72.65	74.53	89.54
*	15430	230	0	0	66.53	2975	75.34	75.34	77.88	87.46
*	15430	230	0	0	66.53	4150	76.92	76.92	79.65	80.86
*	15430	230	0	0	66.53	7800	79.96	79.96	83.62	87.37
15700	270	0	0	67.88	1400	75.19	74.44	76.37	50.61	9.41
*	15700	270	0	0	67.88	2975	78.5	76.98	79.05	19.36

*	15700	270	0	0	67.88	4150	80.16	77.74	80.65	14.83
*	15700	270	0	0	67.88	7800	84.07	79.53	84.54	9.82
*	15950	250	0	0	69.14	1400	76.76	75.07	77.07	15.86
15950	250	0	0	69.14	2975	78.97	76.55	79.47	17.17	6.86
15950	250	0	0	69.14	4150	80.45	77.4	81.03	16.02	7.32
15950	250	0	0	69.14	7800	84.21	79.52	84.82	11.82	7.69
*	16250	300	0	0	70.64	1400	77.31	76.58	78.02	48.58
16250	300	0	0	70.64	2975	79.76	78.48	80.19	27.66	7.3
16250	300	0	0	70.64	4150	81.32	79.17	81.63	18.29	6.63
16250	300	0	0	70.64	7800	85	80.66	85.23	10.24	6.09
*	16500	250	0	0	71.89	1400	78.41	75.2	78.63	13.2
16500	250	0	0	71.89	2975	80.31	76.93	80.77	20.36	5.86
16500	250	0	0	71.89	4150	81.61	78.05	82.17	20.98	6.6
16500	250	0	0	71.89	7800	84.98	80.73	85.7	19.78	7.9
*	16850	350	0	0	73.65	1400	78.66	78.16	80.05	139.07
*	16850	350	0	0	73.65	2975	80.63	80.63	83.31	170.5
*	16850	350	0	0	73.65	4150	82.21	82.21	85.12	144.81
*	16850	350	0	0	73.65	7800	85.53	85.53	89.26	131.49
*	17050	200	0	0	74.66	1400	81.14	80.03	81.72	55.11
*	17050	200	0	0	74.66	2975	84.26	81.91	84.63	29.04
*	17050	200	0	0	74.66	4150	85.96	82.96	86.29	24.28
*	17050	200	0	0	74.66	7800	90.02	84.67	90.36	19.9
17200	150	0	0	75.41	1400	81.94	81.65	82.85	90.41	9.44
17200	150	0	0	75.41	2975	84.69	83.46	85.18	43.09	8.37
17200	150	0	0	75.41	4150	86.34	84.2	86.69	29.63	7.8
17200	150	0	0	75.41	7800	90.4	85.73	90.64	18.37	7.65
*	17450	250	0	0	76.67	1400	83.65	81.55	83.97	24.98
17450	250	0	0	76.67	2975	85.63	83.49	86.02	27.28	6.54
17450	250	0	0	76.67	4150	87	84.44	87.29	20.2	6.22
17450	250	0	0	76.67	7800	90.8	86.45	90.97	9.81	5.4

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
*	17650	200	0	0	77.68	1400	84.37	83.56	84.73	62.64
17650	200	0	0	77.68	2975	86.41	84.76	86.71	45.12	6.86
17650	200	0	0	77.68	4150	87.54	85.38	87.82	37.82	6.82
17650	200	0	0	77.68	7800	91.07	86.9	91.21	14.5	5.19
*	17870	220	0	0	78.79	1400	85.27	83.55	85.35	20.2
*	17870	220	0	0	78.79	2975	87.09	84.35	87.19	17.33
*	17870	220	0	0	78.79	4150	88.13	84.79	88.25	16.56
17870	220	0	0	78.79	7800	91.3	85.89	91.42	10.73	3.9
*	18100	230	0	0	79.95	1400	85.66	85.21	86.15	111.17
*	18100	230	0	0	79.95	2975	87.38	86.35	87.85	89.91
*	18100	230	0	0	79.95	4150	88.39	86.92	88.87	85.02
*	18100	230	0	0	79.95	7800	91.43	88.32	91.84	62.75
*	18199	99	0	0	79.55	1400	85.67	84.39	87.14	47.33
*	18199	99	0	0	79.55	2975	88.1	88.1	91.38	75.25
*	18199	99	0	0	79.55	4150	89.9	89.9	91.54	41.74
*	18199	99	0	0	79.55	7800	91.75	91.75	93.83	53.24
*	18241	42	87.9	84.95	79.05	1400	88.22	0	88.85	9.55
*	18241	42	87.9	84.95	79.05	2975	92.3	0	92.69	5.19
*	18241	42	87.9	84.95	79.05	4150	93.24	0	93.8	7.19
*	18241	42	87.9	84.95	79.05	7800	94.86	0	96.09	14.73

*		18330	89	0	0	81.05	1400	88.92	85.15	88.94	1.16
*		18330	89	0	0	81.05	2975	92.73	86.01	92.74	0.66
*		18330	89	0	0	81.05	4150	93.85	86.5	93.87	0.84
*		18330	89	0	0	81.05	7800	96.2	87.57	96.24	1.38
*		18500	170	0	0	81.73	1400	88.94	83.96	88.95	0.47
	18500	170	0	0	81.73	2975	92.74	85.03	92.75	0.35	1.27
	18500	170	0	0	81.73	4150	93.86	85.44	93.88	0.45	1.56
	18500	170	0	0	81.73	7800	96.21	86.34	96.26	0.8	2.33
*		18750	250	0	0	82.28	1400	88.95	84.42	88.98	1.63
*		18750	250	0	0	82.28	2975	92.74	85.73	92.77	0.86
*		18750	250	0	0	82.28	4150	93.86	86.4	93.91	1.04
	18750	250	0	0	82.28	7800	96.21	87.93	96.3	1.61	3.19
*		19000	250	0	0	82.84	1400	88.97	86.31	89.08	6.34
*		19000	250	0	0	82.84	2975	92.73	87.57	92.82	2.9
*		19000	250	0	0	82.84	4150	93.85	88.4	93.98	3.4
*		19000	250	0	0	82.84	7800	96.18	89.98	96.41	4.78
*		19300	300	0	0	83.49	1400	89.27	87.37	89.36	13.86
	19300	300	0	0	83.49	2975	92.88	88.44	92.93	4.1	2.53
	19300	300	0	0	83.49	4150	94.03	88.93	94.1	4.45	2.86
	19300	300	0	0	83.49	7800	96.46	90.07	96.58	5.56	3.68

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
19550	250	0	0	84.04	1400	89.63	88.14	89.76	20.85	4.06
19550	250	0	0	84.04	2975	92.98	89.4	93.03	4.28	2.55
19550	250	0	0	84.04	4150	94.14	89.81	94.2	4.26	2.76
19550	250	0	0	84.04	7800	96.59	90.79	96.69	4.96	3.45
*	19850	300	0	0	84.7	1400	89.84	89.84	91.54	186.53
*	19850	300	0	0	84.7	2975	92.5	92.5	94	115.43
*	19850	300	0	0	84.7	4150	93.5	93.5	94.93	105.37
*	19850	300	0	0	84.7	7800	96.3	95.12	97.18	54.81
*	20050	200	0	0	86.9	1400	92.08	91.22	92.45	15.94
*	20050	200	0	0	86.9	2975	94.28	92.42	94.65	11.67
*	20050	200	0	0	86.9	4150	95.13	93.09	95.59	13.25
*	20050	200	0	0	86.9	7800	97	94.73	97.76	17.59
*	20200	150	0	0	88.55	1400	92.61	92.61	93.4	65.58
*	20200	150	0	0	88.55	2975	94.36	93.68	95.05	42.79
*	20200	150	0	0	88.55	4150	95.23	94.29	96.02	41.72
*	20200	150	0	0	88.55	7800	97.15	95.84	98.28	45.21
*	20600	400	0	0	89.13	1400	94.69	93.65	94.88	27.45
20600	400	0	0	89.13	2975	96.03	94.62	96.31	30.84	6.4
20600	400	0	0	89.13	4150	96.91	95.13	97.22	29.38	6.81
20600	400	0	0	89.13	7800	99.07	96.32	99.46	26.23	7.65
20750	150	0	0	89.35	1400	94.96	94.05	95.64	54.88	7.28
*	20750	150	0	0	89.35	2975	96.27	96.07	97.23	67.79
20750	150	0	0	89.35	4150	97.2	96.91	98.04	56.95	9.49
20750	150	0	0	89.35	7800	99.51	98.19	99.96	27.24	7.9
20919	169	0	0	90.75	1400	96.23	95.42	96.54	38.16	6.19
*	20919	169	0	0	90.75	2975	97.86	96.47	98.23	34.11
20919	169	0	0	90.75	4150	98.49	97.06	98.99	40.87	8.16
*	20919	169	0	0	90.75	7800	99.97	98.42	100.83	56.22
*	20920	1	93.2	95.65	90.75	1400	96.2	95.78	96.58	132.91

*	20920	1	93.2	95.65	90.75	2975	97.86	96.62	98.24	77.61
20920	1	93.2	95.65	90.75	4150	98.49	97.11	99	83.11	4.92
20920	1	93.2	95.65	90.75	7800	99.97	98.44	100.85	96.3	6.06
20932	12	93.2	95.65	89.65	1400	96.34	95.73	96.74	119.29	6.38
20932	12	93.2	95.65	89.65	2975	98.02	96.85	98.34	72.89	4.66
20932	12	93.2	95.65	89.65	4150	98.73	97.3	99.12	70.28	4.9
20932	12	93.2	95.65	89.65	7800	100.44	98.45	101.03	64.57	5.4
*	20933	1	0	0	89.65	1400	96.42	96.28	96.75	33.8
*	20933	1	0	0	89.65	2975	98.15	96.45	98.38	16.21
*	20933	1	0	0	89.65	4150	98.86	96.61	99.15	19.54
*	20933	1	0	0	89.65	7800	100.58	97.99	101.06	25.49

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
21000	67	0	0	91.65	1400	96.74	95.82	96.96	32.77	5.61
21000	67	0	0	91.65	2975	98.23	96.75	98.55	32.2	6.63
21000	67	0	0	91.65	4150	98.95	97.26	99.36	35.88	7.5
21000	67	0	0	91.65	7800	100.67	98.54	101.33	42.34	9.41
*	21250	250	0	0	92.09	1400	97.22	95.41	97.26	6.71
*	21250	250	0	0	92.09	2975	98.78	96.05	98.84	6.37
*	21250	250	0	0	92.09	4150	99.6	96.43	99.67	6.6
*	21250	250	0	0	92.09	7800	101.58	97.38	101.69	7.06
*	21550	300	0	0	92.62	1400	98.52	98.52	99.13	82.46
*	21550	300	0	0	92.62	2975	99.31	99.31	100.15	113.44
*	21550	300	0	0	92.62	4150	99.75	99.75	100.71	123.96
*	21550	300	0	0	92.62	7800	101.71	100.8	102.3	58.48
*	21740	190	0	0	92.95	1400	99.51	98.17	99.6	10.74
*	21740	190	0	0	92.95	2975	100.64	98.9	100.8	15.37
*	21740	190	0	0	92.95	4150	101.25	99.32	101.46	18.17
*	21740	190	0	0	92.95	7800	102.59	100.32	102.98	25.98
21789	49	0	0	93.65	1400	99.54	98.86	99.7	19.57	4.64
21789	49	0	0	93.65	2975	100.69	99.45	100.93	23.86	5.81
21789	49	0	0	93.65	4150	101.32	99.88	101.6	26.5	6.5
21789	49	0	0	93.65	7800	102.68	100.88	103.17	34.59	8.33
21790	1	97.3	97.85	93.65	1400	99.6	98.65	99.72	39.48	2.69
21790	1	97.3	97.85	93.65	2975	100.74	99.19	100.94	38.74	3.1
21790	1	97.3	97.85	93.65	4150	101.36	99.61	101.62	40.22	3.38
21790	1	97.3	97.85	93.65	7800	102.72	100.67	103.18	47.79	4.21
21800	10	97.3	97.95	92.95	1400	99.65	98.64	99.76	37.16	2.74
21800	10	97.3	97.95	92.95	2975	100.78	99.19	100.98	39.22	3.24
21800	10	97.3	97.95	92.95	4150	101.39	99.59	101.66	41.45	3.56
21800	10	97.3	97.95	92.95	7800	102.76	100.66	103.24	49.87	4.42
*	21801	1	0	0	92.95	1400	99.63	98.65	99.77	14.92
21801	1	0	0	92.95	2975	100.77	99.39	101	20.79	5.59
21801	1	0	0	92.95	4150	101.38	99.84	101.68	24.06	6.36
21801	1	0	0	92.95	7800	102.75	100.9	103.26	32.84	8.3
21850	49	0	0	93.95	1400	99.79	98.11	99.85	8.86	3.11
21850	49	0	0	93.95	2975	100.98	98.77	101.11	12.85	4.26
21850	49	0	0	93.95	4150	101.64	99.16	101.81	15.17	4.93
21850	49	0	0	93.95	7800	103.12	100.15	103.44	21.27	6.6
*	22200	350	0	0	95.55	1400	100.14	100.14	100.6	74.48
*	22200	350	0	0	95.55	2975	101.44	100.77	101.67	35
22200	350	0	0	95.55	4150	102.14	101.06	102.37	29.67	6.29

22200	350	0	0	95.55	7800	103.77	101.83	104.05	25.03	6.72

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
*	22239	39	0	0	95.25	1400	100.63	100.28	100.85	29.69
22239	39	0	0	95.25	2975	101.56	100.87	101.81	32.62	6.46
22239	39	0	0	95.25	4150	102.25	101.2	102.49	28.85	6.51
22239	39	0	0	95.25	7800	103.86	102.01	104.15	24.89	6.97
22240	1	98.7	99.55	95.25	1400	100.78	100.08	100.89	48.85	2.78
22240	1	98.7	99.55	95.25	2975	101.68	100.67	101.84	45.26	3.05
22240	1	98.7	99.55	95.25	4150	102.33	100.92	102.52	38.06	3.04
22240	1	98.7	99.55	95.25	7800	103.9	101.69	104.16	30.81	3.22
22257	17	98.7	99.55	95.25	1400	100.87	100.08	100.96	39.99	2.55
22257	17	98.7	99.55	95.25	2975	101.77	100.67	101.92	39.96	2.9
22257	17	98.7	99.55	95.25	4150	102.4	100.92	102.58	35.36	2.95
22257	17	98.7	99.55	95.25	7800	103.96	101.69	104.22	29.58	3.17
*	22258	1	0	0	95.25	1400	100.87	100.14	100.97	13.1
*	22258	1	0	0	95.25	2975	101.77	100.71	101.92	16
*	22258	1	0	0	95.25	4150	102.41	101	102.58	15.11
*	22258	1	0	0	95.25	7800	103.98	101.76	104.22	13.88
22310	52	0	0	95.55	1400	100.98	99.8	101.04	8.32	2.86
22310	52	0	0	95.55	2975	101.89	100.43	102	10.86	3.65
22310	52	0	0	95.55	4150	102.53	100.71	102.66	10.93	3.91
22310	52	0	0	95.55	7800	104.09	101.48	104.3	11.09	4.53
*	22600	290	0	0	96.61	1400	101.14	99.17	101.17	3.86
*	22600	290	0	0	96.61	2975	102.13	99.95	102.19	5.5
22600	290	0	0	96.61	4150	102.78	100.34	102.86	5.77	2.73
22600	290	0	0	96.61	7800	104.38	101.15	104.51	6.14	3.28
22900	300	0	0	97.72	1400	101.25	99.02	101.28	3.01	1.36
22900	300	0	0	97.72	2975	102.28	99.57	102.35	4.87	2.05
22900	300	0	0	97.72	4150	102.94	99.92	103.03	5.51	2.39
22900	300	0	0	97.72	7800	104.55	100.82	104.71	6.63	3.13
*	23170	270	0	0	98.71	1400	101.76	101.76	102.58	155.98
*	23170	270	0	0	98.71	2975	102.88	102.88	104.1	141.63
*	23170	270	0	0	98.71	4150	103.61	103.61	104.96	122.44
*	23170	270	0	0	98.71	7800	105.14	105.14	106.92	110.45
*	23550	380	0	0	100.1	1400	104.87	104.26	105.27	48.28
*	23550	380	0	0	100.1	2975	106.14	105.37	106.74	50.21
*	23550	380	0	0	100.1	4150	106.78	105.95	107.55	54.25
23550	380	0	0	100.1	7800	108.32	107.37	109.54	60.92	10.54
*	23590	40	0	0	100.25	1400	104.96	104.96	105.71	111.45
23590	40	0	0	100.25	2975	106.23	105.97	107.06	83.18	9.19
23590	40	0	0	100.25	4150	106.92	106.52	107.85	77.22	9.61
23590	40	0	0	100.25	7800	108.51	107.87	109.84	73.33	10.95

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH
*	23631	41	0	0	101.25	1400	105.73	105.73	106.39	103.61
*	23631	41	0	0	101.25	2975	106.59	106.59	107.56	124.55
23631	41	0	0	101.25	4150	107.23	107.09	108.28	108.37	10.63
23631	41	0	0	101.25	7800	108.83	108.34	110.17	85.85	11.23

*	23632	1	102.6	105.65	101.25	1400	106.28	106.28	106.99	117.27
*	23632	1	102.6	105.65	101.25	2975	107.19	107.19	108.17	133.07
*	23632	1	102.6	105.65	101.25	4150	107.71	107.71	108.86	132.34
*	23632	1	102.6	105.65	101.25	7800	108.92	108.92	110.66	134.03
*	23647	15	104.6	105.65	101.15	1400	106.98	106.98	107.53	124.68
*	23647	15	104.6	105.65	101.15	2975	107.67	107.67	108.6	162.6
*	23647	15	104.6	105.65	101.15	4150	108.12	108.12	109.28	166.22
*	23647	15	104.6	105.65	101.15	7800	109.34	109.34	111.06	151.72
*	23648	1	0	0	101.15	1400	107.54	106.7	107.66	12.88
*	23648	1	0	0	101.15	2975	108.55	107.04	108.81	20.37
*	23648	1	0	0	101.15	4150	109.17	107.49	109.53	23.44
*	23648	1	0	0	101.15	7800	110.76	108.67	111.39	28.46
23690	42	0	0	102.15	1400	107.57	106.7	107.77	22.49	4.89
23690	42	0	0	102.15	2975	108.59	107.53	108.98	32.11	6.56
23690	42	0	0	102.15	4150	109.22	108.02	109.72	35.37	7.33
23690	42	0	0	102.15	7800	110.81	109.27	111.63	39.68	8.91
23920	230	0	0	102.35	1400	108.11	107.16	108.3	20.1	4.39
23920	230	0	0	102.35	2975	109.39	108.1	109.61	19.31	5.01
*	23920	230	0	0	102.35	4150	110.13	108.59	110.35	16.62
*	23920	230	0	0	102.35	7800	111.98	109.73	112.18	11.29

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SUMMAF PRINTOU TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
190	1900	4.7	0	0	0	97.94	0
*	190	3900	5.69	0.99	0	0.99	97.96	0
*	190	5300	6.55	0.85	0	1.85	97.98	0
*	190	9700	8.75	2.2	0	4.05	98.03	0
*	400	1900	6.13	0	1.43	0	62.46	210
*	400	3900	8.37	2.23	2.67	0	101.37	210
*	400	5300	9.61	1.25	3.07	0	150.51	210
*	400	9700	12.98	3.36	4.23	0	257.9	210
580	1900	8.69	0	2.56	0	152.36	180
*	580	3900	11.59	2.9	3.22	0	321.53	180
*	580	5300	13.25	1.66	3.64	0	335.62	180
*	580	9700	17.11	3.86	4.14	0	397.24	180
689	1900	9.25	0	0.56	0	51.96	109
*	689	3900	11.52	2.27	-0.07	0	51.98	109
*	689	5300	12.8	1.28	-0.45	0	52	109
*	689	9700	15.65	2.85	-1.46	0	52	109
*	990	1900	12.25	0	2.99	0	51.99	300
*	990	3900	18.01	5.77	6.49	0	125.35	300
*	990	5300	19.38	1.37	6.58	0	132.08	300
*	990	9700	25.76	6.38	10.11	0	155.14	300
*	1100	1900	14.28	0	2.04	0	55.62	110
1100	3900	18.41	4.13	0.4	0	116.09	110
1100	5300	19.89	1.48	0.51	0	256.48	110
*	1100	9700	26.66	6.77	0.89	0	686.02	110
*	1300	1900	15.23	0	0.95	0	49.38	200

*		1300	3900	19.53	4.3	1.12	0	258.98	200
*		1300	5300	20.78	1.25	0.89	0	287.68	200
	1300	9700	26.32	5.55	-0.33	0	351.32	200	
*		1500	1900	18.08	0	2.86	0	121.72	200
*		1500	3900	21.85	3.77	2.33	0	217.96	200
*		1500	5300	23.1	1.24	2.32	0	243.52	200
	1500	9700	27.23	4.14	0.91	0	388.84	200	
*		1750	1900	18.13	0	0.05	0	85.45	250
*		1750	3900	21.81	3.68	-0.04	0	148.46	250
*		1750	5300	22.99	1.18	-0.11	0	211.27	250
	1750	9700	26.93	3.94	-0.3	0	268.33	250	

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	2000	1900	18.4	0	0.26	0	343.37	250
*	2000	3900	22.26	3.86	0.45	0	394.62	250
*	2000	5300	23.63	1.37	0.64	0	406.57	250
*	2000	9700	27.81	4.18	0.87	0	442.32	250
2250	1900	18.48	0	0.08	0	543.8	250	
2250	3900	22.34	3.87	0.08	0	740.9	250	
2250	5300	23.73	1.39	0.11	0	811.88	250	
*	2250	9700	27.96	4.22	0.15	0	876.54	250
2500	1900	18.52	0	0.04	0	711.03	250	
2500	3900	22.38	3.87	0.04	0	1008.92	250	
2500	5300	23.78	1.4	0.05	0	1060.04	250	
2500	9700	28.01	4.23	0.05	0	1298.27	250	
*	2750	1900	17.93	0	-0.59	0	156.7	250
*	2750	3900	22.22	4.3	-0.16	0	804.42	250
*	2750	5300	23.66	1.43	-0.12	0	847.69	250
*	2750	9700	27.93	4.28	-0.07	0	1090.06	250
2950	1900	19.3	0	1.37	0	64.49	200	
*	2950	3900	22.33	3.02	0.1	0	126.59	200
*	2950	5300	23.57	1.24	-0.09	0	173.5	200
*	2950	9700	27.62	4.05	-0.32	0	962.81	200
3100	1900	19.92	0	0.62	0	62.43	150	
3100	3900	22.95	3.03	0.62	0	72.8	150	
3100	5300	24.15	1.2	0.58	0	74.21	150	
3100	9700	28.04	3.9	0.43	0	434.72	150	
3300	1900	20.77	0	0.85	0	57.95	200	
3300	3900	23.89	3.11	0.94	0	71.3	200	
3300	5300	25.29	1.4	1.14	0	77.32	200	
3300	9700	29.19	3.91	1.15	0	739.51	200	
3570	1900	22.23	0	1.46	0	64	220	
3570	3900	25.65	3.42	1.76	0	77	220	
3570	5300	27.4	1.75	2.11	0	217.72	220	
3570	9700	30.17	2.78	0.98	0	474	220	
*	3680	1900	24.32	0	2.09	0	26	160
*	3680	3900	27.7	3.38	2.05	0	26	160
*	3680	5300	29.71	2.01	2.32	0	26	160
*	3680	9700	35.08	5.36	4.9	0	26	160
*	3681	1900	25.4	0	1.08	0	26	1
*	3681	3900	29.44	4.04	1.74	0	26	1
*	3681	5300	31.84	2.4	2.13	0	26	1

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*            3681    9700     38.35      6.5     3.27       0      26       1

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 SECNO    Q          CWSEL   DIFWSP     DIFWSX   DIFKWS  TOPWID  XLCH

 *            3778    1900     26.87       0     1.47       0      26      97
     3778     3900     31.2     4.33    1.76       0      26      97
     3778     5300    33.53     2.33    1.69       0      26      97
     3778     9700    41.18     7.64    2.83       0      26      97

 *            3779    1900     26.89       0     0.01       0      26       1
 *            3779    3900     31.41    4.52     0.21       0      26       1
 *            3779    5300     34.05    2.64     0.52       0      26       1
 *            3779    9700     41.18    7.13        0       0      26       1

     3870     1900    27.13       0     0.24       0   55.29      91
 *            3870    3900     32.87    5.74     1.46       0   82.27      91
 *            3870    5300     36.26    3.39     2.21       0    98.3      91
 *            3870    9700     45.73    9.47     4.55       0  515.41      91

 *            4100    1900     28.29       0     1.16       0   221.3     230
 *            4100    3900     33.63    5.34     0.76       0  239.94     230
 *            4100    5300     36.92    3.29     0.65       0  289.52     230
 *            4100    9700     45.95    9.03     0.22       0 1106.98     230

 *            4375    1900     28.37       0     0.08       0   75.05     275
 *            4375    3900     33.53    5.16    -0.09       0  184.13     275
 *            4375    5300     36.87    3.33    -0.05       0  214.52     275
     4375     9700    45.93    9.06    -0.02       0  666.88     275

 *            4475    1900     28.47       0      0.1       0   35.96     105
 *            4475    3900     32.99    4.51    -0.55       0   36.01     105
 *            4475    5300     36.09    3.11    -0.77       0   36.04     105
 *            4475    9700     45.94    9.85     0.01       0 1426.23     105

     4528     1900    29.04       0     0.56       0   35.95      53
     4528     3900    33.33    4.29     0.34       0   36.01      53
     4528     5300    37.62    4.29     1.52       0   36.06      53
     4528     9700    45.95    8.33     0.01       0 1431.36      53

 *            4630    1900     30.65       0     1.61       0   58.42      95
 *            4630    3900     35.34     4.7     2.01       0  178.62      95
 *            4630    5300     39.37    4.03     1.76       0  262.11      95
     4630     9700    45.88    6.51    -0.07       0 1421.94      95

 *            4850    1900     31.39       0     0.74       0   97.08     220
     4850     3900    35.88    4.49     0.54       0  351.97     220
     4850     5300    39.85    3.97     0.48       0  883.58     220
     4850     9700    46.08    6.23      0.2       0 1575.26     220

 *            5100    1900     33.07       0     1.68       0  488.45     250
 *            5100    3900     36.65    3.58     0.77       0  579.81     250
     5100     5300    40.17    3.52     0.31       0  904.75     250
     5100     9700    46.31    6.15     0.23       0 2058.87     250

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 SECNO    Q          CWSEL   DIFWSP     DIFWSX   DIFKWS  TOPWID  XLCH

     5300     1900    33.31       0     0.24       0  584.88     200
     5300     3900     36.8    3.49     0.15       0  739.71     200
     5300     5300    40.23    3.43     0.07       0  869.33     200
     5300     9700    46.33     6.1     0.02       0 1303.48     200
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*		5500	1900	33.52	0	0.21	0	77.56	200
*		5500	3900	36.81	3.29	0.01	0	281.47	200
	5500	5300	40.28	3.48	0.05	0	558.54	200	
	5500	9700	46.44	6.16	0.11	0	1560.53	200	
*		5700	1900	34.64	0	1.12	0	317.84	200
	5700	3900	37.72	3.08	0.92	0	386.48	200	
	5700	5300	40.66	2.93	0.37	0	397.12	200	
	5700	9700	46.63	5.97	0.19	0	632.51	200	
	5900	1900	35.14	0	0.5	0	303.7	200	
	5900	3900	38.24	3.1	0.52	0	407.18	200	
	5900	5300	40.96	2.72	0.31	0	440.58	200	
	5900	9700	46.83	5.87	0.2	0	754.27	200	
	6100	1900	35.3	0	0.16	0	77.96	200	
	6100	3900	38.2	2.9	-0.04	0	203.82	200	
	6100	5300	40.8	2.59	-0.17	0	281.49	200	
	6100	9700	46.58	5.79	-0.25	0	685.29	200	
	6330	1900	35.54	0	0.25	0	87.78	230	
	6330	3900	38.59	3.04	0.39	0	210.39	230	
	6330	5300	41.07	2.48	0.27	0	222.07	230	
	6330	9700	46.65	5.58	0.07	0	302.59	230	
	6435	1900	35.73	0	0.19	0	91.21	105	
	6435	3900	38.95	3.21	0.36	0	105.76	105	
	6435	5300	41.46	2.52	0.39	0	117.2	105	
	6435	9700	47.21	5.75	0.56	0	294.98	105	
	6488	1900	35.73	0	0	0	97.97	53	
	6488	3900	38.95	3.21	0	0	112.05	53	
	6488	5300	41.46	2.52	0	0	117.53	53	
	6488	9700	47.99	6.53	0.79	0	332.39	53	
*		6580	1900	35.74	0	0.01	0	86.47	102
*		6580	3900	38.93	3.19	-0.01	0	98.01	102
*		6580	5300	41.48	2.55	0.02	0	280.86	102
	6580	9700	48.17	6.69	0.18	0	384.49	102	
*		6800	1900	36.15	0	0.4	0	233.14	220
*		6800	3900	39.52	3.37	0.59	0	247.55	220
*		6800	5300	41.95	2.42	0.46	0	319.63	220
*		6800	9700	48.33	6.38	0.16	0	723.3	220

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	7000	1900	36.19	0	0.04	0	318.59	200
	7000	3900	39.57	3.38	0.05	0	334.04	200
	7000	5300	42	2.42	0.05	0	785.63	200
*		7000	9700	48.37	6.37	0.04	0	871	200
	7200	1900	36.21	0	0.02	0	303.07	200
	7200	3900	39.59	3.38	0.01	0	316.89	200
	7200	5300	42.01	2.42	0.01	0	673.54	200
	7200	9700	48.38	6.38	0.01	0	1643.92	200
*		7400	1900	36.22	0	0.01	0	222.66	200
*		7400	3900	39.59	3.37	0	0	237.97	200
	7400	5300	42	2.42	-0.01	0	387.2	200
	7400	9700	48.38	6.38	0	0	1265.73	200
*		7600	1900	36.19	0	-0.03	0	127.65	200

*	7600	3900	39.5	3.31	-0.08	0	148	200
*	7600	5300	41.9	2.4	-0.1	0	193.42	200
*	7600	9700	48.26	6.37	-0.11	0	727.54	200
7800	1900	36.32	0	0.13	0	122.02	200	
7800	3900	39.59	3.28	0.09	0	151.6	200	
7800	5300	41.97	2.37	0.07	0	190.9	200	
7800	9700	48.37	6.4	0.11	0	1122.14	200	
*	8000	1900	36.36	0	0.04	0	118.91	200
8000	3900	39.58	3.22	-0.01	0	168.23	200	
8000	5300	41.95	2.37	-0.02	0	231.17	200	
8000	9700	48.45	6.5	0.08	0	1700.26	200	
8250	1900	36.74	0	0.38	0	128.74	250	
8250	3900	39.87	3.13	0.29	0	157.85	250	
8250	5300	42.19	2.33	0.24	0	407.55	250	
8250	9700	48.53	6.34	0.08	0	1655.4	250	
*	8500	1900	36.67	0	-0.07	0	67.85	250
*	8500	3900	39.02	2.35	-0.85	0	80.13	250
*	8500	5300	41.53	2.51	-0.66	0	204.19	250
8500	9700	48.58	7.05	0.06	0	1564.03	250	
8750	1900	38.56	0	1.89	0	47.92	250	
*	8750	3900	42.07	3.51	3.05	0	357.92	250
*	8750	5300	43.85	1.77	2.31	0	916.58	250
*	8750	9700	46.62	2.77	-1.97	0	1610.92	250
*	9000	1900	41.1	0	2.53	0	602.44	250
*	9000	3900	45.03	3.93	2.95	0	1157.32	250
*	9000	5300	46.62	1.59	2.77	0	1685	250
*	9000	9700	50.01	3.39	3.4	0	1817.87	250

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
9250	1900	41.49	0	0.4	0	691.63	250
9250	3900	45.33	3.84	0.3	0	1309.3	250
9250	5300	46.93	1.6	0.31	0	1377.17	250
9250	9700	50.4	3.47	0.39	0	1448.91	250
9500	1900	41.62	0	0.12	0	235.25	250
9500	3900	45.41	3.79	0.08	0	1017.12	250
9500	5300	47.01	1.6	0.08	0	1253.45	250
*	9500	9700	50.51	3.49	0.1	0	1330.94	250
*	9750	1900	41.84	0	0.22	0	77	250
9750	3900	45.49	3.65	0.08	0	1086.7	250	
9750	5300	47.08	1.59	0.06	0	1167.35	250	
9750	9700	50.54	3.46	0.03	0	1221.52	250	
10000	1900	43.47	0	1.63	0	266.86	250	
*	10000	3900	45.89	2.41	0.4	0	674.21	250
*	10000	5300	47.25	1.37	0.17	0	1049.84	250
*	10000	9700	50.61	3.36	0.07	0	1152.53	250
*	10794	1900	43.5	0	0.03	0	180.39	50
10794	3900	45.51	2.01	-0.37	0	480.29	50	
10794	5300	47.05	1.54	-0.2	0	685.49	50	
10794	9700	50.54	3.48	-0.08	0	1064.42	50	
*	60	1286	44.08	0	0.57	0	137.06	60
*	60	2549	46.14	2.07	0.63	0	243.98	60
*	60	3447	47.28	1.14	0.23	0	333.15	60

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*          60    6104    50.59    3.31    0.05    0    545.94    60

    110    1286    44.34    0    0.26    0    79.24    50
*          110    2549    46.13    1.79    -0.01    0    119.23    50
*          110    3447    47.17    1.04    -0.11    0    177.1    50
*          110    6104    50.5    3.33    -0.09    0    406.81    50

*          250    1286    45.25    0    0.91    0    219.53    140
*          250    2549    47.17    1.92    1.04    0    282.15    140
*          250    3447    48.19    1.02    1.02    0    315.31    140
*          250    6104    50.96    2.77    0.46    0    405.45    140

*          390    1286    45.68    0    0.43    0    221.62    140
    390    2549    47.49    1.81    0.31    0    289.1    140
    390    3447    48.47    0.98    0.28    0    319.42    140
    390    6104    51.14    2.68    0.18    0    397.16    140

    480    1286    46.4    0    0.72    0    119.83    90
    480    2549    47.8    1.4    0.31    0    195.77    90
    480    3447    48.67    0.87    0.21    0    224.75    90
    480    6104    51.25    2.58    0.11    0    489.53    90

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 SECNO   Q    CWSEL   DIFWSP    DIFWSX   DIFKWS  TOPWID  XLCH

    575    1286    46.96    0    0.57    0    207.65    95
*          575    2549    48.48    1.51    0.68    0    230.2    95
    575    3447    49.31    0.83    0.63    0    310.32    95
    575    6104    51.58    2.27    0.33    0    351.26    95

    667    1286    47.3    0    0.34    0    115.21    92
    667    2549    48.79    1.49    0.31    0    202.76    92
    667    3447    49.59    0.8    0.28    0    222.32    92
    667    6104    51.74    2.16    0.16    0    292.99    92

*          767    1286    47.66    0    0.36    0    105.91    100
*          767    2549    49.09    1.43    0.3    0    188.79    100
*          767    3447    49.87    0.78    0.28    0    215.3    100
    767    6104    51.99    2.12    0.25    0    247.88    100

*          787    1286    48.22    0    0.56    0    194.84    20
*          787    2549    49.86    1.63    0.77    0    216.16    20
*          787    3447    50.61    0.76    0.74    0    243.15    20
    787    6104    52.42    1.81    0.43    0    277.16    20

    800    1286    48.58    0    0.36    0    196.09    60
    800    2549    50.12    1.54    0.27    0    225.58    60
    800    3447    50.88    0.76    0.27    0    243.46    60
    800    6104    52.66    1.78    0.24    0    296.58    60

*          11720    1900    48.5    0    -0.08    0    201.17    79
*          11720    3900    49.81    1.31    -0.31    0    304.6    79
  11720    5300    50.49    0.68    -0.39    0    367.6    79
*          11720    9700    52.2    1.71    -0.46    0    588.57    79

*          11150    1900    48.56    0    0.06    0    62.92    255
*          11150    3900    51.42    2.86    1.61    0    154.08    255
*          11150    5300    52.7    1.28    2.21    0    203.25    255
*          11150    9700    55.3    2.6    3.1    0    612.57    255

*          11400    1900    51.6    0    3.04    0    170.47    250
*          11400    3900    53.26    1.66    1.84    0    217.77    250
  11400    5300    54.71    1.45    2.01    0    278.06    250
  11400    9700    56.48    1.77    1.18    0    429.9    250
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11570	1900	52.16	0	0.56	0	71.66	170	
*	11570	3900	54.69	2.53	1.43	0	214.63	170
*	11570	5300	56	1.31	1.28	0	340.72	170
*	11570	9700	57.94	1.94	1.46	0	536.64	170
11700	1900	53.04	0	0.88	0	62.18	130	
11700	3900	55.19	2.14	0.5	0	167.08	130	
*	11700	5300	55.97	0.78	-0.03	0	266.38	130
*	11700	9700	58.91	2.95	0.98	0	511.88	130

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	11900	1900	53.27	0	0.22	0	45.36	200
*	11900	3900	56.47	3.2	1.28	0	188	200
*	11900	5300	57.96	1.49	1.99	0	348.05	200
*	11900	9700	61.04	3.08	2.12	0	637.55	200
*	12100	1900	55.28	0	2.02	0	62.15	200
12100	3900	58.64	3.35	2.17	0	312.05	200	
12100	5300	60.6	1.96	2.65	0	595.07	200	
12100	9700	64.59	3.99	3.55	0	945.23	200	
12500	1900	58.36	0	3.07	0	51.81	400	
*	12500	3900	61.04	2.69	2.4	0	283.51	400
12500	5300	62.53	1.49	1.93	0	545.38	400	
12500	9700	66.69	4.16	2.1	0	940.89	400	
*	12800	1900	59.39	0	1.03	0	29.62	300
12800	3900	60.52	1.13	-0.52	0	31.47	300	
*	12800	5300	64.82	4.3	2.28	0	573.19	300
*	12800	9700	66.47	1.65	-0.22	0	769.55	300
13000	1900	60.12	0	0.74	0	40.06	200	
*	13000	3900	64.53	4.4	4.01	0	609.11	200
13000	5300	64.96	0.43	0.14	0	633.75	200	
*	13000	9700	66.98	2.03	0.52	0	983.4	200
*	13120	1900	60.89	0	0.76	0	33	120
13120	3900	64.87	3.99	0.34	0	112.85	120	
13120	5300	65.37	0.5	0.41	0	131.87	120	
*	13120	9700	70.02	4.65	3.04	0	882	120
13122	1900	65.31	0	4.43	0	128.48	2	
*	13122	3900	66.45	1.14	1.58	0	395.42	2
*	13122	5300	66.49	0.04	1.12	0	412.86	2
13122	9700	70.48	4	0.46	0	904.5	2	
13170	1900	65.39	0	0.08	0	457.51	48	
*	13170	3900	67.02	1.63	0.57	0	662.33	48
*	13170	5300	67.66	0.64	1.18	0	683.27	48
13170	9700	70.63	2.97	0.15	0	899.08	48	
*	13350	1900	65.64	0	0.25	0	376.61	180
*	13350	3900	67.26	1.63	0.24	0	700.96	180
*	13350	5300	67.92	0.66	0.26	0	737.07	180
13350	9700	70.76	2.83	0.13	0	973.49	180	
*	13550	1900	65.69	0	0.05	0	269.79	200
*	13550	3900	67.35	1.66	0.09	0	434.85	200
*	13550	5300	68.03	0.68	0.11	0	461.27	200
*	13550	9700	70.83	2.8	0.07	0	683.17	200

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	13730	1900	65.39	0	-0.3	0	121.36	180
*	13730	3900	67.05	1.66	-0.3	0	147.24	180
*	13730	5300	68.06	1.01	0.03	0	190.47	180
*	13730	9700	70.02	1.95	-0.81	0	204.55	180
*	13834	1900	65.99	0	0.59	0	27.95	104
*	13834	3900	67.92	1.94	0.87	0	27.97	104
*	13834	5300	69.84	1.92	1.78	0	27.99	104
*	13834	9700	76.92	7.08	6.9	0	1066.81	104
*	13846	1900	66.09	0	0.11	0	27.95	12
*	13846	3900	69.78	3.69	1.86	0	27.99	12
*	13846	5300	70.48	0.7	0.64	0	27.99	12
*	13846	9700	77.52	7.03	0.6	0	1149.23	12
*	13950	1900	67.79	0	1.7	0	387.87	104
*	13950	3900	73.43	5.64	3.65	0	789.98	104
*	13950	5300	76.49	3.06	6.01	0	1023.07	104
*	13950	9700	78.77	2.28	1.25	0	1105.71	104
*	14250	1900	68.67	0	0.88	0	504.28	300
*	14250	3900	73.68	5.01	0.24	0	845.92	300
*	14250	5300	76.68	3.01	0.19	0	952.8	300
*	14250	9700	79.15	2.47	0.38	0	1058.12	300
*	14500	1900	68.59	0	-0.08	0	366.44	250
*	14500	3900	73.68	5.09	0	0	568.47	250
*	14500	5300	76.68	3	0	0	678.78	250
*	14500	9700	79.15	2.47	0	0	783.62	250
*	14750	1400	69.29	0	0.71	0	148.44	250
*	14750	2975	73.73	4.43	0.05	0	670.74	250
14750	4150	76.71	2.98	0.03	0	782.53	250
14750	7800	79.19	2.48	0.04	0	897.85	250
14837	1400	69.64	0	0.34	0	24	87
*	14837	2975	72.98	3.34	-0.75	0	344.7	87
*	14837	4150	76.4	3.42	-0.3	0	804.75	87
*	14837	7800	78.67	2.27	-0.52	0	875.48	87
*	14883	1400	67.55	0	-2.09	0	24	46
*	14883	2975	74.29	6.73	1.3	0	597.53	46
*	14883	4150	76.93	2.65	0.53	0	826.13	46
*	14883	7800	79.62	2.68	0.94	0	908.24	46
*	14950	1400	73.44	0	5.89	0	512.04	67
14950	2975	74.41	0.97	0.13	0	554.97	67
*	14950	4150	76.91	2.5	-0.02	0	870.59	67
*	14950	7800	79.51	2.6	-0.11	0	898.69	67

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
15200	1400	73.56	0	0.12	0	113.5	250
15200	2975	74.71	1.15	0.3	0	129.82	250
15200	4150	77.09	2.38	0.18	0	162.64	250
15200	7800	79.76	2.67	0.25	0	205.41	250
*	15430	1400	72.72	0	-0.83	0	40.38	230
*	15430	2975	75.34	2.62	0.63	0	61.44	230
*	15430	4150	76.92	1.57	-0.17	0	76.64	230

*		15430	7800	79.96	3.04	0.2	0	98.18	230
	15700	1400	75.19	0	2.47	0	100.89	270	
*		15700	2975	78.5	3.31	3.16	0	146.34	270
*		15700	4150	80.16	1.66	3.25	0	158.61	270
*		15700	7800	84.07	3.91	4.11	0	225.63	270
*		15950	1400	76.76	0	1.56	0	91.83	250
	15950	2975	78.97	2.21	0.46	0	104.7	250	
	15950	4150	80.45	1.48	0.29	0	133.77	250	
	15950	7800	84.21	3.76	0.14	0	212.83	250	
*		16250	1400	77.31	0	0.56	0	127.54	300
	16250	2975	79.76	2.44	0.79	0	248.77	300	
	16250	4150	81.32	1.56	0.87	0	278.07	300	
	16250	7800	85	3.68	0.79	0	332.99	300	
*		16500	1400	78.41	0	1.09	0	101.26	250
	16500	2975	80.31	1.9	0.55	0	137.12	250	
	16500	4150	81.61	1.3	0.29	0	157.22	250	
	16500	7800	84.98	3.37	-0.02	0	202	250	
*		16850	1400	78.66	0	0.25	0	42.27	350
*		16850	2975	80.63	1.98	0.33	0	53.73	350
*		16850	4150	82.21	1.58	0.6	0	211.74	350
*		16850	7800	85.53	3.33	0.56	0	462.29	350
*		17050	1400	81.14	0	2.48	0	110.06	200
*		17050	2975	84.26	3.13	3.63	0	507.57	200
*		17050	4150	85.96	1.7	3.75	0	606.52	200
*		17050	7800	90.02	4.06	4.49	0	695.2	200
	17200	1400	81.94	0	0.8	0	109.19	150	
	17200	2975	84.69	2.75	0.43	0	280.63	150	
	17200	4150	86.34	1.65	0.38	0	392.56	150	
	17200	7800	90.4	4.06	0.38	0	664.19	150	
*		17450	1400	83.65	0	1.71	0	140.88	250
	17450	2975	85.63	1.98	0.94	0	422.72	250	
	17450	4150	87	1.36	0.66	0	502.76	250	
	17450	7800	90.8	3.81	0.4	0	689.71	250	

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*		17650	1400	84.37	0	0.71	0	165.85	200
	17650	2975	86.41	2.04	0.78	0	266.47	200	
	17650	4150	87.54	1.13	0.55	0	330.99	200	
	17650	7800	91.07	3.53	0.27	0	585.32	200	
*		17870	1400	85.27	0	0.9	0	269.67	220
*		17870	2975	87.09	1.82	0.68	0	308.77	220
*		17870	4150	88.13	1.04	0.59	0	330.21	220
	17870	7800	91.3	3.17	0.23	0	496.11	220	
*		18100	1400	85.66	0	0.39	0	227.4	230
*		18100	2975	87.38	1.72	0.29	0	328.61	230
*		18100	4150	88.39	1	0.26	0	355.15	230
*		18100	7800	91.43	3.04	0.13	0	596.32	230
*		18199	1400	85.67	0	0.01	0	24.02	99
*		18199	2975	88.1	2.43	0.71	0	214.29	99
*		18199	4150	89.9	1.81	1.52	0	459.57	99
*		18199	7800	91.75	1.84	0.31	0	562.89	99

*		18241	1400	88.22	0	2.56	0	53.71	42
*		18241	2975	92.3	4.08	4.2	4.08	220	42
*		18241	4150	93.24	0.94	3.34	5.02	220	42
*		18241	7800	94.86	1.62	3.11	6.63	220	42
*		18330	1400	88.92	0	0.69	0	509.05	89
*		18330	2975	92.73	3.81	0.42	3.81	698.77	89
*		18330	4150	93.85	1.13	0.61	4.94	716.51	89
*		18330	7800	96.2	2.35	1.34	7.28	765.02	89
*		18500	1400	88.94	0	0.02	0	382.38	170
	18500	2975	92.74	3.8	0.01	3.8	406.96	170	
	18500	4150	93.86	1.13	0.01	4.92	415.95	170	
	18500	7800	96.21	2.35	0.01	7.27	491.9	170	
*		18750	1400	88.95	0	0.01	0	275.05	250
*		18750	2975	92.74	3.79	0	3.79	319.53	250
*		18750	4150	93.86	1.13	0	4.92	329.24	250
	18750	7800	96.21	2.35	0	7.27	351.99	250	
*		19000	1400	88.97	0	0.02	0	176.78	250
*		19000	2975	92.73	3.76	-0.01	3.76	220.56	250
*		19000	4150	93.85	1.12	-0.01	4.89	244.7	250
*		19000	7800	96.18	2.33	-0.03	7.22	316.18	250
*		19300	1400	89.27	0	0.31	0	248.22	300
	19300	2975	92.88	3.61	0.15	3.61	295.42	300	
	19300	4150	94.03	1.15	0.18	4.76	314.69	300	
	19300	7800	96.46	2.43	0.27	7.18	402.19	300	

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
19550	1400	89.63	0	0.36	0	331.44	250
19550	2975	92.98	3.35	0.1	3.35	363.92	250
19550	4150	94.14	1.16	0.11	4.51	373.62	250
19550	7800	96.59	2.45	0.14	6.97	396.21	250
*	19850	1400	89.84	0	0.21	0	46.05	300
*	19850	2975	92.5	2.65	-0.48	2.65	121.96	300
*	19850	4150	93.5	1.01	-0.64	3.66	212.84	300
*	19850	7800	96.3	2.8	-0.29	6.46	258.4	300
*	20050	1400	92.08	0	2.24	0	188.19	200
*	20050	2975	94.28	2.2	1.79	2.2	220.44	200
*	20050	4150	95.13	0.85	1.63	3.05	231.27	200
*	20050	7800	97	1.87	0.7	4.92	255.5	200
*	20200	1400	92.61	0	0.53	0	180.26	150
*	20200	2975	94.36	1.75	0.07	1.75	188.2	150
*	20200	4150	95.23	0.88	0.1	2.62	199.1	150
*	20200	7800	97.15	1.92	0.15	4.54	212.67	150
*	20600	1400	94.69	0	2.08	0	225.48	400
20600	2975	96.03	1.34	1.67	1.34	251.26	400	
20600	4150	96.91	0.88	1.68	2.22	268.28	400	
20600	7800	99.07	2.16	1.92	4.38	327.05	400	
20750	1400	94.96	0	0.27	0	139.96	150	
*	20750	2975	96.27	1.31	0.24	1.31	209.87	150
20750	4150	97.2	0.93	0.28	2.24	341.05	150	
20750	7800	99.51	2.31	0.44	4.55	465.89	150	
20919	1400	96.23	0	1.28	0	184.31	169	
*	20919	2975	97.86	1.63	1.59	1.63	201.46	169

	20919	4150	98.49	0.63	1.29	2.26	207.24	169	
*		20919	7800	99.97	1.48	0.46	3.73	229.79	169
*		20920	1400	96.2	0	-0.03	0	183.93	1
*		20920	2975	97.86	1.66	0	1.66	201.51	1
	20920	4150	98.49	0.63	0	2.29	207.29	1	
	20920	7800	99.97	1.48	0	3.77	229.88	1	
	20932	1400	96.34	0	0.14	0	200.69	12	
	20932	2975	98.02	1.68	0.16	1.68	232.91	12	
	20932	4150	98.73	0.71	0.24	2.38	245.89	12	
	20932	7800	100.44	1.71	0.47	4.09	283.22	12	
*		20933	1400	96.42	0	0.07	0	161.45	1
*		20933	2975	98.15	1.74	0.13	1.74	235.34	1
*		20933	4150	98.86	0.7	0.13	2.44	248.3	1
*		20933	7800	100.58	1.72	0.14	4.16	286.28	1

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
21000	1400	96.74	0	0.32	0	182.97	67
21000	2975	98.23	1.49	0.08	1.49	201.47	67
21000	4150	98.95	0.71	0.09	2.21	210.31	67
21000	7800	100.67	1.72	0.09	3.93	237.34	67
*	21250	1400	97.22	0	0.48	0	405.66	250
*	21250	2975	98.78	1.56	0.55	1.56	449.84	250
*	21250	4150	99.6	0.82	0.65	2.38	464.69	250
*	21250	7800	101.58	1.98	0.91	4.36	498.74	250
*	21550	1400	98.52	0	1.3	0	246.29	300
*	21550	2975	99.31	0.78	0.52	0.78	275.46	300
*	21550	4150	99.75	0.45	0.16	1.23	295.53	300
*	21550	7800	101.71	1.96	0.13	3.19	407.28	300
*	21740	1400	99.51	0	0.99	0	292.91	190
*	21740	2975	100.64	1.13	1.33	1.13	306.33	190
*	21740	4150	101.25	0.61	1.5	1.74	311.52	190
*	21740	7800	102.59	1.34	0.88	3.08	322.92	190
21789	1400	99.54	0	0.03	0	280.4	49
21789	2975	100.69	1.15	0.06	1.15	295.56	49
21789	4150	101.32	0.62	0.07	1.77	299.49	49
21789	7800	102.68	1.37	0.1	3.14	308.15	49
21790	1400	99.6	0	0.06	0	281.69	1
21790	2975	100.74	1.14	0.05	1.14	295.85	1
21790	4150	101.36	0.62	0.04	1.75	299.75	1
21790	7800	102.72	1.36	0.04	3.12	308.37	1
21800	1400	99.65	0	0.04	0	269.45	10
21800	2975	100.78	1.13	0.04	1.13	284.42	10
21800	4150	101.39	0.62	0.04	1.75	290.74	10
21800	7800	102.76	1.36	0.04	3.11	299.62	10
*	21801	1400	99.63	0	-0.01	0	269.5	1
21801	2975	100.77	1.13	-0.01	1.13	284.45	1
21801	4150	101.38	0.62	-0.01	1.75	290.75	1
21801	7800	102.75	1.37	-0.01	3.12	299.6	1
21850	1400	99.79	0	0.16	0	283.88	49
21850	2975	100.98	1.19	0.22	1.19	293.76	49
21850	4150	101.64	0.65	0.25	1.85	297.88	49
21850	7800	103.12	1.48	0.36	3.32	307.2	49

*	22200	1400	100.14	0	0.35	0	387.83	350
*	22200	2975	101.44	1.3	0.46	1.3	424.69	350
22200	4150	102.14	0.7	0.5	2	435.21	350	
22200	7800	103.77	1.62	0.65	3.63	455.99	350	

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	22239	1400	100.63	0	0.49	0	402.85	39
22239	2975	101.56	0.93	0.12	0.93	426.3	39	
22239	4150	102.25	0.68	0.1	1.62	436.75	39	
22239	7800	103.86	1.61	0.09	3.23	456.72	39	
22240	1400	100.78	0	0.15	0	411.71	1	
22240	2975	101.68	0.9	0.11	0.9	427.94	1	
22240	4150	102.33	0.65	0.08	1.55	438.17	1	
22240	7800	103.9	1.57	0.04	3.12	457.06	1	
22257	1400	100.87	0	0.09	0	416.4	17	
22257	2975	101.77	0.89	0.09	0.89	429.2	17	
22257	4150	102.4	0.64	0.07	1.53	439.21	17	
22257	7800	103.96	1.56	0.06	3.09	457.49	17	
*	22258	1400	100.87	0	0	0	416.46	1
*	22258	2975	101.77	0.9	0	0.9	429.26	1
*	22258	4150	102.41	0.64	0.01	1.54	439.41	1
*	22258	7800	103.98	1.57	0.02	3.11	457.62	1
22310	1400	100.98	0	0.11	0	417.9	52	
22310	2975	101.89	0.92	0.13	0.92	431.36	52	
22310	4150	102.53	0.63	0.12	1.55	441.51	52	
22310	7800	104.09	1.56	0.11	3.11	458.6	52	
*	22600	1400	101.14	0	0.16	0	477.92	290
*	22600	2975	102.13	0.99	0.23	0.99	523.26	290
22600	4150	102.78	0.65	0.25	1.64	544.45	290	
22600	7800	104.38	1.6	0.29	3.24	572.12	290	
22900	1400	101.25	0	0.11	0	379.02	300	
22900	2975	102.28	1.04	0.16	1.04	424.45	300	
22900	4150	102.94	0.66	0.17	1.7	446.21	300	
22900	7800	104.55	1.61	0.17	3.31	486.03	300	
*	23170	1400	101.76	0	0.51	0	117.9	270
*	23170	2975	102.88	1.11	0.59	1.11	139.11	270
*	23170	4150	103.61	0.73	0.66	1.85	172.28	270
*	23170	7800	105.14	1.53	0.58	3.37	207.67	270
*	23550	1400	104.87	0	3.11	0	151.11	380
*	23550	2975	106.14	1.27	3.26	1.27	169.62	380
*	23550	4150	106.78	0.64	3.17	1.91	178.47	380
23550	7800	108.32	1.54	3.18	3.45	197.3	380	
*	23590	1400	104.96	0	0.09	0	125.34	40
23590	2975	106.23	1.27	0.1	1.27	177.19	40	
23590	4150	106.92	0.68	0.14	1.96	183.75	40	
23590	7800	108.51	1.59	0.19	3.55	199.21	40	

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH

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*          23631   1400   105.73    0    0.76    0    159.85    41
*          23631   2975   106.59   0.87  0.36   0.87  198.45    41
    23631   4150   107.23   0.64   0.32   1.51   202.84    41
    23631   7800   108.83   1.6    0.32   3.1    213.81    41

*          23632   1400   106.28    0    0.56    0    196.33     1
*          23632   2975   107.19   0.91  0.6    0.91  202.57     1
*          23632   4150   107.71   0.51  0.47   1.42  206.08     1
*          23632   7800   108.92   1.22  0.09   2.64  214.45     1

*          23647   1400   106.98    0    0.69    0    205.66    15
*          23647   2975   107.67   0.7   0.48   0.7   209.87    15
*          23647   4150   108.12   0.45  0.41   1.14  212.57    15
*          23647   7800   109.34   1.22  0.42   2.37  219.98    15

*          23648   1400   107.54    0    0.56    0    209.07     1
*          23648   2975   108.55   1.01  0.87   1.01  215.16     1
*          23648   4150   109.17   0.62  1.05   1.63  218.94     1
*          23648   7800   110.76   1.59  1.42   3.22  231.14     1

    23690   1400   107.57    0    0.03    0    191.05    42
    23690   2975   108.59   1.02  0.04   1.02  201.21    42
    23690   4150   109.22   0.63  0.05   1.65  207.47    42
    23690   7800   110.81   1.59  0.05   3.24  223.31    42

    23920   1400   108.11    0    0.54    0    241.27   230
    23920   2975   109.39   1.28  0.8    1.28  438.75   230
*          23920   4150   110.13   0.75  0.92   2.02  501.72   230
*          23920   7800   111.98   1.85  1.17   3.87  612.48   230

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 ########   11:18:48 PAGE          76


 SUMMAF OF        ERRORS  AND        SPECIAL   NOTES


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 CAUTION SECNO=      190 PROFILE=          3 CRITICAI DEPTH    ASSUMED
 CAUTION SECNO=      190 PROFILE=          4 CRITICAI DEPTH    ASSUMED

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 CAUTION SECNO=      400 PROFILE=          1 MINIMUN SPECIFIC ENERGY
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 CAUTION SECNO=      400 PROFILE=          2 MINIMUN SPECIFIC ENERGY
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 CAUTION SECNO=      400 PROFILE=          3 MINIMUN SPECIFIC ENERGY
 CAUTION SECNO=      400 PROFILE=          4 CRITICAI DEPTH    ASSUMED
 CAUTION SECNO=      400 PROFILE=          4 MINIMUN SPECIFIC ENERGY

 WARNIN( SECNO=      580 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
 WARNIN( SECNO=      580 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
 WARNIN( SECNO=      580 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

 WARNIN( SECNO=      689 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
 WARNIN( SECNO=      689 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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 CAUTION SECNO=      990 PROFILE=          1 PROBABI MINIMUN SPECIFIC ENERGY
 CAUTION SECNO=      990 PROFILE=          1 WSEL    ASSUMEI BASED    ON        MIN       DIFF
 CAUTION SECNO=      990 PROFILE=          1        20 TRIALS  ATTEMPT TO       BALANC WSEL
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 CAUTION SECNO=      990 PROFILE=          3 HYDRAU JUMP       D.S.
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CAUTION SECNO=   1300 PROFILE=    3 MINIMUN SPECIFIC ENERGY

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CAUTION SECNO=    11700 PROFILE=          3 CRITICAL DEPTH     ASSUMED
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CAUTION SECNO=      11900 PROFILE=          3 CRITICAL DEPTH     ASSUMED
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CAUTION SECNO=      11900 PROFILE=          4 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=      13730 PROFILE=          3 CRITICAL DEPTH     ASSUMED
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CAUTION SECNO=      13730 PROFILE=          4 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=      13834 PROFILE=          3 CRITICAL DEPTH     ASSUMED
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CAUTION SECNO=      13834 PROFILE=          4 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=      13834 PROFILE=          4 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=    13846 PROFILE=          4 WSEL    ASSUMED BASED   ON      MIN     DIFF
CAUTION SECNO=    13846 PROFILE=          4       20 TRIALS  ATTEMPT TO     BALANC WSEL

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WARNIN SECNO=     14500 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

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CAUTION SECNO=    15430 PROFILE=          3 CRITICAL DEPTH    ASSUMED
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CAUTION SECNO=    16850 PROFILE=          4 CRITICAL DEPTH    ASSUMED
CAUTION SECNO=    16850 PROFILE=          4 MINIMUM SPECIFIC ENERGY
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WARNIN SECNO=     17050 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     17050 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

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WARNIN SECNO=     17870 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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WARNIN SECNO=     17870 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     17870 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNIN SECNO=     18100 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     18100 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     18100 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     18100 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNIN SECNO=     18199 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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CAUTION SECNO=    18199 PROFILE=          2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    18199 PROFILE=          3 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=    18199 PROFILE=          3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    18199 PROFILE=          4 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=    18199 PROFILE=          4 MINIMUM SPECIFIC ENERGY

WARNIN SECNO=     18241 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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WARNIN SECNO=     18241 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNIN SECNO=     18330 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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WARNIN SECNO=     18330 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNIN SECNO=     18500 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNIN SECNO=     18750 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     18750 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     18750 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNIN SECNO=     19000 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     19000 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     19000 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     19000 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

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CAUTION SECNO=    19850 PROFILE=          1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    19850 PROFILE=          2 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=    19850 PROFILE=          2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    19850 PROFILE=          3 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=    19850 PROFILE=          3 MINIMUM SPECIFIC ENERGY
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WARNIN SECNO=     20050 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     20050 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNIN SECNO=     20050 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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CAUTION SECNO=     20200 PROFILE=          1 MINIMUM SPECIFIC ENERGY
WARNING SECNO=     20200 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     20200 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     20200 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     20600 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     20750 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     20919 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     20919 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     20920 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     20920 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

CAUTION SECNO=     20933 PROFILE=          1 WSEL      ASSUMED BASED    ON        MIN       DIFF
CAUTION SECNO=     20933 PROFILE=          1        20 TRIALS  ATTEMPT TO        BALANC WSEL
WARNING SECNO=     20933 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     20933 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     20933 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

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WARNING SECNO=     21250 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     21250 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     21250 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

CAUTION SECNO=     21550 PROFILE=          1 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     21550 PROFILE=          1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     21550 PROFILE=          2 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     21550 PROFILE=          2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     21550 PROFILE=          3 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     21550 PROFILE=          3 MINIMUM SPECIFIC ENERGY
WARNING SECNO=     21550 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

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WARNING SECNO=     21740 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     21740 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     21740 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     21801 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

CAUTION SECNO=     22200 PROFILE=          1 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     22200 PROFILE=          1 MINIMUM SPECIFIC ENERGY
WARNING SECNO=     22200 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     22239 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     22258 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     22258 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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WARNING SECNO=     22258 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     22600 PROFILE=          1 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     22600 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

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CAUTION SECNO=     23170 PROFILE=          1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23170 PROFILE=          2 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23170 PROFILE=          2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23170 PROFILE=          3 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23170 PROFILE=          3 MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=     23170 PROFILE=          4 MINIMUM SPECIFIC ENERGY

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WARNING SECNO=     23550 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     23550 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

CAUTION SECNO=     23590 PROFILE=          1 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23590 PROFILE=          1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=     23631 PROFILE=          1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23631 PROFILE=          2 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23631 PROFILE=          2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     23632 PROFILE=          1 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23632 PROFILE=          1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23632 PROFILE=          2 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23632 PROFILE=          2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23632 PROFILE=          3 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23632 PROFILE=          3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23632 PROFILE=          4 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23632 PROFILE=          4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     23647 PROFILE=          1 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23647 PROFILE=          1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23647 PROFILE=          2 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23647 PROFILE=          2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     23647 PROFILE=          3 CRITICAL DEPTH     ASSUMED
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CAUTION SECNO=     23647 PROFILE=          4 CRITICAL DEPTH     ASSUMED
CAUTION SECNO=     23647 PROFILE=          4 MINIMUM SPECIFIC ENERGY

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WARNING SECNO=     23648 PROFILE=          2 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     23648 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
WARNING SECNO=     23648 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE

WARNING SECNO=     23920 PROFILE=          3 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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WARNING SECNO=     23920 PROFILE=          4 CONVEY CHANGE OUTSIDE ACCEPTA RANGE
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APPENDIX H

Existing Conditions HEC-RAS Model Output Summary and River Stationing Differences Between Effective and Existing

APPENDIX H
COMPARISON OF RIVER STATIONING OF
EFFECTIVE AND EXISTING CONDITIONS MODEL

Cross Section	1993 FIS River Distance	Effective Model HEC-2 Section Number	Existing Conditions River Station
		new section	0
		new section	108
		new section	208
Boston Post Road		new bridge	250.5 BR D
		new section	334
		190	434
		400	631
A	580	580	811
		689	872
Interstate 95		Bridge #1	1066.5 Culv Group#1
		990	1260
		1100	1335
		1300	1544
B	1500	1500	1724
		1750	1978
		2000	2232
		2250	2495
		2500	2752
		2750	2954
		2950	3183
C	3100	3100	3386
		3300	3536
D	3539	3570	3752
		3680	3864
		3681	removed duplicate
Conrail		Bridge #2	3967.5 BR U
		3778	removed duplicate
		3779	4071
		3870	4114
E	4100	4100	4350
		4375	4618
		4475	4689
Vest Avenue / Maple Tree Avenue		Bridge #3	4740.5 BR D
		4528	4791
		4630	4848
F	4850	4850	5107
		5100	5330
		5300	5553
		5500	5753
G	5700	5700	5950
		5900	6145
		6100	6348
		6330	6584
		6435	6661
iddlesex Road / Glenbrook Avenue		Bridge #4	6719.5 BR D
		6488	6777
H	6580	6580	6850
		new section	6907
		new section	6923
		6800	7095
		7000	7307
		7200	7512
		7400	7717
		7600	7925
		7800	8130
		8000	8351

APPENDIX H
COMPARISON OF RIVER STATIONING OF
EFFECTIVE AND EXISTING CONDITIONS MODEL

Cross Section	1993 FIS River Distance	Effective Model HEC-2 Section Number	Existing Conditions River Station
I	8250	8250	8593
		8500	8837
		8750	9095
		9000	9350
		9250	9606
		9500	9864
		9750	10120
		10000	10364
		10794	removed inaccurate
		60	removed inaccurate
		110	10499
		250	removed inaccurate
		390	10846
		480	10928
		575	removed inaccurate
		667	removed inaccurate
		767	removed inaccurate
		787	removed inaccurate
		800	11371
		11720	11508
		11150	11770
		11400	12023
		11570	12195
		11700	12337
		11900	12530
J	12150	12100	12709
		12500	13129
		12800	13435
K	13100	13000	13634
		13120	13742
Dam		Bridge #5	13752.5
		13122	13767
		13170	13825
		13350	13988
		13550	14187
L	13820	13730	14341
		13834	14423
Conrail		Bridge #6	14462.5 BR D
		13846	14501
		13950	14599
		14250	14870
		14500	15105
M	14840	14750	15361
		14837	15454
Camp Avenue		Bridge #7	15490.5 BR D
		14883	15527
		14950	15610
		new section	15688
N	15300	15200	15834
		15430	16072
		15700	16345
		15950	16568
		16250	16900
O	16600	16500	17133
		new section	17410
		16850	17499

APPENDIX H
COMPARISON OF RIVER STATIONING OF
EFFECTIVE AND EXISTING CONDITIONS MODEL

Cross Section	1993 FIS River Distance	Effective Model HEC-2 Section Number	Existing Conditions River Station
		17050	17701
		17200	17851
		17450	18102
		17650	18298
		17870	18523
P	18200	18100	18753
		18199	18826
Woodway Road		Bridge #8	18874.5 BR D
		18241	18922
		18330	18991
Q	18600	18500	19164
		18750	19414
		19000	19666
		19300	19972
R	19650	19550	20220
		19850	20520
		20050	20728
		20200	20884
S	20700	20600	21277
		20750	21433
		20919	21617
		20920	removed duplicate
#3		Bridge #9	21635.5 BR U
		20932	removed duplicate
		20933	21655
T	21100	21000	21708
		21250	21964
U	21650	21550	22292
		21740	22497
		21789	22534
		21790	removed duplicate
#7		Bridge #10	22556.5 BR U
		21800	removed duplicate
		21801	22578
V	21950	21850	22614
		22200	22976
		22239	23022
		22240	removed duplicate
#10		Bridge #11	23038.5 BR U
		22257	removed duplicate
		22258	23055
		22310	23104
W	22700	22600	23390
		22900	23691
		23170	23965
X	23650	23550	24348
		23590	24395
		23631	24442
		23632	removed duplicate
#13		Bridge #12	24464.5 BR U
		23647	removed duplicate
		23648	24486
		23690	24515
Y	24020	23920	24704

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	1023.90	101.25	107.24	105.53	107.27	0.000428	2.09	999.17	557.96	0.16
Mainstem	24704	2813.20	101.25	109.06	106.62	109.10	0.000408	2.49	2044.08	587.81	0.17
Mainstem	24704	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	4492.60	101.25	110.25	107.09	110.30	0.000418	2.79	2767.79	660.48	0.17
Mainstem	24704	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24704	1261.30	101.25	107.54	105.87	107.57	0.000421	2.15	1168.19	561.99	0.16
Mainstem	24704	3041.50	101.25	109.24	106.69	109.28	0.000409	2.53	2150.51	589.83	0.17
Mainstem	24704	5925.30	101.25	111.09	107.37	111.15	0.000421	2.99	3362.01	750.04	0.18
Mainstem	24704	7650.60	101.25	111.95	107.66	112.02	0.000425	3.19	4029.89	794.84	0.18
Mainstem	24515	1023.90	101.05	107.09	105.00	107.16	0.000751	2.94	531.24	500.27	0.21
Mainstem	24515	2813.20	101.05	108.77	106.40	108.95	0.001389	4.73	867.97	548.67	0.30
Mainstem	24515	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	4492.60	101.05	109.85	107.15	110.13	0.001756	5.81	1106.26	581.79	0.35
Mainstem	24515	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24515	1261.30	101.05	107.37	105.44	107.46	0.000869	3.26	584.35	507.82	0.23
Mainstem	24515	3041.50	101.05	108.94	106.52	109.13	0.001447	4.90	903.38	553.86	0.31
Mainstem	24515	5925.30	101.05	110.62	107.71	110.97	0.001973	6.52	1295.02	654.99	0.37
Mainstem	24515	7650.60	101.05	111.42	108.30	111.83	0.002135	7.16	1552.39	718.36	0.39
Mainstem	24486	1023.90	100.71	106.92	106.02	107.10	0.001945	4.78	384.06	362.61	0.35
Mainstem	24486	2813.20	100.71	108.51	107.17	108.85	0.002968	6.94	682.65	421.60	0.45
Mainstem	24486	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	4492.60	100.71	109.54	107.95	110.01	0.003461	8.17	896.84	452.41	0.50
Mainstem	24486	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24486	1261.30	100.71	107.18	106.22	107.38	0.002171	5.20	429.78	372.47	0.37
Mainstem	24486	3041.50	100.71	108.67	107.28	109.03	0.003045	7.13	714.55	426.30	0.46
Mainstem	24486	5925.30	100.71	110.27	108.51	110.83	0.003718	8.94	1057.63	471.41	0.52
Mainstem	24486	7650.60	100.71	110.99	109.10	111.67	0.004048	9.82	1233.27	546.75	0.55
Mainstem	24464.5	Bridge									
Mainstem	24442	1023.90	99.46	105.81	105.81	106.53	0.005800	8.10	221.25	274.23	0.60
Mainstem	24442	2813.20	99.46	107.22	107.22	108.29	0.008559	11.41	443.30	325.16	0.75
Mainstem	24442	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	4492.60	99.46	108.09	108.09	109.41	0.009790	13.18	602.22	354.71	0.82
Mainstem	24442	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24442	1261.30	99.46	106.08	106.08	106.84	0.006227	8.66	259.81	284.32	0.62
Mainstem	24442	3041.50	99.46	107.35	107.35	108.46	0.008805	11.71	465.89	329.60	0.77
Mainstem	24442	5925.30	99.46	108.67	108.67	110.20	0.010709	14.44	713.75	372.08	0.87
Mainstem	24442	7650.60	99.46	109.48	109.28	111.05	0.009987	14.82	881.86	401.92	0.85
Mainstem	24395	1023.90	99.15	103.29	104.03	105.55	0.032734	13.71	108.37	84.40	1.30
Mainstem	24395	2813.20	99.15	106.23	105.56	107.03	0.006922	9.50	446.29	170.04	0.66
Mainstem	24395	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	4492.60	99.15	107.42	106.66	108.37	0.006824	10.57	637.61	265.18	0.68
Mainstem	24395	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24395	1261.30	99.15	103.55	104.30	105.85	0.032096	14.26	131.42	90.32	1.30
Mainstem	24395	3041.50	99.15	106.40	105.73	107.22	0.006983	9.71	471.34	186.58	0.67
Mainstem	24395	5925.30	99.15	108.37	107.35	109.37	0.006262	10.96	812.12	306.76	0.66
Mainstem	24395	7650.60	99.15	109.45	108.08	110.46	0.005539	11.15	1030.20	349.92	0.63
Mainstem	24348	1023.90	99.00	104.17	103.39	104.56	0.004091	5.87	247.56	104.91	0.48
Mainstem	24348	2813.20	99.00	106.00		106.73	0.005745	8.66	476.78	140.31	0.60
Mainstem	24348	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	4492.60	99.00	106.93		108.02	0.007444	10.77	611.57	149.93	0.70
Mainstem	24348	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	24348	1261.30	99.00	104.59	103.68	105.01	0.004037	6.17	294.26	116.39	0.48
Mainstem	24348	3041.50	99.00	106.15		106.93	0.005963	8.96	498.13	141.79	0.61
Mainstem	24348	5925.30	99.00	107.54		108.94	0.008727	12.29	704.64	155.55	0.76
Mainstem	24348	7650.60	99.00	108.14		109.92	0.010171	13.93	800.53	161.00	0.83
Mainstem	23965	1023.90	97.61	103.61		103.74	0.001213	3.64	504.81	255.10	0.27
Mainstem	23965	2813.20	97.61	105.33		105.54	0.001722	5.20	1008.87	327.49	0.34
Mainstem	23965	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	4492.60	97.61	106.09		106.39	0.002375	6.52	1268.24	351.80	0.41
Mainstem	23965	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	23965	1261.30	97.61	104.11		104.23	0.001089	3.66	638.86	278.44	0.26
Mainstem	23965	3041.50	97.61	105.47		105.68	0.001796	5.38	1052.93	333.32	0.35
Mainstem	23965	5925.30	97.61	106.61		106.99	0.002822	7.41	1453.85	362.85	0.45
Mainstem	23965	7650.60	97.61	107.15		107.62	0.003280	8.33	1653.21	375.77	0.49
Mainstem	23691	1023.90	96.62	102.14	101.69	102.99	0.007472	8.37	168.39	326.61	0.64
Mainstem	23691	2813.20	96.62	104.14	104.14	104.72	0.005499	8.90	682.69	471.13	0.58
Mainstem	23691	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	4492.60	96.62	104.62	104.62	105.32	0.006875	10.39	917.93	489.04	0.66
Mainstem	23691	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23691	1261.30	96.62	102.17	102.17	103.42	0.011037	10.21	170.34	327.17	0.78
Mainstem	23691	3041.50	96.62	104.18	104.18	104.82	0.005984	9.32	705.62	476.75	0.61
Mainstem	23691	5925.30	96.62	104.93	104.93	105.74	0.007925	11.45	1070.55	494.66	0.71
Mainstem	23691	7650.60	96.62	105.25	105.25	106.19	0.008997	12.52	1229.47	501.21	0.76
Mainstem	23390	1023.90	95.51	99.53	99.53	100.38	0.010017	8.32	224.88	431.12	0.74
Mainstem	23390	2813.20	95.51	100.37	100.84	101.81	0.018632	12.89	563.45	576.62	1.04
Mainstem	23390	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	4492.60	95.51	101.81	101.24	102.10	0.004258	7.34	1407.83	595.70	0.52
Mainstem	23390	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23390	1261.30	95.51	100.10	100.23	100.66	0.006645	7.40	407.05	572.70	0.61
Mainstem	23390	3041.50	95.51	100.46	100.90	101.81	0.017902	12.80	617.55	578.00	1.02
Mainstem	23390	5925.30	95.51	102.55	101.51	102.80	0.003167	6.83	1855.89	603.07	0.46
Mainstem	23390	7650.60	95.51	103.33	101.80	103.56	0.002601	6.63	2323.94	609.90	0.42
Mainstem	23104	1023.90	94.45	99.39	97.94	99.41	0.000281	1.55	1309.79	691.34	0.13
Mainstem	23104	2813.20	94.45	100.76	98.15	100.79	0.000465	2.37	2317.13	769.90	0.17
Mainstem	23104	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	4492.60	94.45	101.71	98.54	101.75	0.000519	2.77	3080.94	828.17	0.19
Mainstem	23104	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23104	1261.30	94.45	99.62	97.94	99.64	0.000320	1.71	1467.83	711.35	0.14
Mainstem	23104	3041.50	94.45	100.90	98.22	100.93	0.000476	2.44	2424.84	781.35	0.17
Mainstem	23104	5925.30	94.45	102.42	99.03	102.47	0.000601	3.18	3681.69	869.47	0.20
Mainstem	23104	7650.60	94.45	103.20	99.33	103.26	0.000583	3.34	4367.21	881.32	0.20
Mainstem	23055	1023.90	94.15	99.14	98.62	99.32	0.002464	4.69	548.77	402.50	0.38
Mainstem	23055	2813.20	94.15	100.47	99.53	100.68	0.002973	6.08	1139.03	446.03	0.44
Mainstem	23055	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	4492.60	94.15	101.40	100.12	101.64	0.002991	6.70	1559.90	460.79	0.45
Mainstem	23055	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23055	1261.30	94.15	99.34	98.79	99.54	0.002733	5.08	626.62	414.73	0.40
Mainstem	23055	3041.50	94.15	100.61	99.69	100.82	0.002982	6.18	1200.29	447.21	0.44
Mainstem	23055	5925.30	94.15	102.09	100.48	102.35	0.002947	7.09	1880.48	467.97	0.45
Mainstem	23055	7650.60	94.15	102.86	100.84	103.14	0.002852	7.43	2242.93	476.30	0.45
Mainstem	23038.5	Bridge									
Mainstem	23022	1023.90	94.15	98.78	98.55	99.03	0.004467	5.66	472.59	393.41	0.48
Mainstem	23022	2813.20	94.15	100.22	99.33	100.43	0.003666	6.23	1069.89	411.09	0.46
Mainstem	23022	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	4492.60	94.15	101.18	99.82	101.42	0.003584	6.83	1470.41	421.69	0.47
Mainstem	23022	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	23022	1261.30	94.15	99.04	98.70	99.24	0.004010	5.57	590.07	397.88	0.46
Mainstem	23022	3041.50	94.15	100.36	99.40	100.57	0.003652	6.32	1128.97	412.80	0.46
Mainstem	23022	5925.30	94.15	101.88	100.16	102.14	0.003533	7.25	1768.21	427.86	0.47
Mainstem	23022	7650.60	94.15	102.66	100.53	102.95	0.003413	7.62	2102.73	434.47	0.47
Mainstem	22976	1023.90	94.45	98.51	97.95	98.64	0.002749	4.31	466.64	313.65	0.39
Mainstem	22976	2813.20	94.45	99.90	98.71	100.08	0.002747	5.30	927.34	347.41	0.41
Mainstem	22976	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	4492.60	94.45	100.85	99.22	101.07	0.002715	5.89	1263.43	362.12	0.42
Mainstem	22976	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22976	1261.30	94.45	98.76	98.08	98.88	0.002709	4.45	543.21	321.82	0.39
Mainstem	22976	3041.50	94.45	100.04	98.79	100.22	0.002744	5.39	976.36	349.83	0.41
Mainstem	22976	5925.30	94.45	101.54	99.59	101.80	0.002683	6.28	1516.39	370.67	0.42
Mainstem	22976	7650.60	94.45	102.30	99.98	102.61	0.002603	6.64	1803.12	378.24	0.42

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	22614	1023.90	92.85	97.88	97.15	98.00	0.002061	4.25	438.35	246.94	0.35
Mainstem	22614	2813.20	92.85	98.98	97.98	99.26	0.003449	6.34	716.90	258.01	0.47
Mainstem	22614	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	4492.60	92.85	99.82	98.54	100.22	0.003801	7.29	937.15	264.53	0.50
Mainstem	22614	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22614	1261.30	92.85	98.10	97.29	98.23	0.002218	4.55	491.90	250.36	0.36
Mainstem	22614	3041.50	92.85	99.10	98.07	99.40	0.003522	6.50	748.59	258.97	0.47
Mainstem	22614	5925.30	92.85	100.44	98.96	100.92	0.003988	7.92	1101.10	269.27	0.52
Mainstem	22614	7650.60	92.85	101.16	99.43	101.73	0.003983	8.43	1297.14	274.92	0.53
Mainstem	22578	1023.90	92.12	97.84	96.99	97.94	0.001484	3.80	480.56	251.90	0.30
Mainstem	22578	2813.20	92.12	98.90	97.85	99.16	0.002900	6.03	754.04	261.78	0.43
Mainstem	22578	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	4492.60	92.12	99.74	98.42	100.11	0.003345	7.05	975.33	268.91	0.47
Mainstem	22578	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22578	1261.30	92.12	98.05	97.15	98.17	0.001658	4.12	533.89	254.69	0.32
Mainstem	22578	3041.50	92.12	99.02	97.94	99.30	0.002987	6.20	785.69	262.79	0.44
Mainstem	22578	5925.30	92.12	100.35	98.84	100.81	0.003580	7.72	1141.24	274.42	0.49
Mainstem	22578	7650.60	92.12	101.07	99.29	101.62	0.003617	8.24	1342.20	281.11	0.50
Mainstem	22556.5	Bridge									
Mainstem	22534	1023.90	92.38	96.49	96.48	96.91	0.007688	7.11	272.02	239.48	0.64
Mainstem	22534	2813.20	92.38	98.15	97.31	98.45	0.003927	6.48	708.63	304.46	0.49
Mainstem	22534	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	4492.60	92.38	99.07	97.88	99.46	0.003960	7.21	1041.11	485.43	0.50
Mainstem	22534	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22534	1261.30	92.38	96.78	96.62	97.13	0.006339	6.78	340.86	248.96	0.59
Mainstem	22534	3041.50	92.38	98.15	97.40	98.50	0.004616	7.02	707.19	304.00	0.53
Mainstem	22534	5925.30	92.38	99.87	98.31	100.22	0.003037	6.84	1462.15	550.65	0.45
Mainstem	22534	7650.60	92.38	100.72	98.83	101.04	0.002406	6.56	1941.77	574.05	0.41
Mainstem	22497	1023.90	91.85	96.46	95.97	96.64	0.003194	4.88	364.06	542.50	0.42
Mainstem	22497	2813.20	91.85	98.09	96.86	98.33	0.002715	5.61	789.81	767.82	0.41
Mainstem	22497	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	4492.60	91.85	99.22	97.47	99.25	0.000331	2.21	3266.71	992.65	0.15
Mainstem	22497	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22497	1261.30	91.85	96.73	96.13	96.92	0.003060	4.98	428.82	592.87	0.42
Mainstem	22497	3041.50	91.85	98.28	96.95	98.31	0.000327	1.99	2413.36	826.16	0.14
Mainstem	22497	5925.30	91.85	100.00	97.89	100.04	0.000305	2.28	4048.64	999.33	0.14
Mainstem	22497	7650.60	91.85	100.84	98.12	100.88	0.000287	2.37	4887.12	1006.08	0.14
Mainstem	22292	1023.90	91.52	96.41	95.00	96.42	0.000343	1.60	1023.33	514.69	0.14
Mainstem	22292	2813.20	91.52	98.05	95.49	98.09	0.000376	2.09	1898.14	549.61	0.15
Mainstem	22292	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	4492.60	91.52	99.13	95.85	99.19	0.000401	2.42	2504.43	568.23	0.16
Mainstem	22292	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	22292	1261.30	91.52	96.67	94.99	96.69	0.000350	1.69	1162.42	520.39	0.14
Mainstem	22292	3041.50	91.52	98.21	95.54	98.25	0.000380	2.14	1987.21	552.39	0.15
Mainstem	22292	5925.30	91.52	99.91	96.13	99.97	0.000418	2.65	2949.75	581.31	0.17
Mainstem	22292	7650.60	91.52	100.73	96.44	100.81	0.000433	2.89	3434.45	594.54	0.17
Mainstem	21964	1023.90	90.99	96.16		96.24	0.001083	3.22	529.99	251.70	0.25
Mainstem	21964	2813.20	90.99	97.71		97.87	0.001492	4.53	931.15	268.41	0.31
Mainstem	21964	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	4492.60	90.99	98.70		98.94	0.001860	5.56	1216.15	303.01	0.36
Mainstem	21964	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21964	1261.30	90.99	96.41		96.50	0.001172	3.47	593.66	254.30	0.27
Mainstem	21964	3041.50	90.99	97.85		98.03	0.001534	4.67	971.31	270.16	0.32
Mainstem	21964	5925.30	90.99	99.42		99.71	0.001961	6.07	1440.42	315.54	0.37
Mainstem	21964	7650.60	90.99	100.20		100.54	0.002013	6.53	1687.20	323.65	0.38
Mainstem	21708	1023.90	90.55	95.89		96.00	0.001555	3.99	450.20	192.21	0.31
Mainstem	21708	2813.20	90.55	97.20		97.50	0.003046	6.49	716.21	212.06	0.45
Mainstem	21708	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	4492.60	90.55	98.00		98.46	0.004123	8.15	888.37	223.20	0.53
Mainstem	21708	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21708	1261.30	90.55	96.10		96.24	0.001845	4.46	490.68	195.79	0.34
Mainstem	21708	3041.50	90.55	97.33		97.64	0.003205	6.74	742.23	213.76	0.46
Mainstem	21708	5925.30	90.55	98.59		99.19	0.004772	9.24	1024.68	235.36	0.58
Mainstem	21708	7650.60	90.55	99.26		99.99	0.005161	10.14	1184.23	242.20	0.61
Mainstem	21655	1023.90	88.94	95.79	94.45	95.93	0.001472	4.32	478.07	214.68	0.30
Mainstem	21655	2813.20	88.94	97.02	95.89	97.36	0.003133	7.10	785.16	341.66	0.46
Mainstem	21655	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	4492.60	88.94	97.84	96.64	98.29	0.003875	8.46	1078.94	379.36	0.52
Mainstem	21655	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21655	1261.30	88.94	95.98	94.75	96.15	0.001811	4.88	518.52	220.08	0.34
Mainstem	21655	3041.50	88.94	97.15	96.04	97.50	0.003258	7.32	827.90	348.28	0.47
Mainstem	21655	5925.30	88.94	98.44	97.24	98.96	0.004207	9.23	1318.10	414.60	0.54
Mainstem	21655	7650.60	88.94	99.13	97.73	99.72	0.004313	9.82	1621.44	467.25	0.56
Mainstem	21635.5	Bridge									
Mainstem	21617	1023.90	89.65	94.44	93.83	95.28	0.008765	8.31	215.41	228.81	0.71
Mainstem	21617	2813.20	89.65	96.42	95.81	96.78	0.004048	7.27	874.94	408.82	0.51
Mainstem	21617	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	4492.60	89.65	97.28	96.42	97.69	0.004173	8.05	1256.17	461.22	0.53
Mainstem	21617	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21617	1261.30	89.65	94.99	94.89	95.50	0.005544	7.16	357.55	293.26	0.57
Mainstem	21617	3041.50	89.65	96.50	95.90	96.90	0.004284	7.55	911.57	415.44	0.53
Mainstem	21617	5925.30	89.65	98.05	96.86	98.43	0.003622	8.03	1620.16	482.91	0.50
Mainstem	21617	7650.60	89.65	98.90	97.32	99.26	0.003158	8.02	2034.39	501.73	0.48
Mainstem	21433	1023.90	88.25	93.35		93.95	0.005212	6.60	188.34	106.23	0.55
Mainstem	21433	2813.20	88.25	95.08		95.81	0.005707	8.59	544.62	261.69	0.61
Mainstem	21433	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	4492.60	88.25	96.35		96.91	0.003943	8.08	886.87	283.08	0.52
Mainstem	21433	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21433	1261.30	88.25	93.61		94.36	0.006205	7.48	221.68	147.40	0.61
Mainstem	21433	3041.50	88.25	95.30		95.97	0.005167	8.36	602.25	268.21	0.58
Mainstem	21433	5925.30	88.25	97.23		97.76	0.003380	8.06	1187.25	403.22	0.49
Mainstem	21433	7650.60	88.25	98.18		98.68	0.002910	8.03	1583.45	428.03	0.46
Mainstem	21277	1023.90	88.03	92.86		93.08	0.003645	5.26	365.54	234.38	0.45
Mainstem	21277	2813.20	88.03	94.86		95.03	0.002074	5.13	963.56	342.70	0.36
Mainstem	21277	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	4492.60	88.03	96.17		96.34	0.001589	5.10	1434.42	381.58	0.33
Mainstem	21277	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	21277	1261.30	88.03	93.12		93.35	0.003779	5.57	427.92	259.91	0.46
Mainstem	21277	3041.50	88.03	95.08		95.25	0.001925	5.06	1042.68	349.75	0.35
Mainstem	21277	5925.30	88.03	97.07		97.26	0.001410	5.18	1808.83	441.22	0.31
Mainstem	21277	7650.60	88.03	98.04		98.24	0.001276	5.30	2245.34	459.79	0.30
Mainstem	20884	1023.90	87.45	91.13		91.44	0.005595	5.45	309.36	176.22	0.53
Mainstem	20884	2813.20	87.45	93.96		94.22	0.002434	5.44	824.76	187.25	0.39
Mainstem	20884	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	4492.60	87.45	95.19		95.58	0.002896	6.70	1058.89	193.68	0.44
Mainstem	20884	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20884	1261.30	87.45	91.60		91.88	0.004394	5.28	393.27	178.04	0.48
Mainstem	20884	3041.50	87.45	94.21		94.48	0.002402	5.55	871.54	188.30	0.39
Mainstem	20884	5925.30	87.45	95.99		96.50	0.003316	7.69	1216.40	199.57	0.47
Mainstem	20884	7650.60	87.45	96.84		97.47	0.003717	8.69	1387.11	205.82	0.51
Mainstem	20728	1023.90	85.80	90.77		90.91	0.002199	4.28	437.12	189.88	0.35
Mainstem	20728	2813.20	85.80	93.80		93.95	0.001265	4.54	1062.54	221.76	0.29
Mainstem	20728	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	4492.60	85.80	95.00		95.23	0.001650	5.71	1335.77	233.55	0.34
Mainstem	20728	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20728	1261.30	85.80	91.32		91.45	0.001806	4.18	543.12	196.27	0.32
Mainstem	20728	3041.50	85.80	94.05		94.21	0.001272	4.65	1118.61	224.27	0.29
Mainstem	20728	5925.30	85.80	95.77		96.08	0.002037	6.71	1521.11	247.24	0.38
Mainstem	20728	7650.60	85.80	96.58		96.98	0.002486	7.83	1728.84	267.65	0.43

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	20520	1023.90	83.60	89.36	87.95	90.11	0.005431	7.64	177.49	57.17	0.57
Mainstem	20520	2813.20	83.60	91.76	91.76	93.23	0.008327	12.00	426.44	142.95	0.75
Mainstem	20520	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	4492.60	83.60	93.30	93.30	94.48	0.006645	12.05	759.24	303.79	0.69
Mainstem	20520	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20520	1261.30	83.60	89.72	88.50	90.67	0.006447	8.67	199.42	66.86	0.63
Mainstem	20520	3041.50	83.60	91.88	91.88	93.46	0.008953	12.56	443.19	145.97	0.78
Mainstem	20520	5925.30	83.60	93.83	93.83	95.18	0.007565	13.33	892.37	329.11	0.74
Mainstem	20520	7650.60	83.60	94.37	94.37	95.91	0.008486	14.62	1032.01	350.50	0.79
Mainstem	20220	1023.90	82.94	88.77	87.37	89.00	0.002151	4.73	445.40	255.22	0.35
Mainstem	20220	2813.20	82.94	91.40	89.49	91.55	0.001275	4.73	1318.05	346.22	0.29
Mainstem	20220	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	4492.60	82.94	92.37	90.16	92.58	0.001673	5.83	1654.92	403.35	0.34
Mainstem	20220	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	20220	1261.30	82.94	89.24	87.90	89.47	0.002054	4.89	587.80	328.81	0.35
Mainstem	20220	3041.50	82.94	91.65	89.59	91.80	0.001244	4.76	1403.38	356.06	0.29
Mainstem	20220	5925.30	82.94	93.21	90.62	93.45	0.001766	6.36	1955.83	438.50	0.35
Mainstem	20220	7650.60	82.94	94.10	91.09	94.38	0.001856	6.90	2278.96	475.16	0.37
Mainstem	19972	1023.90	82.39	88.12	86.81	88.34	0.003061	4.88	370.78	234.40	0.37
Mainstem	19972	2813.20	82.39	90.63	88.44	91.00	0.003558	6.81	735.65	271.08	0.43
Mainstem	19972	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	4492.60	82.39	91.94	89.43	92.12	0.001719	5.24	1528.05	307.12	0.31
Mainstem	19972	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19972	1261.30	82.39	88.62	87.08	88.84	0.002886	5.03	440.54	238.24	0.37
Mainstem	19972	3041.50	82.39	90.81	88.59	91.23	0.003985	7.31	765.22	285.79	0.46
Mainstem	19972	5925.30	82.39	92.74	90.14	92.96	0.001895	5.82	1776.14	311.77	0.33
Mainstem	19972	7650.60	82.39	93.59	90.48	93.86	0.002069	6.43	2043.42	319.66	0.34
Mainstem	19666	1023.90	81.74	88.01	85.71	88.07	0.000320	2.59	650.06	161.83	0.19
Mainstem	19666	2813.20	81.74	90.42	86.29	90.57	0.000613	4.51	1052.68	175.51	0.28
Mainstem	19666	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	4492.60	81.74	91.42	87.24	91.72	0.001013	6.26	1234.07	186.98	0.36
Mainstem	19666	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19666	1261.30	81.74	88.50	86.19	88.57	0.000351	2.86	729.03	164.07	0.20
Mainstem	19666	3041.50	81.74	90.58	86.43	90.76	0.000665	4.76	1081.50	177.21	0.29
Mainstem	19666	5925.30	81.74	92.02	87.93	92.46	0.001386	7.64	1348.23	194.44	0.43
Mainstem	19666	7650.60	81.74	92.61	88.66	93.24	0.001852	9.18	1465.75	202.25	0.50
Mainstem	19414	1023.90	81.18	87.97	85.00	88.00	0.000164	1.97	863.87	231.89	0.14
Mainstem	19414	2813.20	81.18	90.34	85.00	90.44	0.000332	3.45	1493.30	286.64	0.20
Mainstem	19414	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	4492.60	81.18	91.32	86.03	91.48	0.000539	4.71	1777.36	296.39	0.27
Mainstem	19414	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19414	1261.30	81.18	88.45	85.00	88.49	0.000186	2.19	979.56	248.77	0.15
Mainstem	19414	3041.50	81.18	90.50	85.10	90.60	0.000359	3.63	1539.09	288.33	0.21
Mainstem	19414	5925.30	81.18	91.89	86.79	92.13	0.000733	5.71	1949.74	302.08	0.31
Mainstem	19414	7650.60	81.18	92.46	87.58	92.80	0.000971	6.81	2123.56	307.69	0.36
Mainstem	19164	1023.90	80.63	87.97	83.60	87.97	0.000047	1.11	1664.52	350.24	0.07
Mainstem	19164	2813.20	80.63	90.34	83.82	90.37	0.000107	2.05	2531.10	377.65	0.12
Mainstem	19164	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	4492.60	80.63	91.32	84.65	91.38	0.000184	2.86	2903.61	384.10	0.16
Mainstem	19164	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	19164	1261.30	80.63	88.45	83.60	88.46	0.000054	1.25	1834.35	355.84	0.08
Mainstem	19164	3041.50	80.63	90.50	83.93	90.54	0.000117	2.16	2591.50	378.75	0.12
Mainstem	19164	5925.30	80.63	91.90	85.34	91.98	0.000257	3.51	3127.82	388.13	0.19
Mainstem	19164	7650.60	80.63	92.48	85.88	92.60	0.000351	4.24	3353.86	396.10	0.22
Mainstem	18991	1023.90	79.95	87.95		87.96	0.000097	1.64	1301.19	397.53	0.11
Mainstem	18991	2813.20	79.95	90.32		90.35	0.000145	2.41	2598.58	628.56	0.14
Mainstem	18991	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	4492.60	79.95	91.30		91.34	0.000196	2.99	3220.32	646.69	0.16
Mainstem	18991	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18991	1261.30	79.95	88.43		88.45	0.000102	1.75	1505.84	449.73	0.11
Mainstem	18991	3041.50	79.95	90.48		90.51	0.000151	2.49	2699.22	631.39	0.14

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	18991	5925.30	79.95	91.87		91.93	0.000245	3.47	3597.80	659.17	0.18
Mainstem	18991	7650.60	79.95	92.45		92.53	0.000301	3.98	3981.00	669.55	0.20
Mainstem	18922	1023.90	79.30	87.88	83.63	87.94	0.000221	2.75	880.94	452.53	0.17
Mainstem	18922	2813.20	79.30	90.26	86.06	90.33	0.000288	3.71	2404.79	586.22	0.20
Mainstem	18922	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	4492.60	79.30	91.20	87.00	91.30	0.000434	4.82	2973.14	629.98	0.25
Mainstem	18922	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18922	1261.30	79.30	88.35	84.03	88.42	0.000256	3.07	973.60	466.73	0.18
Mainstem	18922	3041.50	79.30	90.41	86.30	90.49	0.000306	3.86	2496.31	589.88	0.21
Mainstem	18922	5925.30	79.30	91.74	87.80	91.88	0.000567	5.68	3323.68	650.72	0.29
Mainstem	18922	7650.60	79.30	92.28	88.61	92.46	0.000726	6.61	3680.40	671.91	0.33
Mainstem	18874.5	Bridge									
Mainstem	18826	1023.90	76.78	84.63	81.62	85.03	0.001186	5.35	252.22	156.40	0.36
Mainstem	18826	2813.20	76.78	86.00	85.20	87.67	0.004174	11.36	347.76	187.53	0.70
Mainstem	18826	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	4492.60	76.78	87.40	87.14	88.61	0.003291	11.22	872.18	265.21	0.64
Mainstem	18826	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18826	1261.30	76.78	84.86	82.11	85.41	0.001572	6.30	267.20	163.46	0.42
Mainstem	18826	3041.50	76.78	86.09	85.53	87.97	0.004651	12.08	355.53	191.91	0.74
Mainstem	18826	5925.30	76.78	88.20	87.82	89.51	0.003486	12.19	1088.14	277.85	0.67
Mainstem	18826	7650.60	76.78	89.14	88.83	90.59	0.003698	13.31	1390.92	344.66	0.70
Mainstem	18753	1023.90	78.85	84.03		84.74	0.008236	8.38	235.52	154.36	0.68
Mainstem	18753	2813.20	78.85	86.42		86.70	0.003186	6.83	914.86	343.82	0.45
Mainstem	18753	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	4492.60	78.85	87.66		87.91	0.002577	6.83	1344.97	353.78	0.42
Mainstem	18753	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18753	1261.30	78.85	84.42		85.13	0.008012	8.71	301.94	198.77	0.68
Mainstem	18753	3041.50	78.85	86.62		86.88	0.003022	6.78	982.66	345.51	0.44
Mainstem	18753	5925.30	78.85	88.51		88.78	0.002420	7.06	1648.88	362.31	0.41
Mainstem	18753	7650.60	78.85	89.52		89.80	0.002143	7.12	2024.61	374.84	0.39
Mainstem	18523	1023.90	77.67	83.71		83.79	0.001598	3.60	593.17	257.53	0.27
Mainstem	18523	2813.20	77.67	86.11		86.21	0.001354	4.20	1279.41	310.72	0.26
Mainstem	18523	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	4492.60	77.67	87.30		87.44	0.001710	5.17	1673.52	362.72	0.30
Mainstem	18523	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18523	1261.30	77.67	84.14		84.22	0.001506	3.67	705.40	272.18	0.26
Mainstem	18523	3041.50	77.67	86.30		86.41	0.001395	4.33	1338.95	315.76	0.27
Mainstem	18523	5925.30	77.67	88.14		88.31	0.001802	5.63	1995.13	390.55	0.31
Mainstem	18523	7650.60	77.67	89.19		89.37	0.001724	5.88	2424.62	431.86	0.31
Mainstem	18298	1023.90	76.58	82.68		83.27	0.004358	6.80	249.17	148.16	0.50
Mainstem	18298	2813.20	76.58	85.47		85.86	0.002667	6.95	846.25	286.60	0.42
Mainstem	18298	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	4492.60	76.58	86.58		87.03	0.003026	8.04	1216.67	380.32	0.46
Mainstem	18298	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18298	1261.30	76.58	83.20		83.74	0.003947	6.86	332.39	172.46	0.49
Mainstem	18298	3041.50	76.58	85.65		86.05	0.002746	7.15	896.50	294.75	0.43
Mainstem	18298	5925.30	76.58	87.47		87.90	0.002897	8.35	1619.47	481.60	0.45
Mainstem	18298	7650.60	76.58	88.65		89.02	0.002385	8.13	2200.98	504.14	0.42
Mainstem	18102	1023.90	75.57	82.22		82.58	0.002347	5.29	302.69	128.50	0.38
Mainstem	18102	2813.20	75.57	84.68		85.27	0.003102	7.64	825.22	399.71	0.46
Mainstem	18102	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	4492.60	75.57	85.96		86.44	0.002771	7.93	1400.29	486.20	0.45
Mainstem	18102	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	18102	1261.30	75.57	82.69		83.09	0.002456	5.69	365.63	139.84	0.39
Mainstem	18102	3041.50	75.57	84.91		85.46	0.002988	7.63	915.26	413.42	0.45
Mainstem	18102	5925.30	75.57	86.97		87.37	0.002361	7.81	1908.01	514.32	0.42
Mainstem	18102	7650.60	75.57	88.27		88.59	0.001807	7.37	2590.65	535.94	0.37
Mainstem	17851	1023.90	74.31	80.63		81.58	0.007322	8.90	205.62	101.02	0.65
Mainstem	17851	2813.20	74.31	83.60		84.31	0.004900	9.61	698.89	271.19	0.57

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	17851	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	4492.60	74.31	84.79		85.53	0.005130	10.70	1061.05	348.28	0.60
Mainstem	17851	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17851	1261.30	74.31	81.23		82.11	0.006484	8.95	271.86	117.75	0.63
Mainstem	17851	3041.50	74.31	83.48		84.40	0.006316	10.81	666.59	259.13	0.65
Mainstem	17851	5925.30	74.31	86.12		86.66	0.003710	9.90	1573.01	406.82	0.52
Mainstem	17851	7650.60	74.31	87.69		88.07	0.002525	8.91	2243.50	442.05	0.44
Mainstem	17701	1023.90	73.56	79.77	78.00	80.45	0.006644	7.03	196.79	85.07	0.52
Mainstem	17701	2813.20	73.56	83.25	82.21	83.63	0.003135	6.68	942.87	383.95	0.39
Mainstem	17701	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	4492.60	73.56	84.46	83.08	84.82	0.003136	7.26	1483.52	486.24	0.40
Mainstem	17701	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17701	1261.30	73.56	80.46	79.02	81.12	0.005882	7.15	263.44	108.19	0.50
Mainstem	17701	3041.50	73.56	82.65	82.35	83.41	0.006173	8.95	723.17	339.63	0.54
Mainstem	17701	5925.30	73.56	85.92	83.62	86.16	0.002064	6.43	2264.79	576.97	0.33
Mainstem	17701	7650.60	73.56	87.57	84.21	87.73	0.001359	5.70	3243.75	608.49	0.27
Mainstem	17499	1023.90	72.55	79.28	76.27	79.66	0.002093	5.10	224.28	150.21	0.36
Mainstem	17499	2813.20	72.55	81.40	79.25	82.72	0.005253	9.83	405.27	296.35	0.60
Mainstem	17499	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36
Mainstem	17499	4492.60	72.55	84.05	82.00	84.37	0.001554	6.42	1867.57	425.88	0.34
Mainstem	17499	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17499	1261.30	72.55	79.89	76.73	80.36	0.002304	5.69	254.65	187.88	0.38
Mainstem	17499	3041.50	72.55	82.23	79.66	82.63	0.002058	6.55	1117.30	383.80	0.38
Mainstem	17499	5925.30	72.55	85.55	82.23	85.83	0.001283	6.36	2521.87	452.32	0.32
Mainstem	17499	7650.60	72.55	87.24	82.93	87.48	0.001064	6.30	3316.89	484.38	0.29
Mainstem	17410	1023.90	72.33	78.25	77.38	79.25	0.010049	8.70	154.85	99.13	0.64
Mainstem	17410	2813.20	72.33	81.85	81.23	82.08	0.002567	6.09	1145.69	415.74	0.35
Mainstem	17410	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	4492.60	72.33	84.07	81.23	84.19	0.001246	4.89	2111.28	440.96	0.25
Mainstem	17410	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17410	1261.30	72.33	78.73	77.98	79.90	0.010864	9.55	180.42	120.94	0.68
Mainstem	17410	3041.50	72.33	82.17	81.23	82.38	0.002269	5.86	1283.69	424.43	0.33
Mainstem	17410	5925.30	72.33	85.57	81.79	85.68	0.000960	4.66	2776.42	449.24	0.23
Mainstem	17410	7650.60	72.33	87.26	82.30	87.36	0.000783	4.56	3576.36	498.77	0.21
Mainstem	17133	1276.90	72.24	77.80		78.05	0.002065	4.19	344.82	95.47	0.34
Mainstem	17133	3581.30	72.24	80.81		81.39	0.002612	6.55	686.19	136.59	0.42
Mainstem	17133	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	5823.30	72.24	82.93		83.67	0.002596	7.67	990.03	151.99	0.43
Mainstem	17133	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	17133	1579.40	72.24	78.32		78.62	0.002164	4.60	395.76	101.37	0.35
Mainstem	17133	3873.60	72.24	81.13		81.72	0.002588	6.70	730.35	140.46	0.42
Mainstem	17133	7662.10	72.24	84.38		85.22	0.002530	8.30	1239.86	188.72	0.44
Mainstem	17133	9889.20	72.24	86.07		86.95	0.002323	8.73	1571.79	204.19	0.43
Mainstem	16900	1276.90	70.91	76.71		77.31	0.004993	7.44	313.38	140.74	0.55
Mainstem	16900	3581.30	70.91	80.32		80.73	0.002599	7.45	974.88	229.84	0.43
Mainstem	16900	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	5823.30	70.91	82.69		83.05	0.001860	7.33	1569.92	260.38	0.38
Mainstem	16900	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16900	1579.40	70.91	77.44		77.93	0.003945	7.17	422.59	159.31	0.50
Mainstem	16900	3873.60	70.91	80.68		81.08	0.002478	7.46	1059.18	245.14	0.42
Mainstem	16900	7662.10	70.91	84.25		84.60	0.001648	7.50	1984.39	270.93	0.36
Mainstem	16900	9889.20	70.91	86.00		86.38	0.001457	7.66	2460.67	271.43	0.35
Mainstem	16568	1276.90	68.04	75.64		76.13	0.002455	6.64	300.13	86.39	0.45
Mainstem	16568	3581.30	68.04	78.82		79.71	0.003151	9.69	615.02	116.00	0.54
Mainstem	16568	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	5823.30	68.04	81.13		82.17	0.003127	11.08	981.70	195.82	0.55
Mainstem	16568	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16568	1579.40	68.04	76.49		76.97	0.002146	6.71	376.34	93.10	0.42
Mainstem	16568	3873.60	68.04	79.12		80.06	0.003244	10.02	650.37	123.78	0.55
Mainstem	16568	7662.10	68.04	82.83		83.82	0.002769	11.35	1332.86	218.01	0.53
Mainstem	16568	9889.20	68.04	84.74		85.69	0.002435	11.59	1797.20	259.96	0.51

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	16345	1276.90	66.78	73.67	72.69	75.20	0.006582	10.26	162.09	61.24	0.73
Mainstem	16345	3581.30	66.78	77.78		78.94	0.003739	10.89	642.37	147.33	0.60
Mainstem	16345	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	5823.30	66.78	80.49		81.52	0.002896	11.21	1116.05	206.02	0.55
Mainstem	16345	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16345	1579.40	66.78	74.27	73.71	76.06	0.006959	11.24	207.68	97.99	0.76
Mainstem	16345	3873.60	66.78	78.18		79.31	0.003562	10.91	701.97	152.69	0.59
Mainstem	16345	7662.10	66.78	82.44		83.25	0.002140	10.58	1532.26	219.35	0.48
Mainstem	16345	9889.20	66.78	84.47		85.18	0.001713	10.31	1993.26	234.53	0.44
Mainstem	16072	1276.90	65.43	70.88	70.88	72.83	0.011455	11.72	134.14	39.88	0.91
Mainstem	16072	3581.30	65.43	74.96	74.96	77.38	0.007946	14.44	395.43	83.11	0.84
Mainstem	16072	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	5823.30	65.43	76.90	76.90	80.04	0.008742	17.20	559.13	86.06	0.91
Mainstem	16072	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	16072	1579.40	65.43	71.57	71.57	73.70	0.010758	12.37	163.17	43.09	0.90
Mainstem	16072	3873.60	65.43	75.25	75.25	77.77	0.008070	14.85	419.13	83.58	0.85
Mainstem	16072	7662.10	65.43	78.18	78.18	81.89	0.009322	19.10	670.98	88.53	0.96
Mainstem	16072	9889.20	65.43	79.69	79.69	83.91	0.009456	20.77	807.18	92.45	0.98
Mainstem	15834	1276.90	64.27	70.97	67.90	71.36	0.002040	5.15	293.03	83.69	0.36
Mainstem	15834	3581.30	64.27	72.73	71.67	74.12	0.005835	10.21	473.62	146.21	0.63
Mainstem	15834	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	5823.30	64.27	72.19	73.71	76.85	0.020738	18.41	410.88	123.28	1.17
Mainstem	15834	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15834	1579.40	64.27	71.51	68.42	71.98	0.002253	5.71	340.81	94.94	0.38
Mainstem	15834	3873.60	64.27	72.94	71.99	74.43	0.006078	10.61	500.70	152.97	0.64
Mainstem	15834	7662.10	64.27	73.11	75.08	78.51	0.021829	20.36	521.60	158.32	1.22
Mainstem	15834	9889.20	64.27	73.90	76.28	80.33	0.024160	22.72	633.47	184.64	1.30
Mainstem	15688	1276.90	63.25	71.01	68.69	71.13	0.000604	3.90	591.03	236.04	0.25
Mainstem	15688	3581.30	63.25	73.38	70.75	73.52	0.000665	4.93	1430.27	449.15	0.28
Mainstem	15688	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	5823.30	63.25	75.03	71.77	75.19	0.000655	5.44	2090.04	471.45	0.28
Mainstem	15688	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15688	1579.40	63.25	71.63	69.33	71.72	0.000522	3.82	770.63	318.42	0.24
Mainstem	15688	3873.60	63.25	73.66	70.90	73.80	0.000643	4.95	1543.67	455.57	0.28
Mainstem	15688	7662.10	63.25	75.76	72.35	75.97	0.000792	6.23	2398.34	519.47	0.32
Mainstem	15688	9889.20	63.25	76.74	72.88	76.94	0.000797	6.59	3247.61	733.52	0.32
Mainstem	15610	1276.90	62.35	70.90	69.33	71.07	0.000805	4.80	501.34	192.46	0.30
Mainstem	15610	3581.30	62.35	73.13	70.99	73.44	0.001325	7.25	1052.73	395.88	0.40
Mainstem	15610	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	5823.30	62.35	74.89	72.32	75.13	0.001096	7.32	2147.43	652.13	0.37
Mainstem	15610	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15610	1579.40	62.35	71.50	69.70	71.68	0.000765	4.91	610.32	221.97	0.29
Mainstem	15610	3873.60	62.35	73.42	71.12	73.73	0.001279	7.25	1162.33	451.54	0.39
Mainstem	15610	7662.10	62.35	75.63	72.81	75.89	0.001231	8.07	2628.80	655.06	0.40
Mainstem	15610	9889.20	62.35	76.59	74.00	76.87	0.001249	8.53	3264.78	663.64	0.40
Mainstem	15527	1276.90	62.29	70.58	66.45	70.94	0.001151	5.07	330.73	218.94	0.31
Mainstem	15527	3581.30	62.29	73.00	71.62	73.33	0.001203	6.15	1349.97	639.90	0.33
Mainstem	15527	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	5823.30	62.29	74.81	72.62	75.03	0.000856	5.76	2664.39	792.85	0.29
Mainstem	15527	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15527	1579.40	62.29	71.28	67.07	71.56	0.000969	4.91	564.39	299.86	0.29
Mainstem	15527	3873.60	62.29	73.33	71.77	73.62	0.001092	5.98	1560.19	651.85	0.32
Mainstem	15527	7662.10	62.29	75.55	73.24	75.79	0.000916	6.19	3255.46	813.73	0.30
Mainstem	15527	9889.20	62.29	76.52	73.64	76.76	0.000849	6.25	4061.32	832.29	0.29
Mainstem	15490.5	Bridge									
Mainstem	15454	1276.90	62.24	68.64	66.90	69.71	0.006059	8.30	157.72	53.37	0.60
Mainstem	15454	3581.30	62.24	72.71	72.17	73.13	0.002186	7.04	1265.21	528.06	0.39
Mainstem	15454	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	5823.30	62.24	74.79	72.85	74.98	0.001057	5.55	2414.75	576.91	0.28

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	15454	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15454	1579.40	62.24	69.71	67.57	70.82	0.005186	8.56	195.40	63.12	0.57
Mainstem	15454	3873.60	62.24	73.26	72.27	73.53	0.001537	6.11	1554.87	540.92	0.33
Mainstem	15454	7662.10	62.24	75.52	73.29	75.72	0.001161	6.04	2838.80	596.48	0.30
Mainstem	15454	9889.20	62.24	76.48	73.72	76.69	0.001127	6.25	3424.60	618.49	0.30
Mainstem	15361	1276.90	60.17	67.06	66.33	68.78	0.010692	10.97	127.63	42.30	0.76
Mainstem	15361	3581.30	60.17	72.79	70.58	72.87	0.000574	3.84	2161.38	592.73	0.19
Mainstem	15361	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	5823.30	60.17	74.80	71.22	74.86	0.000403	3.56	3426.76	832.25	0.17
Mainstem	15361	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15361	1579.40	60.17	67.32	67.12	69.70	0.014257	12.91	134.50	43.55	0.88
Mainstem	15361	3873.60	60.17	73.29	70.68	73.36	0.000460	3.53	2461.68	729.74	0.18
Mainstem	15361	7662.10	60.17	75.52	71.59	75.60	0.000472	3.99	3910.06	867.90	0.18
Mainstem	15361	9889.20	60.17	76.48	71.99	76.57	0.000497	4.26	4577.37	935.76	0.19
Mainstem	15105	1276.90	58.44	66.29	63.67	66.91	0.003023	6.82	284.04	219.37	0.44
Mainstem	15105	3581.30	58.44	72.76	67.96	72.79	0.000121	2.07	3335.46	567.01	0.10
Mainstem	15105	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	5823.30	58.44	74.76	68.79	74.80	0.000131	2.35	4496.93	595.09	0.10
Mainstem	15105	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	15105	1579.40	58.44	66.73	64.36	67.35	0.003097	7.17	389.26	261.89	0.45
Mainstem	15105	3873.60	58.44	73.26	68.26	73.29	0.000110	2.02	3621.91	573.64	0.09
Mainstem	15105	7662.10	58.44	75.47	69.19	75.52	0.000174	2.79	4921.68	607.30	0.12
Mainstem	15105	9889.20	58.44	76.42	69.60	76.48	0.000209	3.18	5525.71	681.62	0.13
Mainstem	14870	1276.90	58.59	65.35	63.77	66.12	0.003622	7.76	290.15	244.62	0.54
Mainstem	14870	3581.30	58.59	72.74	66.89	72.76	0.000087	2.00	3472.58	508.93	0.09
Mainstem	14870	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	5823.30	58.59	74.74	67.66	74.77	0.000106	2.41	4513.29	534.55	0.11
Mainstem	14870	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14870	1579.40	58.59	66.48	64.43	66.76	0.001520	5.59	637.80	348.90	0.36
Mainstem	14870	3873.60	58.59	73.24	67.00	73.27	0.000082	1.99	3730.14	514.87	0.09
Mainstem	14870	7662.10	58.59	75.43	68.17	75.48	0.000144	2.89	4888.23	542.81	0.13
Mainstem	14870	9889.20	58.59	76.37	68.63	76.43	0.000178	3.33	5402.20	550.86	0.14
Mainstem	14599	1276.90	57.26	64.50	62.54	65.29	0.002634	7.49	213.86	62.79	0.52
Mainstem	14599	3581.30	57.26	72.70	67.29	72.74	0.000105	2.60	3372.19	561.08	0.12
Mainstem	14599	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	5823.30	57.26	74.69	68.27	74.74	0.000123	3.06	4512.48	584.20	0.13
Mainstem	14599	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14599	1579.40	57.26	65.37	63.13	66.21	0.002431	7.83	283.25	99.04	0.51
Mainstem	14599	3873.60	57.26	73.21	67.46	73.24	0.000098	2.57	3657.89	566.89	0.12
Mainstem	14599	7662.10	57.26	75.37	69.02	75.44	0.000167	3.66	4918.20	608.36	0.16
Mainstem	14599	9889.20	57.26	76.30	69.65	76.39	0.000203	4.18	5505.86	679.99	0.17
Mainstem	14501	1359.00	56.90	64.13	62.18	65.01	0.002753	7.75	205.46	55.00	0.54
Mainstem	14501	3442.50	56.90	72.23	66.11	72.61	0.000549	6.00	975.24	846.87	0.28
Mainstem	14501	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	5711.10	56.90	74.68	68.54	74.73	0.000124	3.16	5660.23	1017.31	0.14
Mainstem	14501	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14501	1695.90	56.90	64.86	62.86	65.90	0.002851	8.49	256.66	90.49	0.56
Mainstem	14501	3698.50	56.90	72.71	66.43	73.11	0.000550	6.14	1025.43	902.85	0.28
Mainstem	14501	7726.20	56.90	75.36	69.97	75.42	0.000165	3.75	6362.35	1047.25	0.16
Mainstem	14501	9776.90	56.90	76.29	71.23	76.36	0.000176	4.01	7353.48	1078.31	0.16
Mainstem	14462.5	Bridge									
Mainstem	14423	1359.00	56.64	63.84	61.26	64.46	0.001934	6.59	231.60	42.42	0.45
Mainstem	14423	3442.50	56.64	67.83	64.50	69.21	0.002377	9.97	418.13	300.29	0.54
Mainstem	14423	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	5711.10	56.64	68.88	67.20	71.85	0.004640	14.84	492.73	506.72	0.76
Mainstem	14423	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14423	1695.90	56.64	64.27	61.86	65.12	0.002414	7.68	250.23	43.32	0.51
Mainstem	14423	3698.50	56.64	68.36	64.84	69.78	0.002323	10.19	454.94	425.51	0.54
Mainstem	14423	7726.20	56.64	69.87	69.87	74.16	0.006156	18.03	566.36	554.91	0.89
Mainstem	14423	9776.90	56.64	71.05	71.05	76.35	0.006902	20.26	657.51	599.34	0.96

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	14341	1359.00	56.33	63.50	60.80	64.26	0.002106	7.06	208.37	33.97	0.47
Mainstem	14341	3442.50	56.33	64.43	64.43	68.16	0.008830	15.71	240.49	35.14	0.98
Mainstem	14341	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	5711.10	56.33	69.45	69.45	70.77	0.002301	11.12	1175.16	515.24	0.54
Mainstem	14341	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14341	1695.90	56.33	63.71	61.49	64.82	0.002969	8.55	215.45	34.23	0.56
Mainstem	14341	3698.50	56.33	64.82	64.82	68.71	0.008677	16.07	254.01	35.62	0.98
Mainstem	14341	7726.20	56.33	68.52	70.18	73.41	0.007880	19.58	780.84	448.17	0.99
Mainstem	14341	9776.90	56.33	68.77	70.79	75.28	0.010706	23.13	880.52	468.05	1.16
Mainstem	14187	1359.00	54.84	63.50	60.33	63.82	0.001035	5.02	460.67	212.02	0.33
Mainstem	14187	3442.50	54.84	65.18	64.03	65.83	0.002031	8.05	840.30	237.74	0.47
Mainstem	14187	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	5711.10	54.84	63.58	65.15	68.83	0.017285	20.63	476.78	214.95	1.33
Mainstem	14187	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	14187	1695.90	54.84	63.77	61.14	64.17	0.001324	5.81	517.79	220.50	0.37
Mainstem	14187	3698.50	54.84	65.13	64.20	65.90	0.002404	8.74	830.32	236.54	0.51
Mainstem	14187	7726.20	54.84	64.05	65.83	70.90	0.022188	24.36	581.80	225.18	1.53
Mainstem	14187	9776.90	54.84	64.52	67.24	72.42	0.025261	27.01	688.24	228.86	1.64
Mainstem	13988	1359.00	54.76	63.61	58.64	63.67	0.000168	1.99	917.92	261.22	0.13
Mainstem	13988	3442.50	54.76	65.38	60.33	65.52	0.000380	3.49	1673.17	537.56	0.21
Mainstem	13988	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	5711.10	54.76	66.20	62.19	66.46	0.000653	4.85	2169.74	662.77	0.28
Mainstem	13988	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13988	1695.90	54.76	63.90	58.97	63.98	0.000229	2.39	999.18	342.28	0.16
Mainstem	13988	3698.50	54.76	65.38	60.51	65.55	0.000439	3.75	1672.67	537.47	0.22
Mainstem	13988	7726.20	54.76	66.89	63.38	67.22	0.000805	5.65	2657.05	717.23	0.31
Mainstem	13988	9776.90	54.76	67.46	63.75	67.85	0.000920	6.26	3068.87	722.73	0.34
Mainstem	13825	1359.00	55.00	63.42	59.24	63.61	0.000645	3.64	459.46	149.78	0.24
Mainstem	13825	3442.50	55.00	64.93	61.76	65.38	0.001455	6.17	1074.42	527.43	0.37
Mainstem	13825	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	5711.10	55.00	65.20	65.03	66.19	0.003220	9.36	1215.61	538.74	0.56
Mainstem	13825	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13825	1695.90	55.00	63.62	59.68	63.89	0.000903	4.38	494.99	213.25	0.29
Mainstem	13825	3698.50	55.00	64.77	62.02	65.37	0.001910	6.98	992.13	515.86	0.43
Mainstem	13825	7726.20	55.00	65.69	65.69	66.88	0.003971	10.78	1496.99	612.98	0.62
Mainstem	13825	9776.90	55.00	66.35	66.35	67.49	0.003877	11.16	1968.88	803.35	0.62
Mainstem	13767	1359.00	54.63	63.27	59.30	63.54	0.000755	4.23	373.44	262.85	0.28
Mainstem	13767	3442.50	54.63	63.89	61.92	65.05	0.003115	9.09	634.41	568.21	0.58
Mainstem	13767	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	5711.10	54.63	65.06	65.06	65.99	0.002781	9.45	1396.00	687.01	0.56
Mainstem	13767	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13767	1695.90	54.63	63.40	59.79	63.80	0.001082	5.13	414.18	339.40	0.34
Mainstem	13767	3698.50	54.63	64.58	62.21	65.24	0.001868	7.46	1071.37	669.40	0.46
Mainstem	13767	7726.20	54.63	65.32	65.55	66.62	0.004000	11.55	1573.39	696.12	0.68
Mainstem	13767	9776.90	54.63	65.66	65.95	67.15	0.004716	12.85	1812.88	707.85	0.74
Mainstem	13752.5	Inl Struct									
Mainstem	13742	1359.00	49.15	58.31	53.99	58.65	0.000836	4.72	306.03	45.71	0.30
Mainstem	13742	3442.50	49.15	63.88	57.07	64.34	0.000656	5.97	1118.97	604.26	0.29
Mainstem	13742	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	5711.10	49.15	63.92	59.68	65.17	0.001761	9.81	1144.20	612.67	0.47
Mainstem	13742	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13742	1695.90	49.15	59.32	54.55	59.73	0.000860	5.18	352.93	47.43	0.31
Mainstem	13742	3698.50	49.15	64.57	57.39	64.90	0.000491	5.34	1566.02	662.41	0.25
Mainstem	13742	7726.20	49.15	64.64	64.64	66.01	0.002051	10.96	1611.16	664.55	0.51
Mainstem	13742	9776.90	49.15	65.25	65.25	66.67	0.002240	11.78	2019.32	679.13	0.54
Mainstem	13634	1359.00	50.20	57.48	55.35	58.34	0.002754	7.64	201.27	37.31	0.53
Mainstem	13634	3442.50	50.20	63.90	58.90	64.19	0.000601	5.64	1656.78	614.21	0.28
Mainstem	13634	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	5711.10	50.20	64.02	63.42	64.72	0.001523	9.03	1727.62	622.03	0.44

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13634	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13634	1695.90	50.20	58.38	56.02	59.39	0.002739	8.31	235.54	38.91	0.54
Mainstem	13634	3698.50	50.20	64.60	59.28	64.78	0.000416	4.86	2100.06	648.80	0.23
Mainstem	13634	7726.20	50.20	64.68	64.15	65.43	0.001712	9.90	2153.91	650.44	0.47
Mainstem	13634	9776.90	50.20	65.27	64.61	66.04	0.001849	10.58	2545.47	712.73	0.49
Mainstem	13435	1359.00	49.38	56.30	54.80	57.55	0.004293	8.99	155.69	27.49	0.65
Mainstem	13435	3442.50	49.38	58.67	58.67	62.75	0.009035	16.28	223.29	30.23	0.99
Mainstem	13435	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	5711.10	49.38	63.18	63.18	64.27	0.002180	10.65	1485.18	646.49	0.52
Mainstem	13435	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13435	1695.90	49.38	56.89	55.52	58.50	0.004897	10.22	171.88	27.84	0.70
Mainstem	13435	3698.50	49.38	59.11	59.11	63.34	0.008794	16.60	236.54	30.94	0.99
Mainstem	13435	7726.20	49.38	63.81	63.81	64.92	0.002444	11.64	1908.50	708.63	0.56
Mainstem	13435	9776.90	49.38	64.26	64.26	65.47	0.002787	12.71	2236.58	733.88	0.60
Mainstem	13129	1359.00	48.16	54.02	53.85	55.61	0.010051	10.47	150.95	45.49	0.90
Mainstem	13129	3442.50	48.16	57.70	57.54	58.72	0.003883	9.92	737.72	344.00	0.62
Mainstem	13129	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	5711.10	48.16	59.89	58.78	60.37	0.001917	8.21	1714.60	518.94	0.46
Mainstem	13129	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	13129	1695.90	48.16	54.59	54.43	56.42	0.009897	11.32	177.37	46.76	0.92
Mainstem	13129	3698.50	48.16	58.07	57.66	58.95	0.003344	9.49	872.07	387.22	0.58
Mainstem	13129	7726.20	48.16	61.09	59.33	61.48	0.001574	8.02	2371.51	574.38	0.42
Mainstem	13129	9776.90	48.16	62.08	59.89	62.46	0.001435	8.10	2973.22	630.91	0.41
Mainstem	12709	1359.00	45.95	52.10		52.97	0.003824	7.96	211.74	52.39	0.61
Mainstem	12709	3442.50	45.95	56.16		57.41	0.002898	10.13	657.98	206.80	0.58
Mainstem	12709	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	5711.10	45.95	58.29		59.50	0.002600	11.00	1209.02	333.30	0.57
Mainstem	12709	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12709	1695.90	45.95	52.88		53.85	0.003617	8.48	253.89	56.66	0.61
Mainstem	12709	3698.50	45.95	56.40		57.70	0.002984	10.45	706.64	215.17	0.60
Mainstem	12709	7726.20	45.95	59.16		60.62	0.003107	12.63	1512.50	371.47	0.63
Mainstem	12709	9776.90	45.95	59.73		61.55	0.003828	14.44	1732.10	400.38	0.71
Mainstem	12530	1359.00	44.76	50.55		52.01	0.006791	10.24	161.84	41.75	0.81
Mainstem	12530	3442.50	44.76	54.43	54.43	56.62	0.005145	13.15	430.48	168.33	0.78
Mainstem	12530	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	5711.10	44.76	58.09		58.97	0.001949	10.20	1717.09	470.94	0.51
Mainstem	12530	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12530	1695.90	44.76	51.23		52.91	0.006623	11.04	191.33	43.98	0.82
Mainstem	12530	3698.50	44.76	54.86	54.75	56.94	0.004727	13.01	504.75	176.31	0.75
Mainstem	12530	7726.20	44.76	58.95		59.98	0.002286	11.55	2130.71	485.58	0.56
Mainstem	12530	9776.90	44.76	59.46		60.75	0.002880	13.30	2379.02	496.07	0.63
Mainstem	12337	1359.00	44.11	49.87		50.93	0.003779	8.37	178.64	37.33	0.63
Mainstem	12337	3442.50	44.11	52.44	52.12	55.36	0.006481	14.13	297.25	62.85	0.87
Mainstem	12337	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	5711.10	44.11	56.69	56.69	58.44	0.002760	12.21	993.93	403.33	0.61
Mainstem	12337	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12337	1695.90	44.11	50.51		51.81	0.004041	9.31	202.95	38.53	0.66
Mainstem	12337	3698.50	44.11	52.89	52.57	55.82	0.006098	14.21	327.52	69.55	0.86
Mainstem	12337	7726.20	44.11	57.87	57.87	59.45	0.002606	12.61	1557.63	536.81	0.60
Mainstem	12337	9776.90	44.11	58.56	58.56	60.17	0.002782	13.46	1933.99	558.56	0.63
Mainstem	12195	1359.00	43.00	48.08	48.08	50.01	0.010098	11.43	128.37	35.99	0.94
Mainstem	12195	3442.50	43.00	51.93	51.93	54.29	0.006179	13.46	347.13	95.97	0.82
Mainstem	12195	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	5711.10	43.00	52.70	54.50	57.44	0.011582	19.53	435.71	139.83	1.14
Mainstem	12195	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12195	1695.90	43.00	48.81	48.81	50.90	0.009154	12.02	155.59	38.99	0.92
Mainstem	12195	3698.50	43.00	53.11	53.11	54.74	0.003953	11.74	522.72	293.09	0.67
Mainstem	12195	7726.20	43.00	53.75	54.91	58.47	0.011444	20.87	718.83	313.10	1.15
Mainstem	12195	9776.90	43.00	54.45	56.18	59.15	0.011585	21.95	944.93	330.11	1.17
Mainstem	12023	1359.00	41.16	47.90	46.34	48.67	0.003364	7.14	211.32	56.36	0.55

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	12023	3442.50	41.16	50.72	49.40	52.36	0.004328	10.82	407.74	94.17	0.67
Mainstem	12023	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	5711.10	41.16	53.92	50.68	54.77	0.001959	9.11	1261.79	301.13	0.48
Mainstem	12023	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	12023	1695.90	41.16	48.48	46.94	49.41	0.003578	7.90	245.49	61.67	0.58
Mainstem	12023	3698.50	41.16	50.97	49.72	52.86	0.004710	11.52	435.69	134.17	0.71
Mainstem	12023	7726.20	41.16	54.67	53.55	55.73	0.002408	10.54	1523.58	381.06	0.54
Mainstem	12023	9776.90	41.16	55.31	54.38	56.54	0.002785	11.74	1777.79	412.42	0.58
Mainstem	11770	1359.00	41.03	45.55	45.55	47.20	0.010362	10.46	145.56	54.50	0.93
Mainstem	11770	3442.50	41.03	48.97		51.06	0.006382	12.47	397.01	99.76	0.81
Mainstem	11770	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	5711.10	41.03	50.41	50.41	53.64	0.008323	16.04	549.43	112.97	0.95
Mainstem	11770	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11770	1695.90	41.03	46.23	46.15	47.97	0.009015	10.85	185.30	61.85	0.89
Mainstem	11770	3698.50	41.03	49.05	49.05	51.38	0.007050	13.20	404.82	100.46	0.85
Mainstem	11770	7726.20	41.03	53.49	53.49	54.98	0.003324	12.39	1646.12	622.94	0.63
Mainstem	11770	9776.90	41.03	54.09	54.09	55.70	0.003688	13.48	2029.73	660.43	0.67
Mainstem	11508	1359.00	37.63	44.99	42.75	45.65	0.002218	6.70	236.63	537.94	0.47
Mainstem	11508	3442.50	37.63	45.96	45.96	48.93	0.008498	14.40	286.28	556.38	0.94
Mainstem	11508	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	5711.10	37.63	46.33	46.33	46.38	0.000161	2.05	3306.55	572.88	0.13
Mainstem	11508	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11508	1695.90	37.63	43.44	43.44	45.45	0.009605	11.54	161.68	514.28	0.93
Mainstem	11508	3698.50	37.63	46.33	46.33	46.35	0.000068	1.33	3306.57	572.88	0.08
Mainstem	11508	7726.20	37.63	46.98	46.33	47.05	0.000213	2.49	3681.92	587.24	0.15
Mainstem	11508	9776.90	37.63	47.80	46.33	47.89	0.000234	2.78	4208.24	699.21	0.16
Mainstem	11371	1359.00	39.42	44.01	44.01	45.09	0.007882	9.51	244.55	609.13	0.83
Mainstem	11371	3442.50	39.42	44.65	44.19	44.67	0.000033	0.68	3831.40	653.96	0.06
Mainstem	11371	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	5711.10	39.42	45.70	44.19	45.73	0.000059	1.04	4563.24	746.58	0.08
Mainstem	11371	7035.70	39.42	46.25	44.19	46.29	0.000073	1.23	4997.36	829.64	0.09
Mainstem	11371	1695.90	39.42	44.19	44.19	44.19	0.000010	0.35	3532.40	635.43	0.03
Mainstem	11371	3698.50	39.42	44.85	44.19	44.86	0.000036	0.72	3959.11	665.08	0.06
Mainstem	11371	7726.20	39.42	47.00	44.19	47.04	0.000067	1.27	5628.75	851.17	0.08
Mainstem	11371	9776.90	39.42	47.83	44.19	47.87	0.000080	1.50	6368.84	943.89	0.09
Mainstem	10928	1359.00	35.47	42.95	39.01	42.97	0.000074	1.08	1993.25	771.28	0.08
Mainstem	10928	3442.50	35.47	44.62		44.65	0.000138	1.77	3395.59	879.81	0.12
Mainstem	10928	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	5711.10	35.47	45.64		45.70	0.000201	2.35	4307.60	896.42	0.15
Mainstem	10928	7035.70	35.47	46.18		46.25	0.000231	2.64	4841.73	1039.36	0.16
Mainstem	10928	1695.90	35.47	43.39	39.20	43.41	0.000082	1.20	2341.67	823.03	0.09
Mainstem	10928	3698.50	35.47	44.81		44.84	0.000140	1.82	3565.98	884.03	0.12
Mainstem	10928	7726.20	35.47	46.94		47.01	0.000200	2.60	5654.38	1099.54	0.15
Mainstem	10928	9776.90	35.47	47.76		47.84	0.000215	2.86	6572.36	1129.05	0.16
Mainstem	10846	1359.00	35.49	42.84		42.94	0.000761	3.71	967.62	666.09	0.27
Mainstem	10846	3442.50	35.49	44.50		44.61	0.000837	4.59	2324.56	915.10	0.29
Mainstem	10846	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	5711.10	35.49	45.51		45.64	0.000998	5.45	3296.38	1079.34	0.33
Mainstem	10846	7035.70	35.49	46.04		46.19	0.001124	6.01	3884.01	1182.94	0.35
Mainstem	10846	1695.90	35.49	43.29		43.38	0.000704	3.74	1294.59	768.01	0.26
Mainstem	10846	3698.50	35.49	44.70		44.80	0.000802	4.57	2509.21	937.28	0.29
Mainstem	10846	7726.20	35.49	46.86		46.96	0.000714	5.08	4891.46	1247.55	0.28
Mainstem	10846	9776.90	35.49	47.70		47.79	0.000639	5.07	5976.23	1342.14	0.27
Mainstem	10499	1359.00	36.19	42.01		42.52	0.002826	6.51	409.15	339.21	0.52
Mainstem	10499	3442.50	36.19	43.93		44.25	0.001942	6.71	1462.90	713.34	0.45
Mainstem	10499	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	5711.10	36.19	44.96		45.27	0.001918	7.32	2227.13	763.89	0.46
Mainstem	10499	7035.70	36.19	45.51		45.80	0.001806	7.43	2650.68	773.88	0.45
Mainstem	10499	1695.90	36.19	42.68		43.04	0.001990	5.95	691.23	478.11	0.44
Mainstem	10499	3698.50	36.19	44.21		44.48	0.001663	6.38	1665.59	733.35	0.42
Mainstem	10499	7726.20	36.19	46.57		46.74	0.000997	5.97	3502.48	867.06	0.34

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	10499	9776.90	36.19	47.42		47.59	0.000931	6.11	4269.78	920.14	0.33
Mainstem	10364	1407.40	35.16	40.78		41.94	0.006375	9.34	210.77	110.91	0.75
Mainstem	10364	3512.20	35.16	43.39		43.97	0.003066	8.67	1200.79	659.52	0.56
Mainstem	10364	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	5820.40	35.16	44.43		45.00	0.003157	9.60	1843.66	709.13	0.58
Mainstem	10364	7073.90	35.16	45.14		45.58	0.002489	9.00	2356.70	723.50	0.53
Mainstem	10364	1723.80	35.16	41.41	40.82	42.57	0.005725	9.62	295.06	316.81	0.73
Mainstem	10364	3772.30	35.16	43.86		44.27	0.002226	7.69	1462.66	681.31	0.48
Mainstem	10364	7702.10	35.16	46.41		46.63	0.001175	6.75	3295.03	756.57	0.37
Mainstem	10364	10017.20	35.16	47.26		47.49	0.001208	7.21	3961.75	861.17	0.38
Mainstem	10120	1407.40	33.73	39.49		40.41	0.005606	8.02	211.24	56.00	0.64
Mainstem	10120	3512.20	33.73	43.18		43.41	0.001260	5.55	1754.69	673.68	0.34
Mainstem	10120	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	5820.40	33.73	44.00		44.33	0.001858	7.17	2377.81	832.75	0.41
Mainstem	10120	7073.90	33.73	44.82		45.06	0.001412	6.61	3228.88	1072.42	0.37
Mainstem	10120	1723.80	33.73	40.12	38.88	41.17	0.005516	8.63	256.38	173.40	0.65
Mainstem	10120	3772.30	33.73	43.65		43.84	0.001034	5.22	2097.52	786.16	0.31
Mainstem	10120	7702.10	33.73	46.29		46.39	0.000608	4.75	4813.30	1094.48	0.25
Mainstem	10120	10017.20	33.73	47.12		47.24	0.000642	5.11	5740.09	1115.53	0.26
Mainstem	9864	1407.40	32.30	38.79		39.29	0.002956	6.41	330.66	99.18	0.48
Mainstem	9864	3512.20	32.30	43.04		43.17	0.000662	4.43	2289.41	708.62	0.25
Mainstem	9864	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	5820.40	32.30	43.78		43.98	0.001034	5.81	2821.67	776.41	0.31
Mainstem	9864	7073.90	32.30	44.63		44.79	0.000856	5.57	3540.98	857.83	0.29
Mainstem	9864	1723.80	32.30	39.48		40.05	0.002927	6.90	411.00	152.37	0.49
Mainstem	9864	3772.30	32.30	43.55		43.65	0.000513	4.03	2652.75	715.61	0.22
Mainstem	9864	7702.10	32.30	46.19		46.27	0.000417	4.23	4877.19	858.82	0.21
Mainstem	9864	10017.20	32.30	47.01		47.11	0.000476	4.71	5583.58	858.82	0.22
Mainstem	9606	1407.40	31.73	38.25		38.62	0.002105	5.50	356.34	104.93	0.41
Mainstem	9606	3512.20	31.73	42.95		43.02	0.000383	3.50	2937.79	924.28	0.19
Mainstem	9606	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	5820.40	31.73	43.62		43.75	0.000643	4.73	3561.20	926.78	0.25
Mainstem	9606	7073.90	31.73	44.50		44.60	0.000545	4.58	4370.64	930.37	0.23
Mainstem	9606	1723.80	31.73	39.03		39.40	0.001838	5.60	454.77	157.70	0.39
Mainstem	9606	3772.30	31.73	43.48		43.54	0.000299	3.20	3428.42	926.34	0.17
Mainstem	9606	7702.10	31.73	46.12		46.18	0.000276	3.55	5887.81	938.91	0.17
Mainstem	9606	10017.20	31.73	46.93		47.00	0.000330	4.03	6652.54	952.45	0.19
Mainstem	9350	1407.40	31.17	38.08		38.26	0.000764	4.12	934.69	699.85	0.28
Mainstem	9350	3512.20	31.17	42.95		42.97	0.000085	1.99	5328.68	1120.04	0.10
Mainstem	9350	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	5820.40	31.17	43.61		43.65	0.000161	2.84	6081.52	1161.84	0.14
Mainstem	9350	7073.90	31.17	44.48		44.51	0.000153	2.90	7100.04	1183.19	0.14
Mainstem	9350	1723.80	31.17	39.04		39.12	0.000399	3.26	1623.80	771.41	0.21
Mainstem	9350	3772.30	31.17	43.48		43.49	0.000073	1.89	5922.73	1155.62	0.10
Mainstem	9350	7702.10	31.17	46.11		46.13	0.000090	2.41	9032.01	1189.48	0.11
Mainstem	9350	10017.20	31.17	46.91		46.94	0.000113	2.79	9991.38	1191.30	0.13
Mainstem	9095	1407.40	28.97	37.29		37.87	0.002621	6.33	255.25	46.08	0.41
Mainstem	9095	3512.20	28.97	42.55		42.87	0.001100	5.89	1784.49	774.13	0.29
Mainstem	9095	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	5820.40	28.97	42.14	42.14	43.39	0.004035	11.04	1479.71	718.78	0.56
Mainstem	9095	7073.90	28.97	43.88		44.36	0.001798	8.07	2985.30	981.06	0.38
Mainstem	9095	1723.80	28.97	38.17		38.84	0.002609	6.81	297.58	50.81	0.42
Mainstem	9095	3772.30	28.97	43.19		43.42	0.000812	5.24	2329.84	909.77	0.25
Mainstem	9095	7702.10	28.97	45.91		46.06	0.000648	5.30	5014.17	1018.01	0.23
Mainstem	9095	10017.20	28.97	46.68		46.86	0.000751	5.89	5807.08	1021.23	0.25
Mainstem	8837	1407.40	30.03	36.98	34.40	37.31	0.001470	5.31	367.89	281.59	0.38
Mainstem	8837	3512.20	30.03	42.67	36.71	42.71	0.000173	2.84	4659.29	1094.06	0.15
Mainstem	8837	4565.60	30.03	40.60	37.67	40.81	0.000904	5.71	2673.02	750.65	0.32
Mainstem	8837	5820.40	30.03	42.27	39.00	42.41	0.000608	5.21	4228.12	1069.47	0.27
Mainstem	8837	7073.90	30.03	44.01	39.01	44.09	0.000364	4.43	6222.24	1303.97	0.22

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	8837	1723.80	30.03	37.94	34.80	38.29	0.001285	5.48	452.84	424.75	0.37
Mainstem	8837	3772.30	30.03	43.27	36.94	43.30	0.000143	2.67	5323.60	1147.84	0.13
Mainstem	8837	7702.10	30.03	45.92	39.17	45.96	0.000171	3.33	8833.59	1381.28	0.15
Mainstem	8837	10017.20	30.03	46.69	39.89	46.74	0.000209	3.81	9921.83	1450.13	0.17
Mainstem	8593	1407.40	27.59	34.66	33.95	36.49	0.006620	11.03	143.05	29.78	0.80
Mainstem	8593	3512.20	27.59	38.12	38.12	42.19	0.008279	16.74	258.70	560.88	0.96
Mainstem	8593	4565.60	27.59	40.63	40.13	40.68	0.000232	3.28	3339.28	818.67	0.17
Mainstem	8593	5820.40	27.59	42.29	40.13	42.33	0.000150	2.87	4848.99	1142.60	0.14
Mainstem	8593	7073.90	27.59	44.01	40.13	44.04	0.000098	2.52	7043.34	1432.82	0.11
Mainstem	8593	1723.80	27.59	34.95	34.68	37.43	0.008449	12.86	151.60	30.38	0.91
Mainstem	8593	3772.30	27.59	38.55	38.55	42.78	0.008142	17.11	274.91	573.59	0.96
Mainstem	8593	7702.10	27.59	45.92	40.13	45.94	0.000054	2.02	9842.46	1514.40	0.09
Mainstem	8593	10017.20	27.59	46.69	40.13	46.71	0.000069	2.35	11046.70	1577.16	0.10
Mainstem	8351	1407.40	29.43	34.30		35.05	0.003423	7.19	236.02	80.62	0.59
Mainstem	8351	3512.20	29.43	37.97	35.73	38.95	0.002269	8.69	560.18	95.94	0.53
Mainstem	8351	4565.60	29.43	39.22		40.44	0.002347	9.72	736.52	171.11	0.56
Mainstem	8351	5820.40	29.43	41.03		42.14	0.001815	9.60	1105.07	229.27	0.50
Mainstem	8351	7073.90	29.43	43.42		43.94	0.000855	7.49	2972.91	1310.79	0.36
Mainstem	8351	1723.80	29.43	35.02		35.78	0.002945	7.36	295.27	83.63	0.57
Mainstem	8351	3772.30	29.43	38.20	35.98	39.36	0.002515	9.32	583.21	121.00	0.57
Mainstem	8351	7702.10	29.43	45.75		45.90	0.000281	4.77	6402.94	1557.16	0.21
Mainstem	8351	10017.20	29.43	46.50		46.67	0.000327	5.31	7575.20	1561.21	0.23
Mainstem	8130	1407.40	28.78	34.54		34.64	0.000430	2.62	616.21	151.71	0.21
Mainstem	8130	3512.20	28.78	38.38		38.55	0.000340	3.46	1232.29	172.50	0.21
Mainstem	8130	4565.60	28.78	39.80		40.00	0.000341	3.84	1489.01	192.64	0.21
Mainstem	8130	5820.40	28.78	41.48		41.73	0.000334	4.22	1953.83	409.31	0.22
Mainstem	8130	7073.90	28.78	43.54		43.75	0.000245	4.03	3474.57	957.35	0.19
Mainstem	8130	1723.80	28.78	35.29		35.40	0.000387	2.74	731.12	155.21	0.21
Mainstem	8130	3772.30	28.78	38.73		38.90	0.000342	3.57	1292.34	175.96	0.21
Mainstem	8130	7702.10	28.78	45.73		45.85	0.000128	3.22	5739.60	1100.96	0.14
Mainstem	8130	10017.20	28.78	46.46		46.61	0.000169	3.81	6552.19	1132.48	0.16
Mainstem	7925	1407.40	28.66	34.40		34.54	0.000592	3.03	493.21	120.21	0.25
Mainstem	7925	3512.20	28.66	38.22		38.46	0.000466	4.02	994.40	145.41	0.24
Mainstem	7925	4565.60	28.66	39.62		39.91	0.000471	4.48	1218.12	198.25	0.25
Mainstem	7925	5820.40	28.66	41.32		41.65	0.000425	4.73	1627.55	262.91	0.25
Mainstem	7925	7073.90	28.66	43.39		43.69	0.000326	4.63	2183.22	278.77	0.22
Mainstem	7925	1723.80	28.66	35.15		35.31	0.000529	3.17	585.41	124.12	0.24
Mainstem	7925	3772.30	28.66	38.56		38.82	0.000469	4.14	1044.35	148.77	0.25
Mainstem	7925	7702.10	28.66	45.59		45.81	0.000206	4.07	3286.09	817.02	0.18
Mainstem	7925	10017.20	28.66	46.25		46.55	0.000287	4.92	3867.14	917.38	0.21
Mainstem	7717	1407.40	28.54	34.40		34.45	0.000195	1.77	828.93	190.69	0.14
Mainstem	7717	3512.20	28.54	38.28		38.36	0.000159	2.38	1634.34	241.16	0.14
Mainstem	7717	4565.60	28.54	39.70		39.80	0.000157	2.62	2005.75	274.97	0.15
Mainstem	7717	5820.40	28.54	41.42		41.54	0.000143	2.78	2547.87	364.90	0.14
Mainstem	7717	7073.90	28.54	43.49		43.60	0.000113	2.75	3550.06	578.98	0.13
Mainstem	7717	1723.80	28.54	35.16		35.22	0.000176	1.86	977.35	196.33	0.14
Mainstem	7717	3772.30	28.54	38.62		38.71	0.000160	2.45	1719.72	252.86	0.14
Mainstem	7717	7702.10	28.54	45.66		45.74	0.000074	2.46	4863.34	650.06	0.11
Mainstem	7717	10017.20	28.54	46.35		46.46	0.000105	3.01	5324.38	686.27	0.13
Mainstem	7512	1407.40	28.62	34.39	30.53	34.41	0.000078	1.09	1306.94	296.70	0.09
Mainstem	7512	3512.20	28.62	38.30	31.48	38.33	0.000060	1.45	2516.94	331.37	0.09
Mainstem	7512	4565.60	28.62	39.72	31.83	39.76	0.000060	1.61	3075.94	476.88	0.09
Mainstem	7512	5820.40	28.62	41.45	32.20	41.50	0.000054	1.70	4051.11	619.92	0.09
Mainstem	7512	7073.90	28.62	43.53	32.53	43.56	0.000036	1.55	7344.72	1200.95	0.07
Mainstem	7512	1723.80	28.62	35.17	30.72	35.19	0.000069	1.14	1537.56	301.38	0.09
Mainstem	7512	3772.30	28.62	38.64	31.57	38.68	0.000061	1.50	2633.57	339.51	0.09
Mainstem	7512	7702.10	28.62	45.69	32.68	45.72	0.000023	1.36	10028.00	1272.16	0.06
Mainstem	7512	10017.20	28.62	46.39	33.24	46.43	0.000032	1.66	10923.79	1282.22	0.07
Mainstem	7307	1407.40	28.49	34.38	30.48	34.39	0.000110	1.00	1428.55	326.82	0.08
Mainstem	7307	3512.20	28.49	38.28	31.36	38.31	0.000088	1.32	2737.13	371.60	0.08

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	7307	4565.60	28.49	39.71	31.69	39.75	0.000087	1.46	3300.26	400.94	0.08
Mainstem	7307	5820.40	28.49	41.45	32.04	41.48	0.000080	1.56	4090.30	511.83	0.08
Mainstem	7307	7073.90	28.49	43.52	32.37	43.55	0.000052	1.40	7491.47	1117.91	0.07
Mainstem	7307	1723.80	28.49	35.15	30.65	35.17	0.000098	1.04	1682.32	329.34	0.08
Mainstem	7307	3772.30	28.49	38.63	31.44	38.66	0.000088	1.36	2871.48	392.51	0.08
Mainstem	7307	7702.10	28.49	45.69	32.52	45.71	0.000033	1.22	10007.53	1209.57	0.05
Mainstem	7307	10017.20	28.49	46.39	33.07	46.42	0.000046	1.49	10858.94	1220.93	0.06
Mainstem	7095	1407.40	28.37	34.35	30.23	34.37	0.000107	1.17	1223.59	249.37	0.09
Mainstem	7095	3512.20	28.37	38.25	31.13	38.29	0.000098	1.64	2278.38	295.42	0.10
Mainstem	7095	4565.60	28.37	39.68	31.50	39.73	0.000101	1.83	2731.62	348.96	0.10
Mainstem	7095	5820.40	28.37	41.41	31.91	41.46	0.000094	1.96	3402.07	424.79	0.10
Mainstem	7095	7073.90	28.37	43.49	32.28	43.54	0.000069	1.86	5395.26	842.72	0.09
Mainstem	7095	1723.80	28.37	35.12	30.39	35.15	0.000100	1.25	1417.77	253.51	0.09
Mainstem	7095	3772.30	28.37	38.60	31.22	38.64	0.000100	1.69	2382.52	305.20	0.10
Mainstem	7095	7702.10	28.37	45.67	32.46	45.70	0.000043	1.62	7297.47	900.81	0.07
Mainstem	7095	10017.20	28.37	46.36	33.09	46.41	0.000060	1.97	7924.91	913.06	0.08
Mainstem	6923	1407.40	27.27	34.26	30.28	34.33	0.000335	2.26	711.46	153.10	0.16
Mainstem	6923	3512.20	27.27	38.12	31.94	38.25	0.000331	3.15	1335.89	171.68	0.18
Mainstem	6923	4565.60	27.27	39.51	32.61	39.68	0.000362	3.60	1635.30	245.48	0.19
Mainstem	6923	5820.40	27.27	41.22	33.27	41.42	0.000349	3.89	2100.48	315.43	0.19
Mainstem	6923	7073.90	27.27	43.33	33.84	43.50	0.000262	3.73	2783.07	343.15	0.17
Mainstem	6923	1723.80	27.27	35.03	30.56	35.11	0.000320	2.40	830.60	156.44	0.16
Mainstem	6923	3772.30	27.27	38.45	32.14	38.60	0.000350	3.31	1394.02	197.13	0.18
Mainstem	6923	7702.10	27.27	45.59	34.12	45.68	0.000139	2.98	4590.92	646.94	0.13
Mainstem	6923	10017.20	27.27	46.25	35.04	46.38	0.000189	3.57	5020.09	648.21	0.15
Mainstem	6907	1407.40	29.15	33.99	32.79	34.30	0.004833	4.73	336.52	123.91	0.44
Mainstem	6907	3512.20	29.15	37.94	34.35	38.23	0.001775	4.74	866.36	147.84	0.31
Mainstem	6907	4565.60	29.15	39.32	34.94	39.66	0.001721	5.22	1099.17	196.92	0.31
Mainstem	6907	5820.40	29.15	41.08	35.57	41.40	0.001323	5.17	1478.23	228.07	0.28
Mainstem	6907	7073.90	29.15	43.22	36.15	43.48	0.000940	4.92	2023.56	292.13	0.24
Mainstem	6907	1723.80	29.15	34.81	33.14	35.08	0.003226	4.45	440.56	128.13	0.38
Mainstem	6907	3772.30	29.15	38.27	34.50	38.57	0.001782	4.89	916.62	155.41	0.31
Mainstem	6907	7702.10	29.15	45.54	36.43	45.67	0.000457	3.84	3431.36	613.11	0.17
Mainstem	6907	10017.20	29.15	46.19	37.40	46.37	0.000578	4.44	3837.27	621.93	0.20
Mainstem	6850	1447.50	27.98	33.89	31.06	34.11	0.001843	3.82	396.00	85.88	0.30
Mainstem	6850	3606.50	27.98	37.72	33.03	38.12	0.001681	5.27	755.24	107.47	0.31
Mainstem	6850	4679.10	27.98	39.05	33.83	39.55	0.001731	5.86	917.42	134.53	0.32
Mainstem	6850	5964.50	27.98	40.79	34.71	41.30	0.001525	6.10	1161.93	147.62	0.31
Mainstem	6850	7294.20	27.98	42.99	35.53	43.41	0.001103	5.80	1772.74	299.92	0.27
Mainstem	6850	1775.70	27.98	34.71	31.40	34.95	0.001676	4.01	467.19	89.21	0.29
Mainstem	6850	3873.80	27.98	38.03	33.23	38.46	0.001727	5.46	789.98	113.99	0.31
Mainstem	6850	7898.70	27.98	45.39	35.90	45.64	0.000570	4.62	2511.72	318.48	0.20
Mainstem	6850	10258.20	27.98	45.96	37.19	46.32	0.000809	5.63	2695.82	327.13	0.24
Mainstem	6777	1447.50	26.59	33.87	29.74	34.02	0.000458	3.23	482.40	85.43	0.22
Mainstem	6777	3606.50	26.59	37.69	31.81	38.01	0.000556	4.80	856.32	114.31	0.26
Mainstem	6777	4679.10	26.59	39.04	32.63	39.42	0.000579	5.31	1011.83	116.67	0.27
Mainstem	6777	5964.50	26.59	40.77	33.59	41.19	0.000548	5.66	1216.75	120.86	0.27
Mainstem	6777	7294.20	26.59	42.94	34.48	43.36	0.000449	5.65	1485.34	126.10	0.25
Mainstem	6777	1775.70	26.59	34.68	30.10	34.86	0.000458	3.48	553.58	89.53	0.22
Mainstem	6777	3873.80	26.59	38.01	32.03	38.35	0.000570	4.96	892.66	114.86	0.27
Mainstem	6777	7898.70	26.59	45.38	34.86	45.58	0.000224	4.39	2644.07	356.72	0.18
Mainstem	6777	10258.20	26.59	45.95	36.24	46.25	0.000320	5.36	2848.34	372.92	0.22
Mainstem	6719.5	Bridge									
Mainstem	6661	1447.50	26.31	33.21	29.22	33.36	0.000475	3.30	487.92	91.26	0.22
Mainstem	6661	3606.50	26.31	36.92	31.40	37.23	0.000568	4.84	855.36	107.07	0.26
Mainstem	6661	4679.10	26.31	38.24	32.29	38.63	0.000608	5.42	1000.27	112.60	0.28
Mainstem	6661	5964.50	26.31	39.96	33.13	40.40	0.000586	5.82	1200.06	119.67	0.28
Mainstem	6661	7294.20	26.31	42.61	33.93	43.02	0.000440	5.69	1531.11	131.34	0.25
Mainstem	6661	1775.70	26.31	34.00	29.61	34.17	0.000472	3.54	561.39	94.42	0.23
Mainstem	6661	3873.80	26.31	37.23	31.61	37.56	0.000587	5.01	888.50	108.37	0.27

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	6661	7898.70	26.31	44.72	34.27	45.05	0.000311	5.19	1867.19	215.06	0.21
Mainstem	6661	10258.20	26.31	44.85	35.54	45.39	0.000508	6.66	1895.05	224.58	0.27
Mainstem	6584	1447.50	26.10	33.04	29.57	33.28	0.000805	4.23	431.07	81.72	0.29
Mainstem	6584	3606.50	26.10	36.51	31.93	37.09	0.001118	6.61	774.10	159.96	0.37
Mainstem	6584	4679.10	26.10	37.79	32.84	38.47	0.001156	7.28	1002.90	186.51	0.38
Mainstem	6584	5964.50	26.10	39.59	33.87	40.27	0.001011	7.51	1388.30	224.93	0.37
Mainstem	6584	7294.20	26.10	42.41	34.80	42.94	0.000659	6.90	2048.09	245.11	0.30
Mainstem	6584	1775.70	26.10	33.80	29.98	34.09	0.000821	4.59	494.84	85.80	0.30
Mainstem	6584	3873.80	26.10	36.80	32.13	37.41	0.001153	6.84	821.30	169.51	0.37
Mainstem	6584	7898.70	26.10	44.56	35.00	44.99	0.000470	6.34	2620.74	293.69	0.26
Mainstem	6584	10258.20	26.10	44.56	37.52	45.28	0.000793	8.24	2620.49	293.67	0.34
Mainstem	6348	1447.50	26.00	32.76	29.40	33.06	0.000965	4.46	360.82	70.29	0.31
Mainstem	6348	3606.50	26.00	36.04	31.93	36.76	0.001384	7.05	637.26	121.15	0.40
Mainstem	6348	4679.10	26.00	37.19	32.94	38.10	0.001529	7.99	797.67	228.33	0.43
Mainstem	6348	5964.50	26.00	39.13	34.00	39.96	0.001225	7.98	1350.54	401.49	0.39
Mainstem	6348	7294.20	26.00	42.30	35.35	42.76	0.000609	6.52	2842.16	845.97	0.29
Mainstem	6348	1775.70	26.00	33.51	29.84	33.86	0.000987	4.86	414.51	73.94	0.32
Mainstem	6348	3873.80	26.00	36.28	32.19	37.06	0.001463	7.37	661.90	126.59	0.41
Mainstem	6348	7898.70	26.00	44.60	35.69	44.79	0.000263	4.70	5397.23	925.41	0.19
Mainstem	6348	10258.20	26.00	44.64	37.81	44.95	0.000439	6.07	5427.30	925.52	0.25
Mainstem	6145	1447.50	25.53	32.56	29.13	32.86	0.000970	4.51	352.48	594.91	0.31
Mainstem	6145	3606.50	25.53	36.43	31.68	36.48	0.000188	2.72	4201.87	821.91	0.15
Mainstem	6145	4679.10	25.53	37.72	32.72	37.76	0.000170	2.79	5293.23	885.75	0.14
Mainstem	6145	5964.50	25.53	39.63	33.81	39.67	0.000126	2.66	7098.52	980.01	0.13
Mainstem	6145	7294.20	25.53	42.57	34.67	42.60	0.000071	2.28	10321.00	1243.37	0.10
Mainstem	6145	1775.70	25.53	33.29	29.58	33.66	0.001008	4.94	401.46	679.35	0.32
Mainstem	6145	3873.80	25.53	36.71	31.95	36.76	0.000188	2.76	4435.09	832.01	0.15
Mainstem	6145	7898.70	25.53	44.71	34.67	44.72	0.000045	1.97	13088.27	1321.74	0.08
Mainstem	6145	10258.20	25.53	44.81	34.67	44.83	0.000074	2.53	13221.31	1323.57	0.10
Mainstem	5950	1447.50	25.27	32.08	29.41	32.60	0.001687	5.92	286.65	468.67	0.42
Mainstem	5950	3606.50	25.27	36.36	32.00	36.43	0.000278	3.40	3682.84	796.23	0.18
Mainstem	5950	4679.10	25.27	37.66	34.03	37.72	0.000234	3.37	4739.10	832.38	0.17
Mainstem	5950	5964.50	25.27	39.59	35.18	39.64	0.000165	3.13	6387.80	887.15	0.15
Mainstem	5950	7294.20	25.27	42.55	35.18	42.58	0.000088	2.61	9452.10	1241.82	0.11
Mainstem	5950	1775.70	25.27	32.74	29.93	33.37	0.001818	6.56	333.37	516.75	0.44
Mainstem	5950	3873.80	25.27	36.64	32.87	36.71	0.000273	3.43	3909.25	798.99	0.18
Mainstem	5950	7898.70	25.27	44.69	35.18	44.71	0.000054	2.22	12208.43	1318.69	0.09
Mainstem	5950	10258.20	25.27	44.79	35.18	44.82	0.000089	2.85	12331.00	1322.00	0.12
Mainstem	5753	1447.50	25.00	31.02	29.72	32.05	0.004134	8.32	198.98	45.62	0.63
Mainstem	5753	3606.50	25.00	33.87	33.87	36.07	0.005377	12.60	433.65	149.52	0.77
Mainstem	5753	4679.10	25.00	36.47	35.00	37.52	0.002232	9.75	1142.09	448.46	0.52
Mainstem	5753	5964.50	25.00	39.13	36.41	39.54	0.000893	7.14	2596.79	630.28	0.34
Mainstem	5753	7294.20	25.00	42.38	37.15	42.54	0.000342	5.10	5277.21	1021.25	0.22
Mainstem	5753	1775.70	25.00	31.42	30.29	32.75	0.004877	9.48	217.40	48.16	0.70
Mainstem	5753	3873.80	25.00	34.39	34.25	36.38	0.004649	12.21	521.88	192.87	0.73
Mainstem	5753	7898.70	25.00	44.62	37.38	44.69	0.000166	3.87	7704.17	1149.21	0.16
Mainstem	5753	10258.20	25.00	44.66	38.23	44.78	0.000276	4.99	7751.92	1150.98	0.20
Mainstem	5553	1447.50	24.72	30.36	29.00	31.20	0.003859	7.83	285.82	159.69	0.61
Mainstem	5553	3606.50	24.72	35.04	31.85	35.12	0.000364	3.70	2984.35	697.11	0.21
Mainstem	5553	4679.10	24.72	37.08	32.79	37.13	0.000197	3.08	4427.30	718.11	0.16
Mainstem	5553	5964.50	24.72	39.34	33.16	39.37	0.000125	2.76	6094.27	782.76	0.13
Mainstem	5553	7294.20	24.72	42.45	33.47	42.47	0.000065	2.27	9625.87	1434.59	0.10
Mainstem	5553	1775.70	24.72	31.11	30.20	31.81	0.002988	7.54	468.12	385.60	0.55
Mainstem	5553	3873.80	24.72	35.59	32.52	35.66	0.000298	3.47	3370.81	701.85	0.19
Mainstem	5553	7898.70	24.72	44.65	33.61	44.66	0.000039	1.91	12809.55	1471.89	0.08
Mainstem	5553	10258.20	24.72	44.71	34.07	44.73	0.000065	2.47	12899.20	1472.77	0.10
Mainstem	5330	1447.50	23.16	30.29	29.40	30.56	0.001511	5.48	635.90	304.28	0.39
Mainstem	5330	3606.50	23.16	35.01	30.77	35.06	0.000228	3.11	3227.96	667.07	0.17
Mainstem	5330	4679.10	23.16	37.06	31.08	37.09	0.000140	2.73	4684.42	745.03	0.13
Mainstem	5330	5964.50	23.16	39.33	31.40	39.35	0.000096	2.51	6490.92	937.22	0.11

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	5330	7294.20	23.16	42.45	32.45	42.46	0.000053	2.11	10491.04	1597.79	0.09
Mainstem	5330	1775.70	23.16	31.17	29.77	31.34	0.000967	4.79	940.47	407.28	0.32
Mainstem	5330	3873.80	23.16	35.57	30.89	35.61	0.000195	2.97	3608.43	696.03	0.15
Mainstem	5330	7898.70	23.16	44.64	32.58	44.65	0.000031	1.75	14182.62	1755.46	0.07
Mainstem	5330	10258.20	23.16	44.70	33.02	44.72	0.000052	2.26	14285.64	1759.25	0.09
Mainstem	5107	1447.50	22.72	29.53	27.05	30.12	0.001958	6.27	263.90	62.84	0.45
Mainstem	5107	3606.50	22.72	34.28	30.08	34.89	0.001160	7.08	937.42	232.03	0.38
Mainstem	5107	4679.10	22.72	36.56	32.04	36.99	0.000738	6.41	1788.12	524.53	0.31
Mainstem	5107	5964.50	22.72	39.03	33.12	39.28	0.000425	5.46	3357.96	811.21	0.24
Mainstem	5107	7294.20	22.72	42.32	33.99	42.43	0.000194	4.18	6297.47	1658.27	0.17
Mainstem	5107	1775.70	22.72	30.28	27.57	30.97	0.001969	6.79	316.92	82.81	0.46
Mainstem	5107	3873.80	22.72	34.90	30.57	35.46	0.001021	6.89	1092.81	260.12	0.36
Mainstem	5107	7898.70	22.72	44.58	34.57	44.63	0.000103	3.29	10098.10	2006.93	0.13
Mainstem	5107	10258.20	22.72	44.59	36.21	44.69	0.000173	4.27	10123.86	2007.87	0.16
Mainstem	4848	1447.50	23.30	29.05	26.88	29.58	0.002079	5.90	262.25	54.97	0.45
Mainstem	4848	3606.50	23.30	33.69	29.52	34.53	0.001498	7.58	560.09	74.00	0.42
Mainstem	4848	4679.10	23.30	35.78	30.63	36.69	0.001280	7.96	727.43	145.16	0.40
Mainstem	4848	5964.50	23.30	38.11	31.83	39.05	0.001081	8.22	1038.12	325.24	0.38
Mainstem	4848	7294.20	23.30	41.64	32.97	42.29	0.000624	7.23	1923.14	719.56	0.30
Mainstem	4848	1775.70	23.30	29.84	27.34	30.43	0.001968	6.28	306.20	57.84	0.45
Mainstem	4848	3873.80	23.30	34.27	29.81	35.12	0.001414	7.65	603.96	76.44	0.41
Mainstem	4848	7898.70	23.30	44.23	33.46	44.56	0.000321	5.67	3568.11	1071.03	0.22
Mainstem	4848	10258.20	23.30	43.94	35.23	44.56	0.000588	7.61	3380.87	907.44	0.30
Mainstem	4791	1447.50	22.67	28.57	26.76	29.35	0.003679	7.26	212.44	41.69	0.54
Mainstem	4791	3606.50	22.67	32.73	29.79	34.22	0.003405	10.12	395.73	46.67	0.57
Mainstem	4791	4679.10	22.67	34.63	31.06	36.34	0.003124	10.91	488.89	52.19	0.56
Mainstem	4791	5964.50	22.67	36.85	32.37	38.69	0.002695	11.38	612.25	61.84	0.54
Mainstem	4791	7294.20	22.67	41.38	33.65	42.20	0.001024	8.47	1661.13	573.44	0.35
Mainstem	4791	1775.70	22.67	29.27	27.29	30.19	0.003698	7.88	241.98	42.51	0.55
Mainstem	4791	3873.80	22.67	33.28	30.12	34.81	0.003248	10.25	421.95	47.66	0.56
Mainstem	4791	7898.70	22.67	44.27	34.19	44.48	0.000323	5.24	4267.45	1483.11	0.20
Mainstem	4791	10258.20	22.67	44.02	36.84	44.42	0.000594	7.05	3929.18	1164.70	0.27
Mainstem	4740.5	Bridge									
Mainstem	4689	1447.50	21.60	26.69	25.42	27.49	0.004694	7.37	216.53	52.65	0.60
Mainstem	4689	3606.50	21.60	29.73	28.00	31.22	0.004868	10.43	430.80	122.90	0.66
Mainstem	4689	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	5964.50	21.60	34.17	30.71	35.22	0.002074	9.20	833.03	210.26	0.46
Mainstem	4689	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4689	1775.70	21.60	27.42	25.88	28.30	0.004329	7.78	255.74	56.09	0.59
Mainstem	4689	3873.80	21.60	30.14	28.99	31.61	0.004558	10.44	466.59	128.47	0.64
Mainstem	4689	7898.70	21.60	38.69	31.92	38.98	0.000523	5.69	2297.20	273.91	0.25
Mainstem	4689	10258.20	21.60	43.88	33.23	44.04	0.000239	4.61	4628.85	918.37	0.17
Mainstem	4618	1447.50	20.83	26.54		27.09	0.003264	6.14	259.34	71.57	0.50
Mainstem	4618	3606.50	20.83	29.82		30.64	0.002690	7.90	577.48	118.10	0.49
Mainstem	4618	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	5964.50	20.83	34.39		34.82	0.000923	6.25	1369.78	189.51	0.31
Mainstem	4618	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4618	1775.70	20.83	27.32		27.90	0.002828	6.33	320.95	85.20	0.47
Mainstem	4618	3873.80	20.83	30.20		31.06	0.002629	8.06	625.68	133.97	0.49
Mainstem	4618	7898.70	20.83	38.66		38.94	0.000423	5.14	2209.31	211.14	0.22
Mainstem	4618	10258.20	20.83	43.86		44.02	0.000204	4.27	4136.57	578.49	0.16
Mainstem	4350	1447.50	18.99	24.81		25.85	0.005300	8.76	204.50	49.06	0.65
Mainstem	4350	3606.50	18.99	29.43		29.91	0.001649	7.26	910.42	182.32	0.40
Mainstem	4350	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	5964.50	18.99	34.27		34.53	0.000632	5.81	1823.15	196.00	0.26
Mainstem	4350	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4350	1775.70	18.99	25.55		26.73	0.005184	9.40	262.02	111.15	0.65
Mainstem	4350	3873.80	18.99	29.88		30.33	0.001504	7.13	992.71	183.42	0.38
Mainstem	4350	7898.70	18.99	38.60		38.79	0.000349	5.10	2792.22	241.43	0.20
Mainstem	4350	10258.20	18.99	43.83		43.95	0.000193	4.45	4856.31	569.44	0.16

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	4114	1447.50	16.83	24.32		24.91	0.002548	6.46	260.01	53.55	0.46
Mainstem	4114	3606.50	16.83	29.42		29.63	0.000651	4.87	1212.72	215.68	0.25
Mainstem	4114	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	5964.50	16.83	34.28		34.42	0.000274	4.01	2292.99	239.97	0.18
Mainstem	4114	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4114	1775.70	16.83	25.09		25.77	0.002575	7.02	316.06	149.16	0.47
Mainstem	4114	3873.80	16.83	29.87		30.08	0.000602	4.80	1310.83	216.86	0.25
Mainstem	4114	7898.70	16.83	38.62		38.72	0.000154	3.52	3627.85	403.15	0.14
Mainstem	4114	10258.20	16.83	43.84		43.91	0.000084	3.02	6633.82	779.11	0.10
Mainstem	4071	1501.10	16.64	22.26	22.26	24.22	0.025734	11.25	133.44	34.03	1.00
Mainstem	4071	3723.90	16.64	25.72	25.72	28.71	0.018631	13.99	280.93	53.95	0.93
Mainstem	4071	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	6118.30	16.64	33.06	28.50	34.11	0.002978	9.02	864.88	99.58	0.42
Mainstem	4071	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	4071	1836.40	16.64	22.89	22.89	25.05	0.025009	11.80	155.60	35.93	1.00
Mainstem	4071	3996.90	16.64	26.08	26.08	29.13	0.017951	14.19	300.61	56.42	0.92
Mainstem	4071	8124.20	16.64	37.83	30.18	38.52	0.001465	7.66	1391.71	166.49	0.31
Mainstem	4071	10530.20	16.64	43.23	31.89	43.76	0.000831	6.81	2022.11	607.93	0.24
Mainstem	3967.5	Culvert									
Mainstem	3864	1501.10	12.83	19.79	18.38	20.79	0.008389	8.08	194.61	42.48	0.62
Mainstem	3864	3723.90	12.83	23.21	21.64	25.27	0.009213	11.78	357.14	52.52	0.70
Mainstem	3864	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	6118.30	12.83	26.07	25.11	28.86	0.008911	13.98	558.45	124.49	0.72
Mainstem	3864	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3864	1836.40	12.83	20.43	18.95	21.60	0.008539	8.78	222.12	44.34	0.63
Mainstem	3864	3996.90	12.83	23.57	21.97	25.73	0.009229	12.10	375.83	53.56	0.71
Mainstem	3864	8124.20	12.83	28.87	26.87	31.32	0.006387	13.66	829.89	359.33	0.63
Mainstem	3864	10530.20	12.83	31.53	29.14	33.65	0.004811	13.28	1155.32	397.27	0.57
Mainstem	3752	1501.10	13.05	18.88		19.85	0.008214	8.27	218.83	53.11	0.63
Mainstem	3752	3723.90	13.05	22.42		24.14	0.008041	11.45	425.28	64.14	0.67
Mainstem	3752	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	6118.30	13.05	25.42		27.69	0.007505	13.41	637.80	89.07	0.68
Mainstem	3752	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.85	253.85	0.57
Mainstem	3752	1836.40	13.05	19.54		20.63	0.008079	8.86	254.46	55.07	0.63
Mainstem	3752	3996.90	13.05	22.79		24.59	0.007995	11.73	449.21	65.66	0.68
Mainstem	3752	8124.20	13.05	28.93		30.20	0.003630	11.08	1388.93	317.92	0.50
Mainstem	3752	10530.20	13.05	31.98		32.60	0.001756	8.69	2508.83	384.46	0.36
Mainstem	3536	1501.10	11.96	17.49		18.34	0.005574	7.50	218.20	49.14	0.58
Mainstem	3536	3723.90	11.96	20.88		22.64	0.006047	10.92	396.50	57.31	0.66
Mainstem	3536	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	6118.30	11.96	23.05		25.90	0.007409	14.05	527.72	63.90	0.76
Mainstem	3536	7501.30	11.96	23.93		27.54	0.008493	15.85	585.55	69.87	0.82
Mainstem	3536	1836.40	11.96	18.19		19.16	0.005397	8.03	252.92	50.29	0.58
Mainstem	3536	3996.90	11.96	21.17		23.05	0.006222	11.32	412.81	58.16	0.67
Mainstem	3536	8124.20	11.96	24.34	23.30	28.26	0.008825	16.54	617.94	90.06	0.84
Mainstem	3536	10530.20	11.96	26.29	26.29	30.75	0.008469	17.91	841.03	130.88	0.84
Mainstem	3386	1501.10	11.16	16.89		17.55	0.004328	6.72	253.57	54.77	0.52
Mainstem	3386	3723.90	11.16	20.39		21.73	0.004557	9.69	469.75	68.67	0.58
Mainstem	3386	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	6118.30	11.16	22.60		24.73	0.005504	12.37	628.67	73.69	0.66
Mainstem	3386	7501.30	11.16	23.52		26.17	0.006191	13.84	697.29	74.77	0.71
Mainstem	3386	1836.40	11.16	17.64		18.39	0.004105	7.15	295.92	57.75	0.51
Mainstem	3386	3996.90	11.16	20.67		22.11	0.004698	10.04	489.11	69.78	0.59
Mainstem	3386	8124.20	11.16	23.97		26.82	0.006360	14.38	730.98	75.30	0.72
Mainstem	3386	10530.20	11.16	25.61	23.62	29.19	0.006851	16.22	856.02	77.22	0.76
Mainstem	3183	1501.10	10.65	16.26	14.23	16.82	0.002808	6.16	269.86	59.33	0.47
Mainstem	3183	3723.90	10.65	19.82	16.90	20.93	0.002909	8.80	502.42	70.80	0.52
Mainstem	3183	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	6118.30	10.65	22.67	19.12	23.73	0.002259	9.32	1509.45	662.54	0.48

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	3183	7501.30	10.65	24.59	20.00	25.07	0.001126	7.28	2821.13	710.13	0.35
Mainstem	3183	1836.40	10.65	17.09	14.70	17.70	0.002556	6.46	320.13	62.21	0.46
Mainstem	3183	3996.90	10.65	20.08	17.19	21.28	0.003035	9.16	520.69	71.86	0.53
Mainstem	3183	8124.20	10.65	25.31	20.79	25.69	0.000906	6.75	3341.16	732.68	0.31
Mainstem	3183	10530.20	10.65	27.71	23.74	27.92	0.000508	5.60	5166.11	774.41	0.24
Mainstem	2954	1501.10	7.19	15.92		16.37	0.001301	5.48	317.65	54.68	0.34
Mainstem	2954	3723.90	7.19	19.83		20.35	0.001204	6.84	1399.17	622.65	0.35
Mainstem	2954	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	6118.30	7.19	23.10		23.26	0.000444	4.87	3682.37	801.09	0.22
Mainstem	2954	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.48	855.24	0.18
Mainstem	2954	1836.40	7.19	16.72		17.25	0.001404	6.05	366.68	68.68	0.36
Mainstem	2954	3996.90	7.19	20.25		20.67	0.001023	6.45	1663.96	636.01	0.32
Mainstem	2954	8124.20	7.19	25.41		25.50	0.000263	4.12	5620.76	860.73	0.17
Mainstem	2954	10530.20	7.19	27.75		27.81	0.000179	3.69	7674.96	891.47	0.15
Mainstem	2752	1501.10	9.12	15.69	13.35	16.02	0.001833	5.52	424.41	98.52	0.39
Mainstem	2752	3723.90	9.12	20.16	15.68	20.18	0.000029	1.00	4013.55	746.30	0.05
Mainstem	2752	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	6118.30	9.12	23.19	17.37	23.20	0.000026	1.12	6667.63	936.81	0.05
Mainstem	2752	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.47	973.68	0.05
Mainstem	2752	1836.40	9.12	16.55	13.82	16.89	0.001633	5.68	510.25	101.78	0.38
Mainstem	2752	3996.90	9.12	20.52	15.89	20.53	0.000029	1.03	4289.39	803.40	0.05
Mainstem	2752	8124.20	9.12	25.45	18.00	25.47	0.000023	1.16	8868.30	1026.15	0.05
Mainstem	2752	10530.20	9.12	27.77	18.04	27.79	0.000020	1.19	11258.32	1032.56	0.05
Mainstem	2495	1522.30	8.27	15.51	11.75	15.77	0.000560	4.20	423.44	79.50	0.28
Mainstem	2495	3770.80	8.27	20.16	14.24	20.17	0.000019	1.09	4701.86	787.39	0.06
Mainstem	2495	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	6159.20	8.27	23.19	16.00	23.20	0.000018	1.23	7212.93	861.57	0.06
Mainstem	2495	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.64	891.19	0.06
Mainstem	2495	1861.70	8.27	16.36	12.17	16.66	0.000560	4.54	493.90	91.66	0.29
Mainstem	2495	4039.10	8.27	20.51	14.50	20.52	0.000019	1.11	4982.23	797.85	0.06
Mainstem	2495	8210.10	8.27	25.45	17.00	25.46	0.000016	1.31	9208.76	903.61	0.06
Mainstem	2495	10574.60	8.27	27.77	17.00	27.79	0.000016	1.39	11361.10	947.53	0.06
Mainstem	2232	1522.30	8.17	15.49		15.63	0.000306	3.13	656.20	166.12	0.21
Mainstem	2232	3770.80	8.17	19.98		20.14	0.000219	3.71	1896.38	339.12	0.19
Mainstem	2232	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	6159.20	8.17	23.01		23.17	0.000193	4.07	3046.96	414.43	0.19
Mainstem	2232	7581.10	8.17	24.60		24.77	0.000175	4.16	3717.18	423.41	0.18
Mainstem	2232	1861.70	8.17	16.36		16.51	0.000289	3.30	816.36	207.28	0.21
Mainstem	2232	4039.10	8.17	20.34		20.50	0.000218	3.78	2016.84	348.49	0.19
Mainstem	2232	8210.10	8.17	25.28		25.44	0.000168	4.19	4002.34	426.77	0.18
Mainstem	2232	10574.60	8.17	27.60		27.76	0.000151	4.32	5006.79	437.84	0.17
Mainstem	1978	1522.30	6.57	15.18		15.51	0.000597	4.61	361.22	64.16	0.30
Mainstem	1978	3770.80	6.57	19.35		20.00	0.000723	6.80	808.48	149.13	0.35
Mainstem	1978	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	6159.20	6.57	22.12		23.01	0.000804	8.26	1255.39	185.27	0.38
Mainstem	1978	7581.10	6.57	23.63		24.61	0.000806	8.83	1619.98	279.49	0.39
Mainstem	1978	1861.70	6.57	16.00		16.38	0.000626	5.06	416.92	73.25	0.31
Mainstem	1978	4039.10	6.57	19.66		20.35	0.000743	7.02	855.78	151.69	0.36
Mainstem	1978	8210.10	6.57	24.32		25.28	0.000768	8.87	1818.69	292.82	0.38
Mainstem	1978	10574.60	6.57	26.75		27.62	0.000647	8.91	2592.42	336.58	0.36
Mainstem	1724	1522.30	6.66	15.06		15.35	0.000572	4.47	407.89	75.38	0.29
Mainstem	1724	3770.80	6.66	19.24		19.80	0.000659	6.46	924.46	180.17	0.33
Mainstem	1724	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	6159.20	6.66	22.11		22.76	0.000642	7.39	1588.75	267.45	0.34
Mainstem	1724	7581.10	6.66	23.72		24.32	0.000568	7.46	2047.91	317.24	0.33
Mainstem	1724	1861.70	6.66	15.87		16.22	0.000590	4.87	472.39	82.53	0.30
Mainstem	1724	4039.10	6.66	19.56		20.14	0.000675	6.66	982.95	191.68	0.34
Mainstem	1724	8210.10	6.66	24.42		25.01	0.000539	7.47	2285.07	354.83	0.32
Mainstem	1724	10574.60	6.66	26.87		27.38	0.000434	7.35	3256.27	424.08	0.30
Mainstem	1544	1522.30	6.69	14.59		15.13	0.002968	5.86	259.67	46.20	0.44

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	1544	3770.80	6.69	19.13		19.59	0.001603	6.13	971.76	285.35	0.34
Mainstem	1544	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	6159.20	6.69	22.23		22.52	0.000878	5.43	1936.13	326.70	0.27
Mainstem	1544	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.50	354.03	0.24
Mainstem	1544	1861.70	6.69	15.37		15.98	0.003163	6.29	296.25	48.46	0.44
Mainstem	1544	4039.10	6.69	19.49		19.92	0.001502	6.07	1074.01	292.66	0.33
Mainstem	1544	8210.10	6.69	24.56		24.80	0.000649	5.21	2739.82	371.78	0.23
Mainstem	1544	10574.60	6.69	27.01		27.20	0.000474	4.91	3929.13	552.50	0.20
Mainstem	1335	1522.30	6.88	13.40		14.24	0.005897	7.71	229.26	49.18	0.56
Mainstem	1335	3770.80	6.88	17.53		18.94	0.005216	10.35	481.58	138.40	0.58
Mainstem	1335	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	6159.20	6.88	21.77		22.25	0.001648	7.36	1633.29	414.07	0.34
Mainstem	1335	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.52	522.31	0.27
Mainstem	1335	1861.70	6.88	14.09		15.06	0.005918	8.32	264.08	51.49	0.57
Mainstem	1335	4039.10	6.88	17.85		19.29	0.005198	10.55	531.44	167.40	0.58
Mainstem	1335	8210.10	6.88	24.43		24.65	0.000755	5.58	2926.74	526.34	0.24
Mainstem	1335	10574.60	6.88	26.95		27.09	0.000445	4.70	4283.11	545.48	0.19
Mainstem	1260	1522.30	5.89	13.23	10.76	13.73	0.003492	5.82	284.76	61.13	0.42
Mainstem	1260	3770.80	5.89	17.54	13.61	18.35	0.002894	7.63	613.86	162.51	0.42
Mainstem	1260	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	6159.20	5.89	21.71	15.85	22.09	0.001160	6.06	1605.71	441.80	0.28
Mainstem	1260	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2105.99	532.06	0.24
Mainstem	1260	1861.70	5.89	13.95	11.27	14.53	0.003470	6.26	330.30	65.58	0.43
Mainstem	1260	4039.10	5.89	17.86	13.89	18.69	0.002912	7.81	667.91	177.62	0.42
Mainstem	1260	8210.10	5.89	24.28	18.68	24.56	0.000758	5.47	2305.14	538.38	0.23
Mainstem	1260	10574.60	5.89	26.77	20.27	27.02	0.000579	5.23	2982.53	567.53	0.21
Mainstem	1066.5	Mult Open									
Mainstem	872	1522.30	0.90	7.75	5.34	8.27	0.003655	5.99	293.46	129.60	0.43
Mainstem	872	3770.80	0.90	12.91	8.84	13.16	0.001014	4.77	1061.56	253.84	0.25
Mainstem	872	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	6159.20	0.90	16.38	10.49	16.65	0.000863	5.27	1751.57	376.32	0.24
Mainstem	872	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	872	1861.70	0.90	8.25	5.86	8.86	0.003943	6.56	343.72	182.71	0.45
Mainstem	872	4039.10	0.90	13.54	8.95	13.77	0.000879	4.61	1170.64	263.79	0.24
Mainstem	872	8210.10	0.90	17.60	11.46	17.93	0.001003	5.99	2100.89	488.54	0.27
Mainstem	872	10574.60	0.90	18.79	12.29	19.17	0.001049	6.43	2455.62	522.05	0.27
Mainstem	811	1522.30	1.30	7.03	5.68	7.87	0.007222	8.10	277.26	118.16	0.61
Mainstem	811	3770.80	1.30	12.89	8.80	13.06	0.000936	4.76	1588.25	273.07	0.25
Mainstem	811	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	6159.20	1.30	16.39	10.14	16.55	0.000670	4.82	2621.23	319.15	0.22
Mainstem	811	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.91	372.84	0.24
Mainstem	811	1861.70	1.30	7.84	6.00	8.55	0.005490	7.75	381.72	161.01	0.55
Mainstem	811	4039.10	1.30	13.53	8.96	13.68	0.000816	4.61	1763.60	280.30	0.24
Mainstem	811	8210.10	1.30	17.61	10.92	17.81	0.000810	5.58	3043.14	379.67	0.25
Mainstem	811	10574.60	1.30	18.84	11.69	19.02	0.000774	5.73	4572.36	694.83	0.24
Mainstem	631	1522.30	0.85	6.20	4.81	6.98	0.003405	7.39	249.10	62.37	0.59
Mainstem	631	3770.80	0.85	12.63	7.75	12.90	0.000562	5.23	1408.66	251.52	0.27
Mainstem	631	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	6159.20	0.85	16.16	10.17	16.42	0.000418	5.41	2344.33	279.09	0.25
Mainstem	631	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	631	1861.70	0.85	6.81	5.30	7.71	0.003402	7.99	288.70	67.21	0.60
Mainstem	631	4039.10	0.85	13.29	8.61	13.54	0.000490	5.07	1576.94	256.91	0.26
Mainstem	631	8210.10	0.85	17.28	11.15	17.64	0.000537	6.43	2663.32	290.62	0.28
Mainstem	631	10574.60	0.85	18.31	12.13	18.80	0.000674	7.51	2966.89	298.86	0.32
Mainstem	434	1522.30	0.15	6.03		6.40	0.001657	4.93	322.70	76.06	0.40
Mainstem	434	3770.80	0.15	12.50		12.80	0.000463	4.66	1040.99	176.76	0.25
Mainstem	434	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	6159.20	0.15	15.97		16.33	0.000410	5.26	1731.28	221.18	0.24
Mainstem	434	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	434	1861.70	0.15	6.71		7.13	0.001558	5.24	375.30	78.31	0.40

HEC-RAS Plan: 2010 Existing River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	434	4039.10	0.15	13.15		13.45	0.000421	4.62	1160.97	186.62	0.24
Mainstem	434	8210.10	0.15	16.96		17.52	0.000584	6.56	1978.49	279.62	0.29
Mainstem	434	10574.60	0.15	17.90		18.63	0.000738	7.67	2258.26	309.81	0.33
Mainstem	334	1522.30	-0.54	5.79	3.31	6.22	0.001727	5.29	299.49	58.76	0.40
Mainstem	334	3770.80	-0.54	12.17	5.79	12.68	0.000871	5.86	706.46	68.77	0.30
Mainstem	334	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	6159.20	-0.54	15.28	7.87	16.12	0.001126	7.58	1024.73	267.19	0.35
Mainstem	334	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	334	1861.70	-0.54	6.43	3.74	6.94	0.001805	5.78	337.34	59.76	0.41
Mainstem	334	4039.10	-0.54	12.81	6.04	13.33	0.000846	5.93	750.31	69.77	0.30
Mainstem	334	8210.10	-0.54	15.97	9.43	17.22	0.001614	9.35	1219.21	296.02	0.42
Mainstem	334	10574.60	-0.54	16.28	11.07	18.16	0.002418	11.59	1313.28	310.52	0.51
Mainstem	250.5	Bridge									
Mainstem	208	1522.30	-1.48	3.82	2.27	4.24	0.002426	5.24	294.57	79.25	0.47
Mainstem	208	3770.80	-1.48	2.60	4.25	8.15	0.050537	18.93	200.45	76.10	2.02
Mainstem	208	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	6159.20	-1.48	6.94	5.86	8.99	0.005752	11.61	542.85	79.49	0.77
Mainstem	208	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	208	1861.70	-1.48	4.15	2.62	4.68	0.002771	5.90	320.81	79.42	0.50
Mainstem	208	4039.10	-1.48	2.70	4.45	8.63	0.051595	19.57	207.89	76.36	2.05
Mainstem	208	8210.10	-1.48	7.82	7.07	10.68	0.006990	13.73	612.61	79.51	0.86
Mainstem	208	10574.60	-1.48	8.53	8.36	12.52	0.008785	16.21	669.40	79.53	0.97
Mainstem	108	1522.30	-0.93	3.53		3.93	0.003646	5.05	301.49	109.40	0.54
Mainstem	108	3770.80	-0.93	5.30	4.11	6.20	0.004475	7.62	494.56	109.40	0.63
Mainstem	108	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	6159.20	-0.93	6.74		8.12	0.004903	9.44	652.20	109.40	0.68
Mainstem	108	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	108	1861.70	-0.93	3.85		4.33	0.003824	5.54	336.10	109.40	0.56
Mainstem	108	4039.10	-0.93	5.48	4.26	6.44	0.004533	7.86	514.03	109.40	0.64
Mainstem	108	8210.10	-0.93	7.74		9.54	0.005321	10.79	761.18	109.40	0.72
Mainstem	108	10574.60	-0.93	8.64	7.39	10.97	0.005931	12.27	876.90	147.63	0.77
Mainstem	0	1522.30	-2.11	3.05	2.34	3.48	0.004609	5.29	289.18	120.07	0.60
Mainstem	0	3770.80	-2.11	4.82	3.77	5.70	0.004601	7.55	504.44	122.01	0.65
Mainstem	0	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	6159.20	-2.11	6.28	4.99	7.56	0.004601	9.12	683.46	123.60	0.67
Mainstem	0	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69
Mainstem	0	1861.70	-2.11	3.36	2.57	3.87	0.004604	5.73	327.09	120.41	0.61
Mainstem	0	4039.10	-2.11	5.00	3.91	5.93	0.004601	7.75	526.30	122.21	0.65
Mainstem	0	8210.10	-2.11	7.32	5.89	8.90	0.004600	10.20	849.80	195.88	0.69
Mainstem	0	10574.60	-2.11	8.31	7.00	10.18	0.004601	11.19	1057.83	218.44	0.71

HEC-RAS Plan: EX- FEMAQ River: Noroton Reach: Mainstem Profile: PF 3

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	4150.00	101.25	110.03	107.05	110.08	0.000415	2.73	2626.60	645.93	0.17
Mainstem	24515	4150.00	101.05	109.66	107.01	109.92	0.001685	5.61	1062.24	575.93	0.34
Mainstem	24486	4150.00	100.71	109.36	107.81	109.80	0.003355	7.93	857.99	446.96	0.49
Mainstem	24464.5	Bridge									
Mainstem	24442	4150.00	99.46	107.91	107.91	109.20	0.009764	12.96	568.12	348.90	0.82
Mainstem	24395	4150.00	99.15	107.18	106.48	108.12	0.006903	10.41	597.29	255.65	0.68
Mainstem	24348	4150.00	99.00	106.19	106.01	107.61	0.010772	12.09	503.68	142.17	0.82
Mainstem	23965	4150.00	97.61	103.00	103.00	103.80	0.009429	9.41	652.49	224.54	0.75
Mainstem	23691	4150.00	96.62	103.00	103.00	103.11	0.000729	2.89	1617.99	344.29	0.21
Mainstem	23390	4150.00	95.51	101.65	100.00	101.74	0.001009	3.51	1944.32	593.81	0.25
Mainstem	23104	4150.00	94.45	101.53	98.50	101.57	0.000510	2.70	2934.84	821.44	0.18
Mainstem	23055	4150.00	94.15	101.23	100.03	101.46	0.002986	6.59	1480.54	458.98	0.44
Mainstem	23038.5	Bridge									
Mainstem	23022	4150.00	94.15	101.01	99.72	101.23	0.003582	6.71	1396.53	420.16	0.46
Mainstem	22976	4150.00	94.45	100.67	99.13	100.89	0.002702	5.76	1201.61	359.50	0.42
Mainstem	22614	4150.00	92.85	99.69	98.44	100.05	0.003659	7.05	901.80	263.49	0.49
Mainstem	22578	4150.00	92.12	99.60	98.32	99.95	0.003195	6.80	940.38	267.79	0.46
Mainstem	22556.5	Bridge									
Mainstem	22534	4150.00	92.38	98.87	97.77	99.23	0.003915	7.02	950.93	399.89	0.50
Mainstem	22497	4150.00	91.85	99.01	97.37	99.04	0.000318	2.12	3067.63	948.28	0.14
Mainstem	22292	4150.00	91.52	98.93	95.78	98.98	0.000396	2.36	2389.47	564.76	0.16
Mainstem	21964	4150.00	90.99	98.51		98.74	0.001810	5.40	1159.77	297.43	0.35
Mainstem	21708	4150.00	90.55	97.84		98.28	0.003942	7.86	854.71	221.10	0.52
Mainstem	21655	4150.00	88.94	97.69	96.50	98.11	0.003749	8.22	1022.12	372.38	0.51
Mainstem	21635.5	Bridge									
Mainstem	21617	4150.00	89.65	97.09	96.31	97.50	0.004333	8.05	1167.13	455.80	0.54
Mainstem	21433	4150.00	88.25	96.12		96.69	0.004120	8.09	823.96	274.97	0.53
Mainstem	21277	4150.00	88.03	95.93		96.11	0.001647	5.08	1346.92	368.08	0.33
Mainstem	20884	4150.00	87.45	94.99		95.34	0.002774	6.44	1018.94	192.17	0.42
Mainstem	20728	4150.00	85.80	94.80		95.02	0.001561	5.47	1289.35	231.59	0.33
Mainstem	20520	4150.00	83.60	93.15	93.15	94.29	0.006424	11.72	722.79	296.99	0.67
Mainstem	20220	4150.00	82.94	92.14	90.04	92.35	0.001647	5.69	1576.71	387.74	0.34
Mainstem	19972	4150.00	82.39	91.73	89.24	91.90	0.001671	5.09	1463.62	305.97	0.30
Mainstem	19666	4150.00	81.74	91.26	87.06	91.52	0.000924	5.91	1203.86	184.96	0.35
Mainstem	19414	4150.00	81.18	91.16	85.80	91.31	0.000493	4.46	1731.11	294.88	0.25
Mainstem	19164	4150.00	80.63	91.16	84.48	91.21	0.000167	2.70	2843.25	383.00	0.15
Mainstem	18991	4150.00	79.95	91.14		91.18	0.000183	2.87	3119.33	643.65	0.16
Mainstem	18922	4150.00	79.30	91.05	86.95	91.15	0.000401	4.59	2879.70	624.41	0.24
Mainstem	18874.5	Bridge									
Mainstem	18826	4150.00	76.78	87.19	86.68	88.38	0.003238	10.97	816.95	264.40	0.63
Mainstem	18753	4150.00	78.85	87.44		87.70	0.002621	6.77	1269.32	352.18	0.42
Mainstem	18523	4150.00	77.67	87.08		87.22	0.001677	5.04	1598.75	352.50	0.30
Mainstem	18298	4150.00	76.58	86.37		86.81	0.002983	7.87	1139.74	369.54	0.45
Mainstem	18102	4150.00	75.57	85.72		86.23	0.002832	7.89	1287.67	478.66	0.45
Mainstem	17851	4150.00	74.31	84.17		85.16	0.006863	11.86	860.36	301.41	0.68
Mainstem	17701	4150.00	73.56	83.32	82.93	84.09	0.006459	9.63	968.21	393.15	0.56
Mainstem	17499	4150.00	72.55	82.54	82.00	83.16	0.003113	8.24	1241.25	394.85	0.47
Mainstem	17410	4150.00	72.33	82.49	81.23	82.78	0.003245	7.15	1417.13	432.07	0.40
Mainstem	17133	4150.00	72.24	81.42		82.03	0.002573	6.83	770.48	140.46	0.42
Mainstem	16900	4150.00	70.91	81.01		81.39	0.002316	7.37	1141.50	248.83	0.41
Mainstem	16568	4150.00	68.04	79.39		80.39	0.003337	10.35	686.18	134.00	0.56
Mainstem	16345	4150.00	66.78	78.53		79.65	0.003444	10.96	757.22	158.28	0.58
Mainstem	16072	4150.00	65.43	75.51	75.51	78.12	0.008161	15.21	441.19	84.02	0.86
Mainstem	15834	4150.00	64.27	74.22	72.32	75.21	0.003628	9.00	682.60	194.28	0.51
Mainstem	15688	4150.00	63.25	74.72	71.11	74.81	0.000392	4.13	1965.58	465.96	0.22
Mainstem	15610	4150.00	62.35	74.63	71.28	74.77	0.000654	5.57	1979.72	651.14	0.29
Mainstem	15527	4150.00	62.29	74.59	71.90	74.72	0.000508	4.38	2486.61	788.84	0.22
Mainstem	15490.5	Bridge									
Mainstem	15454	4150.00	62.24	74.58	72.37	74.68	0.000623	4.21	2290.02	571.82	0.21
Mainstem	15361	4150.00	60.17	74.58	70.76	74.62	0.000234	2.68	3281.67	824.86	0.13
Mainstem	15105	5300.00	58.44	74.55	68.66	74.58	0.000118	2.22	4368.45	591.59	0.10
Mainstem	14870	5300.00	58.59	74.52	67.49	74.55	0.000094	2.25	4399.49	531.76	0.10
Mainstem	14599	5300.00	57.26	74.48	68.09	74.53	0.000110	2.87	4390.70	581.71	0.12
Mainstem	14501	5300.00	56.90	74.47	68.21	74.51	0.000118	3.07	5448.29	996.09	0.13
Mainstem	14462.5	Bridge									
Mainstem	14423	5300.00	56.64	68.88	66.78	71.44	0.003998	13.77	492.67	506.68	0.71
Mainstem	14341	5300.00	56.33	69.26	69.26	70.57	0.002246	10.88	1092.90	503.77	0.54
Mainstem	14187	5300.00	54.84	65.63	64.99	66.83	0.003667	11.18	951.23	251.22	0.64
Mainstem	13988	5300.00	54.76	66.04	61.84	66.29	0.000618	4.67	2065.65	636.33	0.27
Mainstem	13825	5300.00	55.00	65.09	64.82	66.03	0.003036	9.02	1156.74	535.23	0.54
Mainstem	13767	5300.00	54.63	64.93	64.93	65.85	0.002720	9.25	1306.06	682.84	0.55
Mainstem	13752.5	Inl Struct									
Mainstem	13742	5300.00	49.15	63.79	59.24	64.96	0.001638	9.40	1064.87	585.76	0.45

HEC-RAS Plan: EX- FEMAQ River: Noroton Reach: Mainstem Profile: PF 3 (Continued)

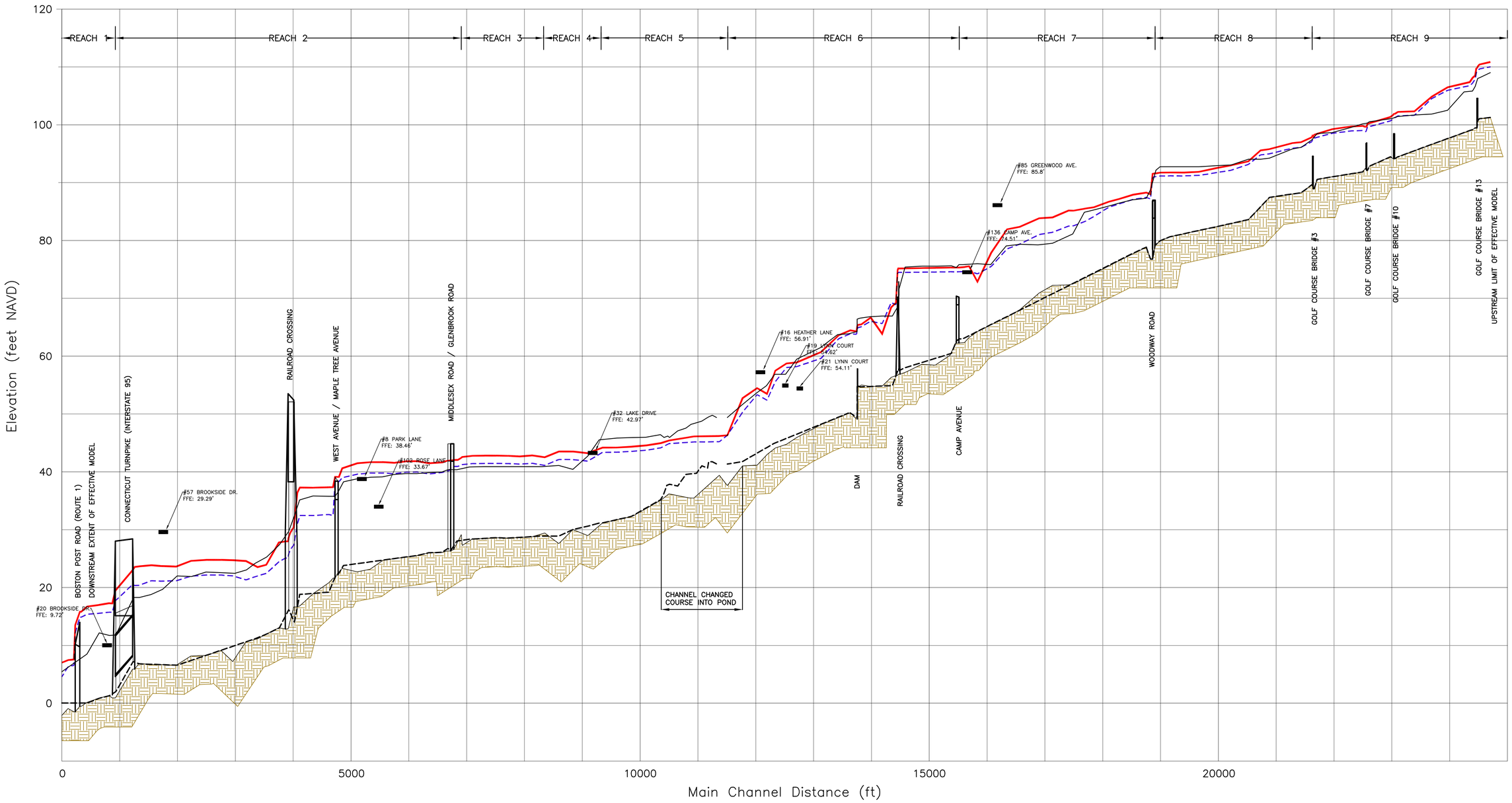
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13634	5300.00	50.20	63.86	63.25	64.55	0.001469	8.80	1631.43	611.46	0.43
Mainstem	13435	5300.00	49.38	63.04	63.04	64.11	0.002109	10.40	1391.00	633.64	0.51
Mainstem	13129	5300.00	48.16	59.62	58.62	60.13	0.002000	8.24	1579.26	504.00	0.46
Mainstem	12709	5300.00	45.95	58.20		59.28	0.002347	10.40	1178.18	331.31	0.54
Mainstem	12530	5300.00	44.76	58.03		58.82	0.001737	9.60	1687.56	469.87	0.48
Mainstem	12337	5300.00	44.11	55.59	55.59	58.14	0.004089	13.97	653.05	221.52	0.73
Mainstem	12195	5300.00	43.00	52.39	54.36	57.02	0.011649	19.13	394.64	116.99	1.13
Mainstem	12023	5300.00	41.16	53.35	50.53	54.35	0.002316	9.56	1093.58	292.29	0.52
Mainstem	11770	5300.00	41.03	50.29	50.29	53.19	0.007570	15.16	536.44	111.52	0.91
Mainstem	11508	5300.00	37.63	46.33	46.33	46.37	0.000139	1.90	3306.55	572.88	0.12
Mainstem	11371	3447.00	39.42	45.20	44.19	45.21	0.000027	0.66	4199.94	702.46	0.05
Mainstem	10928	3447.00	35.47	45.17		45.20	0.000097	1.56	3886.90	888.95	0.10
Mainstem	10846	3447.00	35.49	45.10		45.17	0.000508	3.76	2869.32	1011.04	0.23
Mainstem	10499	3447.00	36.19	44.88		45.00	0.000753	4.56	2165.92	761.54	0.29
Mainstem	10364	5300.00	35.16	44.17		44.79	0.003336	9.67	1665.61	703.71	0.60
Mainstem	10120	5300.00	33.73	43.75		44.09	0.001875	7.08	2178.22	799.37	0.41
Mainstem	9864	5300.00	32.30	43.54		43.73	0.001019	5.68	2646.76	715.49	0.31
Mainstem	9606	5300.00	31.73	43.39		43.51	0.000629	4.61	3343.67	925.99	0.25
Mainstem	9350	5300.00	31.17	43.38		43.41	0.000151	2.72	5813.98	1150.37	0.14
Mainstem	9095	5300.00	28.97	41.86	41.86	43.16	0.004082	10.94	1288.27	630.33	0.56
Mainstem	8837	5300.00	30.03	42.11	38.41	42.25	0.000557	4.94	4062.29	1060.00	0.26
Mainstem	8593	5300.00	27.59	42.14	40.13	42.17	0.000134	2.70	4676.14	1057.13	0.13
Mainstem	8351	5300.00	29.43	41.12		42.01	0.001447	8.62	1126.01	230.37	0.45
Mainstem	8130	5300.00	28.78	41.48		41.68	0.000277	3.85	1952.07	408.59	0.20
Mainstem	7925	5300.00	28.66	41.35		41.61	0.000349	4.29	1634.10	263.00	0.22
Mainstem	7717	5300.00	28.54	41.43		41.52	0.000119	2.53	2550.41	365.28	0.13
Mainstem	7512	5300.00	28.62	41.46	32.06	41.49	0.000045	1.55	4052.05	619.93	0.08
Mainstem	7307	5300.00	28.49	41.45	31.90	41.48	0.000066	1.42	4091.84	512.08	0.07
Mainstem	7095	5300.00	28.37	41.42	31.74	41.46	0.000078	1.78	3406.33	425.31	0.09
Mainstem	6923	5300.00	27.27	41.27	33.02	41.43	0.000285	3.52	2114.20	315.72	0.17
Mainstem	6907	5300.00	29.15	41.15	35.31	41.41	0.001066	4.66	1494.62	229.20	0.25
Mainstem	6850	5300.00	27.98	40.95	34.26	41.34	0.001143	5.32	1185.54	148.82	0.27
Mainstem	6777	5300.00	26.59	40.93	33.11	41.26	0.000412	4.95	1236.57	121.30	0.24
Mainstem	6719.5	Bridge									
Mainstem	6661	5300.00	26.31	40.16	32.71	40.49	0.000438	5.08	1223.45	120.46	0.24
Mainstem	6584	5300.00	26.10	39.90	33.35	40.40	0.000721	6.44	1459.48	226.81	0.31
Mainstem	6348	5300.00	26.00	39.64	33.48	40.20	0.000806	6.65	1531.93	444.25	0.32
Mainstem	6145	5300.00	25.53	39.97	33.27	40.00	0.000088	2.26	7438.60	991.71	0.11
Mainstem	5950	5300.00	25.27	39.95	34.59	39.98	0.000113	2.64	6707.48	901.51	0.12
Mainstem	5753	5300.00	25.00	39.67	35.68	39.92	0.000541	5.71	2943.87	647.57	0.27
Mainstem	5553	5300.00	24.72	39.79	32.97	39.82	0.000084	2.30	6456.25	811.88	0.11
Mainstem	5330	5300.00	23.16	39.79	31.35	39.80	0.000065	2.11	6937.32	1030.30	0.09
Mainstem	5107	5300.00	22.72	39.60	32.61	39.76	0.000268	4.44	3809.77	890.93	0.19
Mainstem	4848	5300.00	23.30	38.99	31.22	39.61	0.000669	6.73	1175.39	365.75	0.30
Mainstem	4791	5300.00	22.67	38.28	31.72	39.40	0.001467	8.96	702.57	204.20	0.40
Mainstem	4740.5	Bridge									
Mainstem	4689	5300.00	21.60	32.44	30.26	33.72	0.003046	10.06	674.40	199.20	0.55
Mainstem	4618	5300.00	20.83	32.62		33.24	0.001530	7.28	1037.01	186.13	0.39
Mainstem	4350	5300.00	18.99	32.45		32.78	0.000928	6.46	1472.09	190.42	0.31
Mainstem	4114	5300.00	16.83	32.46		32.62	0.000392	4.42	1879.32	222.93	0.21
Mainstem	4071	5300.00	16.64	30.94	27.72	32.23	0.004358	9.81	664.67	88.72	0.49
Mainstem	3967.5	Culvert									
Mainstem	3864	5300.00	12.83	25.09	23.47	27.82	0.009539	13.64	473.60	115.35	0.74
Mainstem	3752	5300.00	13.05	24.44		26.55	0.007708	12.84	563.45	72.72	0.68
Mainstem	3536	5300.00	11.96	22.45		24.89	0.006796	12.96	490.27	62.07	0.72
Mainstem	3386	5300.00	11.16	22.01		23.83	0.005039	11.40	585.39	73.00	0.62
Mainstem	3183	5300.00	10.65	21.32	18.42	22.93	0.003456	10.63	640.43	121.81	0.58
Mainstem	2954	5300.00	7.19	22.03		22.24	0.000585	5.33	2862.39	726.80	0.25
Mainstem	2752	5300.00	9.12	22.15	16.83	22.17	0.000028	1.10	5714.55	904.39	0.05
Mainstem	2495	5300.00	8.27	22.15	15.60	22.16	0.000018	1.19	6329.39	843.44	0.06
Mainstem	2232	5300.00	8.17	21.97		22.13	0.000206	4.00	2620.30	397.57	0.19
Mainstem	1978	5300.00	6.57	21.18		21.98	0.000778	7.77	1094.52	163.73	0.37
Mainstem	1724	5300.00	6.66	21.10		21.75	0.000674	7.22	1325.04	246.06	0.35
Mainstem	1544	5300.00	6.69	21.18		21.51	0.001057	5.64	1596.50	320.83	0.29
Mainstem	1335	5300.00	6.88	20.38		21.14	0.002552	8.55	1119.82	309.11	0.42
Mainstem	1260	5300.00	5.89	20.34	15.14	20.85	0.001615	6.69	1243.71	367.88	0.33
Mainstem	1066.5	Mult Open									
Mainstem	872	5300.00	0.90	15.73	10.07	15.95	0.000711	4.64	1589.53	317.79	0.22
Mainstem	811	5300.00	1.30	15.73	9.67	15.87	0.000619	4.49	2410.37	311.37	0.21
Mainstem	631	5300.00	0.85	15.53	9.68	15.75	0.000377	4.99	2169.41	273.10	0.23
Mainstem	434	5300.00	0.15	15.37		15.67	0.000359	4.79	1600.88	212.48	0.23
Mainstem	334	5300.00	-0.54	14.88	7.16	15.52	0.000890	6.62	931.82	174.45	0.31
Mainstem	250.5	Bridge									

HEC-RAS Plan: EX- FEMAQ River: Noroton Reach: Mainstem Profile: PF 3 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	208	5300.00	-1.48	6.54	5.31	8.25	0.005148	10.60	511.16	79.48	0.72
Mainstem	108	5300.00	-0.93	6.31		7.50	0.004607	8.75	605.49	109.40	0.66
Mainstem	0	5300.00	-2.11	4.57	4.57	6.54	0.011164	11.29	473.51	121.73	1.00

APPENDIX I

Existing Conditions
Channel Profile and Floodplain Mapping



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FEMA EFFECTIVE & EXISTING CONDITIONS 100-YEAR FLOOD PROFILE

NOROTON RIVER WATERSHED EVALUATION

DARIEN, CONNECTICUT

JSC	JSC	NEB
DESIGNED	DRAWN	CHECKED

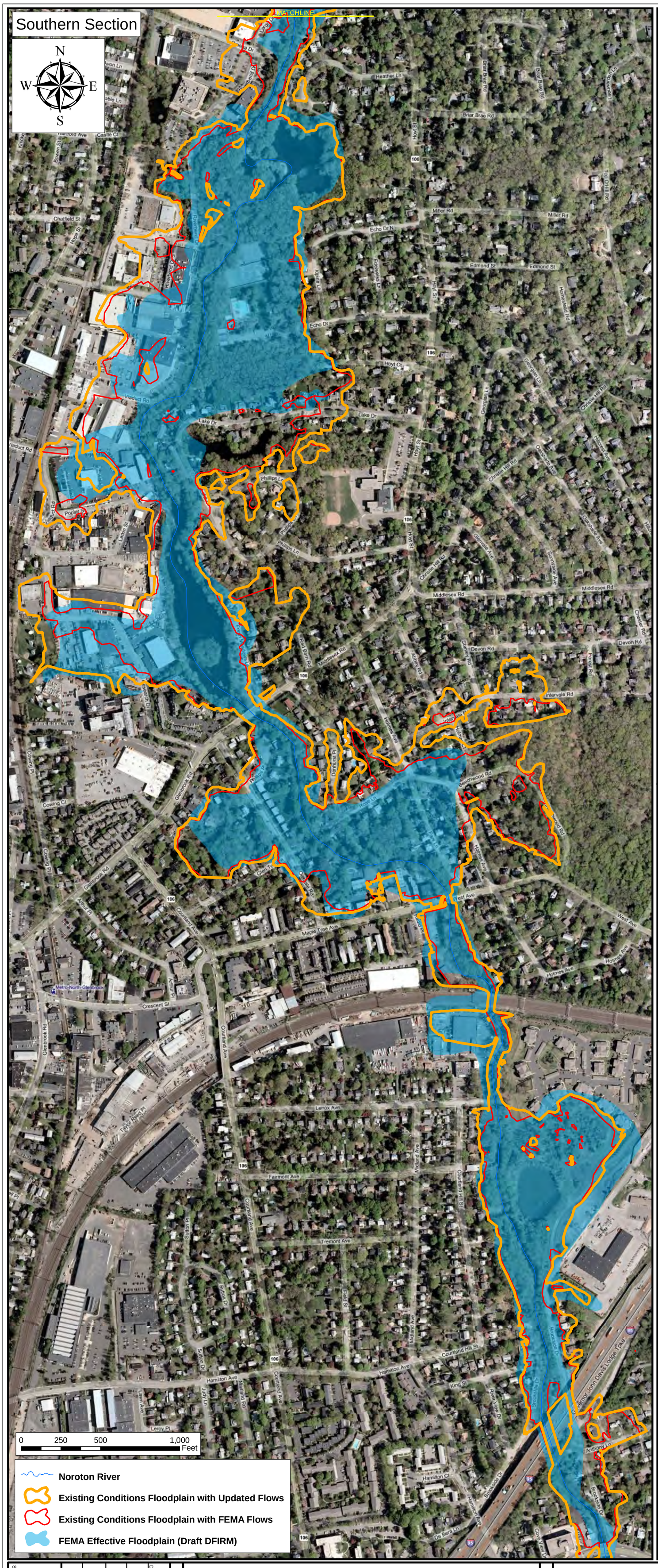
SCALE NOT TO SCALE

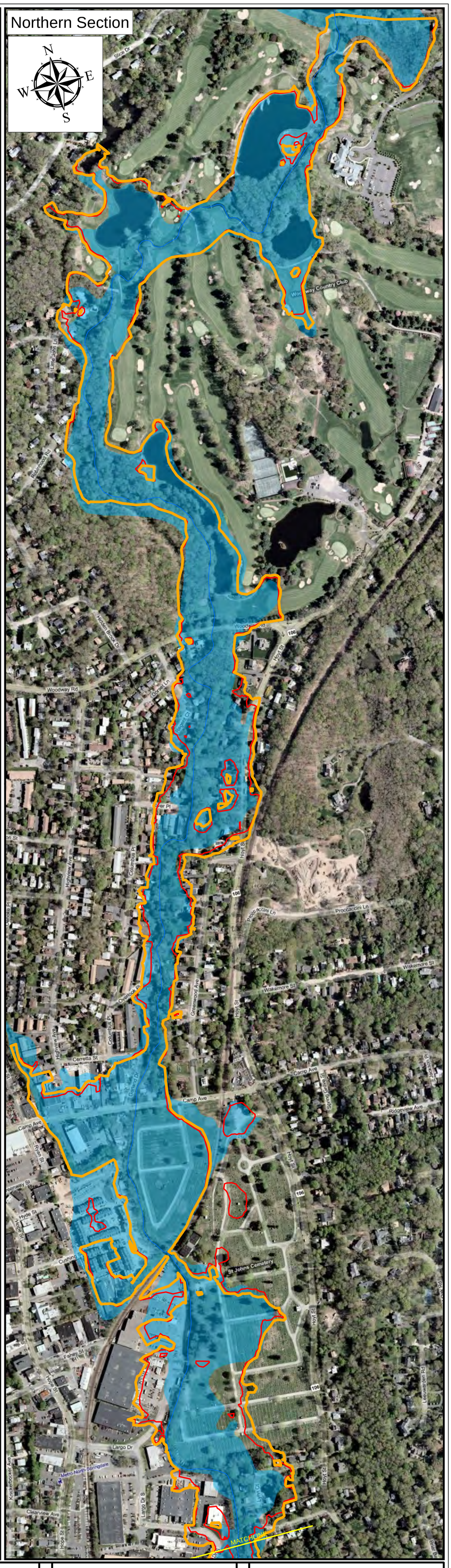
DATE APRIL 20, 2010

PROJECT NO. 1581-04-3

Appendix I-1

SHEET NO.





Appendix I-2

SHEET NO.

DESIGNED	JSC
DRAWN	JSC
CHECKED	NHB
SCALE:	1" = 300'
DATE:	April 2010
PROJECT NO:	1581-04-3
MXD NAME:	H:\Appendix-ExistingFP.MXD

Existing Conditions and FEMA Effective Floodplains

Noroton River Watershed Drainage Evaluation

Darien and Stamford, Connecticut

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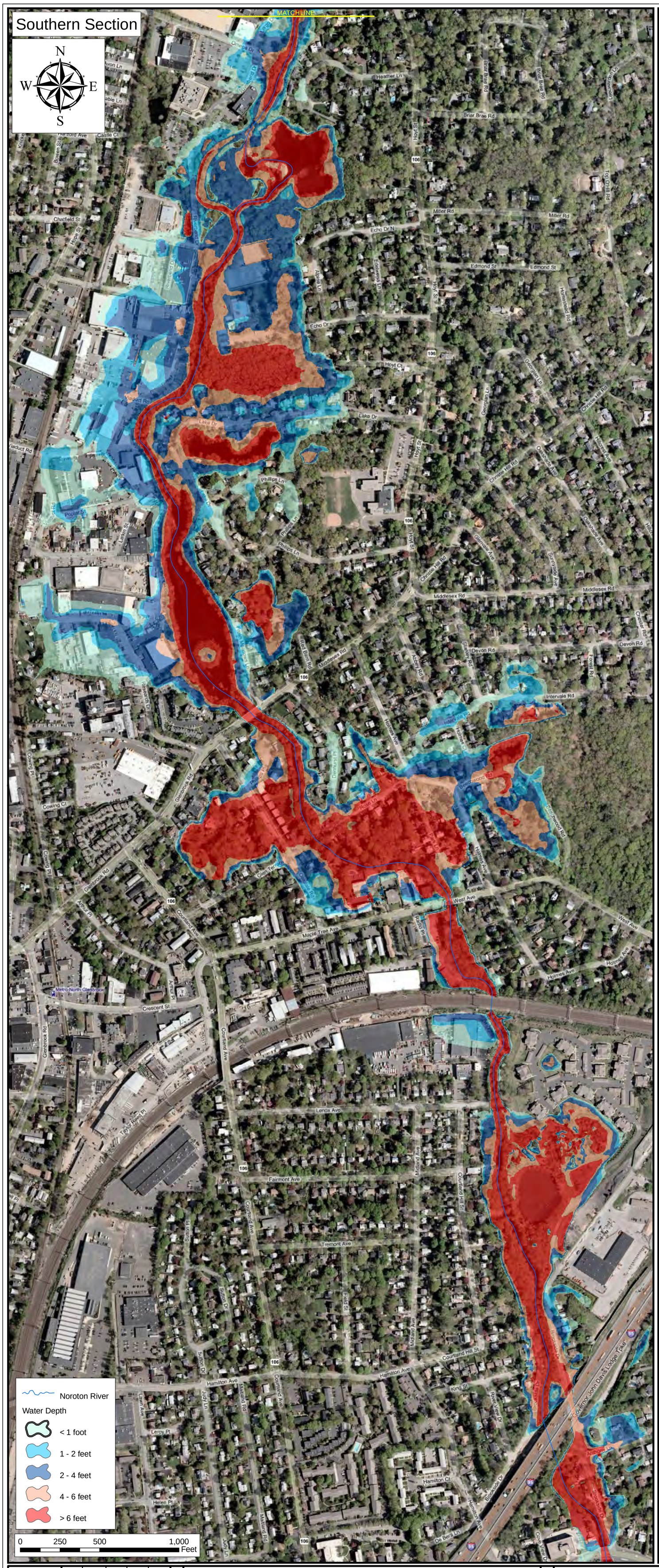

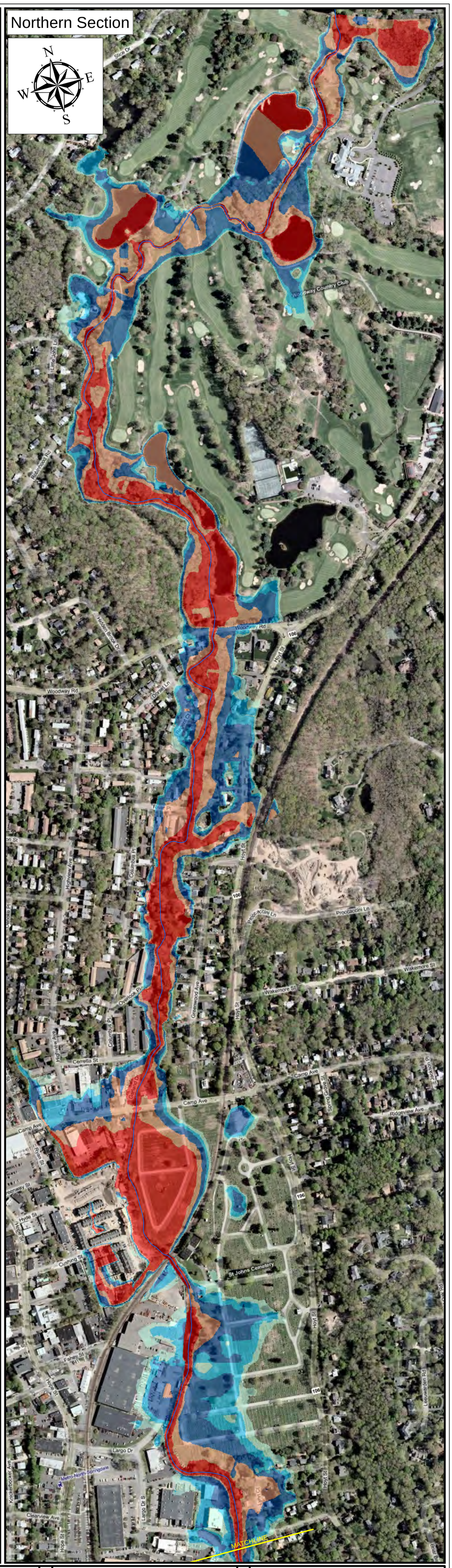

Appendix I-3

SHEET NO.

H:\Appendix\-ExistingWater.MXD

MXD NAME:

PROJECT NO: 1581-04-3

DATE: April 2010

SCALE: 1" = 300'

DESIGNED JSC

DRAWN JSC

CHECKED NHB

Existing Conditions Floodplain Water Depths

Noroton River Watershed Drainage Evaluation

Darien and Stamford, Connecticut

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APPENDIX J

Natural Conditions HEC-RAS Model Output Summary

APPENDIX J: NATURAL CONDITIONS HEC-RAS MODEL OUTPUT

HEC-RAS Plan: Natural River: Noroton Reach: Mainstem

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	3609.60	101.25	109.57	106.87	109.62	0.000440	2.71	2348.31	593.58	0.17
Mainstem	24704	5525.20	101.25	110.79	107.30	110.85	0.000441	3.00	3143.04	718.21	0.18
Mainstem	24515	3609.60	101.05	109.21	106.78	109.46	0.001689	5.41	963.72	562.36	0.34
Mainstem	24515	5525.20	101.05	110.32	107.56	110.67	0.002027	6.46	1213.98	603.09	0.38
Mainstem	24486	3609.60	100.71	108.89	107.56	109.33	0.003598	7.90	759.90	432.90	0.50
Mainstem	24486	5525.20	100.71	109.95	108.37	110.52	0.003963	9.02	986.56	464.14	0.53
Mainstem	24442	3609.60	99.46	107.65	107.65	108.86	0.009345	12.39	519.50	339.87	0.80
Mainstem	24442	5525.20	99.46	108.51	108.51	109.99	0.010491	14.12	683.37	367.45	0.86
Mainstem	24395	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.30	0.68
Mainstem	24395	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	3609.60	99.00	106.48		107.39	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.76	344.91	0.37
Mainstem	23965	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.95	359.87	0.44
Mainstem	23691	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	3609.60	95.51	101.11	101.05	101.62	0.007557	9.03	994.85	587.31	0.68
Mainstem	23390	5525.20	95.51	102.19	101.44	102.49	0.004056	7.46	1638.28	599.76	0.51
Mainstem	23104	3609.60	94.45	101.09	98.38	101.13	0.000562	2.71	2576.90	801.75	0.19
Mainstem	23104	5525.20	94.45	102.06	98.92	102.12	0.000602	3.08	3377.79	843.00	0.20
Mainstem	23055	3609.60	94.15	100.73	99.87	101.00	0.003686	6.96	1254.77	448.25	0.49
Mainstem	23055	5525.20	94.15	101.69	100.39	101.98	0.003519	7.47	1694.90	463.87	0.49
Mainstem	23022	3609.60	94.15	100.66	99.57	100.88	0.003780	6.64	1251.01	416.29	0.47
Mainstem	23022	5525.20	94.15	101.62	100.07	101.88	0.003772	7.31	1654.42	425.48	0.48
Mainstem	22976	3609.60	94.45	100.31	98.96	100.52	0.002905	5.73	1071.57	353.95	0.43
Mainstem	22976	5525.20	94.45	101.24	99.48	101.51	0.002935	6.38	1408.36	367.33	0.44
Mainstem	22614	3609.60	92.85	98.84	98.27	99.35	0.006714	8.69	679.29	256.75	0.65
Mainstem	22614	5525.20	92.85	99.78	98.85	100.38	0.006004	9.11	924.27	264.15	0.63
Mainstem	22578	3609.60	92.12	98.55	98.14	99.13	0.007076	9.05	662.89	258.87	0.66
Mainstem	22578	5525.20	92.12	99.62	98.73	100.22	0.005610	9.03	943.28	267.89	0.61
Mainstem	22534	3609.60	92.38	98.41	97.59	98.81	0.004815	7.40	789.96	324.84	0.55
Mainstem	22534	5525.20	92.38	99.55	98.19	99.94	0.003630	7.25	1284.81	532.78	0.49
Mainstem	22497	3609.60	91.85	98.56	97.19	98.59	0.000355	2.14	2653.75	881.07	0.15
Mainstem	22497	5525.20	91.85	99.69	97.78	99.73	0.000336	2.33	3740.13	996.74	0.15
Mainstem	22292	3609.60	91.52	98.48	95.66	98.53	0.000426	2.33	2137.55	557.06	0.16
Mainstem	22292	5525.20	91.52	99.60	96.06	99.66	0.000442	2.65	2769.40	576.06	0.17
Mainstem	21964	3609.60	90.99	98.05		98.27	0.001888	5.28	1025.25	279.04	0.36
Mainstem	21964	5525.20	90.99	99.09		99.38	0.002150	6.18	1334.84	311.38	0.39
Mainstem	21708	3609.60	90.55	97.32		97.77	0.004542	8.02	740.66	213.65	0.55
Mainstem	21708	5525.20	90.55	98.13		98.79	0.005692	9.69	917.71	226.29	0.63
Mainstem	21655	3609.60	88.94	96.90		97.50	0.005801	9.55	742.95	316.82	0.62
Mainstem	21655	5525.20	88.94	97.89		98.55	0.005610	10.22	1099.84	382.35	0.62
Mainstem	21617	3609.60	89.65	96.79		97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	5525.20	89.65	97.85		98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34

HEC-RAS Plan: Natural River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21277	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	3609.60	82.94	91.50	89.83	91.73	0.001953	5.90	1351.70	346.87	0.36
Mainstem	20220	5525.20	82.94	92.30	90.50	92.63	0.002643	7.30	1630.75	396.55	0.43
Mainstem	19972	3609.60	82.39	89.88	88.91	90.72	0.008862	10.05	622.57	251.67	0.66
Mainstem	19972	5525.20	82.39	91.50	89.94	91.83	0.003442	7.18	1392.60	304.70	0.43
Mainstem	19666	3609.60	81.74	89.04	86.76	89.47	0.002061	7.33	818.88	166.64	0.49
Mainstem	19666	5525.20	81.74	90.29	87.74	90.93	0.002502	9.03	1031.13	174.23	0.56
Mainstem	19414	3609.60	81.18	88.70	85.47	88.99	0.001317	5.98	1041.88	256.50	0.39
Mainstem	19414	5525.20	81.18	89.91	86.59	90.34	0.001589	7.29	1371.27	281.66	0.44
Mainstem	19164	3609.60	80.63	88.68	84.06	88.76	0.000388	3.42	1917.79	358.58	0.22
Mainstem	19164	5525.20	80.63	89.91	85.20	90.04	0.000501	4.29	2368.47	374.16	0.25
Mainstem	18991	3609.60	79.95	88.52		88.67	0.000782	4.88	1548.69	458.21	0.31
Mainstem	18991	5525.20	79.95	89.76		89.92	0.000851	5.61	2246.85	612.95	0.33
Mainstem	18922	3609.60	79.30	87.82		88.43	0.002581	9.36	1161.88	448.78	0.57
Mainstem	18922	5525.20	79.30	89.24		89.73	0.002099	9.38	1844.75	526.96	0.53
Mainstem	18826	3609.60	76.78	86.84		87.99	0.003146	10.53	724.37	257.19	0.62
Mainstem	18826	5525.20	76.78	88.00		89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	3609.60	78.85	87.06		87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18523	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	3609.60	74.31	83.97		84.84	0.006070	10.99	799.67	288.06	0.64
Mainstem	17851	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.62	409.86	0.47
Mainstem	17701	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.82	414.47	0.36
Mainstem	17499	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.70	440.42	0.29
Mainstem	17410	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	4665.70	72.24	81.92		82.57	0.002558	7.08	840.99	141.19	0.42
Mainstem	17133	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	4665.70	70.91	81.58		81.94	0.002110	7.30	1284.47	252.92	0.40
Mainstem	16900	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	4665.70	68.04	79.96		80.98	0.003309	10.66	766.05	149.37	0.56
Mainstem	16568	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	4665.70	66.78	79.16		80.26	0.003305	11.14	859.82	171.98	0.58
Mainstem	16345	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50

HEC-RAS Plan: Natural River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	16072	4665.70	65.43	75.98	75.98	78.74	0.008304	15.84	480.90	84.82	0.87
Mainstem	16072	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	4665.70	64.27	71.41	72.79	75.65	0.020841	17.20	331.58	92.37	1.15
Mainstem	15834	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	4665.70	63.25	73.78	71.34	73.97	0.000864	5.78	1590.83	458.11	0.32
Mainstem	15688	7157.70	63.25	74.66	72.20	74.95	0.001204	7.21	1942.68	465.67	0.38
Mainstem	15610	4665.70	62.35	73.42	71.54	73.86	0.001856	8.74	1162.23	451.46	0.47
Mainstem	15610	7157.70	62.35	74.28	72.78	74.81	0.002454	10.58	1748.73	649.78	0.55
Mainstem	15527	4665.70	62.29	73.26	72.14	73.71	0.001665	7.35	1518.12	649.48	0.39
Mainstem	15527	7157.70	62.29	73.94	73.10	74.57	0.002403	9.19	1976.32	758.97	0.48
Mainstem	15454	4665.70	62.24	72.54	72.54	73.39	0.004431	9.91	1172.19	523.61	0.56
Mainstem	15454	7157.70	62.24	73.18	73.18	74.19	0.005638	11.65	1511.71	539.10	0.63
Mainstem	15361	4665.70	60.17	71.84	70.90	72.12	0.002189	7.10	1607.32	565.52	0.37
Mainstem	15361	7157.70	60.17	72.35	71.49	72.77	0.003324	9.01	1898.93	581.03	0.46
Mainstem	15105	4665.70	58.44	71.77	68.50	71.83	0.000353	3.36	2777.70	552.80	0.16
Mainstem	15105	7157.70	58.44	72.18	69.09	72.31	0.000655	4.68	3009.81	559.05	0.23
Mainstem	14870	4665.70	58.59	71.71	67.31	71.76	0.000239	3.14	2952.95	496.66	0.15
Mainstem	14870	7157.70	58.59	72.07	68.07	72.18	0.000473	4.50	3131.86	501.10	0.22
Mainstem	14599	4665.70	57.26	71.58	67.85	71.69	0.000310	4.23	2751.98	547.76	0.20
Mainstem	14599	7157.70	57.26	71.80	68.86	72.03	0.000651	6.19	2873.34	550.87	0.29
Mainstem	14501	4457.20	56.90	71.47	67.59	71.64	0.000413	5.02	2747.41	766.14	0.24
Mainstem	14501	7035.70	56.90	71.48	69.78	71.90	0.001023	7.91	2755.86	767.20	0.38
Mainstem	14423	4457.20	56.64	71.28	65.79	71.57	0.000545	5.76	1669.11	613.48	0.27
Mainstem	14423	7035.70	56.64	70.57	69.88	71.61	0.001985	10.61	1411.30	580.31	0.51
Mainstem	14341	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	7035.70	56.33	69.96	69.96	71.34	0.002488	11.86	1411.17	545.49	0.57
Mainstem	14187	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	7035.70	54.84	64.17	65.89	69.38	0.016814	21.42	609.23	226.13	1.33
Mainstem	13988	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13767	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13742	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54

HEC-RAS Plan: Natural River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	12337	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	4457.20	41.16	52.01	50.38	53.62	0.003786	11.17	708.50	281.05	0.65
Mainstem	12023	7035.70	41.16	54.46	53.31	55.44	0.002234	10.04	1444.07	369.15	0.52
Mainstem	11770	4457.20	41.03	49.80	49.80	52.28	0.006857	13.88	482.31	107.11	0.86
Mainstem	11770	7035.70	41.03	52.75	52.75	54.61	0.004129	13.22	1212.62	530.68	0.70
Mainstem	11508	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4167.50	699.26	0.07
Mainstem	11371	7035.70	39.42	46.18	44.19	46.22	0.000075	1.24	4940.64	826.51	0.09
Mainstem	10928	4457.20	35.47	45.10		45.15	0.000168	2.05	3827.63	888.18	0.13
Mainstem	10928	7035.70	35.47	46.11		46.19	0.000235	2.64	4770.68	1031.87	0.16
Mainstem	10846	4457.20	35.49	44.98		45.10	0.000917	5.00	2780.20	991.58	0.31
Mainstem	10846	7035.70	35.49	45.98		46.12	0.001107	5.94	3807.82	1167.25	0.35
Mainstem	10499	4457.20	36.19	44.41		44.73	0.001972	7.08	1812.94	746.07	0.46
Mainstem	10499	7035.70	36.19	45.40		45.72	0.001975	7.70	2567.11	771.97	0.47
Mainstem	10364	4565.60	35.16	43.70		44.42	0.003819	9.94	1373.12	670.82	0.63
Mainstem	10364	7073.90	35.16	44.95		45.47	0.002925	9.62	2216.93	720.42	0.57
Mainstem	10120	4565.60	33.73	43.30		43.65	0.001915	6.91	1839.82	688.63	0.41
Mainstem	10120	7073.90	33.73	44.53		44.84	0.001779	7.28	2920.41	1067.27	0.41
Mainstem	9864	4565.60	32.30	43.07		43.28	0.001094	5.70	2308.64	708.97	0.32
Mainstem	9864	7073.90	32.30	44.30		44.50	0.001066	6.09	3256.54	855.79	0.32
Mainstem	9606	4565.60	31.73	42.90		43.04	0.000670	4.62	2895.49	924.06	0.25
Mainstem	9606	7073.90	31.73	44.13		44.26	0.000682	5.02	4030.29	928.50	0.26
Mainstem	9350	4565.60	31.17	42.91		42.94	0.000147	2.61	5278.61	1120.04	0.14
Mainstem	9350	7073.90	31.17	44.11		44.15	0.000184	3.11	6666.74	1180.33	0.15
Mainstem	9095	4565.60	28.97	40.25	40.25	42.58	0.007271	13.24	577.58	280.02	0.73
Mainstem	9095	7073.90	28.97	42.59	42.59	43.88	0.004313	11.70	1822.10	781.15	0.58
Mainstem	8837	4565.60	30.03	40.23	37.67	40.49	0.001106	6.15	2408.56	706.87	0.36
Mainstem	8837	7073.90	30.03	42.98	39.01	43.12	0.000585	5.32	5004.58	1113.38	0.27
Mainstem	8593	4565.60	27.59	40.27	40.13	40.33	0.000295	3.62	3043.91	802.49	0.19
Mainstem	8593	7073.90	27.59	43.00	40.13	43.04	0.000156	3.03	5681.99	1256.30	0.14
Mainstem	8351	4565.60	29.43	38.33		40.00	0.003548	11.18	600.15	139.24	0.67
Mainstem	8351	7073.90	29.43	41.35		42.80	0.002349	11.13	1177.43	233.05	0.58
Mainstem	8130	4565.60	28.78	39.11		39.35	0.000433	4.13	1361.49	180.96	0.24
Mainstem	8130	7073.90	28.78	41.94		42.27	0.000424	4.88	2161.94	485.27	0.25
Mainstem	7925	4565.60	28.66	38.90		39.24	0.000603	4.82	1094.76	152.17	0.28
Mainstem	7925	7073.90	28.66	41.74		42.17	0.000545	5.48	1736.74	264.48	0.28
Mainstem	7717	4565.60	28.54	38.98		39.11	0.000204	2.84	1812.95	263.83	0.16
Mainstem	7717	7073.90	28.54	41.87		42.02	0.000184	3.23	2717.18	389.32	0.16
Mainstem	7512	4565.60	28.62	39.01	31.83	39.06	0.000078	1.74	2760.77	354.73	0.10
Mainstem	7512	7073.90	28.62	41.92	32.53	41.97	0.000069	1.97	4337.44	623.07	0.10
Mainstem	7307	4565.60	28.49	39.00	31.69	39.04	0.000112	1.58	3015.59	394.33	0.09
Mainstem	7307	7073.90	28.49	41.90	32.37	41.95	0.000104	1.82	4336.14	564.03	0.09
Mainstem	7095	4565.60	28.37	38.95	31.50	39.01	0.000128	1.97	2492.30	314.00	0.11

HEC-RAS Plan: Natural River: Noroton Reach: Mainstem (Continued)

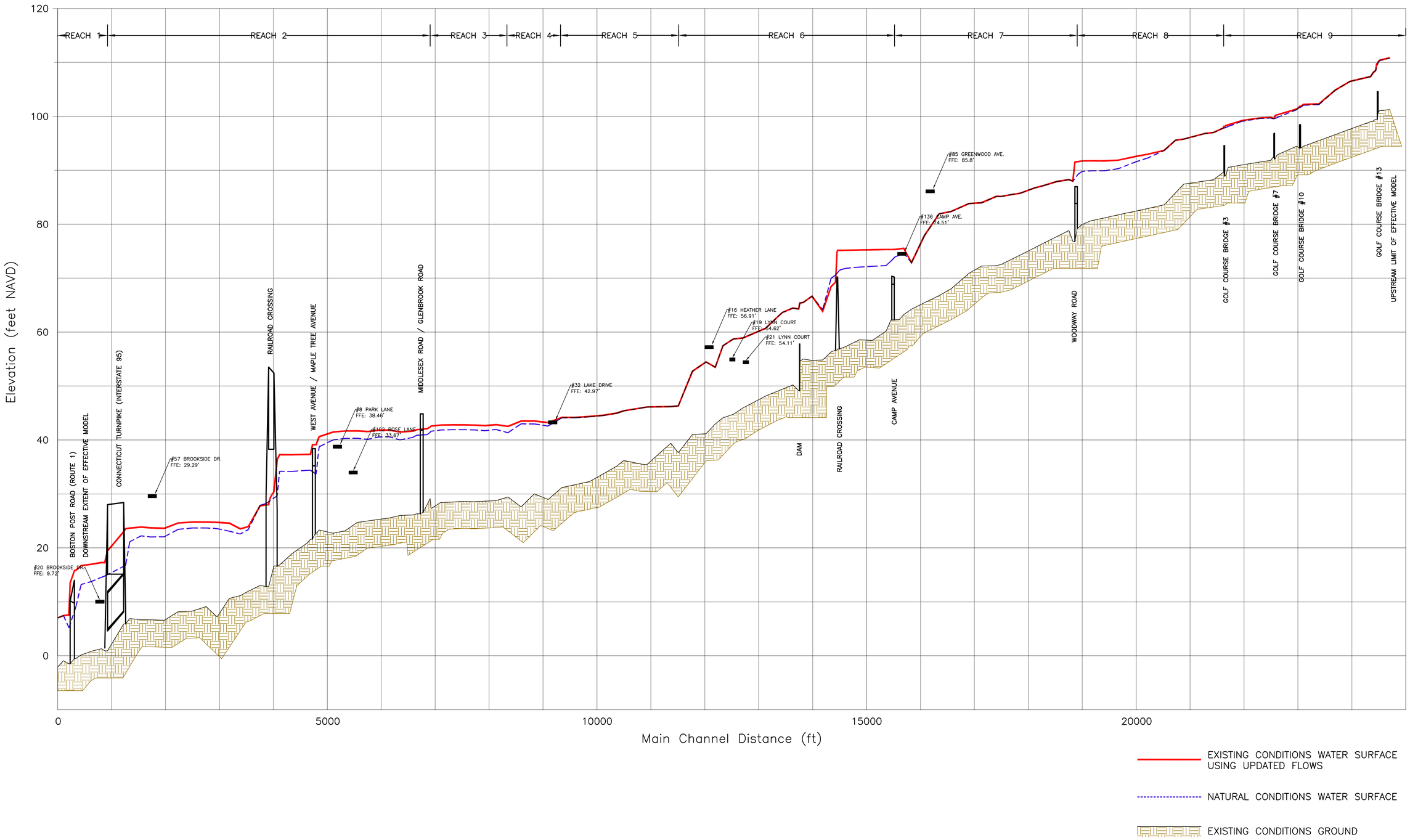
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	7095	7073.90	28.37	41.86	32.28	41.93	0.000116	2.23	4106.47	683.26	0.11
Mainstem	6923	4565.60	27.27	38.75	32.61	38.96	0.000466	3.90	1457.00	219.62	0.21
Mainstem	6923	7073.90	27.27	41.61	33.84	41.87	0.000449	4.50	2224.26	317.99	0.22
Mainstem	6907	4565.60	29.15	38.50	34.94	38.92	0.002367	5.74	953.64	160.87	0.36
Mainstem	6907	7073.90	29.15	41.42	36.15	41.84	0.001709	6.00	1556.93	233.53	0.32
Mainstem	6850	4679.10	27.98	38.16	33.83	38.77	0.002406	6.50	804.43	116.59	0.37
Mainstem	6850	7294.20	27.98	40.97	35.53	41.71	0.002145	7.30	1189.66	149.03	0.37
Mainstem	6777	4679.10	26.59	38.13	32.63	38.61	0.000796	5.91	906.29	115.07	0.31
Mainstem	6777	7294.20	26.59	40.94	34.48	41.56	0.000778	6.80	1238.18	121.33	0.32
Mainstem	6661	4679.10	26.31	38.09	32.29	38.48	0.000640	5.51	982.81	111.93	0.28
Mainstem	6661	7294.20	26.31	40.89	33.93	41.44	0.000678	6.55	1313.16	123.46	0.30
Mainstem	6584	4679.10	26.10	37.60	32.84	38.32	0.001240	7.46	967.68	184.33	0.39
Mainstem	6584	7294.20	26.10	40.48	34.80	41.29	0.001138	8.33	1591.64	230.13	0.39
Mainstem	6348	4679.10	26.00	36.95	32.94	37.91	0.001671	8.23	752.87	195.45	0.45
Mainstem	6348	7294.20	26.00	40.02	35.35	40.97	0.001331	8.70	1678.39	484.88	0.42
Mainstem	6145	4679.10	25.53	37.50	32.72	37.55	0.000187	2.90	5105.05	869.99	0.15
Mainstem	6145	7294.20	25.53	40.59	34.67	40.64	0.000134	2.87	8062.93	1020.98	0.13
Mainstem	5950	4679.10	25.27	37.44	34.03	37.51	0.000261	3.52	4555.24	828.52	0.18
Mainstem	5950	7294.20	25.27	40.55	35.18	40.61	0.000172	3.34	7265.44	942.17	0.15
Mainstem	5753	4679.10	25.00	35.07	35.00	37.17	0.004708	12.91	674.61	267.45	0.74
Mainstem	5753	7294.20	25.00	40.13	37.15	40.51	0.000836	7.25	3247.75	722.25	0.34
Mainstem	5553	4679.10	24.72	36.35	32.79	36.42	0.000284	3.55	3907.19	709.63	0.19
Mainstem	5553	7294.20	24.72	40.32	33.47	40.35	0.000132	2.96	6914.71	982.03	0.13
Mainstem	5330	4679.10	23.16	36.33	31.08	36.37	0.000195	3.10	4145.85	720.35	0.16
Mainstem	5330	7294.20	23.16	40.30	32.45	40.33	0.000104	2.73	7508.14	1184.82	0.12
Mainstem	5107	4679.10	22.72	35.56	32.04	36.21	0.001142	7.56	1332.58	401.16	0.38
Mainstem	5107	7294.20	22.72	40.00	33.91	40.26	0.000434	5.74	4151.10	1035.14	0.25
Mainstem	4848	4679.10	23.30	34.64	30.63	35.79	0.001823	8.89	632.76	78.01	0.47
Mainstem	4848	7294.20	23.30	38.75	32.97	39.98	0.001354	9.47	1136.70	358.29	0.43
Mainstem	4791	4679.10	22.67	31.06	31.06	34.81	0.010905	15.98	319.89	44.56	0.99
Mainstem	4791	7294.20	22.67	33.65	33.65	38.68	0.010223	18.62	439.77	48.76	1.00
Mainstem	4689	4679.10	21.60	31.28	30.00	32.60	0.003705	10.27	665.79	166.10	0.59
Mainstem	4689	7294.20	21.60	34.39	32.18	35.21	0.001930	8.98	1288.13	210.74	0.45
Mainstem	4618	4679.10	20.83	31.33		32.15	0.002252	8.11	800.33	174.67	0.46
Mainstem	4618	7294.20	20.83	34.37		35.01	0.001392	7.67	1365.55	189.49	0.38
Mainstem	4350	4679.10	18.99	31.09		31.50	0.001245	6.97	1216.67	186.53	0.35
Mainstem	4350	7294.20	18.99	34.18		34.58	0.000972	7.17	1805.34	195.67	0.33
Mainstem	4114	4679.10	16.83	31.09		31.29	0.000513	4.74	1577.29	219.96	0.23
Mainstem	4114	7294.20	16.83	34.19		34.40	0.000421	4.95	2272.64	237.26	0.22
Mainstem	4071	4813.50	16.64	27.18	27.18	30.32	0.015649	14.54	368.35	67.94	0.88
Mainstem	4071	7501.30	16.64	29.65	29.65	33.30	0.013779	16.19	554.66	82.40	0.86
Mainstem	3864	4813.50	12.83	24.56	22.92	27.03	0.009303	13.01	430.46	57.90	0.72
Mainstem	3864	7501.30	12.83	28.22	26.69	30.36	0.006089	12.94	919.61	353.61	0.61
Mainstem	3752	4813.50	13.05	23.85		25.84	0.007799	12.45	521.00	69.80	0.68
Mainstem	3752	7501.30	13.05	27.88		29.51	0.004729	12.07	1075.41	269.91	0.56
Mainstem	3536	4813.50	11.96	21.86		24.17	0.006928	12.57	453.99	60.26	0.72
Mainstem	3536	7501.30	11.96	23.40		27.39	0.009932	16.63	550.55	65.13	0.88

HEC-RAS Plan: Natural River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	3386	4813.50	11.16	21.33		23.10	0.005308	11.19	535.96	72.20	0.63
Mainstem	3386	7501.30	11.16	22.57		25.79	0.008353	15.21	626.54	73.65	0.81
Mainstem	3183	4813.50	10.65	20.61	17.97	22.15	0.003623	10.39	565.95	93.43	0.59
Mainstem	3183	7501.30	10.65	23.09	20.00	24.31	0.002661	10.35	1787.45	671.97	0.52
Mainstem	2954	4813.50	7.19	21.12		21.43	0.000829	6.07	2225.94	665.09	0.29
Mainstem	2954	7501.30	7.19	23.58		23.77	0.000529	5.43	4070.92	825.16	0.24
Mainstem	2752	4813.50	9.12	21.31	16.49	21.33	0.000032	1.11	4960.42	874.36	0.06
Mainstem	2752	7501.30	9.12	23.68	17.99	23.70	0.000033	1.29	7129.60	948.55	0.06
Mainstem	2495	4851.30	8.27	21.31	15.22	21.32	0.000020	1.20	5625.04	822.96	0.06
Mainstem	2495	7581.10	8.27	23.68	17.00	23.69	0.000023	1.44	7635.91	869.44	0.07
Mainstem	2232	4851.30	8.17	21.11		21.29	0.000234	4.08	2293.79	368.18	0.20
Mainstem	2232	7581.10	8.17	23.43		23.66	0.000254	4.76	3224.91	416.98	0.22
Mainstem	1978	4851.30	6.57	20.27		21.12	0.000872	7.85	950.02	156.62	0.39
Mainstem	1978	7581.10	6.57	22.05		23.42	0.001240	10.23	1242.87	182.89	0.47
Mainstem	1724	4851.30	6.66	20.16		20.87	0.000789	7.44	1106.27	217.50	0.37
Mainstem	1724	7581.10	6.66	22.03		23.03	0.001002	9.20	1565.87	267.22	0.43
Mainstem	1544	4851.30	6.69	20.15		20.60	0.001498	6.32	1274.34	305.55	0.34
Mainstem	1544	7581.10	6.69	22.22		22.65	0.001337	6.70	1932.40	326.58	0.33
Mainstem	1335	4851.30	6.88	16.08	16.08	19.57	0.015386	16.01	373.10	58.08	0.96
Mainstem	1335	7581.10	6.88	21.13	19.69	22.17	0.003524	10.44	1379.21	373.15	0.50
Mainstem	1260	4851.30	5.89	13.85	14.71	17.92	0.024888	16.61	323.75	64.96	1.14
Mainstem	1260	7581.10	5.89	16.76	16.76	20.77	0.015759	16.88	529.32	75.82	0.97
Mainstem	872	4851.30	0.90	12.04	9.57	12.37	0.001582	5.65	1219.34	246.59	0.31
Mainstem	872	7581.10	0.90	14.77	10.62	15.06	0.001042	5.36	1936.67	284.24	0.26
Mainstem	811	4851.30	1.30	11.76	9.42	12.21	0.002677	7.49	1285.13	261.83	0.41
Mainstem	811	7581.10	1.30	14.56	10.69	14.95	0.001914	7.45	2057.97	292.74	0.37
Mainstem	631	4851.30	0.85	10.18	9.38	11.45	0.003083	10.43	827.52	222.72	0.62
Mainstem	631	7581.10	0.85	13.79	10.87	14.54	0.001421	8.88	1705.50	260.67	0.44
Mainstem	434	4851.30	0.15	9.87		10.87	0.002069	8.24	695.11	127.87	0.50
Mainstem	434	7581.10	0.15	13.21		14.24	0.001455	8.62	1171.11	187.19	0.44
Mainstem	334	4851.30	-0.54	6.77	6.77	9.85	0.010290	14.25	357.64	60.29	0.99
Mainstem	334	7581.10	-0.54	8.96	8.96	13.03	0.009752	16.44	493.55	63.73	0.98
Mainstem	208	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.98	79.47	0.71
Mainstem	208	7581.10	-1.48	5.19	6.71	10.78	0.022150	19.13	404.00	79.44	1.46
Mainstem	108	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.88	109.40	0.66
Mainstem	108	7581.10	-0.93	7.45	6.08	9.12	0.005188	10.39	729.78	109.40	0.71
Mainstem	0	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69

APPENDIX K

Natural Conditions
Channel Profile and Floodplain Mapping



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NATURAL & EXISTING CONDITIONS 100-YEAR FLOOD PROFILE

NOROTON RIVER WATERSHED EVALUATION

DARIEN, CONNECTICUT

JSC	JSC	NEB
DESIGNED	DRAWN	CHECKED

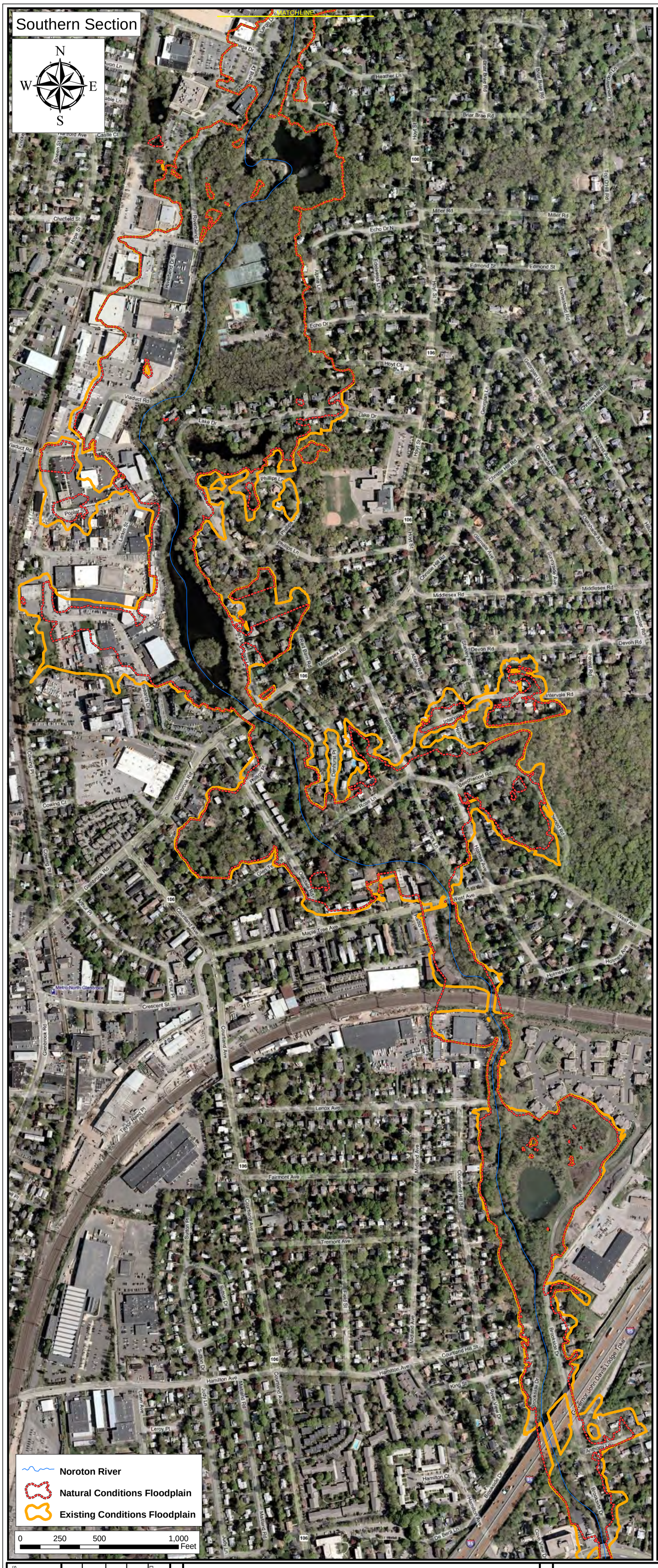
SCALE NOT TO SCALE

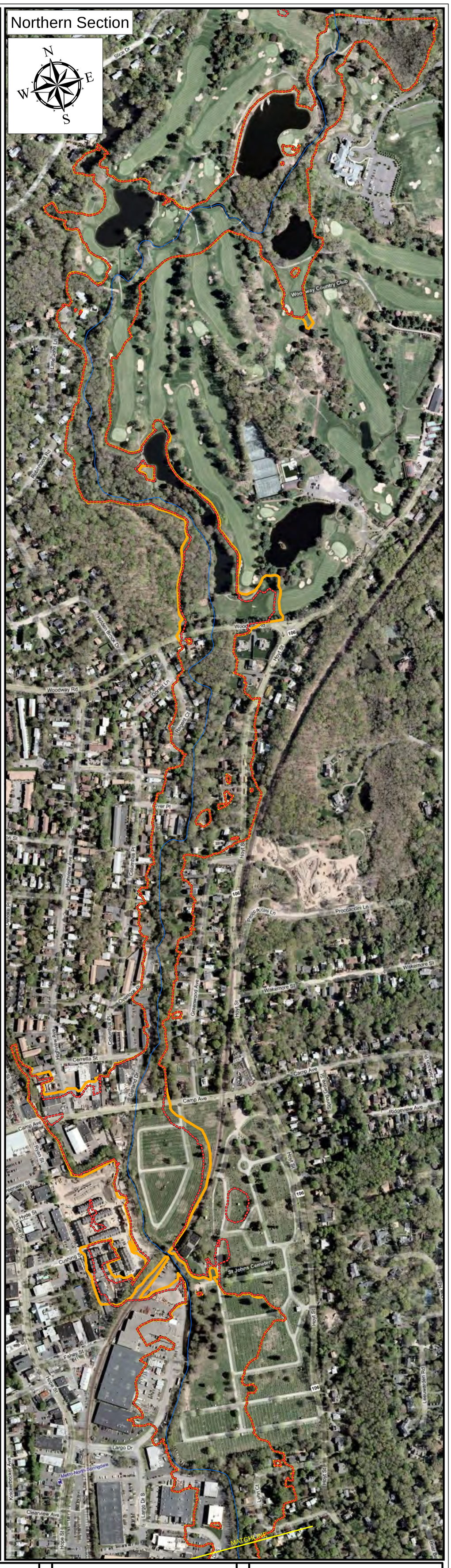
DATE APRIL 20, 2010

PROJECT NO. 1581-04-3

Appendix K-1

SHEET NO.





Natural and Existing Conditions Floodplains

Noroton River Watershed Drainage Evaluation

Darien and Stamford, Connecticut

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SHEET NO.	Appendix K-2
MXD NAME:	H:\Appendix-K-Natural\FP.MXD
PROJECT NO:	1581-04-3
DATE:	April 2010
SCALE:	1" = 300'
DESIGNED	JSC
DRAWN	JSC
CHECKED	NHB

APPENDIX L

Proposed Conditions HEC-RAS Model Output

APPENDIX L1: ALTERNATIVE 1 HEC-RAS RESULTS

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5	Bridge									
Mainstem	24442	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5	Bridge									
Mainstem	23022	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22556.5	Bridge									
Mainstem	22534	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	21964	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21655	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5	Bridge									
Mainstem	21617	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	19972	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19666	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19414	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19164	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	18991	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18922	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18874.5	Bridge									
Mainstem	18826	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18523	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36

APPENDIX L1: ALTERNATIVE 1 HEC-RAS RESULTS

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	17499	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16072	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15610	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15527	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15490.5	Bridge									
Mainstem	15454	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15361	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15105	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	14870	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14599	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14501	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14462.5	Bridge									
Mainstem	14423	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14341	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14187	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	13988	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13825	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13767	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13752.5	Inl Struct									
Mainstem	13742	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	11770	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4946.87	827.66	0.09
Mainstem	10928	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	7035.70	35.47	46.12		46.19	0.000234	2.64	4778.74	1032.79	0.16
Mainstem	10846	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	7035.70	35.49	45.98		46.13	0.001099	5.92	3818.35	1171.09	0.35
Mainstem	10499	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	7035.70	36.19	45.42		45.74	0.001948	7.66	2579.91	772.24	0.47
Mainstem	10364	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	7073.90	35.16	44.98		45.49	0.002845	9.51	2240.48	720.94	0.56
Mainstem	10120	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	7073.90	33.73	44.59		44.88	0.001703	7.15	2977.58	1068.25	0.40
Mainstem	9864	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	7073.90	32.30	44.36		44.55	0.001022	5.98	3310.26	856.18	0.32
Mainstem	9606	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	7073.90	31.73	44.20		44.32	0.000653	4.93	4095.38	928.86	0.25
Mainstem	9350	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	7073.90	31.17	44.18		44.22	0.000177	3.07	6749.50	1180.90	0.15

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	9095	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	7073.90	28.97	43.24		44.01	0.002758	9.68	2376.13	914.82	0.47
Mainstem	8837	4565.60	30.03	41.31	37.67	41.45	0.000608	4.91	3250.20	923.54	0.27
Mainstem	8837	7073.90	30.03	43.51	39.01	43.61	0.000441	4.76	5609.56	1186.14	0.24
Mainstem	8593	4565.60	27.59	41.33	40.13	41.36	0.000153	2.76	3933.68	872.35	0.14
Mainstem	8593	7073.90	27.59	43.52	40.13	43.55	0.000122	2.75	6356.56	1338.33	0.13
Mainstem	8351	4565.60	29.43	40.30		41.20	0.001544	8.47	939.88	220.12	0.46
Mainstem	8351	7073.90	29.43	42.53		43.40	0.001385	9.12	1898.31	1080.78	0.45
Mainstem	8130	4565.60	28.78	40.69		40.86	0.000258	3.54	1684.32	272.23	0.19
Mainstem	8130	7073.90	28.78	42.83		43.09	0.000310	4.37	2819.26	870.12	0.21
Mainstem	7925	4565.60	28.66	40.56		40.80	0.000340	4.04	1429.50	245.35	0.22
Mainstem	7925	7073.90	28.66	42.66		43.00	0.000405	4.97	1982.14	269.21	0.24
Mainstem	7717	4565.60	28.54	40.63		40.71	0.000114	2.37	2275.69	314.92	0.13
Mainstem	7717	7073.90	28.54	42.77		42.89	0.000140	2.96	3137.70	549.01	0.14
Mainstem	7512	4565.60	28.62	40.65	31.83	40.68	0.000044	1.46	3566.66	590.33	0.08
Mainstem	7512	7073.90	28.62	42.81	32.53	42.85	0.000053	1.80	4940.40	771.57	0.09
Mainstem	7307	4565.60	28.49	40.64	31.69	40.67	0.000063	1.32	3702.17	462.45	0.07
Mainstem	7307	7073.90	28.49	42.80	32.37	42.84	0.000066	1.52	6689.93	1102.88	0.07
Mainstem	7095	4565.60	28.37	40.61	31.50	40.65	0.000074	1.66	3079.73	389.50	0.09
Mainstem	7095	7073.90	28.37	42.76	32.28	42.82	0.000087	2.02	4797.71	792.80	0.10
Mainstem	6923	4565.60	27.27	40.48	32.61	40.62	0.000262	3.24	1884.97	265.20	0.16
Mainstem	6923	7073.90	27.27	42.58	33.84	42.78	0.000327	4.02	2533.21	324.68	0.19
Mainstem	6907	4565.60	29.15	40.36	34.94	40.60	0.001101	4.50	1316.85	218.15	0.25
Mainstem	6907	7073.90	29.15	42.43	36.15	42.75	0.001216	5.37	1803.69	263.43	0.27
Mainstem	6850	4679.10	27.98	40.16	33.83	40.53	0.001161	5.13	1070.81	142.88	0.27
Mainstem	6850	7294.20	27.98	42.07	35.53	42.65	0.001553	6.58	1378.42	185.92	0.32
Mainstem	6777	4679.10	26.59	40.15	32.63	40.45	0.000406	4.72	1142.35	119.24	0.23
Mainstem	6777	7294.20	26.59	42.05	34.48	42.54	0.000568	6.12	1373.75	124.09	0.28
Mainstem	6719.5	Bridge									
Mainstem	6661	4679.10	26.31	39.38	32.29	39.68	0.000428	4.83	1130.51	117.24	0.24
Mainstem	6661	7294.20	26.31	41.92	33.93	42.37	0.000519	6.00	1441.55	127.29	0.27
Mainstem	6584	4679.10	26.10	39.11	32.84	39.58	0.000729	6.22	1281.30	222.19	0.31
Mainstem	6584	7294.20	26.10	41.65	34.80	42.27	0.000808	7.40	1865.75	238.14	0.33
Mainstem	6348	4679.10	26.00	38.81	32.94	39.37	0.000849	6.53	1241.63	383.09	0.33
Mainstem	6348	7294.20	26.00	41.48	35.35	42.08	0.000795	7.20	2327.86	662.27	0.33
Mainstem	6145	4679.10	25.53	39.14	32.72	39.17	0.000093	2.23	6625.42	961.67	0.11
Mainstem	6145	7294.20	25.53	41.84	34.67	41.87	0.000089	2.47	9426.49	1177.18	0.11
Mainstem	5950	4679.10	25.27	39.11	34.03	39.15	0.000123	2.64	5969.61	865.39	0.13
Mainstem	5950	7294.20	25.27	41.81	35.18	41.85	0.000112	2.84	8566.50	1114.46	0.13
Mainstem	5753	4679.10	25.00	38.78	35.00	39.07	0.000642	5.95	2382.76	596.13	0.29
Mainstem	5753	7294.20	25.00	41.56	37.15	41.79	0.000490	5.91	4457.79	978.90	0.26
Mainstem	5553	4679.10	24.72	38.93	32.79	38.96	0.000090	2.29	5782.37	750.54	0.11
Mainstem	5553	7294.20	24.72	41.67	33.47	41.70	0.000084	2.50	8519.09	1379.80	0.11
Mainstem	5330	4679.10	23.16	38.92	31.08	38.94	0.000067	2.07	6130.99	828.86	0.09
Mainstem	5330	7294.20	23.16	41.66	32.45	41.68	0.000066	2.30	9290.01	1417.01	0.10

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	5107	4679.10	22.72	38.72	32.04	38.89	0.000296	4.50	3124.47	768.09	0.20
Mainstem	5107	7294.20	22.72	41.49	33.99	41.64	0.000257	4.68	5433.63	1396.60	0.19
Mainstem	4848	4679.10	23.30	38.17	30.63	38.74	0.000653	6.41	1047.95	332.64	0.30
Mainstem	4848	7294.20	23.30	40.61	32.97	41.46	0.000838	8.05	1573.69	585.31	0.35
Mainstem	4791	4679.10	22.67	37.58	31.06	38.57	0.001370	8.39	657.49	74.76	0.39
Mainstem	4791	7294.20	22.67	39.13	33.65	41.05	0.002383	11.84	906.17	215.64	0.52
Mainstem	4740.5	Bridge									
Mainstem	4689	4679.10	21.60	31.47	29.71	32.81	0.003545	10.18	586.24	181.52	0.58
Mainstem	4689	7294.20	21.60	37.35	31.56	37.69	0.000659	6.05	1955.51	246.81	0.27
Mainstem	4618	4679.10	20.83	31.59		32.33	0.001966	7.72	847.17	180.75	0.43
Mainstem	4618	7294.20	20.83	37.33		37.63	0.000521	5.40	1935.60	199.55	0.24
Mainstem	4350	4679.10	18.99	31.38		31.75	0.001100	6.65	1271.14	187.33	0.33
Mainstem	4350	7294.20	18.99	37.25		37.46	0.000410	5.28	2470.61	235.99	0.22
Mainstem	4114	4679.10	16.83	31.38		31.56	0.000456	4.53	1641.92	220.64	0.22
Mainstem	4114	7294.20	16.83	37.27		37.38	0.000183	3.66	3111.01	340.59	0.15
Mainstem	4071	4813.50	16.64	29.54	27.21	31.09	0.005913	10.54	545.62	81.88	0.56
Mainstem	4071	7501.30	16.64	36.38	29.67	37.16	0.001782	8.02	1222.88	133.42	0.34
Mainstem	3967.5	Culvert									
Mainstem	3864	4813.50	12.83	24.04	22.93	26.83	0.011173	13.77	401.59	54.95	0.78
Mainstem	3864	7501.30	12.83	26.38	26.38	30.24	0.012049	16.54	585.18	126.76	0.84
Mainstem	3752	4813.50	13.05	22.95		25.45	0.010878	13.84	460.04	66.34	0.79
Mainstem	3752	7501.30	13.05	25.08	24.23	28.75	0.012563	17.02	610.53	76.08	0.88
Mainstem	3536	4813.50	11.96	22.16		23.42	0.004308	10.11	718.82	112.60	0.57
Mainstem	3536	7501.30	11.96	24.61		26.22	0.004314	11.74	1008.51	123.84	0.59
Mainstem	3386	4813.50	11.16	21.80		22.79	0.003241	9.02	834.97	132.93	0.50
Mainstem	3386	7501.30	11.16	24.35		25.56	0.003150	10.32	1184.32	141.16	0.51
Mainstem	3183	4813.50	10.65	21.50	18.63	22.23	0.001812	7.79	958.60	181.26	0.42
Mainstem	3183	7501.30	10.65	24.70	20.28	25.00	0.000779	6.09	3220.52	713.73	0.29
Mainstem	2954	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.76	855.25	0.18
Mainstem	2752	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.78	973.69	0.05
Mainstem	2495	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.93	891.20	0.06
Mainstem	2232	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	7581.10	8.17	24.61		24.77	0.000175	4.16	3717.32	423.41	0.18
Mainstem	1978	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	7581.10	6.57	23.63		24.61	0.000806	8.83	1620.11	279.50	0.39
Mainstem	1724	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	7581.10	6.66	23.72		24.32	0.000568	7.46	2048.06	317.27	0.33
Mainstem	1544	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.66	354.04	0.24
Mainstem	1335	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.80	522.32	0.27

HEC-RAS Plan: PR1-floodbench River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	1260	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2106.13	532.07	0.24
Mainstem	1066.5	Mult Open									
Mainstem	872	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	811	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.92	372.84	0.24
Mainstem	631	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	434	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	334	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	250.5	Bridge									
Mainstem	208	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	108	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	0	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	7581.10	-2.11	7.01	5.63	8.51	0.004601	9.89	794.74	162.10	0.69

APPENDIX L2: ALTERNATIVE 2 HEC-RAS RESULTS

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5	Bridge									
Mainstem	24442	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5	Bridge									
Mainstem	23022	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22556.5	Bridge									
Mainstem	22534	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	21964	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21655	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5	Bridge									
Mainstem	21617	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	19972	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19666	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19414	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19164	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	18991	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18922	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18874.5	Bridge									
Mainstem	18826	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18523	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	17499	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16072	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15610	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15527	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15490.5	Bridge									
Mainstem	15454	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15361	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15105	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	14870	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14599	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14501	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14462.5	Bridge									
Mainstem	14423	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14341	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14187	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	13988	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13825	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13767	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13752.5	Inl Struct									
Mainstem	13742	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	11770	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	7035.70	39.42	46.24	44.19	46.27	0.000074	1.23	4985.20	829.21	0.09
Mainstem	10928	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	7035.70	35.47	46.17		46.24	0.000233	2.65	4825.92	1037.98	0.16
Mainstem	10846	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	7035.70	35.49	46.02		46.17	0.001140	6.05	3863.37	1180.62	0.35
Mainstem	10499	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	7035.70	36.19	45.48		45.78	0.001851	7.50	2627.21	773.34	0.46
Mainstem	10364	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	7073.90	35.16	45.09		45.55	0.002594	9.15	2320.27	722.69	0.54
Mainstem	10120	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	7073.90	33.73	44.75		45.01	0.001493	6.77	3153.15	1071.25	0.38
Mainstem	9864	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	7073.90	32.30	44.55		44.72	0.000902	5.68	3472.27	857.34	0.30
Mainstem	9606	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	7073.90	31.73	44.41		44.52	0.000575	4.68	4289.33	929.93	0.24
Mainstem	9350	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	7073.90	31.17	44.39		44.43	0.000160	2.95	6996.40	1182.54	0.14

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	9095	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	7073.90	28.97	43.73		44.26	0.001991	8.42	2832.95	964.88	0.40
Mainstem	8837	4565.60	30.03	40.60	37.67	40.81	0.000904	5.71	2673.02	750.65	0.32
Mainstem	8837	7073.90	30.03	43.88	39.01	43.97	0.000376	4.48	6060.38	1269.54	0.22
Mainstem	8593	4565.60	27.59	40.63	40.13	40.68	0.000232	3.28	3339.28	818.67	0.17
Mainstem	8593	7073.90	27.59	43.89	40.13	43.91	0.000104	2.57	6863.38	1410.58	0.12
Mainstem	8351	4565.60	29.43	39.22		40.44	0.002347	9.72	736.52	171.11	0.56
Mainstem	8351	7073.90	29.43	43.22		43.80	0.000956	7.85	2712.19	1253.71	0.38
Mainstem	8130	4565.60	28.78	39.80		40.00	0.000341	3.84	1489.01	192.64	0.21
Mainstem	8130	7073.90	28.78	43.37		43.59	0.000262	4.13	3309.72	941.99	0.20
Mainstem	7925	4565.60	28.66	39.62		39.91	0.000471	4.48	1218.12	198.25	0.25
Mainstem	7925	7073.90	28.66	43.22		43.53	0.000343	4.70	2134.92	276.08	0.23
Mainstem	7717	4565.60	28.54	39.70		39.80	0.000157	2.62	2005.75	274.97	0.15
Mainstem	7717	7073.90	28.54	43.32		43.43	0.000119	2.80	3451.24	575.59	0.13
Mainstem	7512	4565.60	28.62	39.72	31.83	39.76	0.000060	1.61	3075.94	476.88	0.09
Mainstem	7512	7073.90	28.62	43.36	32.53	43.39	0.000038	1.58	7140.91	1190.83	0.08
Mainstem	7307	4565.60	28.49	39.71	31.69	39.75	0.000087	1.46	3300.26	400.94	0.08
Mainstem	7307	7073.90	28.49	43.35	32.37	43.38	0.000055	1.43	7301.24	1116.01	0.07
Mainstem	7095	4565.60	28.37	39.68	31.50	39.73	0.000101	1.83	2731.62	348.96	0.10
Mainstem	7095	7073.90	28.37	43.32	32.28	43.37	0.000073	1.90	5250.78	836.26	0.09
Mainstem	6923	4565.60	27.27	39.51	32.61	39.68	0.000362	3.60	1635.30	245.48	0.19
Mainstem	6923	7073.90	27.27	43.16	33.84	43.33	0.000274	3.78	2723.28	333.52	0.17
Mainstem	6907	4565.60	29.15	39.32	34.94	39.66	0.001721	5.22	1099.17	196.92	0.31
Mainstem	6907	7073.90	29.15	43.03	36.15	43.31	0.001002	5.03	1969.60	286.69	0.25
Mainstem	6850	4679.10	27.98	39.05	33.83	39.55	0.001731	5.86	917.42	134.53	0.32
Mainstem	6850	7294.20	27.98	42.78	35.53	43.24	0.001193	5.97	1709.87	299.25	0.28
Mainstem	6777	4679.10	26.59	39.04	32.63	39.42	0.000579	5.31	1011.83	116.67	0.27
Mainstem	6777	7294.20	26.59	42.73	34.48	43.17	0.000473	5.76	1459.46	125.64	0.26
Mainstem	6719.5	Bridge									
Mainstem	6661	4679.10	26.31	38.24	32.29	38.63	0.000608	5.42	1000.27	112.60	0.28
Mainstem	6661	7294.20	26.31	41.99	33.93	42.43	0.000510	5.97	1450.15	127.54	0.27
Mainstem	6584	4679.10	26.10	37.79	32.84	38.47	0.001156	7.28	1002.90	186.51	0.38
Mainstem	6584	7294.20	26.10	41.73	34.80	42.34	0.000791	7.35	1883.53	238.76	0.33
Mainstem	6348	4679.10	26.00	37.19	32.94	38.10	0.001529	7.99	797.67	228.33	0.43
Mainstem	6348	7294.20	26.00	41.56	35.35	42.15	0.000773	7.13	2372.53	680.42	0.32
Mainstem	6145	4679.10	25.53	37.72	32.72	37.76	0.000170	2.79	5293.23	885.75	0.14
Mainstem	6145	7294.20	25.53	41.91	34.67	41.94	0.000087	2.45	9513.51	1182.40	0.11
Mainstem	5950	4679.10	25.27	37.66	34.03	37.72	0.000234	3.37	4739.10	832.38	0.17
Mainstem	5950	7294.20	25.27	41.89	35.18	41.92	0.000109	2.82	8649.74	1122.92	0.12
Mainstem	5753	4679.10	25.00	36.47	35.00	37.52	0.002232	9.75	1142.09	448.46	0.52
Mainstem	5753	7294.20	25.00	41.65	37.15	41.86	0.000471	5.81	4541.17	981.39	0.26
Mainstem	5553	4679.10	24.72	37.08	32.79	37.13	0.000197	3.08	4427.30	718.11	0.16
Mainstem	5553	7294.20	24.72	41.75	33.47	41.77	0.000082	2.48	8629.53	1385.39	0.11
Mainstem	5330	4679.10	23.16	37.06	31.08	37.09	0.000140	2.73	4684.41	745.03	0.13
Mainstem	5330	7294.20	23.16	41.74	32.45	41.76	0.000065	2.27	9404.10	1430.97	0.10

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	5107	4679.10	22.72	36.56	32.04	36.99	0.000738	6.41	1788.12	524.53	0.31
Mainstem	5107	7294.20	22.72	41.57	33.99	41.72	0.000250	4.62	5511.90	1412.62	0.19
Mainstem	4848	4679.10	23.30	35.78	30.63	36.69	0.001280	7.96	727.43	145.16	0.40
Mainstem	4848	7294.20	23.30	40.72	32.97	41.54	0.000813	7.96	1608.73	592.67	0.34
Mainstem	4791	4679.10	22.67	34.63	31.06	36.34	0.003124	10.91	488.89	52.19	0.56
Mainstem	4791	7294.20	22.67	39.47	33.65	41.20	0.002122	11.33	980.46	253.99	0.49
Mainstem	4740.5	Bridge									
Mainstem	4689	4679.10	21.60	27.61	29.71	33.27	0.026700	19.77	266.68	57.58	1.46
Mainstem	4689	7294.20	21.60	28.99	31.56	37.26	0.030008	24.23	366.27	95.94	1.61
Mainstem	4618	4679.10	20.83	29.68	28.57	31.15	0.004862	10.50	561.22	116.38	0.66
Mainstem	4618	7294.20	20.83	33.14	29.93	34.12	0.002298	9.20	1134.58	188.38	0.48
Mainstem	4350	4679.10	18.99	28.27		29.75	0.005495	12.24	700.28	179.54	0.71
Mainstem	4350	7294.20	18.99	32.85		33.41	0.001521	8.43	1547.79	191.48	0.40
Mainstem	4114	4679.10	16.83	28.18		28.84	0.002163	8.21	946.84	212.43	0.46
Mainstem	4114	7294.20	16.83	32.86		33.15	0.000645	5.78	1969.67	223.71	0.27
Mainstem	4071	4813.50	16.64	27.13	24.15	28.44	0.006727	10.16	548.42	67.63	0.60
Mainstem	4071	7501.30	16.64	31.34	26.25	32.73	0.004620	10.88	884.43	91.85	0.53
Mainstem	3967.5	Culvert									
Mainstem	3864	4813.50	12.83	26.10	21.74	26.70	0.002348	7.19	890.25	182.66	0.37
Mainstem	3864	7501.30	12.83	29.43	23.41	30.11	0.001966	7.78	1296.93	365.24	0.35
Mainstem	3752	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	7501.30	13.05	27.79		29.48	0.004920	12.25	1050.87	253.86	0.57
Mainstem	3536	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	7501.30	11.96	23.93		27.54	0.008492	15.85	585.58	69.87	0.82
Mainstem	3386	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	7501.30	11.16	23.53		26.17	0.006190	13.84	697.34	74.77	0.71
Mainstem	3183	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	7501.30	10.65	24.59	20.00	25.07	0.001125	7.27	2821.63	710.16	0.35
Mainstem	2954	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	7501.30	7.19	24.73		24.84	0.000304	4.31	5038.00	855.26	0.18
Mainstem	2752	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8191.05	973.70	0.05
Mainstem	2495	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8609.18	891.20	0.06
Mainstem	2232	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	7581.10	8.17	24.61		24.77	0.000175	4.16	3717.44	423.41	0.18
Mainstem	1978	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	7581.10	6.57	23.63		24.61	0.000805	8.83	1620.22	279.51	0.39
Mainstem	1724	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	7581.10	6.66	23.72		24.32	0.000568	7.46	2048.18	317.29	0.33
Mainstem	1544	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.80	354.04	0.24
Mainstem	1335	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	7581.10	6.88	23.66		23.93	0.000942	6.05	2526.03	522.32	0.27

HEC-RAS Plan: PR-RROverflow River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	1260	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2106.25	532.08	0.24
Mainstem	1066.5	Mult Open									
Mainstem	872	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	7581.10	0.90	17.26	11.14	17.58	0.000977	5.83	2002.46	473.81	0.26
Mainstem	811	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.76	372.84	0.24
Mainstem	631	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	7581.10	0.85	16.98	10.87	17.31	0.000499	6.12	2575.53	287.65	0.27
Mainstem	434	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.09	263.83	0.28
Mainstem	334	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	7581.10	-0.54	15.81	8.96	16.92	0.001448	8.79	1172.95	289.44	0.39
Mainstem	250.5	Bridge									
Mainstem	208	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	7581.10	-1.48	7.57	6.72	10.18	0.006600	13.09	593.01	79.51	0.83
Mainstem	108	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	7581.10	-0.93	7.45		9.13	0.005185	10.39	729.90	109.40	0.71
Mainstem	0	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69

APPENDIX L3: ALTERNATIVE 3 HEC-RAS RESULTS

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	PR-CHNL-West	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24704	PR-West CHNL+BR	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24704	PR - West Bridge	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	PR-CHNL-West	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24515	PR-West CHNL+BR	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24515	PR - West Bridge	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	PR-CHNL-West	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24486	PR-West CHNL+BR	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24486	PR - West Bridge	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5		Bridge									
Mainstem	24442	PR-CHNL-West	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24442	PR-West CHNL+BR	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24442	PR - West Bridge	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	PR-CHNL-West	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24395	PR-West CHNL+BR	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24395	PR - West Bridge	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	PR-CHNL-West	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	24348	PR-West CHNL+BR	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	24348	PR - West Bridge	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	PR-CHNL-West	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23965	PR-West CHNL+BR	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23965	PR - West Bridge	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	PR-CHNL-West	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23691	PR-West CHNL+BR	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23691	PR - West Bridge	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	PR-CHNL-West	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23390	PR-West CHNL+BR	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23390	PR - West Bridge	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	PR-CHNL-West	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23104	PR-West CHNL+BR	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23104	PR - West Bridge	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	PR-CHNL-West	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23055	PR-West CHNL+BR	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23055	PR - West Bridge	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5		Bridge									
Mainstem	23022	PR-CHNL-West	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	23022	PR-West CHNL+BR	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	23022	PR - West Bridge	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	PR-CHNL-West	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22976	PR-West CHNL+BR	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22976	PR - West Bridge	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	PR-CHNL-West	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22614	PR-West CHNL+BR	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22614	PR - West Bridge	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	PR-CHNL-West	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22578	PR-West CHNL+BR	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22578	PR - West Bridge	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22556.5		Bridge									
Mainstem	22534	PR-CHNL-West	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22534	PR-West CHNL+BR	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22534	PR - West Bridge	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	PR-CHNL-West	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22497	PR-West CHNL+BR	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22497	PR - West Bridge	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	PR-CHNL-West	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	22292	PR-West CHNL+BR	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	22292	PR - West Bridge	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21964	PR-CHNL-West	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21964	PR-West CHNL+BR	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21964	PR - West Bridge	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	PR-CHNL-West	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21708	PR-West CHNL+BR	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21708	PR - West Bridge	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	PR-CHNL-West	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21655	PR-West CHNL+BR	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21655	PR - West Bridge	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5		Bridge									
Mainstem	21617	PR-CHNL-West	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21617	PR-West CHNL+BR	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21617	PR - West Bridge	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	PR-CHNL-West	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21433	PR-West CHNL+BR	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21433	PR - West Bridge	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	PR-CHNL-West	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	21277	PR-West CHNL+BR	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	21277	PR - West Bridge	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	PR-CHNL-West	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20884	PR-West CHNL+BR	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20884	PR - West Bridge	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	PR-CHNL-West	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20728	PR-West CHNL+BR	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20728	PR - West Bridge	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	PR-CHNL-West	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20520	PR-West CHNL+BR	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20520	PR - West Bridge	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	PR-CHNL-West	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	20220	PR-West CHNL+BR	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	20220	PR - West Bridge	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	19972	PR-CHNL-West	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19972	PR-West CHNL+BR	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19972	PR - West Bridge	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19666	PR-CHNL-West	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19666	PR-West CHNL+BR	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19666	PR - West Bridge	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19414	PR-CHNL-West	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19414	PR-West CHNL+BR	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19414	PR - West Bridge	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19164	PR-CHNL-West	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	19164	PR-West CHNL+BR	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	19164	PR - West Bridge	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	18991	PR-CHNL-West	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18991	PR-West CHNL+BR	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18991	PR - West Bridge	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18922	PR-CHNL-West	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18922	PR-West CHNL+BR	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18922	PR - West Bridge	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18874.5		Bridge									
Mainstem	18826	PR-CHNL-West	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18826	PR-West CHNL+BR	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18826	PR - West Bridge	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	PR-CHNL-West	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18753	PR-West CHNL+BR	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18753	PR - West Bridge	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	18523	PR-CHNL-West	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18523	PR-West CHNL+BR	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18523	PR - West Bridge	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	PR-CHNL-West	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18298	PR-West CHNL+BR	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18298	PR - West Bridge	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	PR-CHNL-West	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	18102	PR-West CHNL+BR	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	18102	PR - West Bridge	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	PR-CHNL-West	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17851	PR-West CHNL+BR	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17851	PR - West Bridge	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	PR-CHNL-West	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17701	PR-West CHNL+BR	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17701	PR - West Bridge	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	PR-CHNL-West	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17499	PR-West CHNL+BR	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17499	PR - West Bridge	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	PR-CHNL-West	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17410	PR-West CHNL+BR	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17410	PR - West Bridge	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	PR-CHNL-West	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	17133	PR-West CHNL+BR	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	17133	PR - West Bridge	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	PR-CHNL-West	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16900	PR-West CHNL+BR	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16900	PR - West Bridge	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	PR-CHNL-West	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16568	PR-West CHNL+BR	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16568	PR - West Bridge	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	PR-CHNL-West	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16345	PR-West CHNL+BR	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16345	PR - West Bridge	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16072	PR-CHNL-West	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	16072	PR-West CHNL+BR	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	16072	PR - West Bridge	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	PR-CHNL-West	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15834	PR-West CHNL+BR	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15834	PR - West Bridge	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	PR-CHNL-West	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15688	PR-West CHNL+BR	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15688	PR - West Bridge	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15610	PR-CHNL-West	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15610	PR-West CHNL+BR	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15610	PR - West Bridge	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15527	PR-CHNL-West	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15527	PR-West CHNL+BR	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15527	PR - West Bridge	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15490.5		Bridge									
Mainstem	15454	PR-CHNL-West	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15454	PR-West CHNL+BR	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15454	PR - West Bridge	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15361	PR-CHNL-West	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15361	PR-West CHNL+BR	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15361	PR - West Bridge	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15105	PR-CHNL-West	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	15105	PR-West CHNL+BR	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	15105	PR - West Bridge	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	14870	PR-CHNL-West	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14870	PR-West CHNL+BR	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14870	PR - West Bridge	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14599	PR-CHNL-West	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14599	PR-West CHNL+BR	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14599	PR - West Bridge	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14501	PR-CHNL-West	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14501	PR-West CHNL+BR	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14501	PR - West Bridge	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14462.5		Bridge									
Mainstem	14423	PR-CHNL-West	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14423	PR-West CHNL+BR	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14423	PR - West Bridge	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14341	PR-CHNL-West	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14341	PR-West CHNL+BR	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14341	PR - West Bridge	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14187	PR-CHNL-West	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	14187	PR-West CHNL+BR	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	14187	PR - West Bridge	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	13988	PR-CHNL-West	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13988	PR-West CHNL+BR	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13988	PR - West Bridge	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	PR-CHNL-West	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13825	PR-West CHNL+BR	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13825	PR - West Bridge	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13767	PR-CHNL-West	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13767	PR-West CHNL+BR	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13767	PR - West Bridge	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13752.5		Inl Struct									
Mainstem	13742	PR-CHNL-West	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13742	PR-West CHNL+BR	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13742	PR - West Bridge	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	PR-CHNL-West	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13634	PR-West CHNL+BR	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13634	PR - West Bridge	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	PR-CHNL-West	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13435	PR-West CHNL+BR	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13435	PR - West Bridge	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	PR-CHNL-West	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	13129	PR-West CHNL+BR	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	13129	PR - West Bridge	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	PR-CHNL-West	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12709	PR-West CHNL+BR	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12709	PR - West Bridge	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	PR-CHNL-West	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12530	PR-West CHNL+BR	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12530	PR - West Bridge	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	PR-CHNL-West	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12337	PR-West CHNL+BR	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12337	PR - West Bridge	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	PR-CHNL-West	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12195	PR-West CHNL+BR	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12195	PR - West Bridge	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	PR-CHNL-West	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	12023	PR-West CHNL+BR	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	12023	PR - West Bridge	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	11770	PR-CHNL-West	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11770	PR-West CHNL+BR	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11770	PR - West Bridge	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	PR-CHNL-West	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11508	PR-West CHNL+BR	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11508	PR - West Bridge	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	PR-CHNL-West	7035.70	39.42	46.22	44.19	46.26	0.000074	1.23	4974.31	828.83	0.09
Mainstem	11371	PR-West CHNL+BR	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4946.54	827.60	0.09
Mainstem	11371	PR - West Bridge	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4949.35	827.81	0.09
Mainstem	10928	PR-CHNL-West	7035.70	35.47	46.16		46.23	0.000230	2.62	4814.28	1036.86	0.16
Mainstem	10928	PR-West CHNL+BR	7035.70	35.47	46.12		46.19	0.000234	2.64	4778.32	1032.74	0.16
Mainstem	10928	PR - West Bridge	7035.70	35.47	46.12		46.20	0.000233	2.64	4781.95	1033.16	0.16
Mainstem	10846	PR-CHNL-West	7035.70	35.49	46.01		46.16	0.001153	6.08	3846.44	1178.71	0.36
Mainstem	10846	PR-West CHNL+BR	7035.70	35.49	45.98		46.13	0.001099	5.92	3817.80	1170.89	0.35
Mainstem	10846	PR - West Bridge	7035.70	35.49	45.99		46.13	0.001096	5.91	3822.54	1172.62	0.35
Mainstem	10499	PR-CHNL-West	7035.70	36.19	45.45		45.76	0.001891	7.57	2607.56	772.88	0.46
Mainstem	10499	PR-West CHNL+BR	7035.70	36.19	45.42		45.73	0.001949	7.66	2579.25	772.23	0.47
Mainstem	10499	PR - West Bridge	7035.70	36.19	45.43		45.74	0.001937	7.64	2584.95	772.36	0.47
Mainstem	10364	PR-CHNL-West	7073.90	35.16	45.05		45.53	0.002691	9.29	2288.32	721.98	0.55
Mainstem	10364	PR-West CHNL+BR	7073.90	35.16	44.98		45.49	0.002849	9.51	2239.29	720.91	0.56
Mainstem	10364	PR - West Bridge	7073.90	35.16	44.99		45.49	0.002815	9.47	2249.48	721.13	0.56
Mainstem	10120	PR-CHNL-West	7073.90	33.73	44.69		44.96	0.001571	6.91	3084.68	1070.08	0.38
Mainstem	10120	PR-West CHNL+BR	7073.90	33.73	44.58		44.88	0.001706	7.15	2974.82	1068.20	0.40
Mainstem	10120	PR - West Bridge	7073.90	33.73	44.61		44.90	0.001676	7.10	2998.22	1068.60	0.40
Mainstem	9864	PR-CHNL-West	7073.90	32.30	44.48		44.65	0.000946	5.80	3409.57	856.89	0.30
Mainstem	9864	PR-West CHNL+BR	7073.90	32.30	44.36		44.55	0.001024	5.99	3307.68	856.16	0.32
Mainstem	9864	PR - West Bridge	7073.90	32.30	44.38		44.57	0.001006	5.95	3329.52	856.32	0.31
Mainstem	9606	PR-CHNL-West	7073.90	31.73	44.33		44.44	0.000603	4.77	4214.66	929.51	0.25
Mainstem	9606	PR-West CHNL+BR	7073.90	31.73	44.20		44.32	0.000654	4.93	4092.27	928.84	0.25
Mainstem	9606	PR - West Bridge	7073.90	31.73	44.22		44.35	0.000642	4.90	4118.63	928.99	0.25
Mainstem	9350	PR-CHNL-West	7073.90	31.17	44.31		44.35	0.000166	3.00	6901.30	1181.94	0.15
Mainstem	9350	PR-West CHNL+BR	7073.90	31.17	44.18		44.22	0.000178	3.07	6745.53	1180.88	0.15
Mainstem	9350	PR - West Bridge	7073.90	31.17	44.21		44.25	0.000175	3.06	6779.07	1181.11	0.15
Mainstem	9095	PR-CHNL-West	7073.90	28.97	43.57		44.17	0.002212	8.81	2680.41	947.37	0.42
Mainstem	9095	PR-West CHNL+BR	7073.90	28.97	43.23		44.01	0.002779	9.71	2366.07	913.72	0.47
Mainstem	9095	PR - West Bridge	7073.90	28.97	43.32		44.04	0.002619	9.47	2445.91	922.39	0.46
Mainstem	8837	PR-CHNL-West	7073.90	30.03	43.75	39.01	43.85	0.000392	4.54	5904.15	1226.49	0.22
Mainstem	8837	PR-West CHNL+BR	7073.90	30.03	43.50	39.01	43.61	0.000443	4.76	5600.38	1185.01	0.24
Mainstem	8837	PR - West Bridge	7073.90	30.03	43.56	39.01	43.67	0.000429	4.70	5674.39	1194.15	0.23
Mainstem	8593	PR-CHNL-West	7073.90	27.59	43.76	40.13	43.79	0.000109	2.63	6687.83	1386.62	0.12
Mainstem	8593	PR-West CHNL+BR	7073.90	27.59	43.51	40.13	43.54	0.000122	2.75	6346.29	1336.77	0.13
Mainstem	8593	PR - West Bridge	7073.90	27.59	43.57	40.13	43.60	0.000119	2.72	6429.22	1349.25	0.12
Mainstem	8351	PR-CHNL-West	7073.90	29.43	43.00		43.67	0.001079	8.25	2442.61	1215.15	0.40
Mainstem	8351	PR-West CHNL+BR	7073.90	29.43	42.51		43.39	0.001396	9.15	1881.02	1073.38	0.45
Mainstem	8351	PR - West Bridge	7073.90	29.43	42.64		43.46	0.001308	8.91	2020.59	1117.78	0.44
Mainstem	8130	PR-CHNL-West	7073.90	28.78	43.20		43.43	0.000271	4.17	3149.92	925.91	0.20
Mainstem	8130	PR-West CHNL+BR	7073.90	28.78	42.82		43.07	0.000311	4.38	2808.60	868.57	0.21
Mainstem	8130	PR - West Bridge	7073.90	28.78	42.92		43.16	0.000300	4.32	2894.07	880.51	0.21
Mainstem	7925	PR-CHNL-West	7073.90	28.66	43.04		43.35	0.000362	4.79	2084.62	273.24	0.23
Mainstem	7925	PR-West CHNL+BR	7073.90	28.66	42.65		42.99	0.000407	4.98	1978.76	269.08	0.24
Mainstem	7925	PR - West Bridge	7073.90	28.66	42.75		43.09	0.000395	4.93	2005.72	270.10	0.24
Mainstem	7717	PR-CHNL-West	7073.90	28.54	43.14		43.25	0.000125	2.85	3347.97	572.02	0.14
Mainstem	7717	PR-West CHNL+BR	7073.90	28.54	42.76		42.88	0.000141	2.96	3130.98	543.07	0.14
Mainstem	7717	PR - West Bridge	7073.90	28.54	42.85		42.98	0.000137	2.93	3185.88	566.38	0.14
Mainstem	7512	PR-CHNL-West	7073.90	28.62	43.17	32.53	43.22	0.000047	1.74	5244.51	873.02	0.08
Mainstem	7512	PR-West CHNL+BR	7073.90	28.62	42.79	32.53	42.84	0.000053	1.81	4931.00	768.80	0.09
Mainstem	7512	PR - West Bridge	7073.90	28.62	42.89	32.53	42.94	0.000051	1.79	5007.00	798.09	0.09
Mainstem	7307	PR-CHNL-West	7073.90	28.49	43.17	32.37	43.20	0.000059	1.46	7099.09	1114.01	0.07

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	7307	PR-West CHNL+BR	7073.90	28.49	42.79	32.37	42.82	0.000066	1.52	6676.43	1102.30	0.07
Mainstem	7307	PR - West Bridge	7073.90	28.49	42.89	32.37	42.92	0.000064	1.51	6784.07	1107.21	0.07
Mainstem	7095	PR-CHNL-West	7073.90	28.37	43.13	32.28	43.18	0.000077	1.94	5098.10	829.37	0.09
Mainstem	7095	PR-West CHNL+BR	7073.90	28.37	42.75	32.28	42.80	0.000087	2.02	4787.89	792.10	0.10
Mainstem	7095	PR - West Bridge	7073.90	28.37	42.85	32.28	42.90	0.000085	2.00	4866.30	797.41	0.10
Mainstem	6923	PR-CHNL-West	7073.90	27.27	42.97	33.84	43.15	0.000289	3.85	2660.68	327.54	0.18
Mainstem	6923	PR-West CHNL+BR	7073.90	27.27	42.56	33.84	42.76	0.000328	4.03	2528.97	324.58	0.19
Mainstem	6923	PR - West Bridge	7073.90	27.27	42.67	33.84	42.86	0.000317	3.98	2562.68	325.34	0.19
Mainstem	6907	PR-CHNL-West	7073.90	29.15	42.83	36.15	43.13	0.001069	5.14	1913.49	279.25	0.26
Mainstem	6907	PR-West CHNL+BR	7073.90	29.15	42.41	36.15	42.74	0.001221	5.37	1800.14	262.90	0.27
Mainstem	6907	PR - West Bridge	7073.90	29.15	42.52	36.15	42.84	0.001180	5.31	1828.57	267.09	0.27
Mainstem	6850	PR-CHNL-West	7294.20	27.98	42.52	35.53	43.04	0.001345	6.26	1462.54	188.69	0.30
Mainstem	6850	PR-West CHNL+BR	7294.20	27.98	42.05	35.53	42.64	0.001560	6.59	1375.60	185.82	0.32
Mainstem	6850	PR - West Bridge	7294.20	27.98	42.17	35.53	42.74	0.001501	6.50	1398.00	186.56	0.31
Mainstem	6777	PR-CHNL-West	7294.20	26.59	42.49	34.48	42.95	0.000504	5.88	1429.25	125.09	0.26
Mainstem	6777	PR-West CHNL+BR	7294.20	26.59	42.03	34.48	42.53	0.000570	6.13	1371.88	124.05	0.28
Mainstem	6777	PR - West Bridge	7294.20	26.59	42.15	34.48	42.64	0.000552	6.06	1386.69	124.32	0.28
Mainstem	6719.5		Bridge									
Mainstem	6661	PR-CHNL-West	7294.20	26.31	41.63	33.93	42.10	0.000559	6.15	1404.61	126.21	0.28
Mainstem	6661	PR-West CHNL+BR	7294.20	26.31	41.19	33.93	41.70	0.000627	6.38	1349.53	124.57	0.29
Mainstem	6661	PR - West Bridge	7294.20	26.31	41.30	33.93	41.81	0.000608	6.32	1363.98	125.01	0.29
Mainstem	6584	PR-CHNL-West	7294.20	26.10	41.33	34.80	41.99	0.000885	7.63	1788.87	235.54	0.35
Mainstem	6584	PR-West CHNL+BR	7294.20	26.10	40.83	34.80	41.57	0.001025	8.03	1671.73	232.08	0.37
Mainstem	6584	PR - West Bridge	7294.20	26.10	40.96	34.80	41.68	0.000984	7.92	1702.96	232.80	0.37
Mainstem	6348	PR-CHNL-West	7294.20	26.00	41.12	35.35	41.79	0.000902	7.55	2147.66	577.54	0.35
Mainstem	6348	PR-West CHNL+BR	7294.20	26.00	40.48	35.35	41.30	0.001136	8.22	1866.71	530.42	0.39
Mainstem	6348	PR - West Bridge	7294.20	26.00	40.66	35.35	41.43	0.001065	8.03	1943.29	539.35	0.37
Mainstem	6145	PR-CHNL-West	7294.20	25.53	41.52	34.67	41.55	0.000098	2.56	9059.59	1140.66	0.12
Mainstem	6145	PR-West CHNL+BR	7294.20	25.53	40.98	34.67	41.01	0.000117	2.74	8455.31	1033.65	0.12
Mainstem	6145	PR - West Bridge	7294.20	25.53	41.12	34.67	41.16	0.000112	2.69	8612.53	1102.60	0.12
Mainstem	5950	PR-CHNL-West	7294.20	25.27	41.50	34.80	41.53	0.000120	2.49	8281.81	1082.84	0.11
Mainstem	5950	PR-West CHNL+BR	7294.20	25.27	40.95	34.80	40.99	0.000145	2.66	7702.81	973.65	0.12
Mainstem	5950	PR - West Bridge	7294.20	25.27	41.09	35.18	41.13	0.000142	3.12	7787.37	1043.92	0.14
Mainstem	5753	PR-CHNL-West	7294.20	25.00	41.32	34.83	41.48	0.000441	4.36	4340.17	951.57	0.20
Mainstem	5753	PR-West CHNL+BR	7294.20	25.00	40.72	34.83	40.92	0.000544	4.72	3823.84	799.46	0.22
Mainstem	5753	PR - West Bridge	7294.20	25.00	40.77	37.15	41.06	0.000630	6.48	3741.53	806.98	0.29
Mainstem	5553	PR-CHNL-West	7294.20	24.72	41.38	33.32	41.41	0.000088	2.56	8206.04	1326.36	0.11
Mainstem	5553	PR-West CHNL+BR	7294.20	24.72	40.80	33.32	40.83	0.000107	2.75	7507.71	1098.34	0.12
Mainstem	5553	PR - West Bridge	7294.20	24.72	40.91	33.47	40.94	0.000108	2.75	7542.86	1120.97	0.12
Mainstem	5330	PR-CHNL-West	7294.20	23.16	41.37	30.94	41.39	0.000058	1.90	9076.50	1368.67	0.08
Mainstem	5330	PR-West CHNL+BR	7294.20	23.16	40.79	30.94	40.82	0.000069	2.04	8306.67	1285.17	0.09
Mainstem	5330	PR - West Bridge	7294.20	23.16	40.90	32.45	40.92	0.000085	2.53	8252.51	1302.05	0.11
Mainstem	5107	PR-CHNL-West	7294.20	22.72	41.19	33.03	41.35	0.000270	4.76	5258.55	1332.89	0.20
Mainstem	5107	PR-West CHNL+BR	7294.20	22.72	40.57	33.03	40.77	0.000337	5.19	4704.52	1188.46	0.22
Mainstem	5107	PR - West Bridge	7294.20	22.72	40.66	33.99	40.86	0.000347	5.27	4691.94	1206.66	0.22
Mainstem	4848	PR-CHNL-West	7294.20	23.30	40.30	32.68	41.16	0.000879	8.15	1551.59	567.71	0.35
Mainstem	4848	PR-West CHNL+BR	7294.20	23.30	39.68	32.68	40.56	0.000956	8.28	1378.48	433.41	0.36
Mainstem	4848	PR - West Bridge	7294.20	23.30	39.61	32.97	40.63	0.001073	8.75	1286.51	433.97	0.39
Mainstem	4791	PR-CHNL-West	7294.20	22.67	40.38	31.93	40.97	0.000862	7.54	1576.33	332.61	0.32
Mainstem	4791	PR-West CHNL+BR	7294.20	22.67	39.65	31.87	40.46	0.001114	8.33	1270.16	284.78	0.36
Mainstem	4791	PR - West Bridge	7294.20	22.67	39.65	31.87	40.46	0.001114	8.33	1270.16	284.78	0.36
Mainstem	4740.5		Bridge									
Mainstem	4689	PR-CHNL-West	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4689	PR-West CHNL+BR	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4689	PR - West Bridge	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4618	PR-CHNL-West	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4618	PR-West CHNL+BR	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	4618	PR - West Bridge	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4350	PR-CHNL-West	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4350	PR-West CHNL+BR	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4350	PR - West Bridge	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4114	PR-CHNL-West	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4114	PR-West CHNL+BR	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4114	PR - West Bridge	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4071	PR-CHNL-West	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	4071	PR-West CHNL+BR	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	4071	PR - West Bridge	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	3967.5		Culvert									
Mainstem	3864	PR-CHNL-West	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3864	PR-West CHNL+BR	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3864	PR - West Bridge	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3752	PR-CHNL-West	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.85	253.85	0.57
Mainstem	3752	PR-West CHNL+BR	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.85	253.85	0.57
Mainstem	3752	PR - West Bridge	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.85	253.85	0.57
Mainstem	3536	PR-CHNL-West	7501.30	11.96	23.93		27.54	0.008493	15.85	585.55	69.87	0.82
Mainstem	3536	PR-West CHNL+BR	7501.30	11.96	23.93		27.54	0.008493	15.85	585.55	69.87	0.82
Mainstem	3536	PR - West Bridge	7501.30	11.96	23.93		27.54	0.008493	15.85	585.55	69.87	0.82
Mainstem	3386	PR-CHNL-West	7501.30	11.16	23.52		26.17	0.006191	13.84	697.29	74.77	0.71
Mainstem	3386	PR-West CHNL+BR	7501.30	11.16	23.52		26.17	0.006191	13.84	697.29	74.77	0.71
Mainstem	3386	PR - West Bridge	7501.30	11.16	23.52		26.17	0.006191	13.84	697.29	74.77	0.71
Mainstem	3183	PR-CHNL-West	7501.30	10.65	24.59	20.00	25.07	0.001126	7.28	2821.13	710.13	0.35
Mainstem	3183	PR-West CHNL+BR	7501.30	10.65	24.59	20.00	25.07	0.001126	7.28	2821.13	710.13	0.35
Mainstem	3183	PR - West Bridge	7501.30	10.65	24.59	20.00	25.07	0.001126	7.28	2821.13	710.13	0.35
Mainstem	2954	PR-CHNL-West	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.48	855.24	0.18
Mainstem	2954	PR-West CHNL+BR	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.48	855.24	0.18
Mainstem	2954	PR - West Bridge	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.48	855.24	0.18
Mainstem	2752	PR-CHNL-West	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.47	973.68	0.05
Mainstem	2752	PR-West CHNL+BR	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.47	973.68	0.05
Mainstem	2752	PR - West Bridge	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.47	973.68	0.05
Mainstem	2495	PR-CHNL-West	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.64	891.19	0.06
Mainstem	2495	PR-West CHNL+BR	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.64	891.19	0.06
Mainstem	2495	PR - West Bridge	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.64	891.19	0.06
Mainstem	2232	PR-CHNL-West	7581.10	8.17	24.60		24.77	0.000175	4.16	3717.18	423.41	0.18
Mainstem	2232	PR-West CHNL+BR	7581.10	8.17	24.60		24.77	0.000175	4.16	3717.18	423.41	0.18
Mainstem	2232	PR - West Bridge	7581.10	8.17	24.60		24.77	0.000175	4.16	3717.18	423.41	0.18
Mainstem	1978	PR-CHNL-West	7581.10	6.57	23.63		24.61	0.000806	8.83	1619.98	279.49	0.39
Mainstem	1978	PR-West CHNL+BR	7581.10	6.57	23.63		24.61	0.000806	8.83	1619.98	279.49	0.39
Mainstem	1978	PR - West Bridge	7581.10	6.57	23.63		24.61	0.000806	8.83	1619.98	279.49	0.39
Mainstem	1724	PR-CHNL-West	7581.10	6.66	23.72		24.32	0.000568	7.46	2047.91	317.24	0.33
Mainstem	1724	PR-West CHNL+BR	7581.10	6.66	23.72		24.32	0.000568	7.46	2047.91	317.24	0.33
Mainstem	1724	PR - West Bridge	7581.10	6.66	23.72		24.32	0.000568	7.46	2047.91	317.24	0.33
Mainstem	1544	PR-CHNL-West	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.50	354.03	0.24
Mainstem	1544	PR-West CHNL+BR	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.50	354.03	0.24
Mainstem	1544	PR - West Bridge	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.50	354.03	0.24
Mainstem	1335	PR-CHNL-West	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.52	522.31	0.27
Mainstem	1335	PR-West CHNL+BR	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.52	522.31	0.27
Mainstem	1335	PR - West Bridge	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.52	522.31	0.27
Mainstem	1260	PR-CHNL-West	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2105.99	532.06	0.24
Mainstem	1260	PR-West CHNL+BR	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2105.99	532.06	0.24
Mainstem	1260	PR - West Bridge	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2105.99	532.06	0.24
Mainstem	1066.5		Mult Open									
Mainstem	872	PR-CHNL-West	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	872	PR-West CHNL+BR	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	872	PR - West Bridge	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26

HEC-RAS River: Noroton Reach: Mainstem Profile: 100-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	811	PR-CHNL-West	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.91	372.84	0.24
Mainstem	811	PR-West CHNL+BR	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.91	372.84	0.24
Mainstem	811	PR - West Bridge	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.91	372.84	0.24
Mainstem	631	PR-CHNL-West	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	631	PR-West CHNL+BR	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	631	PR - West Bridge	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	434	PR-CHNL-West	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	434	PR-West CHNL+BR	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	434	PR - West Bridge	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	334	PR-CHNL-West	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	334	PR-West CHNL+BR	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	334	PR - West Bridge	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	250.5		Bridge									
Mainstem	208	PR-CHNL-West	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	208	PR-West CHNL+BR	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	208	PR - West Bridge	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	108	PR-CHNL-West	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	108	PR-West CHNL+BR	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	108	PR - West Bridge	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	0	PR-CHNL-West	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69
Mainstem	0	PR-West CHNL+BR	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69
Mainstem	0	PR - West Bridge	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	PR-CHNL-West	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	PR-West CHNL+BR	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	PR - West Bridge	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24515	PR-CHNL-West	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	PR-West CHNL+BR	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	PR - West Bridge	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24486	PR-CHNL-West	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	PR-West CHNL+BR	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	PR - West Bridge	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24464.5		Bridge									
Mainstem	24442	PR-CHNL-West	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	PR-West CHNL+BR	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	PR - West Bridge	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24395	PR-CHNL-West	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	PR-West CHNL+BR	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	PR - West Bridge	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24348	PR-CHNL-West	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	PR-West CHNL+BR	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	PR - West Bridge	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	23965	PR-CHNL-West	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	PR-West CHNL+BR	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	PR - West Bridge	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23691	PR-CHNL-West	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	PR-West CHNL+BR	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	PR - West Bridge	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23390	PR-CHNL-West	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	PR-West CHNL+BR	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	PR - West Bridge	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23104	PR-CHNL-West	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	PR-West CHNL+BR	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	PR - West Bridge	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23055	PR-CHNL-West	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	PR-West CHNL+BR	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	PR - West Bridge	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23038.5		Bridge									
Mainstem	23022	PR-CHNL-West	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	PR-West CHNL+BR	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	PR - West Bridge	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	22976	PR-CHNL-West	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	PR-West CHNL+BR	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	PR - West Bridge	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22614	PR-CHNL-West	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	PR-West CHNL+BR	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	PR - West Bridge	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22578	PR-CHNL-West	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	PR-West CHNL+BR	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	PR - West Bridge	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22556.5		Bridge									
Mainstem	22534	PR-CHNL-West	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	PR-West CHNL+BR	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	PR - West Bridge	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22497	PR-CHNL-West	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	PR-West CHNL+BR	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	PR - West Bridge	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22292	PR-CHNL-West	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	PR-West CHNL+BR	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	PR - West Bridge	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21964	PR-CHNL-West	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	PR-West CHNL+BR	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	PR - West Bridge	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21708	PR-CHNL-West	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	PR-West CHNL+BR	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	PR - West Bridge	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21655	PR-CHNL-West	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	PR-West CHNL+BR	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	PR - West Bridge	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21635.5		Bridge									
Mainstem	21617	PR-CHNL-West	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	PR-West CHNL+BR	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	PR - West Bridge	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21433	PR-CHNL-West	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	PR-West CHNL+BR	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	PR - West Bridge	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21277	PR-CHNL-West	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	PR-West CHNL+BR	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	PR - West Bridge	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	20884	PR-CHNL-West	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	PR-West CHNL+BR	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	PR - West Bridge	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20728	PR-CHNL-West	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	PR-West CHNL+BR	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	PR - West Bridge	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20520	PR-CHNL-West	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	PR-West CHNL+BR	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	PR - West Bridge	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20220	PR-CHNL-West	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	PR-West CHNL+BR	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	PR - West Bridge	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	19972	PR-CHNL-West	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	PR-West CHNL+BR	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	PR - West Bridge	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19666	PR-CHNL-West	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	PR-West CHNL+BR	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	PR - West Bridge	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19414	PR-CHNL-West	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	PR-West CHNL+BR	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	PR - West Bridge	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19164	PR-CHNL-West	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	PR-West CHNL+BR	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	PR - West Bridge	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	18991	PR-CHNL-West	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	PR-West CHNL+BR	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	PR - West Bridge	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18922	PR-CHNL-West	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	PR-West CHNL+BR	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	PR - West Bridge	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18874.5		Bridge									
Mainstem	18826	PR-CHNL-West	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	PR-West CHNL+BR	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	PR - West Bridge	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18753	PR-CHNL-West	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	PR-West CHNL+BR	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	PR - West Bridge	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	18523	PR-CHNL-West	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	PR-West CHNL+BR	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	PR - West Bridge	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18298	PR-CHNL-West	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	PR-West CHNL+BR	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	PR - West Bridge	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18102	PR-CHNL-West	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	PR-West CHNL+BR	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	PR - West Bridge	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	17851	PR-CHNL-West	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	PR-West CHNL+BR	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	PR - West Bridge	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17701	PR-CHNL-West	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	PR-West CHNL+BR	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	PR - West Bridge	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17499	PR-CHNL-West	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36
Mainstem	17499	PR-West CHNL+BR	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36
Mainstem	17499	PR - West Bridge	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36
Mainstem	17410	PR-CHNL-West	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	PR-West CHNL+BR	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	PR - West Bridge	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17133	PR-CHNL-West	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	PR-West CHNL+BR	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	PR - West Bridge	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	16900	PR-CHNL-West	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	PR-West CHNL+BR	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	PR - West Bridge	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16568	PR-CHNL-West	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	PR-West CHNL+BR	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	PR - West Bridge	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16345	PR-CHNL-West	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	PR-West CHNL+BR	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	PR - West Bridge	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16072	PR-CHNL-West	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	PR-West CHNL+BR	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	PR - West Bridge	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	15834	PR-CHNL-West	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	PR-West CHNL+BR	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	PR - West Bridge	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15688	PR-CHNL-West	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	PR-West CHNL+BR	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	PR - West Bridge	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15610	PR-CHNL-West	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	PR-West CHNL+BR	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	PR - West Bridge	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15527	PR-CHNL-West	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	PR-West CHNL+BR	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	PR - West Bridge	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15490.5		Bridge									
Mainstem	15454	PR-CHNL-West	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	PR-West CHNL+BR	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	PR - West Bridge	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15361	PR-CHNL-West	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	PR-West CHNL+BR	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	PR - West Bridge	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15105	PR-CHNL-West	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	PR-West CHNL+BR	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	PR - West Bridge	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	14870	PR-CHNL-West	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	PR-West CHNL+BR	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	PR - West Bridge	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14599	PR-CHNL-West	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	PR-West CHNL+BR	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	PR - West Bridge	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14501	PR-CHNL-West	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	PR-West CHNL+BR	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	PR - West Bridge	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14462.5		Bridge									
Mainstem	14423	PR-CHNL-West	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	PR-West CHNL+BR	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	PR - West Bridge	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14341	PR-CHNL-West	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	PR-West CHNL+BR	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	PR - West Bridge	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14187	PR-CHNL-West	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	PR-West CHNL+BR	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	PR - West Bridge	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	13988	PR-CHNL-West	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	PR-West CHNL+BR	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	PR - West Bridge	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13825	PR-CHNL-West	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	PR-West CHNL+BR	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	PR - West Bridge	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13767	PR-CHNL-West	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	PR-West CHNL+BR	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	PR - West Bridge	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13752.5		Inl Struct									
Mainstem	13742	PR-CHNL-West	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	PR-West CHNL+BR	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	PR - West Bridge	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13634	PR-CHNL-West	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	PR-West CHNL+BR	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	PR - West Bridge	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13435	PR-CHNL-West	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	PR-West CHNL+BR	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	PR - West Bridge	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13129	PR-CHNL-West	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	PR-West CHNL+BR	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	PR - West Bridge	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	12709	PR-CHNL-West	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	PR-West CHNL+BR	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	PR - West Bridge	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12530	PR-CHNL-West	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	PR-West CHNL+BR	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	PR - West Bridge	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12337	PR-CHNL-West	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	PR-West CHNL+BR	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	PR - West Bridge	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12195	PR-CHNL-West	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	PR-West CHNL+BR	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	PR - West Bridge	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12023	PR-CHNL-West	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	PR-West CHNL+BR	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	PR - West Bridge	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	11770	PR-CHNL-West	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	PR-West CHNL+BR	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	PR - West Bridge	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11508	PR-CHNL-West	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	PR-West CHNL+BR	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	PR - West Bridge	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11371	PR-CHNL-West	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	PR-West CHNL+BR	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	PR - West Bridge	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4167.37	699.25	0.07
Mainstem	10928	PR-CHNL-West	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	PR-West CHNL+BR	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	PR - West Bridge	4457.20	35.47	45.10		45.15	0.000168	2.05	3827.46	888.18	0.13
Mainstem	10846	PR-CHNL-West	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	PR-West CHNL+BR	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	PR - West Bridge	4457.20	35.49	44.98		45.10	0.000917	5.00	2780.00	991.49	0.31
Mainstem	10499	PR-CHNL-West	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	PR-West CHNL+BR	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	PR - West Bridge	4457.20	36.19	44.41		44.73	0.001973	7.08	1812.61	746.04	0.46
Mainstem	10364	PR-CHNL-West	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	PR-West CHNL+BR	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	PR - West Bridge	4565.60	35.16	43.66		44.41	0.003962	10.09	1352.90	669.51	0.64
Mainstem	10120	PR-CHNL-West	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	PR-West CHNL+BR	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	PR - West Bridge	4565.60	33.73	43.25		43.61	0.002009	7.05	1800.53	681.38	0.42
Mainstem	9864	PR-CHNL-West	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	PR-West CHNL+BR	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	PR - West Bridge	4565.60	32.30	43.00		43.22	0.001162	5.85	2256.45	707.99	0.33
Mainstem	9606	PR-CHNL-West	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	PR-West CHNL+BR	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	PR - West Bridge	4565.60	31.73	42.82		42.96	0.000717	4.75	2816.55	923.65	0.26
Mainstem	9350	PR-CHNL-West	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	PR-West CHNL+BR	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	PR - West Bridge	4565.60	31.17	42.82		42.85	0.000155	2.66	5184.93	1120.04	0.14
Mainstem	9095	PR-CHNL-West	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	PR-West CHNL+BR	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	PR - West Bridge	4565.60	28.97	40.64	40.64	42.53	0.005880	12.21	695.65	322.11	0.66
Mainstem	8837	PR-CHNL-West	4565.60	30.03	40.99	37.67	41.17	0.000733	5.28	2976.62	801.04	0.29
Mainstem	8837	PR-West CHNL+BR	4565.60	30.03	40.23	37.67	40.49	0.001108	6.15	2406.52	706.69	0.36
Mainstem	8837	PR - West Bridge	4565.60	30.03	40.54	37.67	40.77	0.000931	5.77	2632.33	743.63	0.33
Mainstem	8593	PR-CHNL-West	4565.60	27.59	41.02	40.13	41.06	0.000183	2.98	3663.88	857.24	0.15
Mainstem	8593	PR-West CHNL+BR	4565.60	27.59	40.26	40.13	40.32	0.000295	3.62	3041.62	802.15	0.19
Mainstem	8593	PR - West Bridge	4565.60	27.59	40.58	40.13	40.63	0.000241	3.33	3294.74	816.41	0.17
Mainstem	8351	PR-CHNL-West	4565.60	29.43	39.89		40.87	0.001772	8.83	853.01	176.81	0.49
Mainstem	8351	PR-West CHNL+BR	4565.60	29.43	38.32		39.99	0.003565	11.20	598.77	138.85	0.67
Mainstem	8351	PR - West Bridge	4565.60	29.43	39.12		40.37	0.002452	9.86	719.50	163.95	0.57
Mainstem	8130	PR-CHNL-West	4565.60	28.78	40.31		40.50	0.000290	3.66	1591.31	223.04	0.20
Mainstem	8130	PR-West CHNL+BR	4565.60	28.78	39.11		39.35	0.000434	4.13	1360.31	180.83	0.24
Mainstem	8130	PR - West Bridge	4565.60	28.78	39.68		39.89	0.000355	3.89	1467.04	190.77	0.22
Mainstem	7925	PR-CHNL-West	4565.60	28.66	40.16		40.42	0.000391	4.22	1335.07	229.89	0.23
Mainstem	7925	PR-West CHNL+BR	4565.60	28.66	38.89		39.23	0.000605	4.82	1093.68	152.09	0.28
Mainstem	7925	PR - West Bridge	4565.60	28.66	39.49		39.80	0.000491	4.53	1194.71	190.25	0.26
Mainstem	7717	PR-CHNL-West	4565.60	28.54	40.24		40.33	0.000130	2.47	2156.47	293.26	0.13
Mainstem	7717	PR-West CHNL+BR	4565.60	28.54	38.98		39.10	0.000205	2.85	1811.11	263.62	0.16
Mainstem	7717	PR - West Bridge	4565.60	28.54	39.58		39.69	0.000164	2.66	1972.99	273.21	0.15
Mainstem	7512	PR-CHNL-West	4565.60	28.62	40.26	31.83	40.29	0.000050	1.52	3341.45	545.98	0.08
Mainstem	7512	PR-West CHNL+BR	4565.60	28.62	39.01	31.83	39.05	0.000078	1.74	2758.32	352.45	0.10
Mainstem	7512	PR - West Bridge	4565.60	28.62	39.61	31.83	39.65	0.000063	1.63	3019.31	473.92	0.09
Mainstem	7307	PR-CHNL-West	4565.60	28.49	40.25	31.69	40.28	0.000072	1.38	3524.03	448.14	0.08

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	7307	PR-West CHNL+BR	4565.60	28.49	38.99	31.69	39.03	0.000113	1.58	3012.83	394.29	0.09
Mainstem	7307	PR - West Bridge	4565.60	28.49	39.60	31.69	39.63	0.000090	1.48	3252.38	399.86	0.08
Mainstem	7095	PR-CHNL-West	4565.60	28.37	40.22	31.50	40.26	0.000084	1.73	2928.76	375.84	0.09
Mainstem	7095	PR-West CHNL+BR	4565.60	28.37	38.94	31.50	39.00	0.000129	1.97	2490.07	313.83	0.11
Mainstem	7095	PR - West Bridge	4565.60	28.37	39.55	31.50	39.61	0.000105	1.85	2689.84	342.50	0.10
Mainstem	6923	PR-CHNL-West	4565.60	27.27	40.07	32.61	40.23	0.000301	3.39	1777.54	258.85	0.17
Mainstem	6923	PR-West CHNL+BR	4565.60	27.27	38.74	32.61	38.95	0.000467	3.90	1455.37	219.22	0.21
Mainstem	6923	PR - West Bridge	4565.60	27.27	39.38	32.61	39.56	0.000378	3.65	1604.50	242.42	0.19
Mainstem	6907	PR-CHNL-West	4565.60	29.15	39.92	34.94	40.20	0.001331	4.80	1223.01	211.52	0.28
Mainstem	6907	PR-West CHNL+BR	4565.60	29.15	38.49	34.94	38.91	0.002375	5.75	952.33	160.68	0.36
Mainstem	6907	PR - West Bridge	4565.60	29.15	39.18	34.94	39.53	0.001826	5.32	1072.30	193.61	0.32
Mainstem	6850	PR-CHNL-West	4679.10	27.98	39.70	33.83	40.12	0.001364	5.41	1006.27	139.43	0.29
Mainstem	6850	PR-West CHNL+BR	4679.10	27.98	38.15	33.83	38.76	0.002414	6.51	803.38	116.40	0.37
Mainstem	6850	PR - West Bridge	4679.10	27.98	38.91	33.83	39.42	0.001828	5.96	897.69	132.16	0.33
Mainstem	6777	PR-CHNL-West	4679.10	26.59	39.69	32.63	40.02	0.000468	4.95	1088.04	118.03	0.25
Mainstem	6777	PR-West CHNL+BR	4679.10	26.59	38.12	32.63	38.60	0.000799	5.91	905.23	115.06	0.31
Mainstem	6777	PR - West Bridge	4679.10	26.59	38.89	32.63	39.29	0.000609	5.40	994.50	116.41	0.28
Mainstem	6719.5		Bridge									
Mainstem	6661	PR-CHNL-West	4679.10	26.31	38.91	32.29	39.24	0.000493	5.06	1076.29	115.32	0.25
Mainstem	6661	PR-West CHNL+BR	4679.10	26.31	37.29	32.29	37.77	0.000838	6.01	895.32	108.63	0.32
Mainstem	6661	PR - West Bridge	4679.10	26.31	38.09	32.29	38.49	0.000639	5.51	983.09	111.94	0.28
Mainstem	6584	PR-CHNL-West	4679.10	26.10	38.58	32.84	39.13	0.000874	6.62	1165.49	215.00	0.34
Mainstem	6584	PR-West CHNL+BR	4679.10	26.10	36.57	32.84	37.53	0.001839	8.51	783.46	164.36	0.47
Mainstem	6584	PR - West Bridge	4679.10	26.10	37.61	32.84	38.32	0.001238	7.45	968.27	184.35	0.39
Mainstem	6348	PR-CHNL-West	4679.10	26.00	38.17	32.94	38.86	0.001074	7.09	1039.93	345.88	0.36
Mainstem	6348	PR-West CHNL+BR	4679.10	26.00	35.43	32.94	36.85	0.002967	9.88	575.61	108.84	0.58
Mainstem	6348	PR - West Bridge	4679.10	26.00	36.95	32.94	37.91	0.001669	8.22	753.56	195.85	0.45
Mainstem	6145	PR-CHNL-West	4679.10	25.53	38.58	32.72	38.61	0.000117	2.43	6087.32	946.77	0.12
Mainstem	6145	PR-West CHNL+BR	4679.10	25.53	36.21	32.72	36.29	0.000356	3.68	4018.60	816.69	0.20
Mainstem	6145	PR - West Bridge	4679.10	25.53	37.51	32.72	37.56	0.000187	2.89	5108.18	870.25	0.15
Mainstem	5950	PR-CHNL-West	4679.10	25.27	38.55	32.53	38.58	0.000148	2.40	5544.92	850.53	0.12
Mainstem	5950	PR-West CHNL+BR	4679.10	25.27	36.11	32.53	36.21	0.000506	3.83	3538.26	791.47	0.21
Mainstem	5950	PR - West Bridge	4679.10	25.27	37.44	34.03	37.51	0.000261	3.51	4558.32	828.58	0.18
Mainstem	5753	PR-CHNL-West	4679.10	25.00	38.29	32.13	38.51	0.000648	4.55	2218.30	569.04	0.23
Mainstem	5753	PR-West CHNL+BR	4679.10	25.00	34.88	32.13	35.91	0.003549	8.50	748.05	241.33	0.51
Mainstem	5753	PR - West Bridge	4679.10	25.00	35.00	35.00	37.17	0.004875	13.08	656.92	252.76	0.75
Mainstem	5553	PR-CHNL-West	4679.10	24.72	38.39	32.62	38.41	0.000104	2.43	5458.51	739.57	0.12
Mainstem	5553	PR-West CHNL+BR	4679.10	24.72	35.33	32.62	35.43	0.000460	4.30	3273.54	699.64	0.24
Mainstem	5553	PR - West Bridge	4679.10	24.72	35.62	32.79	35.71	0.000427	4.16	3390.15	702.08	0.23
Mainstem	5330	PR-CHNL-West	4679.10	23.16	38.38	29.87	38.40	0.000060	1.73	5884.23	788.80	0.08
Mainstem	5330	PR-West CHNL+BR	4679.10	23.16	35.31	29.87	35.37	0.000210	2.76	3621.15	688.86	0.15
Mainstem	5330	PR - West Bridge	4679.10	23.16	35.58	31.08	35.64	0.000283	3.58	3619.87	696.49	0.19
Mainstem	5107	PR-CHNL-West	4679.10	22.72	38.15	30.57	38.35	0.000338	4.70	2817.70	721.79	0.22
Mainstem	5107	PR-West CHNL+BR	4679.10	22.72	34.44	30.57	35.19	0.001479	8.13	1068.37	250.07	0.43
Mainstem	5107	PR - West Bridge	4679.10	22.72	34.43	32.04	35.40	0.001828	8.96	973.13	244.71	0.48
Mainstem	4848	PR-CHNL-West	4679.10	23.30	37.64	30.47	38.19	0.000687	6.41	1056.37	282.41	0.30
Mainstem	4848	PR-West CHNL+BR	4679.10	23.30	33.22	30.47	34.61	0.002737	9.92	581.71	79.91	0.57
Mainstem	4848	PR - West Bridge	4679.10	23.30	33.11	30.63	34.74	0.003108	10.50	518.20	71.58	0.60
Mainstem	4791	PR-CHNL-West	4679.10	22.67	37.52	29.67	38.13	0.000877	6.75	791.23	94.25	0.31
Mainstem	4791	PR-West CHNL+BR	4679.10	22.67	33.17	29.69	34.34	0.002834	9.59	570.63	70.80	0.53
Mainstem	4791	PR - West Bridge	4679.10	22.67	33.17	29.69	34.34	0.002834	9.59	570.63	70.80	0.53
Mainstem	4740.5		Bridge									
Mainstem	4689	PR-CHNL-West	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	PR-West CHNL+BR	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	PR - West Bridge	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4618	PR-CHNL-West	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	PR-West CHNL+BR	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	4618	PR - West Bridge	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4350	PR-CHNL-West	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	PR-West CHNL+BR	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	PR - West Bridge	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4114	PR-CHNL-West	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	PR-West CHNL+BR	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	PR - West Bridge	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4071	PR-CHNL-West	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	PR-West CHNL+BR	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	PR - West Bridge	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	3967.5		Culvert									
Mainstem	3864	PR-CHNL-West	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	PR-West CHNL+BR	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	PR - West Bridge	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3752	PR-CHNL-West	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	PR-West CHNL+BR	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	PR - West Bridge	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3536	PR-CHNL-West	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	PR-West CHNL+BR	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	PR - West Bridge	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3386	PR-CHNL-West	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	PR-West CHNL+BR	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	PR - West Bridge	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3183	PR-CHNL-West	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	PR-West CHNL+BR	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	PR - West Bridge	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	2954	PR-CHNL-West	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	PR-West CHNL+BR	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	PR - West Bridge	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2752	PR-CHNL-West	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	PR-West CHNL+BR	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	PR - West Bridge	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2495	PR-CHNL-West	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	PR-West CHNL+BR	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	PR - West Bridge	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2232	PR-CHNL-West	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	PR-West CHNL+BR	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	PR - West Bridge	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	1978	PR-CHNL-West	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	PR-West CHNL+BR	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	PR - West Bridge	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1724	PR-CHNL-West	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	PR-West CHNL+BR	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	PR - West Bridge	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1544	PR-CHNL-West	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	PR-West CHNL+BR	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	PR - West Bridge	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1335	PR-CHNL-West	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	PR-West CHNL+BR	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	PR - West Bridge	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1260	PR-CHNL-West	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	PR-West CHNL+BR	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	PR - West Bridge	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1066.5		Mult Open									
Mainstem	872	PR-CHNL-West	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	PR-West CHNL+BR	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	PR - West Bridge	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21

HEC-RAS River: Noroton Reach: Mainstem Profile: 25-yr TP-40 (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	811	PR-CHNL-West	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	PR-West CHNL+BR	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	PR - West Bridge	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	631	PR-CHNL-West	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	PR-West CHNL+BR	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	PR - West Bridge	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	434	PR-CHNL-West	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	PR-West CHNL+BR	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	PR - West Bridge	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	334	PR-CHNL-West	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	PR-West CHNL+BR	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	PR - West Bridge	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	250.5		Bridge									
Mainstem	208	PR-CHNL-West	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	PR-West CHNL+BR	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	PR - West Bridge	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	108	PR-CHNL-West	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	PR-West CHNL+BR	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	PR - West Bridge	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	0	PR-CHNL-West	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	PR-West CHNL+BR	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	PR - West Bridge	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66

APPENDIX L4: ALTERNATIVE 4 HEC-RAS RESULTS

HEC-RAS River: Noroton Reach: Mainstem

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	PR-LynnCTBerm	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	PR-LynnBerm+Bend	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	PR-LynnCTBerm	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24704	PR-LynnBerm+Bend	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	PR-LynnCTBerm	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	PR-LynnBerm+Bend	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	PR-LynnCTBerm	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24515	PR-LynnBerm+Bend	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	PR-LynnCTBerm	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	PR-LynnBerm+Bend	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	PR-LynnCTBerm	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24486	PR-LynnBerm+Bend	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5		Bridge									
Mainstem	24442	PR-LynnCTBerm	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	PR-LynnBerm+Bend	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	PR-LynnCTBerm	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24442	PR-LynnBerm+Bend	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	PR-LynnCTBerm	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	PR-LynnBerm+Bend	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	PR-LynnCTBerm	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24395	PR-LynnBerm+Bend	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	PR-LynnCTBerm	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	PR-LynnBerm+Bend	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	PR-LynnCTBerm	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	24348	PR-LynnBerm+Bend	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	PR-LynnCTBerm	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	PR-LynnBerm+Bend	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	PR-LynnCTBerm	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23965	PR-LynnBerm+Bend	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	PR-LynnCTBerm	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	PR-LynnBerm+Bend	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	PR-LynnCTBerm	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23691	PR-LynnBerm+Bend	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	PR-LynnCTBerm	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	PR-LynnBerm+Bend	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	PR-LynnCTBerm	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23390	PR-LynnBerm+Bend	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	PR-LynnCTBerm	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	PR-LynnBerm+Bend	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	PR-LynnCTBerm	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23104	PR-LynnBerm+Bend	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	PR-LynnCTBerm	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	PR-LynnBerm+Bend	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	PR-LynnCTBerm	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23055	PR-LynnBerm+Bend	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5		Bridge									
Mainstem	23022	PR-LynnCTBerm	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	PR-LynnBerm+Bend	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	PR-LynnCTBerm	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	23022	PR-LynnBerm+Bend	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	PR-LynnCTBerm	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	PR-LynnBerm+Bend	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	PR-LynnCTBerm	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22976	PR-LynnBerm+Bend	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	PR-LynnCTBerm	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	PR-LynnBerm+Bend	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	PR-LynnCTBerm	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22614	PR-LynnBerm+Bend	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	PR-LynnCTBerm	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	PR-LynnBerm+Bend	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	PR-LynnCTBerm	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22578	PR-LynnBerm+Bend	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22556.5		Bridge									
Mainstem	22534	PR-LynnCTBerm	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	22534	PR-LynnBerm+Bend	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	PR-LynnCTBerm	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22534	PR-LynnBerm+Bend	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	PR-LynnCTBerm	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	PR-LynnBerm+Bend	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	PR-LynnCTBerm	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22497	PR-LynnBerm+Bend	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	PR-LynnCTBerm	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	PR-LynnBerm+Bend	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	PR-LynnCTBerm	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	22292	PR-LynnBerm+Bend	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	21964	PR-LynnCTBerm	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	PR-LynnBerm+Bend	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	PR-LynnCTBerm	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21964	PR-LynnBerm+Bend	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	PR-LynnCTBerm	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	PR-LynnBerm+Bend	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	PR-LynnCTBerm	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21708	PR-LynnBerm+Bend	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	PR-LynnCTBerm	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	PR-LynnBerm+Bend	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	PR-LynnCTBerm	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21655	PR-LynnBerm+Bend	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5		Bridge									
Mainstem	21617	PR-LynnCTBerm	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	PR-LynnBerm+Bend	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	PR-LynnCTBerm	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21617	PR-LynnBerm+Bend	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	PR-LynnCTBerm	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	PR-LynnBerm+Bend	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	PR-LynnCTBerm	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21433	PR-LynnBerm+Bend	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	PR-LynnCTBerm	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	PR-LynnBerm+Bend	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	PR-LynnCTBerm	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	21277	PR-LynnBerm+Bend	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	PR-LynnCTBerm	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	PR-LynnBerm+Bend	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	PR-LynnCTBerm	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20884	PR-LynnBerm+Bend	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	PR-LynnCTBerm	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	PR-LynnBerm+Bend	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	PR-LynnCTBerm	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20728	PR-LynnBerm+Bend	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	PR-LynnCTBerm	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	PR-LynnBerm+Bend	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	PR-LynnCTBerm	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20520	PR-LynnBerm+Bend	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	PR-LynnCTBerm	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	PR-LynnBerm+Bend	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	PR-LynnCTBerm	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	20220	PR-LynnBerm+Bend	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	19972	PR-LynnCTBerm	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	PR-LynnBerm+Bend	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	PR-LynnCTBerm	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19972	PR-LynnBerm+Bend	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19666	PR-LynnCTBerm	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	PR-LynnBerm+Bend	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	PR-LynnCTBerm	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19666	PR-LynnBerm+Bend	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19414	PR-LynnCTBerm	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	PR-LynnBerm+Bend	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	PR-LynnCTBerm	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19414	PR-LynnBerm+Bend	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19164	PR-LynnCTBerm	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	19164	PR-LynnBerm+Bend	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	PR-LynnCTBerm	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	19164	PR-LynnBerm+Bend	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	18991	PR-LynnCTBerm	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	PR-LynnBerm+Bend	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	PR-LynnCTBerm	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18991	PR-LynnBerm+Bend	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18922	PR-LynnCTBerm	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	PR-LynnBerm+Bend	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	PR-LynnCTBerm	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18922	PR-LynnBerm+Bend	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18874.5		Bridge									
Mainstem	18826	PR-LynnCTBerm	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	PR-LynnBerm+Bend	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	PR-LynnCTBerm	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18826	PR-LynnBerm+Bend	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	PR-LynnCTBerm	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	PR-LynnBerm+Bend	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	PR-LynnCTBerm	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18753	PR-LynnBerm+Bend	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18523	PR-LynnCTBerm	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	PR-LynnBerm+Bend	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	PR-LynnCTBerm	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18523	PR-LynnBerm+Bend	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	PR-LynnCTBerm	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	PR-LynnBerm+Bend	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	PR-LynnCTBerm	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18298	PR-LynnBerm+Bend	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	PR-LynnCTBerm	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	PR-LynnBerm+Bend	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	PR-LynnCTBerm	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	18102	PR-LynnBerm+Bend	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	PR-LynnCTBerm	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	PR-LynnBerm+Bend	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	PR-LynnCTBerm	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17851	PR-LynnBerm+Bend	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	PR-LynnCTBerm	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	PR-LynnBerm+Bend	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	PR-LynnCTBerm	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17701	PR-LynnBerm+Bend	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	PR-LynnCTBerm	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36
Mainstem	17499	PR-LynnBerm+Bend	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36
Mainstem	17499	PR-LynnCTBerm	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17499	PR-LynnBerm+Bend	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	PR-LynnCTBerm	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	PR-LynnBerm+Bend	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	PR-LynnCTBerm	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17410	PR-LynnBerm+Bend	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	PR-LynnCTBerm	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	PR-LynnBerm+Bend	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	PR-LynnCTBerm	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	17133	PR-LynnBerm+Bend	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	PR-LynnCTBerm	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	PR-LynnBerm+Bend	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	PR-LynnCTBerm	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16900	PR-LynnBerm+Bend	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	PR-LynnCTBerm	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	PR-LynnBerm+Bend	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	PR-LynnCTBerm	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16568	PR-LynnBerm+Bend	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	PR-LynnCTBerm	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	PR-LynnBerm+Bend	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	PR-LynnCTBerm	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16345	PR-LynnBerm+Bend	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16072	PR-LynnCTBerm	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	16072	PR-LynnBerm+Bend	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	PR-LynnCTBerm	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	16072	PR-LynnBerm+Bend	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	PR-LynnCTBerm	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	PR-LynnBerm+Bend	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.78	173.28	0.67
Mainstem	15834	PR-LynnCTBerm	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15834	PR-LynnBerm+Bend	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	PR-LynnCTBerm	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	PR-LynnBerm+Bend	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.06	464.43	0.27
Mainstem	15688	PR-LynnCTBerm	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15688	PR-LynnBerm+Bend	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15610	PR-LynnCTBerm	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	PR-LynnBerm+Bend	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.90	649.73	0.36
Mainstem	15610	PR-LynnCTBerm	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15610	PR-LynnBerm+Bend	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15527	PR-LynnCTBerm	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	PR-LynnBerm+Bend	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	PR-LynnCTBerm	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15527	PR-LynnBerm+Bend	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15490.5		Bridge									
Mainstem	15454	PR-LynnCTBerm	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	PR-LynnBerm+Bend	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	PR-LynnCTBerm	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15454	PR-LynnBerm+Bend	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15361	PR-LynnCTBerm	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	PR-LynnBerm+Bend	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	PR-LynnCTBerm	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15361	PR-LynnBerm+Bend	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15105	PR-LynnCTBerm	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	PR-LynnBerm+Bend	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	PR-LynnCTBerm	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	15105	PR-LynnBerm+Bend	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	14870	PR-LynnCTBerm	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	PR-LynnBerm+Bend	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	PR-LynnCTBerm	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14870	PR-LynnBerm+Bend	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14599	PR-LynnCTBerm	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	PR-LynnBerm+Bend	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	PR-LynnCTBerm	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14599	PR-LynnBerm+Bend	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14501	PR-LynnCTBerm	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	PR-LynnBerm+Bend	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	PR-LynnCTBerm	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14501	PR-LynnBerm+Bend	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14462.5		Bridge									
Mainstem	14423	PR-LynnCTBerm	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	PR-LynnBerm+Bend	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	PR-LynnCTBerm	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14423	PR-LynnBerm+Bend	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14341	PR-LynnCTBerm	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	PR-LynnBerm+Bend	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	PR-LynnCTBerm	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14341	PR-LynnBerm+Bend	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14187	PR-LynnCTBerm	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	PR-LynnBerm+Bend	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	PR-LynnCTBerm	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	14187	PR-LynnBerm+Bend	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	13988	PR-LynnCTBerm	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	PR-LynnBerm+Bend	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	PR-LynnCTBerm	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13988	PR-LynnBerm+Bend	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	PR-LynnCTBerm	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	PR-LynnBerm+Bend	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	PR-LynnCTBerm	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13825	PR-LynnBerm+Bend	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13767	PR-LynnCTBerm	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	PR-LynnBerm+Bend	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	PR-LynnCTBerm	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13767	PR-LynnBerm+Bend	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13752.5		Inl Struct									
Mainstem	13742	PR-LynnCTBerm	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	PR-LynnBerm+Bend	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	PR-LynnCTBerm	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13742	PR-LynnBerm+Bend	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	PR-LynnCTBerm	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	PR-LynnBerm+Bend	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	PR-LynnCTBerm	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13634	PR-LynnBerm+Bend	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	PR-LynnCTBerm	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	PR-LynnBerm+Bend	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	PR-LynnCTBerm	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13435	PR-LynnBerm+Bend	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	PR-LynnCTBerm	4457.20	48.16	59.46	58.07	59.86	0.001601	7.29	1496.30	494.53	0.41
Mainstem	13129	PR-LynnBerm+Bend	4457.20	48.16	56.26	58.07	61.86	0.021754	20.52	327.45	202.97	1.43
Mainstem	13129	PR-LynnCTBerm	7035.70	48.16	63.21	59.13	63.32	0.000414	4.62	3742.22	738.09	0.22
Mainstem	13129	PR-LynnBerm+Bend	7035.70	48.16	60.03	59.13	60.69	0.002629	9.70	1789.91	527.28	0.54
Mainstem	12709	PR-LynnCTBerm	4457.20	45.95	56.78	55.00	58.79	0.004146	12.65	548.72	111.56	0.71
Mainstem	12709	PR-LynnBerm+Bend	4457.20	45.95	58.05	53.84	58.32	0.001089	4.22	1138.27	234.61	0.28
Mainstem	12709	PR-LynnCTBerm	7035.70	45.95	55.62	55.55	62.23	0.015864	22.77	432.37	76.47	1.35
Mainstem	12709	PR-LynnBerm+Bend	7035.70	45.95	59.76	55.02	60.02	0.000989	4.49	2307.97	486.91	0.27
Mainstem	12530	PR-LynnCTBerm	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	PR-LynnBerm+Bend	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	PR-LynnCTBerm	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12530	PR-LynnBerm+Bend	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	PR-LynnCTBerm	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	PR-LynnBerm+Bend	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	PR-LynnCTBerm	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12337	PR-LynnBerm+Bend	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	PR-LynnCTBerm	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	PR-LynnBerm+Bend	4457.20	43.00	51.99	53.82	55.85	0.010035	17.23	352.88	96.97	1.04
Mainstem	12195	PR-LynnCTBerm	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12195	PR-LynnBerm+Bend	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	PR-LynnCTBerm	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	PR-LynnBerm+Bend	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	PR-LynnCTBerm	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	12023	PR-LynnBerm+Bend	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	11770	PR-LynnCTBerm	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	PR-LynnBerm+Bend	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	PR-LynnCTBerm	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11770	PR-LynnBerm+Bend	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	PR-LynnCTBerm	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	PR-LynnBerm+Bend	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	PR-LynnCTBerm	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11508	PR-LynnBerm+Bend	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	PR-LynnCTBerm	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	PR-LynnBerm+Bend	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	PR-LynnCTBerm	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4946.87	827.66	0.09
Mainstem	11371	PR-LynnBerm+Bend	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4946.87	827.66	0.09
Mainstem	10928	PR-LynnCTBerm	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	PR-LynnBerm+Bend	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	PR-LynnCTBerm	7035.70	35.47	46.12		46.19	0.000234	2.64	4778.74	1032.79	0.16
Mainstem	10928	PR-LynnBerm+Bend	7035.70	35.47	46.12		46.19	0.000234	2.64	4778.74	1032.79	0.16
Mainstem	10846	PR-LynnCTBerm	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	PR-LynnBerm+Bend	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	PR-LynnCTBerm	7035.70	35.49	45.98		46.13	0.001099	5.92	3818.34	1171.09	0.35
Mainstem	10846	PR-LynnBerm+Bend	7035.70	35.49	45.98		46.13	0.001099	5.92	3818.34	1171.09	0.35
Mainstem	10499	PR-LynnCTBerm	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	PR-LynnBerm+Bend	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	PR-LynnCTBerm	7035.70	36.19	45.42		45.74	0.001948	7.66	2579.91	772.24	0.47
Mainstem	10499	PR-LynnBerm+Bend	7035.70	36.19	45.42		45.74	0.001948	7.66	2579.91	772.24	0.47

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	10364	PR-LynnCTBerm	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	PR-LynnBerm+Bend	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	PR-LynnCTBerm	7073.90	35.16	44.98		45.49	0.002845	9.51	2240.47	720.94	0.56
Mainstem	10364	PR-LynnBerm+Bend	7073.90	35.16	44.98		45.49	0.002845	9.51	2240.47	720.94	0.56
Mainstem	10120	PR-LynnCTBerm	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	PR-LynnBerm+Bend	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	PR-LynnCTBerm	7073.90	33.73	44.59		44.88	0.001703	7.15	2977.57	1068.25	0.40
Mainstem	10120	PR-LynnBerm+Bend	7073.90	33.73	44.59		44.88	0.001703	7.15	2977.57	1068.25	0.40
Mainstem	9864	PR-LynnCTBerm	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	PR-LynnBerm+Bend	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	PR-LynnCTBerm	7073.90	32.30	44.36		44.55	0.001022	5.98	3310.24	856.18	0.32
Mainstem	9864	PR-LynnBerm+Bend	7073.90	32.30	44.36		44.55	0.001022	5.98	3310.24	856.18	0.32
Mainstem	9606	PR-LynnCTBerm	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	PR-LynnBerm+Bend	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	PR-LynnCTBerm	7073.90	31.73	44.20		44.32	0.000653	4.93	4095.37	928.86	0.25
Mainstem	9606	PR-LynnBerm+Bend	7073.90	31.73	44.20		44.32	0.000653	4.93	4095.37	928.86	0.25
Mainstem	9350	PR-LynnCTBerm	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	PR-LynnBerm+Bend	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	PR-LynnCTBerm	7073.90	31.17	44.18		44.22	0.000177	3.07	6749.47	1180.90	0.15
Mainstem	9350	PR-LynnBerm+Bend	7073.90	31.17	44.18		44.22	0.000177	3.07	6749.47	1180.90	0.15
Mainstem	9095	PR-LynnCTBerm	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	PR-LynnBerm+Bend	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	PR-LynnCTBerm	7073.90	28.97	43.24		44.01	0.002759	9.68	2376.07	914.81	0.47
Mainstem	9095	PR-LynnBerm+Bend	7073.90	28.97	43.24		44.01	0.002759	9.68	2376.07	914.81	0.47
Mainstem	8837	PR-LynnCTBerm	4565.60	30.03	41.31	37.67	41.45	0.000608	4.91	3250.20	923.54	0.27
Mainstem	8837	PR-LynnBerm+Bend	4565.60	30.03	41.31	37.67	41.45	0.000608	4.91	3250.20	923.54	0.27
Mainstem	8837	PR-LynnCTBerm	7073.90	30.03	43.51	39.01	43.61	0.000441	4.76	5609.50	1186.13	0.24
Mainstem	8837	PR-LynnBerm+Bend	7073.90	30.03	43.51	39.01	43.61	0.000441	4.76	5609.50	1186.13	0.24
Mainstem	8593	PR-LynnCTBerm	4565.60	27.59	41.33	40.13	41.36	0.000153	2.76	3933.68	872.35	0.14
Mainstem	8593	PR-LynnBerm+Bend	4565.60	27.59	41.33	40.13	41.36	0.000153	2.76	3933.68	872.35	0.14
Mainstem	8593	PR-LynnCTBerm	7073.90	27.59	43.52	40.13	43.55	0.000122	2.75	6356.50	1338.32	0.13
Mainstem	8593	PR-LynnBerm+Bend	7073.90	27.59	43.52	40.13	43.55	0.000122	2.75	6356.50	1338.32	0.13
Mainstem	8351	PR-LynnCTBerm	4565.60	29.43	40.30		41.20	0.001544	8.47	939.88	220.12	0.46
Mainstem	8351	PR-LynnBerm+Bend	4565.60	29.43	40.30		41.20	0.001544	8.47	939.88	220.12	0.46
Mainstem	8351	PR-LynnCTBerm	7073.90	29.43	42.53		43.40	0.001385	9.12	1898.20	1080.73	0.45
Mainstem	8351	PR-LynnBerm+Bend	7073.90	29.43	42.53		43.40	0.001385	9.12	1898.20	1080.73	0.45
Mainstem	8130	PR-LynnCTBerm	4565.60	28.78	40.69		40.86	0.000258	3.54	1684.32	272.23	0.19
Mainstem	8130	PR-LynnBerm+Bend	4565.60	28.78	40.69		40.86	0.000258	3.54	1684.32	272.23	0.19
Mainstem	8130	PR-LynnCTBerm	7073.90	28.78	42.83		43.09	0.000310	4.37	2819.19	870.11	0.21
Mainstem	8130	PR-LynnBerm+Bend	7073.90	28.78	42.83		43.09	0.000310	4.37	2819.19	870.11	0.21
Mainstem	7925	PR-LynnCTBerm	4565.60	28.66	40.56		40.80	0.000340	4.04	1429.50	245.35	0.22
Mainstem	7925	PR-LynnBerm+Bend	4565.60	28.66	40.56		40.80	0.000340	4.04	1429.50	245.35	0.22
Mainstem	7925	PR-LynnCTBerm	7073.90	28.66	42.66		43.00	0.000405	4.97	1982.12	269.21	0.24
Mainstem	7925	PR-LynnBerm+Bend	7073.90	28.66	42.66		43.00	0.000405	4.97	1982.12	269.21	0.24
Mainstem	7717	PR-LynnCTBerm	4565.60	28.54	40.63		40.71	0.000114	2.37	2275.69	314.92	0.13
Mainstem	7717	PR-LynnBerm+Bend	4565.60	28.54	40.63		40.71	0.000114	2.37	2275.69	314.92	0.13
Mainstem	7717	PR-LynnCTBerm	7073.90	28.54	42.77		42.89	0.000140	2.96	3137.66	548.97	0.14
Mainstem	7717	PR-LynnBerm+Bend	7073.90	28.54	42.77		42.89	0.000140	2.96	3137.66	548.97	0.14
Mainstem	7512	PR-LynnCTBerm	4565.60	28.62	40.65	31.83	40.68	0.000044	1.46	3566.66	590.33	0.08
Mainstem	7512	PR-LynnBerm+Bend	4565.60	28.62	40.65	31.83	40.68	0.000044	1.46	3566.66	590.33	0.08
Mainstem	7512	PR-LynnCTBerm	7073.90	28.62	42.81	32.53	42.85	0.000053	1.80	4940.35	771.55	0.09
Mainstem	7512	PR-LynnBerm+Bend	7073.90	28.62	42.81	32.53	42.85	0.000053	1.80	4940.35	771.55	0.09
Mainstem	7307	PR-LynnCTBerm	4565.60	28.49	40.64	31.69	40.67	0.000063	1.32	3702.17	462.45	0.07
Mainstem	7307	PR-LynnBerm+Bend	4565.60	28.49	40.64	31.69	40.67	0.000063	1.32	3702.17	462.45	0.07
Mainstem	7307	PR-LynnCTBerm	7073.90	28.49	42.80	32.37	42.84	0.000066	1.52	6689.85	1102.88	0.07
Mainstem	7307	PR-LynnBerm+Bend	7073.90	28.49	42.80	32.37	42.84	0.000066	1.52	6689.85	1102.88	0.07
Mainstem	7095	PR-LynnCTBerm	4565.60	28.37	40.61	31.50	40.65	0.000074	1.66	3079.73	389.50	0.09
Mainstem	7095	PR-LynnBerm+Bend	4565.60	28.37	40.61	31.50	40.65	0.000074	1.66	3079.73	389.50	0.09
Mainstem	7095	PR-LynnCTBerm	7073.90	28.37	42.76	32.28	42.82	0.000087	2.02	4797.66	792.80	0.10
Mainstem	7095	PR-LynnBerm+Bend	7073.90	28.37	42.76	32.28	42.82	0.000087	2.02	4797.66	792.80	0.10
Mainstem	6923	PR-LynnCTBerm	4565.60	27.27	40.48	32.61	40.62	0.000262	3.24	1884.97	265.20	0.16
Mainstem	6923	PR-LynnBerm+Bend	4565.60	27.27	40.48	32.61	40.62	0.000262	3.24	1884.97	265.20	0.16
Mainstem	6923	PR-LynnCTBerm	7073.90	27.27	42.58	33.84	42.78	0.000327	4.02	2533.18	324.68	0.19
Mainstem	6923	PR-LynnBerm+Bend	7073.90	27.27	42.58	33.84	42.78	0.000327	4.02	2533.18	324.68	0.19
Mainstem	6907	PR-LynnCTBerm	4565.60	29.15	40.36	34.94	40.60	0.001101	4.50	1316.85	218.15	0.25

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	6907	PR-LynnBerm+Bend	4565.60	29.15	40.36	34.94	40.60	0.001101	4.50	1316.85	218.15	0.25
Mainstem	6907	PR-LynnCTBerm	7073.90	29.15	42.43	36.15	42.75	0.001216	5.37	1803.67	263.42	0.27
Mainstem	6907	PR-LynnBerm+Bend	7073.90	29.15	42.43	36.15	42.75	0.001216	5.37	1803.67	263.42	0.27
Mainstem	6850	PR-LynnCTBerm	4679.10	27.98	40.16	33.83	40.53	0.001161	5.13	1070.81	142.88	0.27
Mainstem	6850	PR-LynnBerm+Bend	4679.10	27.98	40.16	33.83	40.53	0.001161	5.13	1070.81	142.88	0.27
Mainstem	6850	PR-LynnCTBerm	7294.20	27.98	42.07	35.53	42.65	0.001553	6.58	1378.41	185.91	0.32
Mainstem	6850	PR-LynnBerm+Bend	7294.20	27.98	42.07	35.53	42.65	0.001553	6.58	1378.41	185.91	0.32
Mainstem	6777	PR-LynnCTBerm	4679.10	26.59	40.15	32.63	40.45	0.000406	4.72	1142.35	119.24	0.23
Mainstem	6777	PR-LynnBerm+Bend	4679.10	26.59	40.15	32.63	40.45	0.000406	4.72	1142.35	119.24	0.23
Mainstem	6777	PR-LynnCTBerm	7294.20	26.59	42.05	34.48	42.54	0.000568	6.12	1373.74	124.09	0.28
Mainstem	6777	PR-LynnBerm+Bend	7294.20	26.59	42.05	34.48	42.54	0.000568	6.12	1373.74	124.09	0.28
Mainstem	6719.5		Bridge									
Mainstem	6661	PR-LynnCTBerm	4679.10	26.31	39.38	32.29	39.68	0.000428	4.83	1130.51	117.24	0.24
Mainstem	6661	PR-LynnBerm+Bend	4679.10	26.31	39.38	32.29	39.68	0.000428	4.83	1130.51	117.24	0.24
Mainstem	6661	PR-LynnCTBerm	7294.20	26.31	41.92	33.93	42.37	0.000519	6.00	1441.54	127.29	0.27
Mainstem	6661	PR-LynnBerm+Bend	7294.20	26.31	41.92	33.93	42.37	0.000519	6.00	1441.54	127.29	0.27
Mainstem	6584	PR-LynnCTBerm	4679.10	26.10	39.11	32.84	39.58	0.000729	6.22	1281.30	222.19	0.31
Mainstem	6584	PR-LynnBerm+Bend	4679.10	26.10	39.11	32.84	39.58	0.000729	6.22	1281.30	222.19	0.31
Mainstem	6584	PR-LynnCTBerm	7294.20	26.10	41.65	34.80	42.27	0.000808	7.40	1865.73	238.14	0.33
Mainstem	6584	PR-LynnBerm+Bend	7294.20	26.10	41.65	34.80	42.27	0.000808	7.40	1865.73	238.14	0.33
Mainstem	6348	PR-LynnCTBerm	4679.10	26.00	38.81	32.94	39.37	0.000849	6.53	1241.63	383.09	0.33
Mainstem	6348	PR-LynnBerm+Bend	4679.10	26.00	38.81	32.94	39.37	0.000849	6.53	1241.63	383.09	0.33
Mainstem	6348	PR-LynnCTBerm	7294.20	26.00	41.48	35.35	42.08	0.000795	7.20	2327.81	662.25	0.33
Mainstem	6348	PR-LynnBerm+Bend	7294.20	26.00	41.48	35.35	42.08	0.000795	7.20	2327.81	662.25	0.33
Mainstem	6145	PR-LynnCTBerm	4679.10	25.53	39.14	32.72	39.17	0.000093	2.23	6625.42	961.67	0.11
Mainstem	6145	PR-LynnBerm+Bend	4679.10	25.53	39.14	32.72	39.17	0.000093	2.23	6625.42	961.67	0.11
Mainstem	6145	PR-LynnCTBerm	7294.20	25.53	41.84	34.67	41.87	0.000089	2.47	9426.40	1177.17	0.11
Mainstem	6145	PR-LynnBerm+Bend	7294.20	25.53	41.84	34.67	41.87	0.000089	2.47	9426.40	1177.17	0.11
Mainstem	5950	PR-LynnCTBerm	4679.10	25.27	39.11	34.03	39.15	0.000123	2.64	5969.61	865.39	0.13
Mainstem	5950	PR-LynnBerm+Bend	4679.10	25.27	39.11	34.03	39.15	0.000123	2.64	5969.61	865.39	0.13
Mainstem	5950	PR-LynnCTBerm	7294.20	25.27	41.81	35.18	41.85	0.000112	2.84	8566.41	1114.45	0.13
Mainstem	5950	PR-LynnBerm+Bend	7294.20	25.27	41.81	35.18	41.85	0.000112	2.84	8566.41	1114.45	0.13
Mainstem	5753	PR-LynnCTBerm	4679.10	25.00	38.78	35.00	39.07	0.000642	5.95	2382.76	596.13	0.29
Mainstem	5753	PR-LynnBerm+Bend	4679.10	25.00	38.78	35.00	39.07	0.000642	5.95	2382.76	596.13	0.29
Mainstem	5753	PR-LynnCTBerm	7294.20	25.00	41.56	37.15	41.79	0.000490	5.91	4457.70	978.90	0.26
Mainstem	5753	PR-LynnBerm+Bend	7294.20	25.00	41.56	37.15	41.79	0.000490	5.91	4457.70	978.90	0.26
Mainstem	5553	PR-LynnCTBerm	4679.10	24.72	38.93	32.79	38.96	0.000090	2.29	5782.37	750.54	0.11
Mainstem	5553	PR-LynnBerm+Bend	4679.10	24.72	38.93	32.79	38.96	0.000090	2.29	5782.37	750.54	0.11
Mainstem	5553	PR-LynnCTBerm	7294.20	24.72	41.67	33.47	41.70	0.000084	2.50	8518.96	1379.79	0.11
Mainstem	5553	PR-LynnBerm+Bend	7294.20	24.72	41.67	33.47	41.70	0.000084	2.50	8518.96	1379.79	0.11
Mainstem	5330	PR-LynnCTBerm	4679.10	23.16	38.92	31.08	38.94	0.000067	2.07	6130.99	828.86	0.09
Mainstem	5330	PR-LynnBerm+Bend	4679.10	23.16	38.92	31.08	38.94	0.000067	2.07	6130.99	828.86	0.09
Mainstem	5330	PR-LynnCTBerm	7294.20	23.16	41.66	32.45	41.68	0.000066	2.30	9289.88	1416.98	0.10
Mainstem	5330	PR-LynnBerm+Bend	7294.20	23.16	41.66	32.45	41.68	0.000066	2.30	9289.88	1416.98	0.10
Mainstem	5107	PR-LynnCTBerm	4679.10	22.72	38.72	32.04	38.89	0.000296	4.50	3124.47	768.09	0.20
Mainstem	5107	PR-LynnBerm+Bend	4679.10	22.72	38.72	32.04	38.89	0.000296	4.50	3124.47	768.09	0.20
Mainstem	5107	PR-LynnCTBerm	7294.20	22.72	41.49	33.99	41.64	0.000257	4.68	5433.53	1396.58	0.19
Mainstem	5107	PR-LynnBerm+Bend	7294.20	22.72	41.49	33.99	41.64	0.000257	4.68	5433.53	1396.58	0.19
Mainstem	4848	PR-LynnCTBerm	4679.10	23.30	38.17	30.63	38.74	0.000653	6.41	1047.95	332.64	0.30
Mainstem	4848	PR-LynnBerm+Bend	4679.10	23.30	38.17	30.63	38.74	0.000653	6.41	1047.95	332.64	0.30
Mainstem	4848	PR-LynnCTBerm	7294.20	23.30	40.61	32.97	41.46	0.000838	8.05	1573.65	585.30	0.35
Mainstem	4848	PR-LynnBerm+Bend	7294.20	23.30	40.61	32.97	41.46	0.000838	8.05	1573.65	585.30	0.35
Mainstem	4791	PR-LynnCTBerm	4679.10	22.67	37.58	31.06	38.57	0.001370	8.39	657.49	74.76	0.39
Mainstem	4791	PR-LynnBerm+Bend	4679.10	22.67	37.58	31.06	38.57	0.001370	8.39	657.49	74.76	0.39
Mainstem	4791	PR-LynnCTBerm	7294.20	22.67	39.13	33.65	41.05	0.002384	11.84	906.06	215.62	0.52
Mainstem	4791	PR-LynnBerm+Bend	7294.20	22.67	39.13	33.65	41.05	0.002384	11.84	906.06	215.62	0.52
Mainstem	4740.5		Bridge									
Mainstem	4689	PR-LynnCTBerm	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	PR-LynnBerm+Bend	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	PR-LynnCTBerm	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4689	PR-LynnBerm+Bend	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4618	PR-LynnCTBerm	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	PR-LynnBerm+Bend	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	PR-LynnCTBerm	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4618	PR-LynnBerm+Bend	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	4350	PR-LynnCTBerm	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	PR-LynnBerm+Bend	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	PR-LynnCTBerm	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4350	PR-LynnBerm+Bend	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4114	PR-LynnCTBerm	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	PR-LynnBerm+Bend	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	PR-LynnCTBerm	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4114	PR-LynnBerm+Bend	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4071	PR-LynnCTBerm	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	PR-LynnBerm+Bend	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	PR-LynnCTBerm	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	4071	PR-LynnBerm+Bend	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	3967.5		Culvert									
Mainstem	3864	PR-LynnCTBerm	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	PR-LynnBerm+Bend	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	PR-LynnCTBerm	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3864	PR-LynnBerm+Bend	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3752	PR-LynnCTBerm	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	PR-LynnBerm+Bend	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	PR-LynnCTBerm	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.86	253.85	0.57
Mainstem	3752	PR-LynnBerm+Bend	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.86	253.85	0.57
Mainstem	3536	PR-LynnCTBerm	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	PR-LynnBerm+Bend	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	PR-LynnCTBerm	7501.30	11.96	23.93		27.54	0.008493	15.85	585.57	69.87	0.82
Mainstem	3536	PR-LynnBerm+Bend	7501.30	11.96	23.93		27.54	0.008493	15.85	585.57	69.87	0.82
Mainstem	3386	PR-LynnCTBerm	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	PR-LynnBerm+Bend	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	PR-LynnCTBerm	7501.30	11.16	23.53		26.17	0.006190	13.84	697.31	74.77	0.71
Mainstem	3386	PR-LynnBerm+Bend	7501.30	11.16	23.53		26.17	0.006190	13.84	697.31	74.77	0.71
Mainstem	3183	PR-LynnCTBerm	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	PR-LynnBerm+Bend	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	PR-LynnCTBerm	7501.30	10.65	24.59	20.00	25.07	0.001126	7.27	2821.40	710.15	0.35
Mainstem	3183	PR-LynnBerm+Bend	7501.30	10.65	24.59	20.00	25.07	0.001126	7.27	2821.40	710.15	0.35
Mainstem	2954	PR-LynnCTBerm	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	PR-LynnBerm+Bend	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	PR-LynnCTBerm	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.76	855.25	0.18
Mainstem	2954	PR-LynnBerm+Bend	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.76	855.25	0.18
Mainstem	2752	PR-LynnCTBerm	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	PR-LynnBerm+Bend	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	PR-LynnCTBerm	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.78	973.69	0.05
Mainstem	2752	PR-LynnBerm+Bend	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.78	973.69	0.05
Mainstem	2495	PR-LynnCTBerm	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	PR-LynnBerm+Bend	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	PR-LynnCTBerm	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.93	891.20	0.06
Mainstem	2495	PR-LynnBerm+Bend	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.93	891.20	0.06
Mainstem	2232	PR-LynnCTBerm	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	PR-LynnBerm+Bend	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	PR-LynnCTBerm	7581.10	8.17	24.61		24.77	0.000175	4.16	3717.32	423.41	0.18
Mainstem	2232	PR-LynnBerm+Bend	7581.10	8.17	24.61		24.77	0.000175	4.16	3717.32	423.41	0.18
Mainstem	1978	PR-LynnCTBerm	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	PR-LynnBerm+Bend	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	PR-LynnCTBerm	7581.10	6.57	23.63		24.61	0.000806	8.83	1620.11	279.50	0.39
Mainstem	1978	PR-LynnBerm+Bend	7581.10	6.57	23.63		24.61	0.000806	8.83	1620.11	279.50	0.39
Mainstem	1724	PR-LynnCTBerm	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	PR-LynnBerm+Bend	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	PR-LynnCTBerm	7581.10	6.66	23.72		24.32	0.000568	7.46	2048.06	317.27	0.33
Mainstem	1724	PR-LynnBerm+Bend	7581.10	6.66	23.72		24.32	0.000568	7.46	2048.06	317.27	0.33
Mainstem	1544	PR-LynnCTBerm	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	PR-LynnBerm+Bend	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	PR-LynnCTBerm	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.66	354.04	0.24
Mainstem	1544	PR-LynnBerm+Bend	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.66	354.04	0.24
Mainstem	1335	PR-LynnCTBerm	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	PR-LynnBerm+Bend	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	PR-LynnCTBerm	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.80	522.32	0.27
Mainstem	1335	PR-LynnBerm+Bend	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.80	522.32	0.27

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	1260	PR-LynnCTBerm	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	PR-LynnBerm+Bend	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	PR-LynnCTBerm	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2106.13	532.07	0.24
Mainstem	1260	PR-LynnBerm+Bend	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2106.13	532.07	0.24
Mainstem	1066.5		Mult Open									
Mainstem	872	PR-LynnCTBerm	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	PR-LynnBerm+Bend	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	PR-LynnCTBerm	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	872	PR-LynnBerm+Bend	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	811	PR-LynnCTBerm	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	PR-LynnBerm+Bend	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	PR-LynnCTBerm	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.92	372.84	0.24
Mainstem	811	PR-LynnBerm+Bend	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.92	372.84	0.24
Mainstem	631	PR-LynnCTBerm	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	PR-LynnBerm+Bend	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	PR-LynnCTBerm	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	631	PR-LynnBerm+Bend	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	434	PR-LynnCTBerm	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	PR-LynnBerm+Bend	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	PR-LynnCTBerm	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	434	PR-LynnBerm+Bend	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	334	PR-LynnCTBerm	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	PR-LynnBerm+Bend	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	PR-LynnCTBerm	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	334	PR-LynnBerm+Bend	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	250.5		Bridge									
Mainstem	208	PR-LynnCTBerm	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	PR-LynnBerm+Bend	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	PR-LynnCTBerm	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	208	PR-LynnBerm+Bend	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	108	PR-LynnCTBerm	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	PR-LynnBerm+Bend	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	PR-LynnCTBerm	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	108	PR-LynnBerm+Bend	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	0	PR-LynnCTBerm	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	PR-LynnBerm+Bend	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	PR-LynnCTBerm	7581.10	-2.11	7.01	5.63	8.51	0.004601	9.89	794.74	162.10	0.69
Mainstem	0	PR-LynnBerm+Bend	7581.10	-2.11	7.01	5.63	8.51	0.004601	9.89	794.74	162.10	0.69

APPENDIX L5: ALTERNATIVE 5 HEC-RAS RESULTS

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5	Bridge									
Mainstem	24442	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5	Bridge									
Mainstem	23022	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22556.5	Bridge									
Mainstem	22534	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	21964	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21655	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5	Bridge									
Mainstem	21617	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	19972	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19666	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19414	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19164	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	18991	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18922	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18874.5	Bridge									
Mainstem	18826	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18523	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	3609.60	74.31	83.96		84.84	0.006070	10.99	799.66	288.06	0.64
Mainstem	17851	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.56	409.85	0.47
Mainstem	17701	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.74	414.47	0.36

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	17499	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.62	440.42	0.29
Mainstem	17410	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	4665.70	72.24	81.92		82.56	0.002558	7.08	840.95	141.19	0.42
Mainstem	17133	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	4665.70	70.91	81.58		81.94	0.002111	7.30	1284.37	252.92	0.40
Mainstem	16900	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	4665.70	68.04	79.96		80.98	0.003311	10.66	765.88	149.34	0.56
Mainstem	16568	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	4665.70	66.78	79.16		80.26	0.003307	11.14	859.51	171.92	0.58
Mainstem	16345	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16072	4665.70	65.43	75.99	75.99	78.74	0.008290	15.83	481.23	84.82	0.87
Mainstem	16072	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	4665.70	64.27	73.56	72.79	75.21	0.006385	11.39	583.79	173.28	0.67
Mainstem	15834	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	4665.70	63.25	74.42	71.34	74.55	0.000587	4.96	1845.07	464.43	0.27
Mainstem	15688	7157.70	63.25	75.55	72.20	75.75	0.000764	6.05	2309.22	493.16	0.31
Mainstem	15610	4665.70	62.35	74.27	71.54	74.49	0.001052	6.92	1739.92	649.73	0.36
Mainstem	15610	7157.70	62.35	75.41	72.78	75.68	0.001212	7.92	2489.43	654.24	0.39
Mainstem	15527	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.41	783.03	0.29
Mainstem	15527	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15490.5	Bridge									
Mainstem	15454	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.89	562.22	0.28
Mainstem	15454	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15361	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.22	811.82	0.16
Mainstem	15361	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15105	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.29	585.10	0.09
Mainstem	15105	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	14870	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.37	526.57	0.09
Mainstem	14870	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14599	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.84	577.15	0.12
Mainstem	14599	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14501	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.70	948.11	0.18
Mainstem	14501	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14462.5	Bridge									
Mainstem	14423	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.08	0.50
Mainstem	14423	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14341	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93
Mainstem	14187	4457.20	54.84	62.69	64.65	68.06	0.019264	20.02	330.43	134.28	1.38
Mainstem	14187	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	13988	4457.20	53.07	64.79	57.62	65.00	0.000342	3.96	1675.48	469.25	0.21
Mainstem	13988	7035.70	53.07	66.91	59.18	67.14	0.000342	4.43	2967.97	717.63	0.21
Mainstem	13825	4457.20	51.75	64.13	58.49	64.85	0.001254	7.06	891.88	464.90	0.36

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13825	7035.70	51.75	66.58	60.87	67.03	0.000850	6.57	2372.88	823.97	0.31
Mainstem	13767	4457.20	51.27	63.44	59.11	64.63	0.002031	8.82	599.54	354.59	0.47
Mainstem	13767	7035.70	51.27	63.87	61.54	66.34	0.004142	12.93	799.47	561.77	0.67
Mainstem	13742	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	11770	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4946.87	827.66	0.09
Mainstem	10928	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	7035.70	35.47	46.12		46.19	0.000234	2.64	4778.74	1032.79	0.16
Mainstem	10846	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	7035.70	35.49	45.98		46.13	0.001099	5.92	3818.34	1171.09	0.35
Mainstem	10499	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	7035.70	36.19	45.42		45.74	0.001948	7.66	2579.91	772.24	0.47
Mainstem	10364	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	7073.90	35.16	44.98		45.49	0.002845	9.51	2240.47	720.94	0.56
Mainstem	10120	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	7073.90	33.73	44.59		44.88	0.001703	7.15	2977.57	1068.25	0.40
Mainstem	9864	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	7073.90	32.30	44.36		44.55	0.001022	5.98	3310.24	856.18	0.32
Mainstem	9606	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	7073.90	31.73	44.20		44.32	0.000653	4.93	4095.37	928.86	0.25
Mainstem	9350	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	7073.90	31.17	44.18		44.22	0.000177	3.07	6749.47	1180.90	0.15
Mainstem	9095	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	7073.90	28.97	43.24		44.01	0.002759	9.68	2376.07	914.81	0.47

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	8837	4565.60	30.03	41.31	37.67	41.45	0.000608	4.91	3250.20	923.54	0.27
Mainstem	8837	7073.90	30.03	43.51	39.01	43.61	0.000441	4.76	5609.50	1186.13	0.24
Mainstem	8593	4565.60	27.59	41.33	40.13	41.36	0.000153	2.76	3933.68	872.35	0.14
Mainstem	8593	7073.90	27.59	43.52	40.13	43.55	0.000122	2.75	6356.50	1338.32	0.13
Mainstem	8351	4565.60	29.43	40.30		41.20	0.001544	8.47	939.88	220.12	0.46
Mainstem	8351	7073.90	29.43	42.53		43.40	0.001385	9.12	1898.20	1080.73	0.45
Mainstem	8130	4565.60	28.78	40.69		40.86	0.000258	3.54	1684.32	272.23	0.19
Mainstem	8130	7073.90	28.78	42.83		43.09	0.000310	4.37	2819.19	870.11	0.21
Mainstem	7925	4565.60	28.66	40.56		40.80	0.000340	4.04	1429.50	245.35	0.22
Mainstem	7925	7073.90	28.66	42.66		43.00	0.000405	4.97	1982.12	269.21	0.24
Mainstem	7717	4565.60	28.54	40.63		40.71	0.000114	2.37	2275.69	314.92	0.13
Mainstem	7717	7073.90	28.54	42.77		42.89	0.000140	2.96	3137.66	548.97	0.14
Mainstem	7512	4565.60	28.62	40.65	31.83	40.68	0.000044	1.46	3566.66	590.33	0.08
Mainstem	7512	7073.90	28.62	42.81	32.53	42.85	0.000053	1.80	4940.35	771.55	0.09
Mainstem	7307	4565.60	28.49	40.64	31.69	40.67	0.000063	1.32	3702.17	462.45	0.07
Mainstem	7307	7073.90	28.49	42.80	32.37	42.84	0.000066	1.52	6689.85	1102.88	0.07
Mainstem	7095	4565.60	28.37	40.61	31.50	40.65	0.000074	1.66	3079.73	389.50	0.09
Mainstem	7095	7073.90	28.37	42.76	32.28	42.82	0.000087	2.02	4797.66	792.80	0.10
Mainstem	6923	4565.60	27.27	40.48	32.61	40.62	0.000262	3.24	1884.97	265.20	0.16
Mainstem	6923	7073.90	27.27	42.58	33.84	42.78	0.000327	4.02	2533.18	324.68	0.19
Mainstem	6907	4565.60	29.15	40.36	34.94	40.60	0.001101	4.50	1316.85	218.15	0.25
Mainstem	6907	7073.90	29.15	42.43	36.15	42.75	0.001216	5.37	1803.67	263.42	0.27
Mainstem	6850	4679.10	27.98	40.16	33.83	40.53	0.001161	5.13	1070.81	142.88	0.27
Mainstem	6850	7294.20	27.98	42.07	35.53	42.65	0.001553	6.58	1378.41	185.91	0.32
Mainstem	6777	4679.10	26.59	40.15	32.63	40.45	0.000406	4.72	1142.35	119.24	0.23
Mainstem	6777	7294.20	26.59	42.05	34.48	42.54	0.000568	6.12	1373.74	124.09	0.28
Mainstem	6719.5	Bridge									
Mainstem	6661	4679.10	26.31	39.38	32.29	39.68	0.000428	4.83	1130.51	117.24	0.24
Mainstem	6661	7294.20	26.31	41.92	33.93	42.37	0.000519	6.00	1441.54	127.29	0.27
Mainstem	6584	4679.10	26.10	39.11	32.84	39.58	0.000729	6.22	1281.30	222.19	0.31
Mainstem	6584	7294.20	26.10	41.65	34.80	42.27	0.000808	7.40	1865.73	238.14	0.33
Mainstem	6348	4679.10	26.00	38.81	32.94	39.37	0.000849	6.53	1241.63	383.09	0.33
Mainstem	6348	7294.20	26.00	41.48	35.35	42.08	0.000795	7.20	2327.81	662.25	0.33
Mainstem	6145	4679.10	25.53	39.14	32.72	39.17	0.000093	2.23	6625.42	961.67	0.11
Mainstem	6145	7294.20	25.53	41.84	34.67	41.87	0.000089	2.47	9426.40	1177.17	0.11
Mainstem	5950	4679.10	25.27	39.11	34.03	39.15	0.000123	2.64	5969.61	865.39	0.13
Mainstem	5950	7294.20	25.27	41.81	35.18	41.85	0.000112	2.84	8566.41	1114.45	0.13
Mainstem	5753	4679.10	25.00	38.78	35.00	39.07	0.000642	5.95	2382.76	596.13	0.29
Mainstem	5753	7294.20	25.00	41.56	37.15	41.79	0.000490	5.91	4457.70	978.90	0.26
Mainstem	5553	4679.10	24.72	38.93	32.79	38.96	0.000090	2.29	5782.37	750.54	0.11
Mainstem	5553	7294.20	24.72	41.67	33.47	41.70	0.000084	2.50	8518.96	1379.79	0.11
Mainstem	5330	4679.10	23.16	38.92	31.08	38.94	0.000067	2.07	6130.99	828.86	0.09
Mainstem	5330	7294.20	23.16	41.66	32.45	41.68	0.000066	2.30	9289.88	1416.98	0.10
Mainstem	5107	4679.10	22.72	38.72	32.04	38.89	0.000296	4.50	3124.47	768.09	0.20

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	5107	7294.20	22.72	41.49	33.99	41.64	0.000257	4.68	5433.53	1396.58	0.19
Mainstem	4848	4679.10	23.30	38.17	30.63	38.74	0.000653	6.41	1047.95	332.64	0.30
Mainstem	4848	7294.20	23.30	40.61	32.97	41.46	0.000838	8.05	1573.65	585.30	0.35
Mainstem	4791	4679.10	22.67	37.58	31.06	38.57	0.001370	8.39	657.49	74.76	0.39
Mainstem	4791	7294.20	22.67	39.13	33.65	41.05	0.002384	11.84	906.06	215.62	0.52
Mainstem	4740.5	Bridge									
Mainstem	4689	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4618	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4350	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4114	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4071	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	3967.5	Culvert									
Mainstem	3864	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3752	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.86	253.85	0.57
Mainstem	3536	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	7501.30	11.96	23.93		27.54	0.008493	15.85	585.57	69.87	0.82
Mainstem	3386	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	7501.30	11.16	23.53		26.17	0.006190	13.84	697.31	74.77	0.71
Mainstem	3183	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	7501.30	10.65	24.59	20.00	25.07	0.001126	7.27	2821.40	710.15	0.35
Mainstem	2954	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.76	855.25	0.18
Mainstem	2752	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.78	973.69	0.05
Mainstem	2495	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.93	891.20	0.06
Mainstem	2232	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	7581.10	8.17	24.61		24.77	0.000175	4.16	3717.32	423.41	0.18
Mainstem	1978	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	7581.10	6.57	23.63		24.61	0.000806	8.83	1620.11	279.50	0.39
Mainstem	1724	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	7581.10	6.66	23.72		24.32	0.000568	7.46	2048.06	317.27	0.33
Mainstem	1544	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.66	354.04	0.24
Mainstem	1335	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.80	522.32	0.27
Mainstem	1260	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32

HEC-RAS Plan: PR-Dam River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	1260	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2106.13	532.07	0.24
Mainstem	1066.5	Mult Open									
Mainstem	872	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	811	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.92	372.84	0.24
Mainstem	631	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	434	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	334	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	250.5	Bridge									
Mainstem	208	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	108	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	0	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	7581.10	-2.11	7.01	5.63	8.51	0.004601	9.89	794.74	162.10	0.69

APPENDIX L6- ALTERNATIVE 6 HEC-RAS RESULTS

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5	Bridge									
Mainstem	24442	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5	Bridge									
Mainstem	23022	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22556.5	Bridge									
Mainstem	22534	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	21964	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	21655	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5	Bridge									
Mainstem	21617	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.58	428.66	0.35
Mainstem	19972	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.11	310.56	0.32
Mainstem	19666	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.13	192.53	0.41
Mainstem	19414	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.32	300.65	0.30
Mainstem	19164	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.42	387.12	0.18
Mainstem	18991	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.55	655.76	0.18
Mainstem	18922	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.57	645.61	0.28
Mainstem	18874.5	Bridge									
Mainstem	18826	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	5525.20	76.78	88.00	87.65	89.25	0.003379	11.84	1031.63	269.81	0.66
Mainstem	18753	3609.60	78.85	87.06	85.86	87.32	0.002763	6.74	1136.99	349.32	0.42
Mainstem	18753	5525.20	78.85	88.27		88.54	0.002462	7.00	1565.22	359.60	0.41
Mainstem	18523	3609.60	77.67	86.73		86.85	0.001544	4.71	1474.81	334.53	0.28
Mainstem	18523	5525.20	77.67	87.91		88.07	0.001790	5.52	1904.74	385.19	0.31
Mainstem	18298	3609.60	76.58	86.03		86.46	0.002893	7.56	1016.95	339.93	0.44
Mainstem	18298	5525.20	76.58	87.21		87.66	0.002983	8.33	1496.51	475.87	0.46
Mainstem	18102	3609.60	75.57	85.34		85.87	0.002930	7.80	1105.25	462.89	0.45
Mainstem	18102	5525.20	75.57	86.68		87.11	0.002491	7.88	1760.81	509.62	0.43
Mainstem	17851	3609.60	74.31	83.97		84.84	0.006070	10.99	799.67	288.06	0.64
Mainstem	17851	5525.20	74.31	85.75		86.34	0.004077	10.15	1424.06	395.76	0.54
Mainstem	17701	3609.60	73.56	83.42	82.67	83.95	0.004509	8.10	1007.62	409.86	0.47
Mainstem	17701	5525.20	73.56	85.52	83.49	85.79	0.002285	6.62	2038.10	569.30	0.35
Mainstem	17499	3609.60	72.55	83.00	81.00	83.35	0.001766	6.40	1426.82	414.47	0.36

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	17499	5525.20	72.55	85.15	82.04	85.44	0.001336	6.35	2344.90	441.03	0.32
Mainstem	17410	3609.60	72.33	82.99	81.23	83.14	0.001660	5.29	1636.70	440.42	0.29
Mainstem	17410	5525.20	72.33	85.17	81.67	85.28	0.001017	4.69	2599.96	441.76	0.23
Mainstem	17133	4665.70	72.24	81.92		82.57	0.002558	7.08	840.99	141.19	0.42
Mainstem	17133	7157.70	72.24	83.99		84.81	0.002571	8.17	1167.56	176.90	0.44
Mainstem	16900	4665.70	70.91	81.58		81.94	0.002110	7.30	1284.47	252.92	0.40
Mainstem	16900	7157.70	70.91	83.83		84.19	0.001702	7.46	1871.74	270.41	0.37
Mainstem	16568	4665.70	68.04	79.96		80.98	0.003309	10.66	766.05	149.37	0.56
Mainstem	16568	7157.70	68.04	82.36		83.38	0.002888	11.34	1232.30	211.98	0.54
Mainstem	16345	4665.70	66.78	79.16		80.26	0.003305	11.14	859.82	171.98	0.58
Mainstem	16345	7157.70	66.78	81.92		82.78	0.002300	10.72	1420.75	216.30	0.50
Mainstem	16072	4665.70	65.43	75.98	75.98	78.74	0.008304	15.84	480.90	84.82	0.87
Mainstem	16072	7157.70	65.43	77.87	77.87	81.40	0.009083	18.54	643.85	87.85	0.94
Mainstem	15834	4665.70	64.27	71.41	72.79	75.65	0.020841	17.20	331.58	92.37	1.15
Mainstem	15834	7157.70	64.27	72.87	74.61	78.09	0.021533	19.85	491.91	150.74	1.21
Mainstem	15688	4665.70	63.25	73.75	71.34	73.94	0.000883	5.83	1577.78	457.47	0.32
Mainstem	15688	7157.70	63.25	74.92	72.20	75.17	0.001049	6.84	2044.52	466.96	0.36
Mainstem	15610	4665.70	62.35	73.38	71.54	73.83	0.001910	8.84	1145.19	438.15	0.48
Mainstem	15610	7157.70	62.35	74.65	72.78	75.06	0.001931	9.58	1987.47	651.18	0.49
Mainstem	15527	4665.70	62.29	73.19	72.11	73.67	0.001756	7.52	1473.66	646.96	0.40
Mainstem	15527	7157.70	62.29	74.47	73.10	74.90	0.001641	7.83	2395.19	787.18	0.40
Mainstem	15490.5	Bridge									
Mainstem	15454	4665.70	62.24	72.53	72.53	73.39	0.004461	9.93	1168.73	523.43	0.56
Mainstem	15454	7157.70	62.24	74.47	73.18	74.81	0.002005	7.50	2226.08	569.19	0.38
Mainstem	15361	4665.70	60.17	70.18	70.90	72.36	0.013624	15.91	721.24	506.44	0.91
Mainstem	15361	7157.70	60.17	74.48	71.49	74.59	0.000739	4.75	3216.68	821.66	0.23
Mainstem	15105	4665.70	58.44	69.96	68.50	70.15	0.001226	5.67	1803.69	523.19	0.30
Mainstem	15105	7157.70	58.44	74.42	69.09	74.47	0.000227	3.05	4292.13	589.50	0.14
Mainstem	14870	4665.70	58.59	69.79	67.31	69.92	0.000720	4.89	2024.27	467.56	0.26
Mainstem	14870	7157.70	58.59	74.37	68.07	74.43	0.000182	3.11	4318.93	529.77	0.14
Mainstem	14599	4665.70	57.26	69.21	67.85	69.66	0.001284	7.56	1522.21	469.68	0.40
Mainstem	14599	7157.70	57.26	74.29	68.86	74.38	0.000216	3.99	4279.50	579.50	0.17
Mainstem	14501	4457.20	56.90	68.52	64.47	69.37	0.002404	7.84	705.68	363.34	0.43
Mainstem	14501	7035.70	56.90	74.28	66.90	74.34	0.000207	3.08	5376.86	963.52	0.13
Mainstem	14462.5	Bridge									
Mainstem	14423	4457.20	56.64	66.03	64.60	68.38	0.004845	12.60	388.32	51.82	0.74
Mainstem	14423	7035.70	56.64	67.10	67.10	71.66	0.008127	17.60	444.39	164.94	0.98
Mainstem	14341	4457.20	56.33	65.81	63.73	67.53	0.009827	10.51	424.52	57.12	0.67
Mainstem	14341	7035.70	56.33	65.04	66.14	70.30	0.032114	18.41	382.22	53.22	1.21
Mainstem	14187	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	7035.70	54.84	65.89	65.89	67.72	0.005549	14.00	1018.66	293.00	0.79
Mainstem	13988	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	13825	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13767	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13752.5	Inl Struct									
Mainstem	13742	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	11770	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11371	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	7035.70	39.42	46.19	44.19	46.23	0.000075	1.24	4946.87	827.66	0.09
Mainstem	10928	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	7035.70	35.47	46.12		46.19	0.000234	2.64	4778.74	1032.79	0.16
Mainstem	10846	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	7035.70	35.49	45.98		46.13	0.001099	5.92	3818.34	1171.09	0.35
Mainstem	10499	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	7035.70	36.19	45.42		45.74	0.001948	7.66	2579.91	772.24	0.47
Mainstem	10364	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	7073.90	35.16	44.98		45.49	0.002845	9.51	2240.47	720.94	0.56
Mainstem	10120	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	7073.90	33.73	44.59		44.88	0.001703	7.15	2977.57	1068.25	0.40
Mainstem	9864	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	7073.90	32.30	44.36		44.55	0.001022	5.98	3310.24	856.18	0.32
Mainstem	9606	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	7073.90	31.73	44.20		44.32	0.000653	4.93	4095.37	928.86	0.25
Mainstem	9350	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	7073.90	31.17	44.18		44.22	0.000177	3.07	6749.47	1180.90	0.15

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	9095	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	7073.90	28.97	43.24		44.01	0.002759	9.68	2376.07	914.81	0.47
Mainstem	8837	4565.60	30.03	41.31	37.67	41.45	0.000608	4.91	3250.20	923.54	0.27
Mainstem	8837	7073.90	30.03	43.51	39.01	43.61	0.000441	4.76	5609.50	1186.13	0.24
Mainstem	8593	4565.60	27.59	41.33	40.13	41.36	0.000153	2.76	3933.68	872.35	0.14
Mainstem	8593	7073.90	27.59	43.52	40.13	43.55	0.000122	2.75	6356.50	1338.32	0.13
Mainstem	8351	4565.60	29.43	40.30		41.20	0.001544	8.47	939.88	220.12	0.46
Mainstem	8351	7073.90	29.43	42.53		43.40	0.001385	9.12	1898.20	1080.73	0.45
Mainstem	8130	4565.60	28.78	40.69		40.86	0.000258	3.54	1684.32	272.23	0.19
Mainstem	8130	7073.90	28.78	42.83		43.09	0.000310	4.37	2819.19	870.11	0.21
Mainstem	7925	4565.60	28.66	40.56		40.80	0.000340	4.04	1429.50	245.35	0.22
Mainstem	7925	7073.90	28.66	42.66		43.00	0.000405	4.97	1982.12	269.21	0.24
Mainstem	7717	4565.60	28.54	40.63		40.71	0.000114	2.37	2275.69	314.92	0.13
Mainstem	7717	7073.90	28.54	42.77		42.89	0.000140	2.96	3137.66	548.97	0.14
Mainstem	7512	4565.60	28.62	40.65	31.83	40.68	0.000044	1.46	3566.66	590.33	0.08
Mainstem	7512	7073.90	28.62	42.81	32.53	42.85	0.000053	1.80	4940.35	771.55	0.09
Mainstem	7307	4565.60	28.49	40.64	31.69	40.67	0.000063	1.32	3702.17	462.45	0.07
Mainstem	7307	7073.90	28.49	42.80	32.37	42.84	0.000066	1.52	6689.85	1102.88	0.07
Mainstem	7095	4565.60	28.37	40.61	31.50	40.65	0.000074	1.66	3079.73	389.50	0.09
Mainstem	7095	7073.90	28.37	42.76	32.28	42.82	0.000087	2.02	4797.66	792.80	0.10
Mainstem	6923	4565.60	27.27	40.48	32.61	40.62	0.000262	3.24	1884.97	265.20	0.16
Mainstem	6923	7073.90	27.27	42.58	33.84	42.78	0.000327	4.02	2533.18	324.68	0.19
Mainstem	6907	4565.60	29.15	40.36	34.94	40.60	0.001101	4.50	1316.85	218.15	0.25
Mainstem	6907	7073.90	29.15	42.43	36.15	42.75	0.001216	5.37	1803.67	263.42	0.27
Mainstem	6850	4679.10	27.98	40.16	33.83	40.53	0.001161	5.13	1070.81	142.88	0.27
Mainstem	6850	7294.20	27.98	42.07	35.53	42.65	0.001553	6.58	1378.41	185.91	0.32
Mainstem	6777	4679.10	26.59	40.15	32.63	40.45	0.000406	4.72	1142.35	119.24	0.23
Mainstem	6777	7294.20	26.59	42.05	34.48	42.54	0.000568	6.12	1373.74	124.09	0.28
Mainstem	6719.5	Bridge									
Mainstem	6661	4679.10	26.31	39.38	32.29	39.68	0.000428	4.83	1130.51	117.24	0.24
Mainstem	6661	7294.20	26.31	41.92	33.93	42.37	0.000519	6.00	1441.54	127.29	0.27
Mainstem	6584	4679.10	26.10	39.11	32.84	39.58	0.000729	6.22	1281.30	222.19	0.31
Mainstem	6584	7294.20	26.10	41.65	34.80	42.27	0.000808	7.40	1865.73	238.14	0.33
Mainstem	6348	4679.10	26.00	38.81	32.94	39.37	0.000849	6.53	1241.63	383.09	0.33
Mainstem	6348	7294.20	26.00	41.48	35.35	42.08	0.000795	7.20	2327.81	662.25	0.33
Mainstem	6145	4679.10	25.53	39.14	32.72	39.17	0.000093	2.23	6625.42	961.67	0.11
Mainstem	6145	7294.20	25.53	41.84	34.67	41.87	0.000089	2.47	9426.40	1177.17	0.11
Mainstem	5950	4679.10	25.27	39.11	34.03	39.15	0.000123	2.64	5969.61	865.39	0.13
Mainstem	5950	7294.20	25.27	41.81	35.18	41.85	0.000112	2.84	8566.41	1114.45	0.13
Mainstem	5753	4679.10	25.00	38.78	35.00	39.07	0.000642	5.95	2382.76	596.13	0.29
Mainstem	5753	7294.20	25.00	41.56	37.15	41.79	0.000490	5.91	4457.70	978.90	0.26
Mainstem	5553	4679.10	24.72	38.93	32.79	38.96	0.000090	2.29	5782.37	750.54	0.11
Mainstem	5553	7294.20	24.72	41.67	33.47	41.70	0.000084	2.50	8518.96	1379.79	0.11
Mainstem	5330	4679.10	23.16	38.92	31.08	38.94	0.000067	2.07	6130.99	828.86	0.09
Mainstem	5330	7294.20	23.16	41.66	32.45	41.68	0.000066	2.30	9289.88	1416.98	0.10

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	5107	4679.10	22.72	38.72	32.04	38.89	0.000296	4.50	3124.47	768.09	0.20
Mainstem	5107	7294.20	22.72	41.49	33.99	41.64	0.000257	4.68	5433.53	1396.58	0.19
Mainstem	4848	4679.10	23.30	38.17	30.63	38.74	0.000653	6.41	1047.95	332.64	0.30
Mainstem	4848	7294.20	23.30	40.61	32.97	41.46	0.000838	8.05	1573.65	585.30	0.35
Mainstem	4791	4679.10	22.67	37.58	31.06	38.57	0.001370	8.39	657.49	74.76	0.39
Mainstem	4791	7294.20	22.67	39.13	33.65	41.05	0.002384	11.84	906.06	215.62	0.52
Mainstem	4740.5	Bridge									
Mainstem	4689	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4618	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4350	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4114	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4071	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	3967.5	Culvert									
Mainstem	3864	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3752	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.86	253.85	0.57
Mainstem	3536	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	7501.30	11.96	23.93		27.54	0.008493	15.85	585.57	69.87	0.82
Mainstem	3386	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	7501.30	11.16	23.53		26.17	0.006190	13.84	697.31	74.77	0.71
Mainstem	3183	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	7501.30	10.65	24.59	20.00	25.07	0.001126	7.27	2821.40	710.15	0.35
Mainstem	2954	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.76	855.25	0.18
Mainstem	2752	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.78	973.69	0.05
Mainstem	2495	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.93	891.20	0.06
Mainstem	2232	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	7581.10	8.17	24.61		24.77	0.000175	4.16	3717.32	423.41	0.18
Mainstem	1978	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	7581.10	6.57	23.63		24.61	0.000806	8.83	1620.11	279.50	0.39
Mainstem	1724	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	7581.10	6.66	23.72		24.32	0.000568	7.46	2048.06	317.27	0.33
Mainstem	1544	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.66	354.04	0.24
Mainstem	1335	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.80	522.32	0.27

HEC-RAS Plan: PR- US RR River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	1260	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2106.13	532.07	0.24
Mainstem	1066.5	Mult Open									
Mainstem	872	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	811	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.92	372.84	0.24
Mainstem	631	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	434	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	334	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	250.5	Bridge									
Mainstem	208	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	108	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	0	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	7581.10	-2.11	7.01	5.63	8.51	0.004601	9.89	794.74	162.10	0.69

APPENDIX L7 - ALTERNATIVE 7 HEC-RAS RESULTS

HEC-RAS River: Noroton Reach: Mainstem

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	24704	PR- Chnl US Camp	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	PR-ChnlUSCamp+BR	3609.60	101.25	109.66	106.87	109.70	0.000412	2.64	2399.09	594.54	0.17
Mainstem	24704	PR- Chnl US Camp	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24704	PR-ChnlUSCamp+BR	5525.20	101.25	110.87	107.30	110.92	0.000421	2.94	3196.66	727.18	0.17
Mainstem	24515	PR- Chnl US Camp	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	PR-ChnlUSCamp+BR	3609.60	101.05	109.32	106.78	109.55	0.001577	5.28	986.87	565.58	0.33
Mainstem	24515	PR- Chnl US Camp	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24515	PR-ChnlUSCamp+BR	5525.20	101.05	110.41	107.56	110.75	0.001923	6.34	1237.71	621.33	0.37
Mainstem	24486	PR- Chnl US Camp	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	PR-ChnlUSCamp+BR	3609.60	100.71	109.04	107.56	109.43	0.003223	7.56	789.69	437.26	0.47
Mainstem	24486	PR- Chnl US Camp	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24486	PR-ChnlUSCamp+BR	5525.20	100.71	110.07	108.36	110.61	0.003653	8.74	1014.43	467.23	0.51
Mainstem	24464.5		Bridge									
Mainstem	24442	PR- Chnl US Camp	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	PR-ChnlUSCamp+BR	3609.60	99.46	107.66	107.66	108.86	0.009290	12.36	520.67	340.09	0.79
Mainstem	24442	PR- Chnl US Camp	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24442	PR-ChnlUSCamp+BR	5525.20	99.46	108.51	108.51	109.99	0.010501	14.12	683.14	367.41	0.86
Mainstem	24395	PR- Chnl US Camp	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	PR-ChnlUSCamp+BR	3609.60	99.15	106.77	106.15	107.68	0.007190	10.22	529.14	231.29	0.68
Mainstem	24395	PR- Chnl US Camp	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24395	PR-ChnlUSCamp+BR	5525.20	99.15	108.11	107.06	109.10	0.006437	10.88	763.05	295.20	0.67
Mainstem	24348	PR- Chnl US Camp	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	PR-ChnlUSCamp+BR	3609.60	99.00	106.48		107.38	0.006558	9.70	545.66	145.22	0.65
Mainstem	24348	PR- Chnl US Camp	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	24348	PR-ChnlUSCamp+BR	5525.20	99.00	107.38		108.70	0.008378	11.88	680.14	154.12	0.75
Mainstem	23965	PR- Chnl US Camp	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	PR-ChnlUSCamp+BR	3609.60	97.61	105.72		105.97	0.002057	5.88	1139.67	344.91	0.37
Mainstem	23965	PR- Chnl US Camp	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23965	PR-ChnlUSCamp+BR	5525.20	97.61	106.48		106.84	0.002701	7.18	1404.96	359.87	0.44
Mainstem	23691	PR- Chnl US Camp	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	PR-ChnlUSCamp+BR	3609.60	96.62	104.39	104.39	105.03	0.006153	9.63	807.09	484.88	0.62
Mainstem	23691	PR- Chnl US Camp	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23691	PR-ChnlUSCamp+BR	5525.20	96.62	104.85	104.85	105.63	0.007683	11.19	1028.70	493.18	0.70
Mainstem	23390	PR- Chnl US Camp	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	PR-ChnlUSCamp+BR	3609.60	95.51	101.29	101.05	101.67	0.005654	7.99	1102.19	589.49	0.59
Mainstem	23390	PR- Chnl US Camp	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23390	PR-ChnlUSCamp+BR	5525.20	95.51	102.34	101.44	102.60	0.003456	6.98	1725.34	601.09	0.47
Mainstem	23104	PR- Chnl US Camp	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	PR-ChnlUSCamp+BR	3609.60	94.45	101.24	98.38	101.28	0.000493	2.57	2697.39	808.11	0.18
Mainstem	23104	PR- Chnl US Camp	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23104	PR-ChnlUSCamp+BR	5525.20	94.45	102.22	98.92	102.27	0.000539	2.96	3511.80	852.24	0.19
Mainstem	23055	PR- Chnl US Camp	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	PR-ChnlUSCamp+BR	3609.60	94.15	100.95	99.87	101.17	0.002950	6.37	1352.43	450.13	0.44
Mainstem	23055	PR- Chnl US Camp	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23055	PR-ChnlUSCamp+BR	5525.20	94.15	101.90	100.38	102.15	0.002968	6.99	1792.37	466.08	0.45
Mainstem	23038.5		Bridge									
Mainstem	23022	PR- Chnl US Camp	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	PR-ChnlUSCamp+BR	3609.60	94.15	100.72	99.57	100.93	0.003558	6.49	1276.46	416.97	0.46
Mainstem	23022	PR- Chnl US Camp	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	23022	PR-ChnlUSCamp+BR	5525.20	94.15	101.69	100.06	101.94	0.003554	7.14	1686.65	426.14	0.47
Mainstem	22976	PR- Chnl US Camp	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	PR-ChnlUSCamp+BR	3609.60	94.45	100.40	98.96	100.59	0.002663	5.54	1102.42	355.27	0.41
Mainstem	22976	PR- Chnl US Camp	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22976	PR-ChnlUSCamp+BR	5525.20	94.45	101.35	99.48	101.60	0.002699	6.19	1446.96	368.54	0.42
Mainstem	22614	PR- Chnl US Camp	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	PR-ChnlUSCamp+BR	3609.60	92.85	99.49	98.27	99.80	0.003344	6.60	849.04	261.94	0.46
Mainstem	22614	PR- Chnl US Camp	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22614	PR-ChnlUSCamp+BR	5525.20	92.85	100.27	98.85	100.72	0.003973	7.78	1054.33	267.93	0.52
Mainstem	22578	PR- Chnl US Camp	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	PR-ChnlUSCamp+BR	3609.60	92.12	99.41	98.15	99.71	0.002876	6.33	889.00	266.14	0.43
Mainstem	22578	PR- Chnl US Camp	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49
Mainstem	22578	PR-ChnlUSCamp+BR	5525.20	92.12	100.17	98.72	100.61	0.003552	7.57	1093.54	272.88	0.49

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	22556.5		Bridge									
Mainstem	22534	PR- Chnl US Camp	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	PR-ChnlUSCamp+BR	3609.60	92.38	98.54	97.59	98.90	0.004166	6.99	833.77	334.66	0.51
Mainstem	22534	PR- Chnl US Camp	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22534	PR-ChnlUSCamp+BR	5525.20	92.38	99.66	98.19	100.02	0.003240	6.92	1346.35	539.10	0.46
Mainstem	22497	PR- Chnl US Camp	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	PR-ChnlUSCamp+BR	3609.60	91.85	98.68	97.19	98.71	0.000320	2.06	2757.02	913.92	0.14
Mainstem	22497	PR- Chnl US Camp	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22497	PR-ChnlUSCamp+BR	5525.20	91.85	99.79	97.78	99.83	0.000310	2.26	3840.87	997.59	0.15
Mainstem	22292	PR- Chnl US Camp	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	PR-ChnlUSCamp+BR	3609.60	91.52	98.60	95.66	98.65	0.000386	2.25	2205.67	559.16	0.16
Mainstem	22292	PR- Chnl US Camp	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	22292	PR-ChnlUSCamp+BR	5525.20	91.52	99.70	96.06	99.76	0.000413	2.59	2830.82	577.85	0.17
Mainstem	21964	PR- Chnl US Camp	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	PR-ChnlUSCamp+BR	3609.60	90.99	98.21		98.41	0.001731	5.13	1071.22	292.00	0.34
Mainstem	21964	PR- Chnl US Camp	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21964	PR-ChnlUSCamp+BR	5525.20	90.99	99.23		99.51	0.001941	5.95	1380.26	313.10	0.37
Mainstem	21708	PR- Chnl US Camp	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	PR-ChnlUSCamp+BR	3609.60	90.55	97.61		97.98	0.003589	7.33	802.59	217.80	0.49
Mainstem	21708	PR- Chnl US Camp	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21708	PR-ChnlUSCamp+BR	5525.20	90.55	98.42		98.99	0.004651	8.99	986.36	233.73	0.57
Mainstem	21655	PR- Chnl US Camp	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	PR-ChnlUSCamp+BR	3609.60	88.94	97.44	96.28	97.83	0.003513	7.79	931.64	361.84	0.49
Mainstem	21655	PR- Chnl US Camp	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21655	PR-ChnlUSCamp+BR	5525.20	88.94	98.27	97.11	98.78	0.004168	9.07	1248.79	405.17	0.54
Mainstem	21635.5		Bridge									
Mainstem	21617	PR- Chnl US Camp	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	PR-ChnlUSCamp+BR	3609.60	89.65	96.79	96.09	97.20	0.004435	7.91	1033.91	437.19	0.54
Mainstem	21617	PR- Chnl US Camp	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21617	PR-ChnlUSCamp+BR	5525.20	89.65	97.85	96.74	98.23	0.003751	8.03	1521.24	477.32	0.51
Mainstem	21433	PR- Chnl US Camp	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	PR-ChnlUSCamp+BR	3609.60	88.25	95.74		96.34	0.004507	8.17	721.34	269.78	0.55
Mainstem	21433	PR- Chnl US Camp	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21433	PR-ChnlUSCamp+BR	5525.20	88.25	96.99		97.53	0.003513	8.06	1092.92	392.01	0.50
Mainstem	21277	PR- Chnl US Camp	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	PR-ChnlUSCamp+BR	3609.60	88.03	95.54		95.71	0.001753	5.05	1204.79	358.82	0.34
Mainstem	21277	PR- Chnl US Camp	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	21277	PR-ChnlUSCamp+BR	5525.20	88.03	96.83		97.02	0.001451	5.15	1703.80	427.67	0.32
Mainstem	20884	PR- Chnl US Camp	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	PR-ChnlUSCamp+BR	3609.60	87.45	94.63		94.95	0.002585	6.01	951.82	190.42	0.41
Mainstem	20884	PR- Chnl US Camp	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20884	PR-ChnlUSCamp+BR	5525.20	87.45	95.78		96.25	0.003206	7.43	1174.45	198.02	0.46
Mainstem	20728	PR- Chnl US Camp	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	PR-ChnlUSCamp+BR	3609.60	85.80	94.46		94.65	0.001417	5.08	1211.64	228.27	0.31
Mainstem	20728	PR- Chnl US Camp	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20728	PR-ChnlUSCamp+BR	5525.20	85.80	95.57		95.86	0.001936	6.45	1471.11	243.65	0.37
Mainstem	20520	PR- Chnl US Camp	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	PR-ChnlUSCamp+BR	3609.60	83.60	92.90	92.90	93.98	0.006029	11.16	662.56	283.90	0.65
Mainstem	20520	PR- Chnl US Camp	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20520	PR-ChnlUSCamp+BR	5525.20	83.60	93.69	93.69	94.99	0.007320	12.99	857.27	322.28	0.73
Mainstem	20220	PR- Chnl US Camp	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	PR-ChnlUSCamp+BR	3609.60	82.94	91.75	89.83	91.94	0.001633	5.50	1437.83	365.25	0.33
Mainstem	20220	PR- Chnl US Camp	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.66	428.67	0.35
Mainstem	20220	PR-ChnlUSCamp+BR	5525.20	82.94	92.99	90.50	93.22	0.001739	6.22	1876.66	428.67	0.35
Mainstem	19972	PR- Chnl US Camp	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	PR-ChnlUSCamp+BR	3609.60	82.39	91.34	88.91	91.50	0.001626	4.88	1346.22	303.87	0.29
Mainstem	19972	PR- Chnl US Camp	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.20	310.56	0.32
Mainstem	19972	PR-ChnlUSCamp+BR	5525.20	82.39	92.53	89.94	92.74	0.001845	5.66	1711.20	310.56	0.32
Mainstem	19666	PR- Chnl US Camp	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	PR-ChnlUSCamp+BR	3609.60	81.74	90.94	86.76	91.16	0.000800	5.37	1145.87	181.11	0.32
Mainstem	19666	PR- Chnl US Camp	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.21	192.53	0.41

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	19666	PR-ChnlUSCamp+BR	5525.20	81.74	91.87	87.74	92.27	0.001278	7.26	1319.21	192.53	0.41
Mainstem	19414	PR- Chnl US Camp	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	PR-ChnlUSCamp+BR	3609.60	81.18	90.85	85.47	90.98	0.000429	4.07	1640.42	291.84	0.24
Mainstem	19414	PR- Chnl US Camp	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.45	300.66	0.30
Mainstem	19414	PR-ChnlUSCamp+BR	5525.20	81.18	91.75	86.59	91.97	0.000676	5.43	1906.45	300.66	0.30
Mainstem	19164	PR- Chnl US Camp	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	PR-ChnlUSCamp+BR	3609.60	80.63	90.85	84.06	90.89	0.000143	2.45	2724.63	381.13	0.14
Mainstem	19164	PR- Chnl US Camp	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.59	387.12	0.18
Mainstem	19164	PR-ChnlUSCamp+BR	5525.20	80.63	91.76	85.20	91.83	0.000236	3.33	3071.59	387.12	0.18
Mainstem	18991	PR- Chnl US Camp	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	PR-ChnlUSCamp+BR	3609.60	79.95	90.83		90.87	0.000169	2.70	2920.86	637.79	0.15
Mainstem	18991	PR- Chnl US Camp	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.83	655.77	0.18
Mainstem	18991	PR-ChnlUSCamp+BR	5525.20	79.95	91.73		91.79	0.000230	3.33	3502.83	655.77	0.18
Mainstem	18922	PR- Chnl US Camp	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	PR-ChnlUSCamp+BR	3609.60	79.30	90.75	86.95	90.83	0.000354	4.24	2697.27	602.05	0.22
Mainstem	18922	PR- Chnl US Camp	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.87	645.63	0.28
Mainstem	18922	PR-ChnlUSCamp+BR	5525.20	79.30	91.61	87.60	91.73	0.000529	5.44	3235.87	645.63	0.28
Mainstem	18874.5		Bridge									
Mainstem	18826	PR- Chnl US Camp	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	PR-ChnlUSCamp+BR	3609.60	76.78	86.33	86.33	88.72	0.005754	13.70	378.45	202.67	0.83
Mainstem	18826	PR- Chnl US Camp	5525.20	76.78	87.97	87.65	89.24	0.003425	11.90	1025.83	269.62	0.66
Mainstem	18826	PR-ChnlUSCamp+BR	5525.20	76.78	87.97	87.65	89.24	0.003425	11.90	1025.83	269.62	0.66
Mainstem	18753	PR- Chnl US Camp	3609.60	78.85	87.06	85.86	87.32	0.002761	6.74	1137.27	349.32	0.42
Mainstem	18753	PR-ChnlUSCamp+BR	3609.60	78.85	87.06	85.86	87.32	0.002761	6.74	1137.27	349.32	0.42
Mainstem	18753	PR- Chnl US Camp	5525.20	78.85	88.26		88.53	0.002492	7.03	1558.89	359.40	0.41
Mainstem	18753	PR-ChnlUSCamp+BR	5525.20	78.85	88.26		88.53	0.002492	7.03	1558.89	359.40	0.41
Mainstem	18523	PR- Chnl US Camp	3609.60	77.67	86.73		86.85	0.001544	4.71	1475.13	334.63	0.28
Mainstem	18523	PR-ChnlUSCamp+BR	3609.60	77.67	86.73		86.85	0.001544	4.71	1475.13	334.63	0.28
Mainstem	18523	PR- Chnl US Camp	5525.20	77.67	87.89		88.05	0.001812	5.55	1896.13	384.59	0.31
Mainstem	18523	PR-ChnlUSCamp+BR	5525.20	77.67	87.89		88.05	0.001812	5.55	1896.13	384.59	0.31
Mainstem	18298	PR- Chnl US Camp	3609.60	76.58	86.03		86.46	0.002889	7.55	1017.57	340.79	0.44
Mainstem	18298	PR-ChnlUSCamp+BR	3609.60	76.58	86.03		86.46	0.002889	7.55	1017.57	340.80	0.44
Mainstem	18298	PR- Chnl US Camp	5525.20	76.58	87.17		87.63	0.003069	8.42	1476.40	474.93	0.47
Mainstem	18298	PR-ChnlUSCamp+BR	5525.20	76.58	87.17		87.63	0.003069	8.42	1476.40	474.93	0.47
Mainstem	18102	PR- Chnl US Camp	3609.60	75.57	85.34		85.87	0.002914	7.78	1108.22	463.17	0.45
Mainstem	18102	PR-ChnlUSCamp+BR	3609.60	75.57	85.34		85.87	0.002914	7.78	1108.23	463.17	0.45
Mainstem	18102	PR- Chnl US Camp	5525.20	75.57	86.61		87.06	0.002615	8.04	1724.97	508.47	0.44
Mainstem	18102	PR-ChnlUSCamp+BR	5525.20	75.57	86.61		87.06	0.002615	8.04	1724.97	508.47	0.44
Mainstem	17851	PR- Chnl US Camp	3609.60	74.31	83.90		84.82	0.006386	11.21	780.97	285.01	0.66
Mainstem	17851	PR-ChnlUSCamp+BR	3609.60	74.31	83.90		84.82	0.006386	11.21	780.92	285.00	0.66
Mainstem	17851	PR- Chnl US Camp	5525.20	74.31	85.54		86.21	0.004665	10.72	1342.96	389.29	0.58
Mainstem	17851	PR-ChnlUSCamp+BR	5525.20	74.31	85.54		86.21	0.004665	10.72	1342.96	389.29	0.58
Mainstem	17701	PR- Chnl US Camp	3609.60	73.56	83.23	82.67	83.86	0.005245	8.62	935.49	383.40	0.51
Mainstem	17701	PR-ChnlUSCamp+BR	3609.60	73.56	83.23	82.67	83.86	0.005248	8.62	935.25	383.38	0.51
Mainstem	17701	PR- Chnl US Camp	5525.20	73.56	85.27	83.49	85.58	0.002695	7.08	1897.02	541.85	0.37
Mainstem	17701	PR-ChnlUSCamp+BR	5525.20	73.56	85.27	83.49	85.58	0.002695	7.08	1897.02	541.85	0.37
Mainstem	17499	PR- Chnl US Camp	3609.60	72.55	82.75	81.00	83.16	0.002059	6.80	1325.66	404.34	0.38
Mainstem	17499	PR-ChnlUSCamp+BR	3609.60	72.55	82.75	81.00	83.16	0.002060	6.80	1325.30	404.31	0.39
Mainstem	17499	PR- Chnl US Camp	5525.20	72.55	84.84	82.04	85.17	0.001550	6.72	2208.60	435.03	0.35
Mainstem	17499	PR-ChnlUSCamp+BR	5525.20	72.55	84.84	82.04	85.17	0.001550	6.72	2208.60	435.03	0.35
Mainstem	17410	PR- Chnl US Camp	3609.60	72.33	82.73	81.23	82.92	0.002020	5.74	1523.22	437.11	0.32
Mainstem	17410	PR-ChnlUSCamp+BR	3609.60	72.33	82.73	81.23	82.92	0.002022	5.74	1522.81	437.10	0.32
Mainstem	17410	PR- Chnl US Camp	5525.20	72.33	84.86	81.67	84.99	0.001196	5.01	2462.88	441.52	0.25
Mainstem	17410	PR-ChnlUSCamp+BR	5525.20	72.33	84.86	81.67	84.99	0.001196	5.01	2462.88	441.52	0.25
Mainstem	17133	PR- Chnl US Camp	4665.70	72.24	81.43		82.20	0.003226	7.66	772.79	140.46	0.47
Mainstem	17133	PR-ChnlUSCamp+BR	4665.70	72.24	81.43		82.20	0.003229	7.66	772.52	140.46	0.47
Mainstem	17133	PR- Chnl US Camp	7157.70	72.24	83.45		84.42	0.003190	8.80	1074.47	169.39	0.48
Mainstem	17133	PR-ChnlUSCamp+BR	7157.70	72.24	83.45		84.42	0.003190	8.80	1074.47	169.39	0.48
Mainstem	16900	PR- Chnl US Camp	4665.70	70.91	80.94		81.43	0.002719	7.94	1142.30	248.45	0.44
Mainstem	16900	PR-ChnlUSCamp+BR	4665.70	70.91	80.93		81.43	0.002724	7.94	1141.53	248.44	0.44
Mainstem	16900	PR- Chnl US Camp	7157.70	70.91	83.23		83.68	0.002021	7.86	1730.66	266.29	0.40
Mainstem	16900	PR-ChnlUSCamp+BR	7157.70	70.91	83.23		83.68	0.002021	7.86	1730.66	266.29	0.40

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	16568	PR- Chnl US Camp	4665.70	68.04	78.90		80.23	0.004117	11.20	649.85	117.66	0.62
Mainstem	16568	PR-ChnlUSCamp+BR	4665.70	68.04	78.89		80.22	0.004137	11.22	648.51	117.42	0.62
Mainstem	16568	PR- Chnl US Camp	7157.70	68.04	81.18		82.65	0.003851	12.41	1017.17	196.49	0.62
Mainstem	16568	PR-ChnlUSCamp+BR	7157.70	68.04	81.18		82.65	0.003851	12.41	1017.17	196.49	0.62
Mainstem	16345	PR- Chnl US Camp	4665.70	66.78	78.06		79.36	0.003781	11.19	748.02	150.75	0.61
Mainstem	16345	PR-ChnlUSCamp+BR	4665.70	66.78	78.04		79.35	0.003821	11.23	744.51	150.37	0.61
Mainstem	16345	PR- Chnl US Camp	7157.70	66.78	80.58		81.84	0.003142	11.77	1197.85	207.08	0.57
Mainstem	16345	PR-ChnlUSCamp+BR	7157.70	66.78	80.58		81.84	0.003142	11.77	1197.85	207.08	0.57
Mainstem	16072	PR- Chnl US Camp	4665.70	65.43	74.86	74.86	77.59	0.010938	14.28	423.70	82.92	0.83
Mainstem	16072	PR-ChnlUSCamp+BR	4665.70	65.43	74.91	74.87	77.58	0.010648	14.15	428.41	83.02	0.82
Mainstem	16072	PR- Chnl US Camp	7157.70	65.43	76.78	76.78	80.16	0.011264	16.44	586.38	85.89	0.87
Mainstem	16072	PR-ChnlUSCamp+BR	7157.70	65.43	76.78	76.78	80.16	0.011264	16.44	586.38	85.89	0.87
Mainstem	15834	PR- Chnl US Camp	4665.70	64.27	73.50	72.79	75.19	0.006586	11.52	575.25	171.37	0.68
Mainstem	15834	PR-ChnlUSCamp+BR	4665.70	64.27	72.79	72.79	75.09	0.009557	13.14	481.70	148.17	0.80
Mainstem	15834	PR- Chnl US Camp	7157.70	64.27	73.83	74.61	77.30	0.013105	16.65	623.09	182.39	0.96
Mainstem	15834	PR-ChnlUSCamp+BR	7157.70	64.27	73.83	74.61	77.30	0.013105	16.65	623.09	182.39	0.96
Mainstem	15688	PR- Chnl US Camp	4665.70	63.25	74.41	70.91	74.55	0.000494	4.37	1891.78	464.37	0.24
Mainstem	15688	PR-ChnlUSCamp+BR	4665.70	63.25	73.72	70.91	73.92	0.000735	5.09	1616.18	456.84	0.29
Mainstem	15688	PR- Chnl US Camp	7157.70	63.25	75.54	72.03	75.75	0.000662	5.43	2355.27	492.91	0.28
Mainstem	15688	PR-ChnlUSCamp+BR	7157.70	63.25	74.89	72.03	75.16	0.000902	6.09	2085.31	466.83	0.33
Mainstem	15610	PR- Chnl US Camp	4665.70	62.35	74.25	71.17	74.49	0.000929	5.91	1781.34	649.69	0.30
Mainstem	15610	PR-ChnlUSCamp+BR	4665.70	62.35	73.37	71.17	73.82	0.001619	7.40	1190.26	435.77	0.40
Mainstem	15610	PR- Chnl US Camp	7157.70	62.35	75.40	72.60	75.68	0.001110	6.88	2528.75	654.18	0.34
Mainstem	15610	PR-ChnlUSCamp+BR	7157.70	62.35	74.61	72.60	75.06	0.001752	8.28	2013.79	651.06	0.42
Mainstem	15527	PR- Chnl US Camp	4665.70	62.29	74.18	72.11	74.41	0.000863	5.59	2168.38	783.03	0.29
Mainstem	15527	PR-ChnlUSCamp+BR	4665.70	62.29	73.19	72.11	73.67	0.001756	7.52	1473.66	646.96	0.40
Mainstem	15527	PR- Chnl US Camp	7157.70	62.29	75.33	73.10	75.57	0.000921	6.14	3081.25	808.54	0.30
Mainstem	15527	PR-ChnlUSCamp+BR	7157.70	62.29	74.47	73.10	74.90	0.001641	7.83	2395.19	787.18	0.40
Mainstem	15490.5		Bridge									
Mainstem	15454	PR- Chnl US Camp	4665.70	62.24	74.17	72.53	74.35	0.001058	5.36	2057.88	562.22	0.28
Mainstem	15454	PR-ChnlUSCamp+BR	4665.70	62.24	72.53	72.53	73.39	0.004461	9.93	1168.73	523.43	0.56
Mainstem	15454	PR- Chnl US Camp	7157.70	62.24	75.31	73.18	75.51	0.001149	5.95	2714.15	589.95	0.29
Mainstem	15454	PR-ChnlUSCamp+BR	7157.70	62.24	74.47	73.18	74.81	0.002005	7.50	2226.08	569.19	0.38
Mainstem	15361	PR- Chnl US Camp	4665.70	60.17	74.18	70.90	74.23	0.000381	3.36	3017.20	811.82	0.16
Mainstem	15361	PR-ChnlUSCamp+BR	4665.70	60.17	70.18	70.90	72.36	0.013624	15.91	721.24	506.44	0.91
Mainstem	15361	PR- Chnl US Camp	7157.70	60.17	75.31	71.49	75.39	0.000460	3.90	3768.02	859.06	0.18
Mainstem	15361	PR-ChnlUSCamp+BR	7157.70	60.17	74.48	71.49	74.59	0.000739	4.75	3216.68	821.66	0.23
Mainstem	15105	PR- Chnl US Camp	4665.70	58.44	74.15	68.50	74.17	0.000108	2.08	4134.27	585.10	0.09
Mainstem	15105	PR-ChnlUSCamp+BR	4665.70	58.44	69.95	68.50	70.14	0.001236	5.69	1798.17	522.96	0.30
Mainstem	15105	PR- Chnl US Camp	7157.70	58.44	75.26	69.09	75.31	0.000163	2.69	4796.93	603.58	0.12
Mainstem	15105	PR-ChnlUSCamp+BR	7157.70	58.44	74.42	69.09	74.47	0.000227	3.05	4292.13	589.50	0.14
Mainstem	14870	PR- Chnl US Camp	4665.70	58.59	74.13	67.31	74.15	0.000085	2.10	4190.36	526.57	0.09
Mainstem	14870	PR-ChnlUSCamp+BR	4665.70	58.59	69.77	67.31	69.91	0.000725	4.91	2018.77	467.30	0.26
Mainstem	14870	PR- Chnl US Camp	7157.70	58.59	75.23	68.07	75.27	0.000135	2.77	4778.11	540.43	0.12
Mainstem	14870	PR-ChnlUSCamp+BR	7157.70	58.59	74.37	68.07	74.43	0.000182	3.11	4318.93	529.77	0.14
Mainstem	14599	PR- Chnl US Camp	4665.70	57.26	74.09	67.85	74.13	0.000099	2.68	4163.83	577.15	0.12
Mainstem	14599	PR-ChnlUSCamp+BR	4665.70	57.26	69.19	67.85	69.65	0.001301	7.60	1512.73	468.74	0.40
Mainstem	14599	PR- Chnl US Camp	7157.70	57.26	75.17	68.86	75.24	0.000156	3.51	4797.18	602.63	0.15
Mainstem	14599	PR-ChnlUSCamp+BR	7157.70	57.26	74.29	68.86	74.38	0.000216	3.99	4279.50	579.50	0.17
Mainstem	14501	PR- Chnl US Camp	4457.20	56.90	73.98	67.43	74.09	0.000222	4.12	2820.69	948.11	0.18
Mainstem	14501	PR-ChnlUSCamp+BR	4457.20	56.90	68.50	64.47	69.36	0.002422	7.86	703.60	347.15	0.43
Mainstem	14501	PR- Chnl US Camp	7035.70	56.90	75.16	69.51	75.22	0.000150	3.54	6155.43	1039.54	0.15
Mainstem	14501	PR-ChnlUSCamp+BR	7035.70	56.90	74.28	66.90	74.34	0.000207	3.08	5376.86	963.52	0.13
Mainstem	14462.5		Bridge									
Mainstem	14423	PR- Chnl US Camp	4457.20	56.64	70.06	65.80	71.42	0.001929	10.19	580.87	562.07	0.50
Mainstem	14423	PR-ChnlUSCamp+BR	4457.20	56.64	65.94	64.60	68.34	0.005018	12.74	383.71	51.69	0.76
Mainstem	14423	PR- Chnl US Camp	7035.70	56.64	69.25	69.25	73.37	0.006232	17.55	519.90	526.93	0.89
Mainstem	14423	PR-ChnlUSCamp+BR	7035.70	56.64	67.10	67.10	71.66	0.008127	17.60	444.39	164.94	0.98
Mainstem	14341	PR- Chnl US Camp	4457.20	56.33	65.93	65.93	70.25	0.008197	16.98	294.93	39.30	0.97
Mainstem	14341	PR-ChnlUSCamp+BR	4457.20	56.33	65.75	63.74	67.51	0.008484	10.65	420.86	57.00	0.68
Mainstem	14341	PR- Chnl US Camp	7035.70	56.33	68.43	69.96	72.77	0.006943	18.29	744.54	434.13	0.93

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	14341	PR-ChnlUSCamp+BR	7035.70	56.33	65.03	66.15	70.35	0.027259	18.51	382.06	53.22	1.21
Mainstem	14187	PR- Chnl US Camp	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	PR-ChnlUSCamp+BR	4457.20	54.84	65.41	64.65	66.37	0.002963	9.89	896.10	244.46	0.57
Mainstem	14187	PR- Chnl US Camp	7035.70	54.84	63.86	65.89	70.37	0.021183	23.42	539.49	222.59	1.49
Mainstem	14187	PR-ChnlUSCamp+BR	7035.70	54.84	65.89	65.89	67.72	0.005549	14.00	1018.66	293.00	0.79
Mainstem	13988	PR- Chnl US Camp	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	PR-ChnlUSCamp+BR	4457.20	54.76	65.73	61.12	65.93	0.000513	4.16	1874.10	597.64	0.24
Mainstem	13988	PR- Chnl US Camp	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13988	PR-ChnlUSCamp+BR	7035.70	54.76	66.67	62.85	66.99	0.000763	5.42	2499.86	712.88	0.30
Mainstem	13825	PR- Chnl US Camp	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	PR-ChnlUSCamp+BR	4457.20	55.00	65.02	62.71	65.73	0.002260	7.74	1123.75	533.26	0.47
Mainstem	13825	PR- Chnl US Camp	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13825	PR-ChnlUSCamp+BR	7035.70	55.00	65.50	65.48	66.66	0.003805	10.42	1388.15	587.06	0.61
Mainstem	13767	PR- Chnl US Camp	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	PR-ChnlUSCamp+BR	4457.20	54.63	64.65	64.65	65.54	0.002540	8.75	1115.66	672.89	0.53
Mainstem	13767	PR- Chnl US Camp	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13767	PR-ChnlUSCamp+BR	7035.70	54.63	65.39	65.39	66.39	0.003091	10.21	1627.03	698.78	0.59
Mainstem	13752.5		Inl Struct									
Mainstem	13742	PR- Chnl US Camp	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	PR-ChnlUSCamp+BR	4457.20	49.15	63.49	58.31	64.48	0.001360	8.43	903.11	523.94	0.41
Mainstem	13742	PR- Chnl US Camp	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13742	PR-ChnlUSCamp+BR	7035.70	49.15	64.30	61.02	65.76	0.002119	10.96	1384.81	649.90	0.52
Mainstem	13634	PR- Chnl US Camp	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	PR-ChnlUSCamp+BR	4457.20	50.20	63.52	62.86	64.17	0.001334	8.24	1425.71	589.19	0.41
Mainstem	13634	PR- Chnl US Camp	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13634	PR-ChnlUSCamp+BR	7035.70	50.20	64.46	63.87	65.20	0.001659	9.64	2012.24	646.12	0.46
Mainstem	13435	PR- Chnl US Camp	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	PR-ChnlUSCamp+BR	4457.20	49.38	62.64	62.64	63.73	0.002034	10.00	1148.16	590.57	0.50
Mainstem	13435	PR- Chnl US Camp	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13435	PR-ChnlUSCamp+BR	7035.70	49.38	63.63	63.63	64.72	0.002329	11.26	1783.04	690.54	0.54
Mainstem	13129	PR- Chnl US Camp	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	PR-ChnlUSCamp+BR	4457.20	48.16	58.88	58.07	59.52	0.002506	8.74	1221.08	457.58	0.51
Mainstem	13129	PR- Chnl US Camp	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	13129	PR-ChnlUSCamp+BR	7035.70	48.16	60.71	59.13	61.13	0.001655	8.04	2158.77	557.80	0.43
Mainstem	12709	PR- Chnl US Camp	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	PR-ChnlUSCamp+BR	4457.20	45.95	57.21		58.47	0.002796	10.68	890.43	247.32	0.58
Mainstem	12709	PR- Chnl US Camp	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12709	PR-ChnlUSCamp+BR	7035.70	45.95	58.92		60.27	0.002892	12.02	1424.07	358.82	0.61
Mainstem	12530	PR- Chnl US Camp	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	PR-ChnlUSCamp+BR	4457.20	44.76	56.82	55.85	57.94	0.002415	10.57	1161.68	382.86	0.56
Mainstem	12530	PR- Chnl US Camp	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12530	PR-ChnlUSCamp+BR	7035.70	44.76	58.72		59.68	0.002126	11.01	2019.20	481.69	0.54
Mainstem	12337	PR- Chnl US Camp	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	PR-ChnlUSCamp+BR	4457.20	44.11	53.69	53.69	57.01	0.006289	15.31	386.18	78.43	0.88
Mainstem	12337	PR- Chnl US Camp	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12337	PR-ChnlUSCamp+BR	7035.70	44.11	57.47	57.47	59.15	0.002717	12.62	1347.47	497.32	0.61
Mainstem	12195	PR- Chnl US Camp	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	PR-ChnlUSCamp+BR	4457.20	43.00	52.00	53.82	55.84	0.009990	17.21	353.70	97.22	1.04
Mainstem	12195	PR- Chnl US Camp	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12195	PR-ChnlUSCamp+BR	7035.70	43.00	53.49	54.79	58.15	0.011281	20.36	635.98	304.85	1.14
Mainstem	12023	PR- Chnl US Camp	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	PR-ChnlUSCamp+BR	4457.20	41.16	52.03	50.38	53.62	0.003724	11.10	715.55	281.26	0.64
Mainstem	12023	PR- Chnl US Camp	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	12023	PR-ChnlUSCamp+BR	7035.70	41.16	54.46	53.31	55.44	0.002233	10.03	1444.30	369.25	0.52
Mainstem	11770	PR- Chnl US Camp	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	PR-ChnlUSCamp+BR	4457.20	41.03	49.78	49.78	52.28	0.006912	13.92	480.65	106.97	0.86
Mainstem	11770	PR- Chnl US Camp	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11770	PR-ChnlUSCamp+BR	7035.70	41.03	52.75	52.75	54.61	0.004131	13.23	1212.01	530.56	0.70
Mainstem	11508	PR- Chnl US Camp	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	PR-ChnlUSCamp+BR	4457.20	37.63	46.33	46.33	46.36	0.000098	1.60	3306.56	572.88	0.10
Mainstem	11508	PR- Chnl US Camp	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16
Mainstem	11508	PR-ChnlUSCamp+BR	7035.70	37.63	46.33	46.33	46.40	0.000245	2.53	3306.55	572.88	0.16

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	11371	PR- Chnl US Camp	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	PR-ChnlUSCamp+BR	4457.20	39.42	45.15	44.19	45.17	0.000045	0.85	4168.35	699.33	0.07
Mainstem	11371	PR- Chnl US Camp	7035.70	39.42	46.25	44.19	46.29	0.000073	1.23	4997.36	829.64	0.09
Mainstem	11371	PR-ChnlUSCamp+BR	7035.70	39.42	46.25	44.19	46.29	0.000073	1.23	4997.36	829.64	0.09
Mainstem	10928	PR- Chnl US Camp	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	PR-ChnlUSCamp+BR	4457.20	35.47	45.10		45.15	0.000168	2.05	3828.74	888.19	0.13
Mainstem	10928	PR- Chnl US Camp	7035.70	35.47	46.18		46.25	0.000231	2.64	4841.73	1039.36	0.16
Mainstem	10928	PR-ChnlUSCamp+BR	7035.70	35.47	46.18		46.25	0.000231	2.64	4841.73	1039.36	0.16
Mainstem	10846	PR- Chnl US Camp	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	PR-ChnlUSCamp+BR	4457.20	35.49	44.98		45.10	0.000916	5.00	2781.56	992.16	0.31
Mainstem	10846	PR- Chnl US Camp	7035.70	35.49	46.04		46.19	0.001124	6.01	3884.01	1182.94	0.35
Mainstem	10846	PR-ChnlUSCamp+BR	7035.70	35.49	46.04		46.19	0.001124	6.01	3884.01	1182.94	0.35
Mainstem	10499	PR- Chnl US Camp	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	PR-ChnlUSCamp+BR	4457.20	36.19	44.41		44.73	0.001966	7.07	1815.16	746.27	0.46
Mainstem	10499	PR- Chnl US Camp	7035.70	36.19	45.51		45.80	0.001806	7.43	2650.68	773.88	0.45
Mainstem	10499	PR-ChnlUSCamp+BR	7035.70	36.19	45.51		45.80	0.001806	7.43	2650.68	773.88	0.45
Mainstem	10364	PR- Chnl US Camp	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	PR-ChnlUSCamp+BR	4565.60	35.16	43.74		44.43	0.003664	9.77	1396.21	672.31	0.62
Mainstem	10364	PR- Chnl US Camp	7073.90	35.16	45.14		45.58	0.002489	9.00	2356.70	723.50	0.53
Mainstem	10364	PR-ChnlUSCamp+BR	7073.90	35.16	45.14		45.58	0.002489	9.00	2356.70	723.50	0.53
Mainstem	10120	PR- Chnl US Camp	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	PR-ChnlUSCamp+BR	4565.60	33.73	43.37		43.69	0.001819	6.77	1883.20	698.37	0.40
Mainstem	10120	PR- Chnl US Camp	7073.90	33.73	44.82		45.06	0.001412	6.61	3228.88	1072.42	0.37
Mainstem	10120	PR-ChnlUSCamp+BR	7073.90	33.73	44.82		45.06	0.001412	6.61	3228.88	1072.42	0.37
Mainstem	9864	PR- Chnl US Camp	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	PR-ChnlUSCamp+BR	4565.60	32.30	43.15		43.34	0.001027	5.55	2364.27	710.03	0.31
Mainstem	9864	PR- Chnl US Camp	7073.90	32.30	44.63		44.79	0.000856	5.57	3540.98	857.83	0.29
Mainstem	9864	PR-ChnlUSCamp+BR	7073.90	32.30	44.63		44.79	0.000856	5.57	3540.98	857.83	0.29
Mainstem	9606	PR- Chnl US Camp	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	PR-ChnlUSCamp+BR	4565.60	31.73	42.99		43.12	0.000625	4.49	2978.43	924.49	0.24
Mainstem	9606	PR- Chnl US Camp	7073.90	31.73	44.50		44.60	0.000545	4.58	4370.64	930.37	0.23
Mainstem	9606	PR-ChnlUSCamp+BR	7073.90	31.73	44.50		44.60	0.000545	4.58	4370.64	930.37	0.23
Mainstem	9350	PR- Chnl US Camp	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	PR-ChnlUSCamp+BR	4565.60	31.17	42.99		43.02	0.000140	2.56	5377.32	1120.04	0.13
Mainstem	9350	PR- Chnl US Camp	7073.90	31.17	44.48		44.51	0.000153	2.90	7100.04	1183.19	0.14
Mainstem	9350	PR-ChnlUSCamp+BR	7073.90	31.17	44.48		44.51	0.000153	2.90	7100.04	1183.19	0.14
Mainstem	9095	PR- Chnl US Camp	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	PR-ChnlUSCamp+BR	4565.60	28.97	41.11	41.11	42.74	0.004899	11.47	871.19	453.65	0.61
Mainstem	9095	PR- Chnl US Camp	7073.90	28.97	43.88		44.36	0.001798	8.07	2985.30	981.06	0.38
Mainstem	9095	PR-ChnlUSCamp+BR	7073.90	28.97	43.88		44.36	0.001798	8.07	2985.30	981.06	0.38
Mainstem	8837	PR- Chnl US Camp	4565.60	30.03	40.60	37.67	40.81	0.000904	5.71	2673.02	750.65	0.32
Mainstem	8837	PR-ChnlUSCamp+BR	4565.60	30.03	40.60	37.67	40.81	0.000904	5.71	2673.02	750.65	0.32
Mainstem	8837	PR- Chnl US Camp	7073.90	30.03	44.01	39.01	44.09	0.000364	4.43	6222.24	1303.97	0.22
Mainstem	8837	PR-ChnlUSCamp+BR	7073.90	30.03	44.01	39.01	44.09	0.000364	4.43	6222.24	1303.97	0.22
Mainstem	8593	PR- Chnl US Camp	4565.60	27.59	40.63	40.13	40.68	0.000232	3.28	3339.28	818.67	0.17
Mainstem	8593	PR-ChnlUSCamp+BR	4565.60	27.59	40.63	40.13	40.68	0.000232	3.28	3339.28	818.67	0.17
Mainstem	8593	PR- Chnl US Camp	7073.90	27.59	44.01	40.13	44.04	0.000098	2.52	7043.34	1432.82	0.11
Mainstem	8593	PR-ChnlUSCamp+BR	7073.90	27.59	44.01	40.13	44.04	0.000098	2.52	7043.34	1432.82	0.11
Mainstem	8351	PR- Chnl US Camp	4565.60	29.43	39.22		40.44	0.002347	9.72	736.52	171.11	0.56
Mainstem	8351	PR-ChnlUSCamp+BR	4565.60	29.43	39.22		40.44	0.002347	9.72	736.52	171.11	0.56
Mainstem	8351	PR- Chnl US Camp	7073.90	29.43	43.42		43.94	0.000855	7.49	2972.91	1310.79	0.36
Mainstem	8351	PR-ChnlUSCamp+BR	7073.90	29.43	43.42		43.94	0.000855	7.49	2972.91	1310.79	0.36
Mainstem	8130	PR- Chnl US Camp	4565.60	28.78	39.80		40.00	0.000341	3.84	1489.01	192.64	0.21
Mainstem	8130	PR-ChnlUSCamp+BR	4565.60	28.78	39.80		40.00	0.000341	3.84	1489.01	192.64	0.21
Mainstem	8130	PR- Chnl US Camp	7073.90	28.78	43.54		43.75	0.000245	4.03	3474.57	957.35	0.19
Mainstem	8130	PR-ChnlUSCamp+BR	7073.90	28.78	43.54		43.75	0.000245	4.03	3474.57	957.35	0.19
Mainstem	7925	PR- Chnl US Camp	4565.60	28.66	39.62		39.91	0.000471	4.48	1218.12	198.25	0.25
Mainstem	7925	PR-ChnlUSCamp+BR	4565.60	28.66	39.62		39.91	0.000471	4.48	1218.12	198.25	0.25
Mainstem	7925	PR- Chnl US Camp	7073.90	28.66	43.39		43.69	0.000326	4.63	2183.22	278.77	0.22
Mainstem	7925	PR-ChnlUSCamp+BR	7073.90	28.66	43.39		43.69	0.000326	4.63	2183.22	278.77	0.22
Mainstem	7717	PR- Chnl US Camp	4565.60	28.54	39.70		39.80	0.000157	2.62	2005.75	274.97	0.15
Mainstem	7717	PR-ChnlUSCamp+BR	4565.60	28.54	39.70		39.80	0.000157	2.62	2005.75	274.97	0.15

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	7717	PR- Chnl US Camp	7073.90	28.54	43.49		43.60	0.000113	2.75	3550.06	578.98	0.13
Mainstem	7717	PR-ChnlUSCamp+BR	7073.90	28.54	43.49		43.60	0.000113	2.75	3550.06	578.98	0.13
Mainstem	7512	PR- Chnl US Camp	4565.60	28.62	39.72	31.83	39.76	0.000060	1.61	3075.94	476.88	0.09
Mainstem	7512	PR-ChnlUSCamp+BR	4565.60	28.62	39.72	31.83	39.76	0.000060	1.61	3075.94	476.88	0.09
Mainstem	7512	PR- Chnl US Camp	7073.90	28.62	43.53	32.53	43.56	0.000036	1.55	7344.72	1200.95	0.07
Mainstem	7512	PR-ChnlUSCamp+BR	7073.90	28.62	43.53	32.53	43.56	0.000036	1.55	7344.72	1200.95	0.07
Mainstem	7307	PR- Chnl US Camp	4565.60	28.49	39.71	31.69	39.75	0.000087	1.46	3300.26	400.94	0.08
Mainstem	7307	PR-ChnlUSCamp+BR	4565.60	28.49	39.71	31.69	39.75	0.000087	1.46	3300.26	400.94	0.08
Mainstem	7307	PR- Chnl US Camp	7073.90	28.49	43.52	32.37	43.55	0.000052	1.40	7491.47	1117.91	0.07
Mainstem	7307	PR-ChnlUSCamp+BR	7073.90	28.49	43.52	32.37	43.55	0.000052	1.40	7491.47	1117.91	0.07
Mainstem	7095	PR- Chnl US Camp	4565.60	28.37	39.68	31.50	39.73	0.000101	1.83	2731.62	348.96	0.10
Mainstem	7095	PR-ChnlUSCamp+BR	4565.60	28.37	39.68	31.50	39.73	0.000101	1.83	2731.62	348.96	0.10
Mainstem	7095	PR- Chnl US Camp	7073.90	28.37	43.49	32.28	43.54	0.000069	1.86	5395.26	842.72	0.09
Mainstem	7095	PR-ChnlUSCamp+BR	7073.90	28.37	43.49	32.28	43.54	0.000069	1.86	5395.26	842.72	0.09
Mainstem	6923	PR- Chnl US Camp	4565.60	27.27	39.51	32.61	39.68	0.000362	3.60	1635.30	245.48	0.19
Mainstem	6923	PR-ChnlUSCamp+BR	4565.60	27.27	39.51	32.61	39.68	0.000362	3.60	1635.30	245.48	0.19
Mainstem	6923	PR- Chnl US Camp	7073.90	27.27	43.33	33.84	43.50	0.000262	3.73	2783.07	343.15	0.17
Mainstem	6923	PR-ChnlUSCamp+BR	7073.90	27.27	43.33	33.84	43.50	0.000262	3.73	2783.07	343.15	0.17
Mainstem	6907	PR- Chnl US Camp	4565.60	29.15	39.32	34.94	39.66	0.001721	5.22	1099.17	196.92	0.31
Mainstem	6907	PR-ChnlUSCamp+BR	4565.60	29.15	39.32	34.94	39.66	0.001721	5.22	1099.17	196.92	0.31
Mainstem	6907	PR- Chnl US Camp	7073.90	29.15	43.22	36.15	43.48	0.000940	4.92	2023.56	292.13	0.24
Mainstem	6907	PR-ChnlUSCamp+BR	7073.90	29.15	43.22	36.15	43.48	0.000940	4.92	2023.56	292.13	0.24
Mainstem	6850	PR- Chnl US Camp	4679.10	27.98	39.05	33.83	39.55	0.001731	5.86	917.42	134.53	0.32
Mainstem	6850	PR-ChnlUSCamp+BR	4679.10	27.98	39.05	33.83	39.55	0.001731	5.86	917.42	134.53	0.32
Mainstem	6850	PR- Chnl US Camp	7294.20	27.98	42.99	35.53	43.41	0.001103	5.80	1772.74	299.92	0.27
Mainstem	6850	PR-ChnlUSCamp+BR	7294.20	27.98	42.99	35.53	43.41	0.001103	5.80	1772.74	299.92	0.27
Mainstem	6777	PR- Chnl US Camp	4679.10	26.59	39.04	32.63	39.42	0.000579	5.31	1011.83	116.67	0.27
Mainstem	6777	PR-ChnlUSCamp+BR	4679.10	26.59	39.04	32.63	39.42	0.000579	5.31	1011.83	116.67	0.27
Mainstem	6777	PR- Chnl US Camp	7294.20	26.59	42.94	34.48	43.36	0.000449	5.65	1485.34	126.10	0.25
Mainstem	6777	PR-ChnlUSCamp+BR	7294.20	26.59	42.94	34.48	43.36	0.000449	5.65	1485.34	126.10	0.25
Mainstem	6719.5		Bridge									
Mainstem	6661	PR- Chnl US Camp	4679.10	26.31	38.24	32.29	38.63	0.000608	5.42	1000.27	112.60	0.28
Mainstem	6661	PR-ChnlUSCamp+BR	4679.10	26.31	38.24	32.29	38.63	0.000608	5.42	1000.27	112.60	0.28
Mainstem	6661	PR- Chnl US Camp	7294.20	26.31	42.61	33.93	43.02	0.000440	5.69	1531.11	131.34	0.25
Mainstem	6661	PR-ChnlUSCamp+BR	7294.20	26.31	42.61	33.93	43.02	0.000440	5.69	1531.11	131.34	0.25
Mainstem	6584	PR- Chnl US Camp	4679.10	26.10	37.79	32.84	38.47	0.001156	7.28	1002.90	186.51	0.38
Mainstem	6584	PR-ChnlUSCamp+BR	4679.10	26.10	37.79	32.84	38.47	0.001156	7.28	1002.90	186.51	0.38
Mainstem	6584	PR- Chnl US Camp	7294.20	26.10	42.41	34.80	42.94	0.000659	6.90	2048.09	245.11	0.30
Mainstem	6584	PR-ChnlUSCamp+BR	7294.20	26.10	42.41	34.80	42.94	0.000659	6.90	2048.09	245.11	0.30
Mainstem	6348	PR- Chnl US Camp	4679.10	26.00	37.19	32.94	38.10	0.001529	7.99	797.67	228.33	0.43
Mainstem	6348	PR-ChnlUSCamp+BR	4679.10	26.00	37.19	32.94	38.10	0.001529	7.99	797.67	228.33	0.43
Mainstem	6348	PR- Chnl US Camp	7294.20	26.00	42.30	35.35	42.76	0.000609	6.52	2842.16	845.97	0.29
Mainstem	6348	PR-ChnlUSCamp+BR	7294.20	26.00	42.30	35.35	42.76	0.000609	6.52	2842.16	845.97	0.29
Mainstem	6145	PR- Chnl US Camp	4679.10	25.53	37.72	32.72	37.76	0.000170	2.79	5293.23	885.75	0.14
Mainstem	6145	PR-ChnlUSCamp+BR	4679.10	25.53	37.72	32.72	37.76	0.000170	2.79	5293.23	885.75	0.14
Mainstem	6145	PR- Chnl US Camp	7294.20	25.53	42.57	34.67	42.60	0.000071	2.28	10321.00	1243.37	0.10
Mainstem	6145	PR-ChnlUSCamp+BR	7294.20	25.53	42.57	34.67	42.60	0.000071	2.28	10321.00	1243.37	0.10
Mainstem	5950	PR- Chnl US Camp	4679.10	25.27	37.66	34.03	37.72	0.000234	3.37	4739.10	832.38	0.17
Mainstem	5950	PR-ChnlUSCamp+BR	4679.10	25.27	37.66	34.03	37.72	0.000234	3.37	4739.10	832.38	0.17
Mainstem	5950	PR- Chnl US Camp	7294.20	25.27	42.55	35.18	42.58	0.000088	2.61	9452.10	1241.82	0.11
Mainstem	5950	PR-ChnlUSCamp+BR	7294.20	25.27	42.55	35.18	42.58	0.000088	2.61	9452.10	1241.82	0.11
Mainstem	5753	PR- Chnl US Camp	4679.10	25.00	36.47	35.00	37.52	0.002232	9.75	1142.09	448.46	0.52
Mainstem	5753	PR-ChnlUSCamp+BR	4679.10	25.00	36.47	35.00	37.52	0.002232	9.75	1142.09	448.46	0.52
Mainstem	5753	PR- Chnl US Camp	7294.20	25.00	42.38	37.15	42.54	0.000342	5.10	5277.21	1021.25	0.22
Mainstem	5753	PR-ChnlUSCamp+BR	7294.20	25.00	42.38	37.15	42.54	0.000342	5.10	5277.21	1021.25	0.22
Mainstem	5553	PR- Chnl US Camp	4679.10	24.72	37.08	32.79	37.13	0.000197	3.08	4427.30	718.11	0.16
Mainstem	5553	PR-ChnlUSCamp+BR	4679.10	24.72	37.08	32.79	37.13	0.000197	3.08	4427.30	718.11	0.16
Mainstem	5553	PR- Chnl US Camp	7294.20	24.72	42.45	33.47	42.47	0.000065	2.27	9625.87	1434.59	0.10
Mainstem	5553	PR-ChnlUSCamp+BR	7294.20	24.72	42.45	33.47	42.47	0.000065	2.27	9625.87	1434.59	0.10
Mainstem	5330	PR- Chnl US Camp	4679.10	23.16	37.06	31.08	37.09	0.000140	2.73	4684.42	745.03	0.13
Mainstem	5330	PR-ChnlUSCamp+BR	4679.10	23.16	37.06	31.08	37.09	0.000140	2.73	4684.42	745.03	0.13
Mainstem	5330	PR- Chnl US Camp	7294.20	23.16	42.45	32.45	42.46	0.000053	2.11	10491.04	1597.79	0.09

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	5330	PR-ChnlUSCamp+BR	7294.20	23.16	42.45	32.45	42.46	0.000053	2.11	10491.04	1597.79	0.09
Mainstem	5107	PR- Chnl US Camp	4679.10	22.72	36.56	32.04	36.99	0.000738	6.41	1788.12	524.53	0.31
Mainstem	5107	PR-ChnlUSCamp+BR	4679.10	22.72	36.56	32.04	36.99	0.000738	6.41	1788.12	524.53	0.31
Mainstem	5107	PR- Chnl US Camp	7294.20	22.72	42.32	33.99	42.43	0.000194	4.18	6297.47	1658.27	0.17
Mainstem	5107	PR-ChnlUSCamp+BR	7294.20	22.72	42.32	33.99	42.43	0.000194	4.18	6297.47	1658.27	0.17
Mainstem	4848	PR- Chnl US Camp	4679.10	23.30	35.78	30.63	36.69	0.001280	7.96	727.43	145.16	0.40
Mainstem	4848	PR-ChnlUSCamp+BR	4679.10	23.30	35.78	30.63	36.69	0.001280	7.96	727.43	145.16	0.40
Mainstem	4848	PR- Chnl US Camp	7294.20	23.30	41.64	32.97	42.29	0.000624	7.23	1923.14	719.56	0.30
Mainstem	4848	PR-ChnlUSCamp+BR	7294.20	23.30	41.64	32.97	42.29	0.000624	7.23	1923.14	719.56	0.30
Mainstem	4791	PR- Chnl US Camp	4679.10	22.67	34.63	31.06	36.34	0.003124	10.91	488.89	52.19	0.56
Mainstem	4791	PR-ChnlUSCamp+BR	4679.10	22.67	34.63	31.06	36.34	0.003124	10.91	488.89	52.19	0.56
Mainstem	4791	PR- Chnl US Camp	7294.20	22.67	41.38	33.65	42.20	0.001024	8.47	1661.13	573.44	0.35
Mainstem	4791	PR-ChnlUSCamp+BR	7294.20	22.67	41.38	33.65	42.20	0.001024	8.47	1661.13	573.44	0.35
Mainstem	4740.5		Bridge									
Mainstem	4689	PR- Chnl US Camp	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	PR-ChnlUSCamp+BR	4679.10	21.60	31.47	29.71	32.81	0.003537	10.17	586.71	181.94	0.58
Mainstem	4689	PR- Chnl US Camp	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4689	PR-ChnlUSCamp+BR	7294.20	21.60	37.36	31.56	37.70	0.000657	6.04	1957.22	246.89	0.27
Mainstem	4618	PR- Chnl US Camp	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	PR-ChnlUSCamp+BR	4679.10	20.83	31.59		32.33	0.001961	7.71	848.14	180.77	0.43
Mainstem	4618	PR- Chnl US Camp	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4618	PR-ChnlUSCamp+BR	7294.20	20.83	37.33		37.64	0.000519	5.39	1936.97	199.60	0.24
Mainstem	4350	PR- Chnl US Camp	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	PR-ChnlUSCamp+BR	4679.10	18.99	31.39		31.76	0.001097	6.65	1272.24	187.35	0.33
Mainstem	4350	PR- Chnl US Camp	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4350	PR-ChnlUSCamp+BR	7294.20	18.99	37.26		37.46	0.000410	5.27	2472.27	236.02	0.22
Mainstem	4114	PR- Chnl US Camp	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	PR-ChnlUSCamp+BR	4679.10	16.83	31.39		31.57	0.000455	4.53	1643.23	220.65	0.22
Mainstem	4114	PR- Chnl US Camp	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4114	PR-ChnlUSCamp+BR	7294.20	16.83	37.28		37.39	0.000182	3.66	3113.41	341.03	0.15
Mainstem	4071	PR- Chnl US Camp	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	PR-ChnlUSCamp+BR	4813.50	16.64	29.55	27.21	31.10	0.005885	10.52	546.69	81.94	0.56
Mainstem	4071	PR- Chnl US Camp	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	4071	PR-ChnlUSCamp+BR	7501.30	16.64	36.39	29.67	37.16	0.001778	8.01	1223.88	133.56	0.34
Mainstem	3967.5		Culvert									
Mainstem	3864	PR- Chnl US Camp	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	PR-ChnlUSCamp+BR	4813.50	12.83	24.56	22.93	27.04	0.009285	13.01	430.83	58.04	0.72
Mainstem	3864	PR- Chnl US Camp	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3864	PR-ChnlUSCamp+BR	7501.30	12.83	27.99	26.38	30.59	0.007172	13.88	727.53	139.48	0.67
Mainstem	3752	PR- Chnl US Camp	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	PR-ChnlUSCamp+BR	4813.50	13.05	23.86		25.85	0.007769	12.43	521.75	69.84	0.68
Mainstem	3752	PR- Chnl US Camp	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.85	253.85	0.57
Mainstem	3752	PR-ChnlUSCamp+BR	7501.30	13.05	27.79		29.48	0.004921	12.25	1050.85	253.85	0.57
Mainstem	3536	PR- Chnl US Camp	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	PR-ChnlUSCamp+BR	4813.50	11.96	22.10		24.28	0.006348	12.23	468.58	60.97	0.69
Mainstem	3536	PR- Chnl US Camp	7501.30	11.96	23.93		27.54	0.008493	15.85	585.55	69.87	0.82
Mainstem	3536	PR-ChnlUSCamp+BR	7501.30	11.96	23.93		27.54	0.008493	15.85	585.55	69.87	0.82
Mainstem	3386	PR- Chnl US Camp	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	PR-ChnlUSCamp+BR	4813.50	11.16	21.67		23.30	0.004680	10.75	560.89	72.60	0.60
Mainstem	3386	PR- Chnl US Camp	7501.30	11.16	23.52		26.17	0.006191	13.84	697.29	74.77	0.71
Mainstem	3386	PR-ChnlUSCamp+BR	7501.30	11.16	23.52		26.17	0.006191	13.84	697.29	74.77	0.71
Mainstem	3183	PR- Chnl US Camp	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	PR-ChnlUSCamp+BR	4813.50	10.65	21.08	17.97	22.47	0.003071	9.87	612.87	107.99	0.54
Mainstem	3183	PR- Chnl US Camp	7501.30	10.65	24.59	20.00	25.07	0.001126	7.28	2821.13	710.13	0.35
Mainstem	3183	PR-ChnlUSCamp+BR	7501.30	10.65	24.59	20.00	25.07	0.001126	7.28	2821.13	710.13	0.35
Mainstem	2954	PR- Chnl US Camp	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	PR-ChnlUSCamp+BR	4813.50	7.19	21.63		21.85	0.000611	5.34	2574.61	700.35	0.25
Mainstem	2954	PR- Chnl US Camp	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.48	855.24	0.18
Mainstem	2954	PR-ChnlUSCamp+BR	7501.30	7.19	24.73		24.84	0.000304	4.31	5037.48	855.24	0.18
Mainstem	2752	PR- Chnl US Camp	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05
Mainstem	2752	PR-ChnlUSCamp+BR	4813.50	9.12	21.76	16.49	21.77	0.000027	1.05	5361.22	897.10	0.05

HEC-RAS River: Noroton Reach: Mainstem (Continued)

Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	2752	PR- Chnl US Camp	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.47	973.68	0.05
Mainstem	2752	PR-ChnlUSCamp+BR	7501.30	9.12	24.78	17.99	24.80	0.000024	1.14	8190.47	973.68	0.05
Mainstem	2495	PR- Chnl US Camp	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	PR-ChnlUSCamp+BR	4851.30	8.27	21.76	15.22	21.77	0.000017	1.14	6000.11	835.51	0.06
Mainstem	2495	PR- Chnl US Camp	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.64	891.19	0.06
Mainstem	2495	PR-ChnlUSCamp+BR	7581.10	8.27	24.78	17.00	24.79	0.000017	1.29	8608.64	891.19	0.06
Mainstem	2232	PR- Chnl US Camp	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	PR-ChnlUSCamp+BR	4851.30	8.17	21.59		21.74	0.000196	3.83	2473.10	379.66	0.19
Mainstem	2232	PR- Chnl US Camp	7581.10	8.17	24.60		24.77	0.000175	4.16	3717.18	423.41	0.18
Mainstem	2232	PR-ChnlUSCamp+BR	7581.10	8.17	24.60		24.77	0.000175	4.16	3717.18	423.41	0.18
Mainstem	1978	PR- Chnl US Camp	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	PR-ChnlUSCamp+BR	4851.30	6.57	20.88		21.60	0.000717	7.35	1045.60	161.32	0.36
Mainstem	1978	PR- Chnl US Camp	7581.10	6.57	23.63		24.61	0.000806	8.83	1619.98	279.49	0.39
Mainstem	1978	PR-ChnlUSCamp+BR	7581.10	6.57	23.63		24.61	0.000806	8.83	1619.98	279.49	0.39
Mainstem	1724	PR- Chnl US Camp	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	PR-ChnlUSCamp+BR	4851.30	6.66	20.80		21.39	0.000627	6.85	1252.01	235.24	0.33
Mainstem	1724	PR- Chnl US Camp	7581.10	6.66	23.72		24.32	0.000568	7.46	2047.91	317.24	0.33
Mainstem	1724	PR-ChnlUSCamp+BR	7581.10	6.66	23.72		24.32	0.000568	7.46	2047.91	317.24	0.33
Mainstem	1544	PR- Chnl US Camp	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	PR-ChnlUSCamp+BR	4851.30	6.69	20.85		21.17	0.001044	5.50	1490.93	318.40	0.28
Mainstem	1544	PR- Chnl US Camp	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.50	354.03	0.24
Mainstem	1544	PR-ChnlUSCamp+BR	7581.10	6.69	23.85		24.10	0.000705	5.26	2484.50	354.03	0.24
Mainstem	1335	PR- Chnl US Camp	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	PR-ChnlUSCamp+BR	4851.30	6.88	20.12		20.82	0.002366	8.12	1044.27	273.11	0.40
Mainstem	1335	PR- Chnl US Camp	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.52	522.31	0.27
Mainstem	1335	PR-ChnlUSCamp+BR	7581.10	6.88	23.66		23.93	0.000942	6.05	2525.52	522.31	0.27
Mainstem	1260	PR- Chnl US Camp	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	PR-ChnlUSCamp+BR	4851.30	5.89	20.08	14.71	20.56	0.001547	6.46	1173.28	353.39	0.32
Mainstem	1260	PR- Chnl US Camp	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2105.99	532.06	0.24
Mainstem	1260	PR-ChnlUSCamp+BR	7581.10	5.89	23.55	16.78	23.85	0.000840	5.59	2105.99	532.06	0.24
Mainstem	1066.5		Mult Open									
Mainstem	872	PR- Chnl US Camp	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	PR-ChnlUSCamp+BR	4851.30	0.90	15.28	9.81	15.48	0.000637	4.30	1496.32	292.00	0.21
Mainstem	872	PR- Chnl US Camp	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	872	PR-ChnlUSCamp+BR	7581.10	0.90	17.26	11.14	17.58	0.000976	5.83	2002.58	473.82	0.26
Mainstem	811	PR- Chnl US Camp	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	PR-ChnlUSCamp+BR	4851.30	1.30	15.27	9.42	15.40	0.000603	4.34	2271.35	301.21	0.21
Mainstem	811	PR- Chnl US Camp	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.91	372.84	0.24
Mainstem	811	PR-ChnlUSCamp+BR	7581.10	1.30	17.27	10.69	17.46	0.000765	5.35	2916.91	372.84	0.24
Mainstem	631	PR- Chnl US Camp	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	PR-ChnlUSCamp+BR	4851.30	0.85	15.08	9.38	15.30	0.000366	4.81	2048.73	269.82	0.23
Mainstem	631	PR- Chnl US Camp	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	631	PR-ChnlUSCamp+BR	7581.10	0.85	16.98	10.87	17.31	0.000498	6.12	2575.66	287.66	0.27
Mainstem	434	PR- Chnl US Camp	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	PR-ChnlUSCamp+BR	4851.30	0.15	14.95		15.22	0.000340	4.56	1511.52	204.96	0.22
Mainstem	434	PR- Chnl US Camp	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	434	PR-ChnlUSCamp+BR	7581.10	0.15	16.70		17.19	0.000532	6.19	1906.22	263.85	0.28
Mainstem	334	PR- Chnl US Camp	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	PR-ChnlUSCamp+BR	4851.30	-0.54	14.52	6.77	15.08	0.000808	6.21	882.75	113.74	0.29
Mainstem	334	PR- Chnl US Camp	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	334	PR-ChnlUSCamp+BR	7581.10	-0.54	15.81	8.96	16.92	0.001447	8.79	1173.16	289.47	0.39
Mainstem	250.5		Bridge									
Mainstem	208	PR- Chnl US Camp	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	PR-ChnlUSCamp+BR	4851.30	-1.48	6.25	5.01	7.82	0.004993	10.16	487.99	79.47	0.71
Mainstem	208	PR- Chnl US Camp	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	208	PR-ChnlUSCamp+BR	7581.10	-1.48	7.57	6.72	10.18	0.006604	13.09	592.92	79.51	0.83
Mainstem	108	PR- Chnl US Camp	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	PR-ChnlUSCamp+BR	4851.30	-0.93	5.99		7.11	0.004690	8.51	569.90	109.40	0.66
Mainstem	108	PR- Chnl US Camp	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	108	PR-ChnlUSCamp+BR	7581.10	-0.93	7.45		9.12	0.005189	10.39	729.74	109.40	0.71
Mainstem	0	PR- Chnl US Camp	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66

HEC-RAS River: Noroton Reach: Mainstem (Continued)

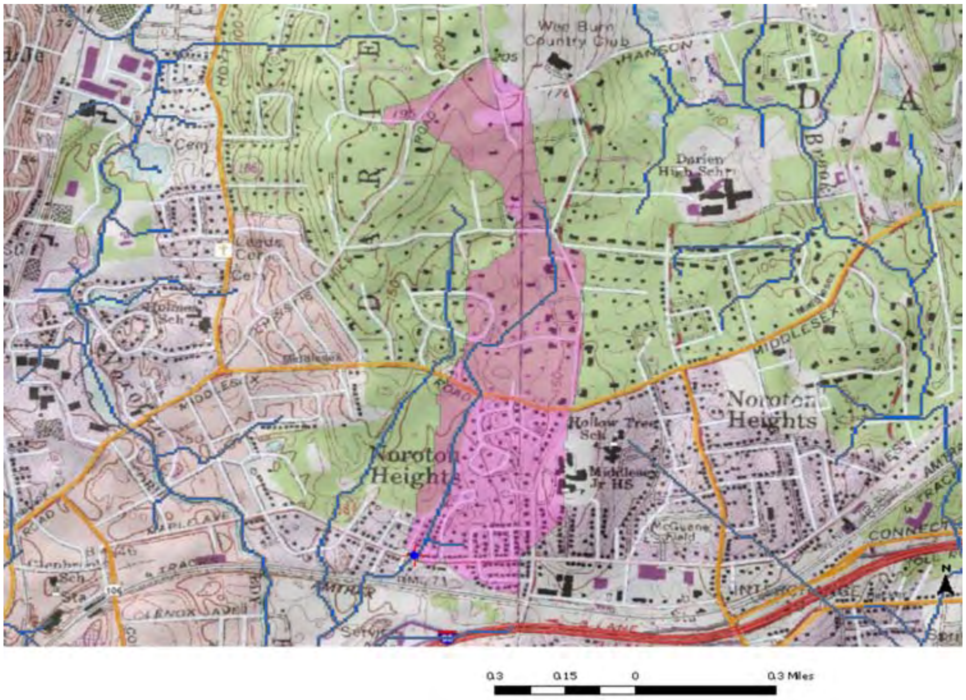
Reach	River Sta	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mainstem	0	PR-ChnlUSCamp+BR	4851.30	-2.11	5.52	4.34	6.58	0.004601	8.32	589.42	122.77	0.66
Mainstem	0	PR- Chnl US Camp	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69
Mainstem	0	PR-ChnlUSCamp+BR	7581.10	-2.11	7.01	5.61	8.51	0.004601	9.89	794.74	162.11	0.69

APPENDIX M

Kelsey Street Drainage Computations

USGS
Connecticut StreamStats

StreamStats Print Page



Legend

- GlobalWatershedPoint
- huc_net_Junctions
- streams
- GlobalWatershed
- ExcludePoly
- hucpoly
- Stream Grid
- Gaging Station, Continuous Record
- Low Flow, Partial Record
- Peak Flow, Partial Record
- Peak and Low Flow, Partial Record
- Miscellaneous Record
- Unknown

4/30/2010 4:18:47 PM

West Avenue Culvert Drainage Area

USGS Connecticut StreamStats

Streamstats Ungaged Site Report

Date: Fri Apr 30 2010 16:18:21 Mountain Daylight Time
Site Location: Connecticut
NAD83 Latitude: 41.0708 (41 04 15)
NAD83 Longitude: -73.5038 (-73 30 13)
NAD27 Latitude: 41.0707 (41 04 14)
NAD27 Longitude: -73.5043 (-73 30 15)
Drainage Area: 0.29 mi2

Peak Flows Region Grid Basin Characteristics

100% Statewide Multiparameter (0.29 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.29 (below min value 1.69)	1.69	715
24 Hour 2 Year Precipitation (inches)	3.6	2.95	3.82
24 Hour 10 Year Precipitation (inches)	5.3	4.15	5.53
24 Hour 25 Year Precipitation (inches)	6.5	4.93	7
24 Hour 50 Year Precipitation (inches)	7.7	5.62	8.36
24 Hour 100 Year Precipitation (inches)	9.1	6.41	9.99
Mean Basin Elevation (feet)	138.03 (below min value 169)	169	1310

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2	20.1		3.5		
PK10	44.3		8.1		
PK25	56.6		11		
PK50	68.2		13		
PK100	78.6		14		
PK500	110		15		

West Avenue Culvert Drainage Area

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River Watershed Evaluation By: BAM Date: 04/29/10
Location: West Avenue Culvert Checked: Date:
Circle one: **Present** *Developed* Watershed:
Circle one: **Tc** *T_t* Subwatershed:

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		Grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.300		
3. Flow Length, L (< 300ft)	ft.	150.0		
4. Two-year 24-hr rainfall, P_2	in.	3.2		
5. Land slope, s	ft./ft.	0.070		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.238	=	0.238

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**			
7. Surface description		lawn		lawn					
8. Manning's roughness coeff., n		0.300		0.300					
9. Paved or unpaved		UNPVD		upvd					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	214.0		850.0					
12. Watercourse slope, s	ft./ft.	0.0800		0.0500					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.76		0.60		0.00			
14. $T_t = \frac{L}{3600 * V}$	hr.	0.078	+	0.392	+	0.000	+		= 0.470

Channel flow

Segment ID		**E-F**		**F-G**					
15. Channel Bottom width, b	ft.	15" pipe		5.00					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.			3.00					
17. Depth of flow, d	ft.	1.25		1.00					
18. Cross sectional flow area, A (assume trapezoidal)	$ft.^2$	1.23		8.00					
19. Wetted perimeter, P_w	ft.	3.93		11.32					
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.31		0.71					
21. Channel slope, s	ft./ft.	0.0050		0.020					
22. Manning's roughness coeff., n		0.013		0.040					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.74		4.18					
24. Flow length, L	ft.	560.0		512.0					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.042	+	0.034					= 0.076
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.783

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Noroton River Watershed Drainage Analysis

6/28/2010
MMI# 1581-04-3
BY: BAM

West Avenue Culvert

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	6249865	2011329	2156036	2082500	0.46		143.477	65.9666414	90
	4928815	2011330		2082501	0.45		113.150	51.1179339	90
	6770650	2013059	2675090	2082501	0.45		155.433	69.5771419	47

Lynn Court

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1	495654	81618	188939	225097	0.35		11.379	4.02105831	36
2	682	682	0		0.90		0.016	0.01409091	5
3	5008	5008	0		0.90		0.115	0.10347107	5
4	64198	22052	42146		0.51		1.474	0.74588154	20
5	99511	20881	62937	15693	0.41		2.284	0.93692837	17
6	51908	27342	24566		0.62		1.192	0.73410468	8
Total	717039						16.461		

Intervale

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1 (direct)	4328	4328	0		0.90		0.099	0.08942149	5
1 (u/s)	75620	27844	47776		0.52		1.736	0.90432507	30
2	51118	16135	34983		0.49		1.174	0.57429752	5
3 (direct)	3123	3123	0		0.90		0.072	0.06452479	5
3 (u/s)	119706	42515	77191		0.51		2.748	1.41002755	30
4	1512	1512	0		0.90		0.035	0.03123967	5
5	13413	13413	0		0.90		0.308	0.2771281	5
6	14155	4235	9920		0.48		0.325	0.15581956	8
7 (direct)	18068	8353	9715		0.58		0.415	0.23949036	8
7 (u/s)	384694	135367	249327		0.51		8.831	4.51396694	30
8	9878	3391	6487		0.51		0.227	0.11473829	5
9	37830	17967	19863		0.58		0.868	0.50801653	8
10	2108	2108	0		0.90		0.048	0.04355372	5
11 (direct)	1545	1545	0		0.90		0.035	0.03192149	5
11 (u/s)	119660	46871	72789		0.54		2.747	1.46971074	30
12	6215	6215	0		0.90		0.143	0.12840909	5
13 (direct)	2016	2016	0		0.90		0.046	0.04165289	5
13 (u/s)	146474	46009	100465		0.49		3.363	1.64250689	30
15 (direct)	105291	35736	69555		0.50		2.417	1.21737603	15
15 (u/s)	427720	121638	196459	109623	0.45		9.819	4.36952479	45

Camp Avenue

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	1901020	319809	1224608	356603	0.38		43.641	16.678859	42

Worksheet 2: Runoff curve number and runoff

Project: Noroton River Watershed Evaluation By: BAM Date: 5/4/2010
Location: West Avenue culvert, Darien Checked: Date:
Circle one: ***Present*** Developed Watershed: EX WS

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B soil	Woods - good condition	55			0.92	50.83
B soil	Grass / Open space - good condition	61			22.92	1397.89
C soil	Woods - good condition	70			13.99	979.46
C soil	Grass / Open space - good condition	74			62.62	4633.80
D soil	Woods - good condition	77			2.80	215.67
D soil	Grass / Open space - good condition	80			18.13	1450.06
N/A	Existing impervious cover	98			33.65	3297.62
				Totals =	155.03	12025.32
					(0.24223	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{12025.32}{155.03}$$

Use CN = **78**

Runoff

Frequency	yr	25	s=	2.892
Rainfall, P	in	5.7		
Runoff, Q	in	3	3.273	

APPENDIX N

Lynn Court Drainage Computations

USGS Connecticut StreamStats

Streamstats Ungaged Site Report

Date: Fri Apr 30 2010 16:26:07 Mountain Daylight Time
Site Location: Connecticut
NAD83 Latitude: 41.0886 (41 05 18)
NAD83 Longitude: -73.5140 (-73 30 50)
NAD27 Latitude: 41.0885 (41 05 18)
NAD27 Longitude: -73.5144 (-73 30 51)
Drainage Area: 0.0655 mi2

Peak Flows Region Grid Basin Characteristics			
100% Statewide Multiparameter (0.0655 mi2)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.0655 (below min value 1.69)	1.69	715
24 Hour 2 Year Precipitation (inches)	3.6	2.95	3.82
24 Hour 10 Year Precipitation (inches)	5.3	4.15	5.53
24 Hour 25 Year Precipitation (inches)	6.5	4.93	7
24 Hour 50 Year Precipitation (inches)	7.7	5.62	8.36
24 Hour 100 Year Precipitation (inches)	9.0	6.41	9.99
Mean Basin Elevation (feet)	198.84	169	1310

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Streamflow Statistics					
Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2	7.06		3.5		
PK10	15.4		8.1		
PK25	19.3		11		
PK50	22.9		13		
PK100	25.6		14		
PK500	36.6		15		

Lynn Court Culvert Drainage Area

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Noroton River Watershed Drainage Analysis

6/28/2010
MMI# 1581-04-3
BY: BAM

West Avenue Culvert

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	6249865	2011329	2156036	2082500	0.46		143.477	65.9666414	90
	4928815	2011330		2082501	0.45		113.150	51.1179339	90
	6770650	2013059	2675090	2082501	0.45		155.433	69.5771419	47

Lynn Court

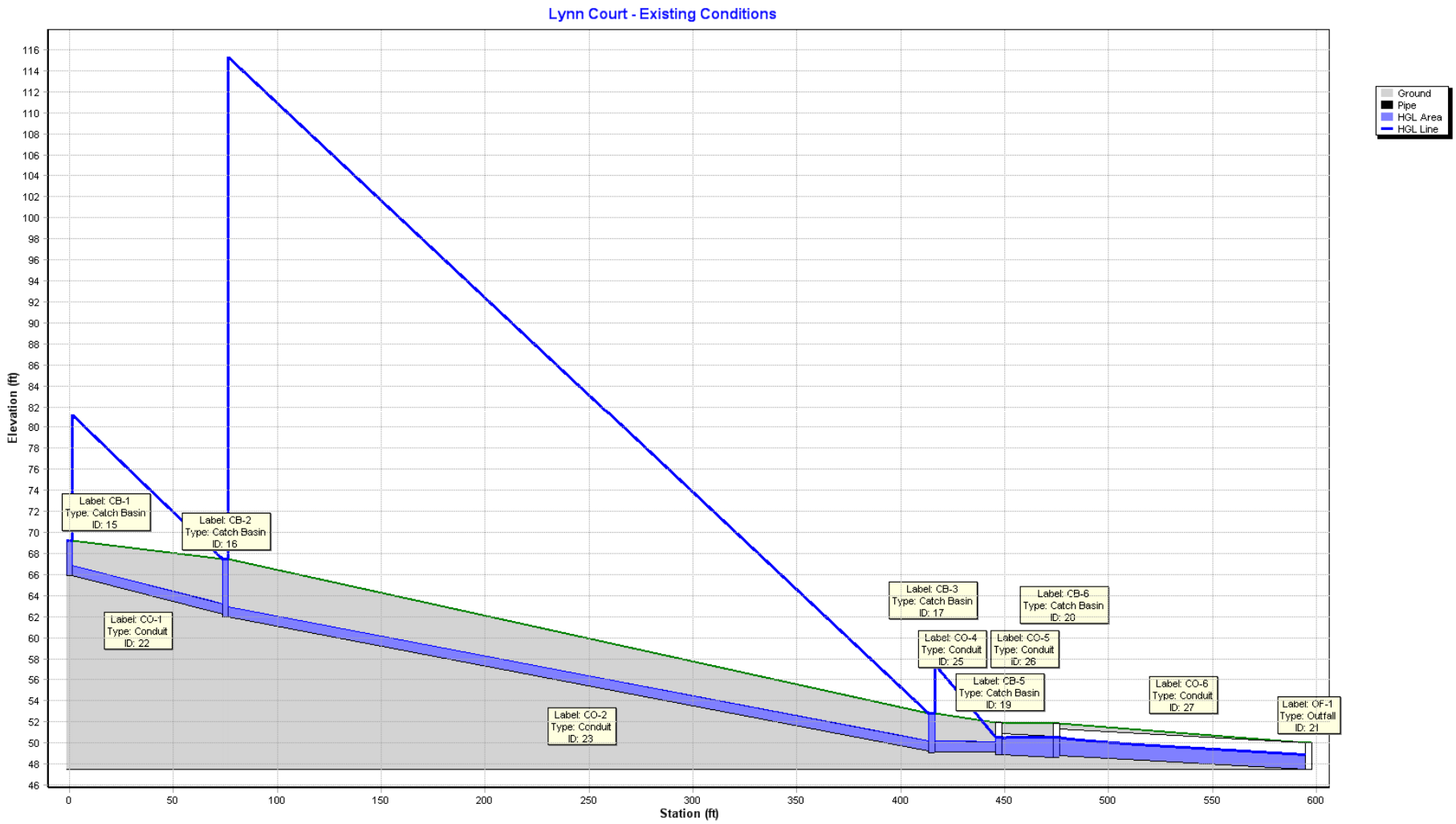
CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1	495654	81618	188939	225097	0.35		11.379	4.02105831	36
2	682	682	0		0.90		0.016	0.01409091	5
3	5008	5008	0		0.90		0.115	0.10347107	5
4	64198	22052	42146		0.51		1.474	0.74588154	20
5	99511	20881	62937	15693	0.41		2.284	0.93692837	17
6	51908	27342	24566		0.62		1.192	0.73410468	8
Total	717039						16.461		

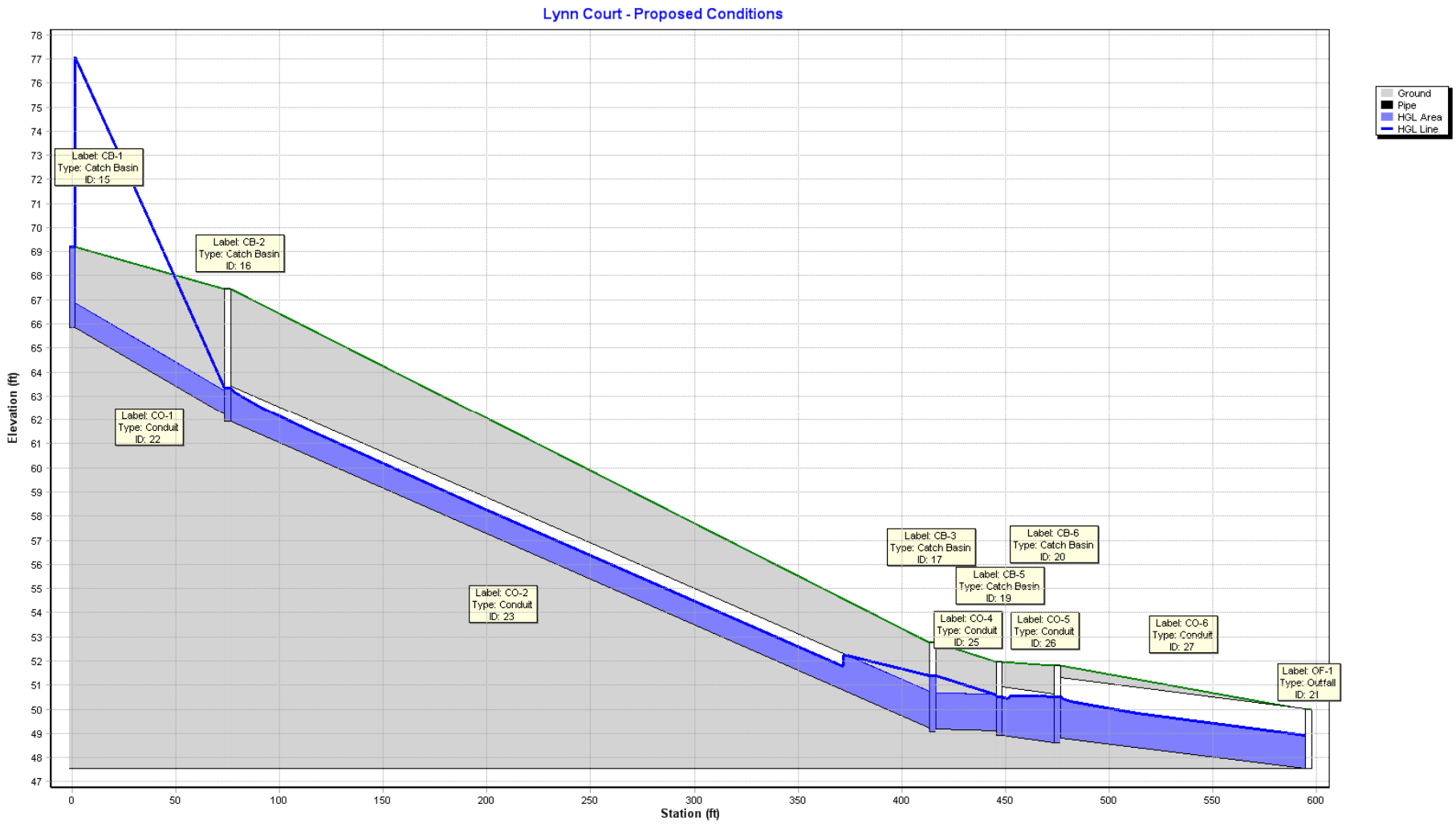
Intervale

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1 (direct)	4328	4328	0		0.90		0.099	0.08942149	5
1 (u/s)	75620	27844	47776		0.52		1.736	0.90432507	30
2	51118	16135	34983		0.49		1.174	0.57429752	5
3 (direct)	3123	3123	0		0.90		0.072	0.06452479	5
3 (u/s)	119706	42515	77191		0.51		2.748	1.41002755	30
4	1512	1512	0		0.90		0.035	0.03123967	5
5	13413	13413	0		0.90		0.308	0.2771281	5
6	14155	4235	9920		0.48		0.325	0.15581956	8
7 (direct)	18068	8353	9715		0.58		0.415	0.23949036	8
7 (u/s)	384694	135367	249327		0.51		8.831	4.51396694	30
8	9878	3391	6487		0.51		0.227	0.11473829	5
9	37830	17967	19863		0.58		0.868	0.50801653	8
10	2108	2108	0		0.90		0.048	0.04355372	5
11 (direct)	1545	1545	0		0.90		0.035	0.03192149	5
11 (u/s)	119660	46871	72789		0.54		2.747	1.46971074	30
12	6215	6215	0		0.90		0.143	0.12840909	5
13 (direct)	2016	2016	0		0.90		0.046	0.04165289	5
13 (u/s)	146474	46009	100465		0.49		3.363	1.64250689	30
15 (direct)	105291	35736	69555		0.50		2.417	1.21737603	15
15 (u/s)	427720	121638	196459	109623	0.45		9.819	4.36952479	45

Camp Avenue

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	1901020	319809	1224608	356603	0.38		43.641	16.678859	42


Lynn Court - Existing Conditions
Elevation (ft)
Station (ft)
Ground
Pipe
HGL Area
HGL Line
Label: CB-1
Type: Catch Basin
ID: 15
Label: CB-2
Type: Catch Basin
ID: 16
Label: CB-3
Type: Catch Basin
ID: 17
Label: CB-5
Type: Catch Basin
ID: 19
Label: CB-6
Type: Catch Basin
ID: 20
Label: CO-1
Type: Conduit
ID: 22
Label: CO-2
Type: Conduit
ID: 23
Label: CO-4
Type: Conduit
ID: 25
Label: CO-5
Type: Conduit
ID: 26
Label: CO-6
Type: Conduit
ID: 27
Label: OF-1
Type: Outfall
ID: 21


Lynn Court - Proposed Conditions
Elevation (ft)
Station (ft)
Ground
Pipe
HGL Area
HGL Line
Label: CB-1
Type: Catch Basin
ID: 15
Label: CB-2
Type: Catch Basin
ID: 16
Label: CO-1
Type: Conduit
ID: 22
Label: CO-2
Type: Conduit
ID: 23
Label: CB-3
Type: Catch Basin
ID: 17
Label: CB-6
Type: Catch Basin
ID: 20
Label: CB-5
Type: Catch Basin
ID: 19
Label: CO-4
Type: Conduit
ID: 25
Label: CO-5
Type: Conduit
ID: 26
Label: CO-6
Type: Conduit
ID: 27
Label: OF-1
Type: Outfall
ID: 21

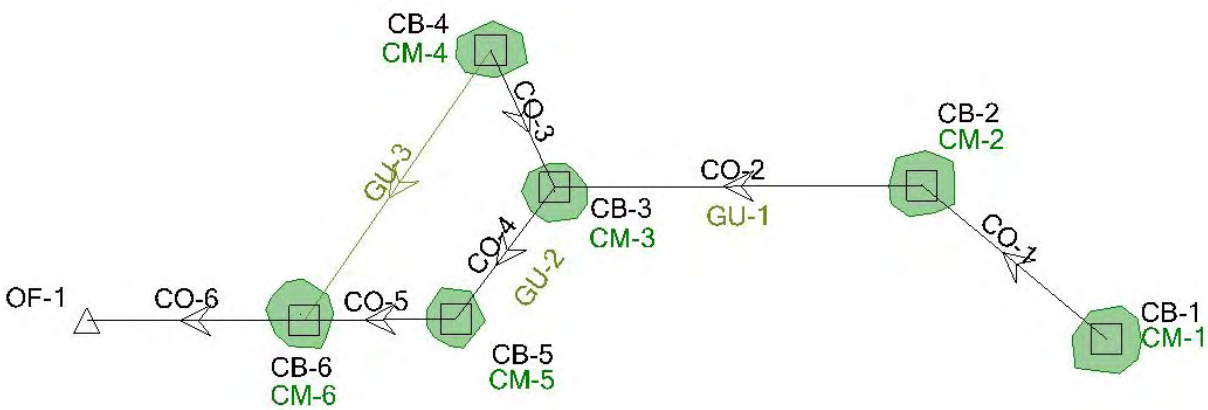
Lynn Court Storm Drainage System
StormCAD Summary Table and System Layout

Lynn Court Existing Conditions

Label	Structure	Upstream Inlet Area (ac)	Upstream Inlet C	Ground (ft)	HGL (ft)	System Rational Flow (ft³/s)	Section Discharge Capacity (ft³/s)	Diameter (in)	Length (ft)	Material	Velocity (Average) (ft/s)
CO-1	CB-1	11.379	0.35	69.21	81.18	15.26	15.26	12	75	Concrete	19.42
	CB-2			67.43	67.43		7.84				
CO-2	CB-2	0.016	0.9	67.43	115.34	15.28	15.28	12	340	Concrete	19.46
	CB-3			52.78	52.78		6.89				
CO-3	CB-4	1.474	0.51	52.58	52.82	1.54	1.54	12	22	Concrete	1.96
	CB-3			52.78	52.78		6.12				
CO-4	CB-3	0.115	0.9	52.78	57.44	16.55	16.55	12	32	Concrete	21.07
	CB-5			51.97	50.54		1.54				
CO-5	CB-5	2.284	0.41	51.97	50.54	20.24	20.24	24	28	Concrete	8.39
	CB-6			51.82	50.51		23.42				
CO-6	CB-6	1.192	0.62	51.82	50.51	24.72	24.72	30	121	Concrete	8.96
	OF-1			50	48.91		42.35				

Lynn Court Proposed Conditions

Label	Structure	Upstream Inlet Area (ac)	Upstream Inlet C	Ground (ft)	HGL (ft)	System Rational Flow (ft³/s)	Section Discharge Capacity (ft³/s)	Diameter (in)	Length (ft)	Material	Velocity (Average) (ft/s)
CO-1	CB-1	11.379	0.35	69.21	77.09	15.26	15.26	12	75	Concrete	19.42
	CB-2			67.43	63.34		7.84				
CO-2	CB-2	0.016	0.9	67.43	63.34	15.28	15.28	18	340	Concrete	12.61
	CB-3			52.78	51.38		20.3				
CO-3	CB-4	1.474	0.51	52.58	51.42	1.54	1.54	12	22	Concrete	1.96
	CB-3			52.78	51.38		6.12				
CO-4	CB-3	0.115	0.9	52.78	51.38	16.48	16.48	18	32	Concrete	9.33
	CB-5			51.97	50.55		4.55				
CO-5	CB-5	2.284	0.41	51.97	50.53	20.14	20.14	24	28	Concrete	8.38
	CB-6			51.82	50.51		23.42				
CO-6	CB-6	1.192	0.62	51.82	50.51	24.59	24.59	30	121	Concrete	8.95
	OF-1			50	48.9		42.35				



APPENDIX O

Intervale Road Drainage Computations

USGS Connecticut StreamStats

Streamstats Ungaged Site Report

Date: Fri Apr 30 2010 16:31:19 Mountain Daylight Time
Site Location: Connecticut
NAD83 Latitude: 41.0742 (41 04 26)
NAD83 Longitude: -73.5125 (-73 30 44)
NAD27 Latitude: 41.0741 (41 04 26)
NAD27 Longitude: -73.5129 (-73 30 46)
Drainage Area: 0.1 mi2

Peak Flows Region Grid Basin Characteristics

100% Statewide Multiparameter (0.1 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.1 (below min value 1.69)	1.69	715
24 Hour 2 Year Precipitation (inches)	3.6	2.95	3.82
24 Hour 10 Year Precipitation (inches)	5.3	4.15	5.53
24 Hour 25 Year Precipitation (inches)	6.5	4.93	7
24 Hour 50 Year Precipitation (inches)	7.7	5.62	8.36
24 Hour 100 Year Precipitation (inches)	9.1	6.41	9.99
Mean Basin Elevation (feet)	88.02 (below min value 169)	169	1310

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2	7.89		3.5		
PK10	17.3		8.1		
PK25	22		11		
PK50	26.5		13		
PK100	30.3		14		
PK500	43.3		15		

Rose Lane Culvert Drainage Area

MILONE & MACBROOM
99 Realty Drive
Cheshire, Connecticut 06410
(203 271-1773

Noroton River Watershed Drainage Analysis

6/28/2010
MMI# 1581-04-3
BY: BAM

West Avenue Culvert

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	6249865	2011329	2156036	2082500	0.46		143.477	65.9666414	90
	4928815	2011330		2082501	0.45		113.150	51.1179339	90
	6770650	2013059	2675090	2082501	0.45		155.433	69.5771419	47

Lynn Court

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1	495654	81618	188939	225097	0.35		11.379	4.02105831	36
2	682	682	0		0.90		0.016	0.01409091	5
3	5008	5008	0		0.90		0.115	0.10347107	5
4	64198	22052	42146		0.51		1.474	0.74588154	20
5	99511	20881	62937	15693	0.41		2.284	0.93692837	17
6	51908	27342	24566		0.62		1.192	0.73410468	8
Total	717039						16.461		

Intervale

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1 (direct)	4328	4328	0		0.90		0.099	0.08942149	5
1 (u/s)	75620	27844	47776		0.52		1.736	0.90432507	30
2	51118	16135	34983		0.49		1.174	0.57429752	5
3 (direct)	3123	3123	0		0.90		0.072	0.06452479	5
3 (u/s)	119706	42515	77191		0.51		2.748	1.41002755	30
4	1512	1512	0		0.90		0.035	0.03123967	5
5	13413	13413	0		0.90		0.308	0.2771281	5
6	14155	4235	9920		0.48		0.325	0.15581956	8
7 (direct)	18068	8353	9715		0.58		0.415	0.23949036	8
7 (u/s)	384694	135367	249327		0.51		8.831	4.51396694	30
8	9878	3391	6487		0.51		0.227	0.11473829	5
9	37830	17967	19863		0.58		0.868	0.50801653	8
10	2108	2108	0		0.90		0.048	0.04355372	5
11 (direct)	1545	1545	0		0.90		0.035	0.03192149	5
11 (u/s)	119660	46871	72789		0.54		2.747	1.46971074	30
12	6215	6215	0		0.90		0.143	0.12840909	5
13 (direct)	2016	2016	0		0.90		0.046	0.04165289	5
13 (u/s)	146474	46009	100465		0.49		3.363	1.64250689	30
15 (direct)	105291	35736	69555		0.50		2.417	1.21737603	15
15 (u/s)	427720	121638	196459	109623	0.45		9.819	4.36952479	45

Camp Avenue

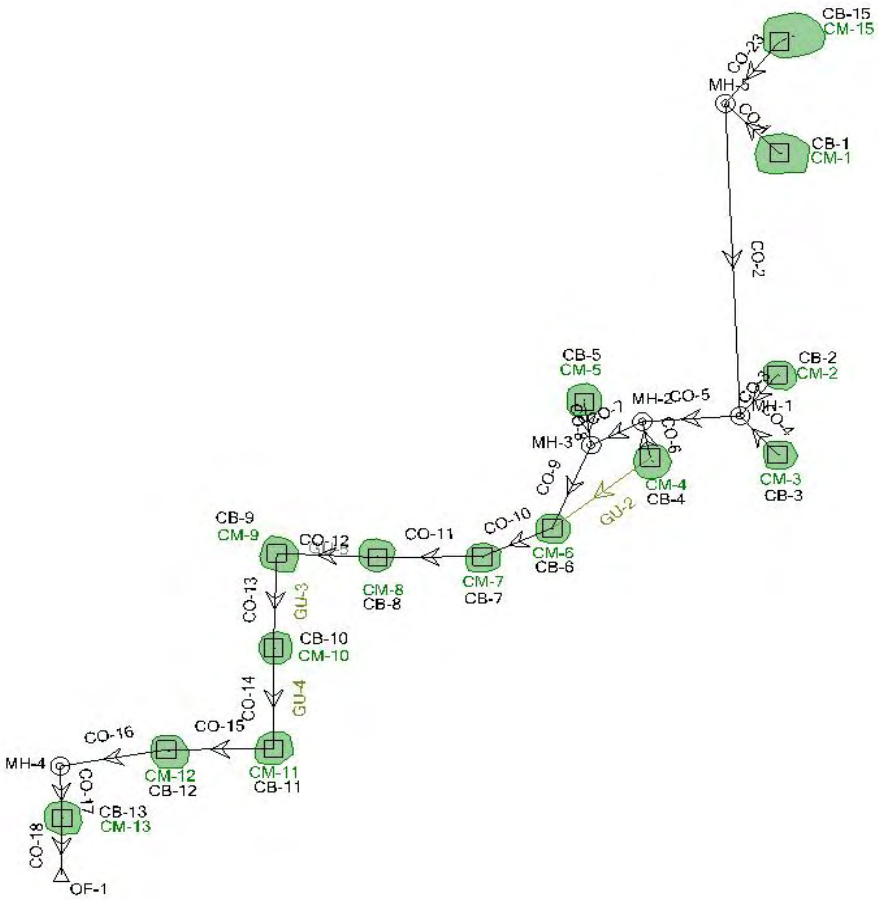
	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	1901020	319809	1224608	356603	0.38		43.641	16.678859	42

Abbey and Intervale Drainage System
Existing Conditions - Outfall at Rose Lane

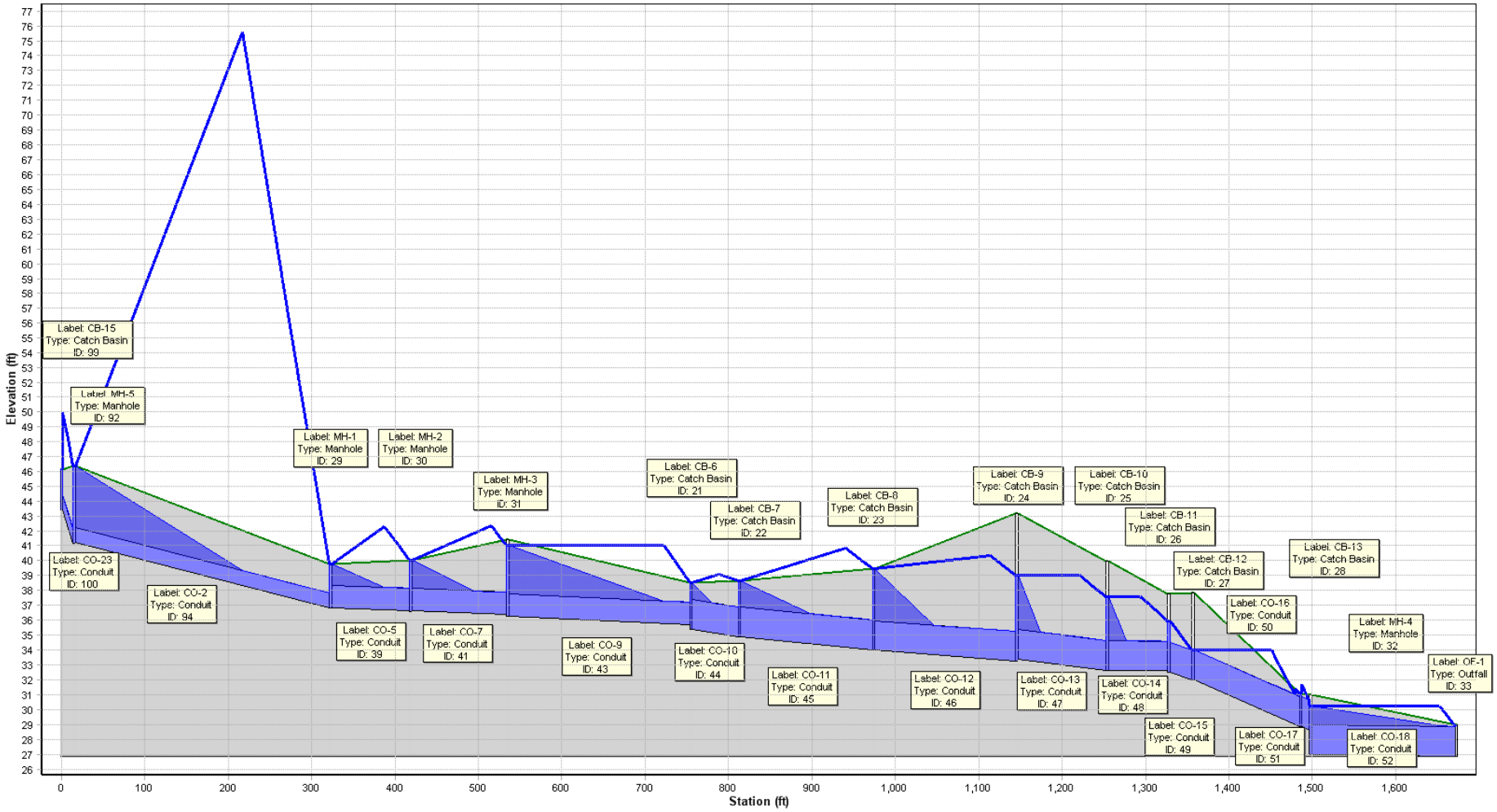
Abbey and Intervale Drainage System - Outfall at Rose Lane

Label	Structure	Upstream Inlet Area (acres)	Upstream Inlet C	Ground (ft)	HGL (ft)	System Rational Flow (ft^3/s)	Section Discharge Capacity (ft^3/s)	Length (ft)	Diameter (in)	Material	Velocity (Average) (ft/s)
CO-1	CB-1	0.099	0.9	45.35	46.59	0.6	3.5	8	12	Concrete	4.46
	MH-5			46.36	46.36		15.01				
CO-3	CB-2	1.174	0.49	39.28	40	3.89	3.89	18	12	Concrete	4.95
	MH-1			39.79	39.79		8.77				
CO-4	CB-3	0.072	0.9	39.42	39.83	0.44	5.09	6	18	Concrete	2.88
	MH-1			39.79	39.79		19.18				
CO-5	MH-1	(N/A)	(N/A)	39.79	42.3	8.97	28.32	96	18	Concrete	16.03
	MH-2			40.05	40.05		4.67				
CO-6	CB-4	0.035	0.9	39.49	40.05	0.19	0.19	2	12	Concrete	0.24
	MH-2			40.05	40.05		7.97				
CO-7	MH-2	(N/A)	(N/A)	40.05	42.32	9.09	28.44	116	18	Concrete	16.1
	MH-3			41.38	41		4.97				
CO-8	CB-5	0.308	0.9	41.01	41.04	1.87	1.87	31	12	Concrete	2.38
	MH-3			41.38	41		9.47				
CO-9	MH-3	(N/A)	(N/A)	41.38	41	10.37	29.72	220	18	Concrete	16.82
	CB-6			38.52	38.52		5.39				
CO-10	CB-6	0.325	0.48	38.52	39.07	11.1	30.45	58	24	Concrete	9.69
	CB-7			38.64	38.64		20.58				
CO-11	CB-7	0.415	0.58	38.64	40.86	12.2	46.45	161	24	Concrete	14.79
	CB-8			39.47	39.47		16.63				
CO-12	CB-8	0.227	0.51	39.47	40.33	12.73	46.98	172	24	Concrete	14.95
	CB-9			43.18	39		14.84				
CO-13	CB-9	0.868	0.58	43.18	39	13.85	48.1	108	24	Concrete	15.31
	CB-10			39.96	37.55		18.98				
CO-14	CB-10	0.048	0.9	39.96	37.55	14.6	48.85	74	24	Concrete	15.55
	CB-11			37.74	35.97		5.88				
CO-15	CB-11	0.035	0.9	37.74	35.97	15.36	54.46	29	24	Concrete	17.33
	CB-12			37.82	33.99		29.4				
CO-16	CB-12	0.143	0.9	37.82	33.99	15.94	55.04	129	24	Concrete	24.25
	MH-4			31.05	31.05		35.18				
CO-17	MH-4	(N/A)	(N/A)	31.05	31.66	15.93	55.03	12	24	Concrete	17.52
	CB-13			31	30.59		34.55				
CO-18	CB-13	0.046	0.9	31	30.24	16.11	60.63	175	24	Concrete	19.3
	OF-1			29	28.87		5.92				
CO-2	MH-5	(N/A)	(N/A)	46.36	75.63	6.02	20.72	308	12	Concrete	26.38
	MH-1			39.79	39.79		4.24				
CO-23	CB-15	2.417	0.5	46.14	49.94	5.6	17.4	15	12	Concrete	22.16
	MH-5			46.36	46.36		13.8				

Abbey and Intervale Drainage System
Existing Conditions - Outfall at Rose Lane



Drainage System to Rose Lane Outfall - Existing Conditions

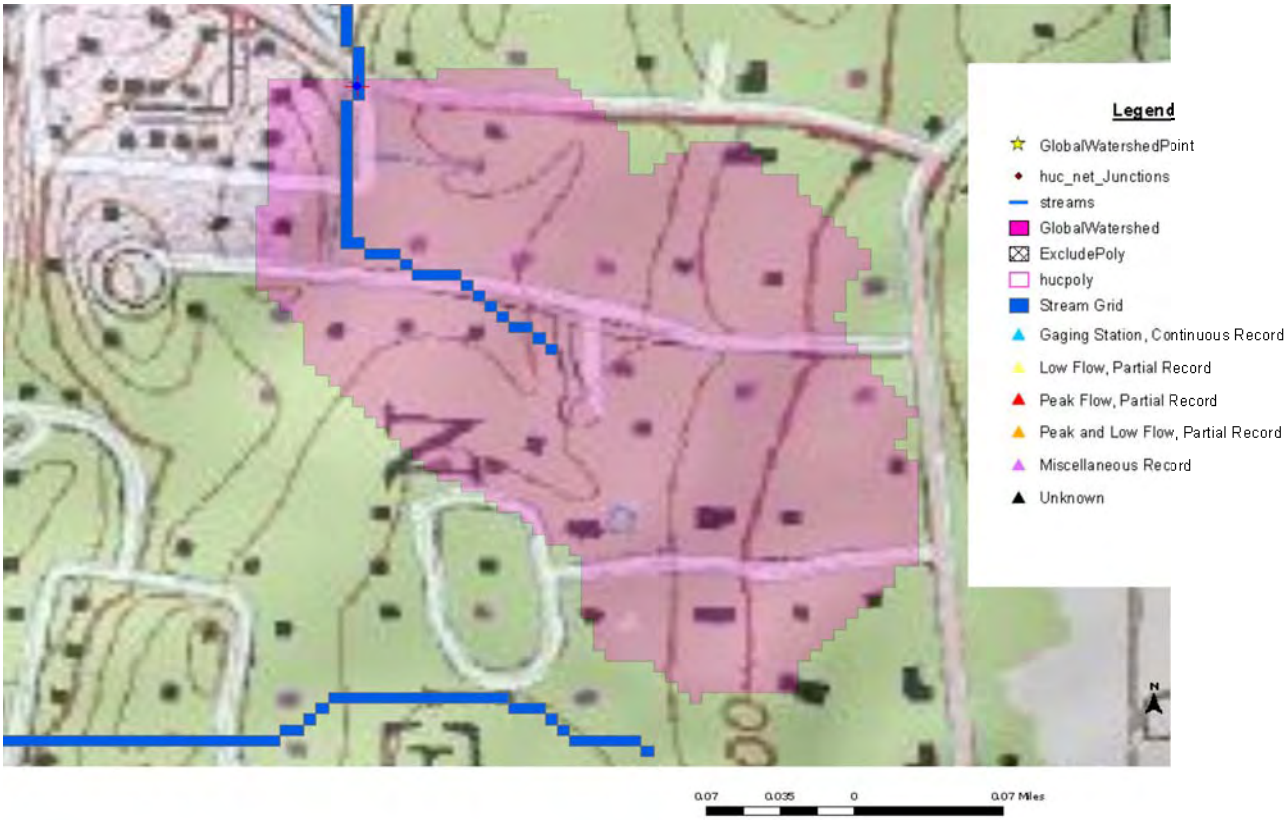


APPENDIX P

Camp Avenue Culvert Drainage Computations

Connecticut StreamStats

StreamStats Print Page



4/30/2010 1:27:35 PM

Camp Avenue Culvert Drainage Area

USGS Connecticut StreamStats

Streamstats Ungaged Site Report

Date: Fri Apr 30 2010 13:26:50 Mountain Daylight Time
Site Location: Connecticut
NAD83 Latitude: 41.0943 (41 05 39)
NAD83 Longitude: -73.5066 (-73 30 23)
NAD27 Latitude: 41.0942 (41 05 39)
NAD27 Longitude: -73.5071 (-73 30 25)
Drainage Area: 0.0683 mi2

Peak Flows Region Grid Basin Characteristics

100% Statewide Multiparameter (0.0683 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.0683 (below min value 1.69)	1.69	715
24 Hour 2 Year Precipitation (inches)	3.6	2.95	3.82
24 Hour 10 Year Precipitation (inches)	5.3	4.15	5.53
24 Hour 25 Year Precipitation (inches)	6.5	4.93	7
24 Hour 50 Year Precipitation (inches)	7.7	5.62	8.36
24 Hour 100 Year Precipitation (inches)	9.0	6.41	9.99
Mean Basin Elevation (feet)	200.21	169	1310

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2	7.3		3.5		
PK10	15.9		8.1		
PK25	19.9		11		
PK50	23.7		13		
PK100	26.5		14		
PK500	37.9		15		

Camp Avenue Culvert Drainage Area

tmp#4.txt

Culvert Calculator

All calculator output should be verified prior to design use

Entered Data:

Shape	Circular
Number of Barrels	1
Solving for	Headwater
Chart Number	1
Scale Number	1
Chart Description	CONCRETE PIPE CULVERT; NO BEVELED RING ENTRANCE
Scale Description	SQUARE EDGE ENTRANCE WITH HEADWALL
Overtopping	Off
Flowrate	100.0000 cfs
Manning's n	0.0130
Roadway Elevation	161.0000 ft
Inlet Elevation	156.0000 ft
Outlet Elevation	153.0000 ft
Diameter	30.0000 in
Length	44.5000 ft
Entrance Loss	0.5000
Tailwater	0.5000 ft

Computed Results:

Headwater	174.1082 ft
Slope	0.0674 ft/ft
Velocity	NA

Messages:

Headwater elevation exceeds roadway elevation.

DIS-CHARGE Flow cfs	HEAD-WATER ELEV. ft	INLET CONTROL DEPTH ft	OUTLET CONTROL DEPTH ft	FLOW TYPE	NORMAL DEPTH in	CRITICAL DEPTH in	OUTLET VEL. fps	TAILWATER DEPTH ft	TAILWATER VEL. fps
10.00	157.41	1.41	0.00	NA	6.21	12.68	13.63	0.52	0.00
0.50									
20.00	158.24	2.24	0.00	NA	8.81	18.22	16.65	0.73	0.00
0.50									
30.00	159.13	3.13	0.00	NA	10.89	22.41	18.65	0.91	0.00
0.50									
40.00	160.23	4.23	0.00	NA	12.74	25.55	20.16	1.06	0.00
0.50									

Culvert Report

Camp Avenue
Proposed Culvert

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Thursday, May 20 2010

Box Culvert

Invert Elev Dn (ft)	=	153.00
Pipe Length (ft)	=	44.50
Slope (%)	=	6.74
Invert Elev Up (ft)	=	156.00
Rise (in)	=	36.0
Shape	=	Box
Span (in)	=	72.0
No. Barrels	=	1
n-Value	=	0.013
Inlet Edge	=	Projecting
Coeff. K,M,c,Y,k	=	0.0145, 1.75, 0.0419, 0.64, 0.5

Embankment

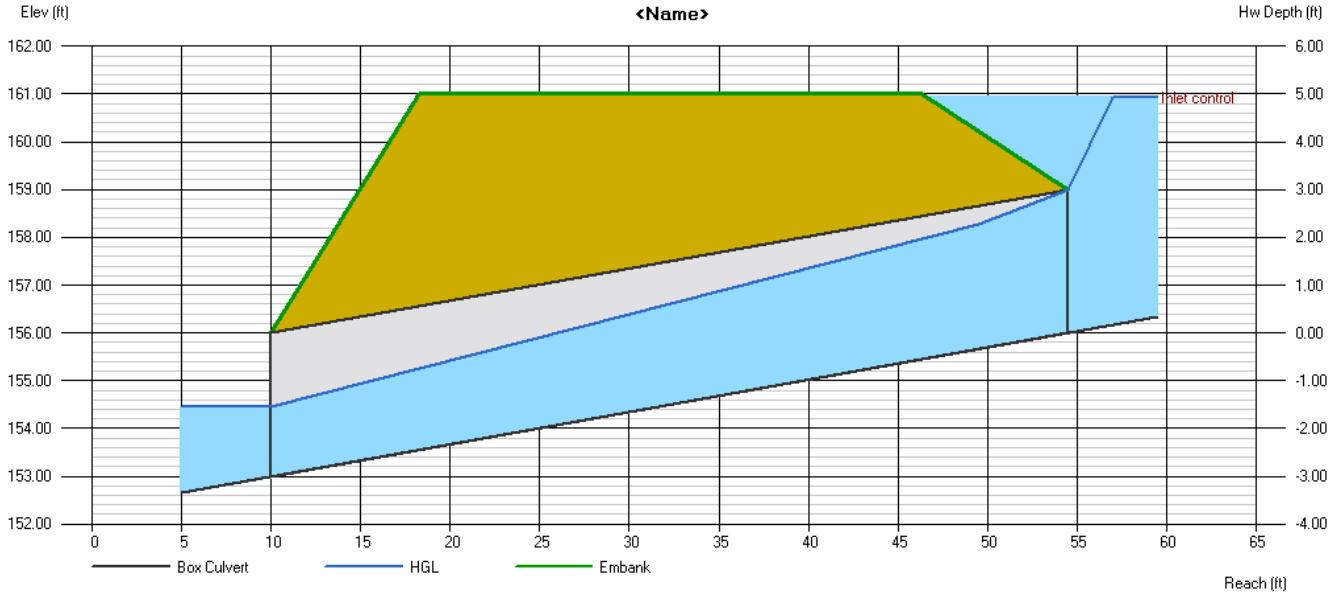
Top Elevation (ft)	=	161.00
Top Width (ft)	=	28.00
Crest Width (ft)	=	44.50

Calculations

Qmin (cfs)	=	50.00
Qmax (cfs)	=	200.00
Tailwater Elev (ft)	=	Normal

Highlighted

Qtotal (cfs)	=	155.00
Qpipe (cfs)	=	155.00
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	17.82
Veloc Up (ft/s)	=	9.41
HGL Dn (ft)	=	154.45
HGL Up (ft)	=	158.75
Hw Elev (ft)	=	160.93
Hw/D (ft)	=	1.64
Flow Regime	=	Inlet Control



Camp Avenue Proposed Culvert
Summary of Flow Capacity Computations by Hydraflow

Q			Veloc		Depth	
Total	Pipe	Over	Dn	Up	Dn	Up
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)
50.00	50.00	0.00	14.37	6.45	6.96	15.51
55.00	55.00	0.00	14.78	6.66	7.44	16.52
60.00	60.00	0.00	14.93	6.85	8.04	17.51
65.00	65.00	0.00	15.26	7.04	8.52	18.47
70.00	70.00	0.00	15.35	7.22	9.12	19.40
75.00	75.00	0.00	15.63	7.38	9.60	20.31
80.00	80.00	0.00	15.87	7.55	10.08	21.21
85.00	85.00	0.00	15.92	7.70	10.68	22.08
90.00	90.00	0.00	16.13	7.85	11.16	22.94
95.00	95.00	0.00	16.32	7.99	11.64	23.78
100.00	100.00	0.00	16.50	8.13	12.12	24.60
105.00	105.00	0.00	16.67	8.26	12.60	25.42
110.00	110.00	0.00	16.82	8.39	13.08	26.22
115.00	115.00	0.00	16.96	8.52	13.56	27.00
120.00	120.00	0.00	17.09	8.64	14.04	27.78
125.00	125.00	0.00	17.08	8.76	14.64	28.55
130.00	130.00	0.00	17.33	8.87	15.00	29.30
135.00	135.00	0.00	17.44	8.99	15.48	30.05
140.00	140.00	0.00	17.54	9.10	15.96	30.78
145.00	145.00	0.00	17.64	9.20	16.44	31.51
150.00	150.00	0.00	17.61	9.31	17.04	32.23
155.00	155.00	0.00	17.82	9.41	17.40	32.94
160.00	158.28	1.72	17.95	9.48	17.64	33.40
165.00	159.71	5.29	17.99	9.50	17.76	33.61
170.00	160.88	9.12	18.00	9.53	17.88	33.77
175.00	161.97	13.03	18.00	9.55	18.00	33.92
180.00	163.03	16.97	17.99	9.57	18.12	34.07
185.00	163.77	21.23	18.08	9.58	18.12	34.17
190.00	164.66	25.34	18.06	9.60	18.24	34.30
195.00	165.57	29.43	18.15	9.62	18.24	34.42
200.00	166.28	33.72	18.11	9.63	18.36	34.52

HGL			
Dn	Up	Hw	Hw/D
(ft)	(ft)	(ft)	
153.58	157.29	158.03	0.68
153.62	157.38	158.18	0.73
153.67	157.46	158.32	0.77
153.71	157.54	158.46	0.82
153.76	157.62	158.60	0.87
153.80	157.69	158.74	0.91
153.84	157.77	158.87	0.96
153.89	157.84	159.01	1.00
153.93	157.91	159.14	1.05
153.97	157.98	159.27	1.09
154.01	158.05	159.41	1.14
154.05	158.12	159.54	1.18
154.09	158.18	159.67	1.22
154.13	158.25	159.80	1.27
154.17	158.32	159.93	1.31
154.22	158.38	160.06	1.35
154.25	158.44	160.19	1.40
154.29	158.50	160.32	1.44
154.33	158.57	160.45	1.48
154.37	158.63	160.58	1.53
154.42	158.69	160.73	1.58
154.45	158.75	160.93	1.64
154.47	158.78	161.06	1.69
154.48	158.80	161.12	1.71
154.49	158.81	161.17	1.72
154.50	158.83	161.21	1.74
154.51	158.84	161.26	1.75
154.51	158.85	161.29	1.76
154.52	158.86	161.33	1.78
154.52	158.87	161.36	1.79
154.53	158.88	161.39	1.80

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Noroton River Watershed Evaluation By: BAM Date: 04/29/10
Location: Camp Avenue Culvert Checked: Date:
Circle one: **Present** *Developed* Watershed:
Circle one: **Tc** *T_t* Subwatershed:

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		Grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.240		
3. Flow Length, L (< 300ft)	ft.	70.0		
4. Two-year 24-hr rainfall, P_2	in.	3.2		
5. Land slope, s	ft./ft.	0.014		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.206	=	0.206

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**		**C-D**		**D-E**			
7. Surface description		lawn							
8. Manning's roughness coeff., n		0.240							
9. Paved or unpaved		UNPVD							
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	570.0							
12. Watercourse slope, s	ft./ft.	0.0150							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.41		0.00		0.00			
14. $T_t = \frac{L}{3600 * V}$	hr.	0.384	+	0.000	+	0.000	+		= 0.384

Channel flow

Segment ID		**E-F**		**F-G**					
15. Channel Bottom width, b	ft.	15" pipe		5.00					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.			3.00					
17. Depth of flow, d	ft.	1.25		1.00					
18. Cross sectional flow area, A (assume trapezoidal)	$ft.^2$	1.23		8.00					
19. Wetted perimeter, P_w	ft.	3.93		11.32					
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.31		0.71					
21. Channel slope, s	ft./ft.	0.0050		0.005					
22. Manning's roughness coeff., n		0.013		0.040					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	3.74		2.09					
24. Flow length, L	ft.	430.0		560.0					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.032	+	0.074					= 0.106
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.696

MILONE & MACBROOM
99 Realty Drive
Cheshire, Connecticut 06410
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Noroton River Watershed Drainage Analysis

6/28/2010
MMI# 1581-04-3
BY: BAM

West Avenue Culvert

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	6249865	2011329	2156036	2082500	0.46		143.477	65.9666414	90
	4928815	2011330		2082501	0.45		113.150	51.1179339	90
	6770650	2013059	2675090	2082501	0.45		155.433	69.5771419	47

Lynn Court

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1	495654	81618	188939	225097	0.35		11.379	4.02105831	36
2	682	682	0		0.90		0.016	0.01409091	5
3	5008	5008	0		0.90		0.115	0.10347107	5
4	64198	22052	42146		0.51		1.474	0.74588154	20
5	99511	20881	62937	15693	0.41		2.284	0.93692837	17
6	51908	27342	24566		0.62		1.192	0.73410468	8
Total	717039						16.461		

Intervale

CB	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
1 (direct)	4328	4328	0		0.90		0.099	0.08942149	5
1 (u/s)	75620	27844	47776		0.52		1.736	0.90432507	30
2	51118	16135	34983		0.49		1.174	0.57429752	5
3 (direct)	3123	3123	0		0.90		0.072	0.06452479	5
3 (u/s)	119706	42515	77191		0.51		2.748	1.41002755	30
4	1512	1512	0		0.90		0.035	0.03123967	5
5	13413	13413	0		0.90		0.308	0.2771281	5
6	14155	4235	9920		0.48		0.325	0.15581956	8
7 (direct)	18068	8353	9715		0.58		0.415	0.23949036	8
7 (u/s)	384694	135367	249327		0.51		8.831	4.51396694	30
8	9878	3391	6487		0.51		0.227	0.11473829	5
9	37830	17967	19863		0.58		0.868	0.50801653	8
10	2108	2108	0		0.90		0.048	0.04355372	5
11 (direct)	1545	1545	0		0.90		0.035	0.03192149	5
11 (u/s)	119660	46871	72789		0.54		2.747	1.46971074	30
12	6215	6215	0		0.90		0.143	0.12840909	5
13 (direct)	2016	2016	0		0.90		0.046	0.04165289	5
13 (u/s)	146474	46009	100465		0.49		3.363	1.64250689	30
15 (direct)	105291	35736	69555		0.50		2.417	1.21737603	15
15 (u/s)	427720	121638	196459	109623	0.45		9.819	4.36952479	45

Camp Avenue

	Area (sf)	Imp. (.9) (sf)	Grass (.3) (sf)	Unimprv (.2) (sf)	Composite C	Column1	Area(ac) (ac)	CA	Tc (min)
	1901020	319809	1224608	356603	0.38		43.641	16.678859	42

Worksheet 2: Runoff curve number and runoff

Project: Noroton River Watershed Evaluation By: BAM Date: 4/30/2010
Location: Camp Avenue, Darien Checked: Date:
Circle one: ***Present*** Developed Watershed: EX WS

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
C soil	Woods - good condition	70			12.55	878.42
C soil	Grass / Open space - good condition	74			36.27	2684.15
C soil	Grass / Open space - fair condition	79			0.00	0.00
C soil	Disturbed Area (Dirt)	87			0.00	0.00
D soil	Woods - good condition	77			6.54	503.84
D soil	Grass / Open space - good condition	80			9.43	754.74
D soil	Grass / Open space - fair condition	84			0.00	0.00
D soil	Disturbed Area (Dirt)	89			0.00	0.00
N/A	Existing impervious cover	98			12.04	1179.76
				Totals =	76.84	6000.91
					(0.12006	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{6000.91}{76.84}$$

Use CN = **78**

Runoff

Frequency	yr	25	s=	2.804
Rainfall, P	in	5.7		
Runoff, Q	in	3	3.325	