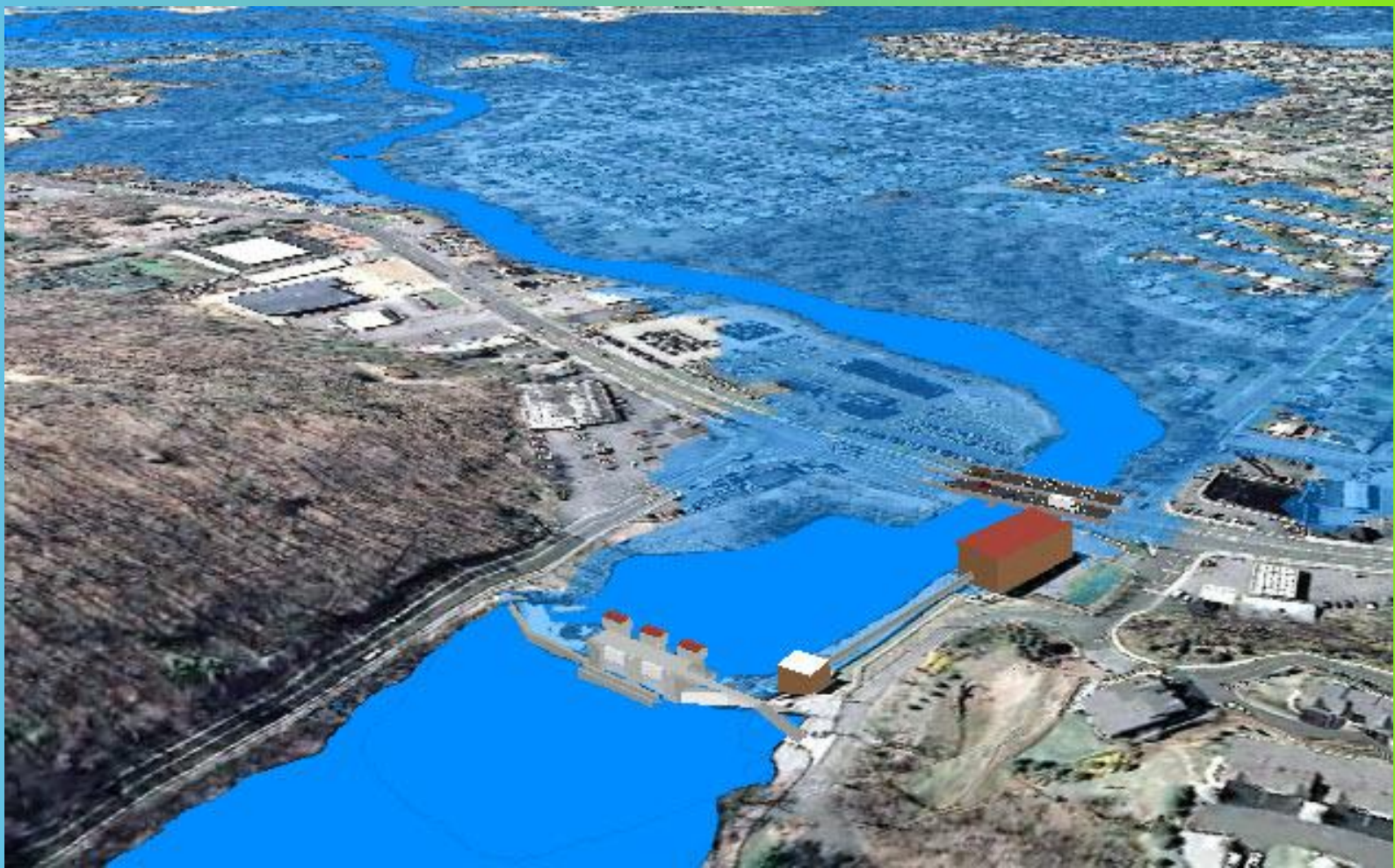


April 12, 2012

Pompton Lake Dam Floodgate Operations Study Final Report



Floodgate Operation Reviewed for the Following Storm Events

March 13-15, 2010

March 6-8, 2011

March 10-12, 2011

Hurricane Irene, August 2011



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1 Executive Summary

In response to the recommendations of the Governor's Passaic River Basin Flood Advisory Commission, NJDEP retained the services of AECOM to evaluate the operational impacts of the Pompton Lakes Dam Floodgate Facility. Advisory Commission and public criticism of the U.S. Army Corps of Engineers' previous studies required that a more impartial study be performed to clarify and confirm the downstream consequences of floodgate operations.

The purpose of the study was to develop a hydraulic computer model to simulate the downstream effects resulting from the operation of the Pompton Lakes Dam Floodgate Facility. The study included approximately 5.50 miles of the Ramapo River (including Pompton Lakes) and 0.17 miles of the Pompton River.

The study area focused on the floodway/floodplain area downstream of the Pompton Lakes Dam, which is within the Borough of Pompton Lakes and Wayne Township. The analysis began at the downstream face of the Route 287 Bridge (Ramapo River crossing) and continued downstream and terminated at the Jackson Avenue Bridge (Pompton River crossing), or approximately 11,500 feet downstream of the Pompton Lakes Dam. Tributaries to the Ramapo that may be affected by backwater were also studied; these included the Wanaque and Pequannock Rivers.

A hydraulic model, the unsteady flow model within the Hydrologic Engineering Centers River Analysis System (HEC-RAS), was used to determine downstream water surface elevations and velocities during various flood events. The existing Operating Rule Curve controlling the floodgate openings and operations of the Pompton Lakes Dam was incorporated into the HEC-RAS computer model. The HEC-RAS unsteady flow model is a widely accepted hydraulic model and it was chosen for this study due to its ability to model the unsteady flow (flow rates that vary with time) discharging from the flood gates and predict both the stages (water surface elevations) and discharges (flow rates and velocities) downstream of the dam.

Precipitation for the four recent floods; March 13-15, 2010, March 6-8, 2011, March 10-12, 2011, and Hurricane Irene, August 2011, were entered into a hydrologic model, HEC-HMS, to develop inflow hydrographs for input into the unsteady flow model. Applied Weather Associates, (AWA), used the Storm Precipitation Analysis System (SPAS) model in conjunction with NEXRAD weather radar data to analyze the rainfall for these four storms over the Pompton Lakes drainage basin. The rainfall amounts were provided in a 1 km grid with 5 minute time intervals for each of the basin/sub-basin boundaries.

The hydrologic model was calibrated to several USGS stream gaging stations throughout the basin. The hydraulic model was also calibrated in a similar manner but also was verified with several high water marks for Hurricane Irene. The four storms were significant flood events.

The three March storms were somewhere between a 10 year and 25 year return period (10% to 4% probability of occurrence). Based on flow records and rainfall, Hurricane Irene was somewhere between a 500-year event in the upper portion of the watershed and about a 100-year event in the lower portion.

The four storms occurred within a short time span of one another, March 2010 to August 2011. All four storms caused significant flooding. The Western Regional Climate Center Desert Research Institute in Reno Nevada produced a map of the United States showing the 72-month accumulated precipitation departure from normal through the end of February 2012. Northern New Jersey has had 50-to 65 additional inches of precipitation over that 72-month period. This same trend is shown in the peak stream flow data taken from the USGS Stream gages for the Ramapo River near Mahwah NJ. The average of the peak stream flow data for the past decade, 2000 to 2011, is about 55% higher than the average of decades for the past 60 years.

Besides analyzing the Floodgate Facility for the four recent flood events, a range of flows from low to high were also analyzed/modeled. All of the flows investigated the Operating Rule Curve by modeling the system as pre-project condition (without gates) and post-project condition (with gates). The results of the analyses found that the gates function as intended with no significant downstream impacts during any of the flow events. The impacts were considered at four locations. Three sites downstream from the Pompton Lakes Dam and one site upstream in Oakland, NJ.

With the gates in operation the flow and the stage may arrive somewhat sooner than without the gate operation. However, the maximum flows and elevations are nearly the same. The increases vary depending on the storm and the associated flow rates. The maximum predicted water surface increase in the vicinity of the Dawes Highway Bridge ranged between 0.18 and 0.24 feet and occurred for the simulated 2-year rainfall storm event. All of the other flow situations had significantly less increases in the flood elevations.

During Hurricane Irene Pompton Lake was lowered three feet prior to the onset of the storm. When comparing that analysis with not lowering lake levels both the stage and flow hydrographs downstream of the dam were essentially identical, indicating that there was no effect of lowering the reservoir before the onset of Hurricane Irene. There is simply not enough storage to attenuate the flooding caused by Hurricane Irene. The March 2010 storm and a smaller simulated storm event were run with the model to determine the effect of lowering the lake by 3.0 ft. prior to the rainfall event occurring. Both cases showed similar results. There is not enough volume of storage in the reservoir to reduce flooding.

Therefore, based on our modeling results, the Pompton Lakes Dam Gates and the Operating Rule Curve are performing as designed with no significant increases in the downstream impacts.

2 Introduction

The purpose of this study was to evaluate the operational impacts of the Pompton Lakes Floodgate Facility by developing a hydraulic computer model to simulate the downstream effects resulting from the operation of the Floodgate Facility. The study reaches includes approximately 5.50 miles of the Ramapo River, which includes Pompton Lake, and 0.17 miles of the Pompton River. Additionally, a 3-D computer animation was developed to illustrate the effects of the floodgate operation and downstream flow dynamics.

The study area focused on the floodway/floodplain area downstream of the Pompton Lakes Dam, which is within the Borough of Pompton Lakes. The study limits are from the Jackson Avenue Bridge (Pompton River crossing), which is approximately 11,500 feet below the Pompton Lakes Dam, to the downstream face of the Route 287 Bridge (Ramapo River crossing). Tributary flows from the Wanaque, Pequannock, Haycock, Pompton and Pequannock Rivers were also incorporated into the hydrologic and hydraulic models.

3 Purpose of Study

In response to the recommendations of the Governor's Passaic River Basin Flood Advisory Commission, NJDEP retained the services of AECOM to evaluate the operational impacts of the Pompton Lakes Dam Floodgate Facility. The study included approximately 5.50 miles of the Ramapo River (including Pompton Lake) and 0.17 miles of the Pompton River. Additionally, a 3-D computer animation was developed for use in public outreach to illustrate the effects of the floodgate operations and downstream flow dynamics.

3.1 Analysis Overview

The US Army Corps of Engineers (USACE) HEC-RAS Unsteady Flow model was used to determine downstream water surface elevations during various flood events. The HEC-RAS model incorporated the existing rules for controlling the floodgate openings and operation. An existing HEC-HMS (ArcHydro/HEC-GeoHMS) model was used to develop inflow hydrographs for input into the unsteady flow HEC-RAS model.

- The existing HEC-HMS watershed model for the Pompton River drainage basin was developed by the Risk Assessment, Mapping, and Planning Partners (RAMPP) team, a joint venture of Dewberry, URS, and ESP. Existing studies completed by the USACE as well as other approved studies were also utilized for this study. Contributory flows of the Ramapo, Pequannock, Wanaque, and Pompton Rivers were incorporated into the analysis/model.

- LIDAR data of the project area collected by the NJ Highlands Council and by the National Geospatial-Intelligence Agency (NGA) were used. Three (3) meter or better Digital Elevation Models (DEMs) of the area or better were downloaded from the USGS National Elevation Dataset website (<http://ned.usgs.gov>). Additional field surveys were also conducted to supplement the LIDAR and USGS data. Approximately 45 channel cross-sections were surveyed and combined with the LIDAR data and used for the cross section information for HEC-RAS between the Pompton Lakes Dam and Jackson Avenue. Also, cross-sectional data/information of the three bridges, two feeder dams and a weir between Jackson Avenue and Pompton Lake Dam was collected. The best available cross-sectional data upstream of the Pompton Lakes Dam was utilized for the needed geometry.
- As part of this analysis, the models were calibrated to four flood events: the March 12-14, 2010, March 6-9, 2011, March 9-13, 2011, and Hurricane Irene (August 2011). For the purpose of the analysis “Post-Condition is defined as the Pompton Lakes Dam Floodgate Facility and the upstream channelization of the Ramapo River. Data from the USGS Pompton Lakes stream gage, USGS Dawes Highway stream gage, SCADA data from the floodgate facility, as well as other available/collected data (i.e. high water marks) were used to calibrate the models and overall analysis.
- Residents within the study area have reported surges each time the floodgate opens. The analysis was developed to ascertain the extent of any possible surge resulting from the operation of the Pompton Lake Floodgate Facility within the limitations of the modeling software.

3.2 Flood Events Investigated

In addition to the four flood events noted above, five other simulated events representing a range in flows were also modeled and analyzed.

- The downstream water surface elevations for the existing conditions (post-condition with floodgate in operation) were used for each of the above-noted flood events.
- The downstream water surface elevations using the pre-condition at the Pompton Lakes Dam were used for each of the above-noted flood events. The original spillway at Pompton Lakes Dam was used for the pre-existing conditions.
- The current Floodgate Operating Rule Curve was used for the post-condition analysis.

- The Pompton River drainage basin HEC-HMS model was used for development of the inflow hydrographs to Pompton Lakes Dam. Additionally, information from existing hydrologic and hydraulic studies completed by the USACE was evaluated for incorporation in the inflow hydrographs to Pompton Lake.

3.3 Computer Animations

3-D computer animations for use in public outreach were developed based upon the results of the analysis. The animations illustrate the overall downstream flooding and the effects of the floodgate operations. The animation was developed with standard HEC RAS and ArcGIS software.

3.4 Additional Analyses

The following additional analyses were completed as part of the study:

- **Alternative Analysis**
For the post-condition only, the downstream effects of lowering the Pompton Lakes Reservoir by 3.0 feet in advance of an impending flood event were analyzed for three storm events. The three events used for these simulations were: (1) Hurricane Irene, (2) March 12-14, 2010 flood event, and (3) a 10-year rainfall storm event. The model was run assuming the floodgates were in automatic operations and was operated in accordance with the existing operating rule curve.
- **Impact of Development Analysis**
The impact of development within the watershed has been evaluated. The analysis included:
 - The evaluation of the Western Regional Climate Center Desert Research Institute in Reno Nevada publication of the 72-month Accumulated Precipitation Departures from Normal through the end of February 2012, and
 - Comparing runoff events on the Ramapo River at Mahwah NJ (most of the watershed at this location is in New York) to the Ramapo River at Pompton Lakes NJ.

4 Analysis

4.1 Hydrology & Hydrologic Modeling

The focus of this study is the Pompton River Basin, located in the larger Passaic River Watershed, which includes areas of northeastern New Jersey and southeastern New York. Figure 1 shows the study area with the USGS Stream Gage Locations identified.



Figure 1 - Pompton Lake Study Area

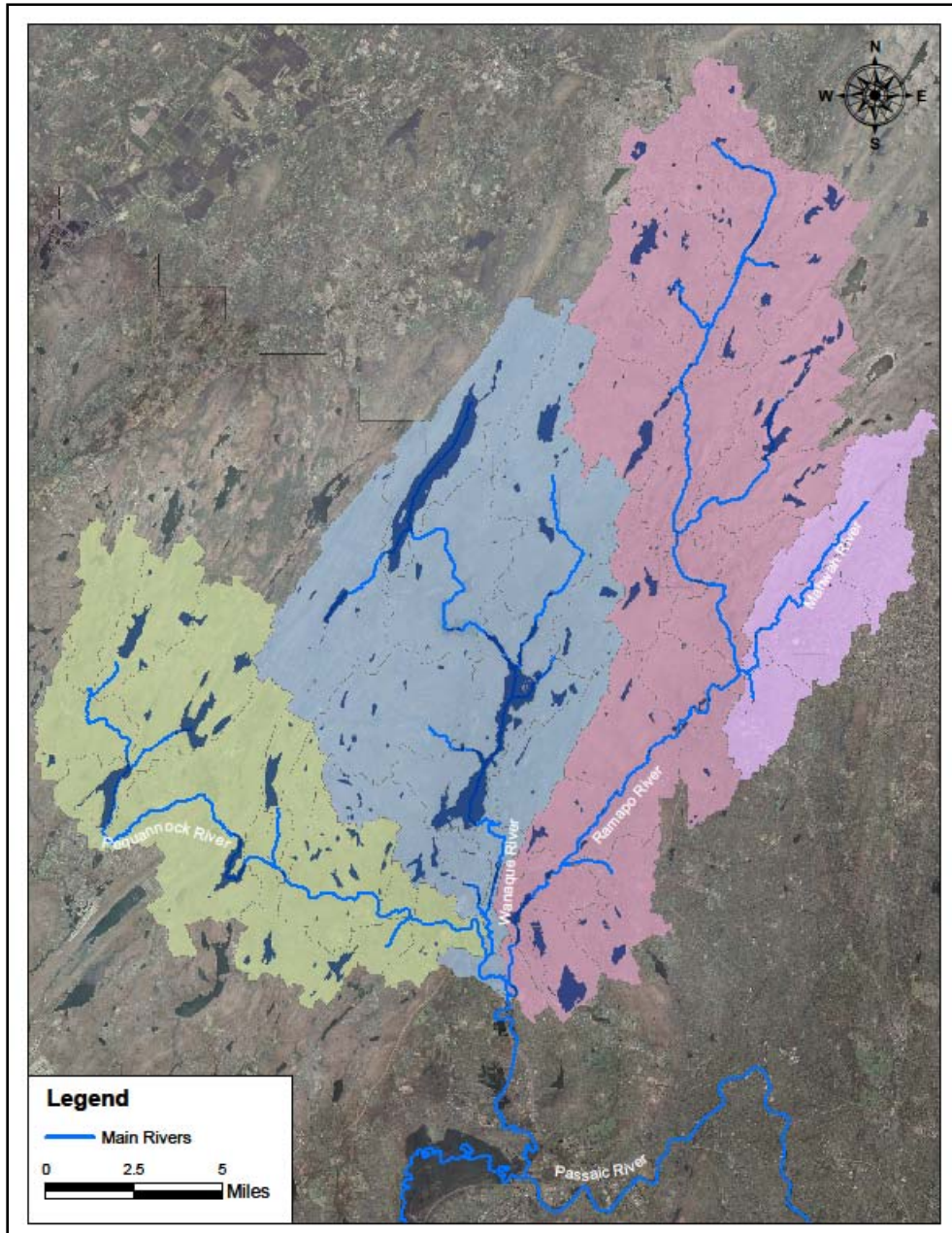


Figure 2 - Study Area

The downstream reach of the Pompton River Basin receives 354 square miles of runoff from numerous tributaries and storage reservoirs. The basin includes three major rivers that flow into the Pompton River near the downstream boundary, the Pequannock, Wanaque, and Ramapo Rivers. The Pompton River Basin is characterized by a varying density of residential areas upstream in the watershed, and increasingly higher density residential and urban land uses downstream in the watershed. The Pompton River Basin has been sub-divided into 64 sub-basins representing a varying degree of land cover, river confluences, impervious coverage, and storage areas within the watershed. The sub-basins were delineated based on a USGS 10 m elevation topographic grid data and the New Jersey

Department of Environmental Protection (NJDEP) Hydrologic Unit Code 14 (HUC14) Delineations. Table 1 in Appendix A provides the area and drainage outlet for each sub-area in the Pompton River Basin.

In 1995 the USACE developed a HEC-1 hydrologic model of the Pompton River Basin as part of the Passaic River Flood Damage Reduction Project. The USACE calibration of the HEC-1 model included an analysis three major storm events in May 1968, November 1977, and April 1984. The primary calibration parameters for the development of the HEC-1 model included the basin curve numbers, lag time values and storage assumptions for the major basin reservoirs. The HEC-1 model peak flow rates and runoff volumes were adjusted by the USACE through the modification of curve numbers that were changed to reflect antecedent moisture conditions. Time of peak discharge values were also calibrated by USACE through the adjustment of lag times as well as the storage assumptions for the major reservoirs located within the basin.

In 2011, as part of FEMA Task Order HSFE02-09-J-001 for Passaic River Watershed Hydrologic & Hydraulic Study, the Risk Assessment, Mapping, and Planning Partners (RAMPP) team updated the USACE HEC-1 study and developed a more detailed HEC-HMS hydrologic model of the Pompton River Basin. The HEC-HMS model was calibrated to four (4) storm events from 1999 to 2008 with return periods of at least 10 years. Two events in September 1999 (validation) and April 2007 (calibration) had recurrence intervals of approximately 25 years. One validation event based on a storm in October 2005 was approximately a 5-year event, with close to a 100 year rainfall amount. The second calibration event in October 2004 was less than a 5-year event and was only used to calibrate lag time. Two of the four events with extreme antecedent moisture conditions were selected for the validation period to examine the model performance. The selection of storms provided the bracketing of a range of SCS values for the basin. The primary purpose of the calibration was to develop a representative 100-year inflow for the steady state hydraulic model completed for the Central Passaic Basin downstream of the Pompton basin outlet.

For the purposes of this study, the RAMPP HEC-HMS hydrologic model of the Pompton River Basin was updated and re-calibrated to four recent flood events. These four recent calibration events included the March 12-14, 2010, March 6-9, 2011, March 9-13, 2011, and Hurricane Irene (August 27-29, 2011) events. The following sections give a brief overview of the RAMPP HEC-HMS model along with a discussion of the calibration process and the resulting flow hydrographs that were developed and used for input into the unsteady HEC-RAS modeling:

4.1.1 RAMPP HEC-HMS Hydrologic Model Overview

The HEC-HMS (HMS) model was developed using several base parameters and storage curves. The following sections provide a summary of the basin characteristics of the existing model that was calibrated to the four storms throughout 2005-2009.

4.1.1.1 Initial SCS CN and Lag Times

The calibrated HMS model calculates runoff with the SCS Curve Numbers (CN) method based on existing land use and soils data for the watershed. Land use data for the watershed areas within the New Jersey boundary was retrieved from NJDEP sources. Land use cover for the watershed areas in New York was retrieved from the Orange and Rockland County municipal web databases. All land use cover was verified against orthoimagery and reclassified into seven different land cover classifications. The land cover classifications for the Pompton River Basin are presented in Table 2 in Appendix A.

4.1.1.2 Soils

Soils data was retrieved from the National Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database. During the soils analysis, the observed discrepancies in the soils data for New York State and were resolved with the Rockland County GIS Department to achieve a more accurate soils representation. Composite curve numbers were processed using HEC-GeoHMS and input into the HEC-HMS model.

4.1.1.3 Recession Baseflow

Recession baseflow was only simulated for watersheds draining into the Ramapo and Pequannock Rivers. These sub-basins are characterized primarily by forest land use and steep slopes. Groundwater inflow can be dominant throughout basins with steep slopes and was therefore simulated in the basin model. Table 3 in Appendix A presents the recession baseflow values input into the HEC-HMS model.

4.1.1.4 Channel and Reservoir Routing

Channel flow was calculated in the basin model using the Muskingum Cunge and Modified Puls methods. Channel slopes and 8-point cross-sections were derived from terrain data built in ArcGIS. The Modified Puls method was used for stream reaches to account for storage and attenuation effects. The existing storage discharge relationships for channel routing in HMS were derived from an approximate HEC-RAS steady flow

hydraulics models. The Manning's roughness coefficients were derived from several sources, including the 1995 USACE study and the existing FEMA Flood Insurance Study.

The hydrology of the Pompton watershed is significantly influenced by numerous lakes and reservoirs with varying degrees of storage capacity and flow attenuation characteristics. The existing model development by the RAMPP team only includes storage areas that are capable of affecting 100-year discharges. The following reservoirs are included in the basin model:

- Charlotteburg Reservoir
- Clinton Reservoir
- Echo Lake Spillway Dam
- Greenwood Lake
- Monksville Reservoir
- Oak Ridge Reservoir
- Wanaque Reservoir

The Canistear Reservoir was not modeled since it is located on a tributary headwater well upstream of the main river system and was identified as providing little storage by the USACE (1995).

4.1.1.5 Model Calibration and Validation

The previous calibration phase of the current model was applied to total of 8 USGS gages within the watershed boundary. The Pompton watershed contains a total of 19 USGS gages. Only gages with over 10% of the total drainage area (35 sq mi) were included in the calibration and validation phase. Five gages were included in the Ramapo Basin, one on the Pompton River, one on the Pequannock River, and Wanaque Rivers.

Two calibration and two validation events were selected to reflect a wide range of possible SCS values and utilize the availability of radar precipitation data; these storms reflected what could be average conditions. Two extreme antecedent moisture conditions were selected for the validation period in an effort to represent average conditions for the Pompton watershed.

Overall CN values were reduced 11% during the calibration process, based on the previous four calibration storms. Overall lag time values were adjusted by a factor of four from the initial estimates. This increase in lag time values was suggested to represent a combination of the wetland land and reservoir storage capacities throughout the watershed. Urban areas along the river valley, especially basins in the Ramapo and

Mahwah River watershed, required significant increases in lag time during the calibration process.

Table 4 in Appendix A presents the initial basin CN and Initial lag time calculated for the Pompton sub-basins. Numerous reservoirs within the Pompton River Basin are not managed as flood control structures, but have significant influences on downstream discharge values. In particular, during extended dry periods the Charlotteburg and Wanaque Reservoirs experience significant draw down which creates significant flood storage. During the calibration and validation stages, observed flows at USGS gages downstream of these reservoirs were used as direct inflows in the model. CN values that were applied to sub-basins downstream of these gages, during the calibration and validation phase, were reflected in the adjustment of CN values upstream of the USGS observation gages. For the 100-year event, the drainage areas upstream of the USGS gages were reconnected to the channel and the reservoirs were adjusted to their normal pool elevations.

The final basin parameters that served as the base parameters for the latest calibration phase of the model were intended to represent conditions with recurrence intervals greater than 10 years. In general, the model was slightly under predicting flows for three of the four events in the Ramapo basin. There was greater discrepancy in model performance versus the observed gage data at the Pompton gage for the calibration events. The greatest discrepancy was seen in a 21.5% mismatch in flows at the Pompton gage in the 1999 event, which was suggested to be a result of poor spatial coverage in rainfall data available for the event.

4.1.2 Current HEC-HMS v3.5 Hydrologic Model

The following sections discuss the development of the hydrology and hydrologic calibration of the Pompton River Basin HEC-HMS model for this study.

4.1.2.1 Frequency Events

As a part of the scope of work for the unsteady state HEC-RAS model for the Pompton River Basin, a range of precipitation frequency events were simulated in HEC-HMS 3.5 to generate input for HEC-RAS model. The precipitation frequency events analyzed for this study included the 2-, 10-, 25-, 40-, 50-, 100-, and 500-yr events for the Pompton River Basin.

The precipitation frequency estimates were retrieved from the NOAA Atlas 14 Precipitation Frequency Atlas Data Server at the following website:

<http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>

4.1.2.2 NOAA Atlas 14

The frequency estimates coincide with the values in NOAA Atlas 14 - Volume 2 - Version 3. The following 24 hour duration estimates, presented in Table 1 below, were retrieved at Latitude (40.9923) | Longitude (-74.2786) within the Pompton River Basin boundary:

Table 1: HEC-HMS Precipitation Frequency Totals

Frequency (Return Period yr)	2	10	25	40	50	100	500
24-hr Rainfall Total (in)	3.42	5.16	6.36	7.01	7.38	8.52	11.65

The 40-year precipitation frequency estimate was not available in NOAA Atlas 14 and was interpolated using a power series trend line.

As previously stated, the Pompton River Basin HMS model includes 64 sub-basins with a high variability in basin size. Since the precipitation frequency estimates for the entire basin were retrieved as point rainfall totals from NOAA Atlas 14, an area reduction factor for the entire basin was applied to the rainfall total for the entire basin. This reduction factor provides a point to area conversion of precipitation to an average depth over the entire basin to address the magnitude of the basin size in comparison to the spatial variability in storm cover that cannot be simulated with the frequency estimates. An overall reduction factor of 7% was applied to the entire Pompton River Basin for each frequency event during the model simulations. This reduction factor was referenced from the U.S. Weather Bureau - Intensity-Frequency Regime—Pt. 1 - Technical Paper 29 (USWB, 1957). The precipitation frequency hydrographs were generated using SCS synthetic rainfall distribution to develop a range of flow to analyze the operation of the Floodgate Facility.

4.1.2.3 USGS Gages

Instantaneous stream flow observations for the four calibration storms were retrieved from the USGS NWIS web data archive for eleven (11) USGS stream gages within the Pompton River Basin. The gage locations are presented in Figure 1. The gage names and drainage areas are presented below in Table 2:

Table 2 : USGS Gage Locations and Drainage Area

USGS Gage	Name	Drainage Area (sq mi)
01382500	Pequannock River at Macopin Intake Dam NJ	63.7
01383500	Wanaque River at Awosting NJ	27.1
01384500	Ringwood Creek near Wanaque NJ	17.9
01386000	West Brook near Wanaque NJ	11.8
01387000	Wanaque River at Wanaque NJ	90.4
01387400	Ramapo River at Ramapo NY	86.9
01387420	Ramapo River at Suffern NY	93.0
01387450	Mahwah River near Suffern NY	12.3
01387500	Ramapo River near Mahwah NJ	120
01388000	Ramapo River at Pompton Lakes NJ - Downstream of Dam	160
01388500	Pompton River at Pompton Plains NJ	355

4.1.2.4 Calibration

The existing RAMPP HEC-HMS model was run with the existing calibration parameters to check the model performance with the new calibration storms. The general shape of the hydrograph (rising and recession limb) showed a fair correlation against the observed data; however, it under-predicted the peak flow for all four storms. The previous RAMPP model calibration was completed against storms with smaller recurrence intervals than the new calibration storms, suggesting that the basin curve numbers and lag time values may be under-calibrated for storms representing more significant precipitation.

The primary gages used during the calibration were the USGS Gage 01388000 - Ramapo River at Pompton Lakes NJ (downstream of the Flood Gate Facility) and USGS Gage 01388500 - Pompton River at Pompton Plains NJ (upstream of the Jackson Avenue Bridge). The gage immediately downstream of the Pompton Lake Dam flood gates was the starting gage to be calibrated for a close match in the simulated versus observed hydrographs from the Ramapo and Mahwah River Basins during the four storm events.

In order to develop the inflow hydrographs required for the unsteady HEC-RAS model in the Pompton River Basin down to the Jackson Avenue Bridge, the HEC-HMS model was also closely calibrated to the USGS Gage 01388500 - Pompton River at Pompton Plains NJ upstream of the Jackson Avenue Bridge to capture the confluence of the Pequannock, Ramapo, and Pompton Rivers just upstream of the gage.

The two primary calibration parameters chosen for the optimization trials were the basin curve numbers and lag time values. These parameters were chosen as calibration parameters since they were adjusted during the previous RAMPP model calibration to the rainfall events from 1999-2008, and are parameters that cannot be explicitly measured in the field. In an effort to minimize major adjustments to the previous model calibration conducted by the RAMPP team, only the basin curve number and lag times values were adjusted to update the model performance based on the new calibration events.

In order to develop inflows hydrographs for the unsteady HEC-RAS model that accurately reflected the hydrographs observed at the USGS gages during the four calibration storms, four individual basin models were created from the existing conditions HMS model and each was calibrated to an individual storm event. Calibrating individual basin models to each storm event allows for the flexibility in developing precise inflow hydrographs for the unsteady HEC-RAS model for each storm event. The alternative would be to simulate all four storms with one average basin model. However, the results using an average basin model would not be as accurate for each of the storms.

4.1.2.5 SPAS Analysis

The HEC-HMS model was calibrated to four recent flood events, March 12-14, 2010, March 6-7, 2011, March 9-12, 2011 and August 27-29, 2011 (Hurricane Irene). The rainfall data for the four storms was supplied by Applied Weather Associates (AWA) of Monument, Colorado. AWA used the Storm Precipitation Analysis System (SPAS) with NEXRAD weather data to analyze rainfall over the Pompton Lake drainage basin in New Jersey. A large storm domain that includes sufficient hourly rain gauge observations to calibrate the NEXRAD data over northern New Jersey and the surrounding areas was analyzed for each storm. NEXRAD data were acquired from Weather Decisions Technologies of Norman, Oklahoma.

The rainfall analysis results were provided on a 1 km by 1 km grid for both the rainfall amount and the temporal frequency of 5 minutes. In addition to the rainfall grids, clipped to the Pompton River Basin, sub-basin average rainfall amounts were provided for all 64 sub-basins.

AWA provided an Average Recurrence Interval (ARI) analysis for each storm to describe frequency (rareness) of the rainfall. The analysis was based on the government-issued precipitation frequency estimates published in NOAA Atlas 14 for areas in New Jersey and Technical Paper 40 (TP-40) in New York. The analysis was based on the maximum 6- and 24-hour values for each grid cell as compared to NOAA Atlas 14 or TP-40. The ARI analysis results are presented in Appendix B.

The focus of the rainfall analysis was the Pompton River Basin (41.75°N/75.0°W to 40.30°N/73.3°W) to ensure a reliable sample size for determining unique Z-R relationship (Z being the radar reflectivity factor and R the rainfall rate) each hour as well as providing an ample buffer area.

For the three storms in March 2010 and March 2011, the analysis used between 217 and 247 rain gages comprised of daily, hourly, pseudo hourly and supplemental gauges. Since Hurricane Irene had such a large areal extent, the large-scale storm analysis used 726 rain gauge reports spanning northern New Jersey, southeastern New York, extreme eastern Pennsylvania, western Connecticut, western Massachusetts and southwestern Vermont. The maximum rainfall of 11.42 inches reported in New Jersey was in Jefferson Township. The maximum 6- and 24- hour rainfall from this event exceeded an Average Recurrence Interval (ARI) of 1,000 years in some areas of the Pompton River Basin.

The four storm events were simulated using the radar rainfall time series (5 min increment) created from the SPAS model and NEXRAD weather radar data. The rainfall data was input for each sub-basin in HEC-HMS as a time series derived from sub-basin averages over the duration of the storm events.

Only one basin model was selected for validation with the precipitation frequency events in order to reflect average conditions during these events. The validation of the HEC-HMS model based on the precipitation frequency events is presented in this report.

4.1.2.6 Reservoir Curves

As an update to the existing RAMPP model, four reservoir curves were revised in the HEC-HMS model based on information provided by NJDEP Bureau of Dam Safety and Flood Control. These reservoirs included the Charlotteburg Reservoir, Wanaque Reservoir, Greenwood Lake, and Echo Lake Reservoir. The existing model simulated these storage units with stage-storage-discharge curves that may have come from extrapolated data. For example, the flow routing at the Echo Lake Dam spillway was only a function of the structure geometry and was included in order to achieve the calibration required at USGS Gage 01382500 - Pequannock River at Macopin Intake Dam NJ. The rating curves for each storage structure were input into HEC-HMS as Storage-Discharge relationships.

4.1.2.7 Optimization

The optimization of the curve number and lag time parameters was conducted simultaneously for all 64 sub-basins using the Univariate-gradient and Nelder & Mead search algorithms available in the HEC-HMS computation block. The optimization routine was applied to find reasonable parameters that yielded the minimum values of the objective function. Up to 1000 trials were performed at the model junctions representing the primary USGS gages. A peak-weighted root mean square error function was applied to measure the peak flow (cfs), total volume (ac-ft), and peak timing of the observed versus simulated hydrographs.

The optimization of the HEC-HMS model was completed in two phases to search for a match between the simulated and observed hydrographs. The first optimization phase involved the calibration of the Ramapo and Mahwah River sub-basins to the USGS 0188000 - Ramapo River at Pompton Lakes NJ gage. Once a satisfactory calibration of the model was achieved using curve numbers and lag time values, the parameters were locked in for the calibration of the Pequannock, Wanaque, and Pompton River Basins. Based on the observed hydrographs, the model was calibrated to the USGS 0188500 - Pompton River at Pompton Plains NJ gage at the downstream outlet to reflect an overall calibration of the Pompton River Basin.

4.1.2.8 HEC-HMS Results

The standard measures for comparison between the simulated and observed hydrographs at the primary calibration gages included peak flow (cfs), total volume (ac-ft), and time to peak (hh:mm). These measures were calculated in HEC-HMS during each iteration of parameter optimizations during the calibration period.

The results of the HEC-HMS calibration to the four storm events by adjusting curve numbers and lag time values for the individual basin models are presented in Figures 1-16 and Tables 5-8 in Appendix A of this report. The final adjusted curve number and lag time values for each basin model are presented in Tables 9 and 10 in Appendix A of this report.

4.1.2.9 Validation

The model was validated to be within one standard error for the 2-, 10-, 25-, 40-, 50- and 100-year frequency rainfall events. Based on the performance of the individual basin models for the four calibration storm events, the basin model calibrated to the August 27-29, 2011 (Hurricane Irene) precipitation was selected for validation against the frequency events. The Hurricane Irene basin model was selected based on the broad range of curve

numbers and lag time values chosen throughout the basin during the optimization trials and the overall wellness of the fit achieved at the primary gages for this event. The range of curve numbers and lag times represent the high variability in land cover, topography, and storage effects from numerous lakes and reservoirs throughout the Pompton River Basin.

Table A.11 in Appendix A presents the model validation summary for the two primary USGS gages analyzed during the calibration period of this study. Predicted peak flow estimates were using the U.S. Army Corps of Engineers Statistical Software Package (HEC-SSP). The SSP model performs flood flow frequency analysis based on Bulletin 17B, “Guidelines for Determining Flood Flow Frequency” (1982). The computed frequency values for the 2-yr, 10-yr, 40-yr (interpolated), and 50-yr, events are presented in Table 12 along with the HEC-HMS simulated peaks.

4.1.2.10 HEC-HMS Summary

The Pompton River Basin HEC-HMS model has been calibrated to the four recent storm events of March 12-14, 2010, March 6-9, 2011, March 9-13, 2011, and Hurricane Irene (August 2011). The model hydrographs at the two primary calibration gages (USGS 0188800 and USGS 0188500) near the downstream reach of the Ramapo and Pompton River, respectively, show a fair fit to the three major calibration measurements of peak volume, peak flow, and time of peak during all four storm events. The secondary gages on the Ramapo, Pequannock, and Wanaque reaches show a higher degree of error based on the observed data. The discrepancies in the calibration of the HEC-HMS model to the Pequannock and Wanaque gages suggest that the effects of storage areas and reservoirs located throughout the watershed has a significant effect on the basin to basin hydrology during lower frequency storms events that could not be simulated with the calibration storm events.

The model has also been validated against the USGS regression equations to be within one standard error for the 2-, 10-, 25-, 40-, 50- and 100-year rainfall events.

Table 12 in Appendix A shows a comparison of the simulated and observed peak flows to estimated annual exceedance probabilities based on historical annual peak flow observations at the USGS gage downstream of the Pompton Lake Dam floodgate facility and at the Jackson Avenue Bridge, at the downstream model boundary. Since there are several ways to complete a flood frequency analysis and related recurrence intervals, a range of flows in the observed data was captured to provide an estimate on the probably return period of the four calibrated events. The analysis was completed using USGS PeakFQ based on Bulletin 17B and the Pearson Type III frequency distribution fit to the

logarithms of the instantaneous annual peak flows. The historical record also included water year 2011 which includes the four calibrated events.

The application of the high resolution radar rainfall precipitation data provided the HEC-HMS model with an excellent spatial coverage of the high return period events analyzed in this study. Due to the broad range in sub-basin size and the overall size of the Pompton River drainage basin, and variation in storm coverage, the availability of precise spatial coverage for each event over the entire basin allowed for a precise calibration of the HEC-HMS model.

4.2 Hydraulics

4.2.1 HEC-RAS – Unsteady Flow Model

The USACE Hydrologic Engineering Centers River Analysis System computer model (HEC-RAS) was used to solve for the flow profiles both up and downstream of the Pompton Lake Dam. The unsteady option within HEC-RAS was chosen for its ability to solve the full dynamic, Saint-Venant equations using the implicit finite difference method. Under unsteady flow, a discharge hydrograph is applied at the upstream boundary, and a discharge-stage rating (rating curve) at the downstream boundary. The unsteady methodology allows the program to calculate both stages and discharges throughout the studied reach. Due to the operation of the Pompton Lake Dam floodgates, the water surface elevation and flow both upstream and downstream of the dam have the potential to change. Therefore, the use of the dynamic wave (discharge and stage vary over time) approach will allow for the attenuation of the water as it moves downstream.

4.2.1.1 Processing

The detail study methodology incorporates WISE (Watershed Concepts, 2004) as a preprocessor to HEC-RAS. WISE utilizes the georeferenced data from the terrain model and miscellaneous shapefiles (including streams, cross sections, etc.) and with user input creates the input data files for HEC-RAS. HEC-RAS Version 4.1.0 (USACE, 2010) is then executed to determine the flood elevation at each cross section of the modeled stream. The resulting elevations are then imported back to WISE for creation of the flood boundaries. The techniques and tools utilized to perform the analyses meet FEMA's adopted standards. No individual community criteria were incorporated within this study. HEC-RAS Version 4.1.0 is the computer program used to build the hydraulic models.

Model cross sections are placed along the study streams using the available contour data. Where roads or other structures are encountered, supplemental cross sections are placed along the top of the structure and at the upstream and downstream faces of the structure to meet HEC-RAS data input needs. Survey data is collected for each detail study structure. All data points collected for each structure are precisely captured and recorded. In addition to structures, natural channel cross sections are also surveyed, and cross sections are placed in these locations using the WISE tools. The channel shapes of the surveyed locations are then used to create a channel shape for the non-surveyed cross sections located near the survey locations. The HEC-RAS preprocessor within WISE blends the survey data with the topographic data to create a seamless transition between the datasets and generates a HEC-RAS model.

4.2.1.2 Surveyed Data

Cross-sectional data for 45 channel cross-sections were surveyed and combined with the LiDAR data and used for the cross section information for HEC-RAS for the entire modeled reach. Detailed descriptions of the surveyed cross-sections can be found in Survey Data section of the Appendix D.

In addition to the surveyed cross-sections, data for nine bridges, six dams, and one culvert were collected and combined with the LiDAR data for use in HEC-RAS. Detailed descriptions of the surveyed structures can be found in the *Survey Data* section of the Appendices E, F, and G.

4.2.1.3 As-Built Data

For the Pompton Lake Dam, construction plans were supplied to AECOM from the US Army Corps of Engineers – NY District July 2003 Ramapo River at Oakland, New Jersey Flood Control Project Pompton Lake Dam. The existing data was converted to the vertical datum of NAVD88 with shift of -0.876 ft calculated via VERTCON (National Geodetic Survey). The Pompton Lake Dam spillway and gated structure with radial gates was transferred to HEC-RAS. In order to capture the inline structure and service bridge, a combination of HEC-RAS inline structure data, blocked obstructions and lidded cross-sections were used. Currently HEC-RAS does not have the ability to perform a multiple opening analysis for a bridge-inline weir combination.

4.2.1.4 Parameter Estimation

To estimate the Manning's roughness coefficients, engineering judgment was used based on available survey pictures, aerial photography and land use data. Polygons were created to identify areas of different Manning's n-values. The original Manning's n-

values represented by the polygons were adjusted where necessary in the hydraulic modeling phase on a cross section by cross section basis. The drag coefficients for the bridge piers were selected based on the pier shape according to Table 5.3 of the HEC-RAS Hydraulic Reference Manual. Table 3 represents a summary of Manning’s n-values used with the unsteady model.

Table 3 : Summary of Roughness Coefficients

Flooding Source	Channel	Overbanks
Pequannock River	0.035	0.024-0.150
Pompton River	0.035	0.024-0.150
Ramapo River	0.024-0.035	0.024-0.150
Ramapo River Lt. Diversion Channel	0.035	0.030-0.15
Ramapo River Rt. Diversion Channel	0.035	0.024-0.140

4.2.1.5 Inflow Hydrographs

The unsteady HEC-RAS model was developed for the study limits presented in Table 4.

Table 4 : Flooding Sources Studied by Unsteady HEC-RAS

Flooding Source	Reach Length (miles)	Study Limits
Pequannock River	2.0	From approximately 88 ft downstream of Riverdale Road to the confluence of the Ramapo and Pequannock Rivers
Pompton River	0.2	From the confluence of the Pequannock and Ramapo Rivers to approximately 148 feet downstream of Jackson Avenue
Ramapo River	5.3	From approximately 260 ft downstream of Interstate 287 to the confluence with the Pequannock River.
Ramapo River Lt. Diversion Channel	0.3	From approximately 100 ft upstream of the Potash Lake weir to 867 ft upstream of Doty Road.
Ramapo River Rt. Diversion Channel	0.6	From approximately 100 ft upstream of the Potash Lake weir to 867 ft upstream of Doty Road.

Within the unsteady HEC-RAS model inflow hydrographs were used as inputs into the model. The source for the data comes from the calibrated HEC-HMS model described above. The locations of the boundary conditions are listed in Table 5.

Table 5 : Unsteady HEC-RAS Inflow Boundary Conditions

River	Reach	RS	Boundary Condition
Pequannock River	Reach-1	10642	Flow Hydrograph
Pequannock River	Reach-1	407	Lateral Inflow Hydrograph
Ramapo River	Reach-1	28220	Flow Hydrograph
Ramapo River	Reach-3	10512	Uniform Lateral Inflow
Ramapo River	Reach-3	955	Lateral Inflow Hydrograph

4.2.1.6 Rating Curve

For all model runs, a downstream boundary condition of a rating curve was chosen to be the most appropriate approach. A rating curve was constructed for USGS Gage No. 01388500 near Jackson Avenue from the USGS Water Watch website Custom Rating Curve Builder toolkit (U.S. Department of the Interior). All stage versus discharge data was converted from NGVD 29 to NAVD88 and then the stage value was converted to water surface elevation using the gages localized datum.

4.2.1.7 USACE Rule Curve

The floodgates on the Pompton Lake Dam are operated to maintain a set pool elevation in Pompton Lake. The set point elevations are defined as a function of the gate opening and the lake level, and vary from 201.37 ft (NAVD88) at a gate opening of 0 ft to 201.4 ft (NAVD88) at gate openings equal to or exceeding 4.5 ft as defined by the operation rule curve in the U.S. Army Corps of Engineers, New York, NY Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual (OMRR and R), Pompton Lake Dam, NJ, Appendix C- Gate Operating Rule Curve (March 2008), as shown in Figure 3 on page 24.

The gate operation is a function of the difference between the lake elevation and the set point elevation. If the lake level is more than 0.25 ft above the set point elevation, the gates are to be opened 0.25 ft; if the lake level is more than 0.5 ft above the set point elevation, the gates are to be opened 0.5 ft; if the lake level is more than 1.0 ft above the set point elevation, the gates are to be opened 1.0 ft. Similarly, if the lake level is more than 0.25 ft below the set point elevation, the gates are to be closed 0.5 ft; if the lake level is more than 1.0 ft below the set point elevation, the gates are to be closed 1.0 ft.

The only exception to these rules is that if the lake level is falling, then the gates would not be opened. Similarly, if the lake level is rising, then the gates would not be closed. These exceptions minimize lake level oscillations.

Under normal conditions, the gates remain closed and all outflow passes over the fixed spillway portion of the dam. The gates are initially opened 0.25 ft when the lake level reaches 201.37 ft (NAVD88) or 0.25 ft above the target elevation of 201.37 ft for a gate opening of 0 ft. Initial gate opening is controlled by the PLC/RTU automatic control equipment if the controls are in SCADA AUTO, or can be remotely controlled from either of the two SCADA PC work stations, or locally controlled from the gate control console cabinets.

Every 15 minutes thereafter, the lake level and stream flow gauges are checked, and the gates are operated automatically if necessary. The two gates can be opening simultaneously, or sequentially, but they should maintain the same opening.

Defining the gate operation as a function of the gate opening and lake level allows the gates to be operated manually, without the benefit of computers and gauge data, should those systems become inoperable for any reason. Under such a situation, the gate operator need only check the gate opening and staff gauge at the dam site, and then plot that data on the rule curve to determine the required gate operation.

Should one gate fail to operate, the gate operation would follow the same rules as the normal two gate operation. The one gate will simply open faster since the rules will make the gate open more frequently.

4.2.1.8 Rule Curve Coding

The aforementioned rule curve data was extracted from the Pompton Lake Dam, NJ, Appendix C, NY OMRR and R Manual document (USACE, 2008) as supplied by the USACE – NY District and coded into HEC-RAS user-defined Rule Operation boundary condition. The rule curve operation was coded in such a way to determine the simulated water surface elevation for each unsteady simulation at every fifteenth minute. The water surface elevation reading was taken at the first cross-section just upstream of Pompton Lake Dam. This elevation was then used to calculate the difference in relation to the set point (target) elevation which in turn, determined the gate opening so as to mimic the rule curve data defined in Table 6.

Table 6 : Pompton Lake Dam Rule Curve Data

Gate Operation Rule Curve Data (NAVD 88)							
Lake Elevation (feet)							
Current Gate Opening	Open 1.0 (ft.)	Open 0.5 (ft.)	Open .25 (ft.)	TARGET	Close 0.25 (ft.)	Close 0.5 (ft.)	Close 1.0 (ft.)
0.00	202.37	201.87	201.62	201.37	201.12	200.87	200.37
0.25	202.37	201.87	201.62	201.37	201.12	200.87	200.37
0.50	202.32	201.82	201.57	201.32	201.07	200.82	200.32
0.75	202.27	201.77	201.52	201.27	201.02	200.77	200.27
1.00	202.22	201.72	201.47	201.22	200.97	200.72	200.22
1.25	202.17	201.67	201.42	201.17	200.92	200.67	200.17
1.50	202.12	201.62	201.37	201.12	200.87	200.62	200.12
1.75	202.07	201.57	201.32	201.07	200.82	200.57	200.07
2.00	202.02	201.52	201.27	201.02	200.77	200.52	200.02
2.25	201.97	201.47	201.22	200.97	200.72	200.47	199.97
2.50	201.92	201.42	201.17	200.92	200.67	200.42	199.92
2.75	201.87	201.37	201.12	200.87	200.62	200.37	199.87
3.00	201.82	201.32	201.07	200.82	200.57	200.32	199.82
3.25	201.77	201.27	201.02	200.77	200.52	200.27	199.77
3.50	201.72	201.22	200.97	200.72	200.47	200.22	199.72
3.75	201.67	201.17	200.92	200.67	200.42	200.17	199.67
4.00	201.62	201.12	200.87	200.62	200.37	200.12	199.62
4.25	201.57	201.07	200.82	200.57	200.32	200.07	199.57
4.50	201.52	201.02	200.77	200.52	200.27	200.02	199.52
14.00	201.52	201.02	200.77	200.52	200.27	200.02	199.52

In order to correctly model the USACE rule curves that govern the operation of the Pompton Lakes Dam floodgates (aka tainter gates); HEC-RAS user-defined rules for hydraulic structures was invoked as an internal boundary condition within the unsteady flow data editor. This option allowed for user-defined control of the gates and subsequent release/impoundment of water during a modeled flood event. HEC-RAS rule operations editor was used to code the day-to-day functioning of the gates. The custom coding allowed the program to extract simulation values such as the water surface elevation just upstream of the dam. As described in the above USACE Rule Curve section, the water surface elevation pulled from the simulation value was used to determine if the lake level was falling or rising. This simulation value was in turn, used

to determine the difference in height between the target elevation and water surface elevation thus dictating the height at which the gate opens or closes.

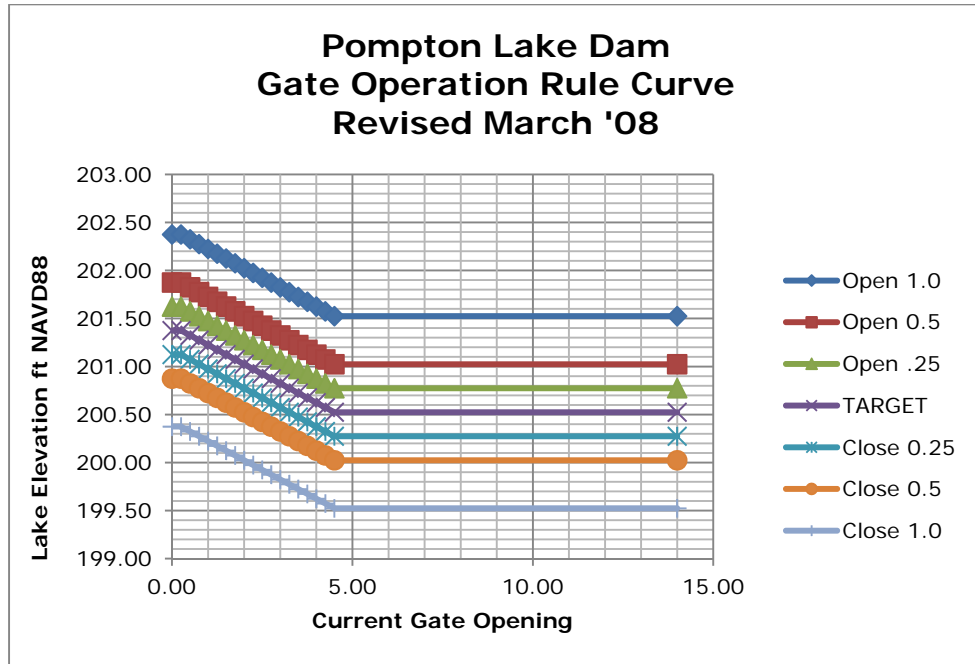


Figure 3 - Pompton Lake Dam Rule Curve

4.2.1.9 Calibration of the Unsteady HEC-RAS Analysis

Since a great deal of effort was spent in calibrating the existing HEC-HMS modeled developed by RAMPP, the goal of the hydraulic calibration was to maintain as close as possible duplication of the routed inflow hydrograph data to that of observed hydrograph at the following USGS gages: No. 1388500 near Jackson Avenue, and No. 1388000 just upstream of Pompton Lake Dam and the stages at No. 0138810 Dawes Highway Bridge. Minor modifications were made to two of the inflow hydrographs by the use of a multiplier. Various multipliers were tested for the Hurricane Irene plan since numerous high waters were available for this event. A multiplier of 0.9 was applied to the inflow hydrograph for the Ramapo River and 0.4 for the Pequannock River. These values yielded the best comparison between the routed hydrology and observed hydrographs as well as the observed high water marks.

4.2.1.10 High Water Marks

For calibration of the unsteady HEC-RAS model high water marks were acquired from three different sources for the Hurricane Irene event: The USGS Water Website and field measurements from both the United State Army Corps of Engineers and the United States Geological Survey.

The USGS Water Watch website Flood Table Tool was used to extract high water marks from Hurricane Irene as shown in Table 7.

Table 7 : USGS Gage High Water Marks from Hurricane Irene

USGS Gage No.	Station Name	HWM (ft) NAVD88
1387940	Ramapo River at Lakeside Avenue in Pompton Lakes NJ	202.994
1387998	Ramapo River above dam in Pompton Lakes NJ	201.567
1388100	Ramapo River at Dawes Highway in Pompton Lakes NJ	188.384
1388500	Pompton River in Pompton Plains NJ	184.325

The USGS also supplied field measured high water marks from Hurricane Irene for various locations along the modeled reaches of the Ramapo River, Pequannock River, and Pompton River. A summary of these high water marks can be found in Table 8. Note that on Table 8, the distance downstream is in reference to the cross section number if not specifically noted.

Table 8 : USGS Field Measured High Water Marks from Hurricane Irene

Stream	R.S.	USGS Site Name	HWM ID	Reference Location	HWM (ft) NAVD 88
Pequannock River	10642	PEQU2	3	Downstream of Riverdale Road	188.731
Pequannock River	10642	PEQU2	4	Downstream of Riverdale Road	188.711
Pequannock River	1744	PEQU1	1	198 feet downstream of feeder dam	184.93
Pequannock River	1744	PEQU1	2	224 feet downstream of feeder dam	184.91

Stream	R.S.	USGS Site Name	HWM ID	Reference Location	HWM (ft) NAVD 88
Pequannock River	1744	PEQU1	4	224 feet downstream of feeder dam	185.26
Pequannock River	1804	PEQU1	5	Just upstream of feeder dam	186.18
Pequannock River	1804	PEQU1	6	Just upstream of feeder dam	186.53
Pequannock River	1744	PEQU1	7	136 feet downstream of feeder dam	184.18
Pequannock River	1744	PEQU1	8	99 feet downstream of feeder dam	183.85
Ramapo River	28076	RAMA5	2	142 feet downstream	220.074
Ramapo River	27845	RAMA5	1	14 feet downstream	219.534
Ramapo River	27716	RAMA5	3	Upstream face of West Oakland Avenue	219.344
Ramapo River	27716	RAMA5	4	87 feet upstream of West Oakland Avenue	220.004
Ramapo River	27616	RAMA5	5	Downstream face of West Oakland Avenue	217.544
Ramapo River	27616	RAMA5	6	93 feet downstream of West Oakland Avenue	217.564
Ramapo River	21862	RAMA4	1	Doty Road	206.538
Ramapo River	21614	RAMA4	2	82 feet downstream	206.788

Stream	R.S.	USGS Site Name	HWM ID	Reference Location	HWM (ft) NAVD 88
Ramapo River	22118	RAMA4	3	83 feet downstream	207.058
Ramapo River	22118	RAMA4	4	140 feet downstream	207.188
Ramapo River	22118	RAMA4	5	25 feet downstream	207.028
Ramapo River	21813	RAMA4	7	Downstream face of Doty Road	206.218
Ramapo River	1336	RAMA1	1	44 feet downstream	186.1125
Ramapo River	1336	RAMA1	2	63 feet downstream	185.8825
Ramapo River	21813	RAMA4	8	Downstream face of Doty Road	206.188
Ramapo River	21862	RAMA4	9	Doty Road	206.368

The United States Army Corps of Engineers – New York District also supplied field measured high water marks. A summary of the high water marks as it pertains to the model can be found in Table 9.

Table 9 : USACE - NY District Measured High Water Marks from Hurricane Irene

Stream	R.S.	USACE Node Name	Downstream distance from R.S.	HWM (ft) NAVD 88
Pequannock River	8339	Pomp3	400	187.62
Ramapo River	9865	Ram1	0	191.95
Ramapo River	7993	Ram2	70.2	187.24
Ramapo River	4937	Ram3	44	186.77

4.2.1.11 HEC-2 Pre- and Post- Conditions

The HEC-2 data files from prior studies were converted to HEC-RAS data format. The data for the HEC-RAS files are in Appendix J.

5 Study Results

The study results are described in the following paragraphs.

5.1 Impact of Floodgate Operation

Four recent flood events, March 12-14, 2010, March 6-9, 2011, March 9-13, 2011, and Hurricane Irene were modeled and analyzed to investigate the effect of the Floodgate Facility Operation on downstream flooding. In addition flows ranging from low to high were also modeled and analyzed. These flows were generated from the HEC-HMS hydrologic model by entering hypothetical 2-, 10-, 25-, 40- and 50-year rainfall amounts to generate hydrographs that were inputted in the HEC-RAS Unsteady Flow Model. All of the flows investigated the Operating Rule Curve by modeling the system as pre-project condition (without gates) and post-project condition (with gates). The impacts were considered at four location for each event, three downstream of the Pompton Lake Dam; the first just upstream from the Jackson Avenue Bridge, the second just downstream of the Dawes Highway Bridge, and the third just upstream of the Hamburg Turnpike Bridge. The fourth location was just downstream of the railroad bridge in Oakland NJ.

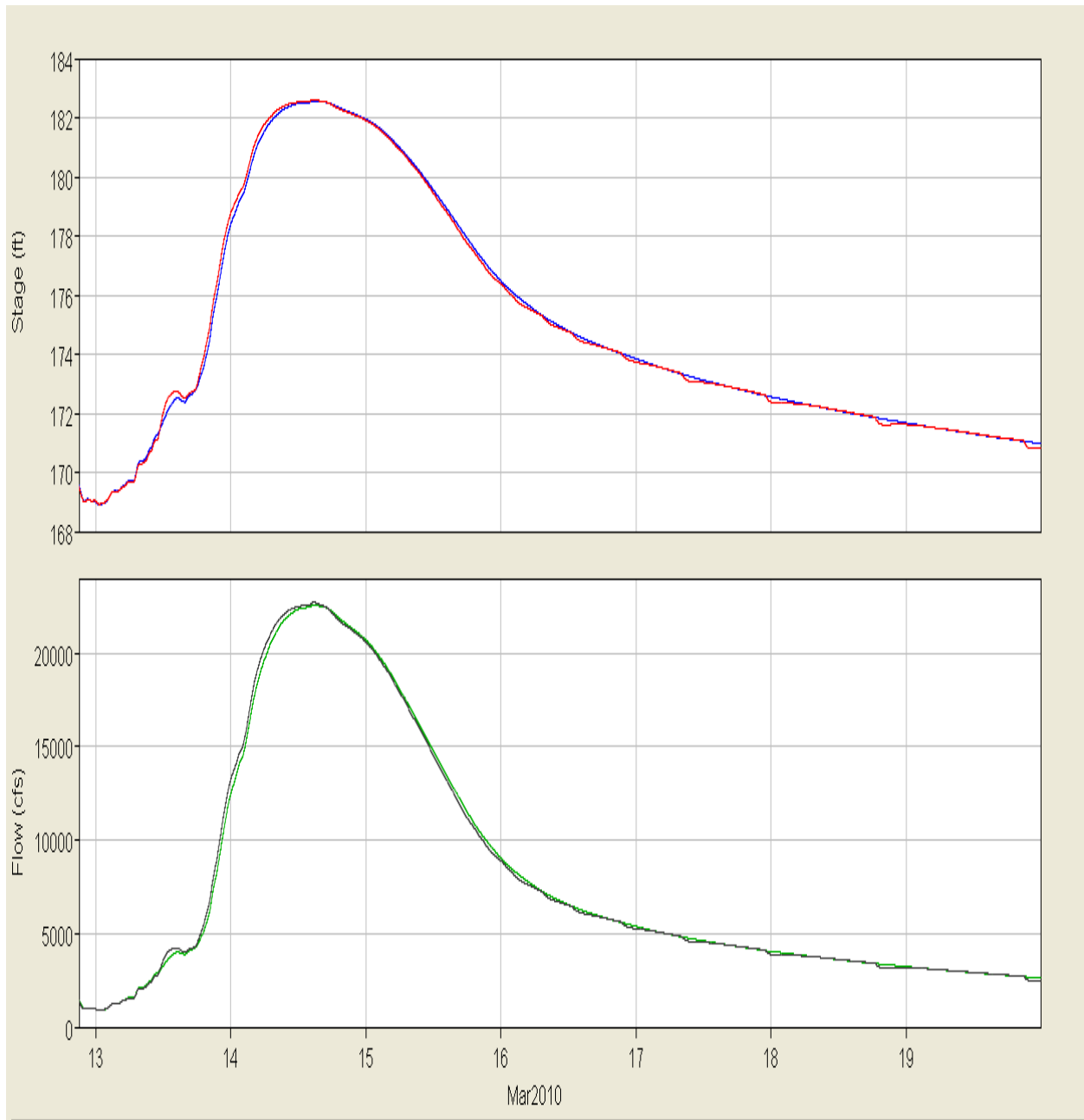
The results of the runs for the recent storms (the March storms and Hurricane Irene) are presented in Figures 3 through 18; the results for the rainfall frequency storm events are shown in Figures 19 through 38.

The stage hydrographs for cross section 10135 which is just upstream of the Hamburg Turnpike Bridge shows some flattening of the stages for a few of the storm events. When the stage reaches an elevation of about 186.5 at the bridge the flow transitions from low flow (water passing beneath the bridge) to pressure flow (when the flow impacts the low chord of the bridge.) This creates a backwater at the bridge and the flattening of the hydrograph.

With the gates in operation the flow and stage may arrive somewhat sooner than without the gate operation. However, the maximum flows and elevations are nearly the same. The increases vary depending on the storm and the associated flow rates. The maximum predicted water surface increase in the vicinity of the Dawes Highway Bridge ranged between 0.18 and 0.24 feet and occurred for the simulated 2-year rainfall storm event. All of the other flow situations had significantly less increases in the flood elevations.

The modeling results for the runs with the flows ranging from low to high are shown in Figures 19 through 38.

During Hurricane Irene Pompton Lake was lowered three feet prior to the onset of the storm. The stage and flow hydrographs downstream of the dam were essentially identical, indicating that there is no effect due to the lowering of the reservoir level. The only difference in the hydrographs is at the beginning of the storm where the lake level is 3.0 feet lower at the beginning of the event. There is simply not enough storage to attenuate the flooding caused by Hurricane Irene. The March 2010 storm and a 10-year rainfall storm event were run with the model to determine the effect of lowering the lake by 3.0 ft. prior to the rainfall event occurring. Both cases showed similar results. There is not enough volume of storage in the reservoir to reduce flooding



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 4 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre Project Condition and Post Project Conditions

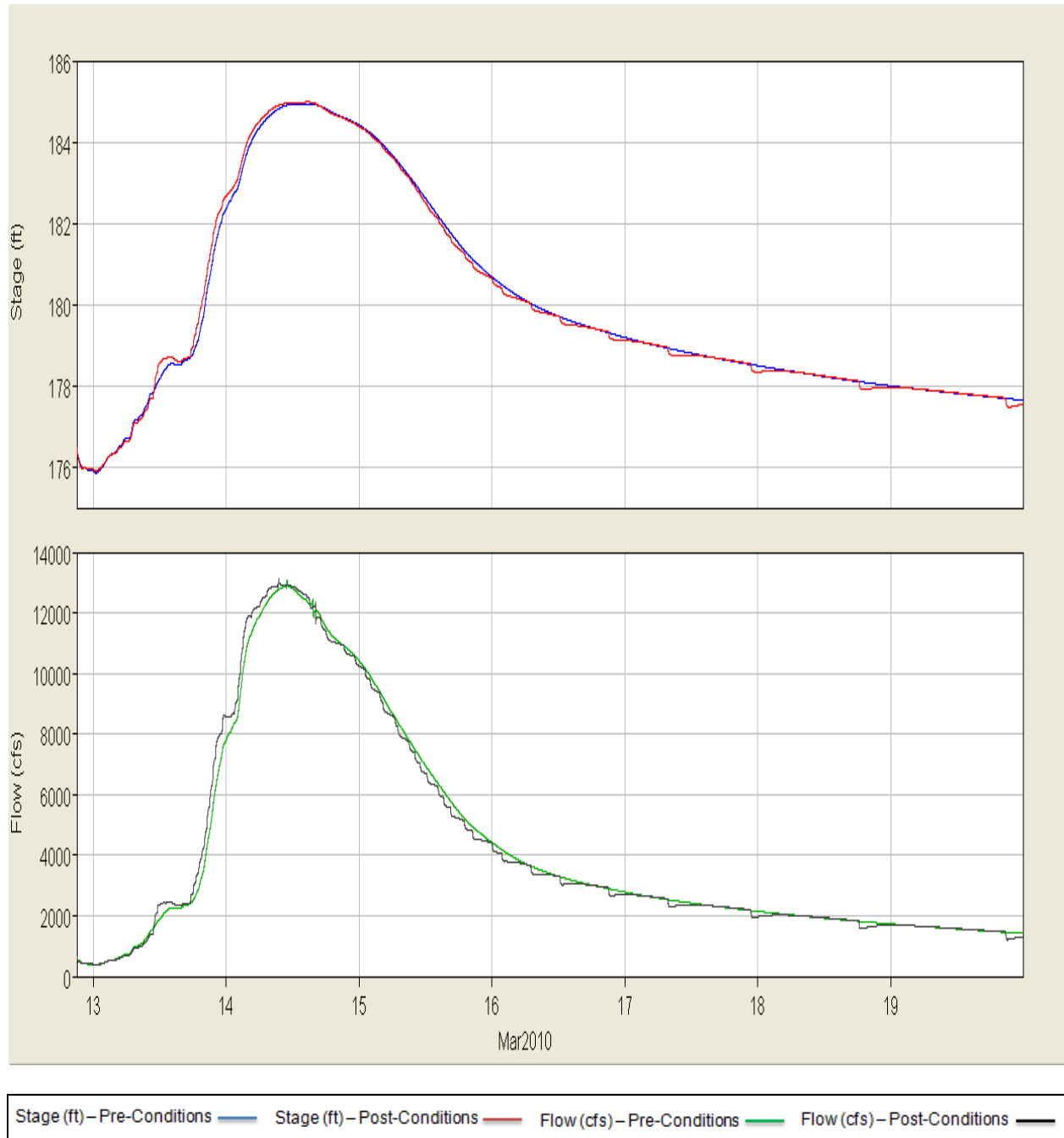


Figure 5: March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge - Pre Project Condition and Post Project Conditions

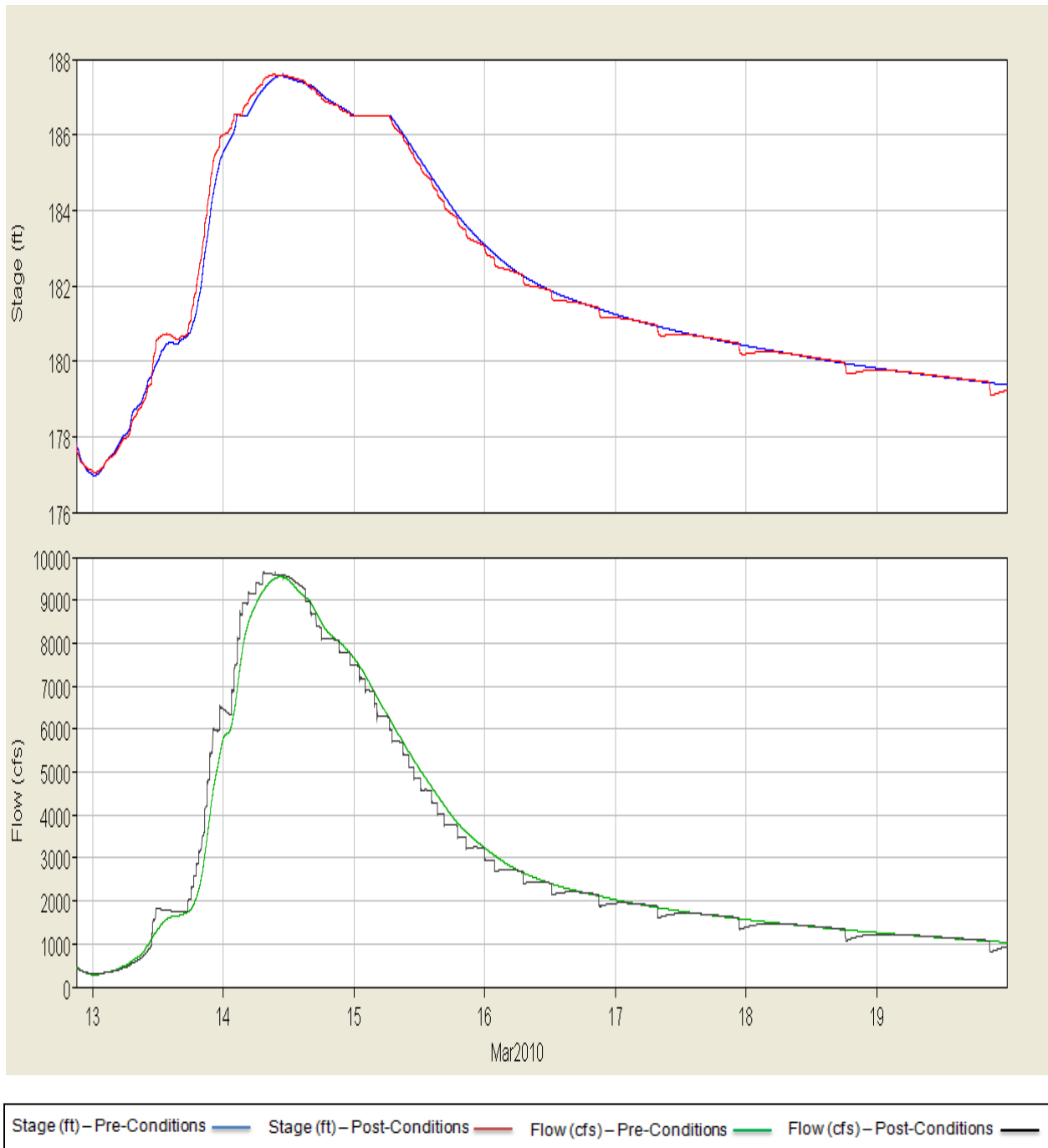


Figure 6 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge - Pre Project Condition and Post Project Conditions

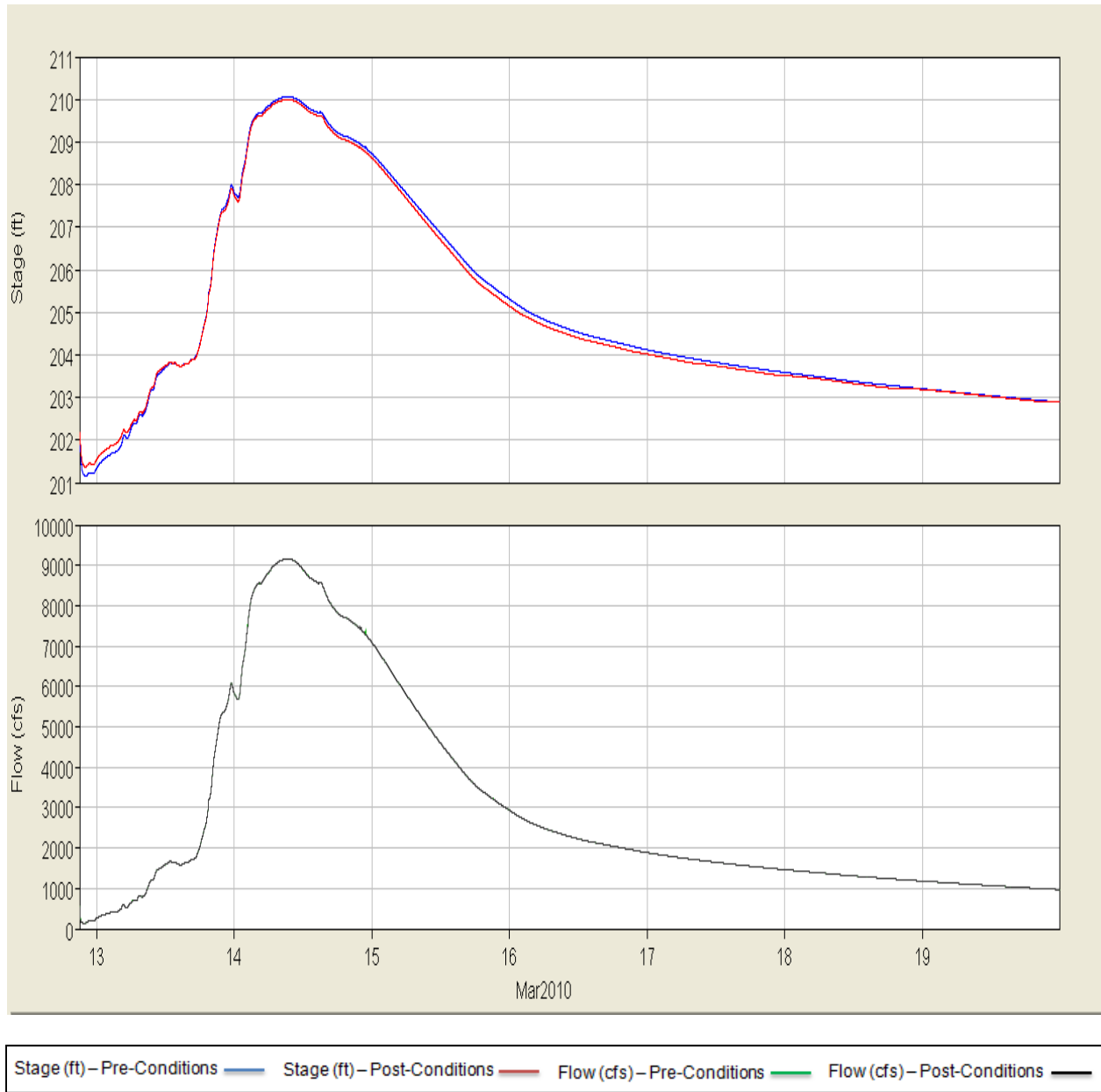


Figure 7 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ - Pre Project Condition and Post Project Conditions

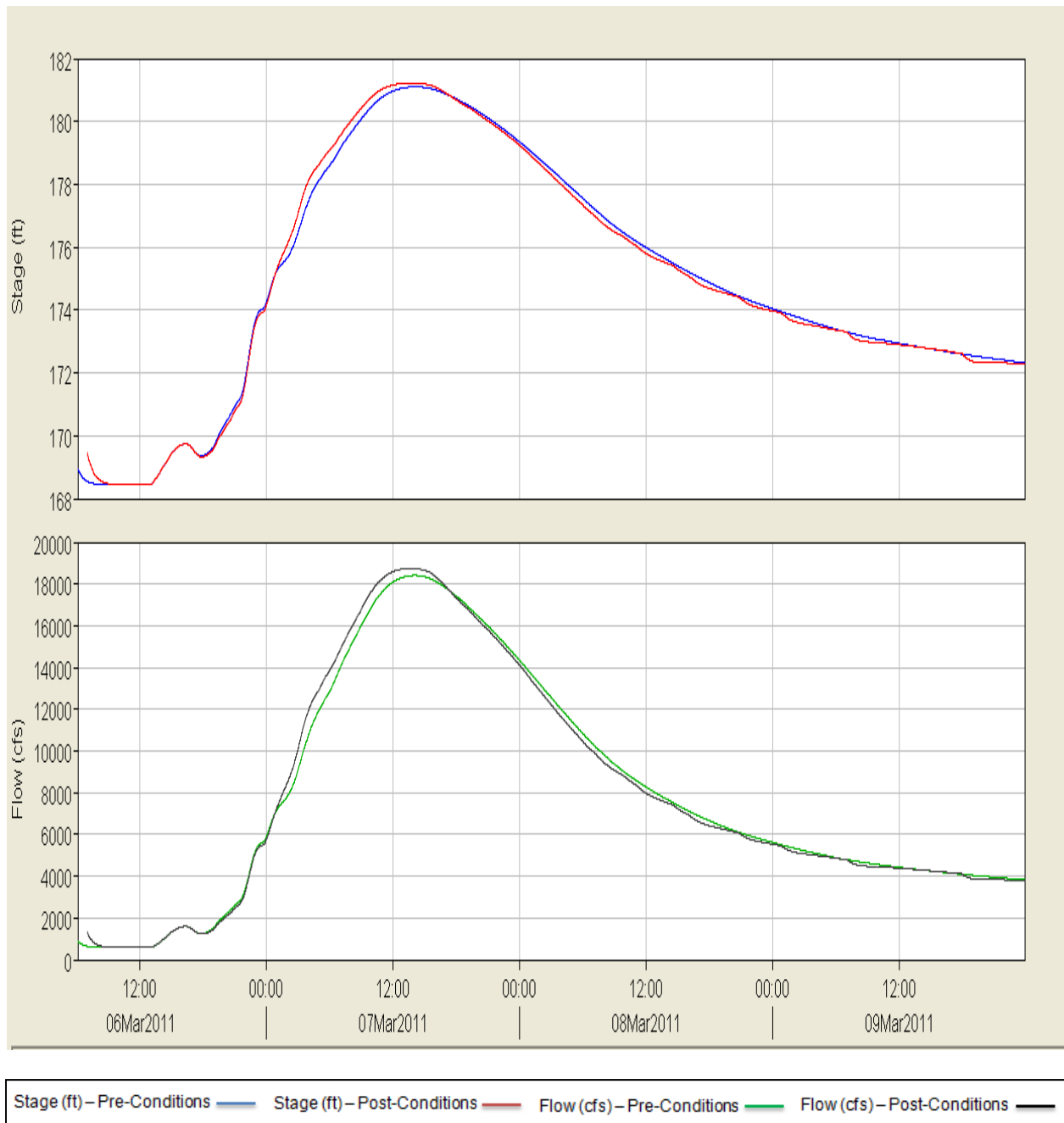


Figure 8 : March 6-9, 2011 Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre Project Condition and Post Project Conditions

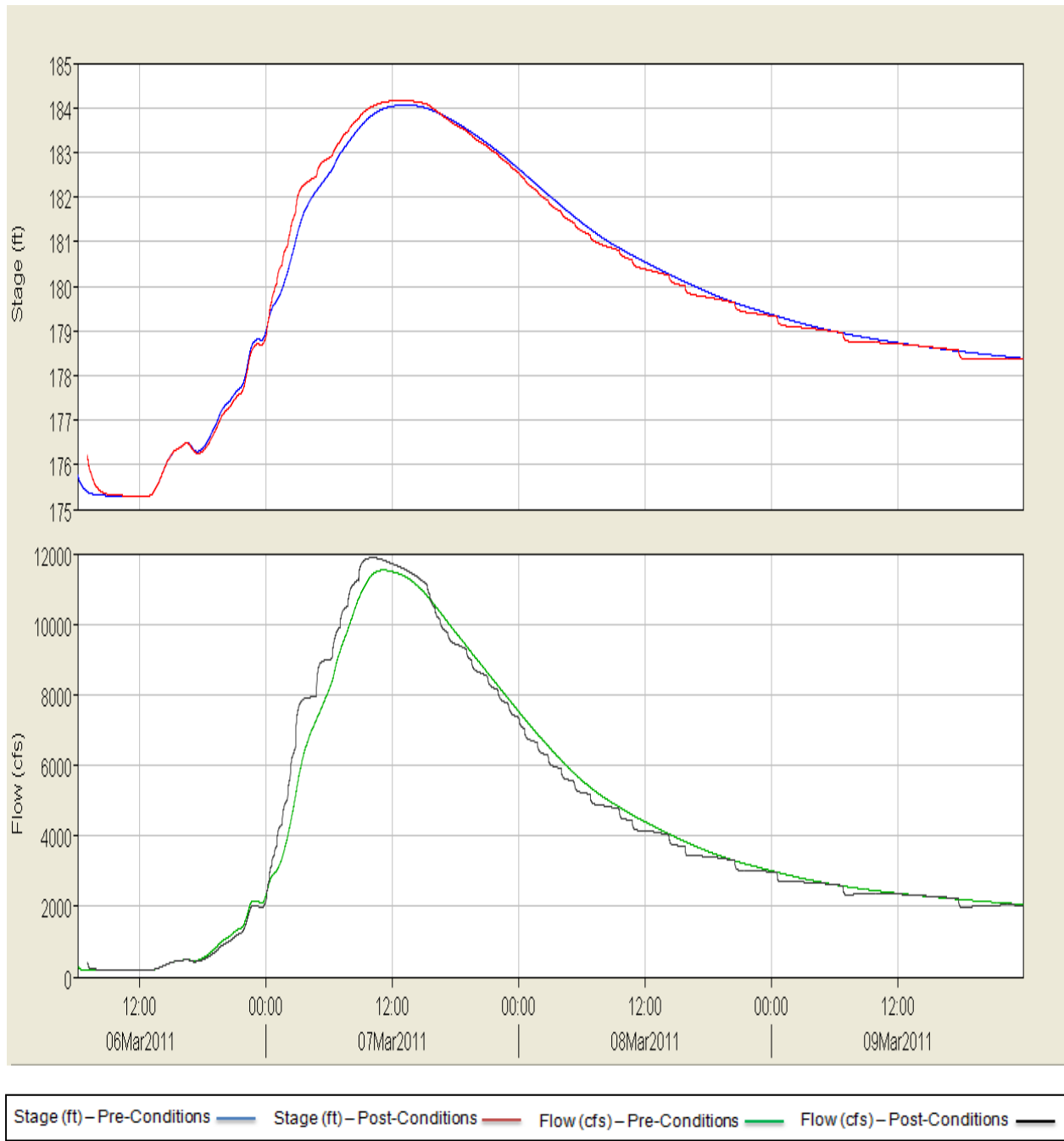


Figure 9 : March 6-9, 2011 Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge – Pre Project Condition and Post Project Conditions

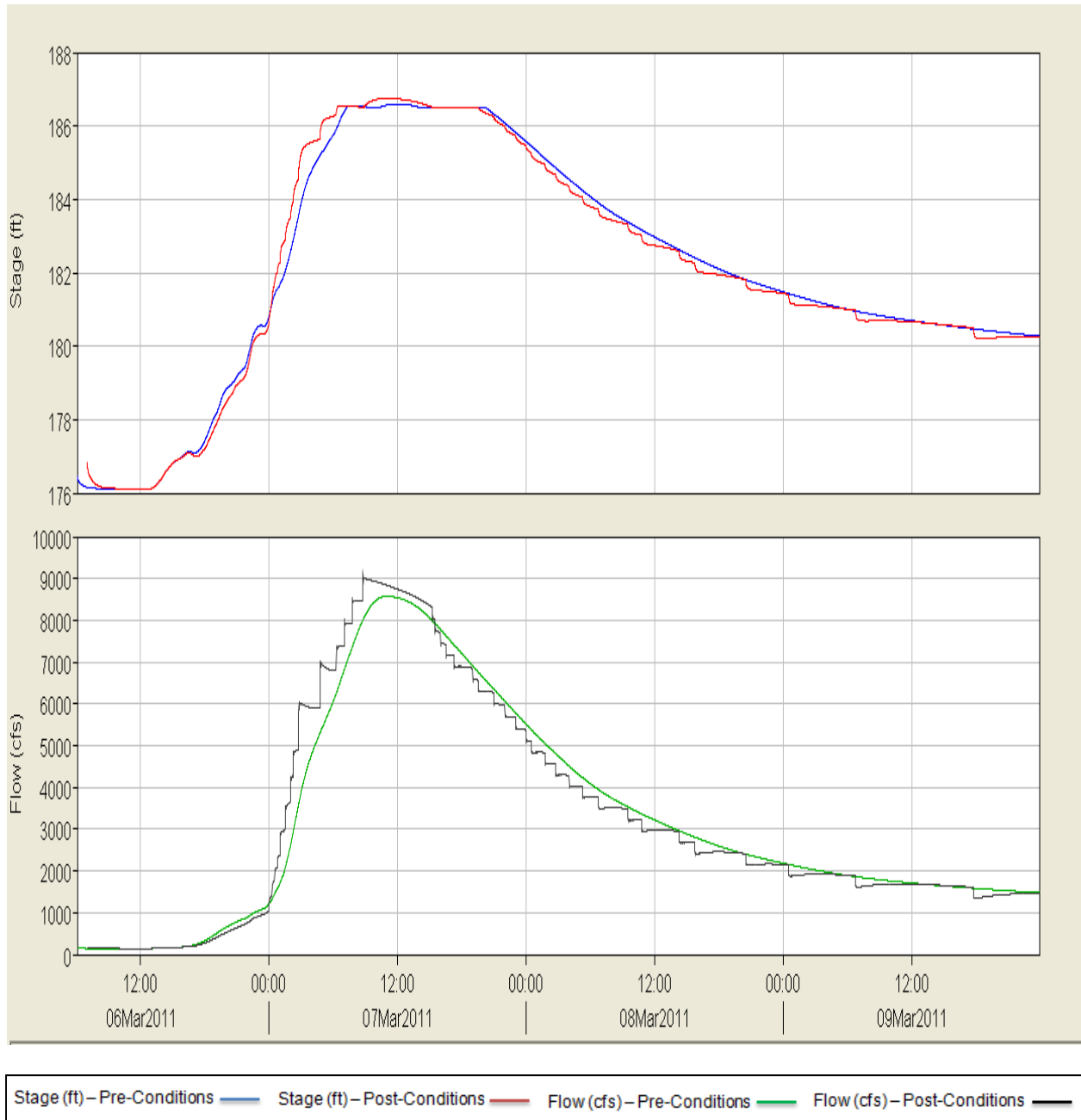


Figure 10 : March 6-9, 2011 Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream the Hamburg Turnpike Bridge – Pre Project Condition and Post Project Conditions

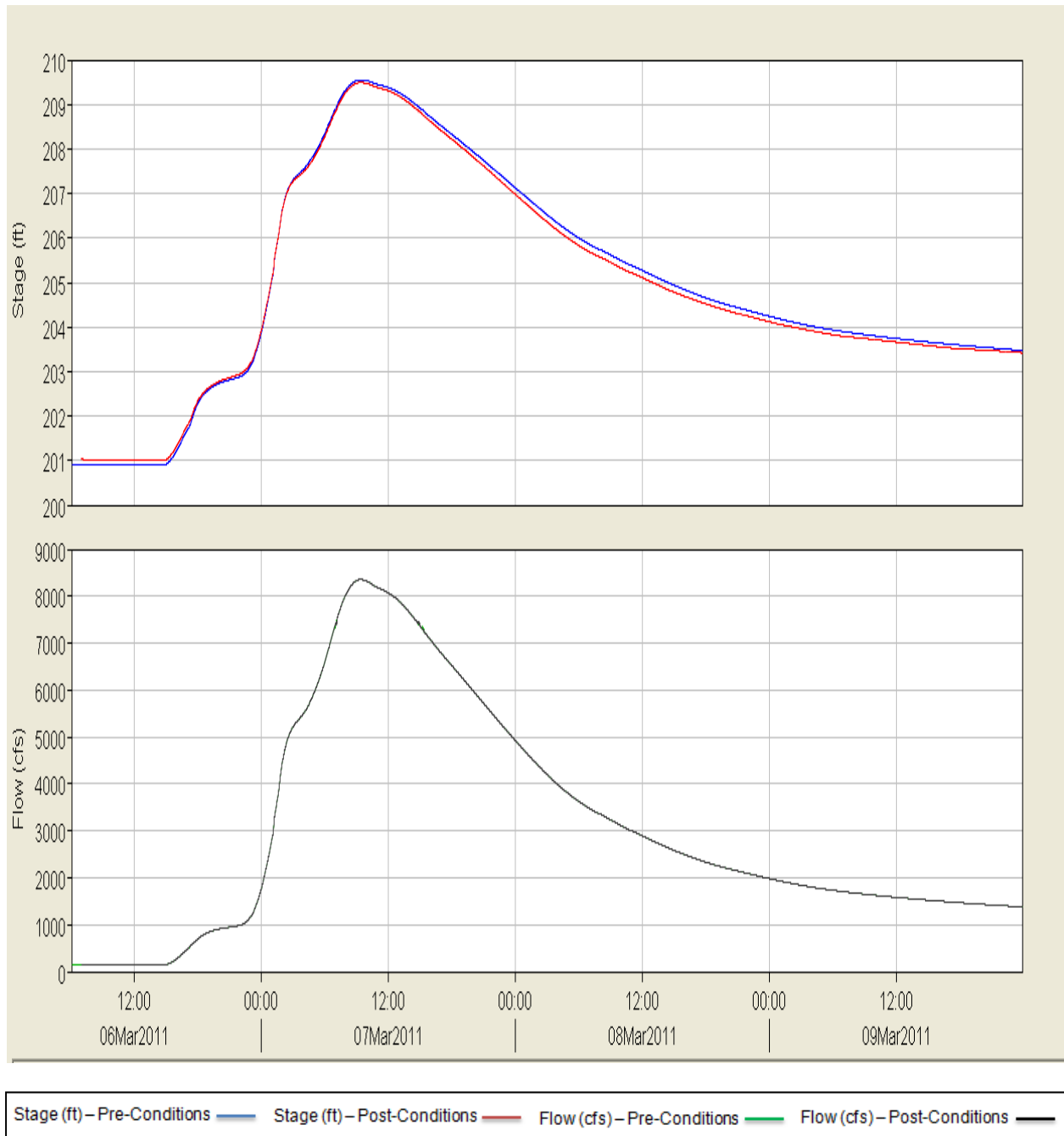
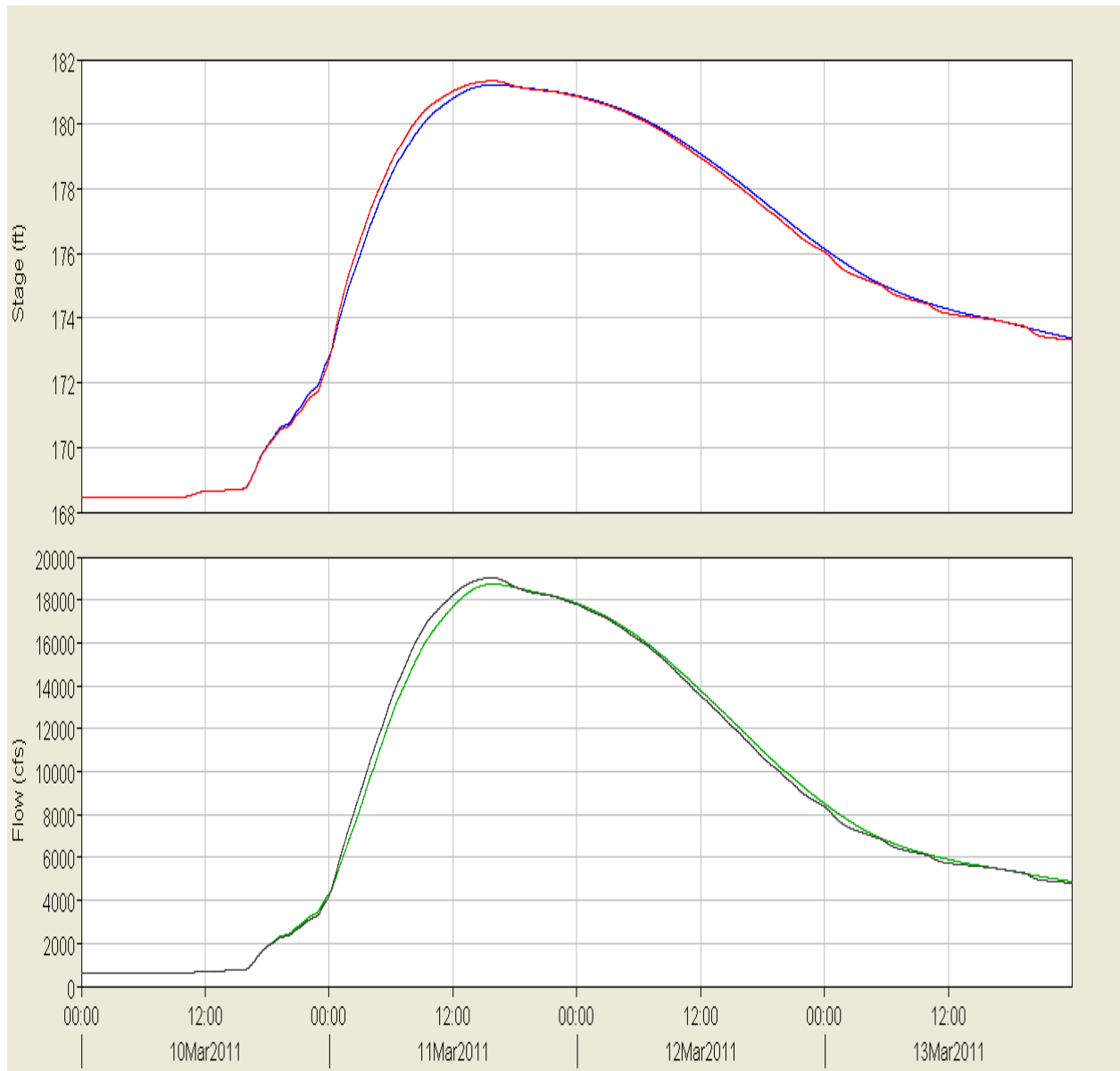


Figure 11 : March 6-9, 2011 Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre Project Condition and Post Project Conditions



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 12 : March 9-13, 2011 Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre Project Condition and Post Project Conditions

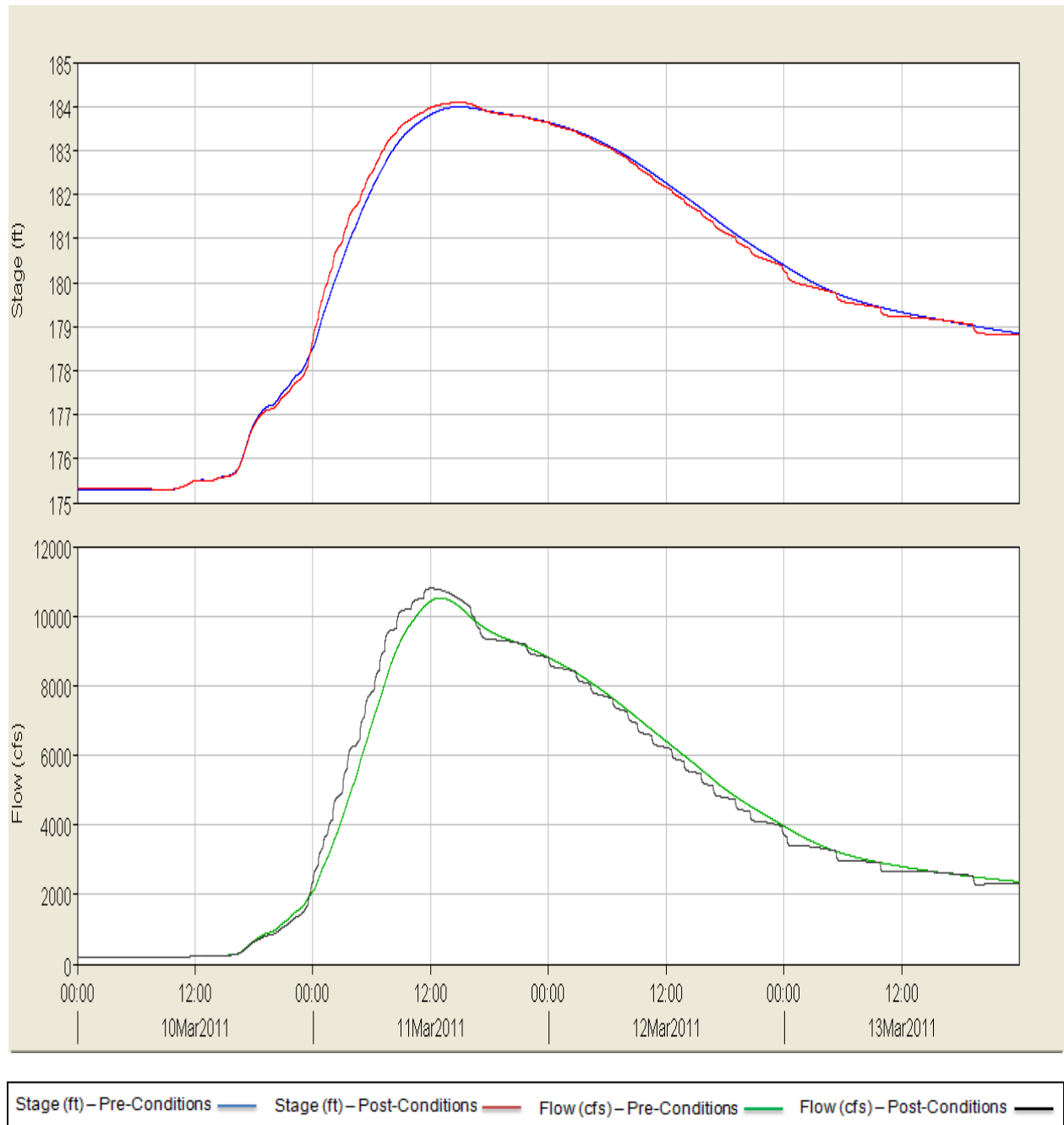


Figure 13 : March 9-13, 2011 Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge – Pre Project Condition and Post Project Conditions

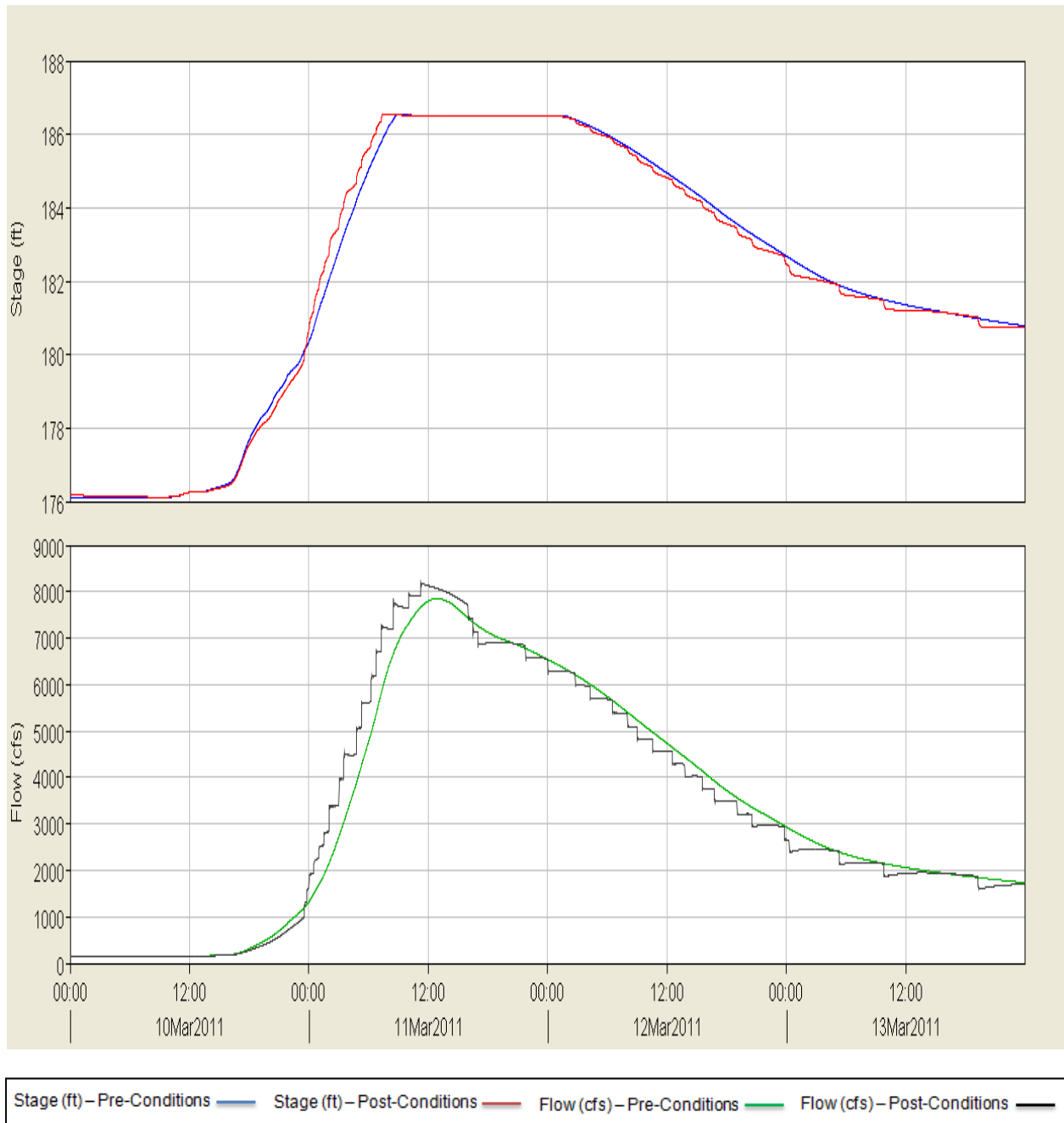


Figure 14 : March 9-13, 2011 Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream the Hamburg Turnpike Bridge – Pre Project Condition and Post Project Conditions

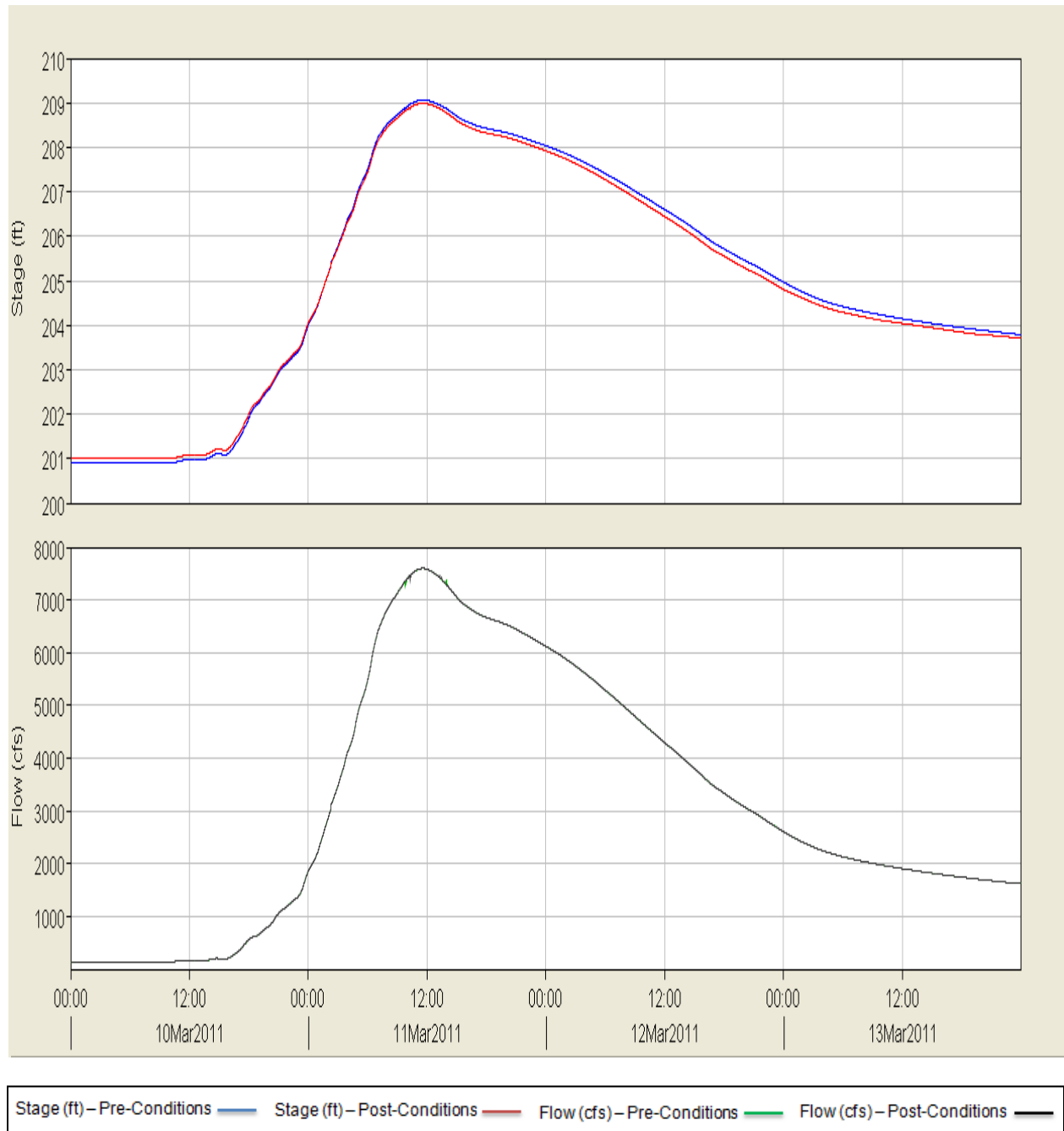


Figure 15 : March 9-13, 2011 Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre Project Condition and Post Project Conditions

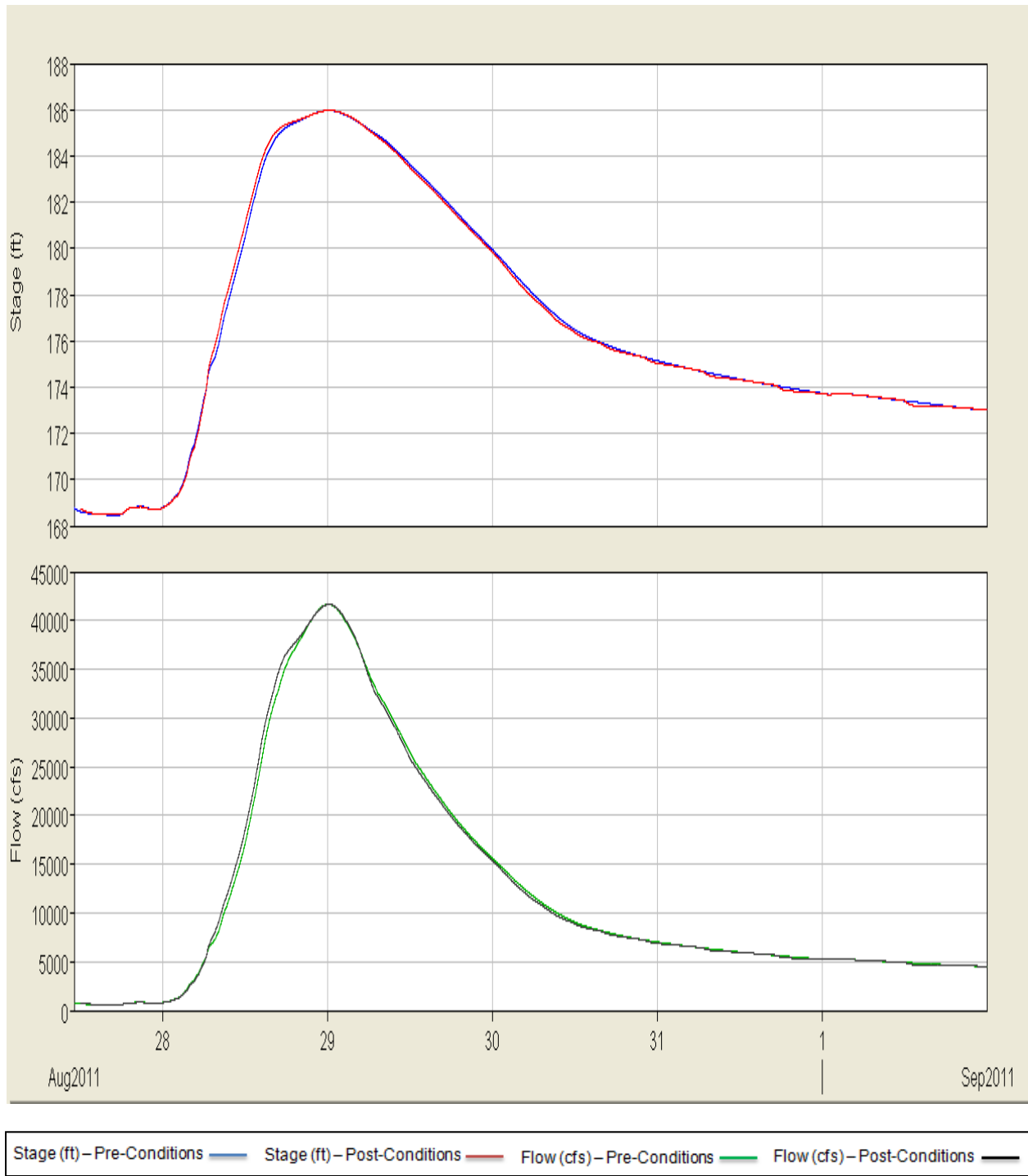


Figure 16 : Hurricane Irene, August 2011, Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre Project Condition and Post Project Conditions

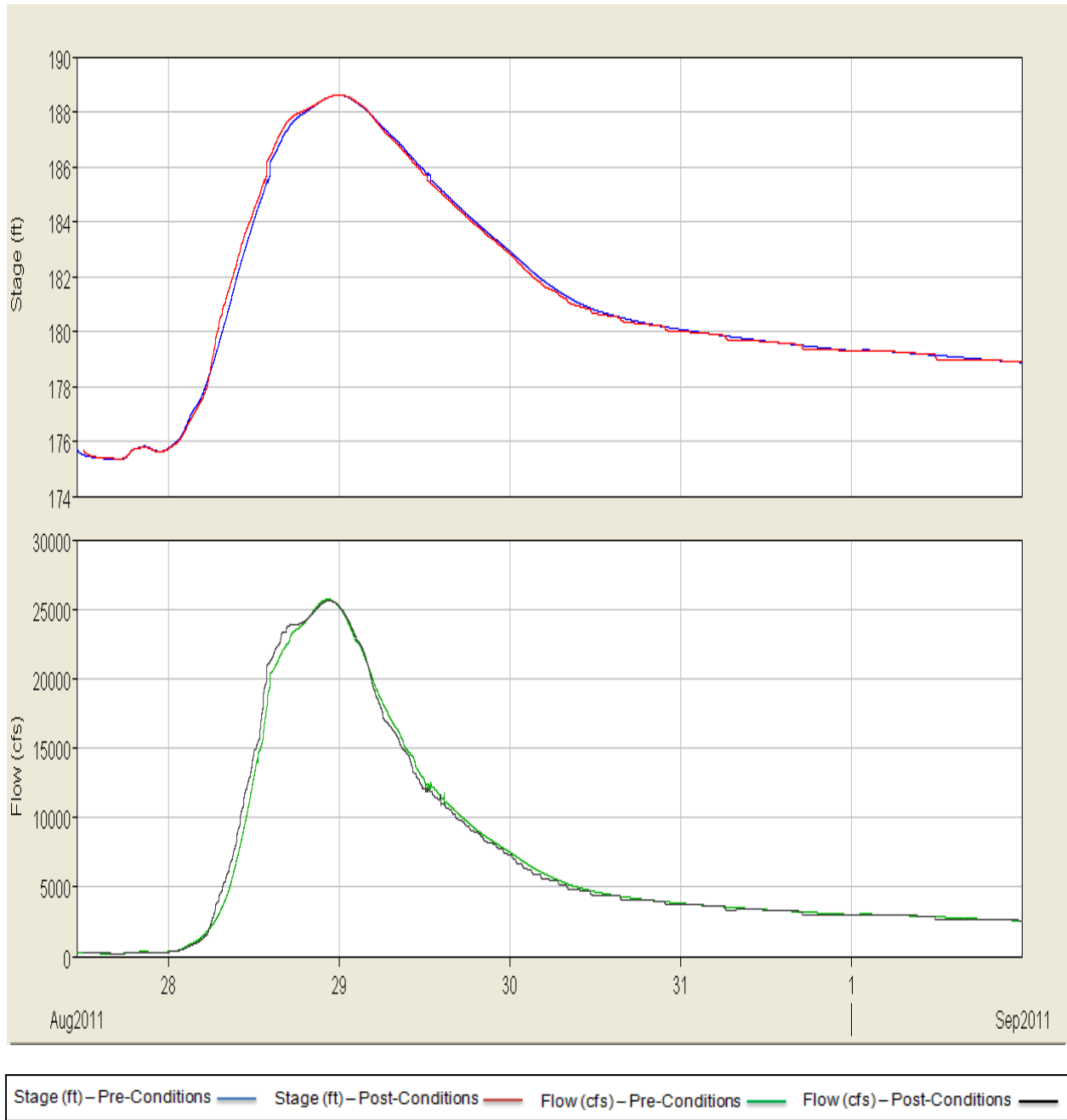


Figure 17 : Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge – Pre Project Condition and Post Project Conditions

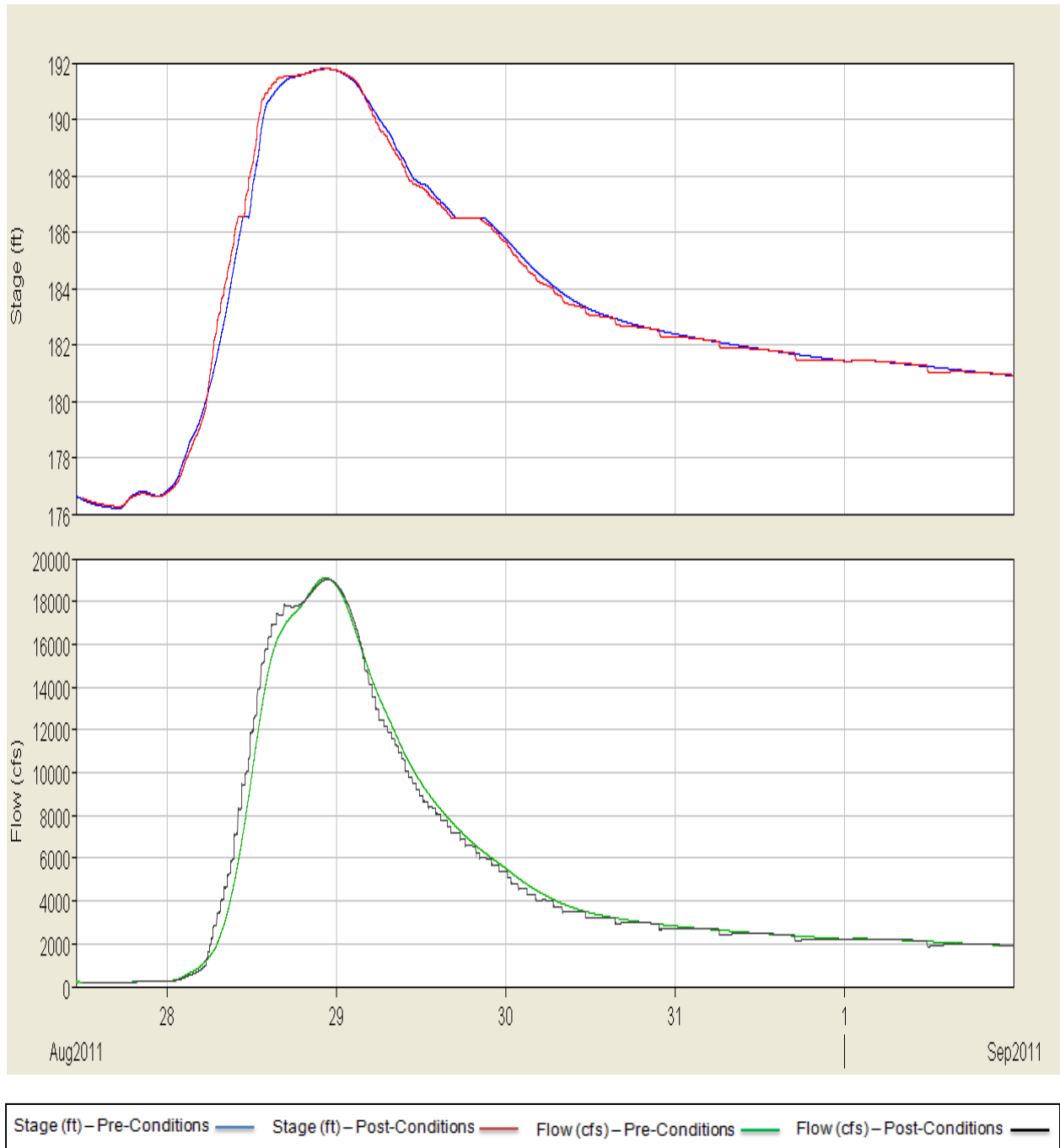
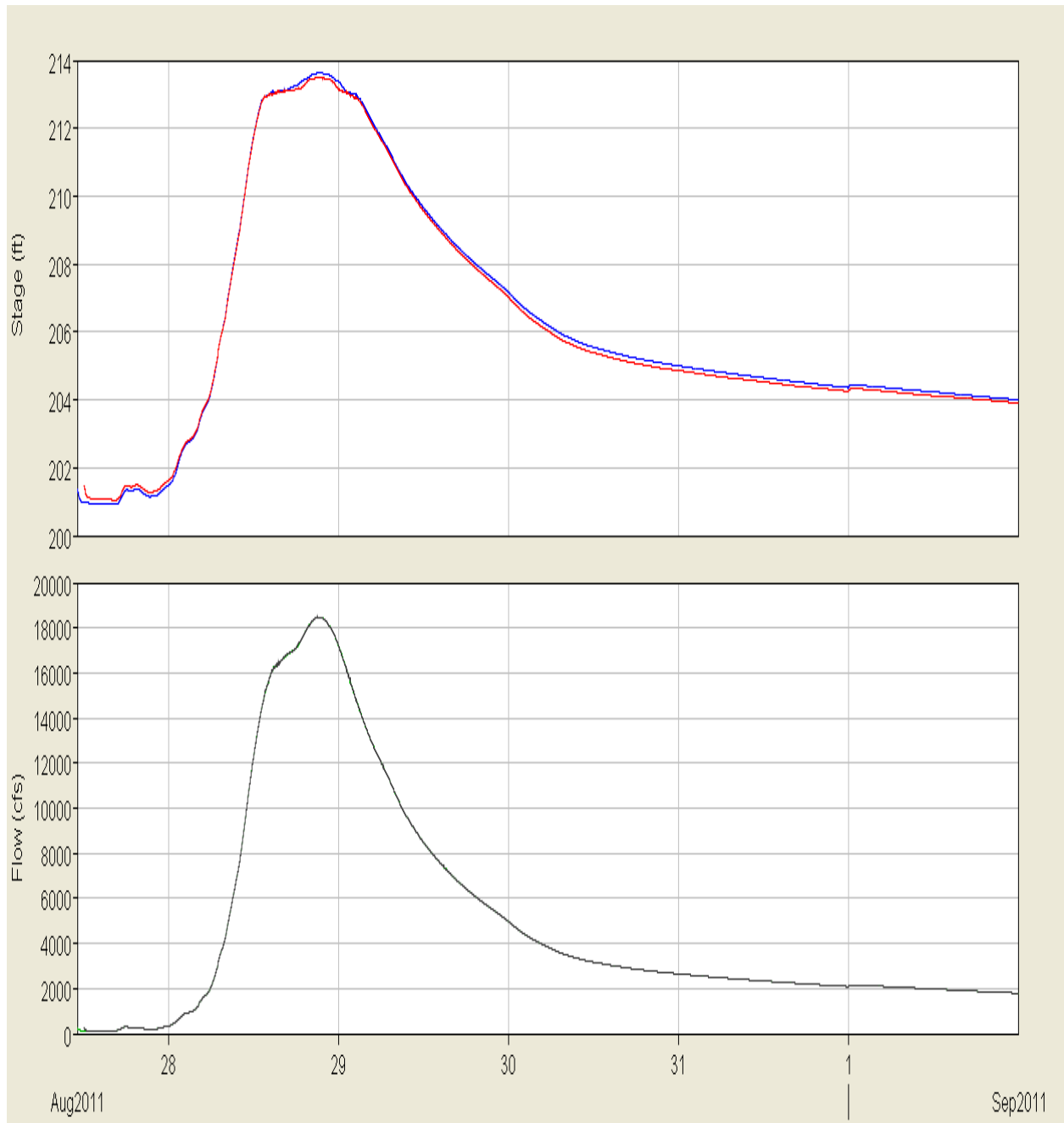


Figure 18 : Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Pre Project Condition and Post Project Conditions



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 19 : Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre Project Condition and Post Project Conditions

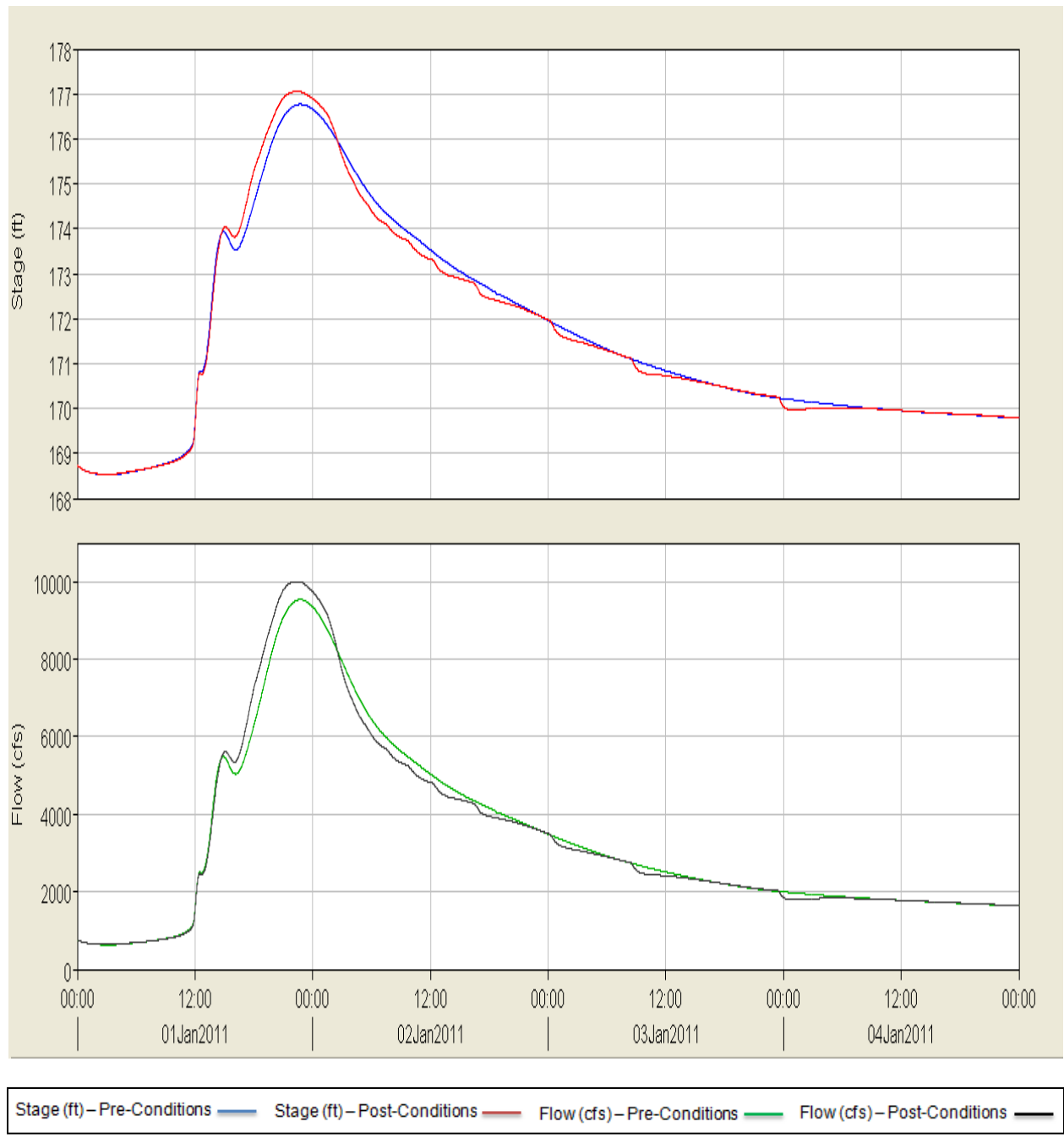


Figure 20 : 2-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre and Post Conditions

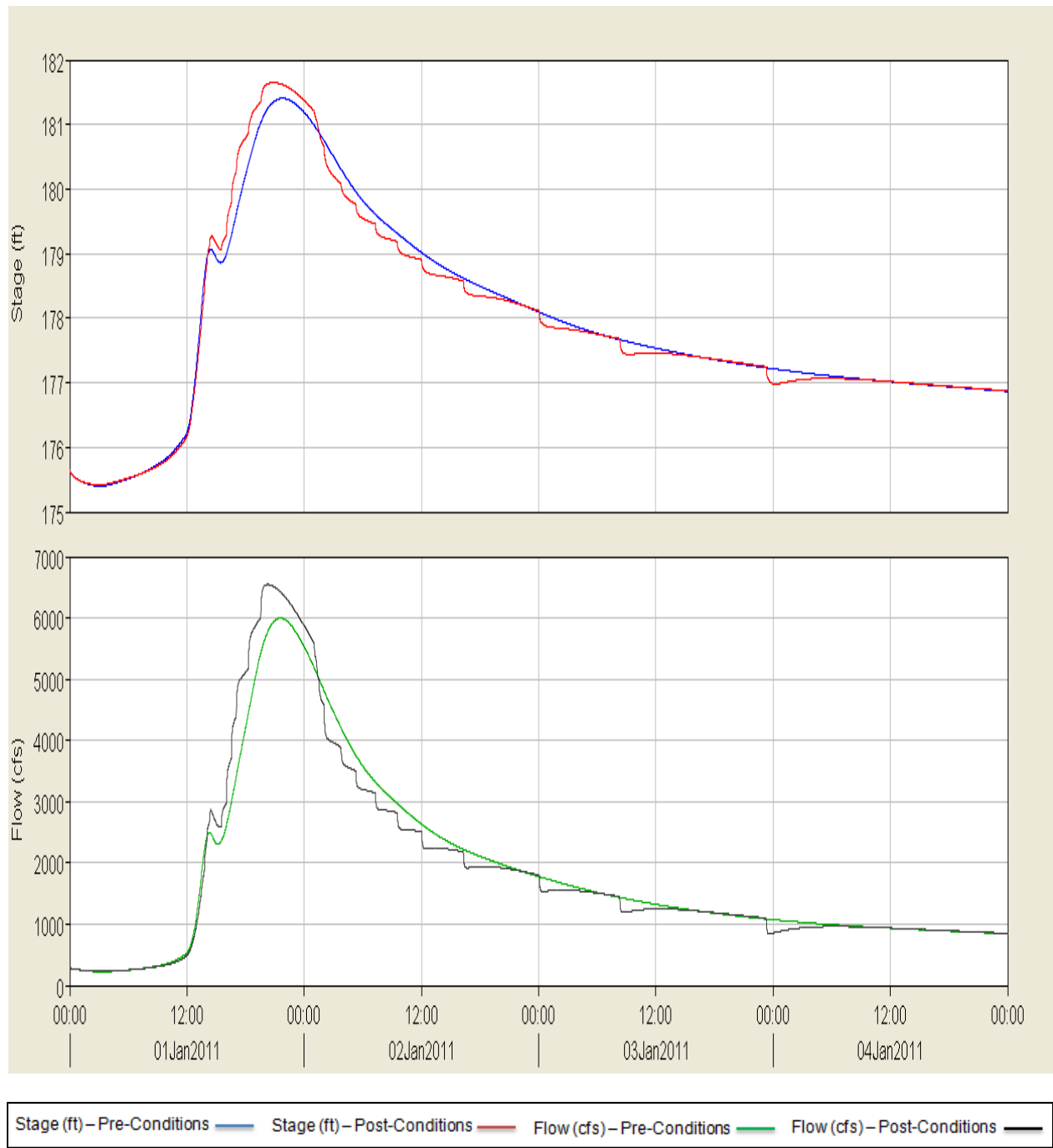
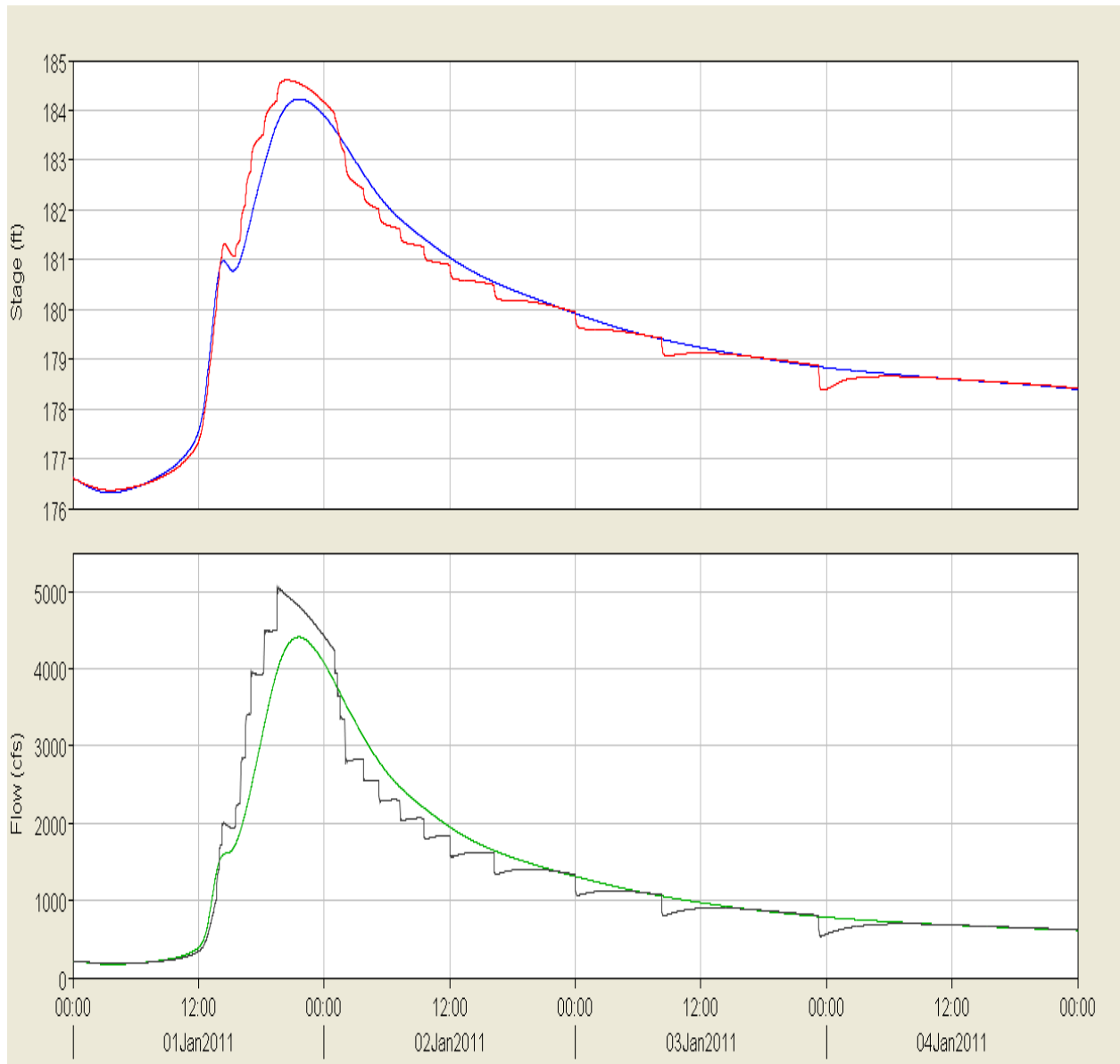


Figure 21 : 2-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge – Pre and Post Conditions



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 22 : 2-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Pre and Post Conditions

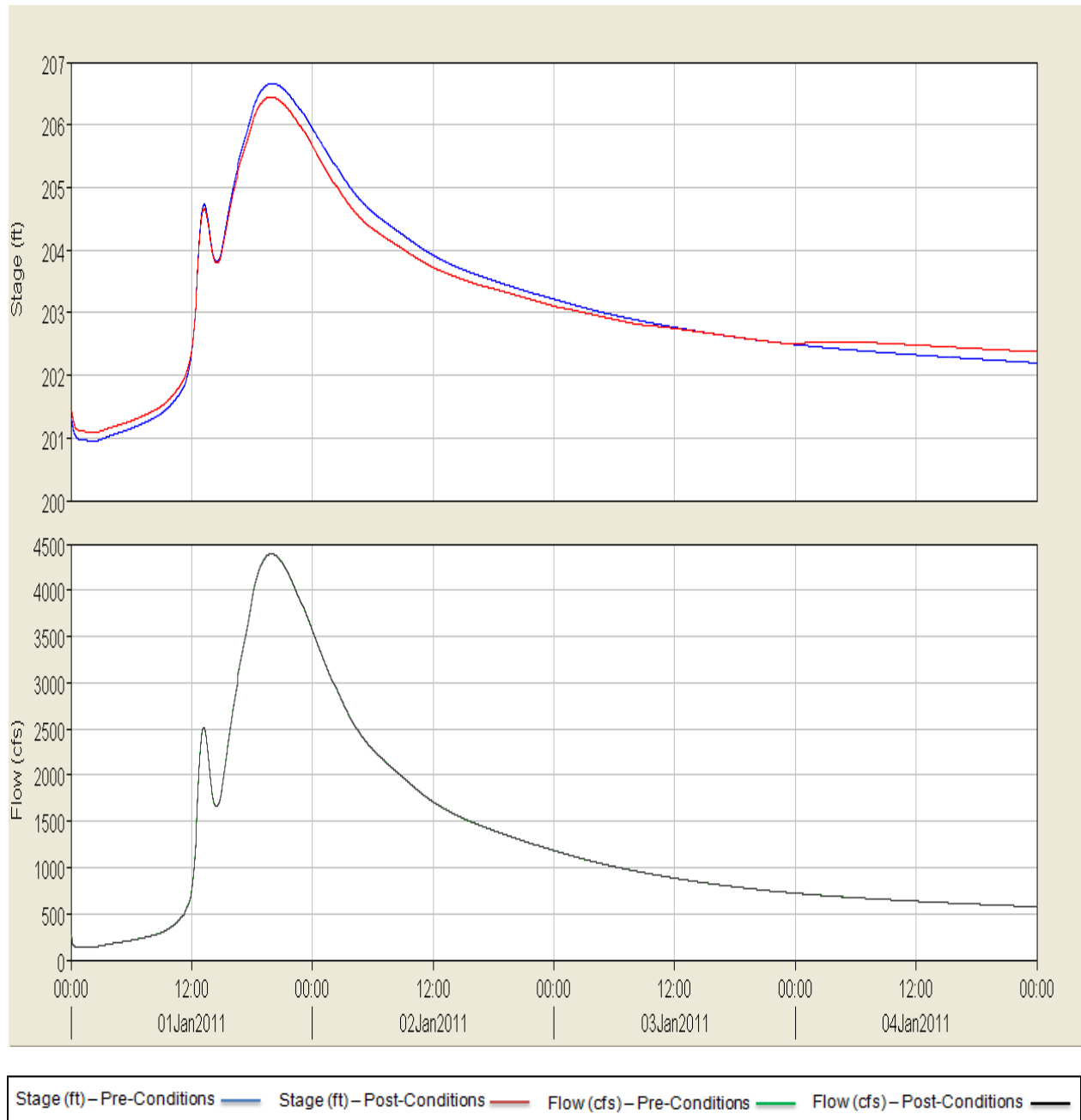


Figure 23 : 2-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre and Post Conditions

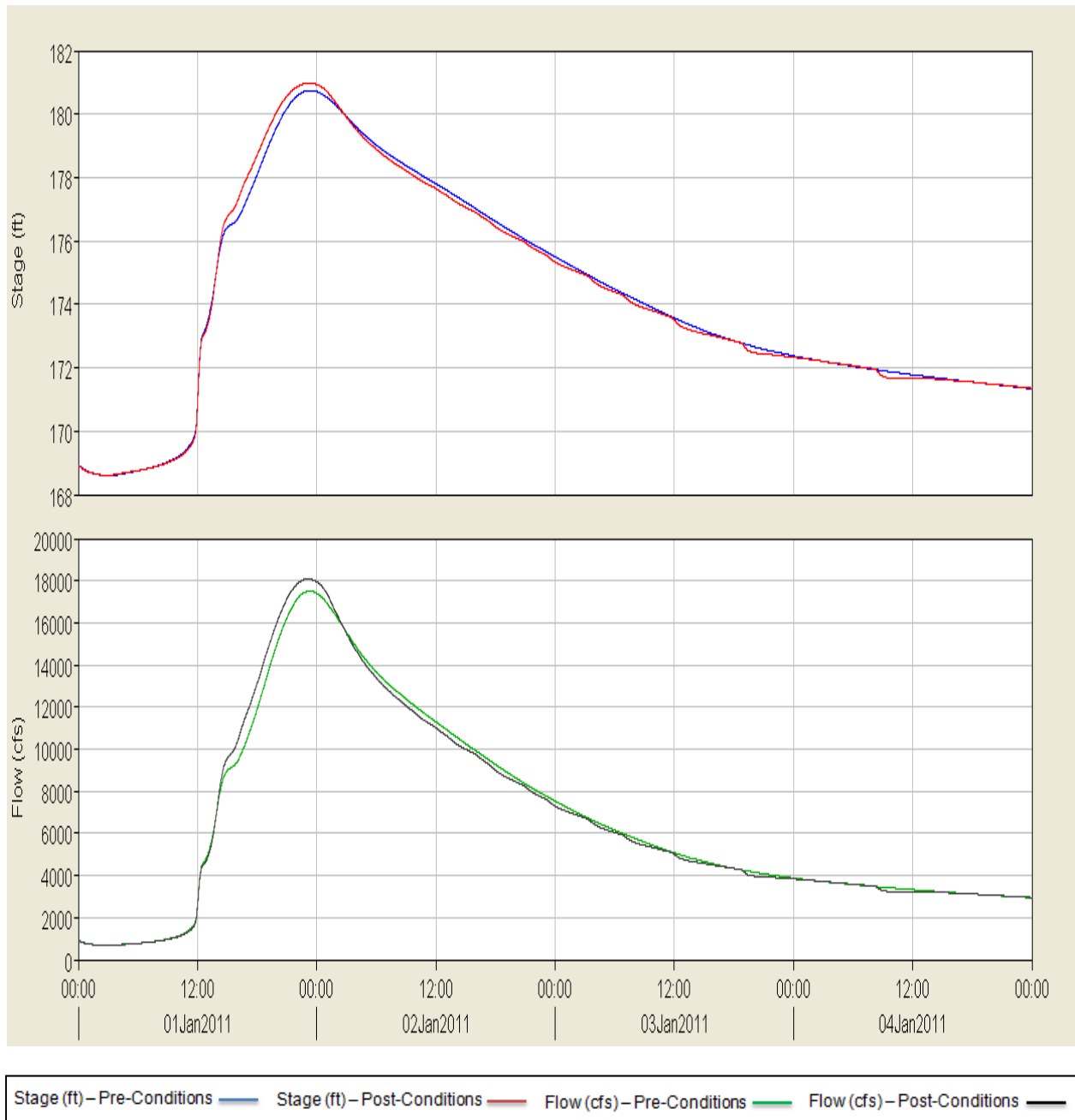


Figure 24 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre and Post Conditions

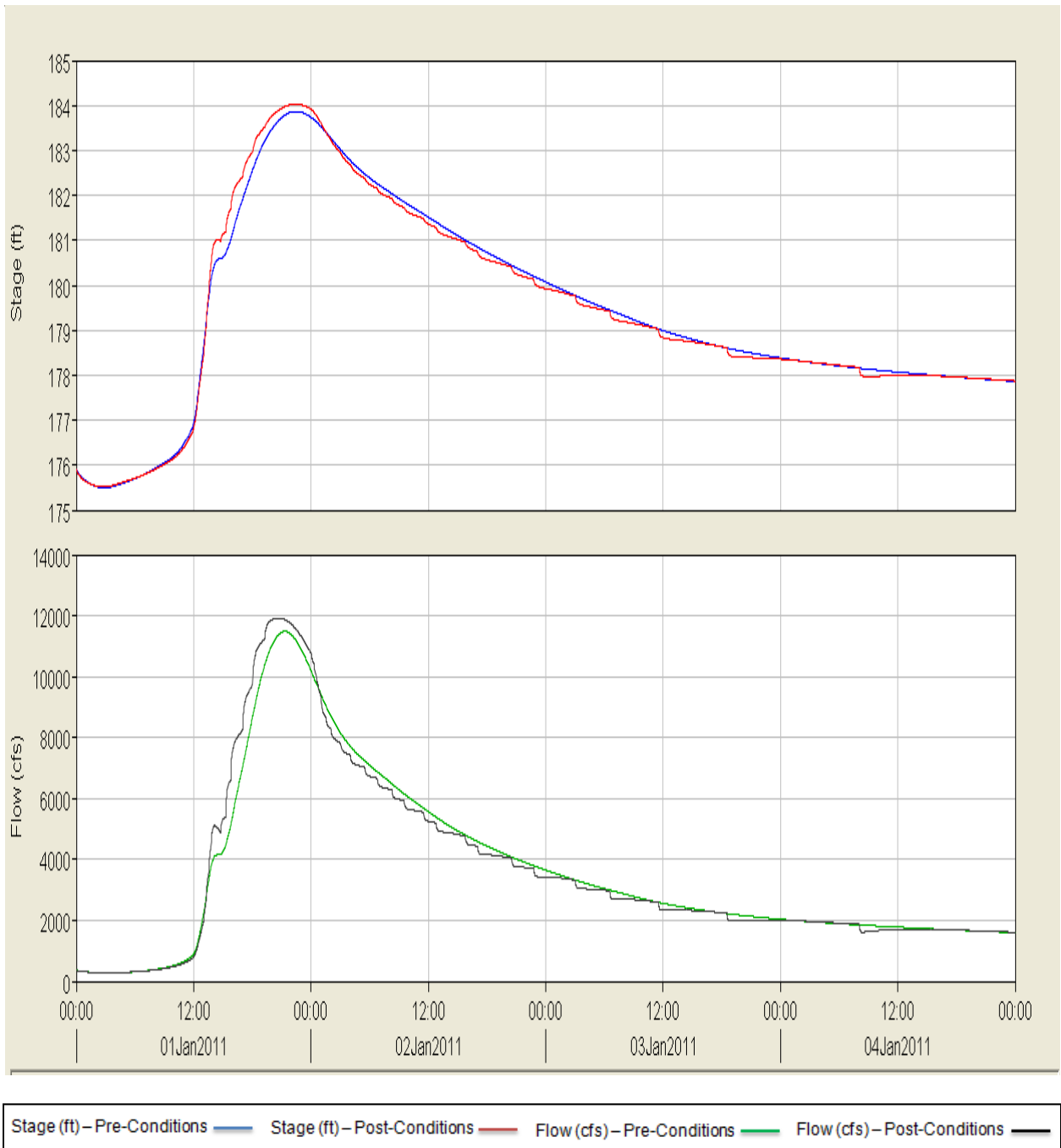
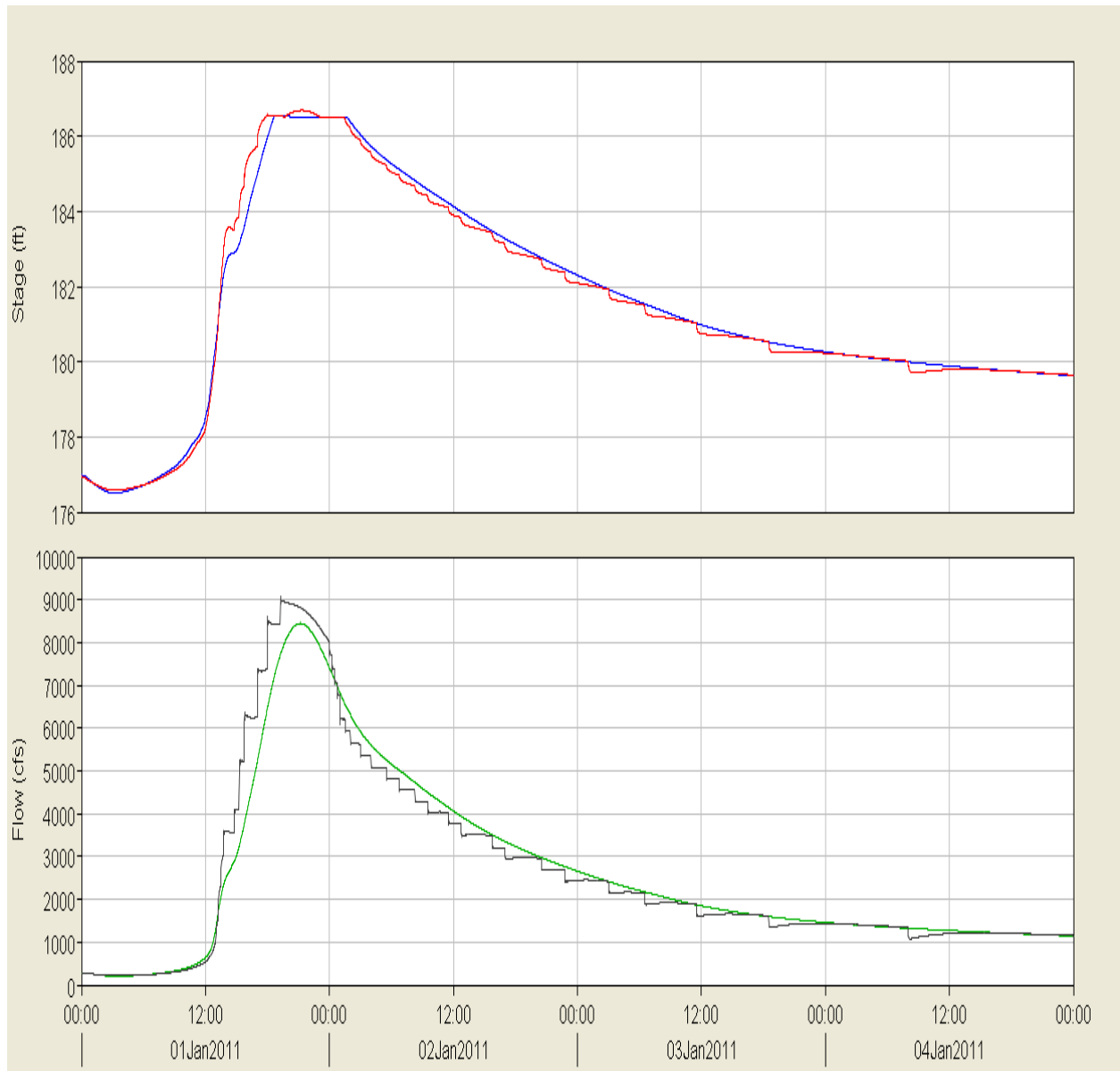


Figure 25 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream from the Dawes Highway Bridge – Pre and Post Conditions



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 26 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Pre and Post Conditions

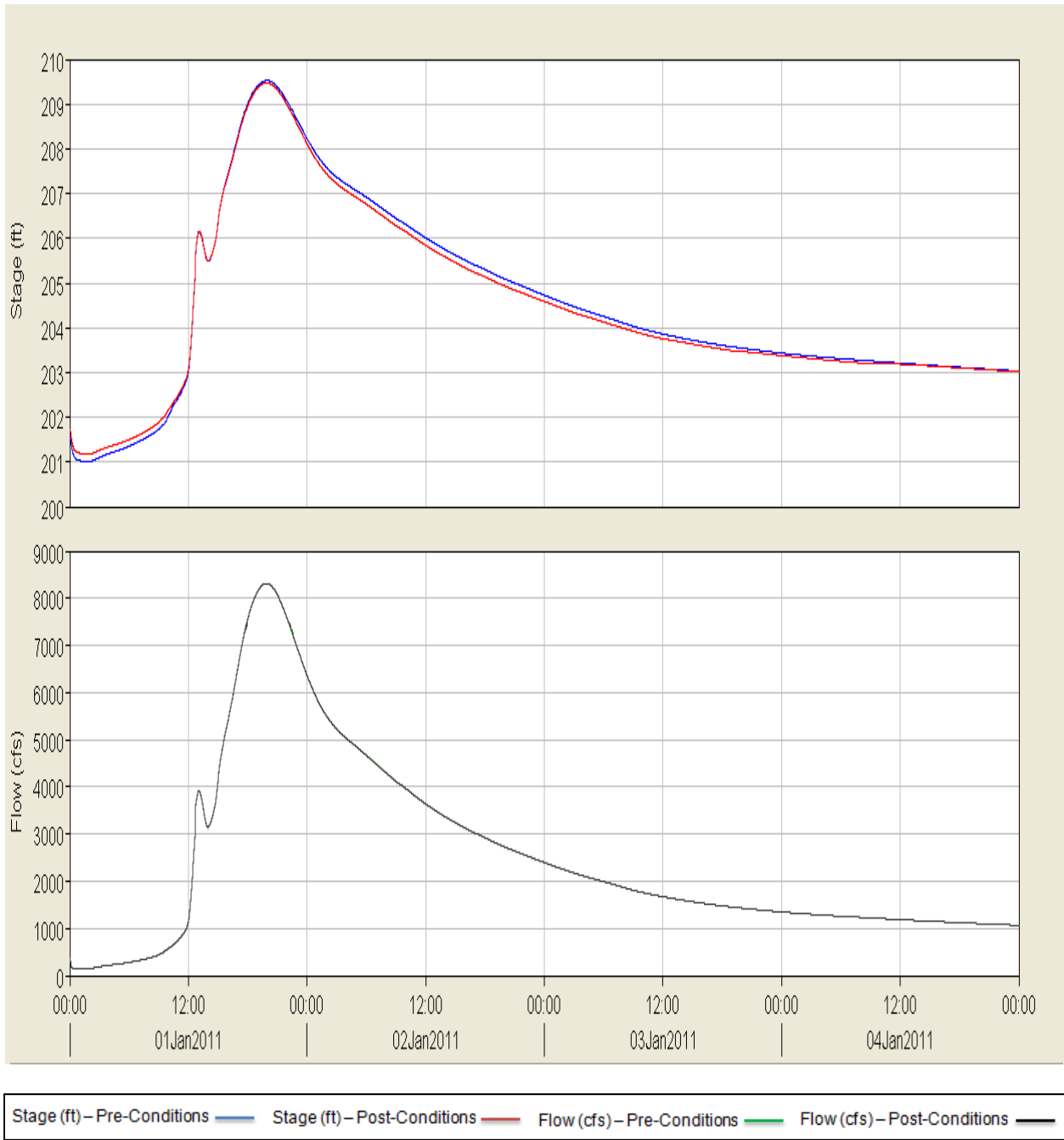


Figure 27 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre and Post Conditions

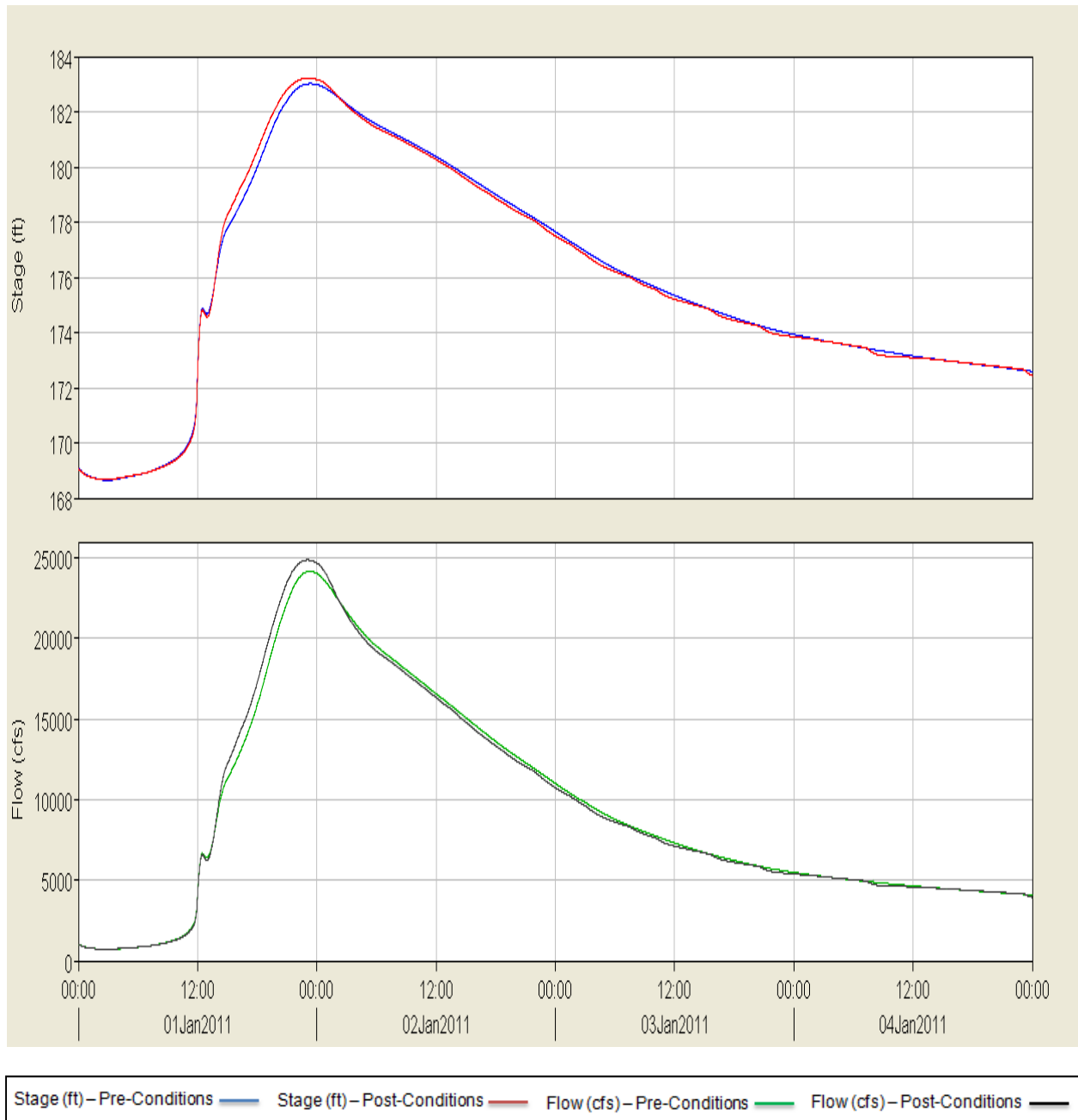


Figure 28 : 25-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre and Post Conditions

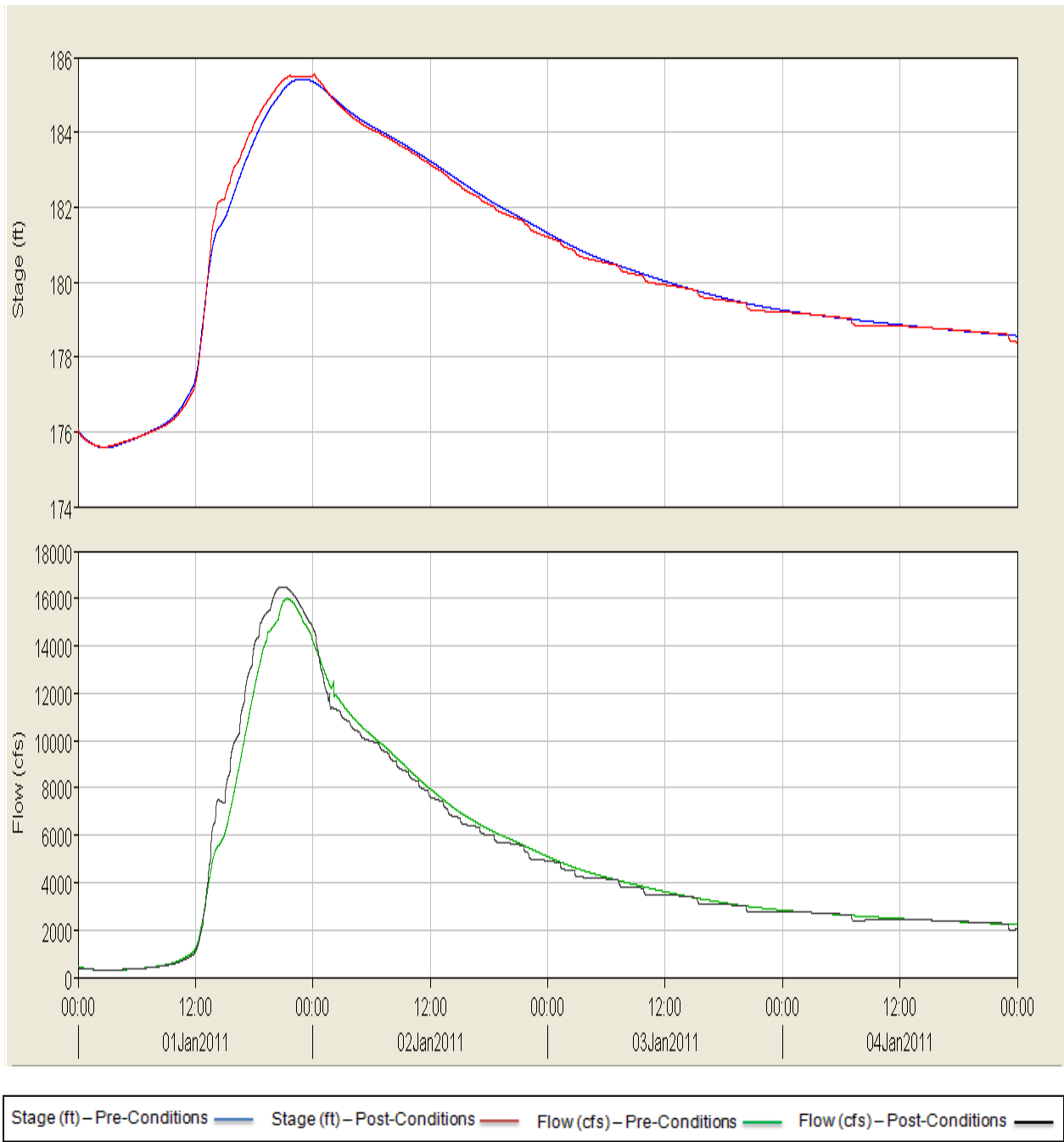


Figure 29 : 25-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream from the Dawes Highway Bridge – Pre and Post Conditions

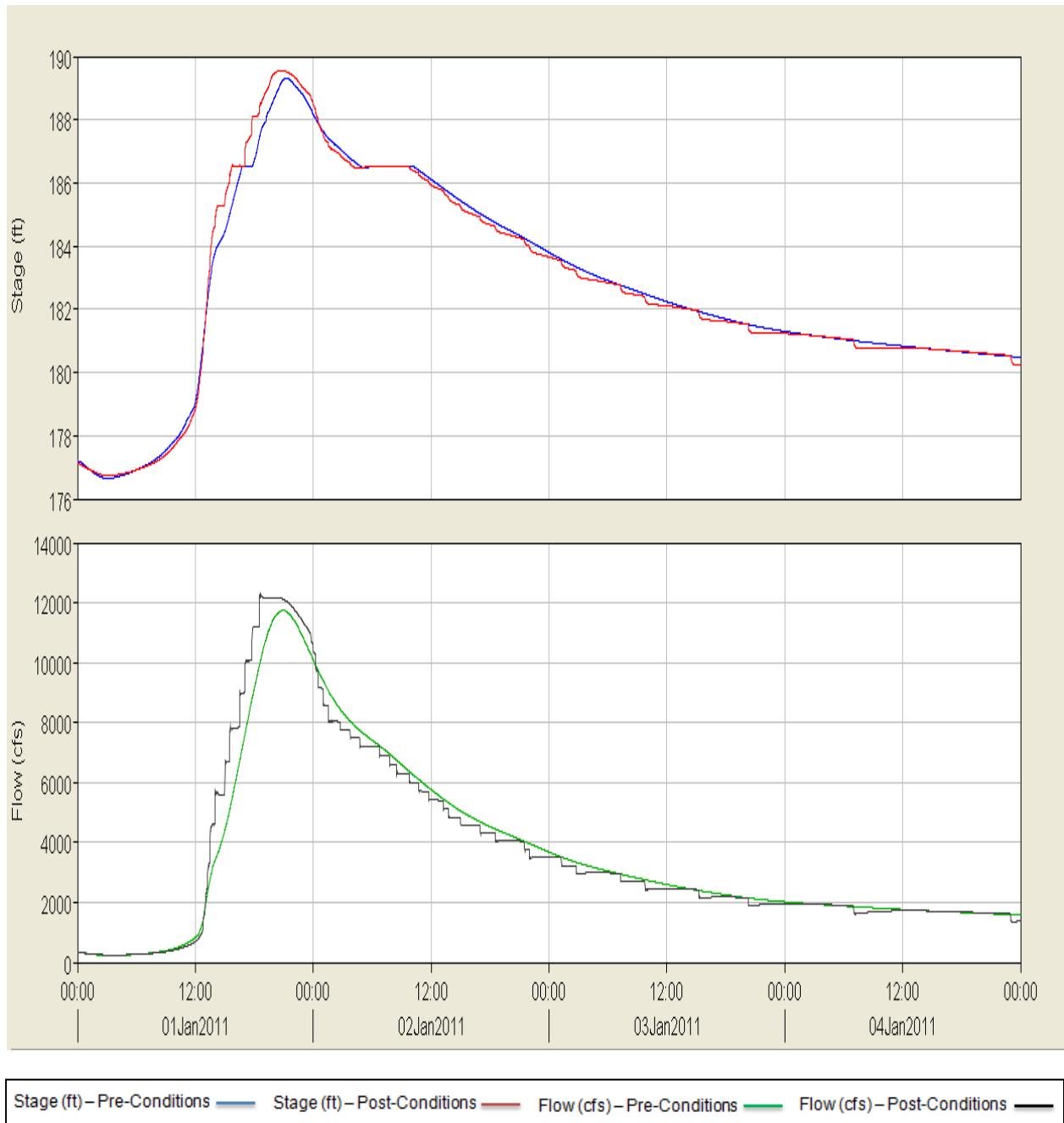


Figure 30: 25-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Pre and Post Conditions

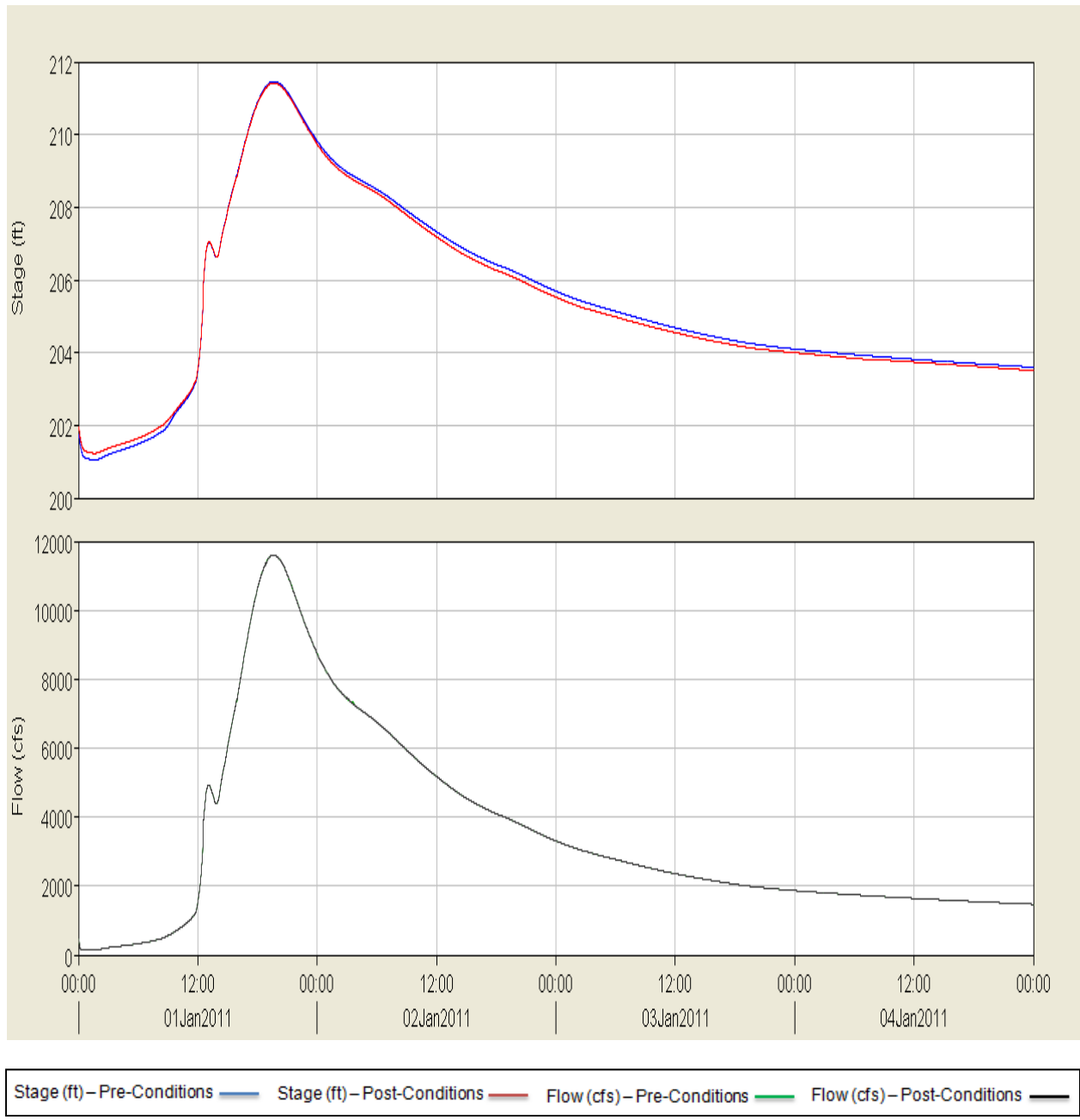


Figure 31 : 25-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre and Post Conditions

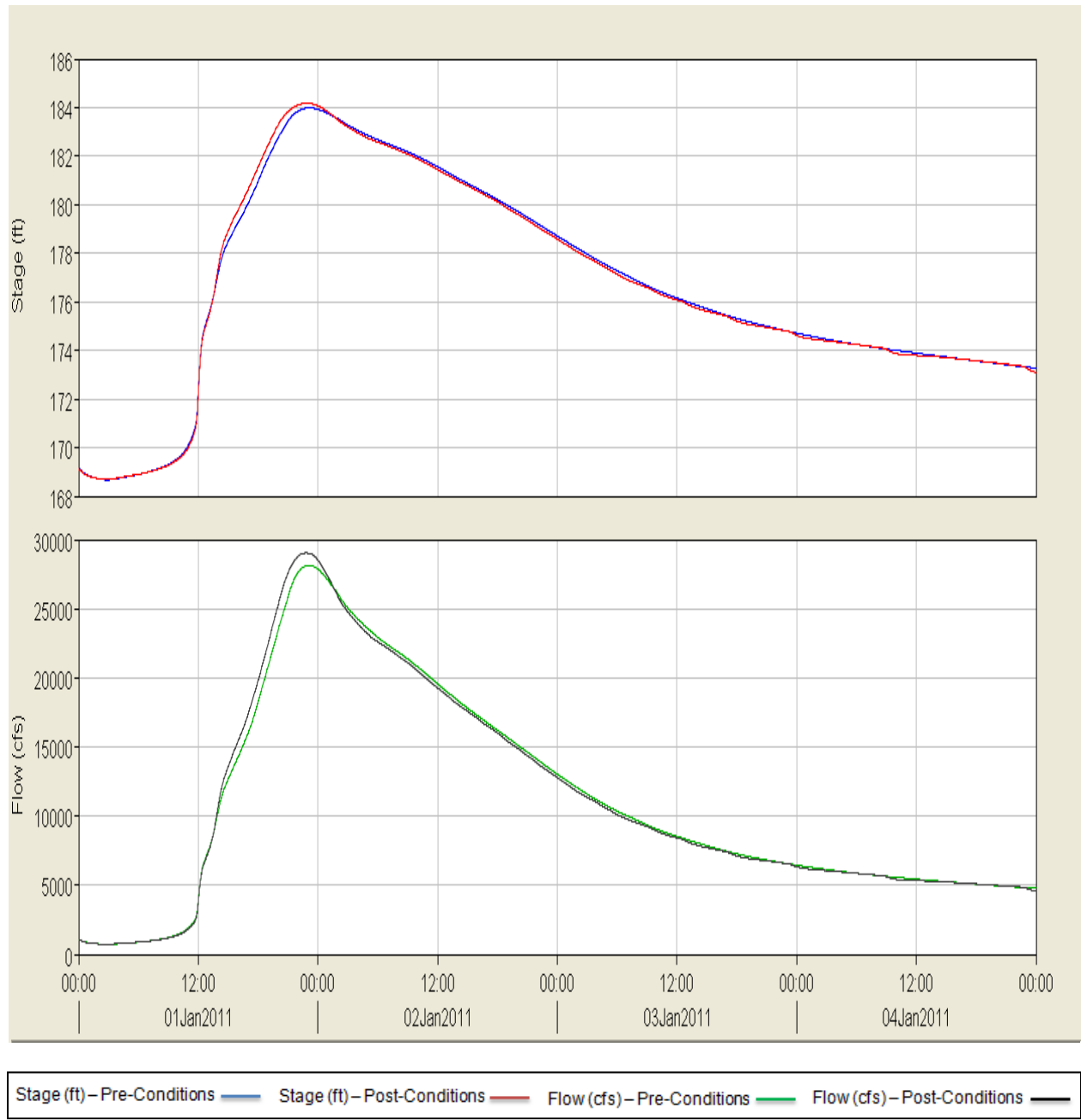


Figure 32 : 40-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre and Post Conditions

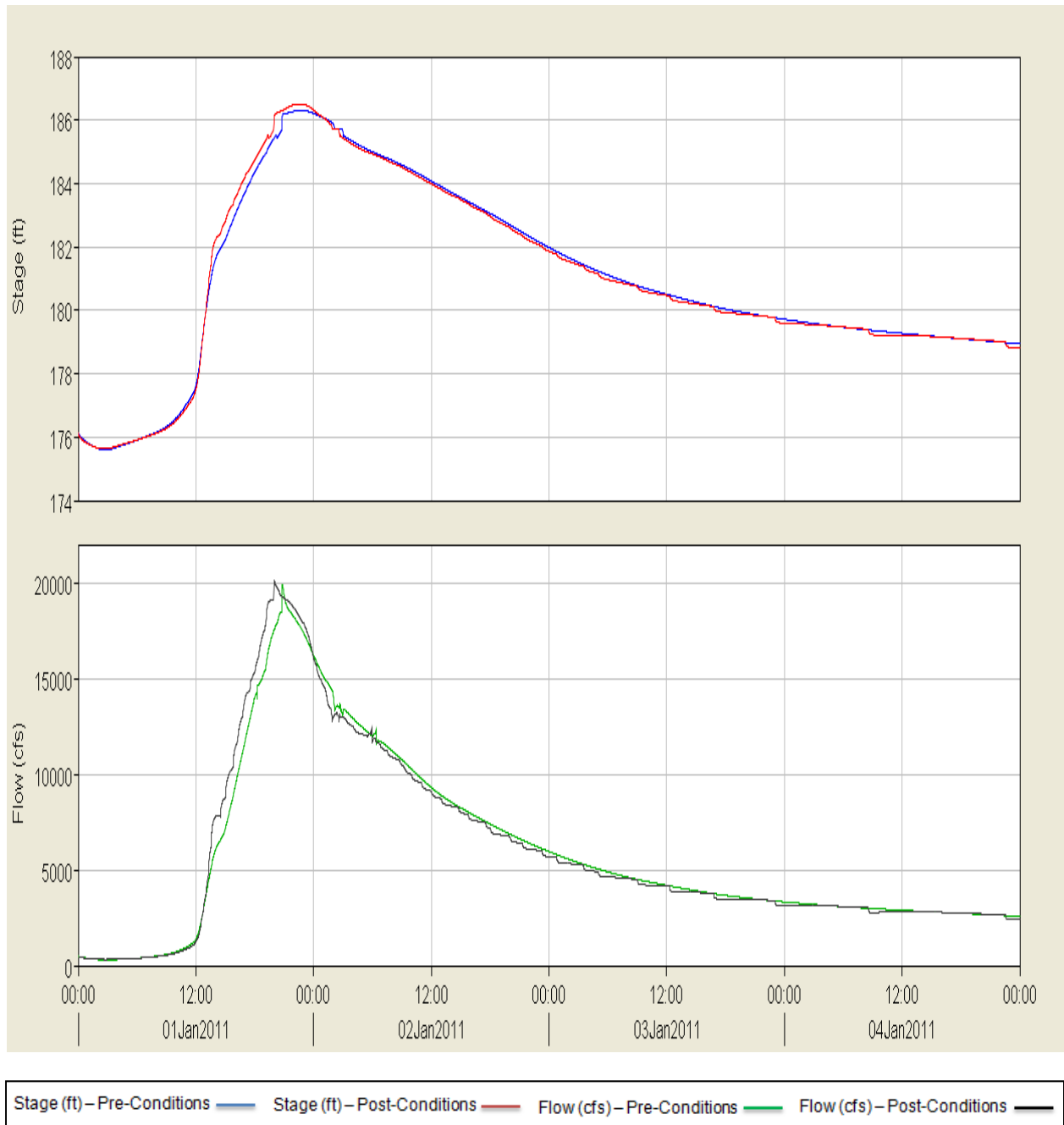


Figure 33 : 40-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream from the Dawes Highway Bridge – Pre and Post Conditions

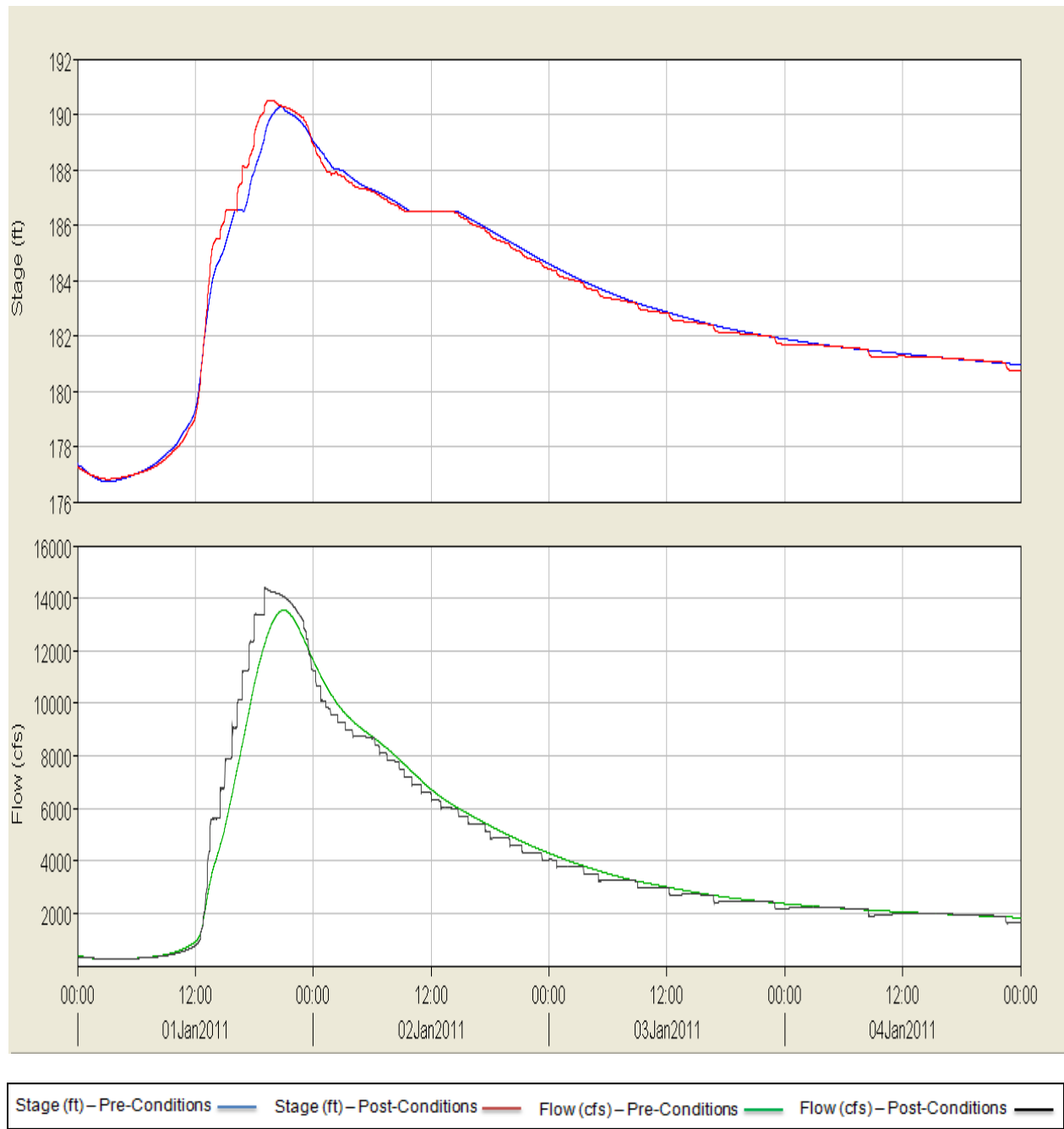


Figure 34 : 40-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Pre and Post Conditions

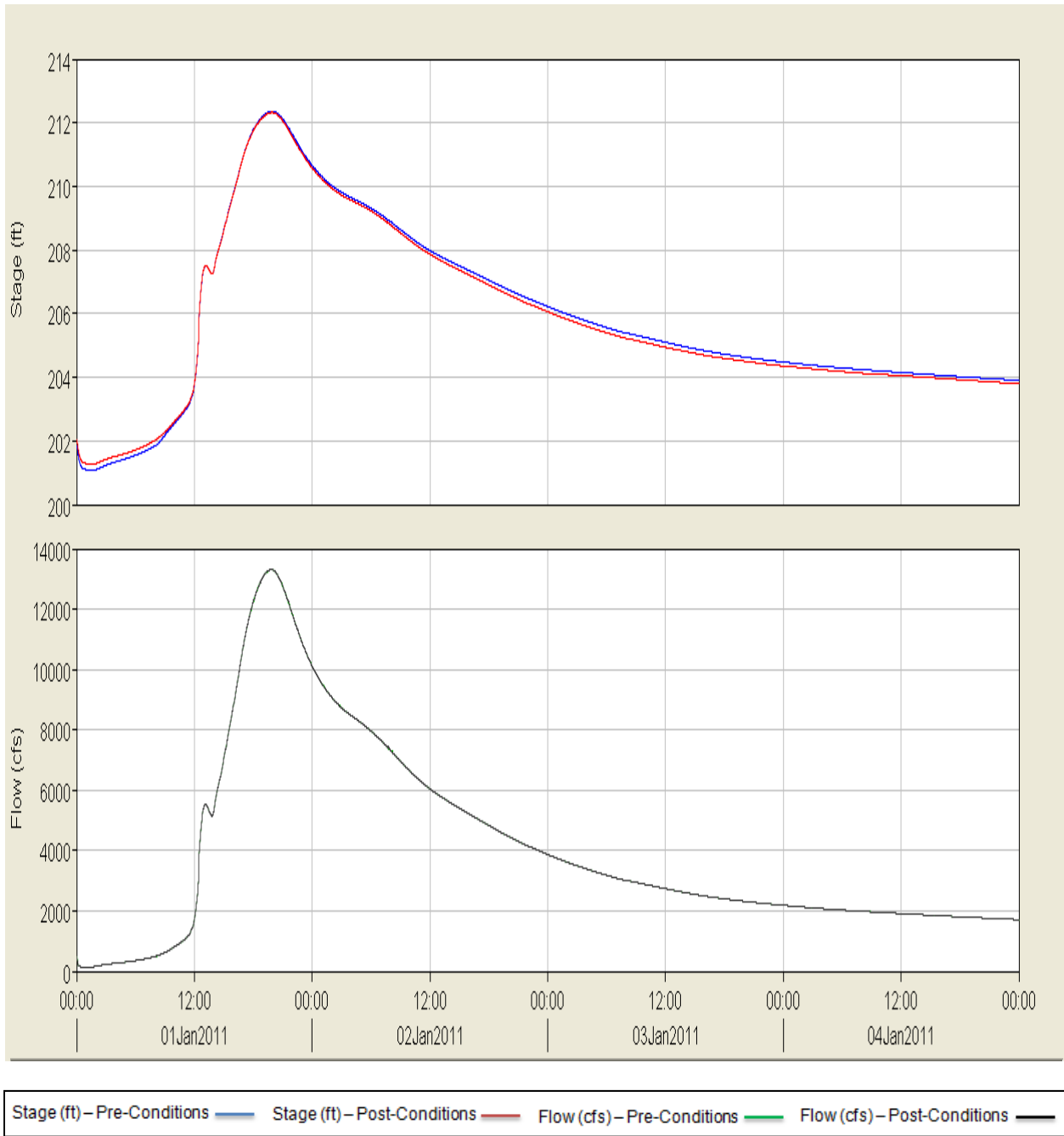


Figure 35 : 40-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre and Post Conditions

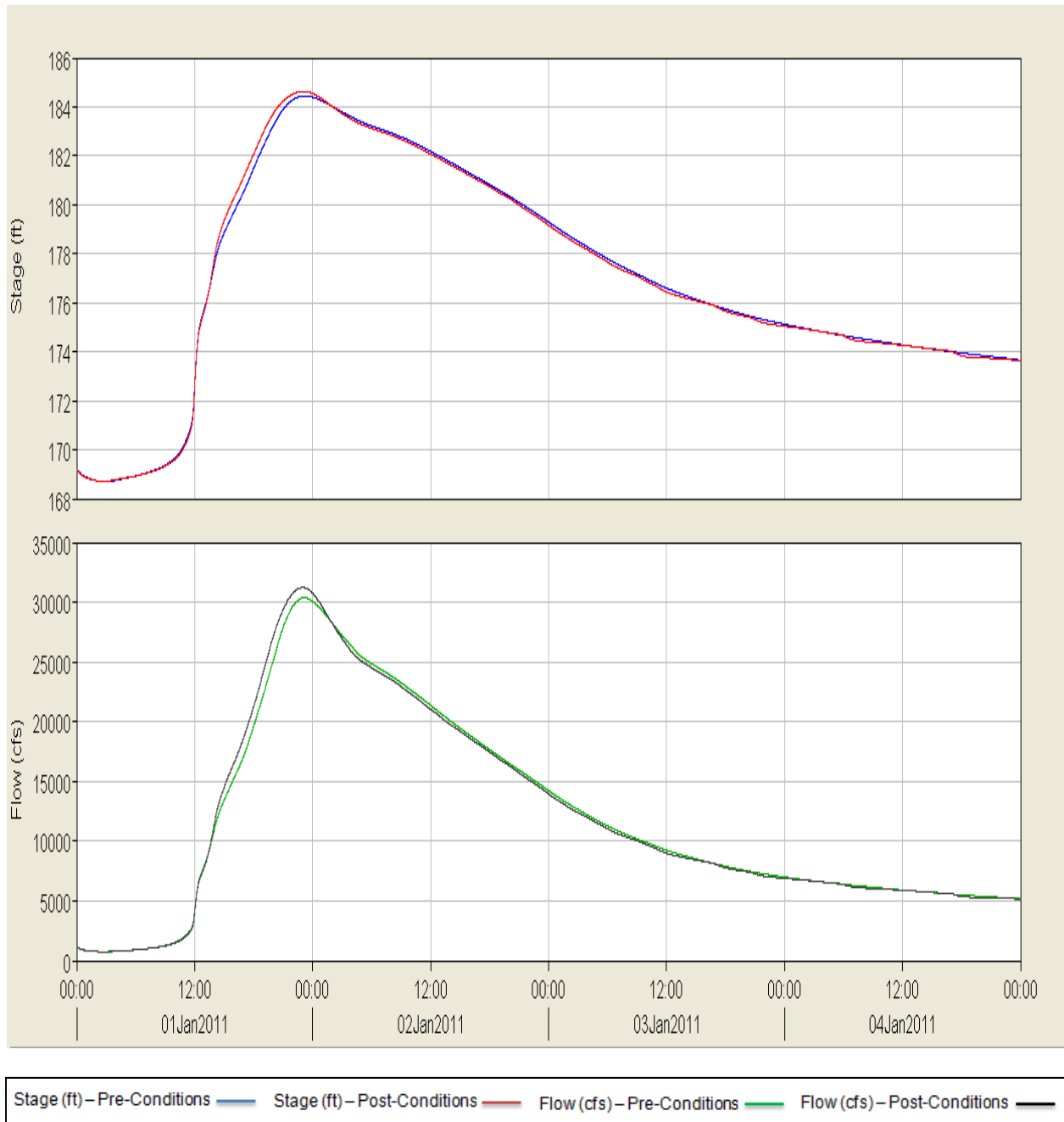


Figure 36: 50-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Pre and Post Conditions

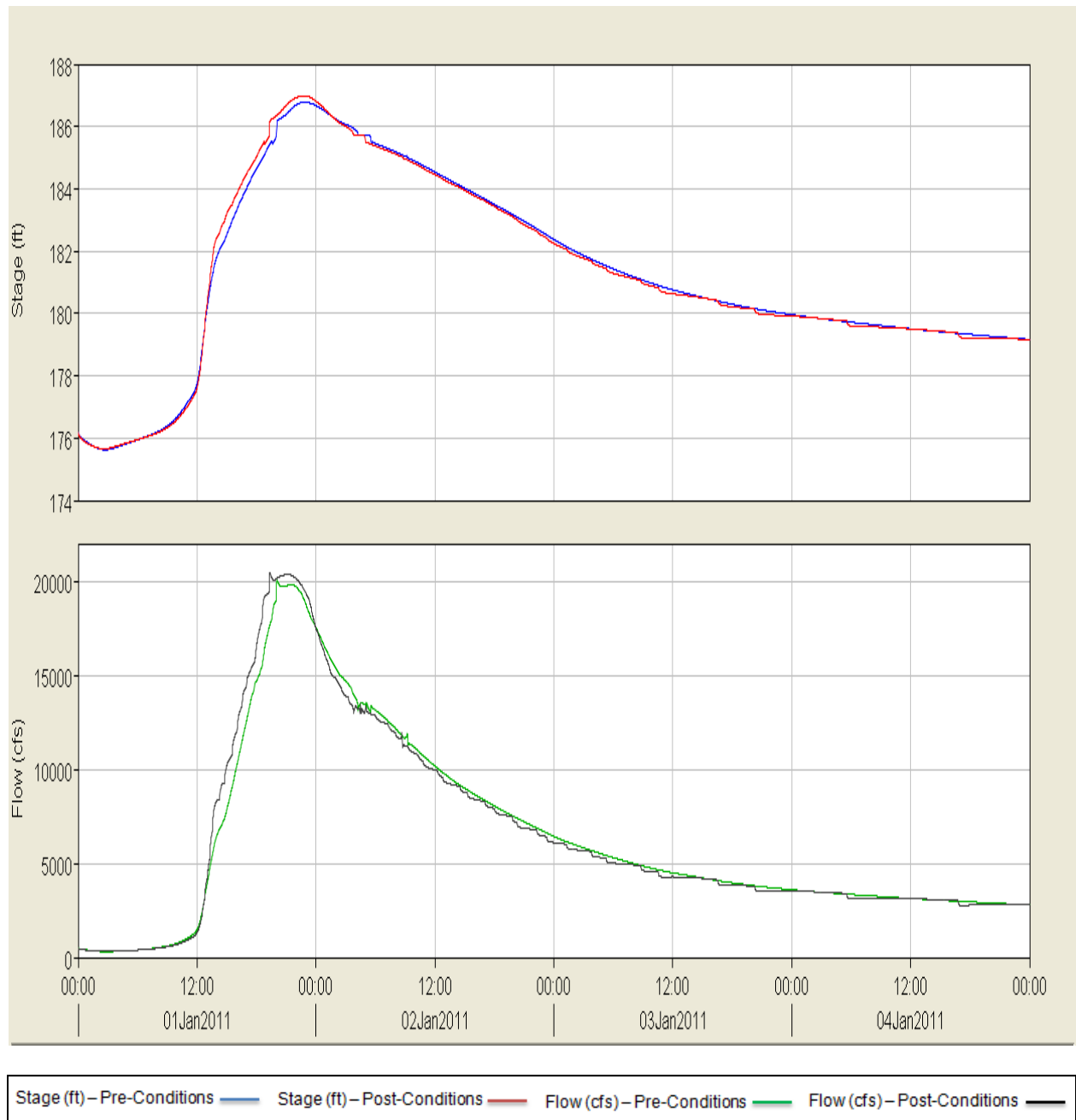


Figure 37 : 50-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream from the Dawes Highway Bridge – Pre and Post Conditions

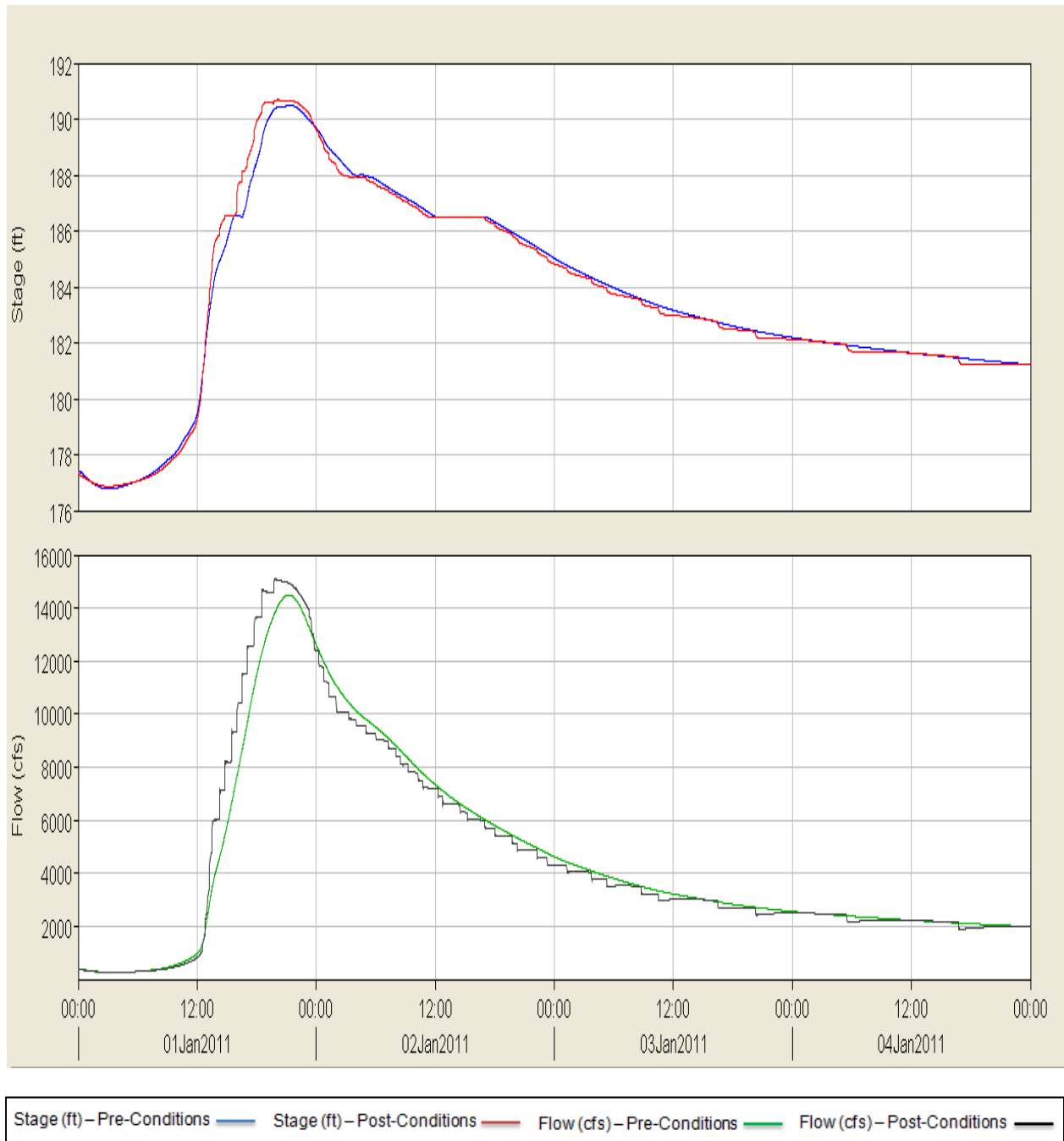


Figure 38 : 50-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Pre and Post Conditions

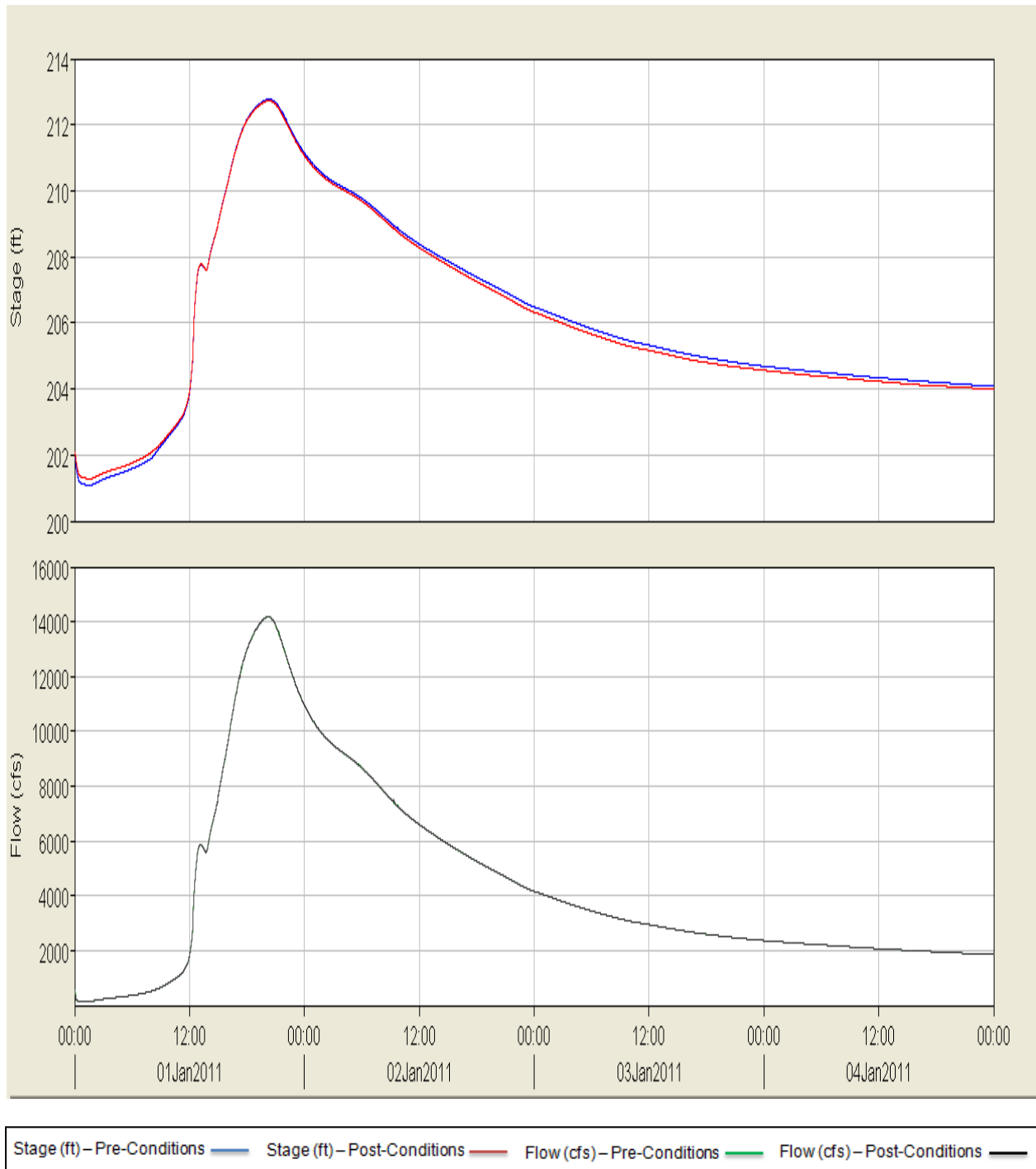


Figure 39 : 50-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ – Pre and Post Conditions

The results are similar to results presented above for the recent storms; with the flow hydrographs showing more variation than the stage hydrographs. However, the operation of the Floodgate Facility has more impact on the smaller storms (i.e. the 2-year and 10-year) simulated rainfall events than the larger storms. The stage hydrograph shows less difference, with the 2-year rainfall event about 0.5 ft higher at the Hamburg Turnpike Bridge and less than 0.25 ft higher at the Dawes Highway Bridge. The 10-year rainfall storm event and the other larger flow events all indicate less of an impact.

There is little to no negative impact when comparing the stage and flow hydrographs in Oakland NJ, just downstream of the railroad bridge.

5.2 Alternative Analysis

For the post condition only, the downstream impacts of lowering the Pompton Lakes Reservoir by 3.0 feet in advance of the impending flood were analyzed for three storm events. The three events analyzed were: (1) Hurricane Irene, (2) March 12-14, 2010 flood event, and (3) a simulated event of smaller magnitude (lower peak flow and less volume of runoff). The model was run assuming that the floodgates were in automatic operation and were operated in accordance with the existing operating rule curve. The results of those runs are shown in Figures 39 through 50.

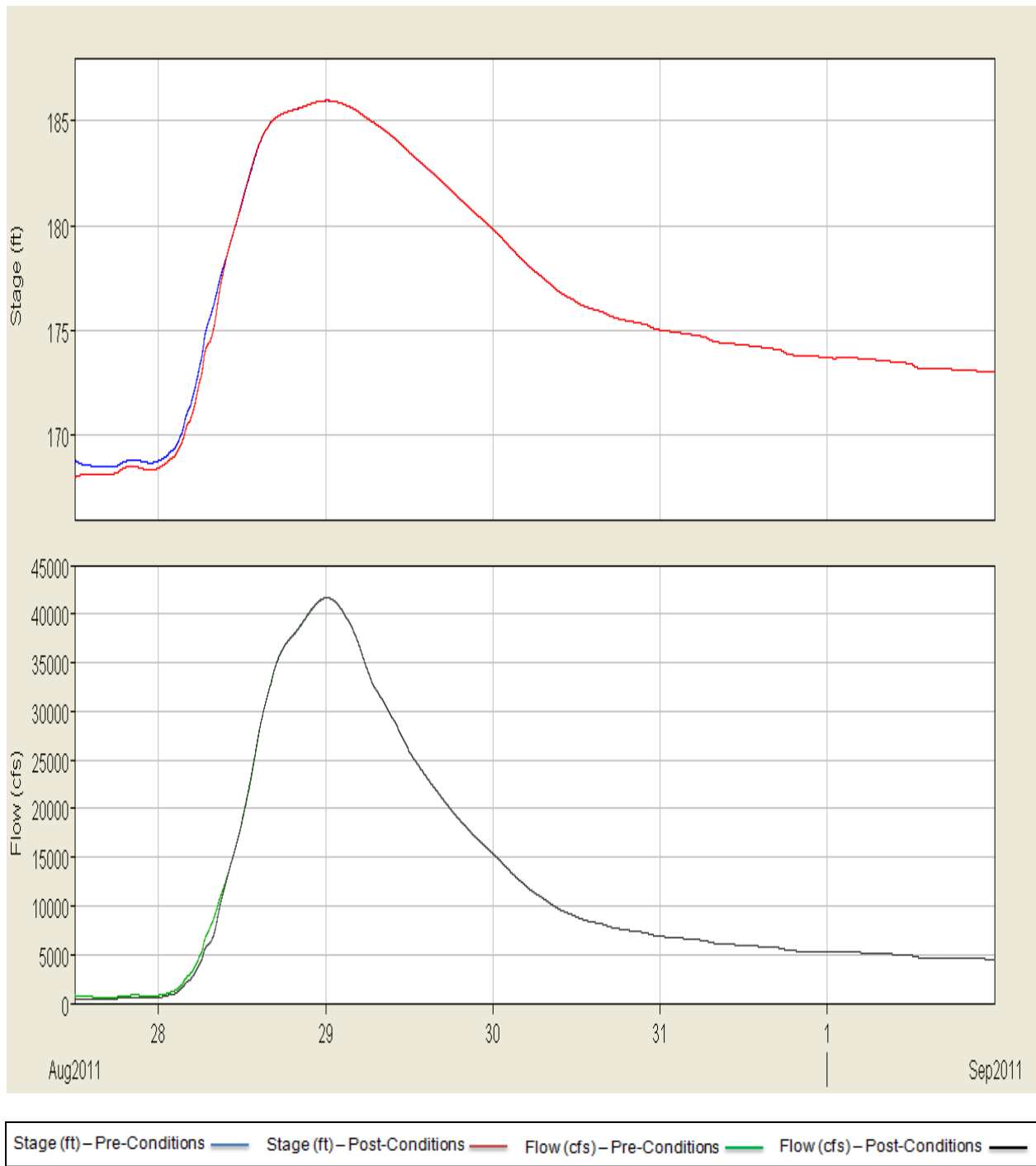


Figure 40 : Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge – Lowering Reservoir 3.0 feet Compared to Post Conditions

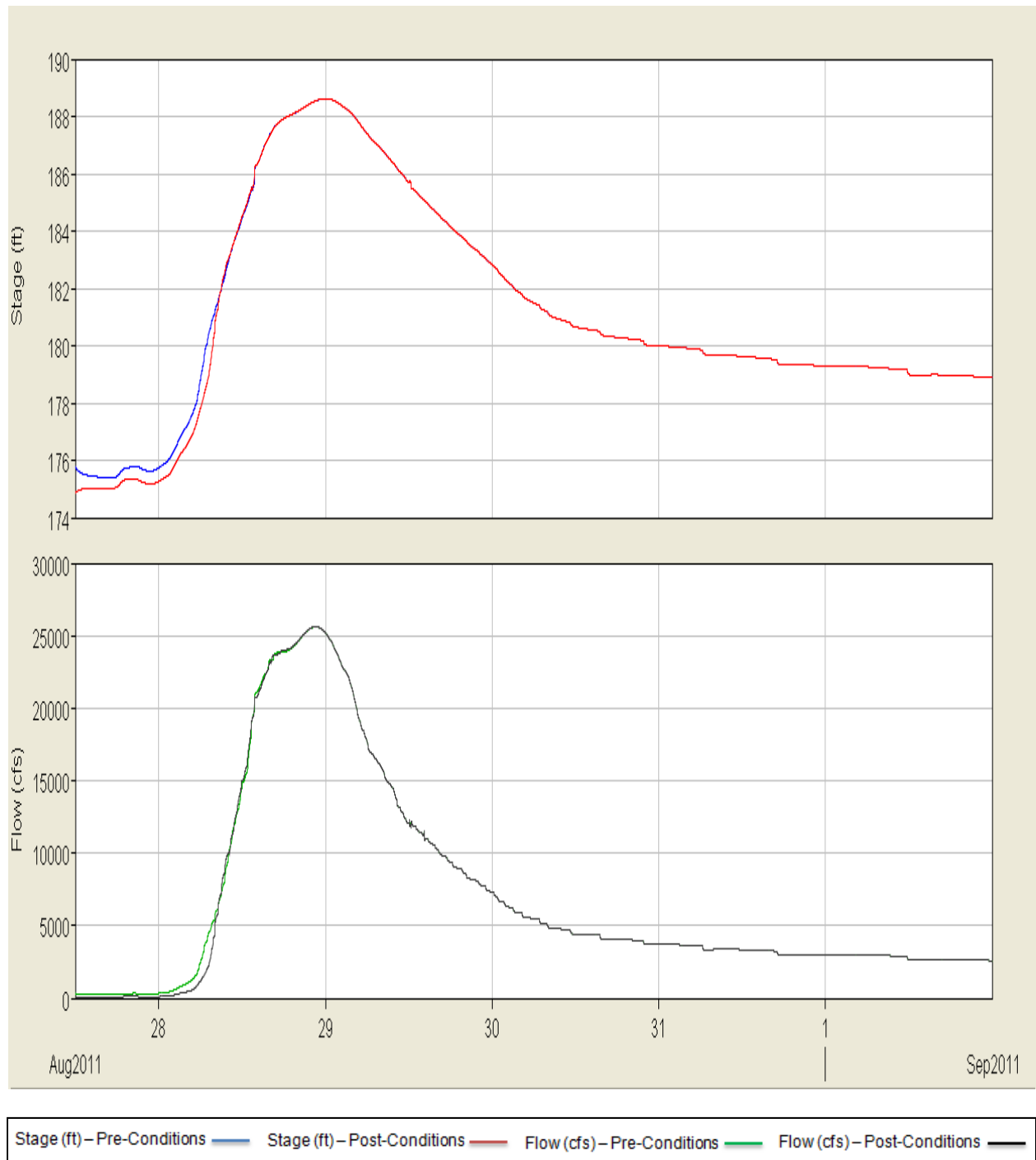


Figure 41 : Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge – Lowering Reservoir 3.0 feet Compared to Post Conditions

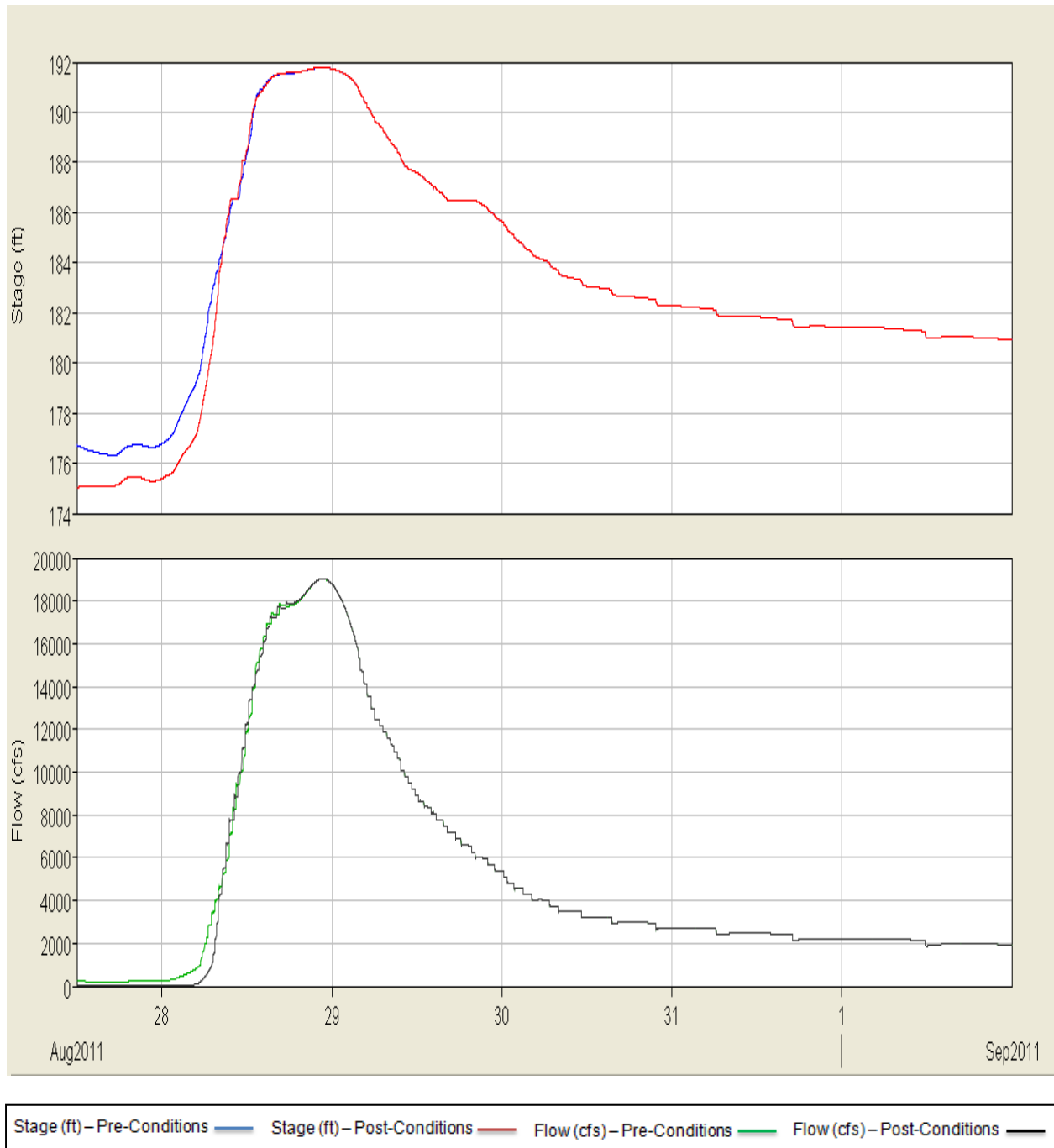


Figure 42: Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Lowering Reservoir 3.0 feet Compared to Post Conditions

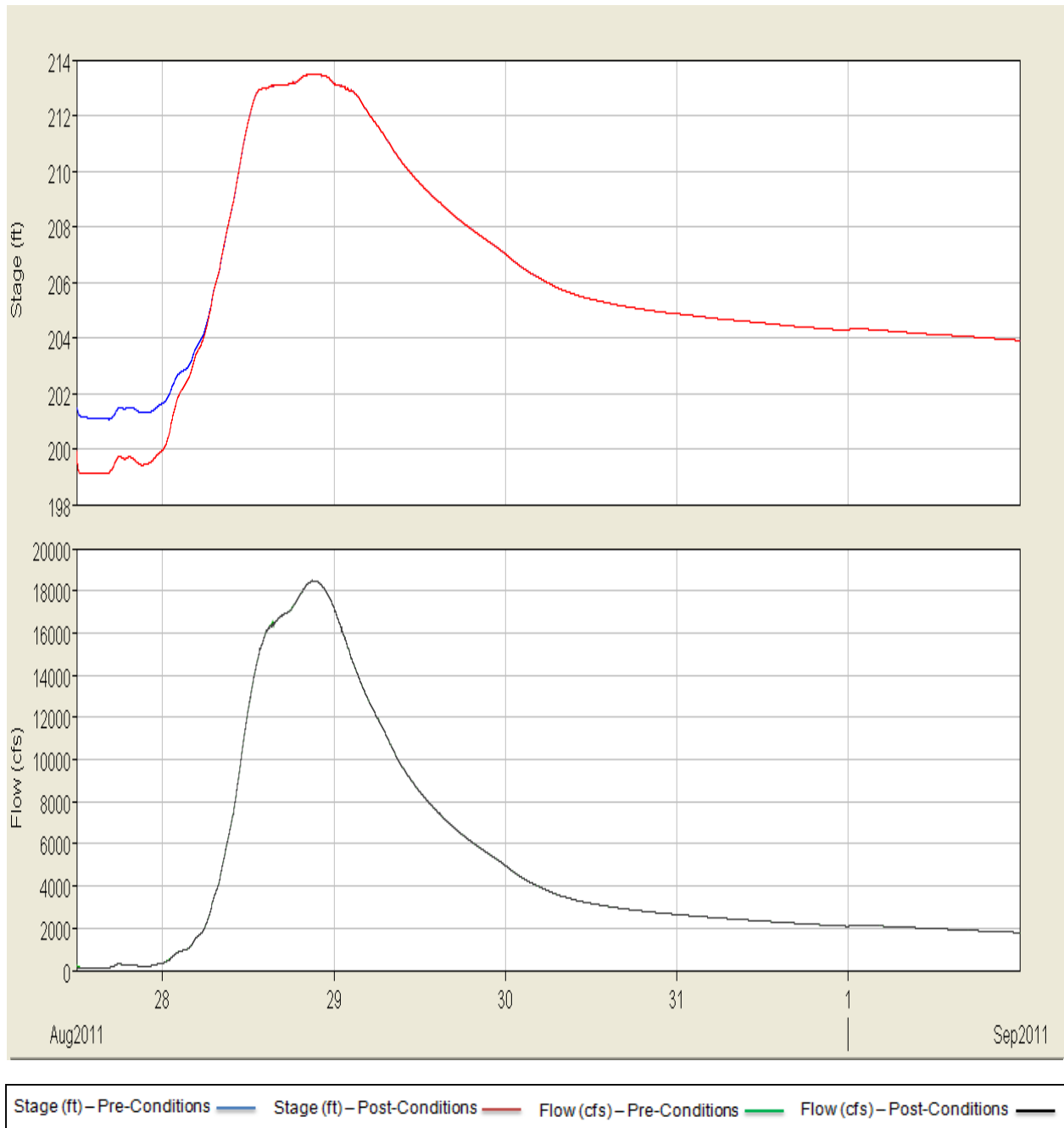


Figure 43 : Hurricane Irene, August 29, 2011 Storm Event – Stage and Flow Hydrographs at Station 26058 Just Downstream of the Railroad Bridge in Oakland NJ – Lowering Reservoir 3.0 feet Compared to Post Conditions

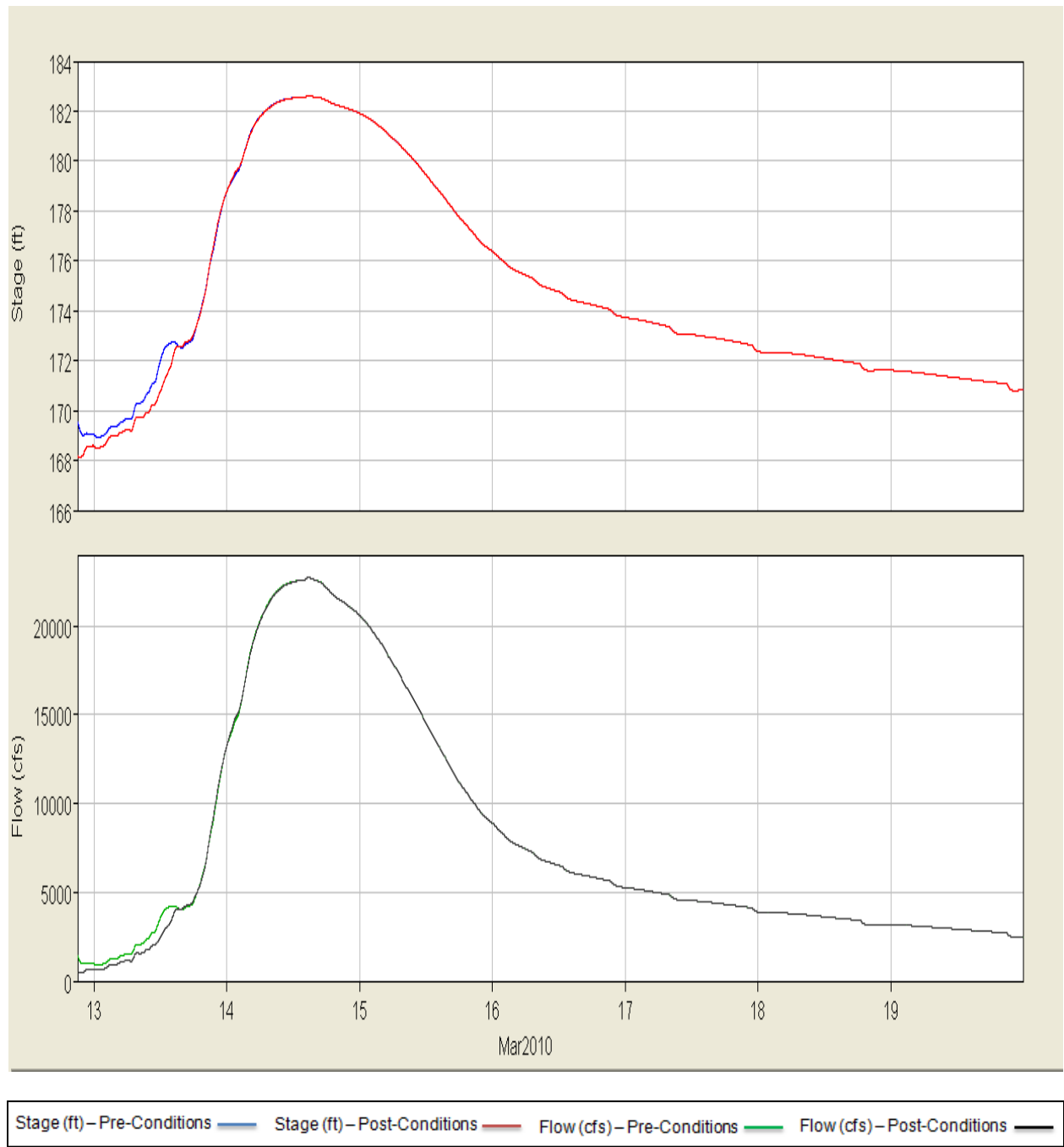
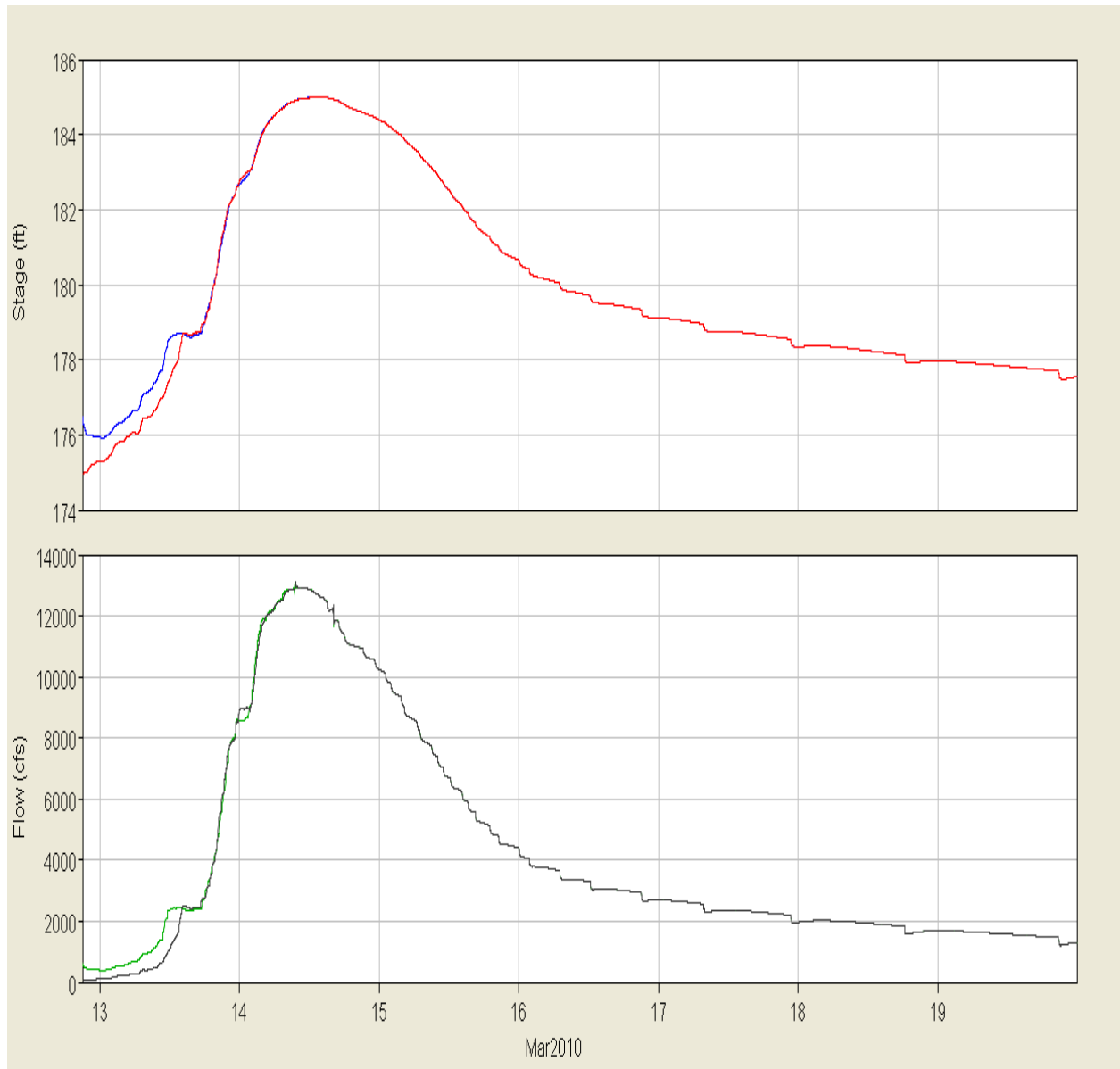
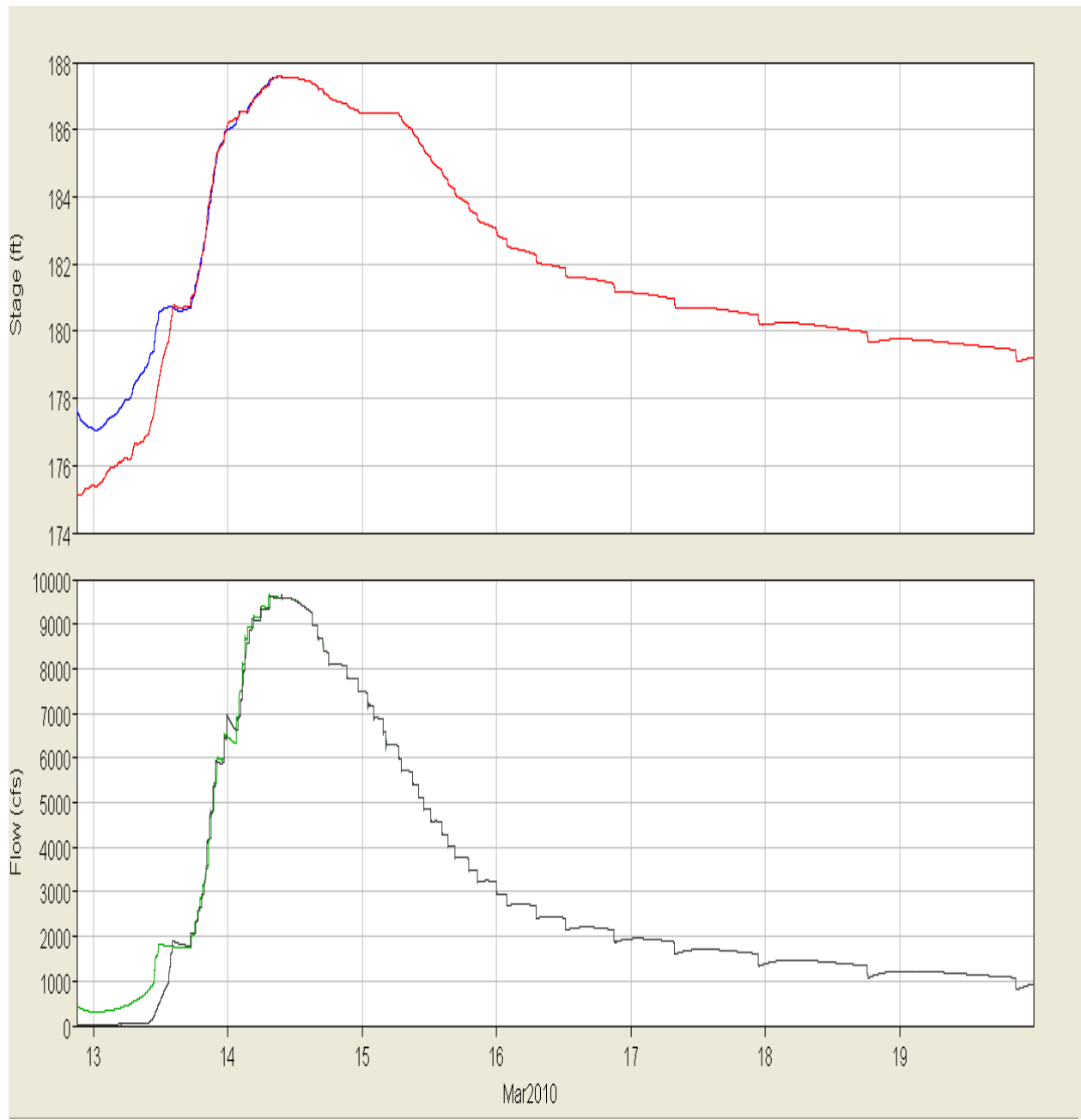


Figure 44 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 34810 Pompton River Just Upstream of the Hamburg Turnpike - Lowering Reservoir 3.0 feet Compared to Post Conditions



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 45 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge - Lowering Reservoir 3.0 feet Compared to Post Conditions



Stage (ft) – Pre-Conditions — Stage (ft) – Post-Conditions — Flow (cfs) – Pre-Conditions — Flow (cfs) – Post-Conditions —

Figure 46 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge - Lowering Reservoir 3.0 feet Compared to Post Conditions

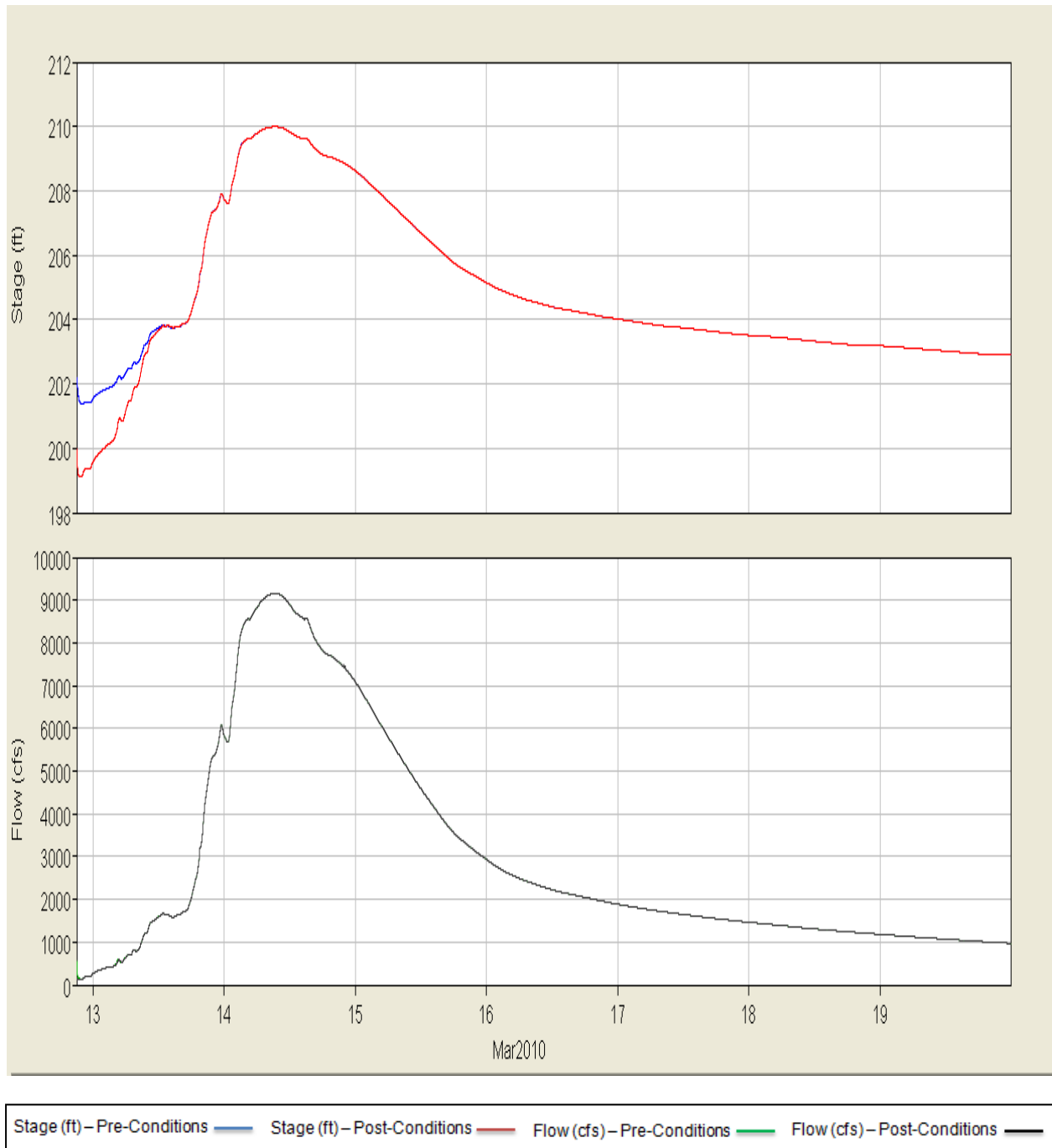


Figure 47 : March 12-14, 2010 Storm Event – Stage and Flow Hydrographs at Station 26058 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ - Lowering Reservoir 3.0 feet Compared to Post Conditions

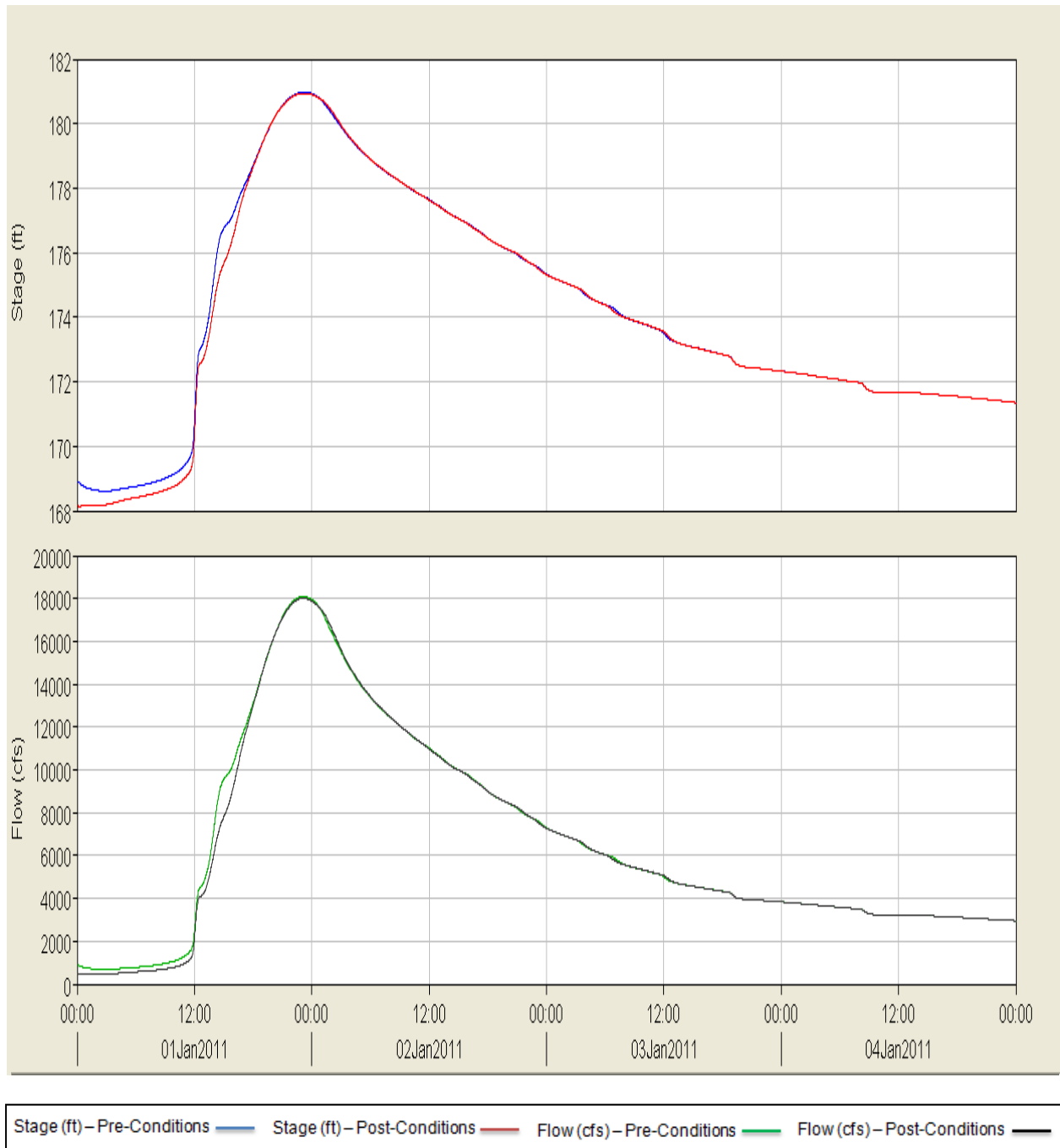


Figure 48 : 10-Year Rainfall Storm Event – Stage and Flow Discharges at Station 34810 Pompton River Just Upstream of the Jackson Avenue Bridge - Lowering Reservoir 3.0 feet Compared to Post Conditions

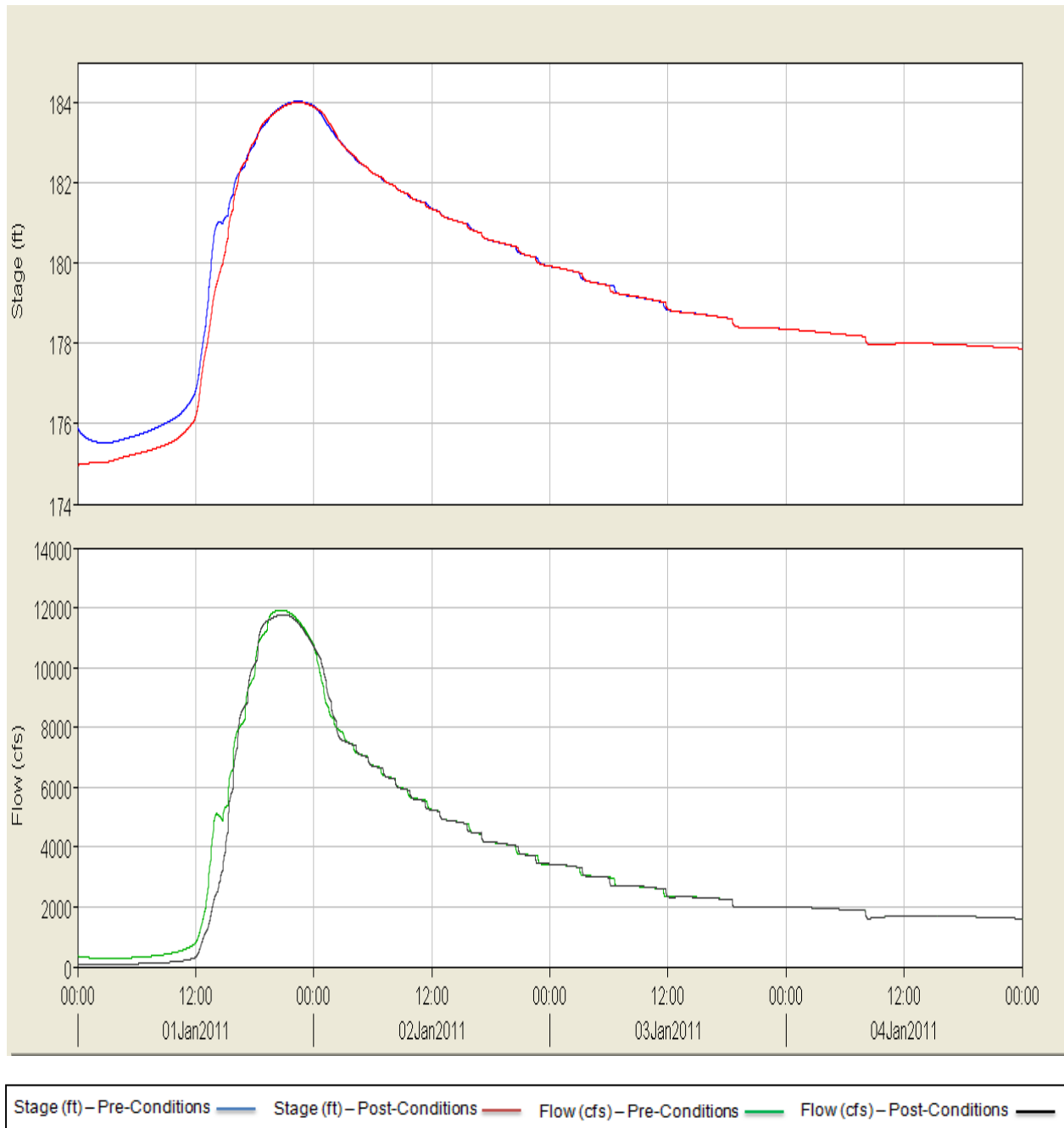


Figure 49 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 7445 Ramapo River Just Downstream of the Dawes Highway Bridge - Lowering Reservoir 3.0 feet Compared to Post Conditions

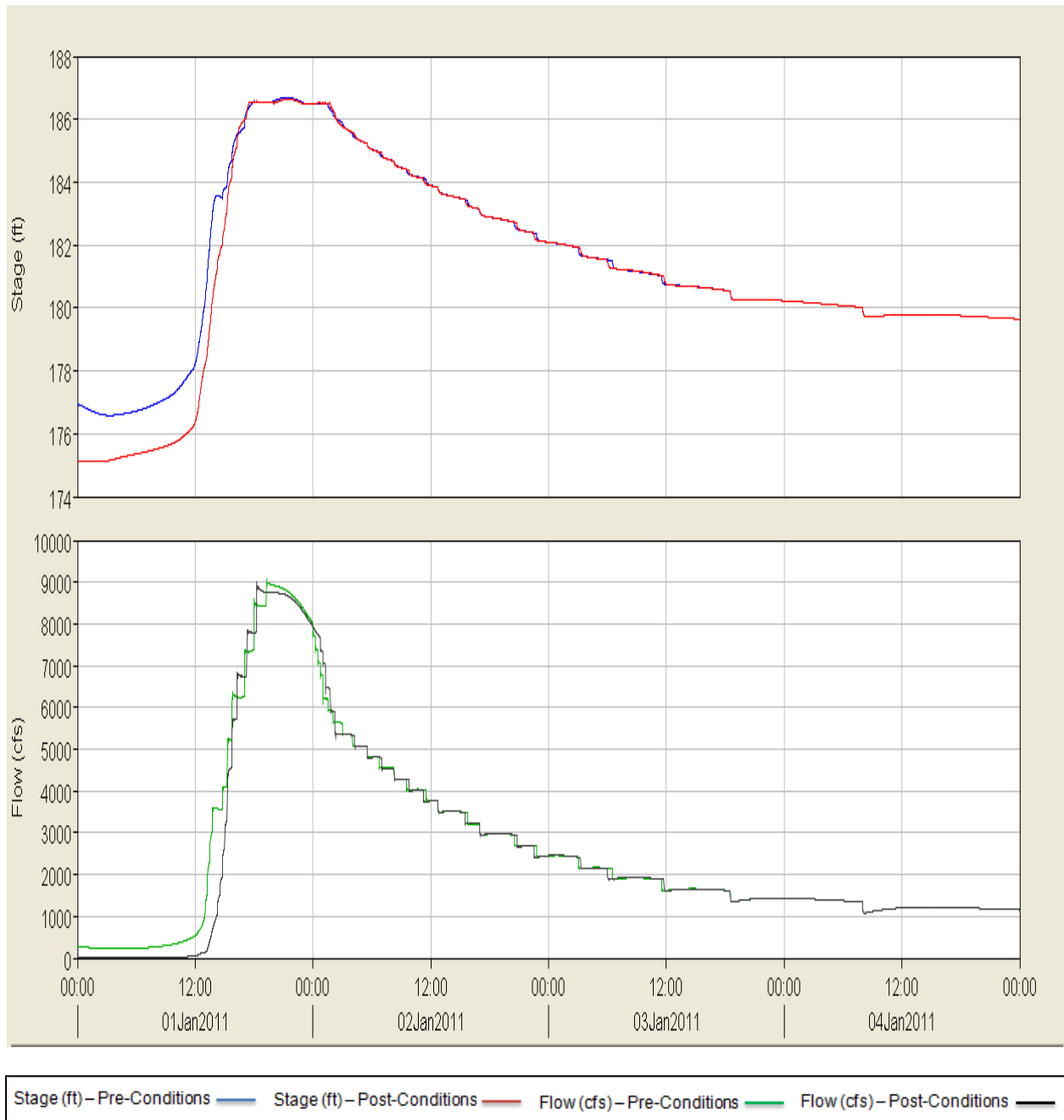


Figure 50 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 10135 Ramapo River Just Upstream of the Hamburg Turnpike Bridge – Lowering Reservoir 3.0 feet Compared to Post Conditions

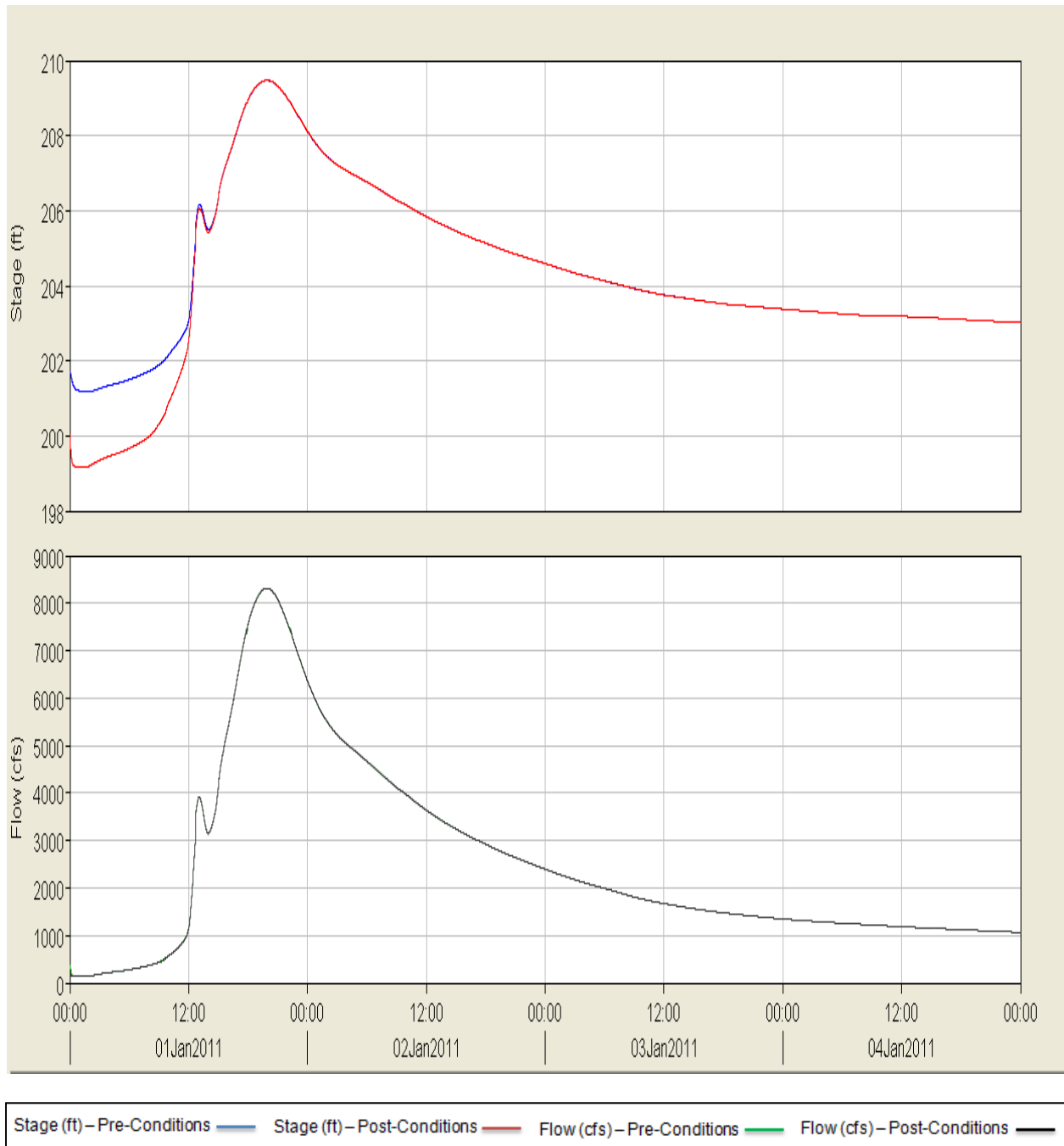


Figure 51 : 10-Year Rainfall Storm Event – Stage and Flow Hydrographs at Station 25085 Ramapo River Just Downstream of the Railroad Bridge in Oakland NJ - Lowering Reservoir 3.0 feet Compared to Post Conditions

5.3 Impact of Development Analysis

The impact that upstream development has had on the inflow rates to Pompton Lake Dam was evaluated. The evaluation included:

- Analysis of the Western Regional Climate Center Desert Research Institute in Reno Nevada publication of the 72-month Accumulated Precipitation Departures from Normal through the end of February 2012, and
- Comparing runoff events on the Ramapo River at Mahwah NJ (most of the watershed at this location is in New York) to the Ramapo River at Pompton Lakes NJ.

Figures 51 through 53 show the 72-month accumulated precipitation departure from normal through the end of February 2011.

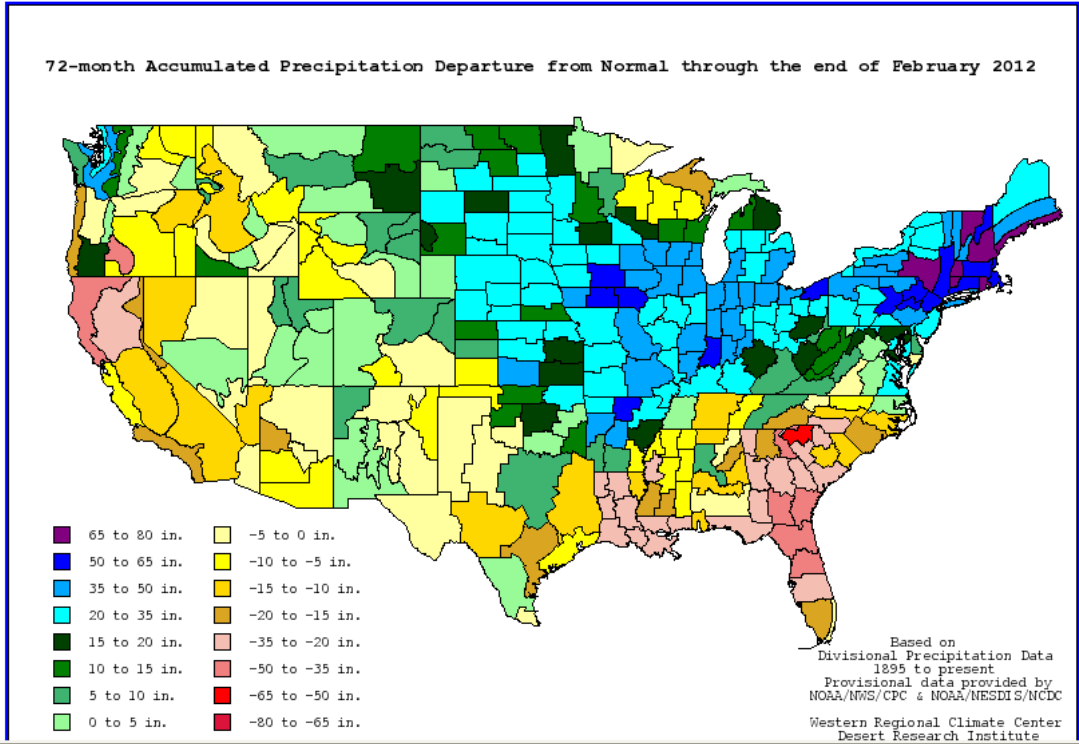


Figure 52 : 72 - Month Accumulated Precipitation Departure from Normal through the End of February 2012

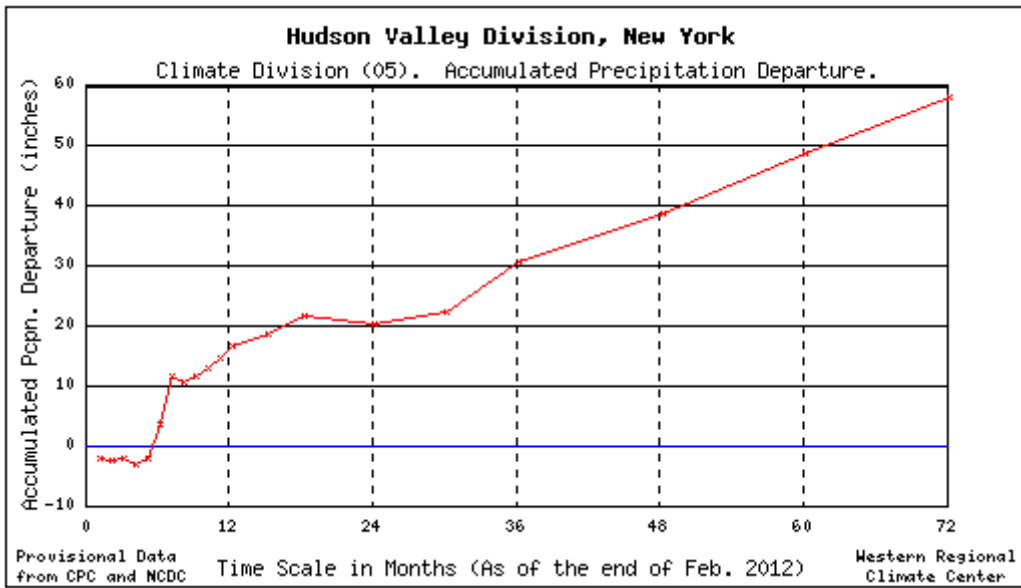


Figure 53 : Northern New Jersey Accumulated Precipitation Departure from Normal through the End of February 2012

From Figure 52, the Hudson Valley Division in New York area received about 50 to 60 inches of additional rainfall over the past 72 months. That has translated into more runoff and consequently more flooding. Figure 53 is a plot of average peak annual flows for each decade for the Ramapo River near Mahwah, NJ (the major portion of the watershed is in New York). Over the last decade the average of the peak flows for each decade has increased by more than 50%. This is consistent with the additional rainfall causing additional flooding.

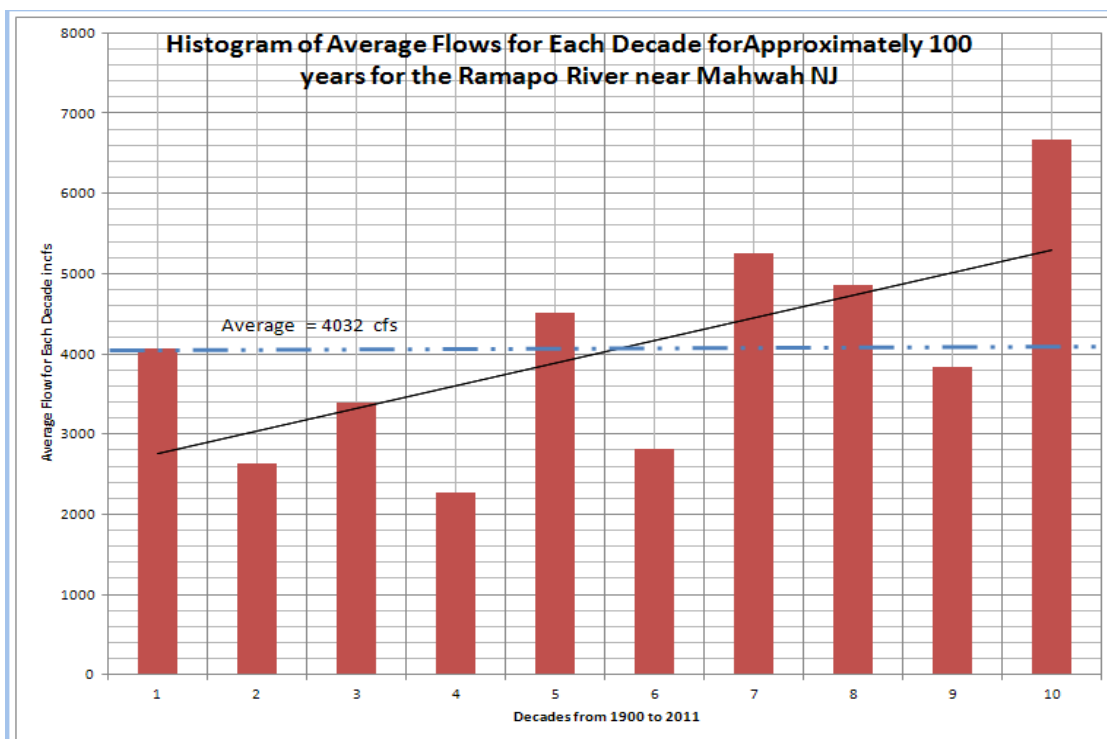


Figure 54 : Average Peak Flows for each Decade for Ramapo River near Mahwah

5.4 Channel Velocity Downstream

Appendix H present the flow distribution tables and figures of velocity distributions for the March 2010 and 2011 storm events, Hurricane Irene and the five rainfall storm at the Hamburg Turnpike Bridge. Table 11 below summarizes the maximum velocities for the Pre- and Post Project Conditions. The differences in the velocities for the Pre- and Post Project Conditions are not very different at Hamburg Turnpike Bridge and have less of a difference downstream of the Bridge. The 10-year rainfall storm event and the March 9-13 storm event show the greatest difference in the maximum velocities at the Hamburg Turnpike Bridge. However, just downstream from the Bridge the differences in the velocities is only 0.16 fps (5.34 fps – 5.38 fps) for the 10-year rainfall storm event and for the March 9-13 storm event the difference is 0.07 fps (5.16 fps – 5.09 fps).

Table 10: Maximum velocities for the Pre- and Post Project Conditions

Storm Event	Maximum Velocity at Hamburg Turnpike Bridge Pre-Project Condition (fps)	Maximum Velocity at Hamburg Turnpike Bridge Post-Project Condition (Fps)	Difference in Velocity (fps)
March 12-14, 2010	5.92	5.95	0.03
March 6-9, 2011	5.76	5.88	0.12
March 9-13, 2011	4.63	5.11	0.48
Hurricane Irene	7.09	7.07	-0.02
2-Year Rainfall	3.69	4.00	0.31
10-Year Rainfall	4.89	5.88	0.99
25-Year Rainfall	5.81	5.89	0.08
40-Year Rainfall	5.96	6.12	0.16
50-Year Rainfall	6.24	6.30	0.06

5.5 HEC-2 Pre and Post Conditions

The HEC-2 converted data files (files that were converted to HEC-RAS format) are in Appendix I along with the HEC-2 converted runs for the 10-, 40-, 100- and 500-year flood events. All figures and tables in this section are presented in Appendix I.

The US Army Corps of Engineers has designed and implemented channel modifications to the Ramapo River upstream of the Pompton Lakes Dam through Potash Lake for approximately 15,000 feet. The channel modifications consisted of lowering the stream channel inverts and the formation of a series of riffles and pools throughout the stream reach. Figures I.1 and I.2 illustrate the type of channel modifications that were carried out. Essentially the low flow channel was shaped more as a trapezoid and the invert was lowered. The Manning’s n resistance coefficient for these sections was typically lowered to better represent the new channel conditions.

The Pre-Project Condition HEC-2 data files indicated that there was approximately 33,600 feet of stream channel measured from the Jackson Avenue Bridge to the Lenape Lane Bridge in Oakland. The Post-Project Condition HEC-2 geometry data indicated that there was approximately 47,400 feet of stream channel measured from the Jackson Avenue Bridge to the Lenape Bridge in Oakland. The additional distance appears to be the result of the added sinuosity in the Post-Project flow channel. Figures I.3, I.4, and I.5 show the channel invert elevations between the two bridges as measured along the thalweg (the lowest elevation point within each cross section).

Running the HEC-RAS steady flow model for the converted HEC-2 data files for the 10-, 40-, 100-, and 500-year flood events for the Pre- and Post-Project Conditions resulted in slightly higher water surface elevations for the Post-Project Conditions as illustrated in Table I.1 for the geometry of cross section 20070. Also, note that the flows in the USACE study are slightly higher for the Post-Project Condition which would contribute to the slightly higher water surface

elevations when compared to the Pre-Project Conditions. The water surface profiles for the Pre- and Post-Project Conditions for the 40-year flood event are shown in Figure I.7.

Table I.2 shows the results of the accumulated travel time using the average channel velocity divided into the channel length from the Lenape Lane Bridge to the Jackson Avenue Bridge. The average travel time for the Pre-Project Condition was computed to be approximately 5 ¼ hours in contrast to 7 hours for the Post-Project Conditions. Thus, the added sinuosity of the Post-Project condition seems to have lengthened the travel time throughout the reach.

The perception that the Pre-Project Condition has more storage available upstream of the Pompton Lakes Dam compared to the Post-Project Condition does not seem to be valid. The results of the HEC-RAS (converted HEC-2 data) steady flow runs for the two conditions resulted in similar water surfaces in the upstream channel (see Table I.1). Due to the difference in the length of channel for the pre and post conditions, the Post-Project Condition would actually account for more storage than the Pre-Project Condition. Also, the accumulated average travel time through the reach is longer for the Post-Project Condition, which would indicate that the Post-Project Condition is not conveying flows faster through the reach than the Pre-Post Condition.

5.6 Overall Summary of Results

The overall results of this study can be summarized as follows:

- The installation and operation of the Pompton Lake Flood Gate Facility has not contributed to increased flooding downstream of the dam. Based on our modeling results the Pompton Lakes Dam Gates and the Operating Rule Curve are performing as designed with little or no significant increases in the downstream impacts.
- Lowering the Pompton Lake Reservoir prior to flooding events will not have any significant reduction in downstream flooding. There simply is not enough storage volume in the reservoir relative to the overall runoff volume to make any difference.
- Based on a limited analysis of the older HEC-2 modeling versus the newer HEC-RAS modeling, it does not appear that the upstream channel modifications have had any effect on downstream flooding.
- While overall development (or an increase in impervious coverage) in the watershed cannot be ruled out as a source of more frequent flooding as a result of this study, it is apparent from the average watershed runoff rates over the past few decades, that the percentage of runoff from the different reaches of the watershed has remained consistent. This indicates that development in one part of the

watershed has not outpaced development in another part of the watershed and thus resulted in a higher percentage of the overall runoff from a particular reach of the watershed. Analysis of regional climatic and flow data indicates that there has been an increase in flooding events over the past decade, but it is most likely due to the significant increase in precipitation that the region has seen over the past 72 months.

6 References

1. OMRR & R Manual, Pompton Lake Dam, NJ, Appendix C- Gate Operating Rule Curve. March 2008. U.S. Army Corps of Engineers, New York, NY.
2. U.S. Department of the Interior, U.S. Geological Survey, <http://waterwatch.usgs.gov>
3. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS, River Analysis System v4.1.0, Davis, California, January 2010.
<http://www.hec.usace.army.mil>
4. Watershed Concepts, WISE (Watershed Information System), Greensboro, North Carolina, revised 2011.
5. National Geodetic Survey, NAVD 88 minus NGVD 29 Datum Shift Contours.
<http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html>

Appendix A
HYDROLOGIC DATA

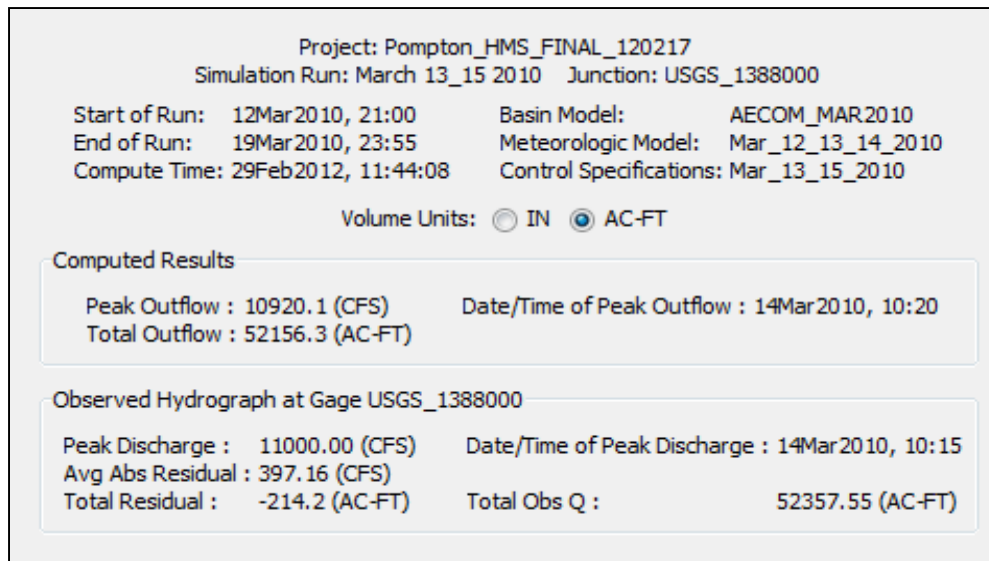


Figure A.1: Summary of Results - March 13-15, 2010

USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

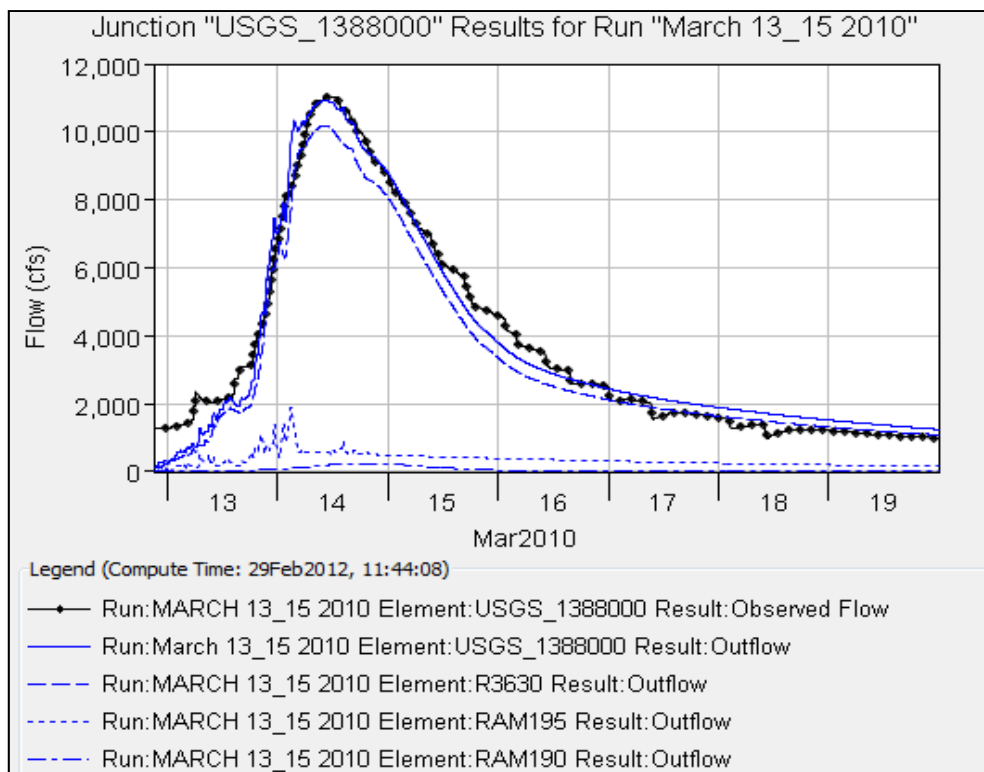


Figure A.2: Simulated versus Observed Hydrograph - March 13-15, 2010

USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

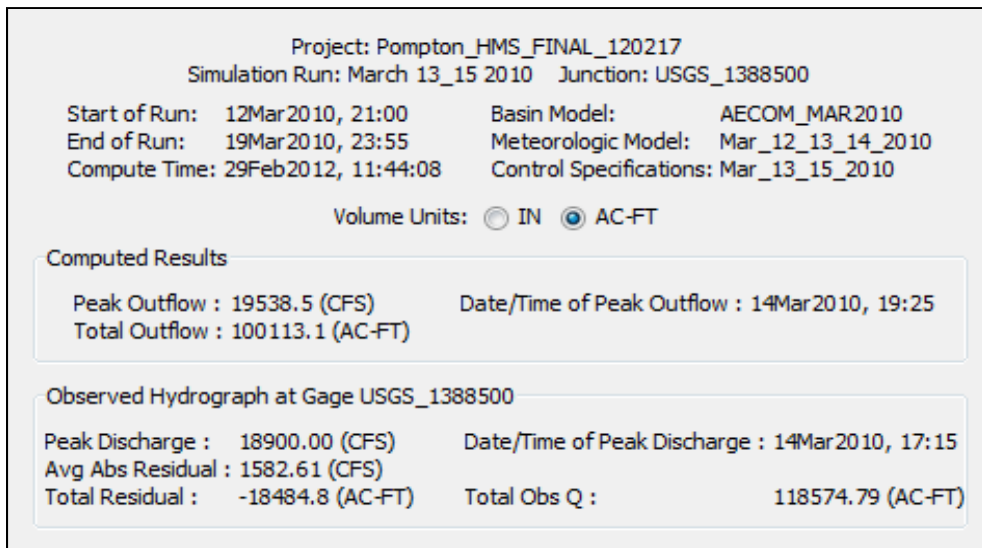


Figure A.3: Summary of Results - March 13-15, 2010
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ

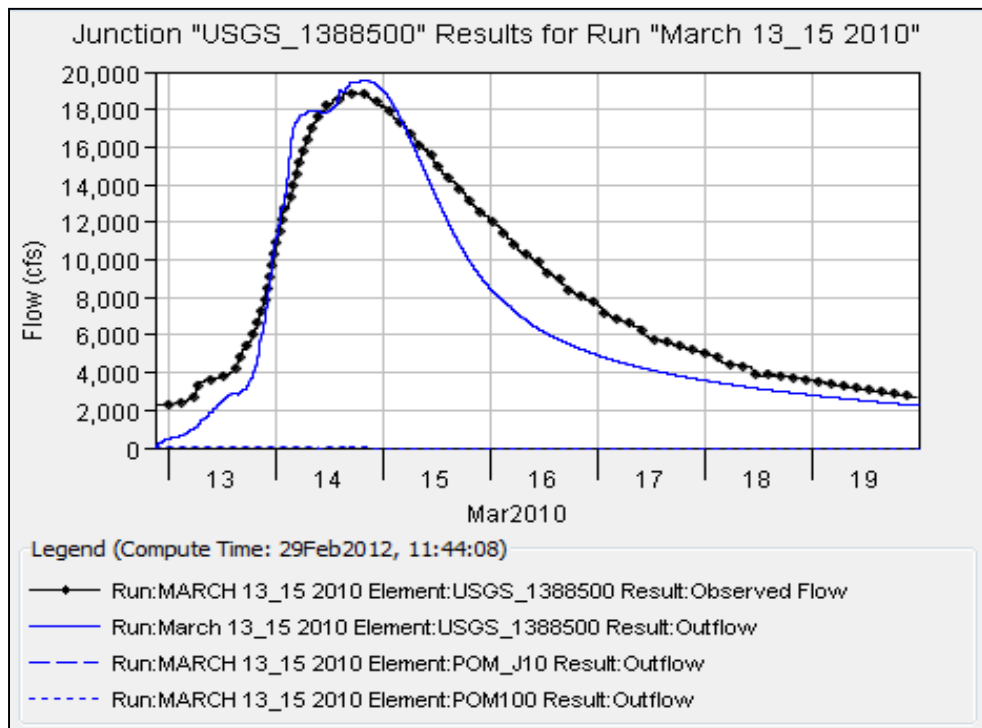


Figure A.4: Simulated versus Observed Hydrograph - March 13-15, 2010
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ

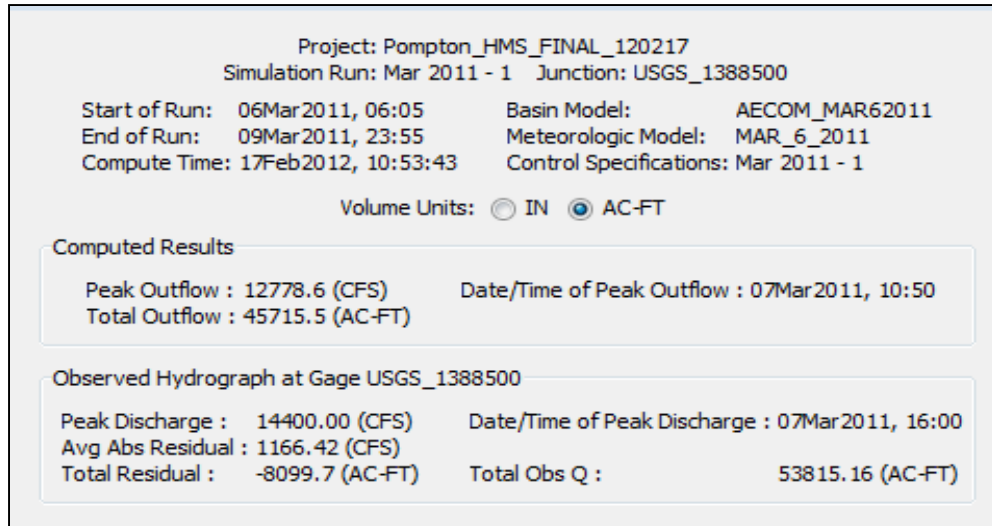


Figure A.5: Summary of Results - March 6-8, 2011
USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

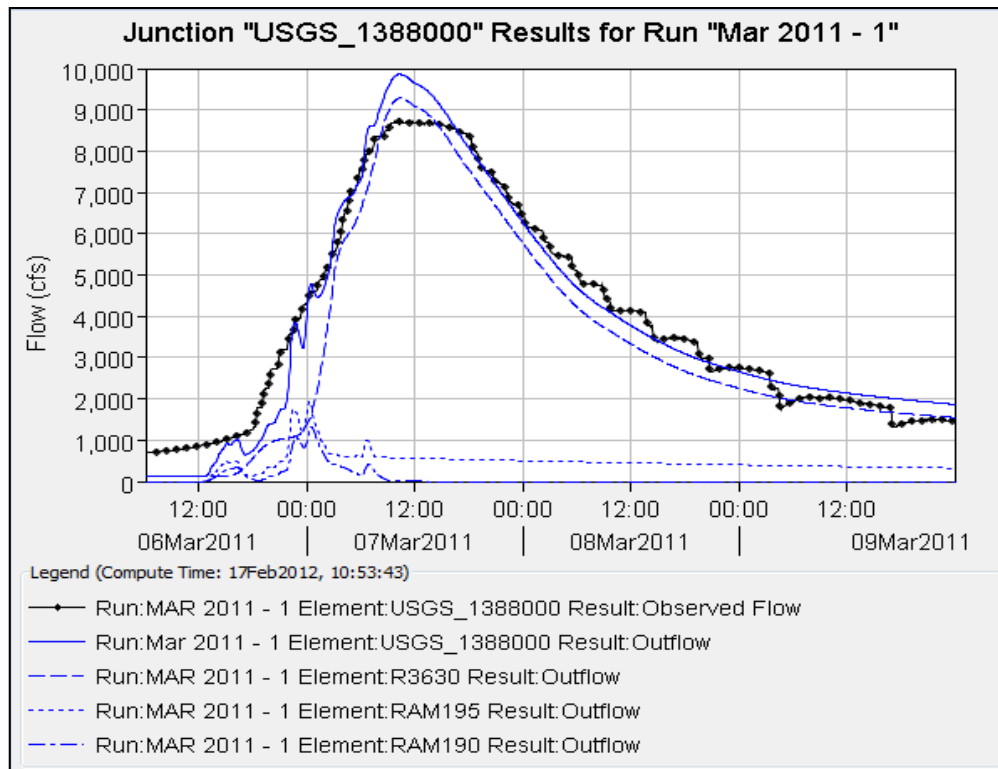
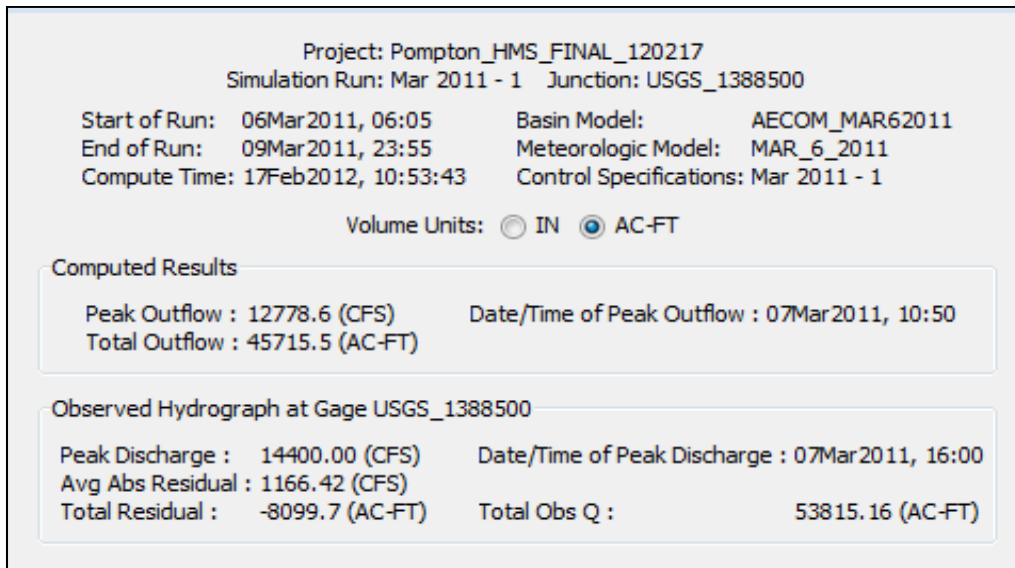
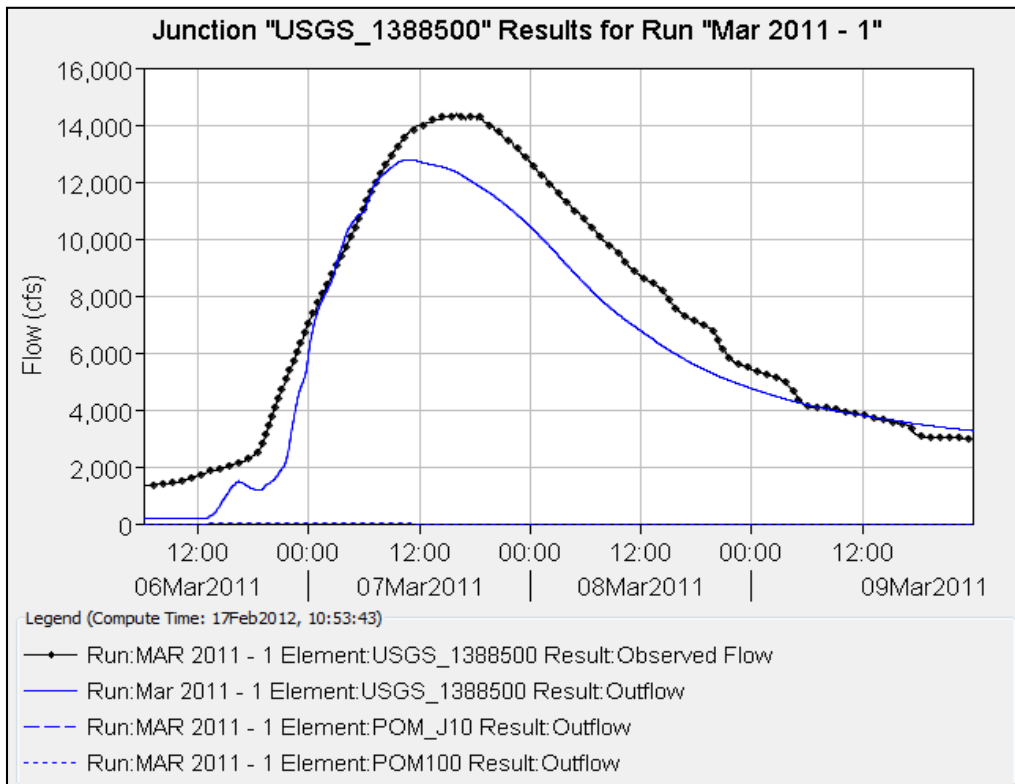


Figure A.6: Simulated versus Observed Hydrograph - March 6-8, 2011
USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam



**Figure A.7: Summary of Results - March 6-8, 2011
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ**



**Figure A.8: Simulated versus Observed Hydrograph - March 6-8, 2011
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ**

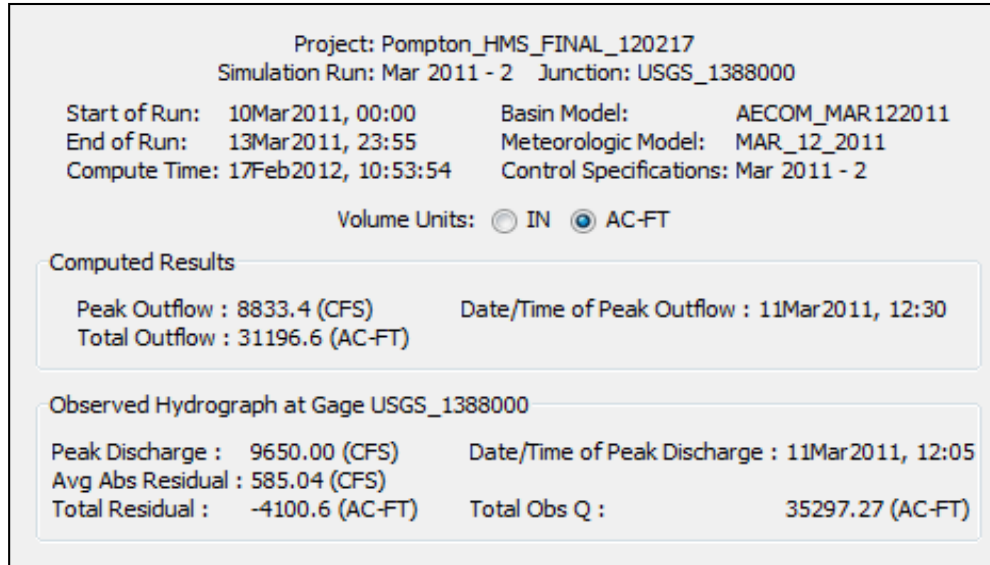


Figure A.9: Summary of Results - March 10-12, 2011

USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

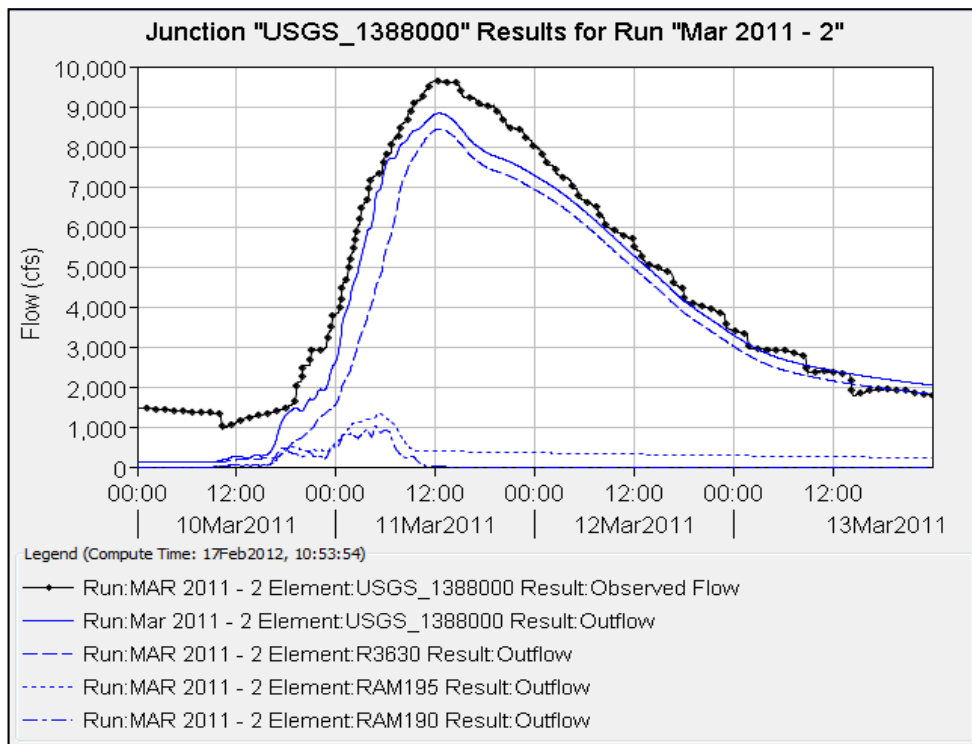


Figure A.10: Simulated versus Observed Hydrograph - March 10-12, 2011

USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

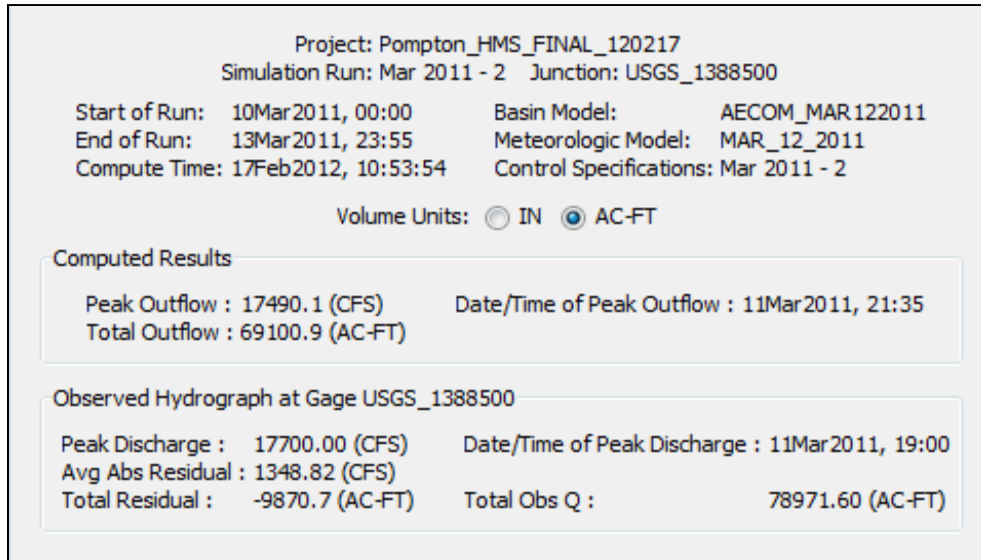


Figure A.11: Summary of Results - March 10-12, 2011
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ

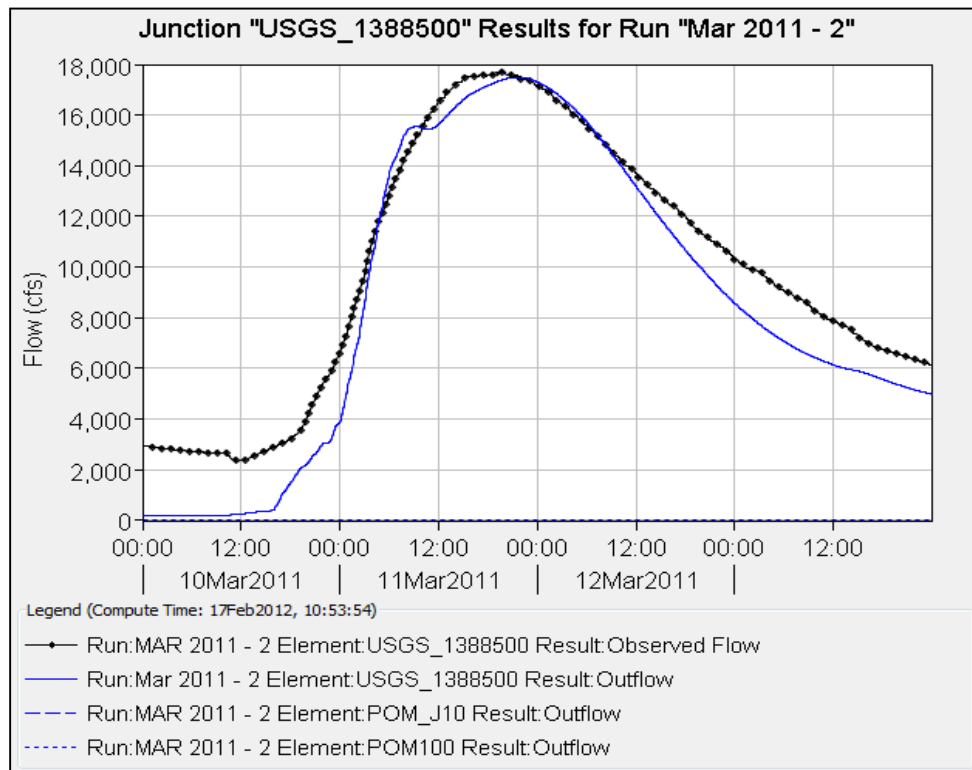


Figure A.12: Simulated versus Observed Hydrograph - March 10-12, 2011
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ

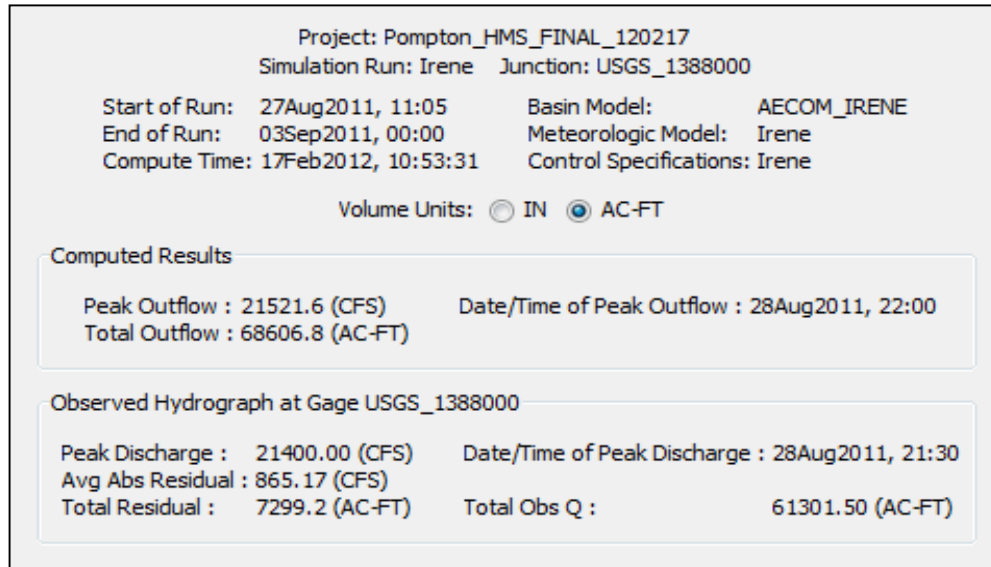


Figure A.13: Summary of Results - August 27-29, 2011
USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

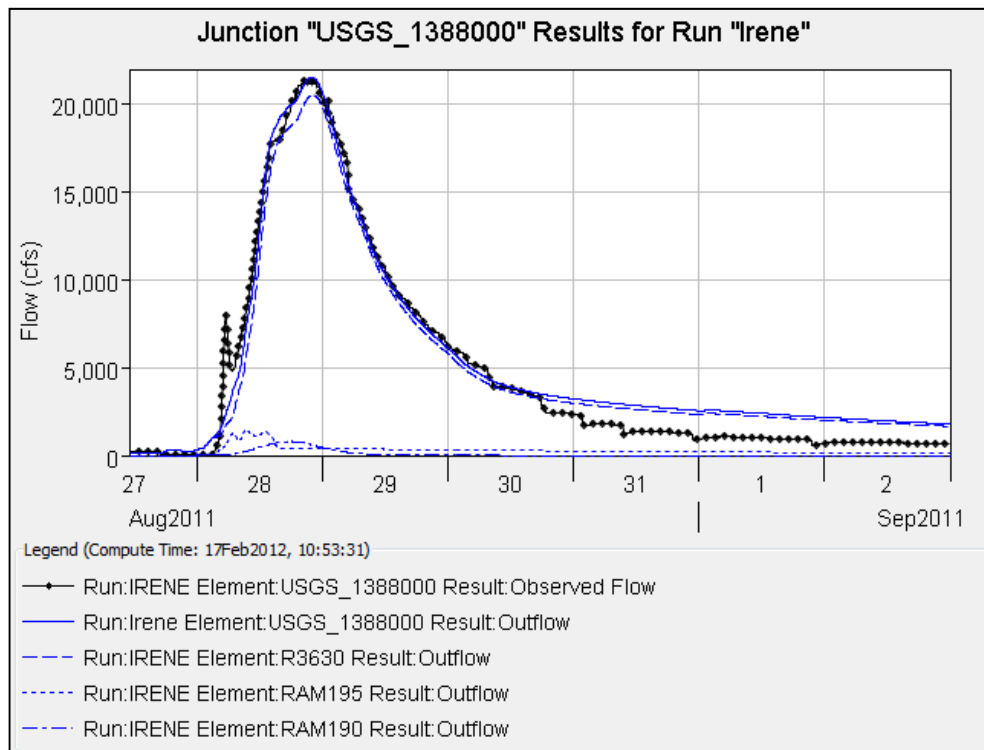


Figure A.14: Simulated versus Observed Hydrograph - August 27-29, 2011
USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam

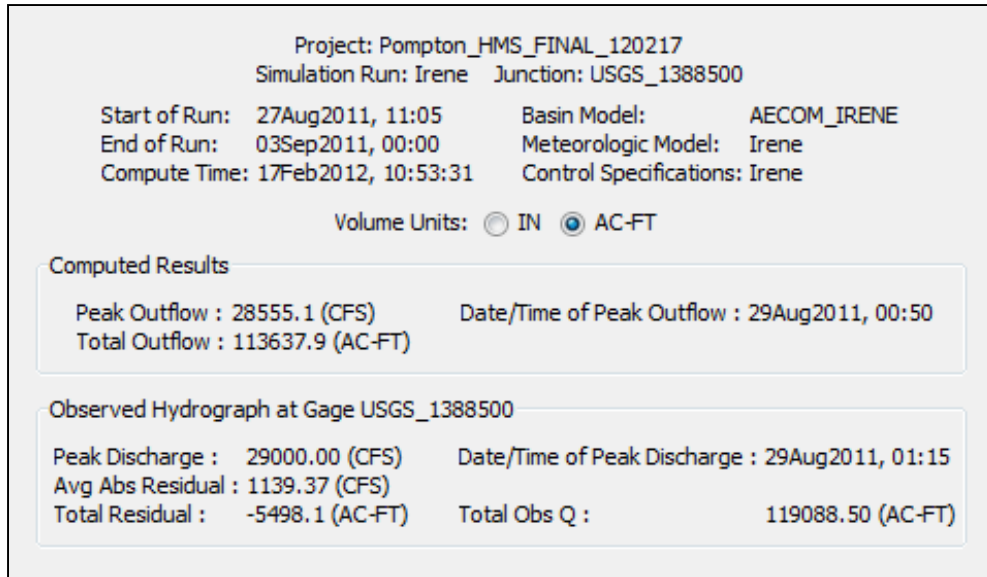


Figure A.15: Summary of Results - August 27-29, 2011
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ

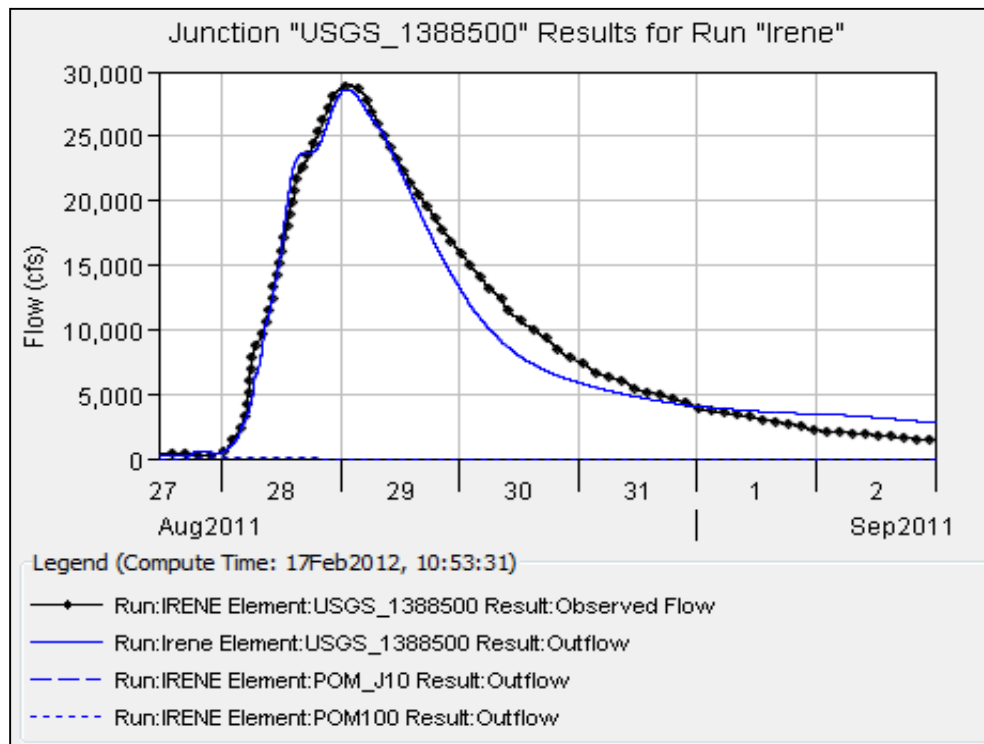


Figure A.16: Simulated versus Observed Hydrograph - August 27-29, 2011
USGS GAGE 01388500 - Pompton River at Pompton Plains NJ

Table A.1: Sub-basin Drainage Areas

River	Sub-Basin	Area Sq Mi
Mahwah	MAH070	6.3
	MAH075	3.6
	MAH080	2.0
	MAH085	2.0
	MAH090	6.4
	MAH095	4.8
	MAH100	0.5
Pequannock	PEQ050	6.9
	PEQ055	6.4
	PEQ060	6.0
	PEQ065	13.2
	PEQ069	3.3
	PEQ070	19.4
	PEQ075	1.7
	PEQ076	2.2
	PEQ077	2.0
	PEQ078	0.9
	PEQ080	2.7
	PEQ084	0.3
	PEQ085	6.5
	PEQ086	5.5
	PEQ090	2.0
	PEQ095	1.9
PEQ100	4.1	
Pompton	POM095	1.4
	POM100	0.1
Ramapo	RAM070	8.7
	RAM075	8.2
	RAM080	7.6
	RAM085	8.7
	RAM090	3.5
	RAM095	6.8
	RAM100	8.3
	RAM105	7.9
	RAM110	10.4
	RAM115	8.5

	RAM120	1.9
	RAM125	2.6
	RAM130	3.5
	RAM135	6.2
	RAM140	0.7
	RAM145	0.8
	RAM150	3.6
	RAM154	1.1
	RAM155	3.5
	RAM159	6.7
	RAM160	4.5
	RAM170	3.8
	RAM180	7.1
	RAM190	3.7
	RAM195	5.1
	RAM200	1.6
Wanaque	WAN045	14.9
	WAN050	14.0
	WAN055	18.0
	WAN060	13.7
	WAN065	11.8
	WAN070	6.1
	WAN074	4.2
	WAN075	14.4
	WAN080	5.2
	WAN085	2.9
	WAN095	1.7
	WAN100	0.6

Table A.2: Land Cover Classification

	Land Use
1	Predominately Forest (85%)
2	Suburban (generally R-4 to R-6 and less)
3	Transportation, Commercial, High Density Urban
4	Deciduous Wetlands, Herbaceous Wetlands, Wetland Rights-of-Way, Managed Wetlands, Former Agricultural Wetlands, etc.
5	Stormwater Basin, Natural Lakes and Artificial Lakes
6	Agricultural - Rangeland/Pasture/Abandoned/Farmland
7	Agricultural - Row/Cereal/etc

Table A.3: Recession Baseflow Values for Sub-basins

Subbasin	Recession Constant	Threshold Type	Ratio to Peak
RAM080	0.8	Ratio to Peak	0.28
RAM085	0.8	Ratio to Peak	0.28
RAM100	0.8	Ratio to Peak	0.28
RAM095	0.8	Ratio to Peak	0.28
RAM110	0.8	Ratio to Peak	0.28
RAM115	0.8	Ratio to Peak	0.28
RAM150	0.8	Ratio to Peak	0.28
RAM159	0.8	Ratio to Peak	0.28
RAM170	0.8	Ratio to Peak	0.28
RAM195	0.8	Ratio to Peak	0.3
PEQ050	0.8	Ratio to Peak	0.28
PEQ055	0.8	Ratio to Peak	0.28
PEQ070	0.8	Ratio to Peak	0.28
PEQ065	0.8	Ratio to Peak	0.28

Table A.4: Initial CN and Lag Time Estimates

River	Sub-Basin	Initial Basin CN	Initial Lag Time (min)
Mahwah	MAH070	76	178
	MAH075	77	308
	MAH080	70	300
	MAH085	74	300
	MAH090	81	178
	MAH095	83	111
	MAH100	79	80*
Pequannock	PEQ050	77	229
	PEQ055	76	289
	PEQ060	75	327
	PEQ065	77	277
	PEQ069	78	52
	PEQ070	74	165
	PEQ075	77	44

	PEQ076	81	113
	PEQ077	73	87
	PEQ078	73	51
	PEQ080	77	120
	PEQ084	78	56
	PEQ085	79	181
	PEQ086	78	158
	PEQ090	85	120
	PEQ095	86	120
	PEQ100	81	138
Pompton	POM095	81	103
	POM100	76	55
Ramapo	RAM070	81	213
	RAM075	78	102
	RAM080	75	137
	RAM085	79	218
	RAM090	72	212
	RAM095	77	175
	RAM100	78	153
	RAM105	74	182
	RAM110	72	221
	RAM115	71	100
	RAM120	77	143
	RAM125	72	143
	RAM130	76	250
	RAM135	73	147
	RAM140	83	109
	RAM145	84	165
	RAM150	73	250
	RAM154	77	100
	RAM155	76	252
	RAM159	73	250
RAM160	76	200	
RAM170	76	180	
RAM180	77	186	
RAM190	87	101	
RAM195	81	120	
RAM200	85	98	

Wanaque	WAN045	77	314
	WAN050	82	227
	WAN055	76	164
	WAN060	77	173
	WAN065	76	90
	WAN070	79	129
	WAN074	78	91
	WAN075	82	100
	WAN080	78	233
	WAN085	81	100
	WAN095	80	153
	WAN100	89	51

Table A.5: Calibration Summary Table - March 13-15, 2010

River	Measure	Simulated	Observed	Difference
Ramapo	USGS GAGE 01387400 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	28,739.1	32,033.3	-10%
	Peak Flow (CFS)	7,363.4	7,560.5	-3%
	Time of Peak	3:45	4:00	-00:15
	USGS GAGE 01387420 - Ramapo River at Suffern NY			
	Volume (AC-FT)	30,117.6	34,450.7	-13%
	Peak Flow (CFS)	7,808.9	7,538.7	4%
	Time of Peak	4:10	3:00	+01:10
	USGS GAGE 01387500 - Ramapo River near Mahwah NJ			
	Volume (AC-FT)	33,482.3	43,501.0	-23%
	Peak Flow (CFS)	8,476.5	11,500.0	-26%
	Time of Peak	6:45	5:00	+00:15
	USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam			
	Volume (AC-FT)	52,156.3	52,357.6	0%
	Peak Flow (CFS)	10,920.1	11,000.0	-1%
Time of Peak	10:20	10:15	+00:05	
Pompton	USGS GAGE 01388500 - Pompton River at Pompton Plains NJ			
	Volume (AC-FT)	100,113.1	118,574.8	-16%
	Peak Flow (CFS)	19,538.5	18,900.0	3%
Pequannock	USGS GAGE 01382500 - Pequannock River at Macopin Intake Dam NJ			
	Volume (AC-FT)	26,192.6	18,867.6	39%
	Peak Flow (CFS)	5,066.1	3,110.0	63%
Wanaque	USGS GAGE 01387000 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	14,262.1	17,973.0	-21%
	Peak Flow (CFS)	4,159.1	3,100.0	34%
	Time of Peak	19:10	21:30	-02:20

Table A.6: Calibration Summary Table - March 6-8, 2011

River	Measure	Simulated	Observed	Difference
Ramapo	USGS GAGE 01387400 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	13,795.3	19,147.2	-28%
	Peak Flow (CFS)	4,902.0	6,624.3	-26%
	Time of Peak	6:50	9:00	-02:10
	USGS GAGE 01387420 - Ramapo River at Suffern NY			
	Volume (AC-FT)	14,968.5	18,824.6	-20%
	Peak Flow (CFS)	6,004.8	5,963.7	1%
	Time of Peak	7:10	7:30	-00:20
	USGS GAGE 01387500 - Ramapo River near Mahwah NJ			
	Volume (AC-FT)	17,626.2	24,319.6	-28%
	Peak Flow (CFS)	7,087.5	9,130.0	-22%
	Time of Peak	7:50	7:00	+00:50
	USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam			
	Volume (AC-FT)	29,059.5	29,387.5	-1%
	Peak Flow (CFS)	9,861.5	8,710.0	13%
Time of Peak	10:15	9:45	+00:30	
Pompton	USGS GAGE 01388500 - Pompton River at Pompton Plains NJ			
	Volume (AC-FT)	45,715.5	53,815.2	-15%
	Peak Flow (CFS)	12,778.6	14,400.0	-11%
	Time of Peak	10:50	16:00	-05:10
Pequannock	USGS GAGE 01382500 - Pequannock River at Macopin Intake Dam NJ			
	Volume (AC-FT)	11,434.9	7,570.8	51%
	Peak Flow (CFS)	3,274.6	1,620.0	102%
	Time of Peak	2:55	14:30	-5:10
Wanaque	USGS GAGE 01387000 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	1,544.3	349.2	342%
	Peak Flow (CFS)	499.4	190.0	163%
	Time of Peak	13:20	2:45	-11:40

Table A.7: Calibration Summary Table - March 10-12, 2011

River	Measure	Simulated	Observed	Difference
Ramapo	USGS GAGE 01387400 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	17,859.0	18,580.8	-4%
	Peak Flow (CFS)	5,267.5	5,707.6	-8%
	Time of Peak	9:35	10:30	-00:55
	USGS GAGE 01387420 - Ramapo River at Suffern NY			
	Volume (AC-FT)	18,053.1	18,114.3	0%
	Peak Flow (CFS)	5,412.1	5,209.9	4%
	Time of Peak	9:55	4:45	+04:50
	USGS GAGE 01387500 - Ramapo River near Mahwah NJ			
	Volume (AC-FT)	19,893.0	24,139.5	-18%
	Peak Flow (CFS)	5,985.8	7,870.0	-24%
	Time of Peak	10:30	6:45	
	USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam			
	Volume (AC-FT)	31,196.6	35,297.3	-12%
	Peak Flow (CFS)	8,833.4	9,650.0	-8%
Time of Peak	12:30	12:05	+00:25	
Pompton	USGS GAGE 01388500 - Pompton River at Pompton Plains NJ			
	Volume (AC-FT)	69,100.9	78,971.6	-12%
	Peak Flow (CFS)	17,490.1	17,700.0	-1%
Pompton	Time of Peak	21:35	19:00	+02:35
	USGS GAGE 01382500 - Pequannock River at Macopin Intake Dam NJ			
	Volume (AC-FT)	18,494.6	10,635.2	74%
Pequannock	Peak Flow (CFS)	4,556.0	2,790.0	63%
	Time of Peak	6:00	9:45	-03:45
Wanaque	USGS GAGE 01387000 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	12,067.1	13,708.4	-12%
	Peak Flow (CFS)	4,305.4	3,740.0	15%
Wanaque	Time of Peak	14:30	14:00	+00:30

Table A.8: Calibration Summary Table - August 27-29, 2011

River	Measure	Simulated	Observed	Difference
Ramapo	USGS GAGE 01387400 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	40,066.1	34,187.2	17%
	Peak Flow (CFS)	12,910.5	13,700.0	-6%
	Time of Peak	13:50	13:00	+00:50
	USGS GAGE 01387420 - Ramapo River at Suffern NY			
	Volume (AC-FT)	41,678.8	35,469.3	18%
	Peak Flow (CFS)	14,346.4	13,100.0	10%
	Time of Peak	15:25	13:45	+01:40
	USGS GAGE 01387500 - Ramapo River near Mahwah NJ			
	Volume (AC-FT)	47,789.2	47,271.9	1%
	Peak Flow (CFS)	17,792.4	17,600.0	1%
	Time of Peak	14:15	16:00	-01:45
	USGS GAGE 01388000 - Ramapo River at Pompton Lakes NJ - Downstream of Dam			
	Volume (AC-FT)	68,606.8	61,301.5	12%
	Peak Flow (CFS)	21,521.6	21,400.0	1%
Time of Peak	22:00	21:30	-00:30	
Pompton	USGS GAGE 01388500 - Pompton River at Pompton Plains NJ			
	Volume (AC-FT)	113,637.9	119,088.5	-5%
	Peak Flow (CFS)	28,555.1	29,000.0	-2%
	Time of Peak	0:50	1:15	-00:25
Pequannock	USGS GAGE 01382500 - Pequannock River at Macopin Intake Dam NJ			
	Volume (AC-FT)	15,645.3	13,385.4	17%
	Peak Flow (CFS)	3,596.8	3,030.0	19%
	Time of Peak	10:00	14:45	-04:45
Wanaque	USGS GAGE 01387000 - Wanaque River at Wanaque NJ			
	Volume (AC-FT)	17,138.9	16,452.7	4%
	Peak Flow (CFS)	5,883.9	3,520.0	67%
	Time of Peak	2:35	2:45	-00:10

Table A.9: Final Calibrated Curve Number Values for Individual Basin Models

River	Sub-Basin	Basin Model	Basin Model	Basin Model	Basin Model
		March 13-15, 2010 CN	March 6-8, 2011 CN	March 10-12, 2011 CN	Aug. 27-29, 2011 CN
Mahwah	MAH070	82	79	94	50
	MAH075	55	70	63	35
	MAH080	90	87	52	54
	MAH085	72	89	46	99
	MAH090	86	79	44	38
	MAH095	86	81	63	88
	MAH100	43	96	99	99
Pequannock	PEQ050	99	91	94	72
	PEQ055	99	89	94	70
	PEQ060	99	87	94	69
	PEQ065	99	85	94	67
	PEQ069	99	91	94	72
	PEQ070	90	92	73	73
	PEQ075	99	84	94	67
	PEQ076	99	90	94	71
	PEQ077	99	99	94	78
	PEQ078	99	84	94	67
	PEQ080	81	98	94	90
	PEQ084	70	92	66	73
	PEQ085	82	98	94	93
	PEQ086	81	98	94	92

River	Sub-Basin	Basin Model	Basin Model	Basin Model	Basin Model
		March 13-15, 2010 CN	March 6-8, 2011 CN	March 10-12, 2011 CN	Aug. 27-29, 2011 CN
	PEQ090	99	98	94	98
	PEQ095	99	98	94	98
	PEQ100	99	98	94	99
Pompton	POM095	99	98	99	82
	POM100	99	96	99	82
Ramapo	RAM070	99	80	99	74
	RAM075	98	79	99	66
	RAM080	88	84	99	57
	RAM085	99	53	80	55
	RAM090	82	84	99	65
	RAM095	99	87	99	62
	RAM100	99	88	77	41
	RAM105	99	77	74	64
	RAM110	99	82	73	55
	RAM115	77	81	99	57
	RAM120	99	84	99	99
	RAM125	99	90	99	62
	RAM130	89	85	45	99
	RAM135	99	98	56	64
	RAM140	99	98	99	99
RAM145	99	98	99	99	
RAM150	99	98	99	74	

River	Sub-Basin	Basin Model	Basin Model	Basin Model	Basin Model
		March 13-15, 2010 CN	March 6-8, 2011 CN	March 10-12, 2011 CN	Aug. 27-29, 2011 CN
	RAM154	99	80	99	99
	RAM155	99	98	46	99
	RAM159	99	98	99	55
	RAM160	99	98	99	57
	RAM170	99	84	99	99
	RAM180	82	98	68	63
	RAM190	99	98	99	73
	RAM195	99	98	99	67
	RAM200	99	98	99	75
	Wanaque	WAN045	99	62	99
WAN050		99	70	99	76
WAN055		85	52	78	57
WAN060		85	54	79	58
WAN065		85	52	78	57
WAN070		99	57	99	62
WAN074		99	55	99	59
WAN075		90	60	84	65
WAN080		90	61	85	66
WAN085		99	56	99	61
WAN095		99	60	99	65
WAN100		99	58	99	63

Table A.10: Final Calibrated Lag Time (min) Values for Individual Basin Models

River	Sub-Basin	Basin Model	Basin Model	Basin Model	Basin Model
		March 13-15, 2010 Lag Time (min)	March 6-8, 2011 Lag Time (min)	March 10-12, 2011 Lag Time (min)	Aug. 27-29, 2011 Lag Time (min)
Mahwah	MAH070	894	895	1196	814
	MAH075	900	900	900	884
	MAH080	678	273	192	87
	MAH085	677	297	196	85
	MAH090	822	911	444	565
	MAH095	883	562	376	357
	MAH100	59	57	86	26
Pequannock	PEQ050	171	25	114	591
	PEQ055	199	439	102	693
	PEQ060	686	288	691	691
	PEQ065	1193	887	1212	1242
	PEQ069	625	348	541	546
	PEQ070	116	73	29	904
	PEQ075	26	26	38	26
	PEQ076	915	271	616	610
	PEQ077	66	44	66	100
	PEQ078	43	29	63	43
	PEQ080	1218	815	1218	1224
	PEQ084	120	120	120	120
	PEQ085	1223	1188	1222	1223

River	Sub-Basin	Basin Model	Basin Model	Basin Model	Basin Model
		March 13-15, 2010	March 6-8, 2011	March 10-12, 2011	Aug. 27-29, 2011
		Lag Time (min)	Lag Time (min)	Lag Time (min)	Lag Time (min)
	PEQ086	1223	1189	1222	1223
	PEQ090	51	50	75	51
	PEQ095	88	11	39	39
	PEQ100	64	42	42	95
Pompton	POM095	33	47	48	21
	POM100	18	26	26	38
Ramapo	RAM070	1488	991	1137	949
	RAM075	1009	861	588	562
	RAM080	1216	1188	1212	1332
	RAM085	1192	753	1157	1163
	RAM090	613	182	400	118
	RAM095	256	579	1301	602
	RAM100	1186	499	710	1186
	RAM105	364	105	356	160
	RAM110	234	678	1153	727
	RAM115	188	203	198	221
	RAM120	47	12	27	63
	RAM125	26	17	90	85
	RAM130	978	371	169	180
	RAM135	730	373	484	407
	RAM140	13	9	6	19
	RAM145	19	13	18	19

River	Sub-Basin	Basin Model	Basin Model	Basin Model	Basin Model
		March 13-15, 2010	March 6-8, 2011	March 10-12, 2011	Aug. 27-29, 2011
		Lag Time (min)	Lag Time (min)	Lag Time (min)	Lag Time (min)
	RAM150	44	109	488	123
	RAM154	12	26	17	12
	RAM155	913	564	405	405
	RAM159	39	188	277	131
	RAM160	98	96	127	489
	RAM170	29	98	65	68
	RAM180	815	589	756	502
	RAM190	1216	46	44	502
	RAM195	23	34	83	57
	RAM200	21	20	31	44
Wanaque	WAN045	359	333	350	360
	WAN050	260	111	259	266
	WAN055	556	250	373	559
	WAN060	593	176	176	393
	WAN065	687	305	203	790
	WAN070	929	1179	1223	1223
	WAN074	918	465	1042	799
	WAN075	767	29	96	331
	WAN080	925	1189	1223	1400
	WAN085	776	39	125	58
	WAN095	1357	909	79	900
WAN100	53	10	35	111	

Table A.11: Pompton Basin HEC-HMS Model Validation Summary

River	USGS GAGE	Precipitation Frequency	Simulated Peak Flow	HEC-SSP Flow	Confidence Limits
			(cfs)	(cfs)	(cfs)
Ramapo	01388000	2-yr	5,239	3,606	3,231 to 4,020
		10-yr	10,169	8,578	7392 to 9,969
		40-yr	16,457	-	-
		50-yr	17,582	15,352	12,396 to 18,625
		100-yr	20,942	19,098	14,496 to 25,500
River	USGS GAGE	Precipitation Frequency	Simulated Peak Flow	HEC-SSP Flow	Standard Error
			cfs	cfs	%
Pompton	01388500	2-yr	5,961	6,021	-
		10-yr	11,837	14,753	-
		40-yr	19,228	-	-
		50-yr	20,681	25,950	-
		100-yr	25,723	31,878	-

Table A.12: Flood Frequency Analysis

River	USGS Gage	Storm	Simulated Peak	Observed Peak	Bulletin 17B Estimate	Annual Exceedance Probability	Recurrence Interval
			(cfs)	(cfs)	(cfs)	-	(yr)
Ramapo	01388000	March 13-15, 2010	10,920	11,000	8,341 - 12,230	0.1 - 0.04	10 - 25yr
		March 6-8, 2011	9,862	8,710	8,341 - 12,230	0.1 - 0.04	10 - 25yr
		March 10-12, 2011	8,833	9,650	8,341 - 12,230	0.1 - 0.04	10 - 25yr
		Aug. 27-29, 2011	21,522	21,400	20,320 - 25,670	0.01 - 0.005	100 - 200yr

River	USGS Gage	Storm	Simulated Peak	Observed Peak	Bulletin 17B Estimate	Annual Exceedance Probability	Recurrence Interval
			(cfs)	(cfs)	(cfs)	-	(yr)
Pompton	01388500	March 13-15, 2010	19,539	18,900	14,040 - 19,910	0.1 - 0.04	10 - 25yr
		March 6-8, 2011	12,779	14,400	10,220 - 14,040	0.2 - 0.1	5 - 10yr
		March 10-12, 2011	17,490	17,700	14,040 - 19,910	0.1 - 0.04	10 - 25yr
		Aug. 27-29, 2011	28,555	29,000	25,100 - 31,030	0.02 - 0.01	50 - 100yr

Appendix B
SPAS FIGURES

SPAS 1221 Total Storm Rainfall (48-hours)
 March 12, 2010 (2100 UTC) to March 14, 2010 (2100 UTC)

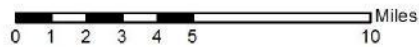
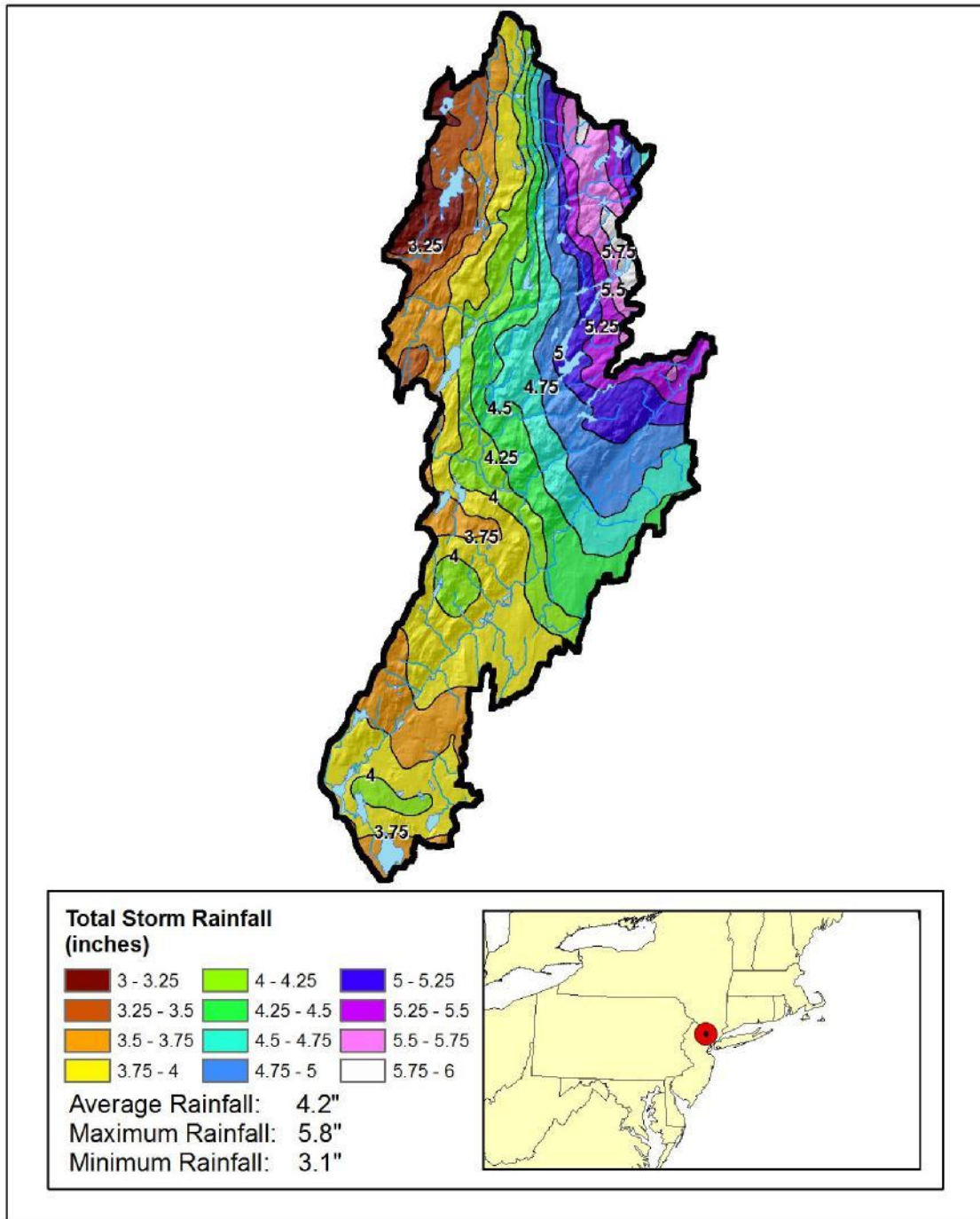


Figure 1 Total storm rainfall over Pompton Lake Drainage Basin (PLDB)

6-hour Average Recurrence Interval
SPAS 1221 - March 12-14, 1010

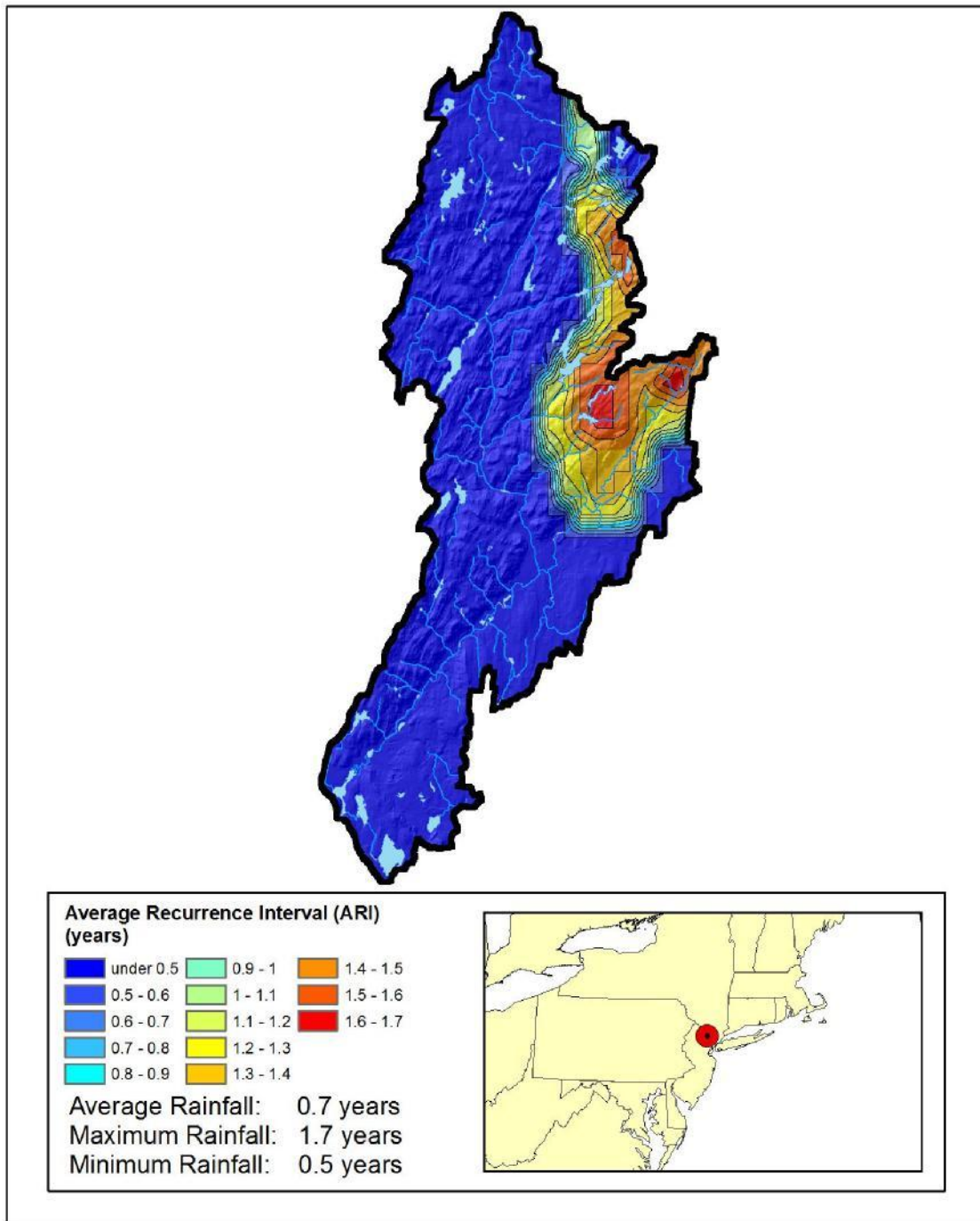


Figure 2 6-hour ARI over Pompton Lake Drainage Basin (PLDB)

24-hour Average Recurrence Interval
SPAS 1221 - March 12-14, 1010

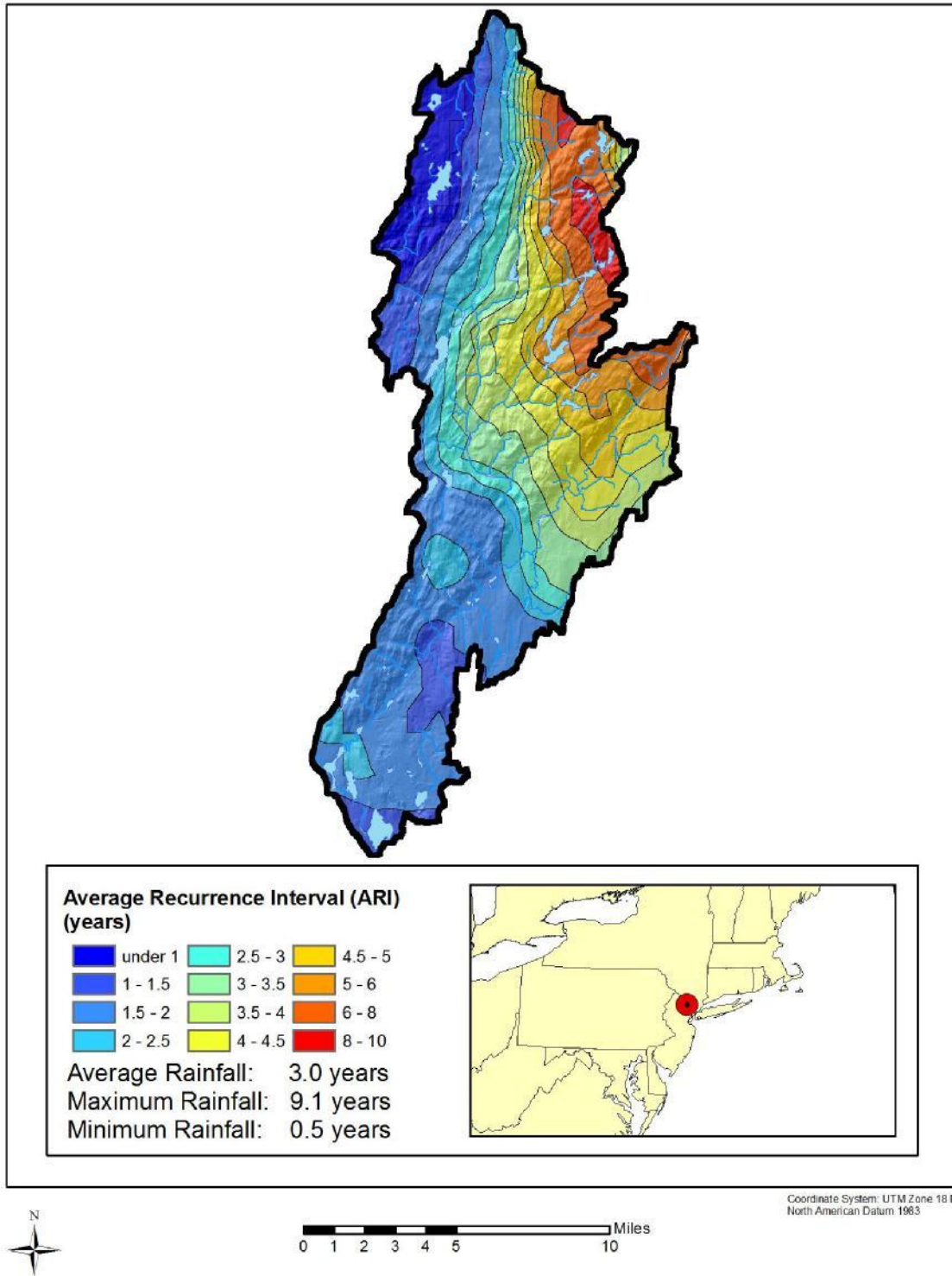


Figure 3 24-hour ARI over Pompton Lake Drainage Basin (PLDB)

SPAS 1222 Total Storm Rainfall (31-hours)
 March 6, 2011 (0600 UTC) to March 7, 2011 (1300 UTC)

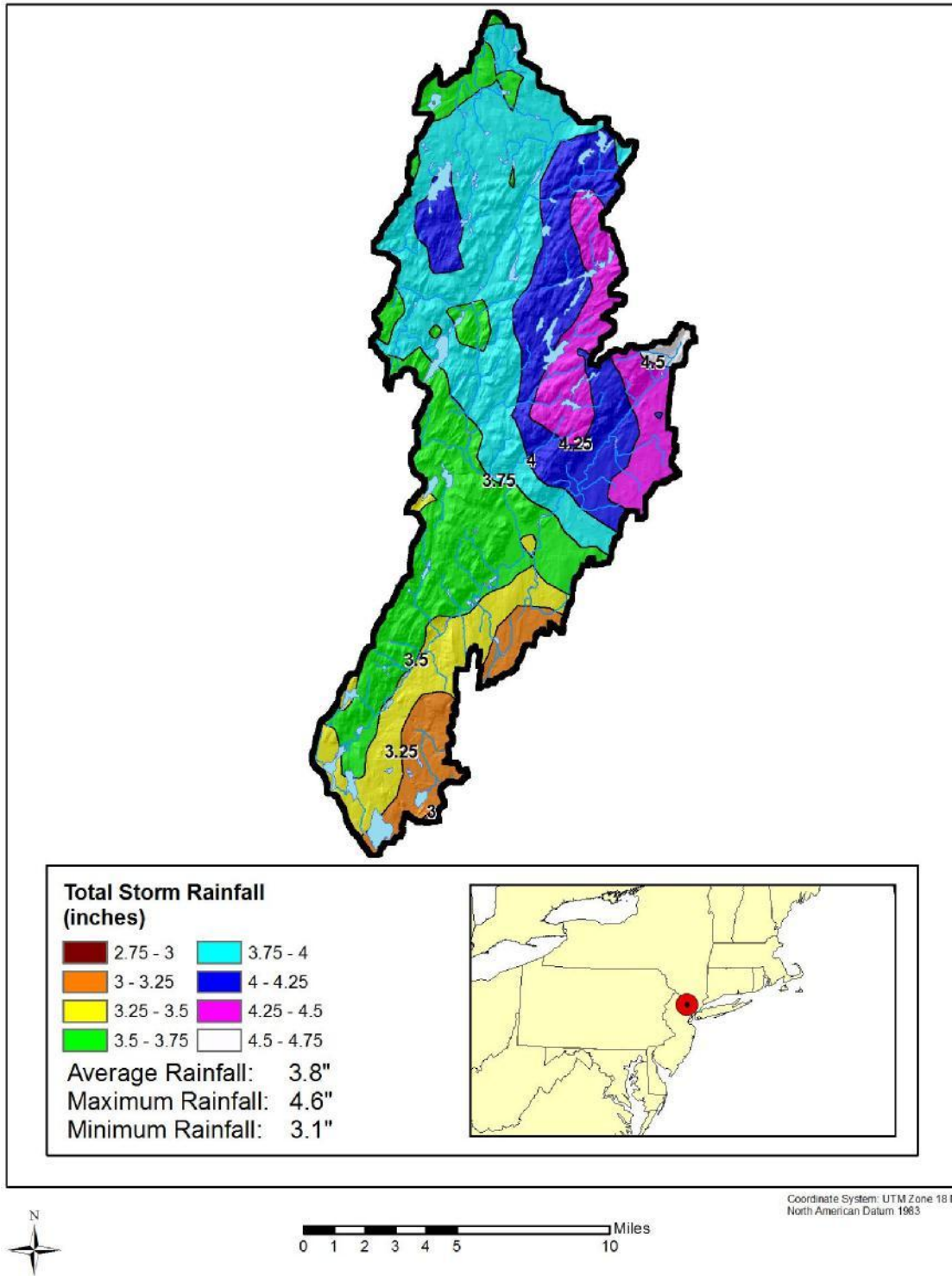


Figure 4 Total storm rainfall over Pompton Lake Drainage Basin (PLDB)

6-hour Average Recurrence Interval
SPAS 1222 - March 6-7, 2011

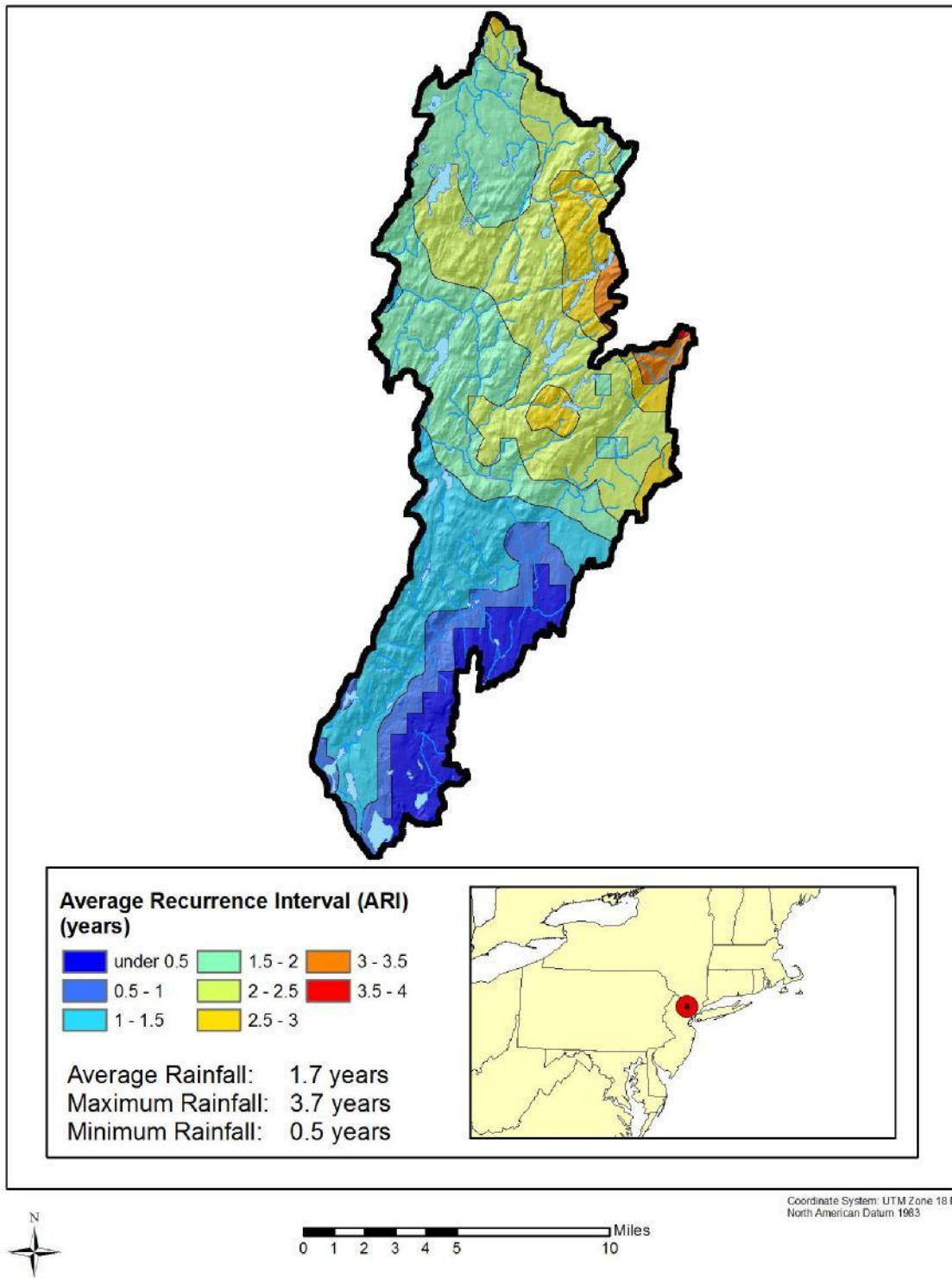


Figure 5 6-hour ARI over Pompton Lake Drainage Basin (PLDB)

24-hour Average Recurrence Interval
 SPAS 1222 - March 6-7, 2011

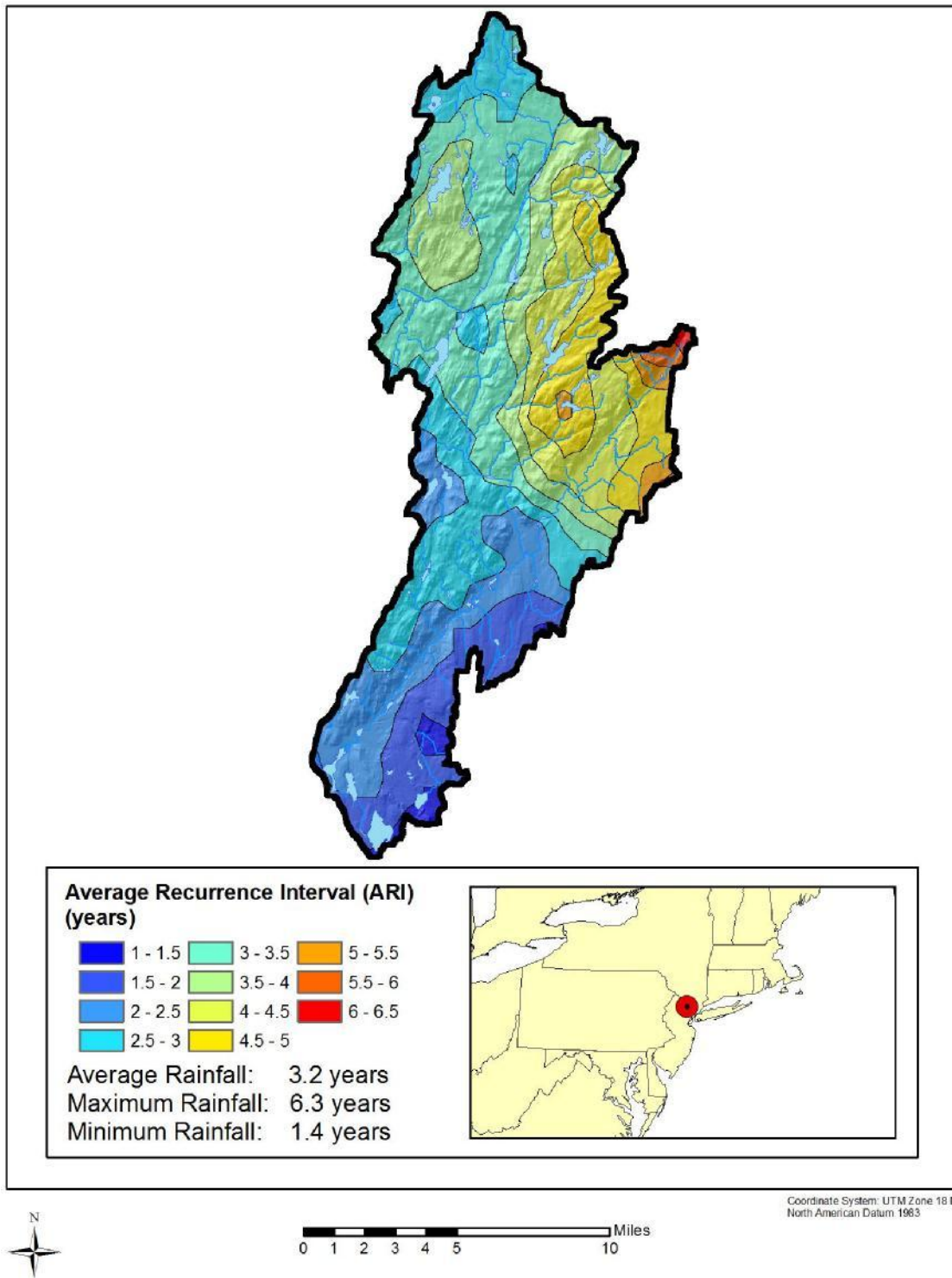


Figure 6 24-hour ARI over Pompton Lake Drainage Basin (PLDB)

SPAS 1223 Total Storm Rainfall (32-hours)
 March 10, 2011 (0600 UTC) to March 11, 2011 (1400 UTC)

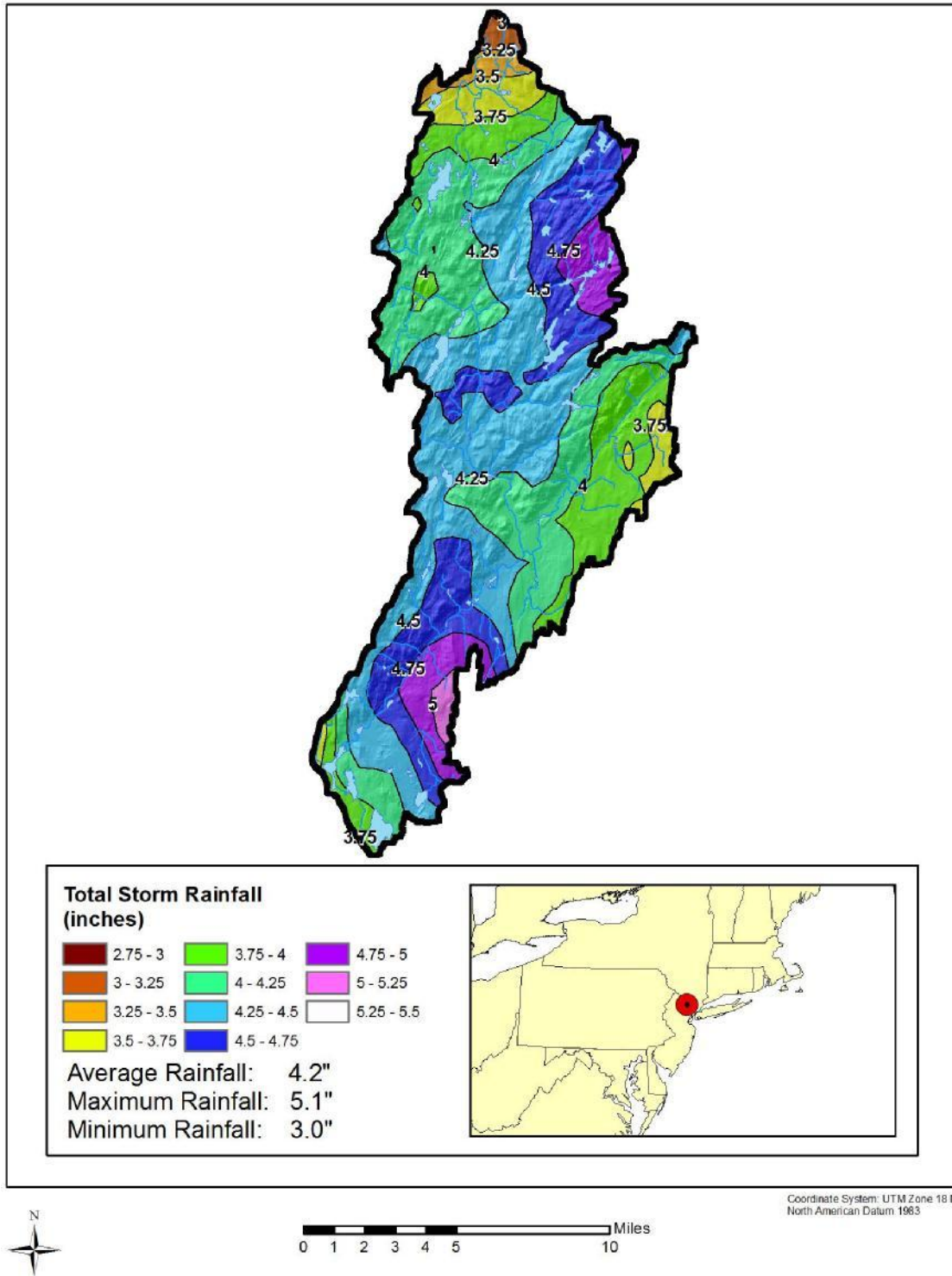


Figure 7 Total storm rainfall over Pompton Lake Drainage Basin (PLDB)

6-hour Average Recurrence Interval
SPAS 1223 - March 10-11, 2011

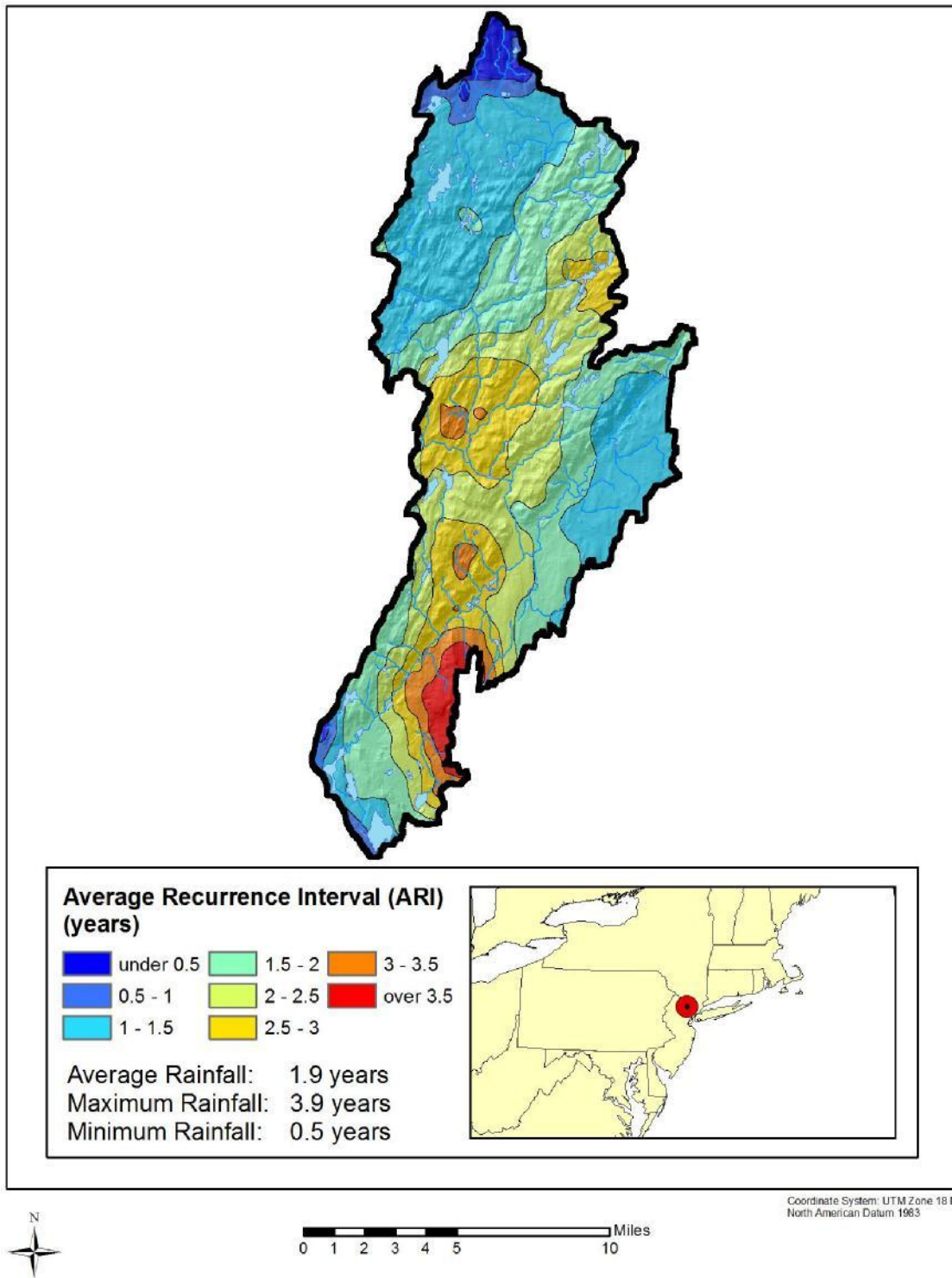


Figure 8 6-hour ARI over Pompton Lake Drainage Basin (PLDB)

24-hour Average Recurrence Interval
SPAS 1223 - March 10-11, 2011

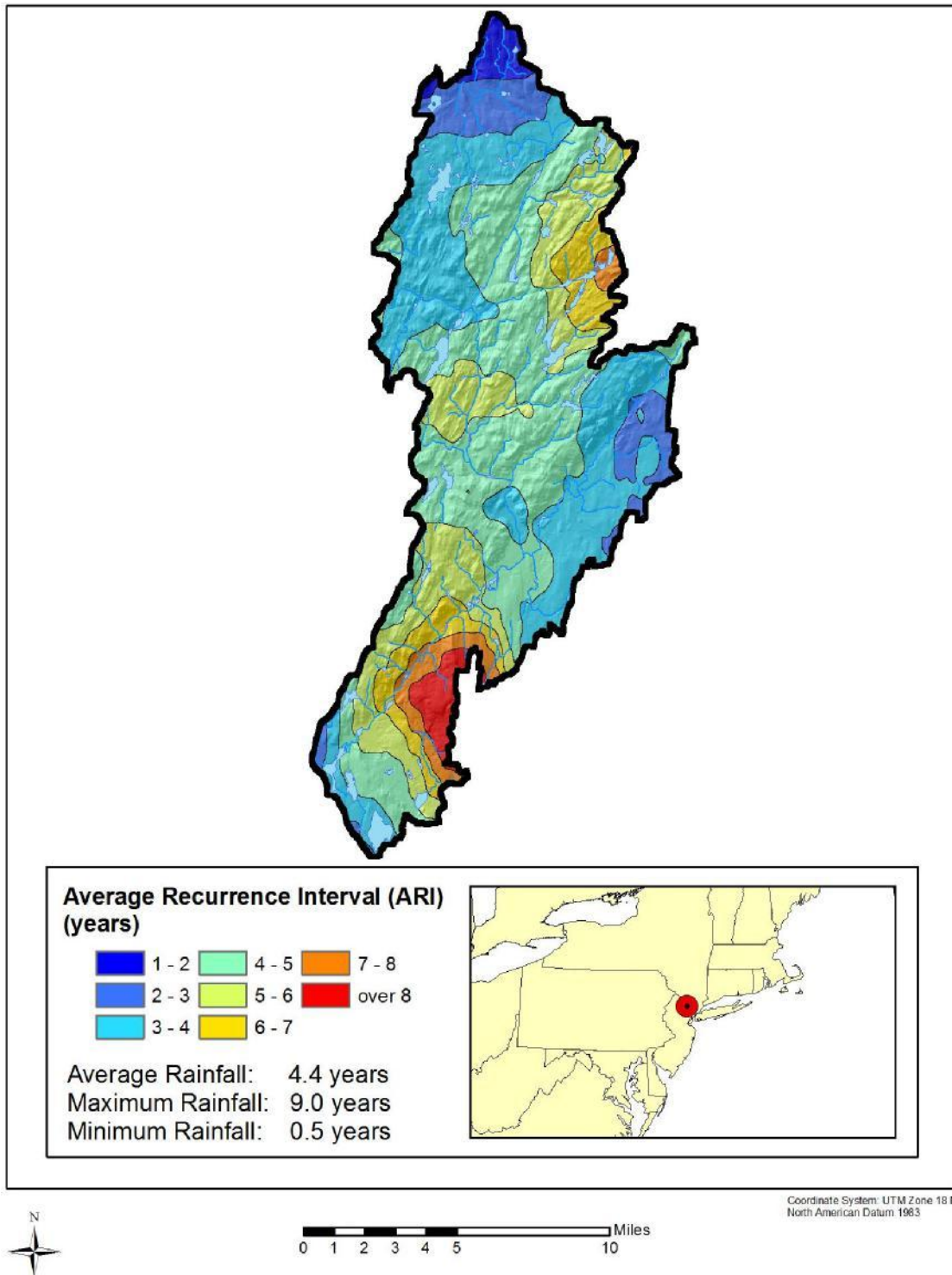


Figure 9 24-hour ARI over Pompton Lake Drainage Basin(PLDB)

Hurricane Irene - SPAS 1224 Total Storm Rainfall (42-hours)
 August 27, 2011 1200 UTC to August 29, 2011 0500 UTC

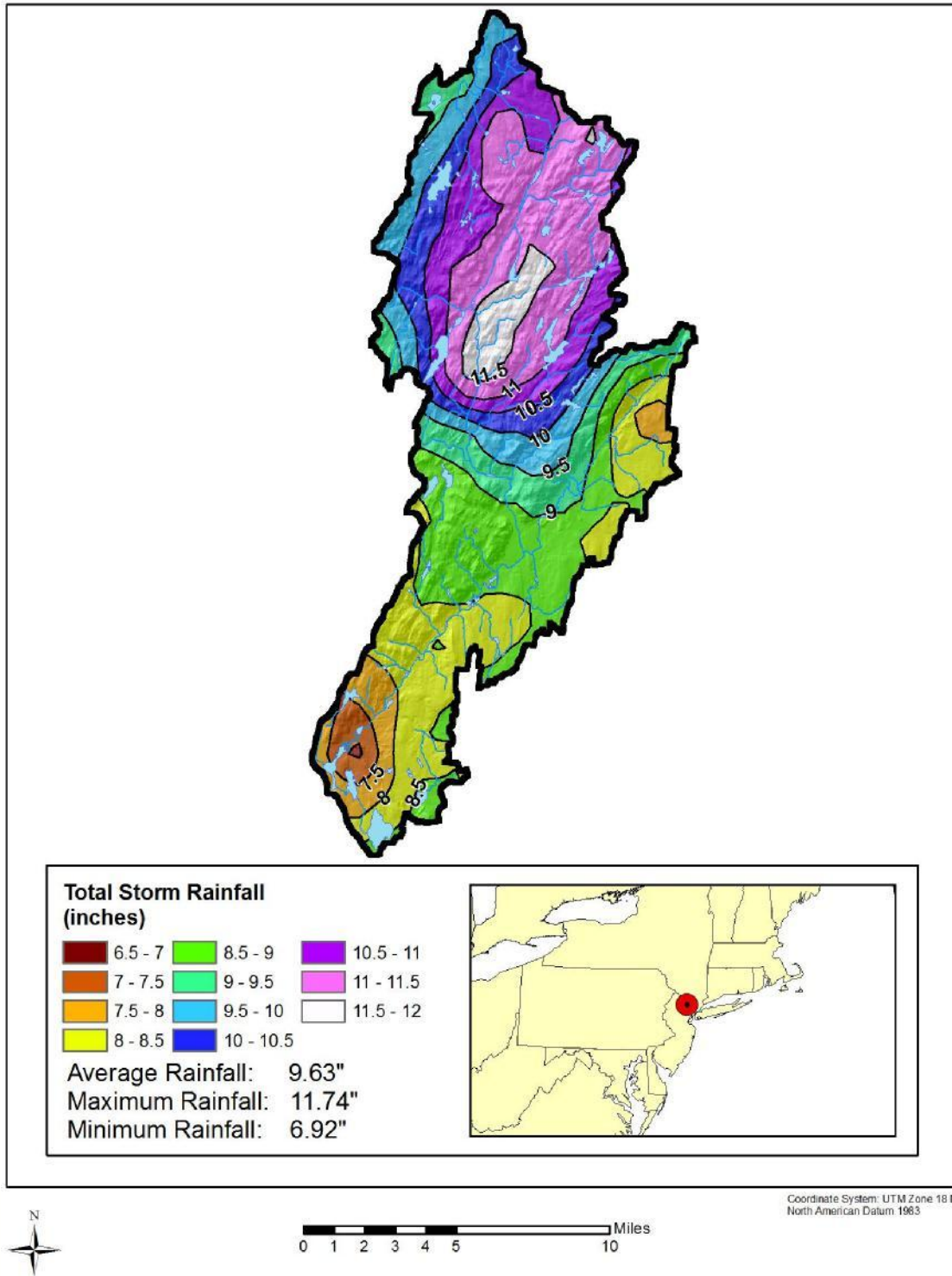


Figure 10 Total storm rainfall over Pompton Lake Drainage Basin (PLDB)

6-hour Average Recurrence Interval - Hurricane Irene
 SPAS 1224 - August 27 - 29, 2011

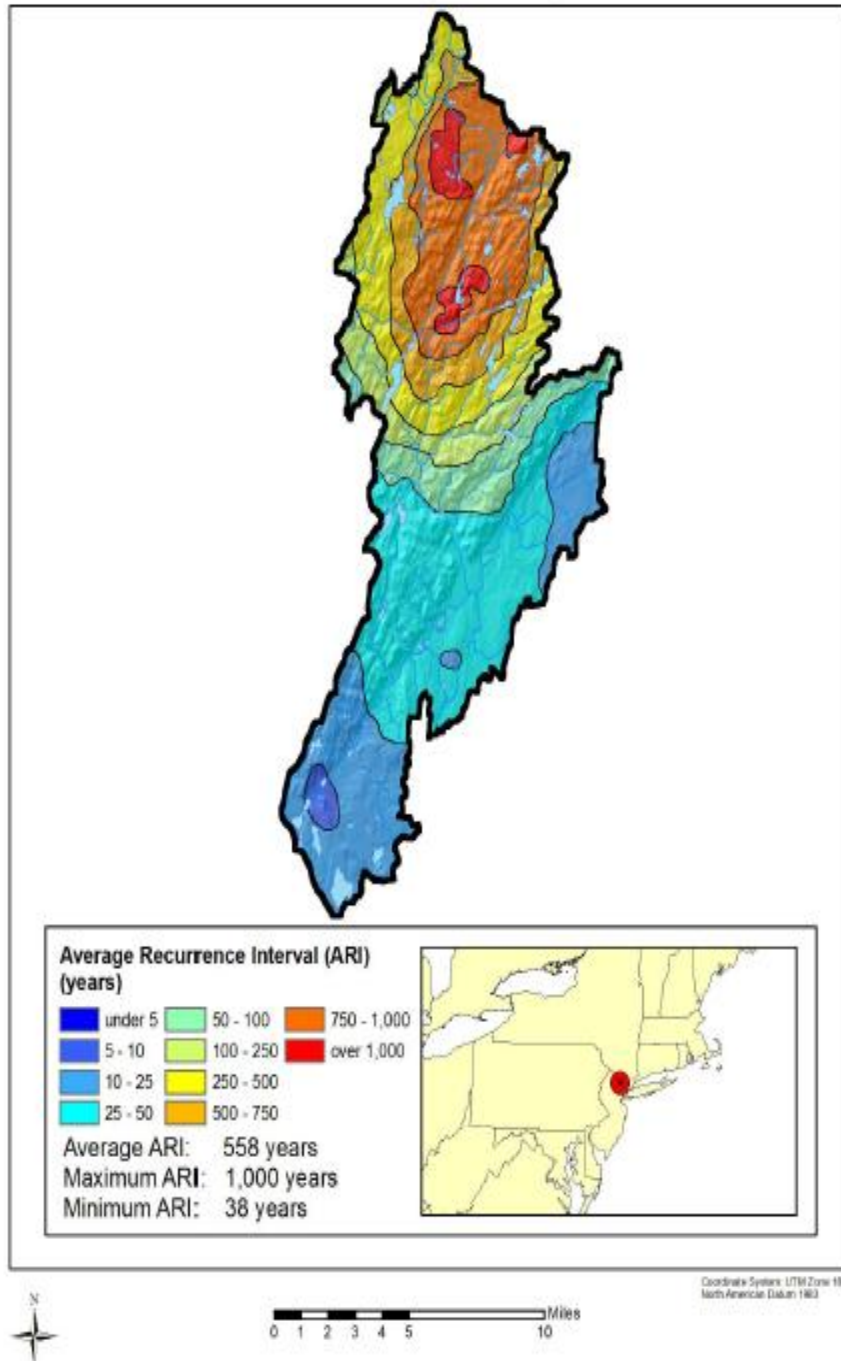


Figure 11 6-hour ARI over Pompton Lake Drainage Basin (PLDB)

24-hour Average Recurrence Interval - Hurricane Irene
SPAS 1224 - August 27 - 29, 2011

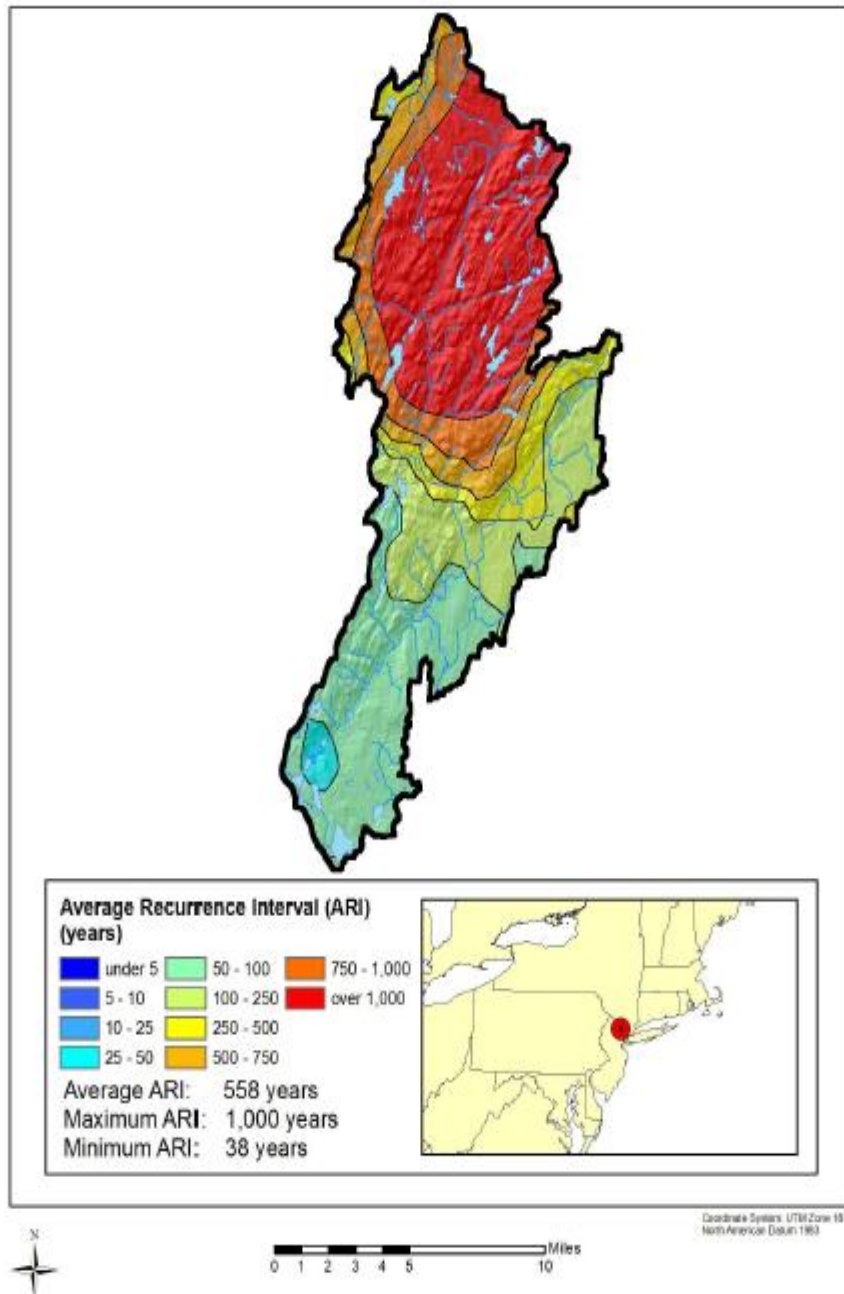
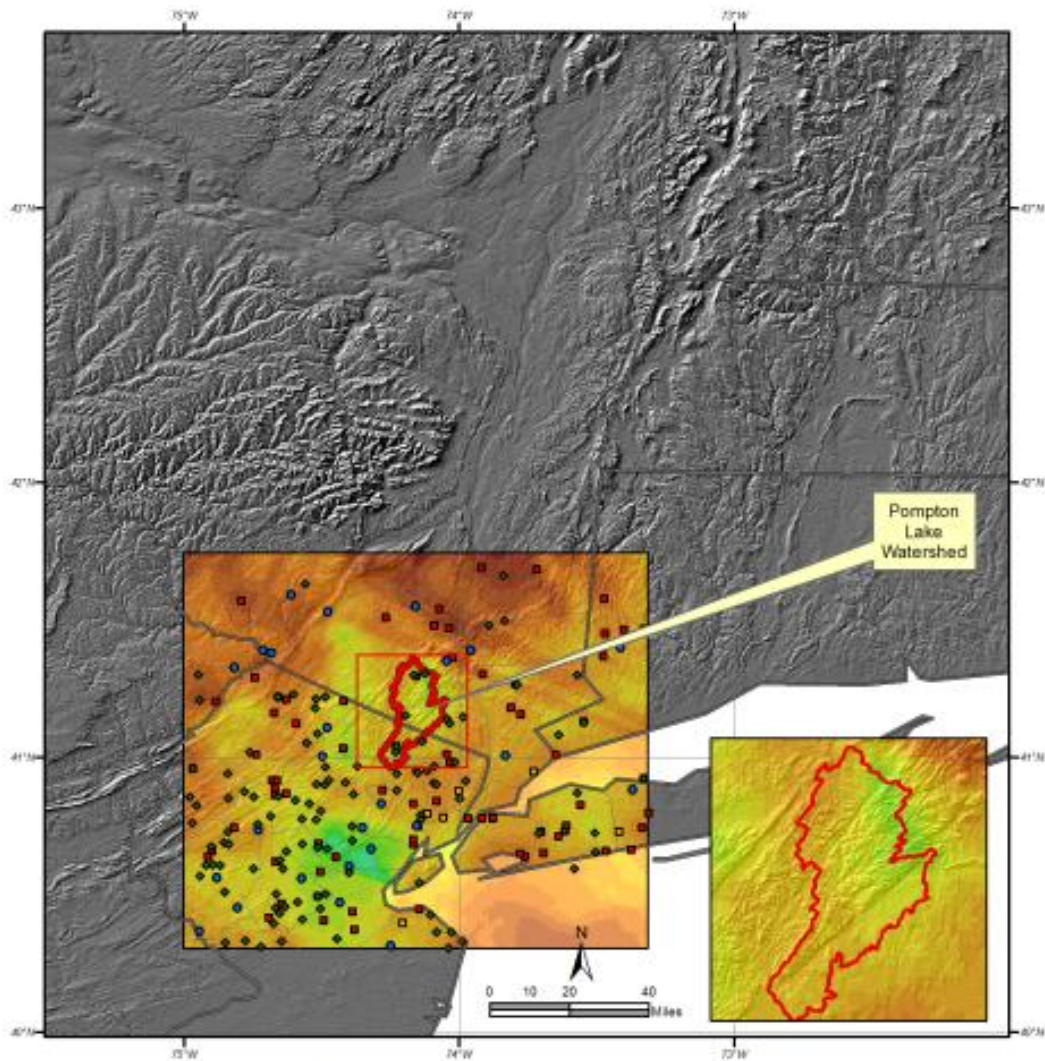


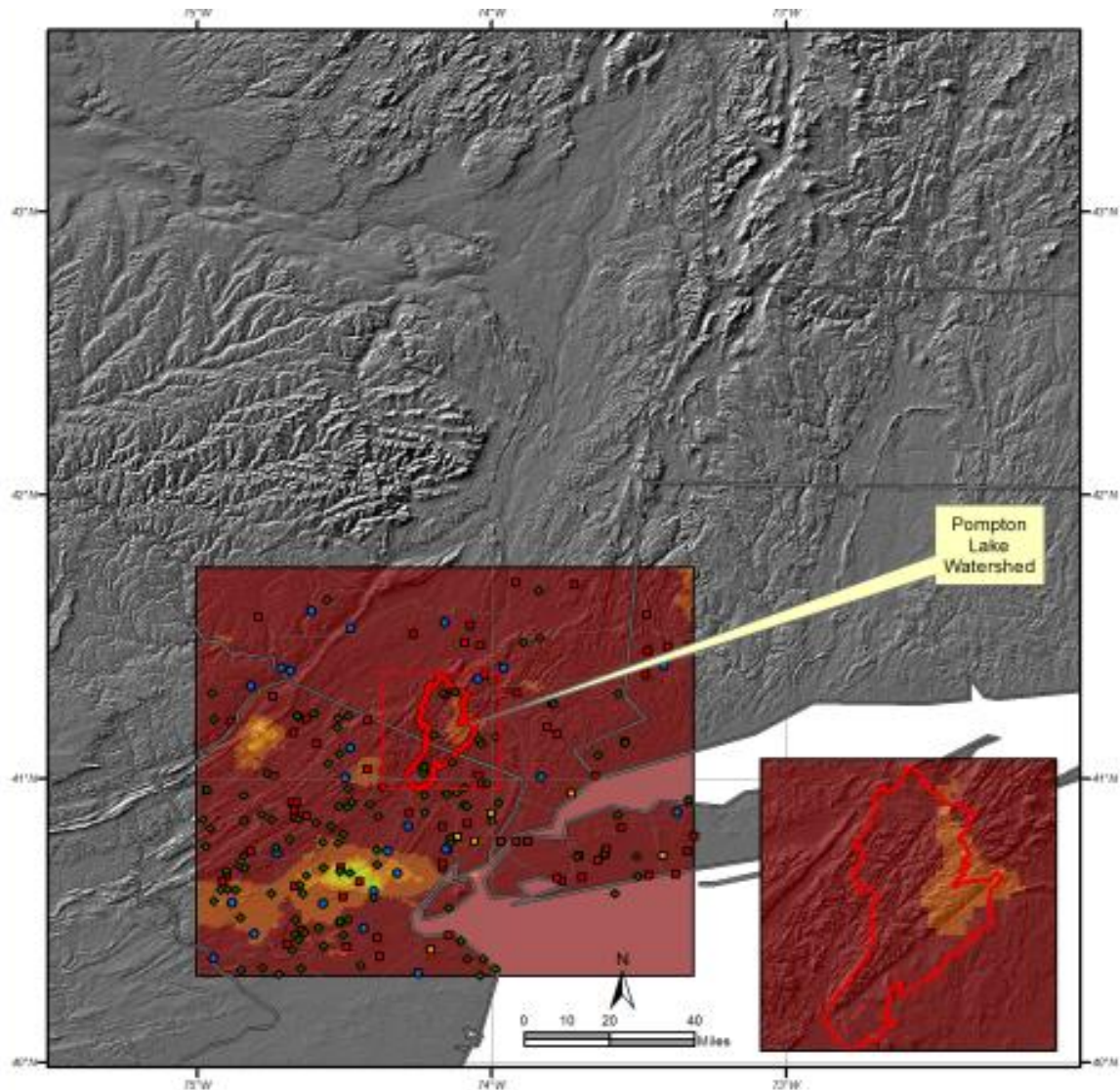
Figure 12 24-hour ARI over Pompton Lake Drainage Basin (PLDB)



Total Storm Precipitation (inches)
March 12, 2010 (2100 UTC) - March, 14, 2010 (2100 UTC)
SPAS #1221



Figure 13 Total Storm Precipitation of the March 12-14, 2010 Storm Domain



**6-hr Average Recurrence Interval of Maximum 6-hour Precipitation
 March 12, 2010 (2100 UTC) - March 14, 2010 (2100 UTC)
 SPAS #1221**

Inches

- | | | | | |
|-------------|---------------|-----------------|-----------------|---------------------|
| ■ ≤ 1.0 | ■ 4.1 - 5.0 | ■ 50.1 - 100.0 | ■ 400.1 - 500.0 | ● Daily |
| ■ 1.1 - 2.0 | ■ 5.1 - 10.0 | ■ 100.1 - 200.0 | □ > 500 | ■ Hourly |
| ■ 2.1 - 3.0 | ■ 10.1 - 20.0 | ■ 200.1 - 300.0 | | ■ Hourly Pseudo |
| ■ 3.1 - 4.0 | ■ 20.1 - 50.0 | ■ 300.1 - 400.0 | | ◆ Supplemental |
| | | | | ◆ Supplemental Est. |



Figure 14 6-hour ARI over the Storm Domain for the March 12-14, 2010 Precipitation Event

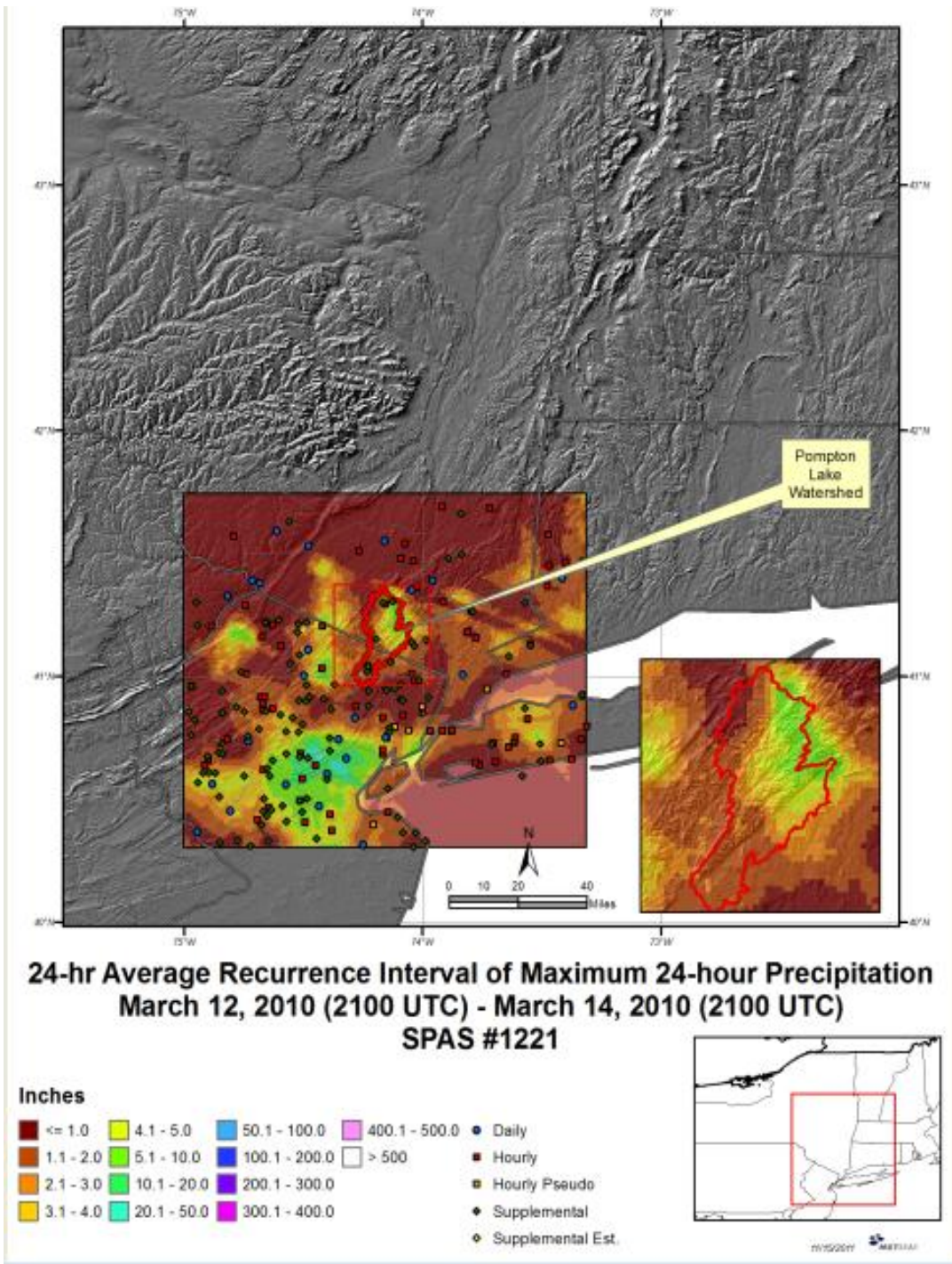


Figure 15 24-hour ARI over the Storm Domain for the March 12-14, 2010 Precipitation Event

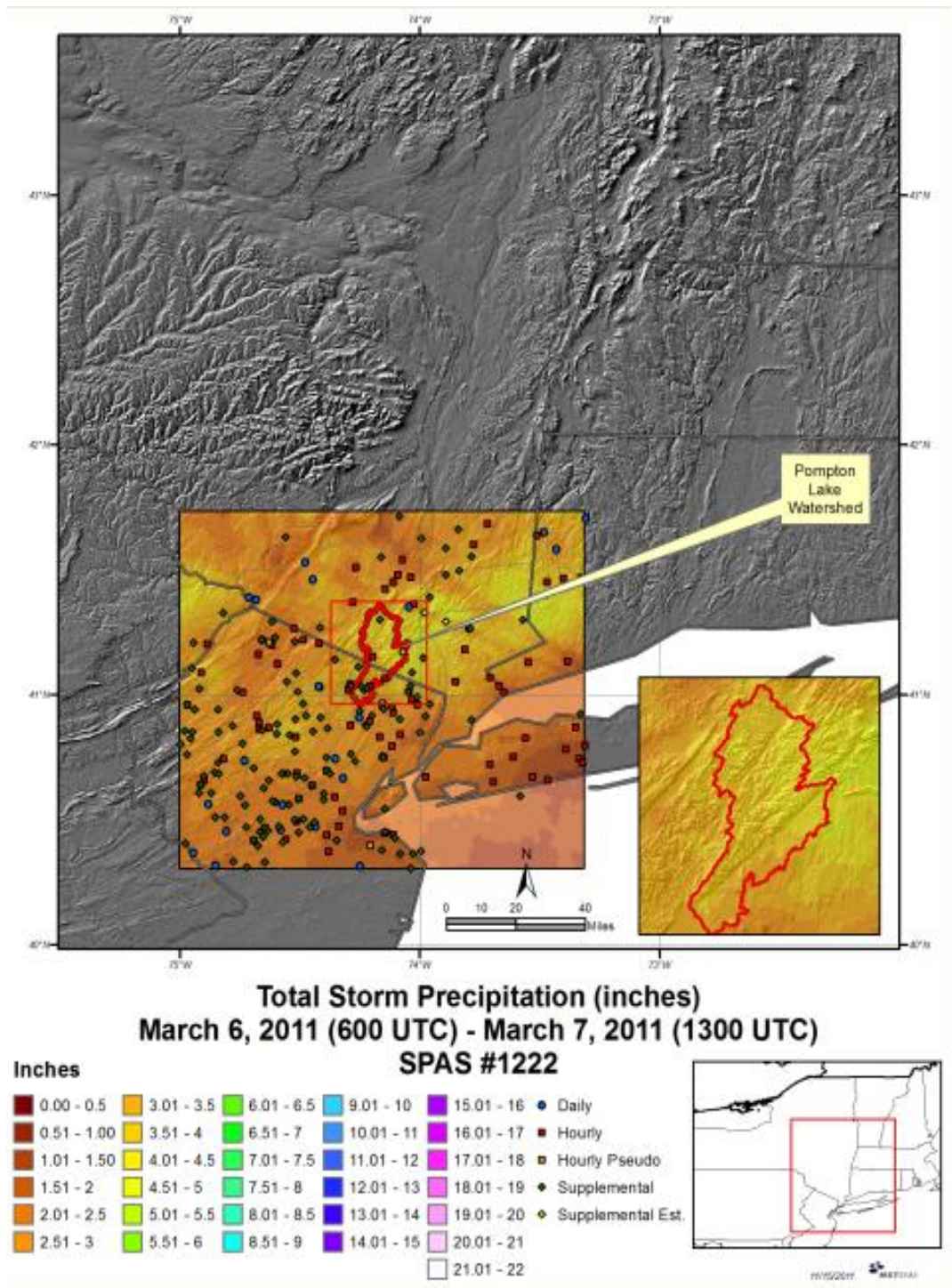


Figure 16 Total Storm Precipitation of the March 6-7, 2011 Storm Domain

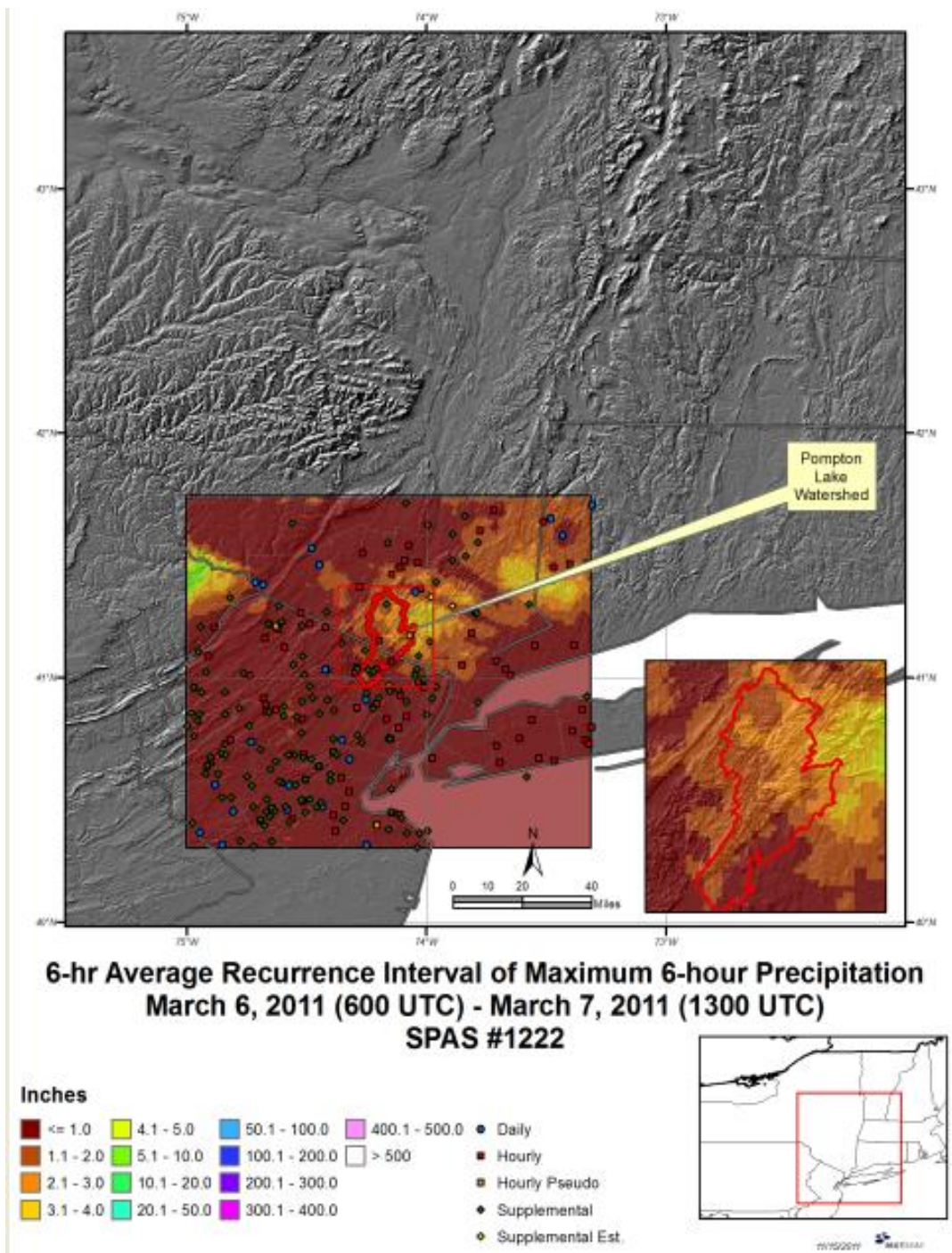


Figure 17 6-hour ARI over the Storm Domain for March 6-7, 2011 Precipitation Event

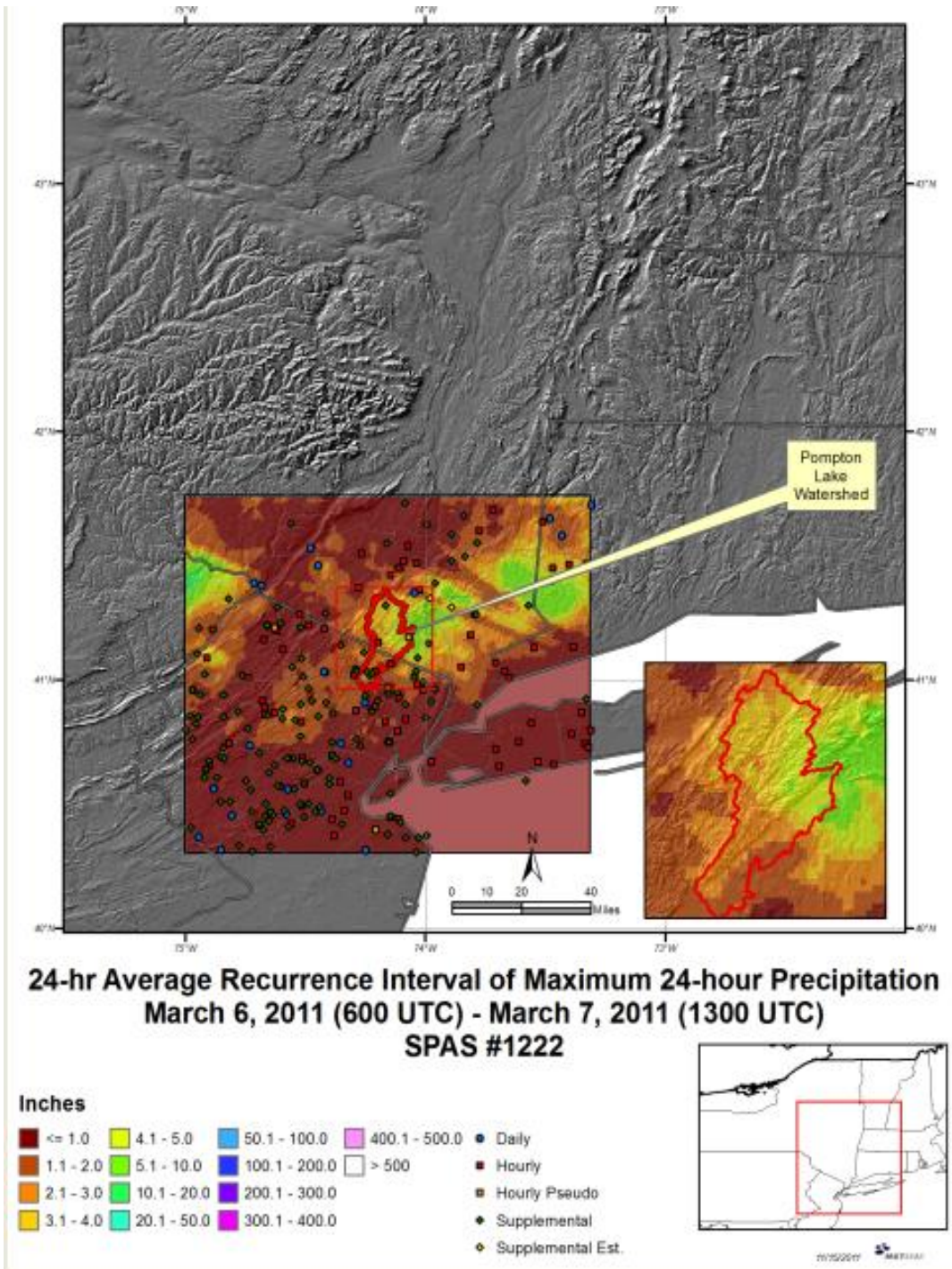


Figure 18 24-hour ARI over the Storm Domain for March 6-7, 2011 Precipitation Event

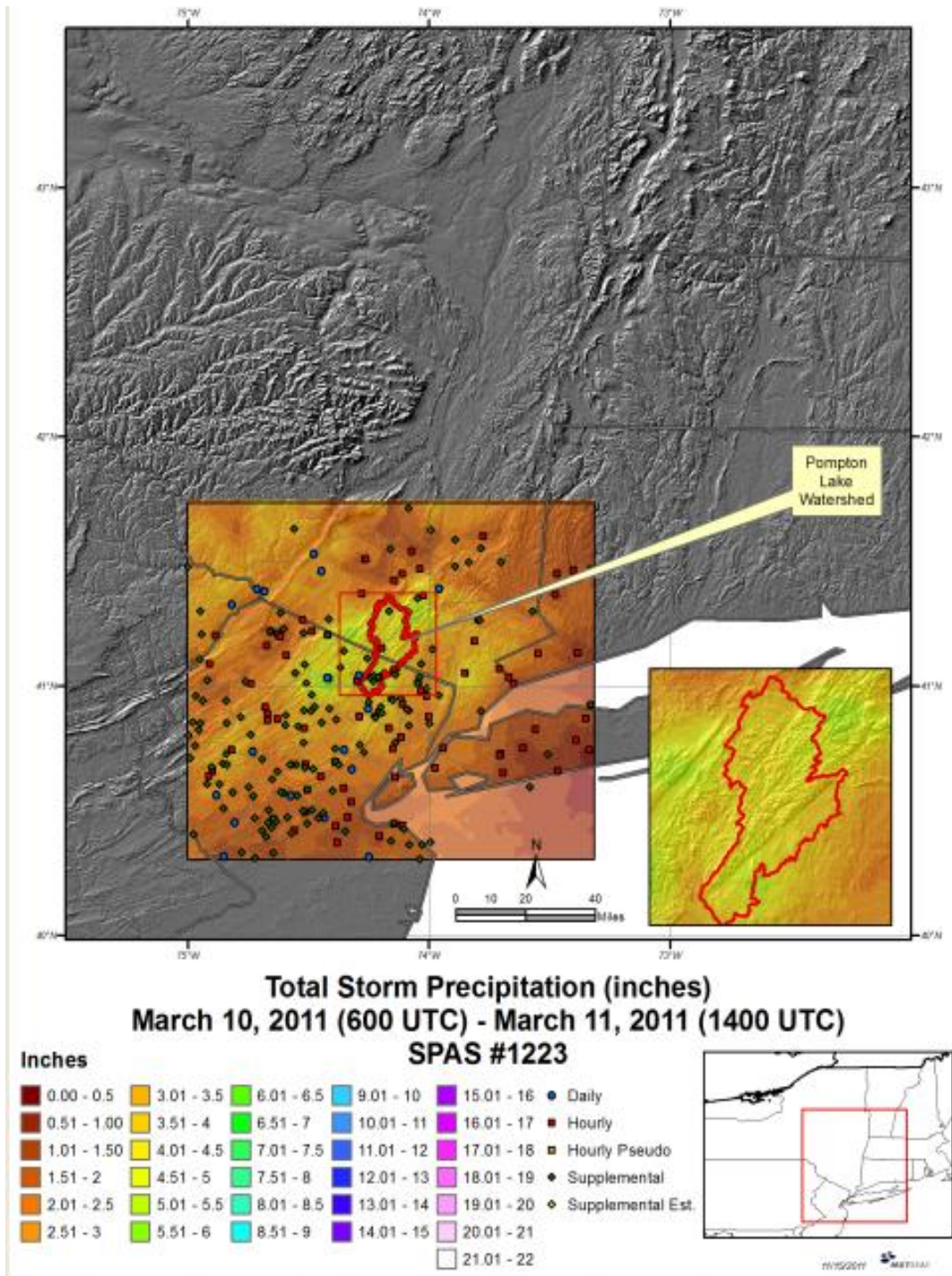


Figure 19 Total Storm Precipitation of the March 10-11, 2011 Storm Domain

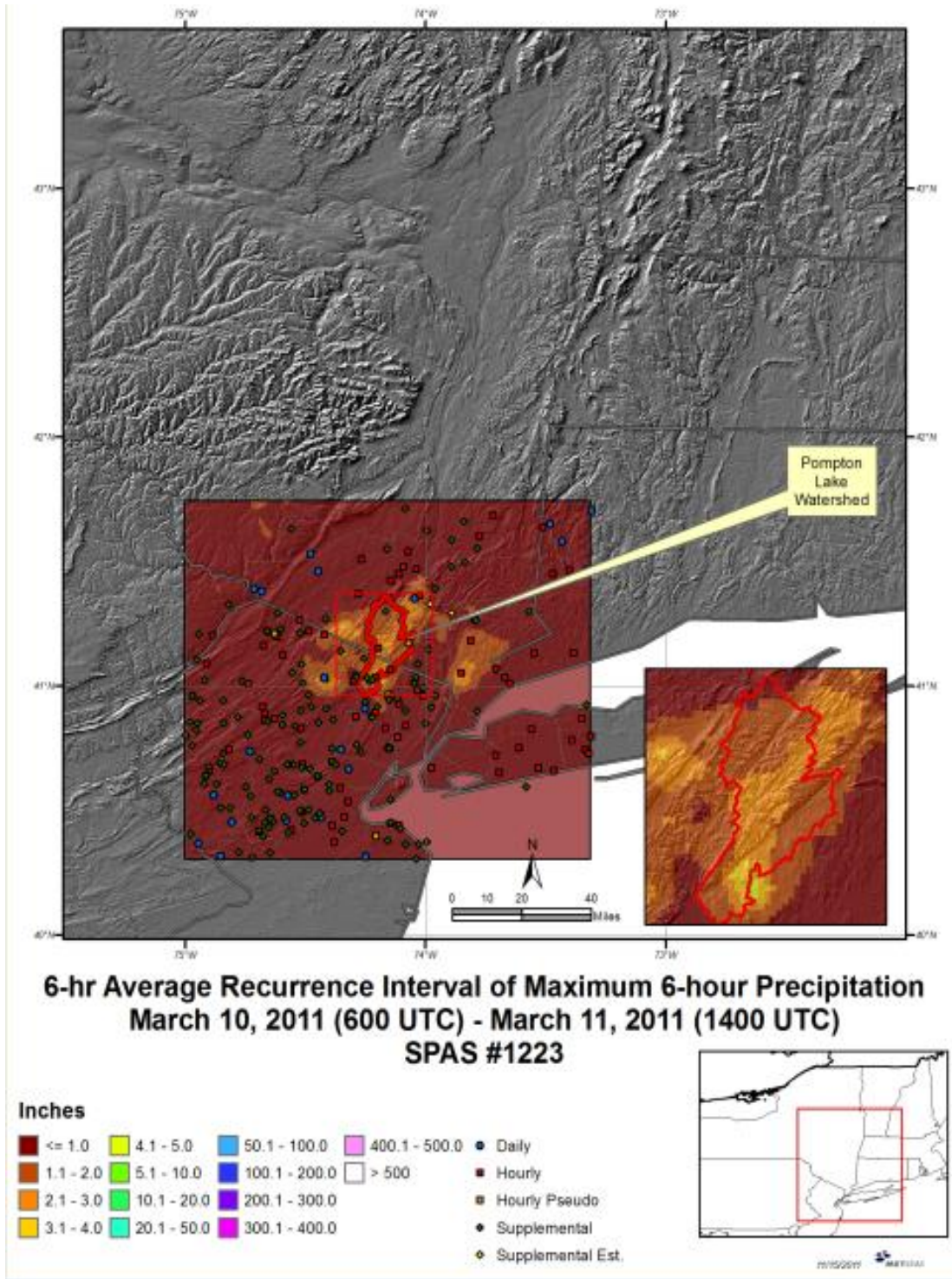
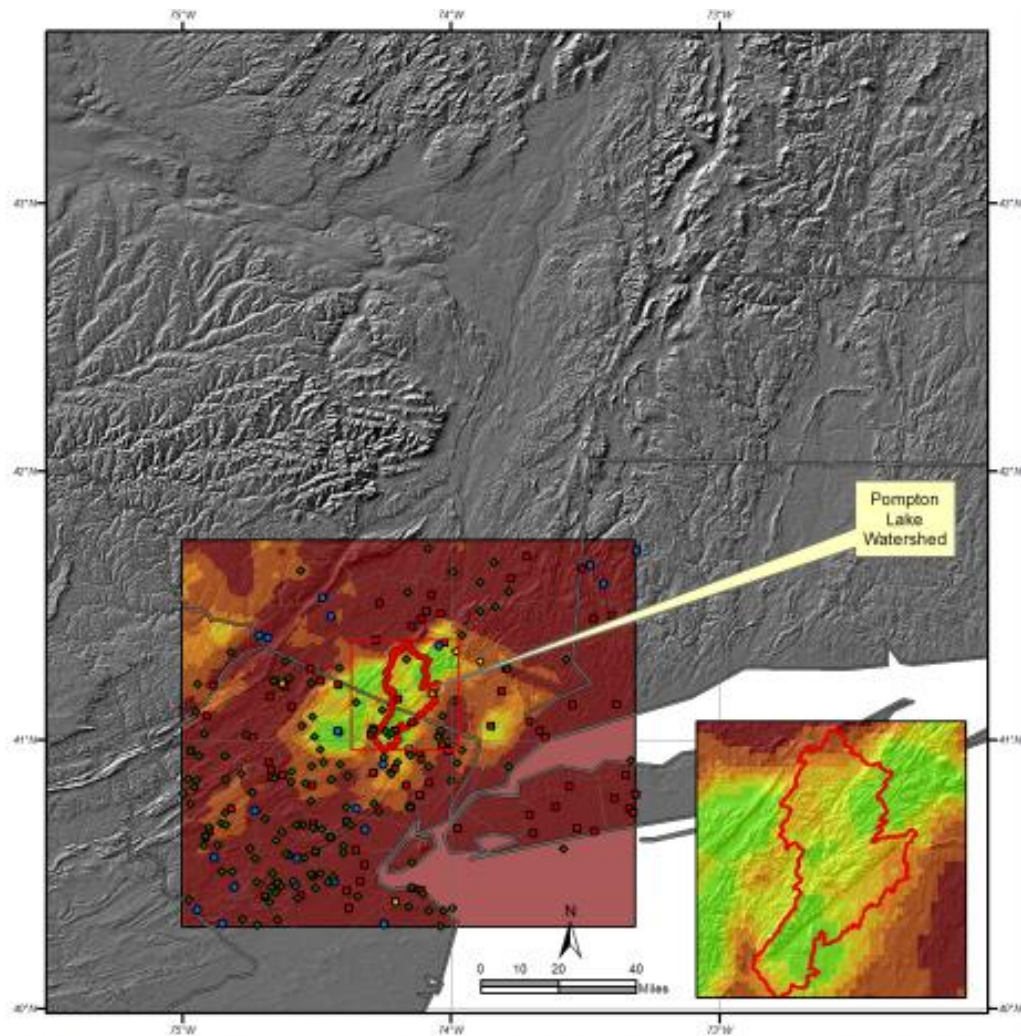


Figure 20 6-hour ARI over the Storm Domain for March 10-11, 2011 Precipitation Event



**24-hr Average Recurrence Interval of Maximum 24-hour Precipitation
 March 10, 2011 (600 UTC) - March 11, 2011 (1400 UTC)
 SPAS #1223**

Inches

- | | | | | |
|-------------|---------------|-----------------|-----------------|---------------------|
| ■ ≤ 1.0 | ■ 4.1 - 5.0 | ■ 50.1 - 100.0 | ■ 400.1 - 500.0 | ● Daily |
| ■ 1.1 - 2.0 | ■ 5.1 - 10.0 | ■ 100.1 - 200.0 | □ > 500 | ■ Hourly |
| ■ 2.1 - 3.0 | ■ 10.1 - 20.0 | ■ 200.1 - 300.0 | | ■ Hourly Pseudo |
| ■ 3.1 - 4.0 | ■ 20.1 - 50.0 | ■ 300.1 - 400.0 | | ◆ Supplemental |
| | | | | ◆ Supplemental Est. |



2/15/2011

Figure 21 24-hour ARI over the Storm Domain for March 10-11, 2011 Precipitation Event

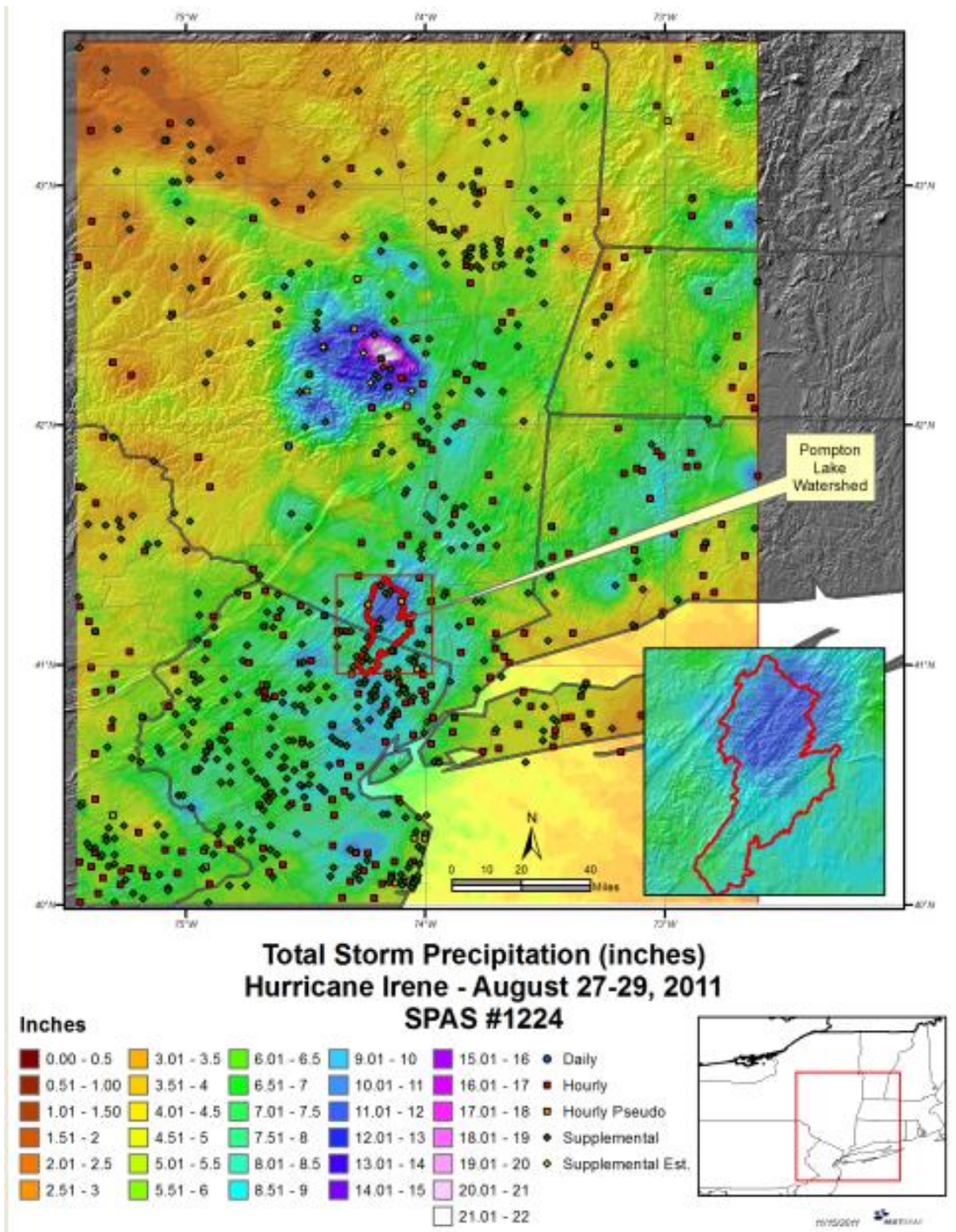
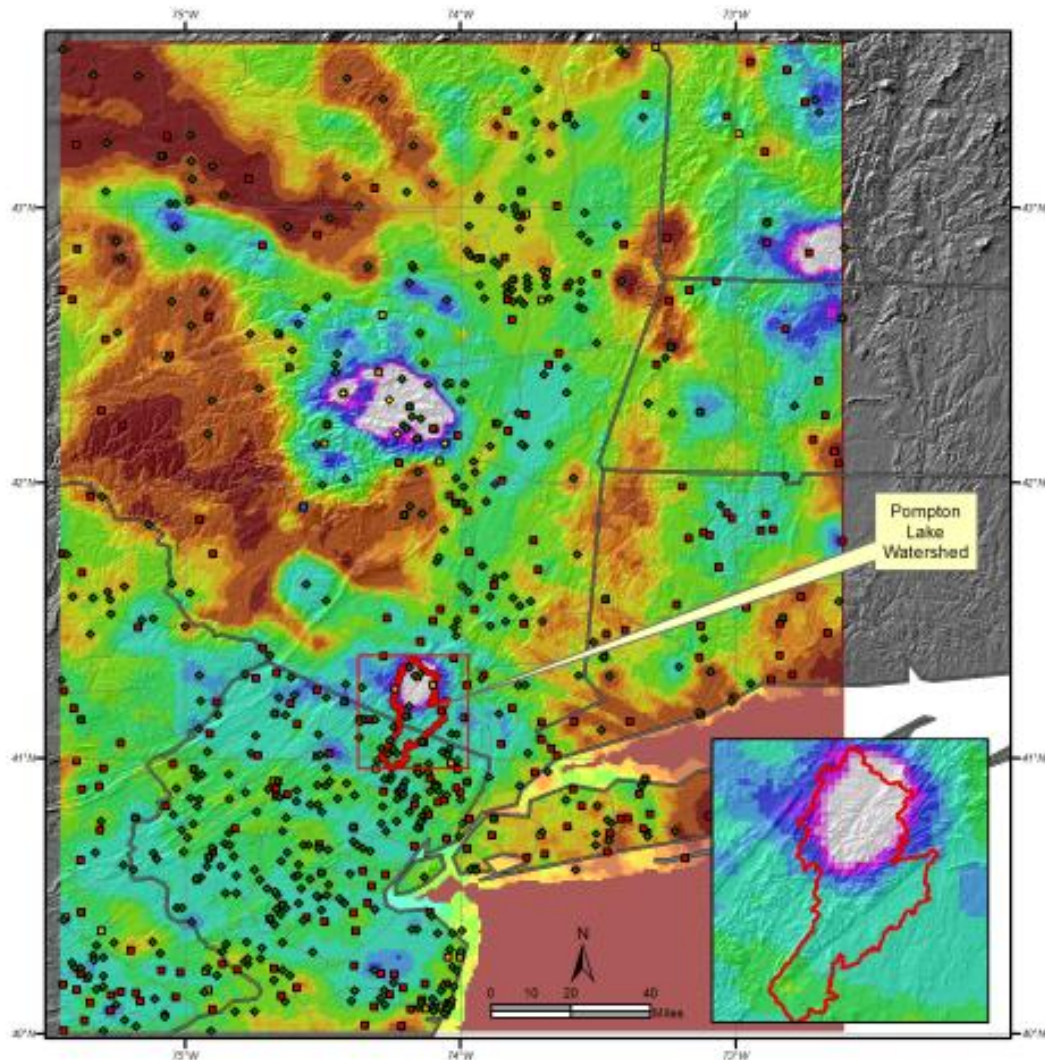


Figure 22 Total Storm Precipitation Hurricane Irene August 27-29, 2011 Storm Domain



**6-hr Average Recurrence Interval of Maximum 6-hour Precipitation
Hurricane Irene - August 27-29, 2011
SPAS #1224**

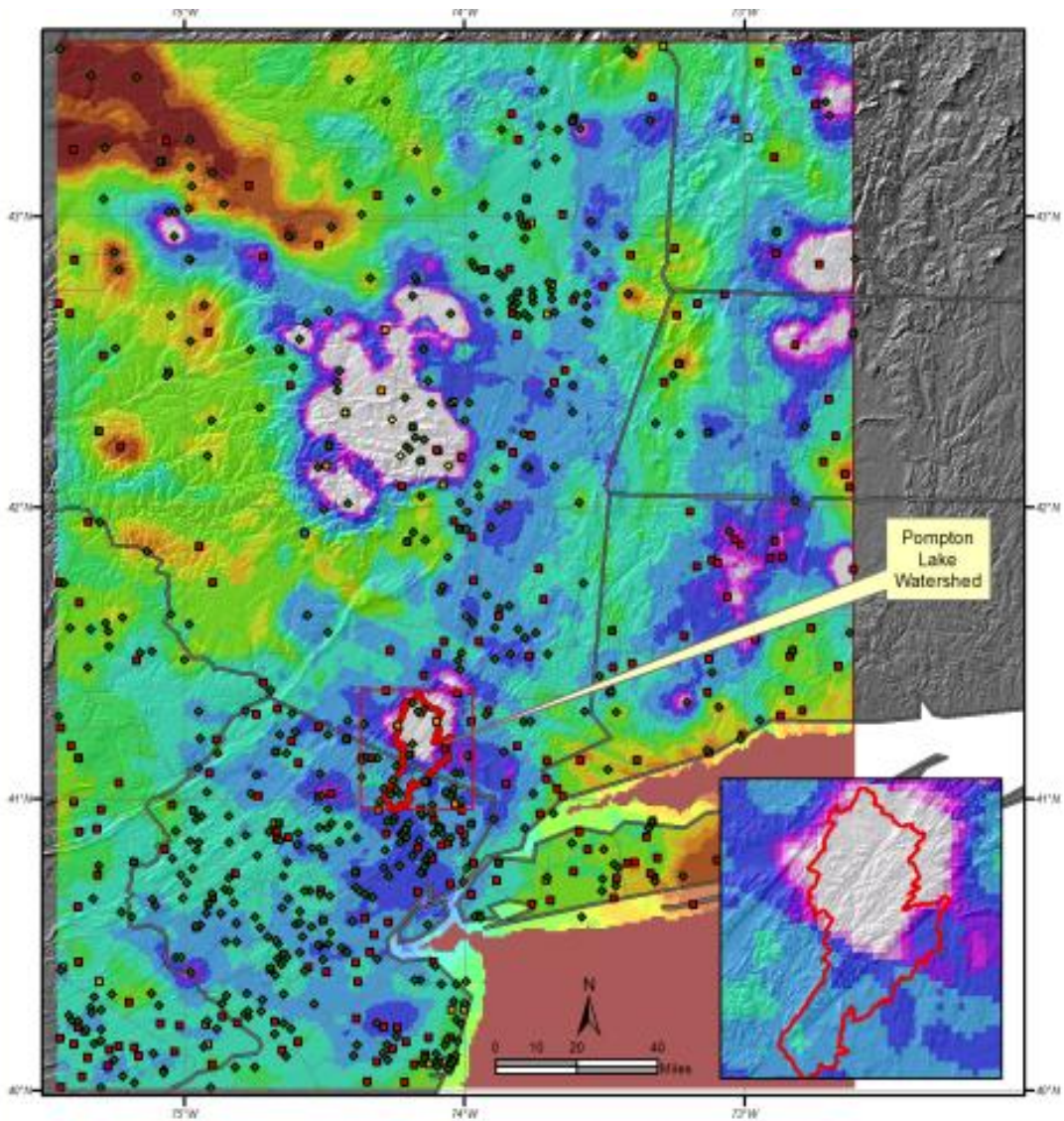
Inches

- | | | | | |
|-------------|---------------|-----------------|-----------------|---------------------|
| ■ ≤ 1.0 | ■ 4.1 - 5.0 | ■ 50.1 - 100.0 | ■ 400.1 - 500.0 | ● Daily |
| ■ 1.1 - 2.0 | ■ 5.1 - 10.0 | ■ 100.1 - 200.0 | □ > 500 | ■ Hourly |
| ■ 2.1 - 3.0 | ■ 10.1 - 20.0 | ■ 200.1 - 300.0 | | ● Hourly Pseudo |
| ■ 3.1 - 4.0 | ■ 20.1 - 50.0 | ■ 300.1 - 400.0 | | ◆ Supplemental |
| | | | | ◆ Supplemental Est. |



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Figure 23 6-hour ARI over the Storm Domain for Hurricane Irene August 27-29, 2011 Precipitation Event



**24-hr Average Recurrence Interval of Maximum 24-hour Precipitation
Hurricane Irene - August 27-29, 2011
SPAS #1224**

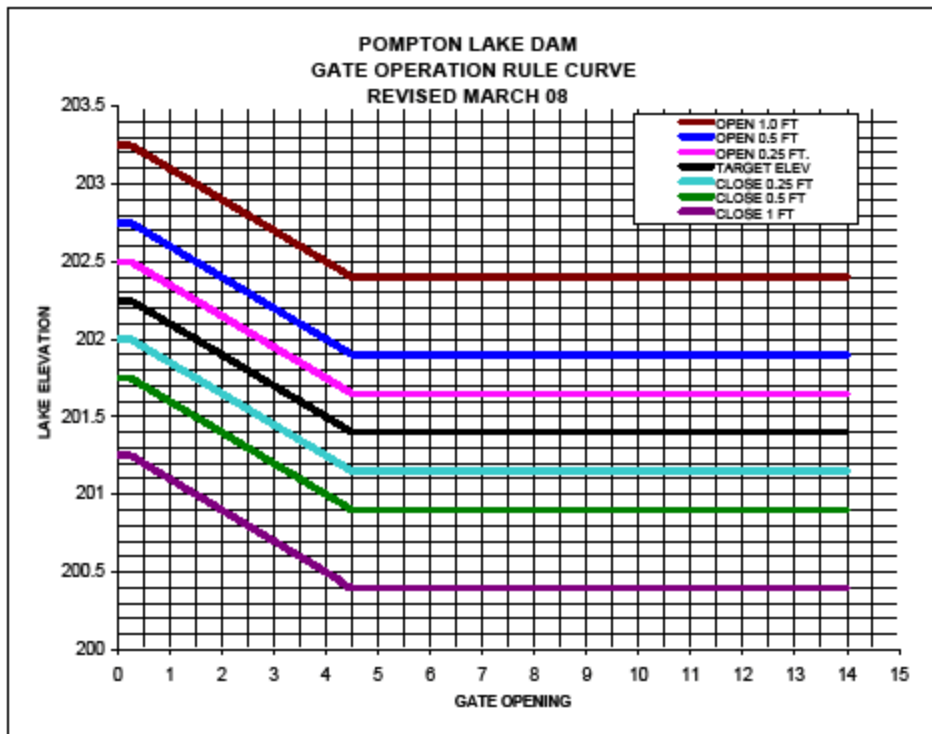
Inches

- | | | | | |
|-------------|---------------|-----------------|-----------------|---------------------|
| ■ ≤ 1.0 | ■ 4.1 - 5.0 | ■ 50.1 - 100.0 | ■ 400.1 - 500.0 | ● Daily |
| ■ 1.1 - 2.0 | ■ 5.1 - 10.0 | ■ 100.1 - 200.0 | □ > 500 | ■ Hourly |
| ■ 2.1 - 3.0 | ■ 10.1 - 20.0 | ■ 200.1 - 300.0 | | ■ Hourly Pseudo |
| ■ 3.1 - 4.0 | ■ 20.1 - 50.0 | ■ 300.1 - 400.0 | | ◆ Supplemental |
| | | | | ◆ Supplemental Est. |



Figure 24 24-hour ARI over the Storm Domain for Hurricane Irene August 27-29, 2011 Precipitation Event

Appendix C
OPERATING RULE CURVE



EXCEPTIONS
LAKE LEVEL RISING - DO NOT CLOSE GATES
LAKE LEVEL FALLING - DO NOT OPEN GATES

GATE OPERATION RULE CURVE - DATA							
GATE	OPEN 1.0	OPEN 0.5	OPEN 0.25	TARGET	CLOSE 0.25	CLOSE 0.5	CLOSE 1.0
0	203.25	202.75	202.5	202.25	202	201.75	201.25
0.25	203.25	202.75	202.5	202.25	202	201.75	201.25
0.5	203.2	202.7	202.45	202.2	201.95	201.7	201.2
0.75	203.15	202.65	202.4	202.15	201.9	201.65	201.15
1	203.1	202.6	202.35	202.1	201.85	201.6	201.1
1.25	203.05	202.55	202.3	202.05	201.8	201.55	201.05
1.5	203	202.5	202.25	202	201.75	201.5	201
1.75	202.95	202.45	202.2	201.95	201.7	201.45	200.95
2	202.9	202.4	202.15	201.9	201.65	201.4	200.9
2.25	202.85	202.35	202.1	201.85	201.6	201.35	200.85
2.5	202.8	202.3	202.05	201.8	201.55	201.3	200.8
2.75	202.75	202.25	202	201.75	201.5	201.25	200.75
3	202.7	202.2	201.95	201.7	201.45	201.2	200.7
3.25	202.65	202.15	201.9	201.65	201.4	201.15	200.65
3.5	202.6	202.1	201.85	201.6	201.35	201.1	200.6
3.75	202.55	202.05	201.8	201.55	201.3	201.05	200.55
4	202.5	202	201.75	201.5	201.25	201	200.5
4.25	202.45	201.95	201.7	201.45	201.2	200.95	200.45
4.5	202.4	201.9	201.65	201.4	201.15	200.9	200.4
14	202.4	201.9	201.65	201.4	201.15	200.9	200.4



RAMAPO RIVER @ OAKLAND, NEW JERSEY

GATE OPERATION

The gates are operated to maintain a set point pool elevation in Pompton Lake. The set point elevations are defined as a function of the gate opening and lake level, and vary from 202.25 at a gate opening of 0 ft to 201.4 at gate openings equal to or exceeding 4.5 ft as defined in the Gate Operation Rule Curve. Elevations are referenced to the National Geodetic Vertical Datum (N.G.V.D.).

The gate operation is a function of the difference between the lake elevation and the set point elevation. If the lake level is more than 0.25 ft above the set point elevation, the gates are to be opened 0.25 ft; if the lake level is more than 0.5 ft above the set point elevation, the gates are to be opened 0.5 ft; if the lake level is more than 1.0 ft above the set point elevation, the gates are to be opened 1.0 ft. Similarly, if the lake level is more than 0.25 ft below the set point elevation, the gates are to be closed 0.25 ft; if the lake level is more than 0.5 ft below the set point elevation, the gates are to be closed 0.5 ft; if the lake level is more than 1.0 ft below the set point elevation, the gates are to be closed 1.0 ft.

The only exception to these rules is that if the lake level is falling, then the gates would not be opened. Similarly, if the lake level is rising, then the gates would not be closed. These exceptions will minimize lake level oscillations.

Under normal conditions, the gates remain closed and all outflow passes over the fixed spillway portion of the dam. The gates are initially opened 0.25 ft when the lake elevation reaches 202.5, or 0.25 ft above the target elevation of 202.25 for a gate opening of 0. Initial gate opening will be controlled by the PLC/RTU automatic control equipment if the controls are in SCADA AUTO, or can be remotely controlled from either of the two SCADA PC work stations, or locally controlled from the gate control console cabinets.

Every 15 minutes thereafter, the lake level and stream flow gauges are checked, and the gates operated automatically if necessary. The two gates can be opened simultaneously, or sequentially, but they should maintain the same opening.



Defining the gate operation as a function of gate opening and lake level allows the gates to be operated manually, without the benefit of computers and gauge data, should those systems become inoperable for any reason. Under such a situation, the gate operator need only check the gate opening and staff gauge at the dam site, and then plot that data on the rule curve to determine the required gate operation.

Should one gate fail to operate, the gate operation would follow the same rules as the normal two gate operation. The one gate will simply open faster since the rules will make that gate open more frequently.



SEQUENCE OF OPERATIONS – TAINTER GATES

A. INITIATION OF GATE OPERATION

1. Lake level reaches 202.2, alarm sounds at Water Commission HQ in Wanaque.
2. Lake level reaches 202.5 (approx. 30 min after alarm sounded)
 - a. A warning is sounded.
 - b. Gate operation is initiated automatically or manually.
3. At 15 minute intervals:
 - a. Gate operation continues automatically or,
 - b. Operator can manually override gate operation as necessary.

B. RETURN TO NORMAL OPERATION

1. Normal gate operation closes gates.
2. Operator dispatched to site to inspect and lubricate all equipment.



Appendix D
SURVEY CROSS SECTION DATA



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {7467F3E7-6DBC-4B2B-8534-52B2D82D8247}	Stream	Centerline
Name: BE_RAM_22XS	Name:	Station: 1,212.33
Location: 67 LAKEVIEW TERR	Station: 0.00	Easting: 557,073.56
County:	Orientation: Looking D/S	Northing: 795,078.31
State:	Datum	Invert: 177.87
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_22XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	558,247.19	795,156.63	411.77	219.28	SPECIAL	RAM_06A FLD
2	558,247.18	795,156.63	411.78	219.27	SPECIAL	PA_RAM_06A
3	558,078.11	795,369.56	680.21	215.24	SPECIAL	PA_RAM_22BXS REF
4	557,968.35	795,512.29	857.50	210.06	SPECIAL	PA_RAM_06B
5	557,968.35	795,512.29	857.51	210.04	SPECIAL	RAM_06B FLD
6	557,236.13	794,921.71	1,000.00	201.19	GR	GR
7	557,236.13	794,921.71	1,000.00	201.19	SPECIAL	ALPT1
8	557,300.61	795,024.16	1,021.46	203.18	SPECIAL	PA_RAM_22CXS
9	557,219.92	794,936.14	1,021.70	201.51	GR	GR
10	557,207.26	794,953.88	1,043.01	202.67	GR	GR
11	557,197.37	794,961.85	1,055.69	202.72	GR	GR
12	557,181.62	794,981.50	1,080.56	203.04	GR	GR
13	557,172.73	794,986.36	1,090.41	202.68	CB	Channelbank [CB
14	557,171.02	794,988.60	1,093.18	200.79	TE	TE
15	557,168.58	794,990.86	1,096.51	198.16	H2O	H2O
16	557,167.92	794,993.23	1,098.59	197.03	H2O	H2O
17	557,163.85	794,999.13	1,105.58	195.06	H2O	H2O
18	557,155.94	795,006.52	1,116.40	191.32	H2O	H2O
19	557,130.33	795,022.24	1,145.92	183.33	H2O	H2O
20	557,098.62	795,058.15	1,193.54	177.87	H2O	H2O
21	557,072.44	795,078.12	1,226.34	182.54	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_22XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	557,054.72	795,097.45	1,252.46	191.32	H2O	H2O
23	557,048.42	795,101.36	1,259.74	192.34	H2O	H2O
24	557,025.62	795,122.08	1,290.56	194.27	H2O	H2O
25	557,004.18	795,140.11	1,318.54	195.16	H2O	H2O
26	556,998.56	795,148.41	1,328.30	197.07	H2O	H2O
27	556,996.27	795,149.88	1,330.98	197.82	H2O	H2O
28	556,995.96	795,150.29	1,331.48	200.78	TE	TE
29	556,995.66	795,150.53	1,331.86	201.56	CB	Channelbank [CB
30	556,987.81	795,153.26	1,339.51	202.81	GR	GR
31	556,971.16	795,166.18	1,360.51	202.68	GR	GR
32	556,426.23	794,573.35	1,363.18	202.79	SPECIAL	PA_RAM_21A FLD
33	556,426.23	794,573.35	1,363.18	202.79	SPECIAL	DATE 10-18-2011
34	556,426.07	794,573.47	1,363.38	202.75	SPECIAL	PA_RAM_21AXS BS
35	556,948.25	795,184.63	1,389.87	202.74	GR	GR
36	556,931.95	795,199.65	1,412.03	202.74	GR	GR
37	556,919.32	795,211.27	1,429.19	203.11	GR	GR
38	556,909.93	795,219.75	1,441.85	202.57	SPECIAL	BE_RAM_22AXS
39	556,902.81	795,225.85	1,451.22	202.70	GR	GR
40	556,902.70	795,226.16	1,451.51	202.71	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {172C26B9-9908-486F-9356-7DE06D99476A}	Stream	Centerline
Name: BE_RAM_23XS	Name:	Station: 1,226.75
Location: 22 RAMAPO TERR	Station: 0.00	Easting: 557,647.75
County:	Orientation: Looking D/S	Northing: 795,217.48
State:	Datum	Invert: 189.48
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_23XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	557,728.17	794,899.29	1,000.00	202.71	SPECIAL	ALPT1
2	557,728.16	794,899.33	1,000.04	202.71	GR	GR
3	557,724.10	794,920.57	1,021.63	202.94	GR	GR
4	557,717.09	794,946.52	1,048.51	203.19	GR	GR
5	557,710.75	794,970.09	1,072.91	203.62	GR	GR
6	557,709.76	794,972.10	1,075.10	204.77	GR	GR
7	557,708.00	794,977.91	1,081.17	204.76	GR	GR
8	557,704.31	794,985.94	1,089.86	202.83	GR	GR
9	557,701.92	794,994.00	1,098.26	202.52	GR	GR
10	557,697.90	795,017.89	1,122.40	202.59	SPECIAL	BE_RAM_23AXS
11	557,696.86	795,022.72	1,127.34	202.69	CB	Channelbank [CB
12	557,695.36	795,027.14	1,131.99	200.72	TE	TE
13	557,693.34	795,031.23	1,136.45	199.52	H2O	H2O
14	557,691.88	795,034.69	1,140.16	198.00	H2O	H2O
15	557,689.75	795,048.45	1,154.03	193.10	H2O	H2O
16	557,683.15	795,076.11	1,182.46	189.98	H2O	H2O
17	557,674.62	795,098.20	1,205.97	190.12	H2O	H2O
18	557,668.48	795,131.43	1,239.68	189.88	H2O	H2O
19	557,660.72	795,156.51	1,265.91	189.48	H2O	H2O
20	557,654.86	795,175.80	1,286.04	189.51	H2O	H2O
21	557,649.48	795,194.22	1,305.22	193.41	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_23XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	557,650.26	795,204.35	1,314.85	198.34	H2O	H2O
23	557,649.04	795,210.91	1,321.51	200.66	TE	TE
24	557,648.55	795,214.30	1,324.91	201.30	CB	Channelbank [CB
25	557,643.95	795,233.74	1,344.90	201.63	GR	GR
26	557,640.73	795,247.57	1,359.09	201.05	GR	GR
27	558,078.15	795,369.52	1,370.54	215.23	SPECIAL	RAM_22B BS CHK
28	558,078.11	795,369.55	1,370.58	215.21	SPECIAL	DATE 10-11-2011
29	558,078.11	795,369.55	1,370.58	215.21	SPECIAL	BE_RAM_22B FLD
30	558,078.11	795,369.56	1,370.58	215.24	SPECIAL	BE_RAM_22BXS REF
31	557,635.77	795,267.75	1,379.87	200.69	GR	GR
32	557,633.39	795,277.40	1,389.81	200.76	GR	GR
33	557,630.44	795,288.30	1,401.10	199.86	GR	GR XH2O
34	557,628.29	795,297.31	1,410.36	199.84	GR	GR XH2O
35	557,624.67	795,311.59	1,425.10	198.98	GR	GR XH2O
36	557,624.61	795,311.93	1,425.44	198.97	GR	GR XH2O
37	557,622.39	795,320.83	1,434.61	197.72	GR	GR XH2O
38	557,621.37	795,326.00	1,439.87	197.58	GR	GR XH2O
39	557,618.94	795,332.88	1,447.14	198.72	GR	GR XH2O
40	557,612.42	795,361.53	1,476.51	200.72	GR	GR
41	557,608.00	795,376.71	1,492.32	201.10	GR	GR
42	557,605.34	795,390.21	1,506.05	200.72	GR	GR
43	557,603.37	795,398.37	1,514.45	200.12	GR	GR XH2O
44	557,599.61	795,408.44	1,525.13	200.02	GR	GR XH2O
45	557,596.73	795,418.74	1,535.82	198.85	GR	GR XH2O
46	557,594.15	795,432.09	1,549.39	197.35	GR	GR XH2O
47	557,588.12	795,454.47	1,572.57	197.01	GR	GR XH2O
48	557,582.11	795,477.87	1,596.73	196.49	GR	GR XH2O
49	557,575.47	795,504.36	1,624.04	195.54	GR	GR XH2O
50	557,571.55	795,519.31	1,639.49	196.87	GR	GR XH2O
51	557,570.48	795,526.86	1,647.08	198.62	GR	GR XH2O
52	557,570.31	795,528.09	1,648.32	200.99	GR	GR XTE
53	557,570.31	795,528.75	1,648.96	202.24	GR	GR
54	557,567.90	795,535.78	1,656.36	203.18	SPECIAL	ALPT2
55	557,567.90	795,535.78	1,656.36	203.18	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {10C6719C-19E0-4190-8905-8ECC5E8EB630}	Stream	Centerline
Name: BE_RAM_24XS	Name:	Station: 1,272.19
Location: 30 ISLAND TERR	Station: 0.00	Easting: 558,333.01
County:	Orientation: Looking D/S	Northing: 795,839.33
State:	Datum	Invert: 188.37
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_24XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	559,032.85	797,450.88	102.39	206.75	SPECIAL	BE_RAM_28AXS
2	558,514.65	797,469.68	592.22	207.48	SPECIAL	BE_RAM_27C BS
3	558,514.58	797,469.72	592.29	207.40	SPECIAL	DATE 10-20-2011
4	558,514.58	797,469.72	592.29	207.44	SPECIAL	BE_RAM_27C FLD
5	558,514.57	797,469.65	592.32	207.62	SPECIAL	BE_RAM_27C
6	558,569.35	795,902.76	1,000.00	205.34	SPECIAL	ALPT1
7	558,569.33	795,902.75	1,000.02	205.31	GR	GR
8	558,553.15	795,898.60	1,016.70	205.49	GR	GR
9	558,529.89	795,892.00	1,040.88	205.27	GR	GR
10	558,504.58	795,885.17	1,067.08	204.51	GR	GR
11	558,484.88	795,879.96	1,087.44	203.52	GR	GR
12	558,463.74	795,874.25	1,109.33	203.55	GR	GR
13	558,439.81	795,868.10	1,134.00	203.39	GR	GR
14	558,439.68	795,868.19	1,134.10	203.39	GR	GR
15	558,424.67	795,863.89	1,149.72	203.25	GR	GR
16	558,410.35	795,859.35	1,164.73	203.88	GR	GR
17	558,390.80	795,854.60	1,184.82	203.66	CB	Channelbank [CB
18	558,386.79	795,853.75	1,188.90	201.28	TE	TE
19	558,384.58	795,853.15	1,191.19	200.05	H2O	H2O
20	558,379.75	795,852.14	1,196.10	199.13	H2O	H2O
21	558,374.75	795,852.90	1,200.66	197.41	H2O	H2O



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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_24XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	558,372.30	795,853.31	1,202.88	195.47	H2O	H2O
23	558,357.57	795,845.25	1,219.33	190.64	H2O	H2O
24	558,344.84	795,837.75	1,233.70	189.44	H2O	H2O
25	558,326.29	795,838.11	1,251.33	188.82	H2O	H2O
26	558,321.91	795,830.63	1,257.71	188.92	H2O	H2O
27	558,314.54	795,832.74	1,264.14	188.79	H2O	H2O
28	558,296.24	795,820.60	1,285.19	188.37	H2O	H2O
29	558,275.24	795,817.73	1,306.11	188.77	H2O	H2O
30	558,257.99	795,813.62	1,323.80	190.87	H2O	H2O
31	558,241.21	795,811.09	1,340.59	195.31	H2O	H2O
32	558,233.44	795,811.14	1,348.01	197.57	H2O	H2O
33	558,226.60	795,810.98	1,354.59	198.41	H2O	H2O
34	558,225.70	795,810.91	1,355.47	201.26	TE	TE
35	558,224.39	795,810.62	1,356.80	202.30	CB	Channelbank [CB
36	558,218.94	795,808.08	1,362.76	202.57	SPECIAL	BE_RAM_24AXS
37	558,206.39	795,804.29	1,375.88	202.60	GR	GR
38	558,187.96	795,797.32	1,395.54	202.47	GR	GR
39	558,168.81	795,787.84	1,416.62	202.65	GR	GR
40	558,147.23	795,784.41	1,438.26	202.36	GR	GR
41	558,128.94	795,774.97	1,458.52	202.28	GR	GR
42	558,102.40	795,759.34	1,488.48	203.18	GR	GR
43	558,102.40	795,759.34	1,488.48	203.19	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {75E7CCCD-A840-4964-8BDC-EEFF26AEF60B}	Stream	Centerline
Name: BE_RAM_25XS	Name:	Station: 1,321.09
Location: DIVERSION CHANNEL	Station: 0.00	Easting: 558,338.25
County:	Orientation: Looking D/S	Northing: 796,184.92
State:	Datum	Invert: 188.84
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_25XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	559,032.85	797,450.88	407.49	206.75	SPECIAL	BE_RAM_28AXS
2	558,514.57	797,469.65	919.05	207.62	SPECIAL	BE_RAM_27C REF
3	558,595.27	796,219.10	999.98	203.51	GR	GR
4	558,595.25	796,219.11	1,000.00	203.51	SPECIAL	ALPT1
5	558,589.12	796,217.58	1,006.27	204.12	GR	GR
6	558,571.48	796,217.81	1,023.74	204.77	GR	GR
7	558,550.84	796,213.82	1,044.72	204.29	GR	GR
8	558,523.84	796,209.78	1,072.02	204.51	GR	GR
9	558,505.38	796,202.28	1,091.29	203.05	GR	GR
10	558,481.07	796,200.44	1,115.63	202.65	GR	GR
11	558,453.39	796,199.07	1,143.26	203.79	GR	GR
12	558,437.82	796,198.07	1,158.83	204.39	GR	GR
13	558,409.43	796,192.62	1,187.68	204.96	GR	GR
14	558,396.40	796,192.23	1,200.65	204.68	GR	GR
15	558,384.36	796,191.05	1,212.75	204.29	GR	GR
16	558,374.35	796,257.43	1,214.13	206.71	SPECIAL	BE_RAM_25A NL
17	558,372.39	796,188.57	1,224.93	203.79	CB	Channelbank [CB
18	558,365.81	796,189.06	1,231.40	201.22	TE	TE
19	558,362.85	796,189.55	1,234.27	199.61	H2O	H2O
20	558,352.99	796,183.25	1,244.86	197.11	H2O	H2O
21	558,337.16	796,182.73	1,260.63	192.90	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_25XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	558,335.90	796,186.56	1,261.38	192.68	H2O	H2O
23	558,317.85	796,181.07	1,279.99	190.10	H2O	H2O
24	558,298.41	796,173.48	1,300.24	188.84	H2O	H2O
25	558,281.91	796,171.53	1,316.86	190.12	H2O	H2O
26	558,261.17	796,169.19	1,337.73	189.81	H2O	H2O
27	558,241.53	796,164.61	1,357.79	190.00	H2O	H2O
28	558,220.98	796,167.59	1,377.78	195.16	H2O	H2O
29	558,202.03	796,172.58	1,395.94	196.71	H2O	H2O
30	558,195.10	796,170.32	1,403.10	197.59	H2O	H2O
31	558,188.77	796,168.08	1,409.66	199.99	H2O	H2O
32	558,187.69	796,167.86	1,410.77	201.22	TE	TE
33	558,186.55	796,168.71	1,411.78	201.73	CB	Channelbank [CB
34	558,177.35	796,168.42	1,420.95	201.61	GR	GR
35	558,175.23	796,167.94	1,423.11	202.99	GR	GR
36	558,219.05	795,808.02	1,425.99	202.51	SPECIAL	BE_RAM_24A BS
37	558,218.94	795,808.08	1,426.08	202.57	SPECIAL	BE_RAM_24AXS
38	558,218.94	795,808.06	1,426.09	202.56	SPECIAL	DATE 10-20-2011
39	558,218.94	795,808.06	1,426.09	202.56	SPECIAL	BE_RAM_24AXS FLD
40	558,169.90	796,169.20	1,428.24	203.67	GR	GR
41	558,153.85	796,169.45	1,444.12	204.05	GR	GR
42	558,132.05	796,167.64	1,465.97	203.84	GR	GR
43	558,103.50	796,159.53	1,495.33	203.39	GR	GR
44	558,081.07	796,152.37	1,518.49	203.77	GR	GR
45	558,081.07	796,152.37	1,518.49	203.78	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {4EB261D6-65D6-4C1D-AC61-C6775322DEFD}	Stream	Centerline
Name: BE_RAM_26XS	Name:	Station: 1,509.99
Location: DS OF BOAT RAMP	Station: 0.00	Easting: 558,346.59
County:	Orientation: Looking D/S	Northing: 796,912.43
State:	Datum	Invert: 184.99
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_26XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	558,893.77	796,787.98	984.57	200.73	GR	GR XH2O
2	559,032.85	797,450.88	986.94	206.75	SPECIAL	BE_RAM_28AXS
3	558,890.82	796,789.97	987.88	202.08	GR	GR XTE
4	558,887.10	796,791.74	991.88	203.99	GR	GR XCB
5	558,879.44	796,794.73	1,000.00	206.99	SPECIAL	ALPT1
6	558,879.41	796,794.75	1,000.04	206.99	GR	GR
7	558,865.71	796,800.58	1,014.65	209.35	GR	GR
8	558,854.89	796,805.47	1,026.25	210.38	GR	GR
9	558,843.66	796,810.67	1,038.32	210.50	SPECIAL	BE_RAM_26A NL
10	558,843.66	796,810.67	1,038.32	210.50	GR	GR
11	558,840.66	796,811.97	1,041.53	210.25	CB	Channelbank [CB
12	558,840.03	796,811.64	1,042.08	210.14	GR	GR
13	558,828.65	796,817.50	1,054.43	205.73	GR	GR
14	558,819.41	796,821.16	1,064.22	202.03	GR	GR
15	558,813.69	796,821.43	1,069.88	201.22	TE	TE
16	558,810.15	796,822.70	1,073.61	200.41	H2O	H2O
17	558,805.24	796,824.07	1,078.69	199.88	H2O	H2O
18	558,798.48	796,825.46	1,085.59	198.98	H2O	H2O
19	558,789.78	796,828.36	1,094.71	198.59	H2O	H2O
20	558,766.07	796,835.74	1,119.43	198.63	H2O	H2O
21	558,732.45	796,840.89	1,153.39	197.53	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_26XS

Point	Easting	Northing	Station	Elevation	Code	Comment
22	558,688.20	796,849.90	1,198.54	197.73	H2O	H2O
23	558,651.65	796,854.79	1,235.31	198.38	H2O	H2O
24	558,616.63	796,860.17	1,270.68	197.68	H2O	H2O
25	558,583.73	796,869.24	1,304.75	194.93	H2O	H2O
26	558,542.18	796,889.73	1,349.66	186.52	H2O	H2O
27	558,512.76	796,877.19	1,375.82	187.68	H2O	H2O
28	558,497.66	796,895.60	1,394.43	189.14	H2O	H2O
29	558,460.69	796,880.31	1,427.39	187.86	H2O	H2O
30	558,218.94	795,808.08	1,439.99	202.57	SPECIAL	BE_RAM_24AXS
31	558,402.74	796,927.59	1,493.93	188.93	H2O	H2O
32	558,514.66	797,469.70	1,497.64	207.56	SPECIAL	BE_RAM_27C BS
33	558,514.57	797,469.65	1,497.72	207.56	SPECIAL	BE_RAM_27C FLD
34	558,514.57	797,469.65	1,497.72	207.56	SPECIAL	DATE 10-20-2011
35	558,302.74	796,925.67	1,591.33	188.97	H2O	H2O
36	558,229.86	796,931.55	1,663.83	189.79	H2O	H2O
37	558,204.90	796,937.95	1,689.57	189.97	H2O	H2O
38	558,175.38	796,943.76	1,719.66	188.97	H2O	H2O
39	558,151.03	796,954.00	1,745.61	187.02	H2O	H2O
40	558,108.43	796,963.54	1,789.26	184.99	H2O	H2O
41	558,065.54	796,964.90	1,831.50	195.69	H2O	H2O
42	558,034.11	796,971.76	1,863.66	197.47	H2O	H2O
43	558,002.05	796,986.34	1,898.06	200.08	H2O	H2O
44	557,983.18	796,984.26	1,916.08	198.48	H2O	H2O
45	557,965.41	796,985.61	1,933.74	199.19	H2O	H2O
46	557,959.00	796,990.36	1,941.00	200.00	H2O	H2O
47	557,949.81	796,990.92	1,950.11	201.19	TE	TE
48	557,941.90	796,994.36	1,958.55	204.11	GR	GR
49	557,934.82	796,996.15	1,965.85	207.27	CB	Channelbank [CB
50	557,921.78	796,999.44	1,979.30	207.66	GR	GR
51	557,913.95	797,000.62	1,987.20	204.85	GR	GR
52	557,909.72	797,000.84	1,991.38	202.07	GR	GR
53	557,906.95	797,000.65	1,994.05	201.54	GR	GR XTE
54	557,904.05	797,001.03	1,996.96	201.12	GR	GR XH2O
55	557,887.97	797,006.43	2,013.82	201.42	GR	GR XH2O
56	557,887.74	797,006.41	2,014.04	201.45	SPECIAL	ALPT2
57	557,884.51	797,007.09	2,017.34	200.54	GR	GR XH2O
58	557,878.34	797,010.80	2,024.15	199.41	GR	GR XH2O
59	557,870.70	797,012.38	2,031.95	199.11	GR	GR XH2O
60	557,854.92	797,012.00	2,047.30	199.04	GR	GR XH2O
61	557,846.36	797,012.77	2,055.84	200.11	GR	GR XH2O
62	557,845.15	797,013.54	2,057.19	201.68	GR	GR XTE
63	557,837.70	797,015.48	2,064.87	209.18	GR	GR
64	557,830.38	797,018.15	2,072.59	213.93	GR	GR
65	557,819.19	797,021.74	2,084.28	222.99	GR	GR
66	557,800.93	797,025.97	2,103.02	234.81	GR	GR
67	557,795.84	797,026.57	2,108.13	234.53	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {192D732C-2550-4F72-9D83-F43AD4943DE8}	Stream	Centerline
Name: BE_RAM_27XS	Name:	Station: 1,346.78
Location: BOAT RAMP	Station: 0.00	Easting: 558,648.55
County:	Orientation: Looking D/S	Northing: 797,352.13
State:	Datum	Invert: 196.19
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_27XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	558,219.81	795,807.84	697.48	202.55	SPECIAL	BS CK 24A
2	558,218.93	795,808.00	698.23	202.51	SPECIAL	DATE 10-20-2011
3	558,218.93	795,808.00	698.23	202.51	SPECIAL	BE_RAM_24A FLD
4	558,218.94	795,808.08	698.27	202.57	SPECIAL	BE_RAM_24AXS
5	558,973.19	797,028.85	1,000.00	208.69	GR	GR
6	558,973.19	797,028.85	1,000.00	208.69	SPECIAL	ALPT1
7	558,957.41	797,043.34	1,021.42	209.08	GR	GR
8	558,942.38	797,057.77	1,042.26	208.83	GR	GR
9	558,937.43	797,066.23	1,051.69	210.77	GR	GR
10	558,919.85	797,077.92	1,072.47	210.07	CB	Channelbank [CB
11	558,910.62	797,087.82	1,085.98	203.64	GR	GR
12	558,906.82	797,091.07	1,090.97	202.74	GR	GR
13	558,902.19	797,095.74	1,097.54	201.29	TE	TE
14	558,899.89	797,097.08	1,100.13	200.66	H2O	H2O
15	558,897.67	797,098.88	1,102.98	200.06	H2O	H2O
16	558,896.76	797,100.31	1,104.62	200.00	H2O	H2O
17	558,890.13	797,105.69	1,113.13	198.98	H2O	H2O
18	558,880.71	797,119.74	1,129.66	198.25	H2O	H2O
19	558,860.18	797,132.71	1,153.45	198.23	H2O	H2O
20	558,836.82	797,151.01	1,182.97	198.31	H2O	H2O
21	558,816.73	797,170.19	1,210.75	200.53	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_27XS

Point	Easting	Northing	Station	Elevation	Code	Comment
22	558,805.82	797,180.23	1,225.58	198.97	H2O	H2O
23	558,791.99	797,189.73	1,242.13	198.25	H2O	H2O
24	559,032.85	797,450.88	1,249.33	206.75	SPECIAL	BE_RAM_28AXS
25	559,032.89	797,450.98	1,249.38	206.78	SPECIAL	BE_RAM_28A FLD
26	558,777.67	797,210.21	1,266.65	199.48	H2O	H2O
27	558,757.84	797,235.16	1,298.23	200.05	H2O	H2O
28	558,740.67	797,264.39	1,330.86	199.82	H2O	H2O
29	558,718.36	797,290.98	1,365.37	199.50	H2O	H2O
30	558,696.64	797,317.11	1,399.13	198.18	H2O	H2O
31	558,679.97	797,337.42	1,425.22	198.40	H2O	H2O
32	558,650.41	797,354.85	1,458.62	198.66	H2O	H2O
33	558,622.37	797,368.53	1,488.32	197.39	H2O	H2O
34	558,597.43	797,383.83	1,516.91	197.24	H2O	H2O
35	558,582.09	797,398.93	1,538.43	196.19	H2O	H2O
36	558,565.94	797,416.30	1,562.11	196.31	H2O	H2O
37	558,555.61	797,428.98	1,578.34	197.66	H2O	H2O
38	558,549.94	797,442.67	1,591.92	199.31	H2O	H2O
39	558,548.45	797,447.06	1,596.03	201.33	TE	TE
40	558,549.82	797,455.76	1,601.07	203.21	GR	GR
41	558,549.77	797,455.86	1,601.18	203.22	GR	GR
42	558,534.77	797,450.69	1,608.41	202.16	SPECIAL	XTR
43	558,530.70	797,457.41	1,616.00	203.95	SPECIAL	XTR
44	558,536.12	797,472.93	1,622.84	205.32	GR	GR
45	558,524.64	797,463.73	1,624.75	206.02	SPECIAL	XTR
46	558,527.43	797,478.96	1,633.29	206.80	GR	GR
47	558,514.57	797,469.65	1,636.12	207.62	SPECIAL	BE_RAM_27C REF
48	558,506.26	797,480.42	1,649.57	209.44	SPECIAL	XTR
49	558,507.38	797,491.35	1,656.33	210.31	GR	GR
50	558,499.80	797,486.60	1,658.51	210.60	SPECIAL	XTR
51	558,501.86	797,500.87	1,666.91	210.76	GR	GR
52	558,487.86	797,496.62	1,674.06	211.70	SPECIAL	XTR
53	558,491.85	797,512.50	1,682.18	211.98	GR	GR
54	558,485.15	797,509.31	1,684.81	216.41	SPECIAL	XRAIL
55	558,485.13	797,517.30	1,690.36	211.74	CB	Channelbank [CB
56	558,473.10	797,509.56	1,693.67	213.72	SPECIAL	XTR
57	558,476.75	797,518.52	1,697.24	207.48	GR	GR
58	558,473.08	797,522.66	1,702.75	205.10	GR	GR
59	558,464.00	797,518.21	1,706.22	213.71	SPECIAL	XBEGIN
60	558,468.10	797,523.57	1,706.98	216.61	SPECIAL	XRAIL
61	558,467.71	797,526.29	1,709.14	202.68	GR	GR
62	558,464.47	797,528.90	1,713.29	201.89	GR	GR XTE
63	558,459.42	797,532.76	1,719.60	200.39	GR	GR XH2O
64	558,453.20	797,538.12	1,727.80	198.54	GR	GR XH2O
65	558,447.28	797,543.99	1,736.14	198.51	GR	GR XH2O
66	558,440.76	797,550.02	1,745.02	200.08	GR	GR XH2O
67	558,446.68	797,564.58	1,750.84	201.37	GR	GR XH2O
68	558,445.40	797,566.70	1,753.23	201.87	GR	GR XTE



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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_27XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
69	558,444.04	797,568.41	1,755.40	202.27	GR	GR XCB
70	558,427.59	797,561.97	1,762.80	216.45	SPECIAL	XRAIL
71	558,420.99	797,558.90	1,765.44	213.57	SPECIAL	XEND
72	558,438.95	797,580.81	1,767.65	203.62	GR	GR
73	558,432.20	797,591.11	1,779.66	205.59	GR	GR
74	558,408.54	797,570.55	1,782.47	214.00	SPECIAL	XTR
75	558,410.12	797,578.94	1,787.15	216.28	SPECIAL	XRAIL
76	558,421.03	797,603.79	1,796.49	207.65	GR	GR
77	558,406.15	797,592.78	1,799.60	213.56	GR	GR
78	558,390.65	797,587.16	1,806.89	214.48	SPECIAL	XTR
79	558,383.94	797,616.47	1,832.03	214.05	GR	GR
80	558,355.69	797,620.39	1,855.12	215.02	SPECIAL	XTR
81	558,362.20	797,637.24	1,862.10	215.02	GR	GR
82	558,345.24	797,657.47	1,888.35	215.79	GR	GR
83	558,319.87	797,654.59	1,904.64	216.31	SPECIAL	XTR
84	558,327.50	797,679.06	1,916.09	215.96	GR	GR
85	558,303.03	797,672.49	1,929.19	217.25	SPECIAL	XTR
86	558,296.04	797,679.30	1,938.95	218.18	SPECIAL	XTR
87	558,296.03	797,679.31	1,938.97	218.18	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {F2966F04-3E86-4DCB-BC45-1DCCAA030CF9}	Stream	Centerline
Name: BE_RAM_29XS	Name:	Station: 1,080.30
Location: 18 RIVERSIDE DR	Station: 0.00	Easting: 559,517.51
County:	Orientation: Looking D/S	Northing: 797,187.71
State:	Datum	Invert: 192.88
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: **BE_RAM_29XS**

Point	Easting	Northing	Station	Elevation	Code	Comment
1	559,553.20	797,042.78	950.86	210.77	GR	GR
2	559,543.11	797,066.56	976.29	210.96	GR	GR
3	559,542.83	797,076.89	986.43	211.70	GR	GR
4	559,539.62	797,090.08	1,000.00	211.55	SPECIAL	ALPT1
5	559,539.61	797,090.12	1,000.04	211.55	GR	GR
6	559,537.73	797,098.43	1,008.56	211.27	GR	GR
7	559,536.38	797,103.39	1,013.69	210.27	GR	GR
8	559,535.45	797,110.88	1,021.20	209.82	CB	Channelbank [CB
9	559,535.69	797,119.31	1,029.37	205.91	GR	GR
10	559,533.07	797,127.96	1,038.38	202.13	TE	TE
11	559,532.82	797,129.04	1,039.49	201.68	H2O	H2O
12	559,530.88	797,135.27	1,045.99	199.11	H2O	H2O
13	559,530.28	797,139.05	1,049.81	197.16	H2O	H2O
14	559,527.95	797,143.68	1,054.85	195.92	H2O	H2O
15	559,527.17	797,151.28	1,062.43	193.28	H2O	H2O
16	559,517.13	797,165.35	1,078.40	192.88	H2O	H2O
17	559,516.27	797,177.15	1,090.09	193.71	H2O	H2O
18	559,513.57	797,190.24	1,103.45	194.48	H2O	H2O
19	559,512.47	797,198.58	1,111.82	197.39	H2O	H2O
20	559,513.40	797,206.02	1,118.86	199.59	H2O	H2O
21	559,512.68	797,207.96	1,120.92	201.58	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_29XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	559,512.41	797,209.22	1,122.21	202.12	TE	TE
23	559,511.90	797,210.59	1,123.66	202.89	GR	GR
24	559,510.95	797,215.83	1,128.98	204.20	CB	Channelbank [CB
25	559,510.26	797,223.44	1,136.54	205.21	GR	GR
26	559,510.42	797,229.03	1,141.96	207.09	GR	GR
27	559,509.49	797,231.71	1,144.78	207.84	GR	GR
28	559,509.28	797,232.05	1,145.16	209.34	GR	GR
29	559,507.74	797,238.73	1,152.01	209.27	GR	GR
30	559,507.54	797,239.13	1,152.44	210.69	GR	GR
31	559,507.19	797,240.76	1,154.11	210.66	GR	GR
32	559,507.06	797,241.05	1,154.42	210.16	GR	GR
33	559,482.48	797,239.74	1,158.67	207.95	SPECIAL	BE_RAM_29BXS NL
34	559,503.49	797,258.19	1,171.93	210.03	GR	GR
35	559,500.55	797,268.75	1,182.87	210.01	GR	GR
36	559,499.50	797,272.40	1,186.67	209.76	GR	GR
37	559,495.93	797,287.33	1,202.02	209.92	GR	GR
38	559,489.85	797,319.52	1,234.76	209.89	GR	GR
39	559,483.61	797,333.07	1,249.36	210.27	SPECIAL	ALPT2
40	559,483.61	797,333.07	1,249.36	210.27	GR	GR
41	559,910.76	797,540.71	1,355.76	211.38	SPECIAL	DATE 10-11-2011
42	559,910.76	797,540.71	1,355.76	211.38	SPECIAL	BE_RAM_30AXS FLD
43	559,910.71	797,540.71	1,355.77	211.41	SPECIAL	BE_RAM_30AXS
44	559,577.21	797,541.48	1,431.42	209.68	SPECIAL	BE_RAM_29AXS BS
45	559,577.02	797,541.52	1,431.50	209.69	SPECIAL	BE_RAM_29AXS
46	559,577.03	797,541.54	1,431.52	209.67	SPECIAL	BE_RAM_29AXS FLD



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {54B805DC-38E7-4123-BD0F-189350F88907}	Stream	Centerline
Name: BE_RAM_30XS	Name:	Station: 1,155.62
Location: 33 RIVERSIDE DR	Station: 0.00	Easting: 559,992.58
County:	Orientation: Looking D/S	Northing: 797,484.57
State:	Datum	Invert: 193.56
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_30XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	560,126.61	797,395.35	999.94	211.33	GR	GR
2	560,126.56	797,395.39	1,000.00	211.33	SPECIAL	ALPT1
3	560,112.31	797,404.01	1,016.64	211.87	GR	GR
4	560,090.89	797,417.62	1,042.00	212.18	GR	GR
5	560,076.96	797,427.01	1,058.80	212.11	GR	GR
6	560,076.65	797,427.20	1,059.16	211.27	GR	GR
7	560,065.48	797,434.52	1,072.53	210.99	GR	GR
8	560,062.06	797,437.29	1,076.91	210.31	GR	GR
9	560,052.66	797,444.47	1,088.72	209.33	GR	GR
10	560,043.10	797,449.99	1,099.72	206.13	GR	GR
11	560,038.17	797,451.60	1,104.71	205.51	CB	Channelbank [CB
12	560,032.09	797,454.39	1,111.31	203.21	GR	GR
13	560,029.89	797,455.72	1,113.88	202.19	TE	TE
14	560,024.94	797,457.79	1,119.14	200.59	H2O	H2O
15	560,021.27	797,459.71	1,123.25	198.08	H2O	H2O
16	560,020.70	797,461.09	1,124.50	197.17	H2O	H2O
17	560,014.06	797,464.10	1,131.68	195.19	H2O	H2O
18	560,001.00	797,470.41	1,146.04	193.56	H2O	H2O
19	559,990.64	797,477.71	1,158.71	194.15	H2O	H2O
20	559,984.55	797,488.06	1,169.55	194.54	H2O	H2O
21	559,981.04	797,491.85	1,174.58	194.64	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_30XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	559,974.20	797,498.70	1,184.08	197.12	H2O	H2O
23	559,966.42	797,502.31	1,192.55	199.77	H2O	H2O
24	559,964.64	797,504.26	1,195.12	201.27	H2O	H2O
25	559,962.65	797,505.30	1,197.35	202.24	TE	TE
26	559,962.23	797,506.63	1,198.45	203.26	GR	GR
27	559,959.82	797,508.27	1,201.36	204.14	CB	Channelbank [CB
28	559,955.21	797,511.58	1,207.03	205.17	GR	GR
29	559,951.47	797,513.48	1,211.19	206.14	GR	GR
30	559,948.83	797,513.76	1,213.54	207.04	GR	GR
31	559,945.39	797,516.85	1,218.13	211.24	GR	GR
32	559,944.80	797,517.84	1,219.16	211.41	GR	GR
33	559,944.57	797,517.95	1,219.42	211.94	GR	GR
34	559,944.20	797,518.19	1,219.86	212.00	GR	GR
35	559,943.89	797,518.27	1,220.16	211.76	GR	GR
36	559,928.87	797,529.18	1,238.71	211.94	GR	GR
37	559,910.71	797,540.71	1,260.22	211.41	SPECIAL	BE_RAM_30AXS
38	559,910.71	797,540.71	1,260.22	211.71	GR	GR
39	559,892.79	797,552.99	1,281.94	211.70	GR	GR
40	559,873.01	797,566.14	1,305.69	211.14	GR	GR
41	559,859.79	797,575.74	1,322.02	211.59	GR	GR
42	559,859.71	797,575.80	1,322.12	211.59	SPECIAL	ALPT2
43	559,577.02	797,541.52	1,537.11	209.69	SPECIAL	BE_RAM_29AXS
44	559,576.97	797,541.50	1,537.14	209.70	SPECIAL	RAM_29AXS BS CHK
45	559,576.97	797,541.52	1,537.15	209.70	SPECIAL	BE_RAM_29AXS FLD
46	559,576.97	797,541.52	1,537.15	209.70	SPECIAL	DATE 10-11-2011



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {246B6E16-6259-4322-98F1-EC5263103E2C}	Stream	Centerline
Name: BE_RAM_31XS	Name:	Station: 1,278.91
Location: DS OF RAILROAD	Station: 0.00	Easting: 560,221.40
County:	Orientation: Looking D/S	Northing: 797,941.03
State:	Datum	Invert: 196.77
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_31XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	560,901.99	798,119.41	742.78	227.96	SPECIAL	BE_RAM_07B
2	560,473.00	797,823.60	999.98	225.26	GR	GR
3	560,472.98	797,823.61	1,000.00	225.26	SPECIAL	ALPT1
4	560,459.44	797,830.11	1,015.02	224.85	GR	GR
5	560,453.78	797,831.96	1,020.92	223.54	GR	GR
6	560,445.30	797,835.73	1,030.20	219.52	GR	GR
7	560,437.48	797,838.33	1,038.37	219.00	GR	GR
8	560,429.76	797,841.91	1,046.88	215.46	GR	GR
9	560,422.52	797,845.12	1,054.79	215.06	GR	GR
10	560,417.38	797,847.68	1,060.53	213.53	GR	GR
11	560,403.37	797,853.23	1,075.56	211.65	GR	GR
12	560,375.76	797,865.54	1,105.77	211.58	GR	GR
13	560,355.54	797,874.75	1,127.99	212.03	SPECIAL	BE_RAM_31BXS NL
14	560,355.54	797,874.75	1,127.99	212.23	GR	GR
15	560,337.31	797,883.48	1,148.20	210.84	GR	GR
16	560,322.82	797,890.70	1,164.39	210.65	GR	GR
17	560,465.87	798,200.27	1,170.55	213.24	SPECIAL	DATE 10-11-2011
18	560,465.87	798,200.27	1,170.55	213.24	SPECIAL	BE_RAM_07A FLD
19	560,465.87	798,200.26	1,170.55	213.24	SPECIAL	BE_RAM_07A
20	560,311.98	797,897.04	1,176.91	211.28	GR	GR
21	560,381.02	798,051.17	1,181.93	215.53	SPECIAL	BE_RAM_31AXS BS



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_31XS

Point	Easting	Northing	Station	Elevation	Code	Comment
22	560,381.01	798,051.16	1,181.95	215.53	SPECIAL	BE_RAM_31AXS TRA 7A
23	560,381.01	798,051.17	1,181.95	215.53	SPECIAL	BE_RAM_31AXS FLD
24	560,304.87	797,900.72	1,184.91	211.41	GR	GR
25	560,299.16	797,903.41	1,191.23	211.00	GR	GR
26	560,290.87	797,906.42	1,200.00	210.12	CB	Channelbank [CB
27	560,284.50	797,909.27	1,206.97	207.94	GR	GR
28	560,281.99	797,910.42	1,209.73	205.76	GR	GR
29	560,279.26	797,911.18	1,212.52	202.11	TE	TE
30	560,278.54	797,913.84	1,214.33	199.66	H2O	H2O
31	560,273.57	797,915.34	1,219.45	198.72	H2O	H2O
32	560,267.15	797,917.66	1,226.24	198.88	H2O	H2O
33	560,261.10	797,920.56	1,232.95	198.81	H2O	H2O
34	560,254.75	797,924.23	1,240.27	199.24	H2O	H2O
35	560,248.11	797,927.25	1,247.56	199.29	H2O	H2O
36	560,241.54	797,930.38	1,254.84	198.70	H2O	H2O
37	560,233.35	797,931.81	1,262.83	198.21	H2O	H2O
38	560,225.45	797,936.70	1,272.07	198.79	H2O	H2O
39	560,216.00	797,941.90	1,282.84	199.31	H2O	H2O
40	560,206.80	797,947.38	1,293.51	199.77	H2O	H2O
41	560,195.44	797,954.38	1,306.79	199.86	H2O	H2O
42	560,184.41	797,959.91	1,319.13	198.87	H2O	H2O
43	560,177.75	797,964.41	1,327.08	197.62	H2O	H2O
44	560,166.54	797,965.02	1,337.43	196.77	H2O	H2O
45	560,162.60	797,966.64	1,341.68	198.74	H2O	H2O
46	560,159.14	797,967.79	1,345.30	202.11	TE	TE
47	560,153.17	797,975.03	1,353.83	210.53	CB	Channelbank [CB
48	560,139.48	797,981.21	1,368.84	211.14	GR	GR
49	560,137.87	797,982.69	1,370.94	212.41	GR	GR
50	560,118.18	797,992.55	1,392.96	213.07	GR	GR
51	560,105.39	798,001.15	1,408.21	206.26	GR	GR
52	560,087.55	798,009.65	1,427.98	205.57	GR	GR
53	560,067.75	798,019.51	1,450.10	206.79	GR	GR
54	560,049.49	798,028.93	1,470.64	207.91	GR	GR
55	560,029.80	798,038.51	1,492.53	207.61	GR	GR
56	560,014.90	798,045.42	1,508.96	208.99	SPECIAL	ALPT2
57	560,014.77	798,045.38	1,509.06	209.00	GR	GR
58	560,007.55	798,048.59	1,516.95	211.46	GR	GR
59	560,007.44	798,048.64	1,517.07	211.46	GR	GR
60	560,003.82	798,049.24	1,520.60	214.31	GR	GR
61	559,994.18	798,054.31	1,531.48	211.82	GR	GR
62	559,972.66	798,064.46	1,555.27	211.88	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {42EDF44E-8BE0-4318-B909-8475206564B8}	Stream	Centerline
Name: BE_RAM_32XS	Name:	Station: 1,315.93
Location: 10 RIVER RD	Station: 0.00	Easting: 560,526.09
County:	Orientation: Looking D/S	Northing: 798,570.97
State:	Datum	Invert: 199.76
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_32XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	560,901.99	798,119.41	703.39	227.96	SPECIAL	BE_RAM_07B
2	560,751.06	798,400.78	999.92	211.70	GR	GR
3	560,751.02	798,400.86	1,000.00	211.70	SPECIAL	ALPT1
4	560,730.35	798,416.65	1,025.99	211.71	GR	GR
5	560,704.92	798,437.12	1,058.62	212.19	GR	GR
6	560,465.87	798,200.26	1,089.37	213.24	SPECIAL	BE_RAM_07A
7	560,678.88	798,456.66	1,091.13	212.80	GR	GR
8	560,672.94	798,462.25	1,099.27	213.02	GR	GR
9	560,671.43	798,463.37	1,101.15	213.28	GR	GR
10	560,651.74	798,478.09	1,125.70	213.56	GR	GR
11	560,631.28	798,493.11	1,151.02	212.96	GR	GR
12	560,614.08	798,505.57	1,172.20	212.75	GR	GR
13	560,610.32	798,508.00	1,176.65	212.44	GR	GR
14	560,599.25	798,513.70	1,188.80	212.24	GR	GR
15	560,483.43	798,384.66	1,194.50	210.76	SPECIAL	DATE 10-11-2011
16	560,483.43	798,384.66	1,194.50	210.76	SPECIAL	BE_RAM_07D FLD
17	560,483.44	798,384.68	1,194.50	210.76	SPECIAL	BE_RAM_07D TRA 7A
18	560,483.41	798,384.68	1,194.53	210.76	SPECIAL	BS CK 07D
19	560,589.39	798,520.58	1,200.77	211.96	SPECIAL	BE_RAM_32AXS TRA 7D
20	560,580.95	798,527.24	1,211.51	211.86	GR	GR
21	560,565.42	798,538.53	1,230.67	206.06	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_32XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	560,549.09	798,550.11	1,250.61	205.53	CB	Channelbank [CB]
23	560,546.31	798,553.07	1,254.65	203.62	TE	TE
24	560,541.68	798,555.99	1,260.08	201.85	H2O	H2O
25	560,537.11	798,559.64	1,265.93	201.87	H2O	H2O
26	560,529.08	798,565.86	1,276.07	202.35	H2O	H2O
27	560,521.28	798,571.81	1,285.87	202.24	H2O	H2O
28	560,516.61	798,576.43	1,292.42	202.37	H2O	H2O
29	560,509.75	798,582.05	1,301.28	202.53	H2O	H2O
30	560,503.07	798,587.48	1,309.89	201.75	H2O	H2O
31	560,497.16	798,591.91	1,317.27	200.83	H2O	H2O
32	560,491.23	798,597.22	1,325.22	200.06	H2O	H2O
33	560,485.88	798,602.33	1,332.61	199.76	H2O	H2O
34	560,481.41	798,605.94	1,338.35	199.76	H2O	H2O
35	560,478.82	798,609.05	1,342.33	200.01	H2O	H2O
36	560,474.38	798,614.16	1,349.02	201.89	H2O	H2O
37	560,470.54	798,616.87	1,353.70	201.55	H2O	H2O
38	560,462.69	798,624.34	1,364.52	201.88	H2O	H2O
39	560,458.51	798,631.62	1,372.40	202.46	H2O	H2O
40	560,454.88	798,634.77	1,377.21	203.67	TE	TE
41	560,451.90	798,637.58	1,381.30	205.54	GR	GR
42	560,448.12	798,641.67	1,386.82	212.58	CB	Channelbank [CB]
43	560,409.74	798,679.81	1,440.74	211.75	GR	GR
44	560,381.51	798,707.02	1,479.86	211.78	GR	GR
45	560,360.99	798,725.42	1,507.40	211.49	GR	GR
46	560,343.26	798,741.66	1,531.42	212.04	GR	GR
47	560,336.08	798,748.99	1,541.63	214.14	GR	GR
48	560,319.51	798,763.22	1,563.48	215.04	SPECIAL	ALPT2
49	560,319.49	798,763.24	1,563.50	215.03	GR	GR



COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {6F4B1CA1-6304-4D6B-81ED-FDE3386B2BF3}	Stream	Centerline
Name: BE_RAM_33XS	Name:	Station: 1,211.40
Location: 16 RIVER RD	Station: 0.00	Easting: 560,580.99
County:	Orientation: Looking D/S	Northing: 798,730.96
State:	Datum	Invert: 200.63
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_33XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	560,901.99	798,119.41	591.77	227.96	SPECIAL	BE_RAM_07B
2	560,997.25	798,448.31	711.61	225.33	SPECIAL	X BE_RAM_33AXS
3	561,184.34	798,762.59	749.04	216.25	SPECIAL	X BE_RAM_33BXS
4	560,465.87	798,200.26	989.98	213.24	SPECIAL	BE_RAM_07A
5	560,754.08	798,604.56	999.98	212.27	GR	GR
6	560,754.06	798,604.57	1,000.00	212.27	SPECIAL	ALPT1
7	560,746.35	798,608.99	1,008.83	212.53	GR	GR
8	560,740.34	798,612.77	1,015.91	212.78	GR	GR
9	560,732.94	798,617.95	1,024.93	212.90	GR	GR
10	560,722.71	798,624.18	1,036.87	213.17	GR	GR
11	560,711.24	798,630.20	1,049.66	212.74	GR	GR
12	560,710.21	798,631.49	1,051.25	212.37	GR	GR
13	560,699.33	798,638.65	1,064.26	212.42	GR	GR
14	560,690.53	798,644.83	1,075.01	212.40	SPECIAL	BE_RAM_33CXS TRA 7D
15	560,687.06	798,645.81	1,078.38	212.29	GR	GR
16	560,686.00	798,648.42	1,080.78	212.83	GR	GR
17	560,483.44	798,384.68	1,085.93	210.76	SPECIAL	BE_RAM_07D TRA 7A
18	560,483.44	798,384.68	1,085.93	210.75	SPECIAL	DATE 10-11-2011
19	560,483.44	798,384.68	1,085.93	210.75	SPECIAL	BE_RAM_07D FLD
20	560,483.40	798,384.71	1,085.97	210.75	SPECIAL	RAM_07D BS CHK
21	560,679.91	798,653.06	1,088.44	213.09	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_33XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	560,673.54	798,658.04	1,096.52	212.27	GR	GR
23	560,669.81	798,663.55	1,102.80	211.06	CB	Channelbank [CB
24	560,658.49	798,666.81	1,113.83	205.81	GR	GR
25	560,646.13	798,675.74	1,129.08	205.96	GR	GR
26	560,636.90	798,682.66	1,140.61	204.37	GR	GR
27	560,626.06	798,693.83	1,155.98	203.69	TE	TE
28	560,620.47	798,698.67	1,163.35	202.72	H2O	H2O
29	560,610.94	798,705.59	1,175.13	202.49	H2O	H2O
30	560,600.94	798,713.23	1,187.71	201.66	H2O	H2O
31	560,592.90	798,718.11	1,197.07	201.36	H2O	H2O
32	560,586.64	798,724.27	1,205.77	200.63	H2O	H2O
33	560,580.24	798,730.41	1,214.58	200.71	H2O	H2O
34	560,572.11	798,736.72	1,224.86	201.15	H2O	H2O
35	560,563.21	798,743.25	1,235.90	201.27	H2O	H2O
36	560,556.14	798,749.72	1,245.44	201.80	H2O	H2O
37	560,548.05	798,756.32	1,255.87	202.79	H2O	H2O
38	560,539.33	798,762.96	1,266.83	203.66	TE	TE
39	560,535.25	798,766.32	1,272.11	204.67	GR	GR
40	560,531.31	798,768.46	1,276.55	206.24	GR	GR
41	560,529.26	798,770.22	1,279.24	213.13	CB	Channelbank [CB
42	560,505.33	798,788.07	1,309.09	212.63	GR	GR
43	560,485.60	798,802.33	1,333.44	211.65	GR	GR
44	560,466.57	798,817.29	1,357.63	211.51	GR	GR
45	560,446.82	798,832.25	1,382.41	212.34	GR	GR
46	560,439.97	798,837.22	1,390.87	214.27	GR	GR
47	560,425.68	798,848.62	1,409.14	214.51	GR	GR
48	560,423.19	798,850.53	1,412.28	215.03	GR	GR
49	560,410.10	798,860.37	1,428.65	224.52	SPECIAL	ALPT2
50	560,410.09	798,860.38	1,428.67	224.52	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Cross Sections Report

(All Units In Feet)

ID: {3C540EC9-FB51-41B1-ABC5-B7E6FF7FA83B}	Stream	Centerline
Name: BE_RAM_34XS	Name:	Station: 1,130.60
Location: 35 RIVER RD	Station: 0.00	Easting: 560,854.95
County:	Orientation: Looking D/S	Northing: 799,107.23
State:	Datum	Invert: 202.71
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: BE_RAM_34XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	561,095.75	799,040.91	934.22	214.11	SPECIAL	DATE 10-11-2011
2	561,095.73	799,040.91	934.23	214.11	SPECIAL	BE_RAM_34XS
3	561,095.73	799,040.91	934.23	214.11	SPECIAL	BE_RAM_34AXS FLD
4	561,095.71	799,040.90	934.24	214.10	SPECIAL	RAM_34AXS BS CHK
5	561,152.44	799,137.89	959.44	219.28	SPECIAL	BE_RAM_08A
6	561,152.45	799,137.89	959.44	219.26	SPECIAL	BE_RAM_08A FLD
7	560,971.12	799,004.53	1,000.00	211.83	GR	GR
8	560,971.12	799,004.53	1,000.00	211.83	SPECIAL	ALPT1
9	560,957.29	799,014.86	1,017.15	211.69	GR	GR
10	560,944.94	799,023.04	1,031.74	211.28	GR	GR
11	560,929.88	799,033.77	1,050.06	211.31	GR	GR
12	560,926.36	799,036.77	1,054.69	210.39	SPECIAL	BE_RAM_34BXS NL
13	560,923.79	799,039.04	1,058.12	209.77	GR	GR
14	560,922.23	799,039.97	1,059.89	209.12	CB	Channelbank [CB
15	560,920.84	799,041.52	1,061.96	207.96	GR	GR
16	560,916.68	799,045.48	1,067.71	207.31	GR	GR
17	560,915.00	799,047.46	1,070.29	206.20	GR	GR
18	560,910.09	799,050.67	1,076.06	204.36	TE	TE
19	560,907.41	799,054.27	1,080.48	203.75	H2O	H2O
20	560,904.86	799,056.27	1,083.71	203.70	H2O	H2O
21	560,897.71	799,064.06	1,094.25	203.98	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_34XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	560,890.09	799,071.26	1,104.74	203.31	H2O	H2O
23	560,884.56	799,078.10	1,113.45	203.08	H2O	H2O
24	560,876.32	799,086.67	1,125.32	203.32	H2O	H2O
25	560,869.36	799,091.93	1,134.00	202.86	H2O	H2O
26	560,861.72	799,098.69	1,144.20	202.71	H2O	H2O
27	560,856.53	799,103.44	1,151.23	203.02	H2O	H2O
28	560,850.40	799,108.57	1,159.21	203.54	H2O	H2O
29	560,844.15	799,113.83	1,167.37	202.96	H2O	H2O
30	560,837.72	799,120.17	1,176.39	202.96	H2O	H2O
31	560,834.11	799,122.96	1,180.94	203.62	H2O	H2O
32	560,831.65	799,126.48	1,185.14	204.32	TE	TE
33	560,828.82	799,129.27	1,189.11	206.55	GR	GR
34	560,825.43	799,136.73	1,196.69	212.83	CB	Channelbank [CB
35	560,812.41	799,149.40	1,214.86	214.40	GR	GR
36	560,811.58	799,151.01	1,216.57	217.92	GR	GR
37	560,792.79	799,168.31	1,242.11	231.14	GR	GR
38	560,780.68	799,180.61	1,259.36	241.69	GR	GR
39	560,763.24	799,200.94	1,285.99	249.13	GR	GR
40	560,928.69	799,408.24	1,307.67	223.33	SPECIAL	BE_RAM_08B
41	560,745.15	799,217.37	1,310.43	251.65	GR	GR
42	560,745.15	799,217.37	1,310.43	251.65	SPECIAL	ALPT2



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Cross Sections Report

(All Units In Feet)

ID: {73E2E8F1-A35E-413E-9403-7A2BA8C8AA7B}	Stream	Centerline
Name: BE_RAM_35XS	Name:	Station: 1,206.35
Location: DS OF I-287	Station: 0.00	Easting: 561,365.83
County:	Orientation: Looking D/S	Northing: 799,550.22
State:	Datum	Invert: 203.71
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: **BE_RAM_35XS**

Point	Easting	Northing	Station	Elevation	Code	Comment
1	561,514.58	799,446.62	999.96	214.92	GR	GR
2	561,514.54	799,446.64	1,000.00	214.92	SPECIAL	ALPT1
3	561,508.10	799,450.22	1,007.32	214.22	GR	GR
4	561,478.22	799,471.88	1,044.23	213.87	GR	GR
5	561,371.45	799,358.72	1,064.01	215.29	SPECIAL	BE_RAM_35AXS
6	561,371.45	799,358.72	1,064.01	215.29	SPECIAL	BE_RAM_35BXS
7	561,371.47	799,358.76	1,064.02	215.30	SPECIAL	RAM_35AXS BS CHK
8	561,371.46	799,358.76	1,064.02	215.30	SPECIAL	DATE 10-11-2011
9	561,371.46	799,358.76	1,064.02	215.30	SPECIAL	BE_RAM_35AXS FLD
10	561,460.55	799,486.83	1,067.31	214.16	GR	GR
11	561,457.14	799,488.90	1,071.28	214.69	GR	GR
12	561,438.27	799,500.40	1,093.31	215.25	GR	GR
13	561,427.39	799,505.49	1,105.10	215.23	GR	GR
14	561,152.45	799,137.89	1,111.22	219.24	SPECIAL	BE_RAM_08A FLD
15	561,152.44	799,137.89	1,111.22	219.28	SPECIAL	BE_RAM_08A
16	561,418.13	799,511.93	1,116.37	214.85	SPECIAL	BE_RAM_35BXS NL
17	561,418.13	799,511.93	1,116.37	215.15	GR	GR
18	561,411.13	799,516.07	1,124.47	213.69	GR	GR
19	561,408.23	799,518.19	1,128.07	213.30	CB	Channelbank [CB
20	561,401.15	799,524.37	1,137.43	208.46	GR	GR
21	561,399.05	799,525.97	1,140.07	206.49	TE	TE



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: BE_RAM_35XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	561,395.34	799,528.87	1,144.77	206.28	H2O	H2O
23	561,391.15	799,531.21	1,149.54	205.24	H2O	H2O
24	561,386.68	799,534.34	1,154.99	204.16	H2O	H2O
25	561,383.77	799,535.90	1,158.26	203.99	H2O	H2O
26	561,377.71	799,539.87	1,165.50	203.71	H2O	H2O
27	561,374.13	799,543.40	1,170.47	204.25	H2O	H2O
28	561,369.18	799,547.74	1,177.02	204.70	H2O	H2O
29	561,364.24	799,551.78	1,183.40	205.44	H2O	H2O
30	561,356.70	799,558.11	1,193.22	206.22	H2O	H2O
31	561,351.29	799,561.70	1,199.71	205.56	H2O	H2O
32	561,343.44	799,567.77	1,209.62	205.74	H2O	H2O
33	561,336.35	799,573.07	1,218.47	206.24	H2O	H2O
34	561,312.61	799,591.16	1,248.31	205.97	H2O	H2O
35	561,305.15	799,598.42	1,258.62	204.43	H2O	H2O
36	561,301.21	799,599.97	1,262.71	204.13	H2O	H2O
37	561,299.01	799,602.13	1,265.76	204.29	H2O	H2O
38	561,295.67	799,604.67	1,269.96	205.29	H2O	H2O
39	561,293.30	799,605.94	1,272.62	206.48	TE	TE
40	561,281.60	799,613.85	1,286.74	211.57	CB	Channelbank [CB
41	561,271.19	799,622.86	1,300.46	212.25	GR	GR
42	561,249.21	799,640.26	1,328.47	212.18	GR	GR
43	561,221.39	799,659.86	1,362.49	213.52	GR	GR
44	561,221.39	799,659.86	1,362.49	213.52	SPECIAL	ALPT2
45	560,928.69	799,408.24	1,451.19	223.33	SPECIAL	BE_RAM_08B



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Cross Sections Report

(All Units In Feet)

ID: {8CEF6254-31ED-4296-A4DD-2DB6593DFAB1}	Stream	Centerline
Name: PA_POM_09	Name:	Station: 1,072.05
Location: WEIR	Station: 0.00	Easting: 552,210.31
County:	Orientation: Looking D/S	Northing: 778,146.18
State:	Datum	Invert: 156.48
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_POM_09

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,592.30	778,038.11	828.53	183.39	SPECIAL	PA_POM_08B
2	552,359.64	778,234.20	921.10	175.40	GR	GR
3	552,323.65	778,222.19	957.96	174.88	GR	GR
4	552,316.72	778,223.93	962.90	174.60	GR	GR
5	552,305.64	778,222.48	973.05	173.08	GR	GR
6	552,290.63	778,216.72	988.82	172.13	GR	GR
7	552,277.87	778,216.52	999.73	172.88	GR	GR
8	552,312.92	778,160.29	1,000.00	183.49	SPECIAL	WEIR
9	552,312.92	778,160.29	1,000.00	183.49	SPECIAL	ALPT1
10	552,268.60	778,210.82	1,010.62	171.74	CB	Channelbank [CB
11	552,304.67	778,151.46	1,011.68	171.83	SPECIAL	GAGE BOARD 13
12	552,291.06	778,163.71	1,016.68	167.91	TE	TE
13	552,299.15	778,142.79	1,020.97	169.49	SPECIAL	WEIR
14	552,298.50	778,143.27	1,021.26	167.51	SPECIAL	WEIR
15	552,282.80	778,165.09	1,022.94	165.45	H2O	H2O
16	552,271.48	778,163.52	1,033.36	163.42	H2O	H2O
17	552,254.33	778,155.20	1,052.30	160.81	H2O	H2O
18	552,243.90	778,144.34	1,066.92	158.12	H2O	H2O
19	552,229.14	778,138.04	1,082.76	156.48	H2O	H2O
20	552,214.80	778,133.23	1,097.46	157.52	H2O	H2O
21	552,205.29	778,130.46	1,106.99	162.60	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_POM_09

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,218.17	778,097.99	1,113.37	167.53	SPECIAL	WEIR
23	552,189.06	778,117.88	1,127.42	167.84	TE	TE
24	552,184.67	778,117.74	1,131.21	168.65	CB	Channelbank [CB
25	552,187.29	778,081.29	1,148.40	168.01	SPECIAL	ALPT2
26	552,162.55	778,111.65	1,153.18	169.26	GR	GR
27	552,137.35	778,108.15	1,176.37	170.24	GR	GR
28	552,108.75	778,109.19	1,200.03	170.63	GR	GR
29	552,100.55	778,106.16	1,208.59	171.31	GR	GR
30	552,080.28	778,110.60	1,223.39	179.92	GR	GR
31	552,042.00	778,113.00	1,254.51	179.65	GR	GR
32	552,042.00	778,113.00	1,254.51	179.66	SPECIAL	XALPT2
33	552,042.39	777,984.99	1,322.33	185.34	SPECIAL	PA_POM_08A
34	552,042.38	777,984.99	1,322.34	185.36	SPECIAL	PA_POM_08A FLD
35	552,042.38	777,984.99	1,322.34	185.36	SPECIAL	DATE 10-26-2011



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {BB2AC149-C7D2-4725-8C01-96E9B7037B2D}	Stream	Centerline
Name: PA_RAM_01XS	Name:	Station: 1,112.49
Location: US OF JACKSON	Station: 0.00	Easting: 552,319.45
County:	Orientation: Looking D/S	Northing: 778,826.01
State:	Datum	Invert: 162.45
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_01XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,749.66	778,745.94	743.19	215.53	SPECIAL	PA_RAM_01CX
2	552,523.59	778,543.30	826.47	193.84	SPECIAL	PA_RAM_01BXS FLD
3	552,523.58	778,543.30	826.47	193.83	SPECIAL	DATE 10-25-11
4	552,523.57	778,543.34	826.51	193.80	SPECIAL	PA_RAM_01BXS
5	552,478.43	778,761.17	980.80	197.72	SPECIAL	PA_RAM_01AXS
6	552,478.24	778,761.16	980.95	197.70	SPECIAL	BS CK 01FXS
7	552,478.22	778,761.18	980.98	197.69	SPECIAL	PA_RAM_01AXS FLD
8	552,464.74	778,743.52	982.98	197.27	GR	GR
9	552,448.32	778,749.39	1,000.00	195.18	SPECIAL	ALPT1
10	552,448.27	778,749.42	1,000.05	195.16	GR	GR
11	552,439.46	778,754.69	1,010.32	189.85	GR	GR
12	552,432.36	778,757.55	1,017.86	184.96	GR	GR
13	552,425.19	778,760.78	1,025.64	182.48	GR	GR
14	552,418.92	778,763.67	1,032.49	180.45	SPECIAL	PA_RAM_01FXS NL
15	552,418.92	778,763.67	1,032.49	180.45	GR	GR
16	552,414.21	778,766.32	1,037.89	178.98	GR	GR
17	552,405.84	778,771.28	1,047.61	172.16	GR	GR
18	552,401.37	778,773.17	1,052.41	170.55	CB	Channelbank [CB
19	552,399.98	778,774.08	1,054.06	168.12	TE	TE
20	552,399.05	778,774.40	1,055.03	166.27	H2O	H2O
21	552,394.33	778,778.32	1,061.10	164.45	H2O	H2O



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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_01XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,387.45	778,782.02	1,068.90	163.35	H2O	H2O
23	552,376.57	778,785.21	1,079.81	163.00	H2O	H2O
24	552,377.23	778,787.05	1,080.23	162.97	H2O	H2O
25	552,368.87	778,792.16	1,090.03	162.45	H2O	H2O
26	552,359.74	778,797.32	1,100.49	162.92	H2O	H2O
27	552,350.25	778,802.96	1,111.53	163.71	H2O	H2O
28	552,339.10	778,805.35	1,122.24	164.50	H2O	H2O
29	552,330.34	778,814.49	1,134.53	164.46	H2O	H2O
30	552,315.42	778,830.00	1,155.41	164.15	H2O	H2O
31	552,307.46	778,840.04	1,167.50	165.02	H2O	H2O
32	552,302.11	778,837.97	1,170.93	168.16	TE	TE
33	552,299.17	778,839.09	1,174.01	171.69	CB	Channelbank [CB
34	552,288.00	778,846.94	1,187.64	172.63	GR	GR
35	552,281.29	778,851.59	1,195.80	174.23	GR	GR
36	552,262.39	778,863.82	1,218.31	172.98	GR	GR
37	552,255.24	778,868.71	1,226.96	175.05	GR	GR
38	552,231.72	778,885.16	1,255.63	176.58	GR	GR
39	552,206.18	778,901.46	1,285.93	176.34	GR	GR
40	552,179.89	778,918.49	1,317.25	176.18	SPECIAL	ALPT2
41	552,179.88	778,918.50	1,317.27	176.17	GR	GR



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Cross Sections Report

(All Units In Feet)

ID: {D750BDAB-6144-43D3-BA95-BD4BFB70017A}	Stream	Centerline
Name: PA_RAM_02XS	Name:	Station: 1,249.33
Location: 72 COLE STREET	Station: 0.00	Easting: 553,549.40
County:	Orientation: Looking D/S	Northing: 779,498.12
State:	Datum	Invert: 167.40
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_02XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,889.62	779,421.53	940.97	185.20	SPECIAL	PA_RAM_02AXS FLD
2	553,889.62	779,421.53	940.97	185.20	SPECIAL	DATE 10-24-2011
3	553,889.62	779,421.53	940.98	185.25	SPECIAL	PA_RAM_02AXS
4	553,889.61	779,421.52	940.98	185.21	SPECIAL	BS CK 02AXS
5	553,835.68	779,619.69	953.36	187.27	SPECIAL	PA_RAM_02BXS FLD
6	553,835.67	779,619.70	953.38	187.25	SPECIAL	PA_RAM_02BXS
7	553,802.98	779,548.10	999.98	185.64	GR	GR
8	553,802.96	779,548.09	1,000.00	185.64	SPECIAL	ALPT1
9	553,771.67	779,544.77	1,031.31	185.68	GR	GR
10	553,765.37	779,543.96	1,037.65	185.63	SPECIAL	PA_RAM_02CXS REF
11	553,765.37	779,543.96	1,037.65	185.63	GR	GR
12	553,748.54	779,540.92	1,054.74	185.68	GR	GR
13	553,728.70	779,536.39	1,075.09	185.51	GR	GR
14	553,720.14	779,534.90	1,083.77	181.42	GR	GR
15	553,707.85	779,533.31	1,096.13	179.49	GR	GR
16	553,702.28	779,532.27	1,101.80	178.15	GR	GR
17	553,695.65	779,530.28	1,108.69	177.95	CB	Channelbank [CB
18	553,694.61	779,530.02	1,109.76	177.54	GR	GR
19	553,694.14	779,529.55	1,110.32	175.43	GR	GR
20	553,692.43	779,529.31	1,112.04	175.35	TE	TE
21	553,686.57	779,527.33	1,118.18	174.29	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_02XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	553,681.52	779,527.08	1,123.18	172.79	H2O	H2O
23	553,673.71	779,525.57	1,131.13	170.57	H2O	H2O
24	553,658.42	779,518.31	1,147.57	168.17	H2O	H2O
25	553,650.25	779,515.37	1,156.18	167.58	H2O	H2O
26	553,641.08	779,511.01	1,166.04	167.40	H2O	H2O
27	553,622.72	779,501.44	1,185.96	169.01	H2O	H2O
28	553,605.11	779,500.73	1,203.35	170.09	H2O	H2O
29	553,584.61	779,495.87	1,224.41	170.24	H2O	H2O
30	553,562.88	779,487.14	1,247.46	168.60	H2O	H2O
31	553,540.53	779,479.02	1,271.00	169.67	H2O	H2O
32	553,524.23	779,475.76	1,287.62	170.16	H2O	H2O
33	553,505.74	779,469.78	1,306.95	171.69	H2O	H2O
34	553,488.68	779,468.24	1,323.96	172.84	H2O	H2O
35	553,475.96	779,471.72	1,335.70	173.16	H2O	H2O
36	553,460.77	779,467.44	1,351.44	174.19	H2O	H2O
37	553,451.74	779,467.38	1,360.30	174.07	H2O	H2O
38	553,435.11	779,466.15	1,376.84	174.52	H2O	H2O
39	553,427.16	779,466.72	1,384.50	174.76	H2O	H2O
40	553,425.06	779,466.41	1,386.62	175.29	TE	TE
41	553,409.01	779,465.34	1,402.55	175.69	GR	GR
42	553,401.84	779,465.37	1,409.56	179.22	GR	GR
43	553,392.74	779,463.67	1,418.82	182.19	CB	Channelbank [CB
44	553,383.06	779,460.99	1,428.84	182.27	GR	GR
45	553,374.11	779,459.39	1,437.93	178.11	GR	GR
46	553,364.98	779,457.36	1,447.28	175.74	GR	GR
47	553,342.30	779,452.29	1,470.51	174.97	GR	GR
48	553,320.34	779,448.04	1,492.89	174.24	GR	GR
49	553,296.97	779,442.68	1,516.85	174.56	SPECIAL	ALPT2
50	553,296.87	779,442.66	1,516.95	174.57	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {DBD4C786-529C-46FE-A452-D5F94AB629E2}	Stream	Centerline
Name: PA_RAM_03XS	Name:	Station: 1,235.16
Location: 16 MAPLE LN	Station: 0.00	Easting: 553,363.57
County:	Orientation: Looking D/S	Northing: 780,104.32
State:	Datum	Invert: 167.01
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_03XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,758.99	780,167.75	877.67	179.63	SPECIAL	PA_RAM_03AXS
2	553,411.36	780,505.74	964.51	183.13	SPECIAL	PA_RAM_03BXS
3	553,411.36	780,505.74	964.51	183.14	SPECIAL	DATE 10-20-2011
4	553,411.36	780,505.74	964.51	183.14	SPECIAL	PA_RAM_03BXS FLD
5	553,411.28	780,505.71	964.59	183.15	SPECIAL	PA_RAM_03BXS FLD
6	553,555.17	780,242.89	1,000.00	184.53	GR	GR
7	553,555.17	780,242.89	1,000.00	184.53	SPECIAL	ALPT1
8	553,532.44	780,224.78	1,029.02	182.75	GR	GR
9	553,519.56	780,215.90	1,044.66	182.23	SPECIAL	PA_RAM_03C REF
10	553,514.84	780,212.92	1,050.24	182.04	GR	GR
11	553,508.88	780,208.57	1,057.61	178.47	GR	GR
12	553,503.08	780,204.30	1,064.82	177.30	CB	Channelbank [CB
13	553,502.35	780,203.87	1,065.66	175.80	TE	TE
14	553,501.85	780,203.62	1,066.21	174.50	H2O	H2O
15	553,499.54	780,202.38	1,068.82	173.34	H2O	H2O
16	553,492.52	780,198.44	1,076.82	171.32	H2O	H2O
17	553,478.94	780,188.18	1,093.83	167.01	H2O	H2O
18	553,464.77	780,176.91	1,111.91	168.56	H2O	H2O
19	553,451.57	780,165.70	1,129.16	170.99	H2O	H2O
20	553,438.09	780,155.85	1,145.86	172.21	H2O	H2O
21	553,431.27	780,150.07	1,154.78	173.73	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_03XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	553,426.58	780,146.02	1,160.93	174.72	H2O	H2O
23	553,420.59	780,145.09	1,166.36	175.32	H2O	H2O
24	553,419.55	780,144.29	1,167.67	175.78	GR	GR XTE
25	553,418.95	780,144.30	1,168.15	176.96	GR	GR
26	553,417.36	780,143.31	1,170.02	177.69	GR	GR XCB
27	553,403.99	780,131.65	1,187.68	176.99	GR	GR
28	553,386.15	780,119.02	1,209.54	176.42	GR	GR
29	553,363.28	780,102.24	1,237.90	175.99	GR	GR XCB
30	553,361.03	780,100.71	1,240.61	175.79	GR	GR XTE
31	553,357.66	780,098.80	1,244.47	175.09	H2O	H2O
32	553,349.86	780,093.15	1,254.10	174.21	H2O	H2O
33	553,339.94	780,086.45	1,266.07	171.62	H2O	H2O
34	553,331.75	780,078.73	1,277.22	170.37	H2O	H2O
35	553,320.05	780,070.81	1,291.34	170.21	H2O	H2O
36	553,309.18	780,061.84	1,305.40	169.66	H2O	H2O
37	553,301.58	780,057.89	1,313.89	169.96	H2O	H2O
38	553,291.93	780,050.03	1,326.31	168.51	H2O	H2O
39	553,277.29	780,037.16	1,345.69	170.52	H2O	H2O
40	553,258.96	780,025.18	1,367.58	173.01	H2O	H2O
41	553,247.17	780,015.72	1,382.66	173.70	H2O	H2O
42	553,229.89	780,004.83	1,403.06	175.23	H2O	H2O
43	553,228.59	780,003.89	1,404.67	175.76	TE	TE
44	553,227.76	780,003.05	1,405.83	176.39	GR	GR
45	553,224.93	780,000.47	1,409.63	176.94	GR	GR
46	553,219.34	779,996.44	1,416.52	177.50	GR	GR
47	553,212.86	779,993.71	1,423.38	179.96	GR	GR
48	553,205.15	779,990.78	1,431.36	183.01	CB	Channelbank [CB
49	553,197.51	779,985.41	1,440.69	182.98	GR	GR
50	553,181.27	779,976.25	1,459.24	176.61	GR	GR
51	553,170.15	779,968.38	1,472.86	176.63	SPECIAL	ALPT2
52	553,170.15	779,968.38	1,472.86	176.63	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {10D78924-9E75-4E9F-8D82-305EC808629D}	Stream	Centerline
Name: PA_RAM_04XS	Name:	Station: 1,437.92
Location: 33 SHORE ROAD	Station: 0.00	Easting: 552,382.07
County:	Orientation: Looking D/S	Northing: 780,694.00
State:	Datum	Invert: 169.62
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_04XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,763.32	780,957.86	988.00	184.04	SPECIAL	BS CK 04AXS
2	552,763.30	780,957.88	988.01	184.13	SPECIAL	PA_RAM_04AXS
3	552,763.30	780,957.87	988.02	184.04	SPECIAL	PA_RAM_04AXS FLD
4	552,782.12	780,861.87	1,000.00	195.19	SPECIAL	ALPT1
5	552,782.12	780,861.87	1,000.00	185.08	GR	GR
6	552,755.21	780,849.98	1,029.27	185.20	GR	GR
7	552,731.98	780,840.84	1,054.19	185.43	GR	GR
8	552,725.95	780,838.47	1,060.65	185.24	SPECIAL	PA_RAM_04BXS FLD
9	552,725.91	780,838.51	1,060.68	185.24	SPECIAL	BS CK 04BXS
10	552,725.92	780,838.45	1,060.69	185.23	SPECIAL	PA_RAM_04BXS NL
11	552,722.56	780,837.53	1,064.17	184.89	GR	GR
12	552,708.75	780,832.03	1,079.01	178.87	GR	GR
13	552,698.05	780,826.85	1,090.78	178.30	GR	GR XCB
14	552,694.45	780,824.41	1,094.97	175.35	GR	GR XTE
15	552,691.51	780,822.41	1,098.38	174.20	GR	GR XH2O
16	552,691.35	780,819.98	1,099.29	173.92	GR	GR XH2O
17	552,688.02	780,816.57	1,103.52	172.34	GR	GR XH2O
18	552,683.53	780,816.24	1,107.89	172.19	GR	GR XH2O
19	552,674.08	780,812.26	1,118.11	173.43	GR	GR XH2O
20	552,666.17	780,806.11	1,127.54	174.20	GR	GR XH2O
21	552,659.45	780,803.33	1,134.79	174.56	GR	GR XH2O



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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_04XS

Point	Easting	Northing	Station	Elevation	Code	Comment
22	552,652.15	780,800.15	1,142.71	174.44	GR	GR XH2O
23	552,645.90	780,800.36	1,148.59	175.36	GR	GR XTE
24	552,644.06	780,798.78	1,150.83	176.19	GR	GR
25	552,525.17	781,150.59	1,154.38	183.24	SPECIAL	PA_RAM_05AXS
26	552,525.14	781,150.61	1,154.40	183.24	SPECIAL	DATE 10-24-2011
27	552,525.14	781,150.61	1,154.40	183.24	SPECIAL	PA_RAM_05AXS FLD
28	552,639.42	780,797.70	1,155.57	176.03	GR	GR
29	552,637.26	780,796.68	1,157.95	176.32	GR	GR
30	552,633.89	780,794.91	1,161.70	177.05	GR	GR
31	552,619.03	780,787.99	1,177.97	177.36	GR	GR
32	552,601.60	780,779.47	1,197.19	176.43	GR	GR
33	552,596.64	780,777.69	1,202.46	177.19	GR	GR
34	552,582.19	780,771.09	1,218.25	177.20	GR	GR
35	552,564.78	780,767.41	1,235.93	176.93	GR	GR
36	552,555.82	780,762.66	1,245.93	176.58	GR	GR
37	552,533.99	780,748.55	1,271.07	176.13	GR	GR
38	552,510.28	780,737.88	1,296.92	176.58	GR	GR
39	552,478.25	780,722.79	1,332.05	177.26	GR	GR
40	552,473.07	780,721.93	1,337.24	177.59	GR	GR
41	552,461.18	780,716.54	1,350.22	177.00	GR	GR
42	552,454.99	780,712.84	1,357.25	177.13	SPECIAL	PA_RAM_04CXNS NL
43	552,442.87	780,710.13	1,369.62	177.04	CB	Channelbank [CB
44	552,441.27	780,709.78	1,371.24	175.52	TE	TE
45	552,440.18	780,709.41	1,372.40	174.61	H2O	H2O
46	552,438.80	780,709.57	1,373.66	174.13	H2O	H2O
47	552,434.21	780,707.58	1,378.64	173.97	H2O	H2O
48	552,424.09	780,703.78	1,389.44	173.82	H2O	H2O
49	552,415.30	780,700.78	1,398.72	173.78	H2O	H2O
50	552,403.68	780,698.75	1,410.40	173.43	H2O	H2O
51	552,391.45	780,696.86	1,422.61	172.87	H2O	H2O
52	552,378.49	780,690.71	1,436.84	172.73	H2O	H2O
53	552,372.03	780,687.13	1,444.10	172.76	H2O	H2O
54	552,355.80	780,680.86	1,461.47	173.21	H2O	H2O
55	552,337.32	780,677.26	1,480.15	169.62	H2O	H2O
56	552,322.62	780,679.43	1,493.45	169.74	H2O	H2O
57	552,316.40	780,676.68	1,500.22	171.01	H2O	H2O
58	552,312.27	780,675.24	1,504.59	175.48	TE	TE
59	552,310.99	780,675.14	1,505.84	176.00	CB	Channelbank [CB
60	552,288.89	780,669.58	1,528.57	176.10	GR	GR
61	552,253.42	780,663.43	1,564.19	176.41	GR	GR XCB
62	552,252.50	780,662.58	1,565.33	175.60	GR	GR XTE
63	552,251.78	780,661.81	1,566.26	174.24	GR	GR XH2O
64	552,247.55	780,661.40	1,570.40	173.01	GR	GR XH2O
65	552,239.27	780,659.99	1,578.71	173.04	GR	GR XH2O
66	552,226.19	780,656.63	1,592.18	173.04	GR	GR XH2O
67	552,203.69	780,651.11	1,615.29	173.29	GR	GR XH2O
68	552,176.13	780,643.89	1,643.72	173.39	GR	GR XH2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_04XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
69	552,144.61	780,637.91	1,675.55	173.64	GR	GR XH2O
70	552,119.08	780,630.07	1,702.25	173.58	GR	GR XH2O
71	552,082.41	780,621.74	1,739.68	171.15	GR	GR XH2O
72	552,065.38	780,617.34	1,757.24	170.28	GR	GR XH2O
73	552,036.60	780,610.24	1,786.80	169.88	GR	GR XH2O
74	552,000.01	780,601.44	1,824.31	171.68	GR	GR XH2O
75	551,990.26	780,597.80	1,834.71	172.19	GR	GR XH2O
76	551,978.49	780,596.85	1,846.20	175.56	GR	GR XTE
77	551,975.61	780,596.87	1,848.92	177.19	GR	GR XCB
78	551,959.56	780,592.62	1,865.50	177.26	SPECIAL	ALPT2
79	551,959.56	780,592.62	1,865.50	177.26	GR	GR XGR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {3C303E04-3999-4B4A-8620-FC1C0F081B85}	Stream	Centerline
Name: PA_RAM_05XS	Name:	Station: 1,184.96
Location: 47 SHORE ROAD	Station: 0.00	Easting: 552,336.67
County:	Orientation: Looking D/S	Northing: 781,092.93
State:	Datum	Invert: 168.39
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_05XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,763.32	780,957.87	766.41	184.02	SPECIAL	PA_RAM_04AXS FLD
2	552,763.30	780,957.88	766.42	184.02	SPECIAL	DATE 10-24-2011
3	552,763.30	780,957.88	766.42	184.13	SPECIAL	PA_RAM_04AXS
4	552,525.23	781,150.60	987.63	183.25	SPECIAL	BS CK 05AXS
5	552,525.22	781,150.61	987.64	183.25	SPECIAL	PA_RAM_05AXS FLD
6	552,525.17	781,150.59	987.70	183.24	SPECIAL	PA_RAM_05AXS
7	552,516.45	781,107.07	1,000.00	182.72	SPECIAL	ALPT1
8	552,516.43	781,107.07	1,000.02	182.71	GR	GR
9	552,482.60	781,105.60	1,033.86	182.45	GR	GR
10	552,453.27	781,107.29	1,062.95	182.46	GR	GR
11	552,424.05	781,103.14	1,092.42	182.94	GR	GR
12	552,407.27	781,100.97	1,109.32	182.83	SPECIAL	PA_RAM_05BXS NL
13	552,401.74	781,099.20	1,114.97	182.73	GR	GR
14	552,392.70	781,097.00	1,124.17	182.78	GR	GR
15	552,392.07	781,096.97	1,124.79	180.07	GR	GR
16	552,387.49	781,095.41	1,129.48	179.26	CB	Channelbank [CB
17	552,384.55	781,095.00	1,132.46	175.54	TE	TE
18	552,383.64	781,094.90	1,133.36	174.78	H2O	H2O
19	552,378.30	781,093.54	1,138.80	172.32	H2O	H2O
20	552,372.66	781,092.03	1,144.55	170.23	H2O	H2O
21	552,362.00	781,093.77	1,155.02	169.69	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_05XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,348.26	781,086.23	1,169.35	169.48	H2O	H2O
23	552,330.49	781,085.53	1,187.12	168.77	H2O	H2O
24	552,317.61	781,088.22	1,199.72	168.68	H2O	H2O
25	552,304.84	781,088.27	1,212.45	168.39	H2O	H2O
26	552,296.07	781,087.01	1,221.29	169.61	H2O	H2O
27	552,289.46	781,086.85	1,227.89	172.79	H2O	H2O
28	552,280.92	781,089.89	1,236.14	174.63	H2O	H2O
29	552,279.57	781,090.24	1,237.46	175.58	TE	TE
30	552,278.11	781,090.07	1,238.93	177.66	CB	Channelbank [CB
31	552,265.97	781,089.97	1,251.04	176.55	GR	GR
32	552,241.33	781,086.98	1,275.84	176.16	GR	GR
33	552,224.18	781,085.70	1,293.04	175.78	GR	GR
34	552,206.17	781,082.65	1,311.24	175.57	GR	GR
35	552,182.61	781,080.41	1,334.91	175.41	GR	GR
36	552,157.08	781,077.08	1,360.63	175.98	GR	GR
37	552,157.06	781,077.07	1,360.65	175.99	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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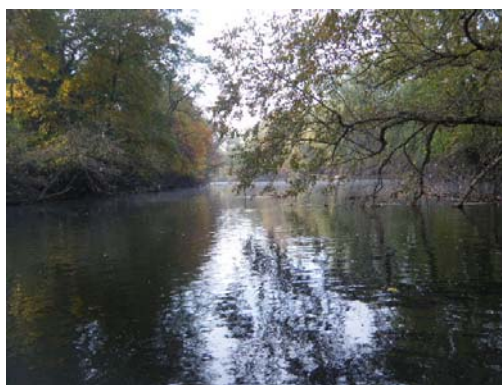
Cross Sections Report

(All Units In Feet)

ID: {96FE53CA-1DE9-4519-B733-58FB307F93B1}	Stream	Centerline
Name: PA_RAM_06XS	Name:	Station: 1,264.54
Location: 21 LAKE ROAD	Station: 0.00	Easting: 552,457.65
County:	Orientation: Looking D/S	Northing: 782,058.68
State:	Datum	Invert: 168.34
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_06XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,822.19	781,363.02	697.12	185.87	SPECIAL	PA_RAM_06BXS FLD
2	552,822.19	781,363.02	697.12	185.87	SPECIAL	DATE 10-24-2011
3	552,822.18	781,363.10	697.16	186.04	SPECIAL	PA_RAM_06BXS
4	552,722.65	781,751.42	893.38	182.15	SPECIAL	PA_RAM_06AXS
5	552,722.65	781,751.42	893.38	182.11	SPECIAL	PA_RAM_06AXS FLD
6	552,679.17	782,002.14	1,000.00	184.23	SPECIAL	ALPT1
7	552,679.13	782,002.15	1,000.04	184.23	GR	GR
8	552,666.39	782,003.60	1,012.73	184.25	SPECIAL	PA_RAM_06CXS FLD
9	552,666.39	782,003.60	1,012.73	184.25	SPECIAL	BS CK 06CXS
10	552,666.37	782,003.61	1,012.75	184.24	SPECIAL	PA_RAM_06CXS NL
11	552,648.07	782,010.10	1,032.10	184.47	GR	GR
12	552,610.71	782,019.57	1,070.63	184.61	GR	GR
13	552,573.58	782,029.26	1,109.01	184.83	GR	GR
14	552,548.56	782,036.60	1,135.07	185.02	GR	GR
15	552,524.57	782,042.13	1,159.68	185.27	GR	GR
16	552,503.43	782,047.01	1,181.37	185.36	GR	GR
17	552,494.30	782,049.26	1,190.76	185.33	SPECIAL	PA_RAM_06DXS NL
18	552,492.15	782,049.77	1,192.98	185.18	CB	Channelbank [CB
19	552,489.38	782,050.38	1,195.81	184.28	GR	GR
20	552,482.44	782,051.16	1,202.71	179.50	GR	GR
21	552,481.06	782,051.41	1,204.12	178.77	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_06XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,480.96	782,051.61	1,204.27	177.78	GR	GR
23	552,476.73	782,052.74	1,208.64	177.54	GR	GR
24	552,476.27	782,052.74	1,209.09	176.22	GR	GR
25	552,475.33	782,052.76	1,210.00	176.18	GR	GR
26	552,474.80	782,052.71	1,210.49	175.59	TE	TE
27	552,474.09	782,052.88	1,211.22	173.87	H2O	H2O
28	552,472.91	782,052.96	1,212.39	172.80	H2O	H2O
29	552,466.49	782,054.19	1,218.91	168.66	H2O	H2O
30	552,458.02	782,055.92	1,227.53	168.46	H2O	H2O
31	552,444.61	782,054.57	1,240.15	168.90	H2O	H2O
32	552,435.98	782,062.05	1,250.41	168.89	H2O	H2O
33	552,426.07	782,064.11	1,260.52	168.94	H2O	H2O
34	552,408.25	782,070.79	1,279.46	168.46	H2O	H2O
35	552,398.74	782,074.77	1,289.68	168.34	H2O	H2O
36	552,381.96	782,082.06	1,307.76	170.56	H2O	H2O
37	552,376.46	782,083.93	1,313.56	171.33	H2O	H2O
38	552,370.71	782,081.83	1,318.58	175.60	TE	TE
39	552,367.81	782,081.89	1,321.40	179.62	CB	Channelbank [CB
40	552,364.89	782,082.40	1,324.35	179.49	GR	GR
41	552,348.48	782,087.12	1,341.42	177.93	GR	GR
42	552,336.96	782,089.48	1,353.16	177.76	GR	GR
43	552,319.08	782,098.78	1,372.83	177.84	GR	GR
44	552,297.14	782,105.69	1,395.81	177.91	GR	GR
45	552,283.37	782,109.51	1,410.10	178.30	GR	GR
46	552,267.10	782,112.03	1,426.47	180.13	SPECIAL	ALPT2
47	552,267.08	782,112.03	1,426.49	180.13	GR	GR
48	552,237.10	782,118.66	1,457.17	182.00	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {53DD8CF6-9F36-499C-BD8E-EF59C9A5D13F}	Stream	Centerline
Name: PA_RAM_07XS	Name:	Station: 1,226.05
Location: 1576 RIVEREDGE	Station: 0.00	Easting: 552,472.47
County:	Orientation: Looking D/S	Northing: 783,059.39
State:	Datum	Invert: 170.26
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_07XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,677.77	783,100.00	1,000.00	179.71	SPECIAL	ALPT1
2	552,677.69	783,099.99	1,000.08	179.72	GR	GR
3	552,660.09	783,096.13	1,018.10	180.05	GR	GR
4	552,522.72	783,705.83	1,034.84	179.32	SPECIAL	RAM_08AXS FLD
5	552,522.71	783,705.82	1,034.85	179.32	SPECIAL	DATE 10-10-2011
6	552,522.68	783,705.78	1,034.88	179.40	SPECIAL	PA_RAM_08AXS
7	552,640.15	783,093.18	1,038.22	180.30	GR	GR
8	552,632.26	783,090.99	1,046.39	178.56	GR	GR
9	552,628.33	783,090.42	1,050.36	178.04	GR	GR
10	552,617.72	783,089.41	1,060.96	177.50	GR	GR
11	552,607.50	783,086.66	1,071.52	178.75	GR	GR
12	552,593.32	783,082.08	1,086.32	179.21	GR	GR
13	552,587.49	783,081.07	1,092.24	178.13	GR	GR
14	552,585.78	783,080.38	1,094.04	177.58	GR	GR
15	552,581.55	783,079.39	1,098.38	177.59	GR	GR
16	552,575.68	783,078.47	1,104.32	178.93	GR	GR
17	552,567.39	783,077.03	1,112.74	179.67	GR	GR
18	552,563.41	783,076.40	1,116.76	179.69	GR	GR
19	552,557.27	783,075.43	1,122.98	180.37	GR	GR
20	552,546.98	783,073.80	1,133.38	179.82	GR	GR
21	552,543.32	783,073.14	1,137.11	178.29	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_07XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,539.10	783,073.30	1,141.21	177.72	GR	GR
23	552,536.49	783,073.94	1,143.65	175.88	GR	GR
24	552,533.20	783,071.56	1,147.34	174.92	GR	GR
25	552,529.77	783,071.62	1,150.69	174.51	GR	GR
26	552,524.99	783,070.15	1,155.67	175.42	GR	GR
27	552,522.04	783,068.54	1,158.87	178.11	GR	GR
28	552,519.44	783,068.84	1,161.36	178.18	CB	Channelbank [CB
29	552,515.19	783,067.91	1,165.71	175.37	TE	TE
30	552,512.38	783,067.12	1,168.62	174.77	H2O	H2O
31	552,505.56	783,066.87	1,175.36	173.46	H2O	H2O
32	552,494.51	783,062.39	1,187.07	172.67	H2O	H2O
33	552,486.26	783,060.36	1,195.56	172.34	H2O	H2O
34	552,472.28	783,056.28	1,210.06	171.67	H2O	H2O
35	552,455.33	783,053.55	1,227.22	171.23	H2O	H2O
36	552,441.57	783,052.54	1,240.91	170.52	H2O	H2O
37	552,431.59	783,049.60	1,251.28	170.26	H2O	H2O
38	552,416.07	783,047.04	1,267.00	170.37	H2O	H2O
39	552,404.76	783,045.94	1,278.31	172.16	H2O	H2O
40	552,400.94	783,045.92	1,282.06	173.79	H2O	H2O
41	552,397.35	783,045.17	1,285.73	174.78	H2O	H2O
42	552,396.69	783,045.11	1,286.38	175.54	TE	TE
43	552,390.20	783,042.83	1,293.20	181.40	CB	Channelbank [CB
44	552,377.84	783,038.67	1,306.13	181.13	SPECIAL	PA_RAM_07BXS NL
45	552,364.56	783,036.08	1,319.66	180.55	GR	GR
46	552,341.08	783,031.94	1,343.49	180.43	GR	GR
47	552,315.18	783,026.69	1,369.92	180.43	GR	GR
48	552,290.77	783,022.75	1,394.63	180.36	GR	GR
49	552,267.26	783,019.00	1,418.42	180.26	SPECIAL	ALPT2
50	552,267.24	783,018.91	1,418.46	180.26	GR	GR
51	552,208.38	783,214.86	1,438.28	180.12	SPECIAL	RAM_07AXS FLD
52	552,208.37	783,214.85	1,438.28	180.12	SPECIAL	RAM_07AXS BS
53	552,208.37	783,214.86	1,438.28	180.12	SPECIAL	PA_RAM_07AXS



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Cross Sections Report

(All Units In Feet)

ID: {195515F8-823A-4F87-B483-2F063B6EA5DD}	Stream	Centerline
Name: PA_RAM_08XS	Name:	Station: 1,199.49
Location: 1524 RIVEREDGE	Station: 0.00	Easting: 552,774.12
County:	Orientation: Looking D/S	Northing: 783,643.90
State:	Datum	Invert: 166.54
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_08XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,906.81	783,510.84	1,000.00	182.46	SPECIAL	ALPT1
2	552,906.79	783,510.85	1,000.02	182.46	GR	GR
3	552,888.48	783,527.45	1,024.69	182.51	GR	GR
4	552,881.39	783,534.85	1,034.93	182.43	GR	GR
5	552,878.48	783,537.99	1,039.21	183.01	GR	GR
6	552,869.15	783,547.56	1,052.58	182.99	GR	GR
7	552,863.79	783,553.66	1,060.70	183.36	GR	GR
8	552,857.96	783,558.96	1,068.56	182.58	GR	GR
9	552,848.30	783,569.31	1,082.71	182.40	GR	GR
10	552,838.83	783,579.35	1,096.51	182.26	GR	GR
11	552,829.34	783,588.32	1,109.56	182.20	GR	GR
12	552,816.71	783,600.48	1,127.08	183.23	GR	GR
13	552,798.84	783,615.94	1,150.62	178.02	CB	Channelbank [CB
14	552,796.99	783,616.07	1,152.01	175.67	TE	TE
15	552,794.70	783,619.78	1,156.26	174.62	H2O	H2O
16	552,791.80	783,623.72	1,161.11	172.76	H2O	H2O
17	552,786.41	783,626.84	1,167.11	170.81	H2O	H2O
18	552,778.51	783,634.16	1,177.86	170.41	H2O	H2O
19	552,774.15	783,640.04	1,185.12	166.54	H2O	H2O
20	552,770.29	783,647.93	1,193.46	166.93	H2O	H2O
21	552,762.43	783,659.24	1,207.05	167.99	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_08XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,754.59	783,669.06	1,219.55	168.82	H2O	H2O
23	552,743.40	783,679.69	1,234.97	168.91	H2O	H2O
24	552,741.31	783,683.17	1,238.92	171.08	H2O	H2O
25	552,735.84	783,686.66	1,245.24	174.63	H2O	H2O
26	552,734.77	783,688.03	1,246.97	175.59	TE	TE
27	552,731.97	783,691.58	1,251.46	181.32	CB	Channelbank [CB
28	552,728.42	783,695.57	1,256.80	181.26	SPECIAL	PA_RAM_08BXS NL
29	552,724.48	783,699.66	1,262.48	181.10	GR	GR
30	552,719.72	783,704.53	1,269.29	179.86	GR	GR
31	552,208.33	783,214.81	1,275.30	180.23	SPECIAL	DATE 10-10-2011
32	552,208.33	783,214.81	1,275.30	180.23	SPECIAL	RAM_07AXS FLD
33	552,208.37	783,214.86	1,275.31	180.12	SPECIAL	PA_RAM_07AXS
34	552,702.76	783,722.59	1,294.06	178.89	GR	GR
35	552,689.50	783,735.23	1,312.37	179.69	GR	GR
36	552,682.19	783,742.33	1,322.55	182.37	GR	GR
37	552,662.62	783,760.75	1,349.40	182.22	GR	GR
38	552,644.60	783,780.03	1,375.79	181.98	GR	GR
39	552,644.60	783,780.03	1,375.79	181.98	SPECIAL	ALPT2
40	552,522.68	783,705.76	1,407.65	179.41	SPECIAL	PA_RAM_08AXS BS
41	552,522.69	783,705.78	1,407.66	179.41	SPECIAL	RAM_08AXS FLD
42	552,522.68	783,705.78	1,407.66	179.40	SPECIAL	PA_RAM_08AXS



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {8991B71B-8600-49E7-ABB0-28EFF2AD2F10}	Stream	Centerline
Name: PA_RAM_09XS	Name:	Station: 1,235.10
Location: 1440 RIVERSEDGE	Station: 0.00	Easting: 552,982.41
County:	Orientation: Looking D/S	Northing: 784,371.68
State:	Datum	Invert: 167.74
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_09XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,178.44	784,436.02	999.74	191.37	GR	GR
2	553,178.22	784,435.86	1,000.00	191.36	SPECIAL	ALPT1
3	553,152.12	784,427.22	1,027.49	190.53	GR	GR
4	553,141.59	784,423.72	1,038.58	189.67	GR	GR
5	553,128.17	784,418.51	1,052.95	187.98	GR	GR
6	553,111.13	784,413.69	1,070.64	185.46	GR	GR
7	553,097.58	784,410.01	1,084.67	183.77	GR	GR
8	553,070.85	784,402.32	1,112.48	182.68	GR	GR
9	553,040.31	784,392.31	1,144.61	182.12	GR	GR
10	553,024.80	784,386.81	1,161.06	181.51	GR	GR
11	553,014.51	784,381.48	1,172.48	181.00	CB	Channelbank [CB
12	553,008.49	784,380.67	1,178.46	176.41	GR	GR
13	553,006.21	784,379.48	1,180.99	175.54	TE	TE
14	553,002.28	784,378.12	1,185.15	174.22	H2O	H2O
15	552,996.17	784,376.78	1,191.38	172.00	H2O	H2O
16	552,987.94	784,373.71	1,200.15	170.77	H2O	H2O
17	552,976.98	784,370.07	1,211.70	170.21	H2O	H2O
18	552,968.93	784,366.19	1,220.54	169.64	H2O	H2O
19	552,959.63	784,361.69	1,230.76	168.99	H2O	H2O
20	552,943.26	784,353.72	1,248.76	167.74	H2O	H2O
21	552,918.53	784,349.98	1,273.48	169.29	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_09XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,913.56	784,347.61	1,278.93	171.98	H2O	H2O
23	552,909.89	784,347.33	1,282.52	173.97	H2O	H2O
24	552,905.00	784,348.32	1,286.89	174.94	H2O	H2O
25	552,902.85	784,347.43	1,289.21	175.50	TE	TE
26	552,898.17	784,345.97	1,294.11	178.43	CB	Channelbank [CB
27	552,894.26	784,344.26	1,298.35	179.52	GR	GR
28	552,888.57	784,343.04	1,304.14	179.37	SPECIAL	PA_RAM_09BXS NL
29	552,877.08	784,339.50	1,316.16	179.58	GR	GR
30	552,626.33	785,122.15	1,321.99	183.26	SPECIAL	PA_RAM_10AXS FLD
31	552,626.33	785,122.15	1,321.99	183.28	SPECIAL	DATE 10-10-2011
32	552,855.20	784,333.67	1,338.79	180.64	GR	GR
33	552,832.08	784,326.73	1,362.93	181.01	GR	GR
34	552,808.14	784,319.34	1,387.98	180.97	GR	GR
35	552,784.66	784,312.84	1,412.33	181.13	GR	GR
36	552,784.63	784,312.83	1,412.37	181.13	SPECIAL	ALPT2
37	552,704.88	784,466.47	1,442.64	180.34	SPECIAL	PA_RAM_09AXS
38	552,704.87	784,466.48	1,442.65	180.35	SPECIAL	PA_RAM_09AXS FLD
39	552,704.87	784,466.47	1,442.66	180.35	SPECIAL	RAM_09AXS BS CH
40	552,753.12	784,069.68	1,514.98	181.93	SPECIAL	PA_RAM_02A



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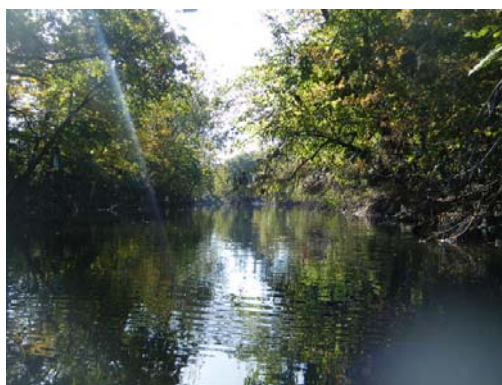
Cross Sections Report

(All Units In Feet)

ID: {57572BAE-5C27-4D13-AC2D-73C7A653FB31}	Stream	Centerline
Name: PA_RAM_10XS	Name:	Station: 1,162.14
Location: RIVEREDGE DR	Station: 0.00	Easting: 552,853.09
County:	Orientation: Looking D/S	Northing: 785,141.02
State:	Datum	Invert: 165.33
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_10XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,023.74	785,159.46	1,000.00	194.84	SPECIAL	ALPT1
2	553,023.68	785,159.46	1,000.06	194.83	GR	GR
3	553,003.53	785,157.55	1,020.30	194.83	GR	GR
4	552,960.31	785,151.95	1,063.88	193.95	GR	GR
5	552,938.69	785,149.55	1,085.63	193.50	GR	GR
6	552,938.65	785,149.54	1,085.67	193.50	GR	GR
7	552,932.56	785,150.11	1,091.65	193.78	GR	GR
8	552,932.11	785,150.05	1,092.10	192.16	GR	GR
9	552,916.71	785,148.66	1,107.56	185.41	GR	GR
10	552,916.49	785,148.70	1,107.77	182.62	GR	GR
11	552,915.36	785,148.22	1,108.94	182.07	GR	GR
12	552,912.31	785,147.67	1,112.04	181.31	GR	GR
13	552,911.96	785,150.19	1,112.09	180.83	CB	Channelbank [CB
14	552,909.77	785,148.19	1,114.51	178.11	GR	GR
15	552,905.38	785,147.04	1,118.99	175.52	TE	TE
16	552,903.24	785,147.09	1,121.12	174.45	H2O	H2O
17	552,899.11	785,145.03	1,125.47	173.05	H2O	H2O
18	552,887.54	785,146.65	1,136.75	167.89	H2O	H2O
19	552,875.07	785,149.82	1,148.75	165.33	H2O	H2O
20	552,862.71	785,146.21	1,161.46	166.36	H2O	H2O
21	552,847.06	785,142.92	1,177.39	168.25	H2O	H2O



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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_10XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,834.03	785,140.61	1,190.60	169.16	H2O	H2O
23	552,826.54	785,138.09	1,198.34	171.80	H2O	H2O
24	552,823.17	785,137.72	1,201.73	173.43	H2O	H2O
25	552,819.74	785,136.54	1,205.28	175.20	TE	TE
26	552,813.51	785,134.86	1,211.67	180.81	CB	Channelbank [CB
27	552,797.08	785,131.25	1,228.41	181.67	SPECIAL	PA_RAM_10BXS NL
28	552,787.40	785,129.70	1,238.20	182.19	GR	GR
29	552,761.48	785,125.28	1,264.47	182.66	GR	GR
30	552,735.65	785,122.14	1,290.49	182.63	GR	GR
31	552,710.56	785,121.03	1,315.53	182.76	GR	GR
32	552,682.95	785,118.15	1,343.29	182.90	GR	GR
33	552,682.93	785,118.15	1,343.31	182.90	SPECIAL	ALPT2
34	552,626.35	785,122.11	1,399.00	183.30	SPECIAL	PA_RAM_10AXS BS
35	552,626.35	785,122.08	1,399.01	183.31	SPECIAL	PA_RAM_10AXS FLD
36	552,626.34	785,122.08	1,399.01	183.31	SPECIAL	PA_RAM_10AXS
37	552,704.88	784,466.47	1,399.95	180.34	SPECIAL	PA_RAM_09AXS
38	552,704.81	784,466.41	1,400.03	180.33	SPECIAL	PA_RAM_09AXS FLD
39	552,704.81	784,466.39	1,400.03	180.33	SPECIAL	DATE 10-10-2011



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Cross Sections Report

(All Units In Feet)

ID: {7DF40654-FF42-45F0-8900-FAF6F4703319}	Stream	Centerline
Name: PA_RAM_11XS	Name:	Station: 1,267.87
Location: CAR LOT	Station: 0.00	Easting: 552,490.38
County:	Orientation: Looking D/S	Northing: 785,901.87
State:	Datum	Invert: 172.98
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_11XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,905.57	786,233.33	858.45	188.71	SPECIAL	RAM_03A FLD
2	552,905.57	786,233.33	858.45	188.71	SPECIAL	DATE 10-10-2011
3	552,905.57	786,233.26	858.47	188.69	SPECIAL	PA_RAM_03A
4	552,928.59	785,680.86	923.33	192.07	SPECIAL	PA_RAM_11AXS FLD
5	552,928.59	785,680.86	923.33	192.08	SPECIAL	RAM_11AXS BS CHK
6	552,928.58	785,680.86	923.33	192.08	SPECIAL	PA_RAM_11AXS
7	552,804.97	785,967.18	999.98	188.31	GR	GR
8	552,804.95	785,967.17	1,000.00	188.31	SPECIAL	ALPT1
9	552,765.62	785,953.94	1,040.93	186.33	GR	GR
10	552,746.37	785,947.47	1,060.97	187.22	GR	GR
11	552,699.96	785,931.47	1,109.33	187.23	GR	GR
12	552,673.81	785,923.74	1,136.38	185.33	SPECIAL	PA_RAM_11BXS
13	552,666.62	785,922.11	1,143.73	184.73	GR	GR
14	552,663.69	785,921.91	1,146.65	184.98	CB	Channelbank [CB
15	552,653.74	785,921.44	1,156.55	180.31	GR	GR
16	552,647.15	785,920.96	1,163.14	176.47	GR	GR
17	552,644.03	785,920.69	1,166.25	175.66	TE	TE
18	552,641.74	785,920.24	1,168.59	174.93	H2O	H2O
19	552,635.41	785,920.78	1,174.76	175.10	H2O	H2O
20	552,627.14	785,920.86	1,182.90	175.20	H2O	H2O
21	552,612.77	785,918.27	1,197.50	175.39	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_11XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,598.21	785,916.69	1,212.14	174.72	H2O	H2O
23	552,574.21	785,916.86	1,235.80	174.90	H2O	H2O
24	552,555.17	785,915.02	1,254.89	174.59	H2O	H2O
25	552,547.26	785,916.10	1,262.53	175.38	H2O	H2O
26	552,531.31	785,915.58	1,278.36	175.26	H2O	H2O
27	552,511.36	785,911.76	1,298.67	174.40	H2O	H2O
28	552,500.58	785,907.46	1,309.99	173.65	H2O	H2O
29	552,486.38	785,905.95	1,324.25	172.98	H2O	H2O
30	552,486.32	785,905.95	1,324.31	172.98	H2O	H2O
31	552,469.19	785,898.57	1,342.40	174.20	H2O	H2O
32	552,457.31	785,898.04	1,354.20	174.81	H2O	H2O
33	552,445.37	785,896.19	1,366.29	175.04	H2O	H2O
34	552,442.19	785,895.81	1,369.49	175.82	TE	TE
35	552,438.65	785,895.88	1,372.97	180.26	CB	Channelbank [CB
36	552,430.93	785,894.91	1,380.75	181.27	GR	GR
37	552,420.15	785,895.37	1,391.32	180.97	GR	GR
38	552,400.82	785,893.20	1,410.75	181.18	GR	GR
39	552,400.79	785,893.19	1,410.79	181.18	GR	GR
40	552,389.55	785,892.54	1,421.99	179.54	GR	GR
41	552,377.81	785,891.35	1,433.77	179.02	GR	GR
42	552,373.14	785,892.37	1,438.21	180.34	GR	GR
43	552,367.23	785,891.34	1,444.21	180.71	GR	GR
44	552,356.88	785,889.16	1,454.77	182.21	GR	GR
45	552,351.55	785,888.82	1,460.09	182.52	GR	GR
46	552,341.06	785,887.26	1,470.70	182.00	GR	GR
47	552,334.32	785,886.64	1,477.45	181.20	GR	GR
48	552,320.74	785,885.17	1,491.09	181.02	GR	GR
49	552,312.26	785,884.54	1,499.56	181.31	GR	GR
50	552,303.60	785,883.38	1,508.30	179.14	GR	GR
51	552,294.51	785,882.67	1,517.39	178.86	GR	GR
52	552,287.21	785,881.41	1,524.79	178.10	GR	GR
53	552,272.56	785,879.80	1,539.51	177.85	GR	GR
54	552,265.85	785,879.07	1,546.25	178.21	GR	GR
55	552,252.22	785,877.58	1,559.95	181.21	GR	GR
56	552,244.06	785,875.00	1,568.41	185.53	GR	GR
57	552,231.86	785,872.92	1,580.79	186.02	GR	GR
58	552,228.45	785,872.94	1,584.15	185.04	GR	GR
59	552,212.57	785,871.55	1,600.05	185.38	GR	GR
60	552,198.94	785,870.01	1,613.76	185.07	GR	GR
61	552,198.70	785,869.98	1,614.00	185.40	GR	GR
62	552,192.92	785,868.88	1,619.87	185.62	SPECIAL	ALPT2
63	552,192.88	785,869.10	1,619.88	185.64	GR	GR
64	552,182.32	785,867.80	1,630.51	186.69	GR	GR
65	552,169.51	785,866.46	1,643.37	187.22	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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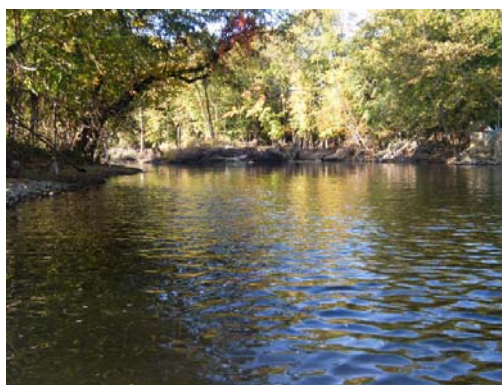
Cross Sections Report

(All Units In Feet)

ID: {752CC3E5-47EF-4448-B510-6D82387DC6C6}	Stream	Centerline
Name: PA_RAM_12XS	Name:	Station: 1,169.63
Location: GEORGES MARKET	Station: 0.00	Easting: 552,553.37
County:	Orientation: Looking D/S	Northing: 786,320.91
State:	Datum	Invert: 167.64
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_12XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,905.59	786,233.23	850.79	188.69	SPECIAL	DATE 10-10-2011
2	552,905.58	786,233.25	850.81	188.69	SPECIAL	PA_RAM_03A FLD
3	552,701.15	786,208.92	999.92	186.59	GR	GR
4	552,701.09	786,208.97	1,000.00	186.58	SPECIAL	ALPT1
5	552,684.42	786,222.85	1,021.66	186.17	GR	GR
6	552,651.41	786,246.91	1,062.51	184.85	GR	GR
7	552,630.36	786,262.01	1,088.41	183.90	GR	GR
8	552,627.67	786,263.90	1,091.69	183.83	CB	Channelbank [CB
9	552,620.83	786,271.55	1,101.75	177.96	GR	GR
10	552,615.10	786,276.46	1,109.28	176.17	TE	TE
11	552,612.26	786,279.03	1,113.09	175.65	H2O	H2O
12	552,608.36	786,282.08	1,118.05	174.84	H2O	H2O
13	552,601.88	786,292.18	1,129.28	172.73	H2O	H2O
14	552,582.33	786,300.99	1,150.21	170.26	H2O	H2O
15	552,571.95	786,312.04	1,165.15	171.09	H2O	H2O
16	552,555.53	786,320.14	1,183.14	167.64	H2O	H2O
17	552,681.78	786,518.19	1,200.71	189.58	SPECIAL	PA_RAM_03B FLD
18	552,681.77	786,518.18	1,200.71	189.58	SPECIAL	PA_RAM_03A
19	552,681.78	786,518.19	1,200.71	189.59	SPECIAL	RAM_03B BS CHK
20	552,537.62	786,337.43	1,207.85	171.27	H2O	H2O
21	552,524.12	786,343.72	1,222.42	174.66	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_12XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	552,519.68	786,350.41	1,229.98	176.17	TE	TE
23	552,508.95	786,354.99	1,241.32	184.37	GR	GR
24	552,502.63	786,359.83	1,249.28	187.85	CB	Channelbank [CB
25	552,489.33	786,370.71	1,266.44	188.49	SPECIAL	PA_RAM_12AXS NL
26	552,480.50	786,376.72	1,277.11	187.74	GR	GR
27	552,477.35	786,374.43	1,278.26	187.66	SPECIAL	PA_RAM_03B
28	552,479.20	786,377.70	1,278.75	187.18	GR	GR
29	552,466.01	786,387.19	1,294.99	187.60	GR	GR
30	552,450.71	786,397.62	1,313.49	187.05	GR	GR
31	552,449.68	786,397.99	1,314.53	187.55	GR	GR
32	552,440.78	786,402.90	1,324.61	188.18	GR	GR
33	552,424.39	786,412.96	1,343.75	189.57	GR	GR
34	552,404.24	786,431.08	1,370.74	190.06	SPECIAL	ALPT2
35	552,404.24	786,431.08	1,370.74	190.06	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {DF60F0B7-34B4-44CE-B466-044D424B3037}	Stream	Centerline
Name: PA_RAM_13XS	Name:	Station: 1,202.33
Location: DS POMPTON LAKE DAM	Station: 0.00	Easting: 553,046.86
County:	Orientation: Looking D/S	Northing: 786,424.20
State:	Datum	Invert: 161.98
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_13XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,084.74	786,230.93	1,000.00	191.98	GR	GR
2	553,084.74	786,230.93	1,000.00	191.98	SPECIAL	ALPT1
3	553,082.25	786,245.44	1,014.71	192.02	GR	GR
4	553,079.15	786,259.56	1,029.17	191.29	GR	GR
5	553,072.37	786,295.83	1,066.04	187.39	GR	GR
6	553,068.73	786,313.92	1,084.49	185.80	CB	Channelbank [CB
7	553,061.06	786,333.03	1,104.80	178.48	TE	TE
8	553,065.90	786,338.22	1,108.84	175.22	H2O	H2O
9	553,059.59	786,342.65	1,114.51	172.48	H2O	H2O
10	553,067.35	786,373.37	1,142.90	162.83	H2O	H2O
11	553,065.42	786,402.26	1,171.54	163.29	H2O	H2O
12	553,039.62	786,445.84	1,219.59	161.98	H2O	H2O
13	553,030.39	786,468.20	1,243.39	163.72	H2O	H2O
14	553,028.47	786,481.11	1,256.42	165.05	H2O	H2O
15	553,024.62	786,493.94	1,269.78	168.71	H2O	H2O
16	553,025.73	786,511.57	1,286.77	172.25	H2O	H2O
17	553,025.02	786,517.59	1,292.80	176.23	H2O	H2O
18	553,023.11	786,521.44	1,296.97	177.27	H2O	H2O
19	553,025.40	786,524.90	1,299.87	178.31	TE	TE
20	553,024.22	786,532.84	1,307.88	181.80	GR	GR
21	553,024.24	786,538.28	1,313.20	184.87	CB	Channelbank [CB



PROJECT NJDEP Field Survey - Cross Sections

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TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_13XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	553,023.89	786,550.23	1,324.95	184.82	GR	GR
23	553,018.01	786,565.28	1,340.90	192.15	GR	GR
24	553,016.71	786,571.77	1,347.52	192.91	GR	GR
25	553,016.34	786,573.30	1,349.09	193.67	GR	GR
26	552,681.75	786,518.20	1,365.98	189.58	SPECIAL	PA_RAM_03B BS CH
27	552,681.74	786,518.22	1,366.00	189.56	SPECIAL	DATE 10-18-2011
28	552,681.74	786,518.22	1,366.00	189.56	SPECIAL	PA_RAM_03B FLD
29	553,012.98	786,596.96	1,372.92	205.47	GR	GR
30	553,001.59	786,615.31	1,393.27	206.02	SPECIAL	ALPT2
31	553,000.36	786,615.31	1,393.53	206.07	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {8DB98357-6FBB-4E9C-BF8F-B6382BA23882}	Stream	Centerline
Name: PA_RAM_14XS	Name:	Station: 1,282.09
Location: HEMLOCK RD	Station: 0.00	Easting: 553,473.67
County:	Orientation: Looking D/S	Northing: 786,641.59
State:	Datum	Invert: 182.82
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_14XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,640.35	786,409.41	977.56	240.14	GR	GR
2	553,633.93	786,428.77	996.74	232.41	GR	GR
3	553,630.68	786,430.36	1,000.00	229.25	SPECIAL	ALPT1
4	553,630.67	786,430.37	1,000.02	229.25	GR	GR
5	553,626.86	786,438.89	1,009.06	220.17	GR	GR
6	553,621.61	786,449.08	1,020.31	211.02	GR	GR
7	553,618.90	786,454.12	1,025.95	208.72	GR	GR
8	553,929.01	786,708.97	1,033.92	209.68	SPECIAL	DATE 10-18-2011
9	553,929.01	786,708.97	1,033.92	209.68	SPECIAL	PA_RAM_14BXS FLD
10	553,929.01	786,708.97	1,033.93	209.68	SPECIAL	PA_RAM_14BXS
11	553,929.00	786,709.00	1,033.96	209.66	SPECIAL	PA_RAM_14BXS BS
12	553,609.35	786,468.21	1,042.93	208.81	GR	GR
13	553,600.85	786,484.04	1,060.62	208.33	GR	GR
14	553,597.68	786,489.09	1,066.55	208.53	CB	Channelbank [CB
15	554,194.82	786,960.96	1,067.10	208.27	SPECIAL	PA_HAY_01A
16	554,194.87	786,961.00	1,067.10	208.29	SPECIAL	HAY_01A FLD
17	553,596.86	786,492.24	1,069.53	205.11	GR	GR
18	553,596.68	786,495.64	1,072.31	202.64	GR	GR
19	553,595.78	786,497.50	1,074.33	200.83	TE	TE
20	553,594.79	786,497.68	1,075.08	200.24	H2O	H2O
21	553,593.96	786,500.58	1,077.87	199.98	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_14XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	553,585.92	786,509.70	1,090.02	197.30	H2O	H2O
23	553,586.60	786,511.45	1,090.97	195.82	H2O	H2O
24	553,581.47	786,520.27	1,101.07	190.50	H2O	H2O
25	553,575.30	786,524.61	1,108.30	186.22	H2O	H2O
26	553,562.23	786,533.04	1,123.01	184.28	H2O	H2O
27	553,537.74	786,560.53	1,159.76	182.82	H2O	H2O
28	553,510.39	786,595.36	1,204.05	184.17	H2O	H2O
29	553,492.58	786,624.28	1,237.79	188.64	H2O	H2O
30	553,466.28	786,656.64	1,279.47	190.86	H2O	H2O
31	553,438.80	786,680.95	1,315.59	191.32	H2O	H2O
32	553,418.08	786,704.76	1,347.12	191.93	H2O	H2O
33	553,405.82	786,733.65	1,377.38	192.05	H2O	H2O
34	553,395.65	786,751.49	1,397.69	193.26	H2O	H2O
35	553,389.44	786,763.24	1,410.77	193.72	H2O	H2O
36	553,375.67	786,775.71	1,429.08	194.61	H2O	H2O
37	553,365.75	786,786.44	1,443.65	194.53	H2O	H2O
38	553,356.89	786,794.09	1,455.14	194.02	H2O	H2O
39	553,350.89	786,802.19	1,465.22	194.42	H2O	H2O
40	553,341.84	786,810.17	1,477.09	195.93	H2O	H2O
41	553,337.04	786,814.97	1,483.83	198.63	H2O	H2O
42	553,331.59	786,816.80	1,488.65	199.99	H2O	H2O
43	553,330.64	786,817.60	1,489.86	200.79	TE	TE
44	553,329.28	786,819.14	1,491.91	203.64	CB	Channelbank [CB
45	553,326.84	786,820.32	1,494.35	204.58	GR	GR
46	553,326.11	786,826.25	1,499.45	204.76	SPECIAL	PA_RAM_14XS
47	553,315.25	786,833.96	1,512.23	205.19	GR	GR
48	553,314.29	786,834.76	1,513.46	205.57	GR	GR
49	553,309.27	786,838.46	1,519.47	209.67	GR	GR
50	553,302.38	786,845.68	1,529.41	215.18	GR	GR
51	553,300.14	786,849.67	1,533.93	218.86	GR	GR
52	553,296.19	786,854.28	1,539.99	223.63	SPECIAL	ALPT2
53	553,296.18	786,854.29	1,540.01	223.64	GR	GR
54	553,289.00	786,861.01	1,549.73	227.73	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {270D7716-50A3-4DD2-BDF6-37D6942F7DDF}	Stream	Centerline
Name: PA_RAM_15XS	Name:	Station: 1,420.40
Location: CONFLUENCE HAYCO	Station: 0.00	Easting: 553,892.94
County:	Orientation: Looking D/S	Northing: 787,704.57
State:	Datum	Invert: 182.21
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_15XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	554,395.46	787,184.75	689.57	207.04	SPECIAL	DATE 10-20-2011
2	554,395.46	787,184.77	689.57	207.02	SPECIAL	PA_HAY_01B TR 1A
3	554,395.47	787,184.77	689.57	207.04	SPECIAL	PA_HAY_01B FLD
4	554,446.95	787,288.63	693.41	210.76	SPECIAL	BS CK 15AXS
5	554,446.92	787,288.58	693.42	210.77	SPECIAL	PA_RAM_15AXS
6	554,446.91	787,288.59	693.43	210.77	SPECIAL	PA_RAM_15AXS FLD
7	554,194.82	786,960.96	760.30	208.27	SPECIAL	PA_HAY_01A
8	553,929.01	786,708.97	875.07	209.68	SPECIAL	PA_RAM_14BXS
9	554,296.76	787,470.85	911.99	204.16	GR	GR
10	554,296.49	787,470.91	912.26	208.75	GR	GR
11	554,286.85	787,477.72	923.97	206.97	GR	GR
12	554,263.92	787,493.09	951.45	206.20	GR	GR
13	554,241.36	787,506.29	977.57	205.17	GR	GR
14	554,224.31	787,521.95	1,000.00	204.08	SPECIAL	ALPT1
15	554,224.29	787,521.96	1,000.02	204.08	GR	GR
16	554,199.99	787,535.41	1,027.80	203.45	GR	GR
17	554,177.65	787,548.01	1,053.44	202.65	GR	GR
18	554,162.11	787,562.20	1,073.84	202.05	SPECIAL	PA_RAM_15BXS NL
19	554,153.26	787,562.63	1,081.85	201.73	CB	Channelbank [CB
20	554,147.63	787,565.65	1,088.23	201.05	TE	TE
21	554,145.96	787,566.60	1,090.16	200.36	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_15XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	554,142.90	787,567.68	1,093.36	197.85	H2O	H2O
23	554,136.37	787,576.15	1,103.12	197.67	H2O	H2O
24	554,127.94	787,585.27	1,114.86	196.75	H2O	H2O
25	554,112.22	787,600.30	1,135.83	196.49	H2O	H2O
26	554,085.89	787,609.13	1,163.20	196.15	H2O	H2O
27	554,069.89	787,612.71	1,178.99	195.53	H2O	H2O
28	554,050.40	787,624.29	1,201.64	192.24	H2O	H2O
29	554,026.49	787,642.33	1,231.25	189.99	H2O	H2O
30	553,981.22	787,670.63	1,284.51	188.10	H2O	H2O
31	553,956.39	787,686.33	1,313.82	185.31	H2O	H2O
32	553,923.66	787,704.80	1,351.39	182.21	H2O	H2O
33	553,902.85	787,718.09	1,376.02	182.84	H2O	H2O
34	553,875.05	787,734.01	1,408.04	184.53	H2O	H2O
35	553,845.06	787,748.61	1,441.37	187.44	H2O	H2O
36	553,809.22	787,771.74	1,483.89	193.42	H2O	H2O
37	553,774.97	787,799.19	1,527.05	194.96	H2O	H2O
38	553,747.91	787,818.61	1,560.08	195.82	H2O	H2O
39	553,715.41	787,828.32	1,593.31	195.81	H2O	H2O
40	553,688.29	787,842.63	1,623.97	197.49	H2O	H2O
41	553,649.20	787,853.04	1,663.33	198.40	H2O	H2O
42	553,619.82	787,860.49	1,692.73	198.57	H2O	H2O
43	553,597.27	787,866.70	1,715.54	198.51	H2O	H2O
44	553,567.22	787,882.90	1,749.68	200.65	H2O	H2O
45	553,564.58	787,884.08	1,752.56	201.03	TE	TE
46	553,560.51	787,885.84	1,756.98	201.89	CB	Channelbank [CB
47	553,546.97	787,893.68	1,772.61	206.25	GR	GR
48	553,532.87	787,898.37	1,787.25	212.26	GR	GR
49	553,514.09	787,903.45	1,806.20	220.16	GR	GR
50	553,500.37	787,911.25	1,821.98	229.25	GR	GR
51	553,491.85	787,915.34	1,831.42	233.97	GR	GR
52	553,480.12	787,922.11	1,844.96	234.85	SPECIAL	ALPT2
53	553,480.11	787,922.11	1,844.96	234.79	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {FD4145C1-60F3-4BFA-A0E6-CFFF15D8A191}	Stream	Centerline
Name: PA_RAM_16XS	Name:	Station: 1,306.79
Location: 287 TERHUNE AVE	Station: 0.00	Easting: 553,884.58
County:	Orientation: Looking D/S	Northing: 788,785.89
State:	Datum	Invert: 183.57
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_16XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	554,169.46	788,817.43	999.96	225.34	GR	GR
2	554,169.42	788,817.43	1,000.00	225.33	SPECIAL	ALPT1
3	554,134.79	788,814.82	1,034.69	220.90	GR	GR
4	554,077.58	789,169.44	1,049.44	208.48	SPECIAL	BS CK 16A
5	554,077.57	789,169.46	1,049.45	208.49	SPECIAL	PA_RAM_16A NL
6	554,077.57	789,169.44	1,049.45	208.48	SPECIAL	PA_RAM_16AXS FLD
7	553,990.00	789,799.07	1,061.74	208.32	SPECIAL	PA_RAM_17AXS
8	554,096.15	788,810.06	1,073.63	217.03	GR	GR
9	554,071.89	788,807.87	1,097.97	213.89	GR	GR
10	553,994.89	789,378.36	1,106.77	204.76	SPECIAL	PA_RAM_17BXS
11	553,994.89	789,378.36	1,106.77	204.76	SPECIAL	PA_RAM_17BXS FLD
12	554,059.49	788,806.51	1,110.45	209.00	SPECIAL	PA_RAM_16BXS NL
13	554,055.57	788,805.87	1,114.41	207.68	GR	GR
14	554,047.01	788,804.72	1,123.05	202.27	CB	Channelbank [CB
15	554,044.75	788,804.37	1,125.34	201.16	TE	TE
16	554,044.20	788,802.98	1,126.04	200.91	H2O	H2O
17	554,041.16	788,802.89	1,129.08	199.88	H2O	H2O
18	554,034.21	788,804.36	1,135.80	199.23	H2O	H2O
19	554,027.29	788,804.92	1,142.60	198.27	H2O	H2O
20	554,013.16	788,803.89	1,156.76	194.38	H2O	H2O
21	553,987.19	788,801.27	1,182.85	191.18	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_16XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	553,963.51	788,797.14	1,206.86	190.33	H2O	H2O
23	553,945.90	788,793.04	1,224.83	189.88	H2O	H2O
24	553,861.07	789,473.24	1,228.40	202.22	SPECIAL	PA_RAM_17CXS REF
25	553,861.02	789,473.27	1,228.44	202.25	SPECIAL	PA_RAM_17CXS FLD
26	553,861.02	789,473.27	1,228.44	202.25	SPECIAL	DATE 10-20-2011
27	553,922.42	788,789.90	1,248.52	189.85	H2O	H2O
28	553,900.15	788,794.61	1,270.07	189.35	H2O	H2O
29	553,875.89	788,789.37	1,294.78	187.09	H2O	H2O
30	553,857.77	788,788.67	1,312.86	185.64	H2O	H2O
31	553,832.91	788,785.39	1,337.93	184.14	H2O	H2O
32	553,797.13	788,782.19	1,373.84	183.57	H2O	H2O
33	553,778.30	788,778.68	1,392.95	184.61	H2O	H2O
34	553,765.43	788,776.33	1,406.01	186.16	H2O	H2O
35	553,760.08	788,774.93	1,411.49	187.46	H2O	H2O
36	553,741.14	788,773.98	1,430.41	192.53	H2O	H2O
37	553,736.16	788,772.56	1,435.53	193.48	H2O	H2O
38	553,729.21	788,771.89	1,442.50	195.83	H2O	H2O
39	553,723.35	788,769.67	1,448.58	197.92	H2O	H2O
40	553,710.73	788,768.76	1,461.22	199.83	H2O	H2O
41	553,696.79	788,765.82	1,475.41	198.86	H2O	H2O
42	553,686.86	788,763.46	1,485.55	200.01	H2O	H2O
43	553,684.96	788,762.95	1,487.50	200.26	H2O	H2O
44	553,684.20	788,763.06	1,488.24	201.16	TE	TE
45	553,680.32	788,762.22	1,492.19	202.78	CB	Channelbank [CB
46	553,678.05	788,761.86	1,494.49	203.80	GR	GR
47	553,667.47	788,759.61	1,505.27	208.13	GR	GR
48	553,663.72	788,760.32	1,508.90	210.04	GR	GR
49	553,649.04	788,757.58	1,523.80	218.34	GR	GR
50	553,635.83	788,755.19	1,537.20	224.54	GR	GR
51	553,621.53	788,752.81	1,551.68	227.72	GR	GR
52	553,600.33	788,749.46	1,573.13	230.13	SPECIAL	ALPT2
53	553,600.33	788,749.47	1,573.13	230.13	GR	GR



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Cross Sections Report

(All Units In Feet)

ID: {8DD4FCAB-E62A-4F92-A561-5F57D651F9B7}	Stream	Centerline
Name: PA_RAM_17XS	Name:	Station: 1,311.12
Location: DOG PARK	Station: 0.00	Easting: 553,720.52
County:	Orientation: Looking D/S	Northing: 789,409.07
State:	Datum	Invert: 184.87
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_17XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,990.02	789,799.12	877.69	208.33	SPECIAL	PA_RAM_17AXS FLD
2	553,990.01	789,799.10	877.70	208.33	SPECIAL	DATE 10-18-2011
3	553,990.00	789,799.07	877.73	208.32	SPECIAL	PA_RAM_17AXS
4	553,989.96	789,799.12	877.75	208.35	SPECIAL	BS CK 17A
5	553,980.32	789,504.55	1,000.00	206.03	GR	GR
6	553,980.32	789,504.55	1,000.00	206.03	SPECIAL	ALPT1
7	553,994.89	789,378.36	1,035.11	204.76	SPECIAL	PA_RAM_17BXS
8	553,994.89	789,378.32	1,035.13	204.74	SPECIAL	PA_RAM_17BXS FLD
9	553,941.52	789,488.56	1,041.96	204.41	GR	GR
10	553,915.64	789,484.92	1,067.25	203.72	GR	GR
11	553,873.65	789,475.55	1,109.62	203.13	GR	GR
12	553,861.07	789,473.24	1,122.12	202.22	SPECIAL	PA_RAM_17CXs REF
13	553,852.69	789,469.89	1,131.13	202.40	CB	Channelbank [CB
14	553,848.40	789,467.29	1,136.10	200.83	TE	TE
15	553,845.78	789,466.96	1,138.64	200.43	H2O	H2O
16	553,838.92	789,467.61	1,144.73	199.20	H2O	H2O
17	553,832.67	789,467.84	1,150.40	198.01	H2O	H2O
18	553,830.68	789,467.04	1,152.55	198.12	H2O	H2O
19	553,805.36	789,455.18	1,180.49	193.34	H2O	H2O
20	553,776.13	789,444.20	1,211.69	190.33	H2O	H2O
21	553,725.93	789,425.39	1,265.27	187.15	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_17XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	553,678.19	789,401.31	1,318.59	187.95	H2O	H2O
23	553,643.92	789,387.33	1,355.60	187.67	H2O	H2O
24	553,614.29	789,372.06	1,388.83	184.87	H2O	H2O
25	553,575.48	789,349.65	1,433.27	186.31	H2O	H2O
26	553,541.90	789,344.97	1,466.07	193.82	H2O	H2O
27	553,537.98	789,343.52	1,470.25	195.33	H2O	H2O
28	553,536.11	789,339.62	1,473.47	197.00	H2O	H2O
29	553,532.60	789,334.00	1,478.87	198.79	H2O	H2O
30	553,529.77	789,329.13	1,483.35	200.17	H2O	H2O
31	553,527.20	789,328.04	1,486.15	200.81	TE	TE
32	553,526.41	789,328.10	1,486.86	203.53	GR	GR
33	553,520.94	789,327.07	1,492.30	209.52	GR	GR
34	553,509.90	789,319.67	1,505.34	218.97	GR	GR
35	553,509.27	789,311.87	1,508.92	225.24	CB	Channelbank [CB
36	553,507.16	789,310.33	1,511.46	225.92	GR	GR
37	553,505.12	789,309.39	1,513.70	225.89	GR	GR
38	553,494.50	789,303.54	1,525.76	226.89	GR	GR
39	553,479.98	789,296.97	1,541.69	227.57	GR	GR
40	553,468.94	789,291.78	1,553.88	228.06	GR	GR
41	553,468.99	789,291.36	1,553.99	236.51	GR	GR WALL
42	553,468.99	789,291.36	1,553.99	236.51	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {72295F74-5E1D-4D42-93E6-A9D5154472D7}	Stream	Centerline
Name: PA_RAM_18XS	Name:	Station: 1,506.82
Location: 603 SCHUYLER AVE	Station: 0.00	Easting: 554,054.19
County:	Orientation: Looking D/S	Northing: 791,433.13
State:	Datum	Invert: 188.94
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_18XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	554,480.93	791,135.41	1,000.00	214.86	SPECIAL	ALPT1
2	554,480.92	791,135.43	1,000.02	214.86	GR	GR
3	554,456.30	791,162.04	1,035.41	213.22	GR	GR
4	554,437.60	791,175.95	1,058.70	211.39	GR	GR
5	554,419.45	791,185.37	1,078.98	208.47	GR	GR
6	554,398.09	791,199.35	1,104.51	203.88	GR	GR
7	554,385.17	791,225.08	1,129.76	202.16	CB	Channelbank [CB
8	554,383.80	791,226.29	1,131.58	201.16	TE	TE
9	554,380.29	791,226.72	1,134.71	199.91	H2O	H2O
10	554,368.94	791,231.30	1,146.66	198.66	H2O	H2O
11	554,358.38	791,237.56	1,158.90	198.37	H2O	H2O
12	554,342.36	791,240.32	1,173.65	197.93	H2O	H2O
13	554,325.17	791,248.53	1,192.45	197.52	H2O	H2O
14	554,292.15	791,261.70	1,227.10	197.29	H2O	H2O
15	554,246.26	791,279.77	1,275.11	196.95	H2O	H2O
16	554,226.85	791,301.35	1,303.36	197.18	H2O	H2O
17	554,183.28	791,343.26	1,363.04	196.42	H2O	H2O
18	554,140.85	791,381.70	1,419.80	193.56	H2O	H2O
19	554,104.96	791,407.99	1,464.27	190.98	H2O	H2O
20	554,100.55	791,406.14	1,466.85	190.80	H2O	H2O
21	554,085.85	791,417.80	1,485.57	189.34	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_18XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	554,075.54	791,416.87	1,493.51	189.20	H2O	H2O
23	554,064.32	791,422.67	1,506.04	188.94	H2O	H2O
24	554,059.40	791,434.95	1,517.08	189.41	H2O	H2O
25	554,033.12	791,441.55	1,542.44	190.03	H2O	H2O
26	553,986.00	791,485.14	1,606.00	192.00	H2O	H2O
27	553,958.85	791,485.90	1,628.75	191.66	H2O	H2O
28	553,922.75	791,505.56	1,669.63	192.68	H2O	H2O
29	553,884.74	791,536.67	1,718.59	194.03	H2O	H2O
30	553,860.60	791,552.17	1,747.25	195.19	H2O	H2O
31	553,842.85	791,555.02	1,763.48	196.47	H2O	H2O
32	553,838.99	791,558.83	1,768.82	194.54	H2O	H2O
33	553,830.98	791,569.77	1,781.63	194.21	H2O	H2O
34	553,819.03	791,574.41	1,794.09	192.70	H2O	H2O
35	553,799.47	791,582.18	1,814.60	191.64	H2O	H2O
36	553,785.45	791,593.92	1,832.81	191.96	H2O	H2O
37	553,777.25	791,607.83	1,847.47	193.82	H2O	H2O
38	553,767.03	791,614.02	1,859.40	196.76	H2O	H2O
39	553,749.34	791,622.93	1,879.02	198.62	H2O	H2O
40	553,747.54	791,625.68	1,882.06	201.32	TE	TE
41	553,743.03	791,631.24	1,888.93	204.49	GR	GR
42	553,734.27	791,634.23	1,897.83	208.79	CB	Channelbank [CB
43	553,732.84	791,635.53	1,899.75	209.14	GR	GR
44	553,732.43	791,636.08	1,900.40	208.88	GR	GR
45	553,722.15	791,646.78	1,914.94	209.21	GR	GR
46	553,709.04	791,663.41	1,935.19	208.85	SPECIAL	PA_RAM_18AXS
47	553,698.15	791,666.41	1,945.85	209.15	GR	GR
48	553,674.69	791,690.13	1,978.64	209.41	GR	GR
49	553,646.68	791,712.66	2,014.49	209.34	SPECIAL	ALPT2
50	553,646.66	791,712.67	2,014.51	209.34	GR	GR
51	553,625.67	791,729.14	2,041.14	209.19	GR	GR
52	553,246.15	791,935.76	2,470.80	210.41	SPECIAL	PA_RAM_18BXS
53	553,246.08	791,935.66	2,470.81	210.41	SPECIAL	BE_RAM_18BXS FLD
54	553,246.14	791,935.76	2,470.82	210.42	SPECIAL	BE_RAM_18BXS FLD
55	553,246.12	791,935.77	2,470.84	210.43	SPECIAL	DATE 10-20-2011
56	553,246.12	791,935.77	2,470.84	210.40	SPECIAL	BS CK 18B
57	553,246.10	791,935.78	2,470.86	210.38	SPECIAL	PA_RAM_18BXS FLD



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {C690B2E1-4D2F-44E9-9A28-6964D6C2575A}	Stream	Centerline
Name: PA_RAM_19XS	Name:	Station: 1,582.73
Location: 11 NOREEN LN	Station: 0.00	Easting: 555,017.41
County:	Orientation: Looking D/S	Northing: 792,877.75
State:	Datum	Invert: 190.29
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_19XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	555,872.63	792,445.10	631.33	232.65	SPECIAL	PA_RAM_19BXS FLD
2	555,872.63	792,445.10	631.33	232.65	SPECIAL	DATE 10-18-2011
3	555,872.56	792,445.14	631.41	232.69	SPECIAL	PA_RAM_19BXS
4	555,599.13	792,598.09	936.99	219.95	SPECIAL	PA_RAM_19AXS CS
5	555,599.13	792,598.18	937.04	219.96	SPECIAL	PA_RAM_19AXS
6	555,599.09	792,598.17	937.07	219.95	SPECIAL	PA_RAM_19AXS FLD
7	555,434.01	792,508.77	1,000.00	228.16	SPECIAL	ALPT1
8	555,433.99	792,508.77	1,000.02	228.17	GR	GR
9	555,419.05	792,518.75	1,017.80	227.27	GR	GR
10	555,412.34	792,525.95	1,027.60	225.90	GR	GR
11	555,403.48	792,533.85	1,039.47	225.00	GR	GR
12	555,396.93	792,539.03	1,047.81	223.88	GR	GR
13	555,382.99	792,548.86	1,064.75	222.60	GR	GR
14	555,372.22	792,556.70	1,078.00	221.42	GR	GR
15	555,359.98	792,566.22	1,093.46	220.12	GR	GR
16	555,308.60	792,542.95	1,116.10	218.68	SPECIAL	PA_RAM_19CXCS
17	555,337.31	792,578.77	1,118.71	217.94	GR	GR
18	555,324.12	792,592.45	1,137.67	215.67	GR	GR
19	555,314.29	792,599.54	1,149.72	214.61	CB	Channelbank [CB
20	555,304.03	792,605.14	1,161.09	210.40	GR	GR
21	555,294.19	792,611.47	1,172.64	205.45	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_19XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	555,287.31	792,616.66	1,181.22	201.19	GR	GR
23	555,286.89	792,616.97	1,181.75	200.78	TE	TE
24	555,286.60	792,617.03	1,182.00	200.33	H2O	H2O
25	555,281.74	792,622.25	1,189.10	199.66	H2O	H2O
26	555,272.42	792,630.17	1,201.32	197.98	H2O	H2O
27	555,260.79	792,647.96	1,221.87	196.73	H2O	H2O
28	555,228.78	792,669.99	1,260.40	197.80	H2O	H2O
29	555,195.09	792,695.39	1,302.44	198.26	H2O	H2O
30	555,168.35	792,717.52	1,337.12	198.18	H2O	H2O
31	555,142.18	792,735.90	1,368.87	197.55	H2O	H2O
32	555,118.29	792,763.04	1,404.78	196.59	H2O	H2O
33	555,093.76	792,786.22	1,438.52	195.67	H2O	H2O
34	555,055.25	792,829.11	1,495.84	192.79	H2O	H2O
35	555,009.36	792,861.26	1,551.45	190.29	H2O	H2O
36	554,958.55	792,891.93	1,609.74	191.66	H2O	H2O
37	554,903.55	792,931.43	1,677.04	191.45	H2O	H2O
38	554,839.46	792,985.58	1,760.90	192.44	H2O	H2O
39	554,804.09	793,047.09	1,828.34	193.18	H2O	H2O
40	554,780.91	793,091.41	1,875.21	192.62	H2O	H2O
41	554,757.40	793,124.81	1,915.03	192.43	H2O	H2O
42	554,728.06	793,155.93	1,957.66	197.67	H2O	H2O
43	554,716.59	793,161.65	1,970.01	198.96	H2O	H2O
44	554,707.58	793,171.24	1,983.12	200.38	H2O	H2O
45	554,706.79	793,171.24	1,983.71	200.75	TE	TE
46	554,704.90	793,170.59	1,984.68	201.81	CB	Channelbank [CB
47	554,700.49	793,172.15	1,989.00	201.90	GR	GR
48	554,691.46	793,178.74	2,000.12	202.54	GR	GR
49	554,681.81	793,185.99	2,012.14	204.02	GR	GR
50	554,673.23	793,196.01	2,025.23	207.01	GR	GR
51	554,664.71	793,204.95	2,037.54	209.42	GR	GR
52	554,657.59	793,216.96	2,050.86	215.01	GR	GR
53	554,630.12	793,225.22	2,076.81	218.35	GR	GR
54	554,623.86	793,234.70	2,087.80	220.17	GR	GR
55	554,606.25	793,253.42	2,113.42	220.76	GR	GR
56	554,606.16	793,253.51	2,113.54	220.76	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {8F2C976E-76F6-4CF5-9A0D-1E992990B5ED}	Stream	Centerline
Name: PA_RAM_20XS	Name:	Station: 1,756.58
Location: 1054 COLFAX AVE	Station: 0.00	Easting: 555,529.22
County:	Orientation: Looking D/S	Northing: 793,751.09
State:	Datum	Invert: 183.13
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_20XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	555,599.33	792,598.07	804.27	219.96	SPECIAL	BS CK 19AXS
2	555,599.17	792,598.03	804.33	219.96	SPECIAL	DATE 10-18-2011
3	555,599.17	792,598.03	804.33	219.96	SPECIAL	PA_RAM_19AXS FLD
4	555,599.13	792,598.18	804.48	219.96	SPECIAL	PA_RAM_19AXS
5	555,996.53	793,133.37	1,000.00	221.79	GR	GR
6	555,996.53	793,133.37	1,000.00	221.82	SPECIAL	ALPT1
7	555,985.18	793,151.80	1,021.57	221.93	GR	GR
8	555,956.53	793,182.66	1,063.40	222.09	GR	GR
9	555,941.77	793,200.86	1,086.81	222.04	GR	GR
10	555,928.52	793,208.04	1,100.44	221.71	CB	Channelbank [CB
11	555,923.83	793,215.90	1,109.56	214.83	GR	GR
12	555,915.16	793,225.32	1,122.28	202.43	GR	GR
13	555,914.69	793,226.19	1,123.26	200.97	GR	GR
14	555,914.27	793,227.06	1,124.21	200.85	TE	TE
15	555,912.28	793,230.36	1,128.05	199.83	H2O	H2O
16	555,907.15	793,234.98	1,134.81	198.24	H2O	H2O
17	555,905.03	793,246.54	1,145.38	194.71	H2O	H2O
18	555,896.82	793,260.68	1,161.63	194.44	H2O	H2O
19	555,899.85	793,274.44	1,170.92	195.10	H2O	H2O
20	555,885.64	793,295.83	1,196.57	196.97	H2O	H2O
21	555,853.39	793,333.66	1,246.15	189.57	H2O	H2O



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_20XS

Point	Easting	Northing	Station	Elevation	Code	Comment
22	555,817.16	793,378.22	1,303.52	191.65	H2O	H2O
23	555,761.90	793,444.84	1,389.92	194.03	H2O	H2O
24	555,712.99	793,496.68	1,460.67	193.14	H2O	H2O
25	555,680.27	793,552.55	1,525.06	190.64	H2O	H2O
26	555,624.41	793,611.44	1,605.60	189.65	H2O	H2O
27	555,568.65	793,691.23	1,702.92	189.69	H2O	H2O
28	555,530.72	793,740.31	1,764.92	189.42	H2O	H2O
29	555,487.51	793,792.47	1,832.55	185.49	H2O	H2O
30	555,463.20	793,823.03	1,871.57	183.13	H2O	H2O
31	555,410.12	793,888.92	1,956.10	189.63	H2O	H2O
32	555,357.70	793,966.48	2,049.63	189.90	H2O	H2O
33	555,316.85	794,023.55	2,119.81	188.32	H2O	H2O
34	555,288.19	794,052.67	2,160.25	188.45	H2O	H2O
35	555,259.24	794,095.00	2,211.51	188.59	H2O	H2O
36	555,236.66	794,135.27	2,257.33	189.01	H2O	H2O
37	555,207.06	794,163.26	2,297.41	189.75	H2O	H2O
38	555,188.96	794,206.45	2,342.93	193.08	H2O	H2O
39	555,171.79	794,230.79	2,372.71	197.34	H2O	H2O
40	555,169.18	794,238.37	2,380.36	198.85	H2O	H2O
41	555,166.80	794,243.84	2,386.18	199.65	H2O	H2O
42	555,165.78	794,246.52	2,388.94	200.86	TE	TE
43	555,164.57	794,247.03	2,390.07	202.37	CB	Channelbank [CB
44	555,163.93	794,250.77	2,393.46	203.15	GR	GR
45	555,160.12	794,255.11	2,399.21	203.11	GR	GR
46	555,141.43	794,247.73	2,404.34	202.69	SPECIAL	PA_RAM_20AXS
47	555,149.43	794,272.80	2,419.79	204.13	GR	GR
48	555,126.92	794,280.35	2,439.22	204.22	GR	GR
49	555,132.67	794,297.08	2,449.28	205.48	GR	GR
50	555,121.93	794,291.18	2,450.90	204.83	GR	GR
51	555,117.06	794,299.74	2,460.68	206.08	GR	GR
52	555,114.64	794,316.18	2,475.36	207.05	GR	GR
53	555,112.83	794,329.81	2,487.41	209.59	GR	GR
54	555,106.20	794,342.63	2,501.66	213.44	GR	GR
55	555,091.38	794,363.49	2,527.25	221.57	GR	GR
56	555,078.18	794,381.08	2,549.24	222.67	GR	GR
57	555,078.29	794,381.18	2,549.25	222.67	SPECIAL	ALPT2



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {4A69AF23-9F54-4539-96F4-7B38A62EEFEB}	Stream	Centerline
Name: PA_RAM_21XS	Name:	Station: 1,157.35
Location: 12 LAKEVIEW TERR	Station: 0.00	Easting: 556,538.95
County:	Orientation: Looking D/S	Northing: 794,488.58
State:	Datum	Invert: 184.06
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		



Looking At: Upstream Channel



Looking At: Downstream Channel

Cross Section Data Data type: PA_RAM_21XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	557,300.75	795,024.09	913.30	203.12	SPECIAL	RAM_22C FLD
2	556,696.86	794,374.06	999.94	200.53	GR	GR
3	556,696.81	794,374.09	1,000.00	200.53	SPECIAL	ALPT1
4	556,682.62	794,384.38	1,017.52	200.80	GR	GR
5	556,663.71	794,393.95	1,038.37	200.95	GR	GR
6	556,644.45	794,407.80	1,062.08	201.41	GR	GR
7	556,632.81	794,418.31	1,077.71	201.35	CB	Channelbank [CB
8	556,630.29	794,420.09	1,080.79	200.82	TE	TE
9	556,628.48	794,421.26	1,082.94	200.23	H2O	H2O
10	556,627.46	794,422.80	1,084.68	196.64	H2O	H2O
11	556,622.24	794,426.09	1,090.83	194.92	H2O	H2O
12	556,607.73	794,444.21	1,113.35	188.38	H2O	H2O
13	556,592.42	794,447.26	1,127.38	187.78	H2O	H2O
14	556,579.70	794,457.37	1,143.63	186.70	H2O	H2O
15	556,559.49	794,469.55	1,167.08	184.70	H2O	H2O
16	556,542.24	794,481.43	1,188.01	184.06	H2O	H2O
17	556,527.14	794,493.23	1,207.17	187.82	H2O	H2O
18	556,511.36	794,504.49	1,226.54	193.47	H2O	H2O
19	556,507.82	794,508.20	1,231.61	197.55	H2O	H2O
20	556,507.83	794,512.00	1,233.90	200.78	TE	TE
21	556,507.03	794,512.47	1,234.82	202.01	CB	Channelbank [CB



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

Cross Section Data Data type: PA_RAM_21XS

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
22	556,486.10	794,532.83	1,263.81	202.56	GR	GR
23	556,472.04	794,545.46	1,282.64	203.20	GR	GR
24	556,452.05	794,560.68	1,307.78	203.24	GR	GR
25	556,448.07	794,563.11	1,312.42	202.76	GR	GR
26	556,433.21	794,575.16	1,331.54	202.90	GR	GR
27	556,426.24	794,573.37	1,336.00	202.81	SPECIAL	RAM_21AXS TR 22A
28	556,909.94	795,219.77	1,342.77	202.53	SPECIAL	PA_RAM_22AXS BS
29	556,909.94	795,219.77	1,342.77	202.51	SPECIAL	DATE 10-18-2011
30	556,909.94	795,219.77	1,342.77	202.51	SPECIAL	PA_RAM_22AXS FLD
31	556,414.50	794,590.10	1,355.47	202.94	GR	GR
32	556,386.54	794,610.36	1,389.99	202.93	GR	GR
33	556,386.52	794,610.37	1,390.01	202.93	SPECIAL	ALPT2



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Cross Sections Report

(All Units In Feet)

ID: {4B40F9D0-81BD-49C4-AB83-BC06D222A057}	Stream	Centerline
Name: MO_PEQ_01XS	Name:	Station: 1,052.97
Location: MO_PEQ_01XS	Station: 0.00	Easting: 551,946.38
County:	Orientation: Looking D/S	Northing: 781,019.34
State:	Datum	Invert: 169.62
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_01XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	551,808.23	780,963.07	1,000.00	177.31	TE	TE
2	551,808.23	780,963.07	1,000.00	177.31	GR	GR
3	551,808.23	780,963.07	1,000.00	177.31	SPECIAL	ALPT1
4	551,811.16	780,964.26	1,003.17	175.87	H2O	H2O
5	551,813.09	780,965.88	1,005.59	174.37	GR	GR
6	551,826.40	780,975.66	1,021.71	173.01	GR	GR
7	551,832.77	780,975.87	1,027.62	173.56	GR	GR
8	551,868.69	780,985.05	1,064.19	171.36	GR	GR
9	551,870.61	780,984.80	1,065.84	176.01	H2O	H2O
10	551,883.01	780,992.79	1,080.41	177.00	GR	GR
11	551,902.35	781,004.70	1,102.91	177.25	SPECIAL	ALPT2
12	551,904.61	781,005.60	1,105.36	175.95	H2O	H2O
13	551,905.14	781,005.83	1,105.93	175.43	TE	TE
14	551,927.90	781,015.88	1,130.81	173.51	CB	Channelbank [CB
15	551,959.03	781,025.81	1,163.29	173.16	GR	GR
16	551,990.77	781,039.16	1,197.72	169.62	GR	GR
17	552,020.17	781,046.06	1,227.40	170.95	GR	GR
18	552,029.43	781,051.18	1,237.94	174.40	GR	GR
19	552,030.71	781,051.81	1,239.37	176.21	H2O	H2O
20	552,032.89	781,052.44	1,241.61	177.92	CB	Channelbank [CB
21	552,086.06	781,072.12	1,298.20	176.74	TE	TE



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {7234AFC9-4F87-4DB8-BEA2-C4784B8CD337}	Stream	Centerline
Name: MO_PEQ_02XS	Name:	Station: 1,358.64
Location: MO_PEQ_02XS	Station: 0.00	Easting: 550,519.67
County:	Orientation: Looking D/S	Northing: 781,764.94
State:	Datum	Invert: 171.69
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_02XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	550,461.37	782,028.50	889.69	178.56	GR	GR
2	550,476.87	781,987.91	931.26	179.07	GR	GR
3	550,480.87	781,978.80	940.62	177.87	H2O	H2O
4	550,489.85	781,969.05	950.97	174.46	GR	GR
5	550,498.95	781,949.67	970.94	172.32	CB	Channelbank [CB]
6	550,504.45	781,934.33	986.62	174.47	GR	GR
7	550,502.66	781,929.11	991.70	177.22	GR	GR
8	550,505.05	781,920.96	1,000.00	177.91	SPECIAL	ALPT1
9	550,519.17	781,821.57	1,100.13	178.79	TE	TE
10	550,515.61	781,769.04	1,152.29	177.66	SPECIAL	ALPT2
11	550,517.28	781,763.59	1,157.84	175.51	GR	GR
12	550,518.62	781,753.18	1,168.32	176.34	GR	GR
13	550,523.23	781,736.73	1,185.05	177.64	H2O	H2O
14	550,524.93	781,732.00	1,189.88	178.09	GR	GR
15	550,527.29	781,697.01	1,224.95	176.70	CB	Channelbank [CB]
16	550,528.41	781,673.79	1,248.20	175.18	GR	GR
17	550,537.32	781,646.69	1,275.85	174.63	GR	GR
18	550,553.73	781,622.68	1,300.94	171.69	GR	GR
19	550,554.25	781,619.28	1,304.37	178.18	CB	Channelbank [CB]
20	550,563.58	781,581.47	1,342.73	178.29	TE	TE
21	550,565.08	781,576.97	1,347.32	176.82	GR	GR
22	550,570.75	781,554.68	1,369.95	176.08	GR	GR
23	550,576.19	781,542.57	1,382.41	177.34	GR	GR
24	550,585.21	781,500.50	1,425.00	178.29	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {B1F72F85-E268-4253-9FE4-69740EB4DCE6}	Stream	Centerline
Name: MO_PEQ_03XS	Name:	Station: 1,106.12
Location: MO_PEQ_03XS	Station: 0.00	Easting: 549,507.08
County:	Orientation: Looking D/S	Northing: 781,849.86
State:	Datum	Invert: 170.72
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_03XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	549,487.67	781,792.32	1,000.00	180.96	GR	GR
2	549,487.67	781,792.32	1,000.00	180.96	SPECIAL	ALPT1
3	549,497.64	781,822.95	1,032.21	180.33	TE	TE
4	549,501.49	781,831.53	1,041.56	178.31	CB	Channelbank [CB
5	549,503.86	781,850.84	1,060.68	172.57	H2O	H2O
6	549,515.01	781,873.40	1,085.55	170.72	GR	GR
7	549,519.02	781,891.93	1,104.43	172.53	CB	Channelbank [CB
8	549,523.34	781,908.30	1,121.34	173.91	CB	CB
9	549,526.66	781,916.72	1,130.37	178.37	TE	TE
10	549,542.04	781,963.94	1,180.02	179.04	SPECIAL	ALPT2
11	549,542.04	781,963.94	1,180.02	179.04	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {CB4C7370-F5F7-45B2-A796-694425A8710B}	Stream	Centerline
Name: MO_PEQ_04XS	Name:	Station: 1,114.13
Location: MO_PEQ_04XS	Station: 0.00	Easting: 547,989.47
County:	Orientation: Looking D/S	Northing: 782,033.06
State:	Datum	Invert: 169.71
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_04XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	548,092.65	782,028.81	1,000.00	181.83	GR	GR
2	548,092.65	782,028.81	1,000.00	181.83	SPECIAL	ALPT1
3	548,032.37	782,030.82	1,060.31	181.28	TE	TE
4	548,030.68	782,030.79	1,061.99	178.73	CB	Channelbank [CB
5	548,028.34	782,031.23	1,064.36	174.14	H20	H20
6	548,009.25	782,037.35	1,083.71	172.43	GR	GR
7	547,977.74	782,034.18	1,115.03	169.71	SPECIAL	ALPT2
8	547,977.74	782,034.18	1,115.03	169.71	GR	GR
9	547,967.09	782,036.86	1,125.80	169.86	GR	GR
10	547,946.26	782,035.09	1,146.53	174.23	GR	CGR
11	547,931.98	782,033.82	1,160.73	176.51	CB	Channelbank [CB
12	547,924.59	782,030.51	1,167.96	180.11	TE	TE
13	547,911.84	782,028.43	1,180.59	179.68	GR	GR OPEN
14	547,886.76	782,027.26	1,205.59	188.45	GR	GR OPEN



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {48FE5FB5-F74C-4A6E-8021-9F5C3838A1FF}	Stream	Centerline
Name: MO_PEQ_05XS	Name:	Station: 1,085.92
Location: MO_PEQ_05XS	Station: 0.00	Easting: 547,962.84
County:	Orientation: Looking D/S	Northing: 782,883.99
State:	Datum	Invert: 172.05
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_05XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	548,062.66	782,890.44	1,000.00	182.67	GR	GR
2	548,062.66	782,890.44	1,000.00	182.67	SPECIAL	ALPT1
3	548,020.68	782,888.05	1,042.02	182.23	TE	TE
4	548,012.06	782,888.01	1,050.63	179.06	CB	Channelbank [CB
5	548,007.99	782,885.99	1,054.73	175.15	H20	H20
6	547,977.35	782,883.07	1,085.41	173.12	GR	GR
7	547,957.67	782,883.76	1,105.08	172.05	GR	GR
8	547,940.49	782,881.68	1,122.29	175.11	GR	GR
9	547,937.42	782,881.91	1,125.35	178.97	CB	Channelbank [CB
10	547,932.95	782,881.75	1,129.82	182.71	TE	TE
11	547,862.87	782,887.53	1,199.81	182.78	SPECIAL	ALPT2
12	547,862.87	782,887.53	1,199.81	182.78	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {CAC87C74-1D33-4F67-B4B0-AC16B106D83A}	Stream	Centerline
Name: MO_PEQ_06XS	Name:	Station: 1,064.45
Location: MO_PEQ_06XS	Station: 0.00	Easting: 548,073.05
County:	Orientation: Looking D/S	Northing: 783,363.11
State:	Datum	Invert: 172.87
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_06XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	548,016.77	783,383.86	1,000.00	183.72	GR	GR
2	548,016.77	783,383.86	1,000.00	183.72	SPECIAL	ALPT1
3	548,040.85	783,374.63	1,025.77	184.10	TE	TE
4	548,045.41	783,373.22	1,030.54	178.64	H2O	H2O
5	548,048.75	783,373.26	1,033.69	175.28	CB	Channelbank [CB
6	548,061.13	783,365.43	1,047.93	172.87	GR	GR
7	548,082.11	783,359.32	1,069.76	173.66	CB	Channelbank [CB
8	548,114.36	783,350.49	1,103.14	176.18	TE	TE
9	548,130.38	783,345.51	1,119.91	177.19	SPECIAL	ALPT2
10	548,130.38	783,345.51	1,119.91	177.19	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {DDFB63E7-0506-45B9-9750-B190E3DA6565}	Stream	Centerline
Name: MO_PEQ_07XS	Name:	Station: 1,050.62
Location: MO_PEQ_07XS	Station: 0.00	Easting: 548,439.79
County:	Orientation: Looking D/S	Northing: 783,839.03
State:	Datum	Invert: 174.50
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_07XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	548,348.87	783,858.90	936.83	183.64	CB	Channelbank [CB
2	548,366.46	783,856.69	954.31	179.17	GR	GR
3	548,410.70	783,845.13	1,000.00	181.12	TE	TE
4	548,410.70	783,845.13	1,000.00	181.12	CB	Channelbank [CB
5	548,412.42	783,844.88	1,001.72	178.80	H2O	H2O
6	548,413.01	783,844.65	1,002.35	176.80	GR	GR
7	548,430.86	783,841.94	1,020.23	174.50	GR	GR
8	548,458.67	783,837.19	1,048.23	174.88	GR	GR
9	548,476.35	783,830.60	1,067.05	174.76	GR	GR
10	548,502.81	783,819.32	1,095.65	177.15	GR	GR
11	548,505.12	783,818.52	1,098.09	178.67	CB	Channelbank [CB
12	548,507.86	783,816.68	1,101.24	179.56	TE	TE
13	548,545.16	783,804.64	1,140.43	185.10	SPECIAL	ALPT2
14	548,545.16	783,804.64	1,140.43	185.10	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

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Cross Sections Report

(All Units In Feet)

ID: {BB19BF16-09A9-4A46-8D95-3ADA76D25A9F}	Stream	Centerline
Name: MO_PEQ_08XS	Name:	Station: 1,092.16
Location: MO_PEQ_08XS	Station: 0.00	Easting: 548,502.54
County:	Orientation: Looking D/S	Northing: 783,921.66
State:	Datum	Invert: 174.10
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_08XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	548,395.84	783,943.33	966.65	184.36	GR	GR
2	548,411.26	783,937.90	982.94	180.21	GR	GR
3	548,427.87	783,934.00	1,000.00	179.15	GR	GR
4	548,427.87	783,934.00	1,000.00	179.15	SPECIAL	ALPT1
5	548,464.83	783,921.27	1,038.97	181.49	TE	TE
6	548,466.52	783,921.71	1,040.50	178.83	CB	Channelbank [CB]
7	548,467.51	783,920.93	1,041.65	176.15	GR	GR
8	548,491.91	783,924.22	1,064.44	174.10	GR	GR
9	548,527.48	783,915.65	1,101.02	174.62	GR	GR
10	548,523.74	783,894.81	1,102.64	175.07	GR	GR
11	548,559.02	783,899.88	1,135.51	177.04	SPECIAL	ALPT2
12	548,559.02	783,899.88	1,135.51	177.04	GR	GR
13	548,561.12	783,898.28	1,137.95	178.77	CB	Channelbank [CB]
14	548,567.81	783,894.60	1,145.35	181.43	TE	TE
15	548,603.80	783,882.43	1,183.24	182.20	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {28409F3E-09E6-4E42-A342-03153D80ED4E}	Stream	Centerline
Name: MO_PEQ_09XS	Name:	Station: 1,115.81
Location: MO_PEQ_09XS	Station: 0.00	Easting: 548,991.63
County:	Orientation: Looking D/S	Northing: 784,456.64
State:	Datum	Invert: 175.43
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_09XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	548,882.18	784,467.84	1,000.00	181.83	GR	GR
2	548,882.18	784,467.84	1,000.00	181.83	SPECIAL	ALPT1
3	548,935.03	784,461.34	1,053.24	180.57	TE	TE
4	548,936.50	784,461.34	1,054.70	179.10	CB	Channelbank [CB
5	548,937.42	784,461.58	1,055.59	176.01	H20	H20
6	548,959.77	784,463.25	1,077.68	175.43	GR	GR
7	549,004.24	784,464.44	1,121.81	175.54	GR	GR
8	549,037.16	784,452.57	1,155.73	175.81	SPECIAL	ALPT2
9	549,037.16	784,452.57	1,155.73	175.81	GR	GR
10	549,048.44	784,451.47	1,167.07	176.98	H20	H20
11	549,050.90	784,449.97	1,169.66	179.11	CB	Channelbank [CB
12	549,059.50	784,448.35	1,178.38	181.85	TE	TE
13	549,101.04	784,445.13	1,220.04	184.35	GR	GR



PROJECT NJDEP Field Survey - Cross Sections

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Cross Sections Report

(All Units In Feet)

ID: {E919C262-5AA5-4B5A-964B-8D86205996D6}	Stream	Centerline
Name: MO_PEQ_10XS	Name:	Station: 1,065.92
Location: MO_PEQ_10XS	Station: 0.00	Easting: 549,205.69
County:	Orientation: Looking D/S	Northing: 784,778.72
State:	Datum	Invert: 175.69
State Zone:	Horizontal:	
Provided By:	Vertical:	
Comments:		

Photographs - None

Cross Section Data Data type: MO_PEQ_10XS

Point	Easting	Northing	Station	Elevation	Code	Comment
1	549,299.76	784,762.57	999.53	193.91	GR	GR
2	549,299.22	784,760.45	1,000.00	180.04	TE	TE
3	549,299.22	784,760.45	1,000.00	180.04	SPECIAL	ALPT1
4	549,292.27	784,763.36	1,007.05	179.22	CB	Channelbank [CB]
5	549,285.61	784,764.18	1,013.73	176.68	GR	GR
6	549,263.16	784,764.64	1,036.18	175.69	GR	GR
7	549,244.79	784,777.15	1,054.96	175.94	GR	GR
8	549,216.36	784,780.03	1,083.48	175.74	GR	GR
9	549,194.09	784,779.52	1,105.71	175.74	GR	GR
10	549,178.26	784,773.33	1,121.33	179.25	CB	Channelbank [CB]
11	549,174.75	784,772.02	1,124.79	180.20	TE	TE
12	549,161.22	784,768.81	1,138.21	180.06	GR	GR
13	549,138.78	784,767.34	1,160.58	182.12	GR	GR
14	549,109.75	784,766.91	1,189.58	182.39	SPECIAL	ALPT2
15	549,109.75	784,766.91	1,189.58	182.39	GR	GR

Appendix E
BRIDGE SURVEY DATA



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

<p>General ID: BE_RAM_06 Road Name: DOTY RD Stream Name: County: State: State Zone:</p>	<p>Material Bed: Unknown Fill: Unknown</p> <p>Datum Horizontal: Vertical:</p>	<p>Design Designer: Contractor: Year Built:</p>
<p>Centerline Station: 1,129.64 Offset: 0.00 Easting: 558,100.21 Northing: 795,371.80</p>	<p>Invert Downstream: 188.89 Upstream: 188.71</p> <p>Rail Height: 2.30 Deck Thickness: 6.00</p>	
<p>Plans Plan Location: Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\BE_RAM_06.TXT Comments:</p>		

Opening	Left	Right	Type: Vertical Wall
Abutment	1,040.63	1,232.37	
Fill Station	1,040.73	1,232.27	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers

<u>CL</u> <u>Station</u>	<u>Foundation</u> <u>Type</u>	<u>Shape</u>	<u>Column</u> <u>Count</u>	<u>Width</u>	<u>Cap</u> <u>Height</u>	<u>Cap</u> <u>Top Elev</u>	<u>Foot</u> <u>Width</u>	<u>Foot</u> <u>Top Elev</u>	<u>Comment</u>
1,135.94	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P1 3.0

Rails

<u>Station</u>	<u>Easting</u>	<u>Northing</u>	<u>Elevation</u>	<u>Height</u>
744.24	558,288.16	795,029.93	224.63	1.70
798.74	558,270.53	795,085.19	223.02	1.53
842.23	558,257.34	795,129.97	221.97	1.46
851.99	558,259.27	795,143.81	220.88	0.58
852.45	558,259.26	795,144.39	218.46	0.00
884.48	558,248.27	795,176.39	217.98	0.00
884.90	558,247.98	795,176.69	220.24	0.62
891.83	558,242.55	795,181.25	220.55	1.04
1,005.94	558,188.77	795,283.92	219.27	1.90
1,010.86	558,185.83	795,287.86	219.53	2.25
1,035.83	558,170.69	795,307.72	219.23	2.38
1,036.04	558,170.59	795,307.91	219.94	3.09
1,037.19	558,170.21	795,309.06	220.65	3.82
1,038.61	558,169.19	795,310.07	220.65	3.84
1,048.46	558,163.18	795,317.87	221.02	4.38
1,222.89	558,055.53	795,455.13	217.80	4.30
1,232.48	558,049.68	795,462.73	217.14	3.82
1,233.94	558,048.75	795,463.85	217.12	3.84
1,235.06	558,048.01	795,464.69	216.41	3.16
1,235.29	558,047.75	795,464.78	215.74	2.50
1,247.71	558,040.19	795,474.65	215.28	2.40
1,260.13	558,032.59	795,484.46	214.92	2.39
1,266.25	558,029.01	795,489.44	214.39	2.04
1,316.18	558,000.27	795,530.33	212.48	2.05
1,440.66	557,929.81	795,633.20	207.52	1.70
1,507.34	557,900.19	795,694.58	206.48	1.64
1,573.94	557,871.63	795,756.70	206.99	2.24



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	558,339.20	795,065.27	740.96	206.68	GR	GR
2	558,331.33	795,076.38	754.56	205.68	GR	GR
3	558,321.85	795,096.15	776.00	204.32	GR	GR
4	558,317.90	795,122.80	799.49	204.06	GR	GR
5	558,327.41	795,143.35	809.93	204.91	GR	GR
6	558,315.81	795,160.18	830.34	211.79	GR	GR RD
7	558,312.88	795,163.07	834.42	212.64	GR	GR RD
8	558,310.94	795,165.84	837.80	212.98	GR	GR RD
9	558,306.48	795,176.65	849.08	213.11	GR	GR RD
10	558,302.06	795,188.73	861.33	212.92	GR	GR RD
11	558,300.07	795,192.01	865.15	212.61	GR	GR RD
12	558,247.18	795,156.63	869.52	219.31	SPECIAL	RAM_06A FLD
13	558,247.18	795,156.63	869.52	219.27	SPECIAL	BE_RAM_06A
14	558,247.21	795,156.68	869.54	219.28	SPECIAL	RAM_06A BS CHK
15	558,291.42	795,192.88	871.12	212.74	GR	GR RD
16	558,290.06	795,213.46	888.24	205.30	GR	GR
17	558,279.39	795,230.99	908.63	204.87	GR	GR
18	558,269.14	795,245.49	926.37	204.49	GR	GR
19	558,258.68	795,267.38	950.09	205.30	GR	GR
20	558,242.78	795,293.10	980.15	205.14	GR	GR
21	558,179.13	795,268.95	1,000.00	217.47	SPECIAL	ALPT1
22	558,236.62	795,318.44	1,003.97	204.69	GR	GR
23	558,202.64	795,332.29	1,035.71	203.86	CB	Channelbank [CB
24	558,171.97	795,311.41	1,037.96	216.93	SPECIAL	ERM BE_RAM_06
25	558,163.19	795,317.90	1,048.47	201.12	TE	TE
26	558,159.88	795,322.15	1,053.86	197.93	H2O	H2O
27	558,153.87	795,329.77	1,063.57	192.61	H2O	H2O
28	558,145.53	795,340.42	1,077.09	189.88	H2O	H2O
29	558,136.69	795,351.69	1,091.42	188.84	H2O	H2O
30	558,129.48	795,360.84	1,103.06	188.97	H2O	H2O
31	558,119.57	795,373.58	1,119.20	188.71	H2O	H2O
32	558,109.24	795,386.75	1,135.94	190.38	P	P1 3.0
33	558,106.80	795,390.65	1,140.52	187.65	SPECIAL	USSTRUCT
34	558,075.85	795,367.57	1,141.20	187.51	SPECIAL	DSSTRUCT
35	558,074.52	795,370.21	1,144.10	188.89	DS	DS IN
36	558,100.99	795,397.31	1,149.34	188.85	H2O	H2O
37	558,089.28	795,412.21	1,168.29	189.54	H2O	H2O
38	558,080.58	795,423.29	1,182.38	190.19	H2O	H2O
39	558,073.26	795,432.57	1,194.20	192.97	H2O	H2O
40	558,065.31	795,442.81	1,207.16	199.70	H2O	H2O
41	558,063.00	795,445.64	1,210.81	201.01	TE	TE
42	558,068.82	795,455.82	1,215.31	203.13	CB	Channelbank [CB
43	558,066.06	795,476.61	1,233.43	203.53	GR	GR
44	558,057.59	795,496.02	1,253.97	203.24	GR	GR
45	558,049.23	795,513.86	1,273.20	202.97	GR	GR
46	558,008.91	795,488.99	1,278.20	212.00	SPECIAL	ALPT2
47	558,038.10	795,531.49	1,293.96	204.43	GR	GR



PROJECT NJDEP Field Survey - Bridges

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TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
48	557,968.35	795,512.29	1,321.44	210.06	SPECIAL	BE_RAM_06B
49	557,968.34	795,512.30	1,321.46	209.99	SPECIAL	DATE 10-05-2011
50	557,968.34	795,512.30	1,321.46	209.99	SPECIAL	BE_RAM_06B FLD
51	557,968.32	795,512.28	1,321.46	210.01	SPECIAL	RAM_06B BS CHK
52	558,015.63	795,557.25	1,328.08	204.79	GR	GR
53	557,990.40	795,591.69	1,370.75	205.11	GR	GR
54	557,962.96	795,618.97	1,409.12	205.04	GR	GR
55	557,943.43	795,639.59	1,437.38	203.92	GR	GR
56	557,926.54	795,660.04	1,463.89	202.79	GR	GR
57	557,896.88	795,708.46	1,520.34	203.38	GR	GR

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	558,276.58	794,997.25	725.47	223.58	TR	TR
2	558,268.98	795,026.48	753.24	222.61	TR	TR
3	558,250.77	795,085.48	811.05	221.18	TR	TR
4	558,230.20	795,151.66	875.98	219.78	TR	TR
5	558,207.26	795,216.54	941.34	218.65	TR	TR
6	558,179.13	795,268.95	1,000.00	217.47	TR	TR
7	558,154.84	795,301.52	1,040.63	216.78	BEGIN	BEGIN
8	558,037.15	795,452.90	1,232.37	213.32	END	END
9	558,008.99	795,489.19	1,278.30	212.00	TR	TR
10	557,950.55	795,565.61	1,374.51	208.03	TR	TR
11	557,912.87	795,626.30	1,445.57	205.66	TR	TR
12	557,876.34	795,700.70	1,526.77	204.59	TR	TR
13	557,851.41	795,753.90	1,584.10	204.78	TR	TR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

<p>General</p> <p>ID: BE_RAM_07</p> <p>Road Name: RAILROAD</p> <p>Stream Name:</p> <p>County:</p> <p>State:</p> <p>State Zone:</p>	<p>Material</p> <p>Bed: Unknown</p> <p>Fill: Unknown</p> <p>Datum</p> <p>Horizontal:</p> <p>Vertical:</p>	<p>Design</p> <p>Designer:</p> <p>Contractor:</p> <p>Year Built:</p>
<p>Centerline</p> <p>Station: 1,378.51</p> <p>Offset: 0.00</p> <p>Easting: 560,327.52</p> <p>Northing: 798,292.76</p>	<p>Invert</p> <p>Downstream: 200.35</p> <p>Upstream: 190.31</p> <p>Rail Height: 0.65</p> <p>Deck Thickness: 11.60</p>	
<p>Plans</p> <p>Plan Location:</p> <p>Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\BE_RAM_07.TXT</p> <p>Comments:</p>		

Opening	Left	Right	Type: Unknown
Abutment	1,199.08	1,506.51	
Fill Station	1,203.91	1,501.86	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers

CL Station	Foundation Type	Shape	Column Count	Width	Cap Height	Cap Top Elev	Foot Width	Foot Top Elev	Comment
1,301.72	FOOTER	Unknown	1	8.00	0.00	0.00	0.00	0.00	P1 8.0
1,404.88	FOOTER	Unknown	1	8.00	0.00	0.00	0.00	0.00	P2 8.0

Rails

Station	Easting	Northing	Elevation	Height
904.46	560,800.81	798,263.80	239.49	0.65
999.92	560,704.85	798,261.93	237.79	0.65
1,000.02	560,704.75	798,261.95	237.78	0.65
1,103.73	560,601.38	798,270.33	236.14	0.65
1,506.51	560,199.90	798,302.80	235.25	0.65
1,508.78	560,197.92	798,306.24	235.32	0.65
1,562.57	560,144.29	798,310.50	235.51	0.65
1,619.97	560,087.06	798,314.82	235.80	0.65
1,706.36	560,000.65	798,318.23	236.49	0.65
1,784.29	559,922.31	798,316.86	237.16	0.65

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	560,902.02	798,119.40	791.34	227.91	SPECIAL	BE_RAM_07B BS CHK
2	560,902.02	798,119.40	791.34	227.92	SPECIAL	DATE 10-05-2011
3	560,902.02	798,119.40	791.34	227.92	SPECIAL	BE_RAM_07B FLD
4	560,901.99	798,119.41	791.37	227.96	SPECIAL	BE_RAM_07B
5	560,704.77	798,261.94	1,000.00	237.13	SPECIAL	ALPT1
6	560,651.92	798,325.85	1,058.09	212.25	GR	GR
7	560,626.40	798,335.08	1,084.30	211.73	GR	GR
8	560,604.65	798,335.72	1,106.03	211.66	GR	GR
9	560,585.91	798,342.00	1,125.24	212.02	GR	GR
10	560,565.68	798,348.25	1,145.92	212.41	GR	GR
11	560,542.29	798,357.71	1,170.03	211.93	GR	GR
12	560,518.14	798,288.53	1,188.22	233.87	SPECIAL	xPL1 60



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
13	560,521.81	798,366.12	1,191.16	211.51	GR	GR
14	560,511.45	798,286.41	1,194.70	233.92	SPECIAL	BE_RAM_07C NL
15	560,503.32	798,289.11	1,203.03	233.80	SPECIAL	xPL1 60
16	560,502.86	798,289.28	1,203.50	229.78	SPECIAL	xPL1 60
17	560,500.68	798,268.61	1,203.91	212.76	TOE	TOE
18	560,504.22	798,371.03	1,209.10	211.35	GR	GR
19	560,501.21	798,344.43	1,209.83	215.55	HIS	HIS HWM4 RIVER RD
20	560,494.15	798,374.97	1,219.46	211.34	GR	GR
21	560,484.12	798,379.95	1,229.89	210.83	GR	GR
22	560,483.44	798,384.68	1,230.96	210.76	SPECIAL	BE_RAM_07D NL
23	560,465.89	798,200.29	1,232.77	213.23	SPECIAL	RAM_07A BC 7C
24	560,465.88	798,200.29	1,232.78	213.23	SPECIAL	RAM_07A FLD
25	560,465.87	798,200.27	1,232.79	213.23	SPECIAL	RAM_07A FLD
26	560,465.87	798,200.27	1,232.79	213.22	SPECIAL	RAM_07A BS CHK
27	560,465.87	798,200.26	1,232.79	213.24	SPECIAL	BE_RAM_07A
28	560,465.83	798,200.28	1,232.82	213.25	SPECIAL	RAM_07A FLD
29	560,465.83	798,200.26	1,232.83	213.24	SPECIAL	RAM_07A BC 7E
30	560,439.97	798,288.68	1,266.11	207.84	GR	GR
31	560,421.12	798,290.43	1,285.04	206.24	GR	GR
32	560,405.32	798,301.40	1,301.72	206.36	P	P1 8.0
33	560,401.38	798,304.48	1,305.90	205.91	CB	Channelbank [CB
34	560,389.28	798,292.31	1,316.93	204.09	TE	TE
35	560,385.29	798,293.07	1,320.97	202.35	H2O	H2O
36	560,370.73	798,294.64	1,335.60	201.54	H2O	H2O
37	560,368.22	798,308.18	1,339.26	201.17	H2O	H2O
38	560,345.68	798,296.56	1,360.73	199.80	H2O	H2O
39	560,342.72	798,274.79	1,361.82	200.35	DS	DS IN
40	560,321.85	798,298.39	1,384.63	198.83	H2O	H2O
41	560,301.69	798,300.24	1,404.88	190.82	P	P2 8.0
42	560,296.87	798,294.29	1,409.17	205.33	SPECIAL	GAGE BOARD 4.1
43	560,290.42	798,300.28	1,416.11	203.98	SPECIAL	GAGE TRANS
44	560,287.51	798,301.39	1,419.10	190.31	H2O	H2O
45	560,272.96	798,302.61	1,433.70	202.13	H2O	H2O
46	560,266.60	798,303.11	1,440.08	204.04	TE	TE
47	560,261.43	798,303.44	1,445.26	206.42	CB	Channelbank [CB
48	560,244.81	798,304.82	1,461.94	210.15	GR	GR
49	560,225.79	798,306.13	1,481.00	212.21	GR	GR
50	560,207.13	798,235.32	1,493.57	216.57	SPECIAL	GAGE
51	560,204.99	798,307.72	1,501.86	212.75	TOE	TOE
52	560,204.92	798,313.83	1,502.45	230.64	SPECIAL	xPL1 60
53	560,204.31	798,313.88	1,503.06	233.87	SPECIAL	xPL1 60
54	560,197.08	798,290.47	1,508.28	233.82	SPECIAL	ERM G20
55	560,196.13	798,315.17	1,511.32	233.88	SPECIAL	RAM_07E TRA 7C
56	560,189.36	798,315.46	1,518.09	233.86	SPECIAL	xPL1 60
57	560,161.75	798,357.32	1,549.16	216.15	GR	GR
58	560,132.65	798,360.36	1,578.41	217.22	GR	GR
59	560,100.95	798,356.76	1,609.70	218.16	GR	GR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
60	560,073.38	798,353.25	1,636.86	218.93	GR	GR
61	559,924.48	798,328.54	1,783.12	233.66	SPECIAL	ALPT2

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	560,800.81	798,263.80	904.46	238.84	TR	RAIL [TR RAIL .65
2	560,704.85	798,261.93	999.92	237.14	TR	RAIL [TR RAIL .65
3	560,704.75	798,261.95	1,000.02	237.13	TR	RAIL [TR RAIL .65
4	560,601.38	798,270.33	1,103.73	235.49	TR	RAIL [TR RAIL .65
5	560,506.39	798,278.68	1,199.08	234.75	BEGIN	BEGIN
6	560,199.90	798,302.80	1,506.51	234.60	END	RAIL [END RAIL .65
7	560,197.92	798,306.24	1,508.78	234.67	TR	RAIL [TR RAIL .65
8	560,144.29	798,310.50	1,562.57	234.86	TR	RAIL [TR RAIL .65
9	560,087.06	798,314.82	1,619.97	235.15	TR	RAIL [TR RAIL .65
10	560,047.19	798,316.98	1,659.87	235.46	TR	TR
11	560,000.65	798,318.23	1,706.36	235.84	TR	RAIL [TR RAIL .65
12	559,961.05	798,318.38	1,745.83	236.21	TR	TR
13	559,922.31	798,316.86	1,784.29	236.51	TR	RAIL [TR RAIL .65



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

General
 ID: **BE_RAM_08**
 Road Name: W OAKLAND RD
 Stream Name:
 County:
 State:
 State Zone:

Material
 Bed: Unknown
 Fill: Unknown

Design
 Designer:
 Contractor:
 Year Built:

Datum
 Horizontal:
 Vertical:

Centerline
 Station: 1,362.74
 Offset: 0.00
 Easting: 561,047.36
 Northing: 799,275.17

Invert
 Downstream: 201.72
 Upstream: 201.29

Rail Height: 3.13

Deck Thickness: 5.00

Plans
 Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\BE_RAM_08.TXT
 Comments:

Opening	Left	Right	Type:
Abutment	1,299.28	1,454.54	Vertical Wall
Fill Station	1,299.20	1,440.65	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers

<u>CL</u> <u>Station</u>	<u>Foundation</u> <u>Type</u>	<u>Shape</u>	<u>Column</u> <u>Count</u>	<u>Width</u>	<u>Cap</u> <u>Height</u>	<u>Cap</u> <u>Top Elev</u>	<u>Foot</u> <u>Width</u>	<u>Foot</u> <u>Top Elev</u>	<u>Comment</u>
1,378.60	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P1 3.0

Rails

<u>Station</u>	<u>Easting</u>	<u>Northing</u>	<u>Elevation</u>	<u>Height</u>
1,200.68	561,185.26	799,185.26	221.96	2.39
1,207.38	561,180.95	799,190.47	222.09	2.46
1,253.07	561,146.31	799,220.33	222.34	2.32
1,278.20	561,127.90	799,237.43	222.91	2.66
1,283.84	561,123.89	799,241.41	223.53	3.23
1,296.74	561,114.40	799,250.15	223.68	3.27
1,297.12	561,114.25	799,250.54	224.14	3.73
1,299.92	561,112.14	799,252.37	224.17	3.73
1,300.19	561,111.94	799,252.56	224.67	4.23
1,456.09	560,998.50	799,359.50	226.36	4.23
1,456.49	560,998.22	799,359.78	225.84	3.71
1,459.29	560,996.13	799,361.66	225.83	3.69
1,459.62	560,995.85	799,361.84	225.39	3.24
1,472.55	560,986.64	799,370.92	225.55	3.34
1,478.49	560,983.10	799,375.82	225.03	2.79
1,493.99	560,975.72	799,390.60	224.61	2.13
1,514.19	560,971.57	799,415.69	223.60	0.75
1,543.12	560,966.34	799,452.36	222.85	0.00

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	561,342.51	799,052.08	994.88	220.31	GR	GR
2	561,311.52	799,026.58	1,000.00	221.45	SPECIAL	ALPT1
3	561,310.14	799,081.18	1,038.40	219.37	GR	GR
4	561,294.69	799,098.11	1,061.25	218.99	GR	GR
5	561,275.61	799,126.85	1,094.84	218.60	GR	GR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
6	561,259.06	799,157.07	1,127.59	217.98	GR	GR
7	561,242.70	799,179.34	1,154.76	217.56	GR	GR
8	561,237.05	799,185.48	1,163.08	217.24	GR	GR
9	561,236.68	799,185.75	1,163.54	216.94	GR	GR
10	561,226.96	799,192.71	1,175.39	217.20	GR	GR
11	561,215.05	799,203.06	1,191.15	216.84	GR	GR
12	561,152.43	799,137.87	1,192.15	219.35	SPECIAL	RAM_08A BS CHK
13	561,152.44	799,137.89	1,192.15	219.28	SPECIAL	BE_RAM_08A
14	561,184.95	799,228.79	1,230.70	214.05	GR	GR
15	561,168.32	799,248.01	1,255.99	212.94	GR	GR
16	561,148.27	799,256.33	1,276.30	212.15	GR	GR
17	561,143.51	799,260.22	1,282.42	212.01	GR	GR
18	561,084.92	799,197.99	1,282.51	226.38	SPECIAL	GAGE TOP
19	561,141.46	799,267.12	1,288.65	211.21	CB	Channelbank [CB
20	561,141.46	799,267.12	1,288.65	211.21	SPECIAL	XGR
21	561,070.65	799,205.08	1,297.77	204.85	SPECIAL	GAGE TRANS
22	561,113.55	799,252.82	1,299.20	205.38	TOE	TOE TE
23	561,111.66	799,254.32	1,301.61	203.43	H2O	H2O
24	561,103.77	799,261.77	1,312.45	201.41	H2O	H2O
25	561,089.15	799,275.51	1,332.52	201.61	H2O	H2O
26	561,038.21	799,242.41	1,346.98	201.72	DS	DS IN
27	561,070.81	799,293.07	1,357.90	201.82	H2O	H2O
28	561,055.99	799,306.90	1,378.18	222.43	SPECIAL	USSTRUCT
29	561,016.34	799,265.01	1,378.38	222.53	SPECIAL	DSSTRUCT
30	561,055.82	799,307.34	1,378.60	201.42	P	P1 3.0
31	561,052.28	799,310.25	1,383.17	201.29	H2O	H2O
32	561,039.59	799,322.11	1,400.55	201.73	H2O	H2O
33	561,028.38	799,333.87	1,416.76	201.62	H2O	H2O
34	561,041.25	799,359.53	1,424.96	204.14	H2O	H2O
35	561,042.81	799,363.11	1,426.28	205.21	TE	TE
36	561,039.98	799,364.76	1,429.47	206.49	CB	Channelbank [CB
37	561,037.39	799,371.72	1,436.12	208.63	GR	GR
38	561,010.91	799,350.16	1,440.65	208.42	TOE	TOE
39	561,034.27	799,380.77	1,444.59	212.36	GR	GR
40	561,028.07	799,387.87	1,453.97	214.30	GR	GR
41	560,980.26	799,337.86	1,454.56	222.12	SPECIAL	ALPT2
42	560,955.72	799,322.06	1,461.63	222.49	SPECIAL	ERM RR-2
43	561,010.88	799,411.11	1,482.41	214.46	GR	GR
44	560,996.14	799,436.23	1,510.35	215.39	GR	GR
45	560,981.87	799,454.56	1,533.31	216.44	GR	GR
46	560,928.69	799,408.24	1,540.33	223.33	SPECIAL	BE_RAM_08B
47	560,928.66	799,408.27	1,540.38	223.20	SPECIAL	DATE 10-07-2011
48	560,928.66	799,408.27	1,540.38	223.20	SPECIAL	BE_RAM_08B FLD
49	560,928.64	799,408.26	1,540.39	223.22	SPECIAL	RAM_08B BS CHK
50	560,928.65	799,408.29	1,540.40	223.20	SPECIAL	BE_RAM_08B FLD
51	560,928.65	799,408.29	1,540.40	223.19	SPECIAL	BE_RAM_08B BS CH
52	560,973.72	799,463.39	1,545.29	218.19	GR	GR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
53	560,958.36	799,464.01	1,556.91	220.63	GR	GR
54	560,930.64	799,463.08	1,576.47	220.25	GR	GR
55	560,903.76	799,466.58	1,598.46	219.44	GR	GR
56	560,889.04	799,471.86	1,612.80	219.45	GR	GR
57	560,874.09	799,479.36	1,628.83	219.99	GR	GR
58	560,862.73	799,484.17	1,640.41	220.38	GR	GR
59	560,845.09	799,494.55	1,660.36	223.15	GR	GR
60	560,821.47	799,517.46	1,693.27	231.73	GR	GR

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	561,311.52	799,026.58	1,000.00	221.45	TR	TR
2	561,259.38	799,075.83	1,071.72	219.57	TR	TR
3	561,216.71	799,115.92	1,130.27	219.19	TR	TR
4	561,174.15	799,155.55	1,188.43	219.47	TR	TR
5	561,093.74	799,231.85	1,299.28	220.43	BEGIN	BEGIN
6	560,980.27	799,337.84	1,454.54	222.12	END	END
7	560,958.94	799,354.88	1,481.76	222.26	TR	TR
8	560,918.23	799,383.82	1,531.24	223.16	TR	TR
9	560,876.36	799,402.72	1,574.70	225.55	TR	TR
10	560,807.58	799,419.51	1,636.32	230.52	TR	TR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

General

ID: BE_RAM_09
 Road Name: I 287
 Stream Name:
 County:
 State:
 State Zone:

Material

Bed: Unknown
 Fill: Unknown

Design

Designer:
 Contractor:
 Year Built:

Datum

Horizontal:
 Vertical:

Centerline

Station: 1,449.53
 Offset: 0.00
 Easting: 561,736.53
 Northing: 799,862.10

Invert

Downstream: 201.88
 Upstream: 199.33

Rail Height: 1.94

Deck Thickness: 10.10

Plans

Plan Location:

Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\BE_RAM_09.TXT

Comments:

Opening

	Left	Right	Type: Spill Through
Abutment	1,319.87	1,649.70	
Fill Station	1,356.45	1,599.38	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers

CL Station	Foundation Type	Shape	Column Count	Width	Cap Height	Cap Top Elev	Foot Width	Foot Top Elev	Comment
1,394.17	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P1 3.0
1,478.74	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P2 3.0
1,568.13	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P3 3.0

Rails

Station	Easting	Northing	Elevation	Height
1,098.38	562,087.14	799,815.74	246.79	2.76
1,132.03	562,053.43	799,819.74	245.99	2.62
1,207.34	561,979.09	799,833.04	244.11	2.08
1,231.48	561,954.87	799,835.78	243.55	1.91
1,238.08	561,948.27	799,836.60	243.75	2.22
1,262.18	561,924.16	799,839.58	243.55	2.26
1,262.84	561,923.49	799,839.62	243.88	2.59
1,689.56	561,502.15	799,914.46	241.38	1.29
1,690.02	561,501.71	799,914.59	240.74	0.65
1,739.43	561,455.01	799,931.38	241.17	0.64

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	562,179.56	799,779.61	999.89	246.18	SPECIAL	BE_RAM_09A BS CH
2	562,179.56	799,779.65	999.89	246.20	SPECIAL	BE_RAM_09A FLD
3	562,179.49	799,779.63	999.95	246.25	SPECIAL	RAM_09A BS CHK
4	562,179.48	799,779.65	999.97	246.25	SPECIAL	BE_RAM_09A FLD
5	562,179.46	799,779.67	1,000.00	246.22	SPECIAL	BE_RAM_09A
6	562,179.46	799,779.67	1,000.00	246.22	SPECIAL	ALPT1
7	562,184.95	799,893.92	1,023.06	268.18	GR	GR
8	562,168.69	799,890.67	1,038.00	268.52	GR	GR
9	562,158.28	799,887.29	1,047.24	268.62	GR	GR
10	562,131.25	799,894.31	1,075.16	256.75	GR	GR
11	562,101.44	799,845.48	1,091.91	261.78	SPECIAL	BE_RAM_09C TRA



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
12	562,106.15	799,904.75	1,102.08	238.15	GR	GR
13	562,089.06	799,921.51	1,122.79	221.26	GR	GR
14	562,077.26	799,934.71	1,137.49	218.56	GR	GR
15	562,037.74	799,927.42	1,173.97	217.30	GR	GR
16	562,008.44	799,924.80	1,201.70	213.55	GR	GR
17	561,960.41	799,931.57	1,249.91	211.87	GR	GR
18	561,924.69	799,946.23	1,288.15	212.65	GR	GR
19	561,831.09	799,856.15	1,356.45	213.76	TOE	TOE
20	561,830.07	799,856.37	1,357.49	213.73	GR	GR
21	561,809.13	799,860.04	1,378.69	211.65	GR	GR
22	561,795.76	799,862.39	1,392.22	210.75	CB	Channelbank [CB
23	561,793.82	799,862.68	1,394.17	210.75	P	P1 3.0
24	561,785.93	799,864.06	1,402.15	207.70	TE	TE
25	561,782.05	799,864.74	1,406.09	207.43	H2O	H2O
26	561,764.62	799,867.82	1,423.73	207.26	H2O	H2O
27	561,747.04	799,870.89	1,441.53	206.86	H2O	H2O
28	561,733.49	799,873.23	1,455.23	205.75	H2O	H2O
29	561,719.10	799,875.86	1,469.82	201.47	H2O	H2O
30	561,710.30	799,877.43	1,478.74	202.10	P	P2 3.0
31	561,693.87	799,880.28	1,495.36	199.33	H2O	H2O
32	561,692.36	799,880.59	1,496.90	207.61	TE	TE
33	561,689.55	799,880.94	1,499.70	210.56	CB	Channelbank [CB
34	561,668.01	799,912.79	1,528.49	210.70	GR	GR
35	561,656.80	799,937.68	1,545.53	211.76	GR	GR
36	561,652.23	799,967.90	1,557.46	212.49	GR	GR
37	561,622.25	799,893.87	1,568.11	210.13	SPECIAL	USSTRUCT
38	561,622.23	799,893.87	1,568.13	210.14	P	P3 3.0
39	561,631.50	799,993.93	1,584.00	212.99	GR	GR
40	561,559.26	799,755.73	1,594.83	201.88	DS	DS IN
41	561,598.85	799,928.52	1,599.38	211.94	SPECIAL	ALPT2
42	561,598.85	799,928.52	1,599.38	211.94	TOE	TOE
43	561,607.78	800,028.47	1,615.55	213.11	GR	GR
44	561,579.17	800,060.37	1,651.19	213.59	GR	GR
45	561,488.65	799,758.72	1,663.96	238.80	SPECIAL	DSSTRUCT
46	561,548.41	800,106.15	1,692.36	214.51	GR	GR
47	561,493.55	799,922.53	1,699.90	238.54	SPECIAL	BE_RAM_09D
48	561,538.65	800,142.22	1,710.77	214.98	GR	GR
49	561,471.53	799,882.83	1,711.37	240.25	SPECIAL	BE_RAM_09Bv
50	561,471.44	799,882.84	1,711.46	240.23	SPECIAL	DATE 11-03-2011
51	561,471.43	799,882.82	1,711.47	240.27	SPECIAL	BE_RAM_09B FLD
52	561,471.42	799,882.82	1,711.48	240.30	SPECIAL	BE_RAM_09B BS CH
53	561,471.42	799,882.84	1,711.48	240.23	SPECIAL	BE_RAM_09B FLD

Cross Section Data Data type: TOP OF ROAD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	562,179.46	799,779.67	1,000.00	246.22	TR	TR
2	562,129.46	799,790.38	1,051.09	245.13	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
3	562,078.42	799,801.01	1,103.17	243.92	TR	TR
4	562,018.12	799,810.35	1,163.91	242.74	TR	TR
5	561,945.82	799,823.58	1,237.22	241.54	TR	TR
6	561,912.52	799,830.65	1,271.23	241.20	TR	TR
7	561,864.54	799,839.35	1,319.87	240.76	BEGIN	BEGIN
8	561,706.25	799,867.48	1,480.19	240.03	TR	TR
9	561,631.42	799,879.69	1,555.71	239.73	TR	TR
10	561,543.04	799,871.85	1,639.37	239.90	TR	TR
11	561,534.71	799,880.92	1,649.70	239.77	END	END
12	561,471.43	799,882.84	1,711.47	240.26	TR	TR
13	561,394.68	799,880.13	1,785.14	240.97	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

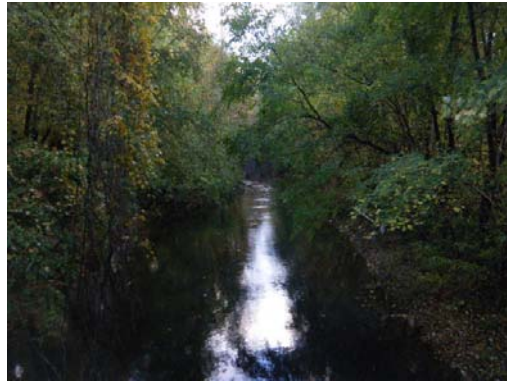
(All Units In Feet)

<p>General ID: BE_RAM_27BR Road Name: BOAT RAMP Stream Name: County: State: State Zone:</p>	<p>Material Bed: Unknown Fill: Unknown</p> <p>Datum Horizontal: Vertical:</p>	<p>Design Designer: Contractor: Year Built:</p>
<p>Centerline Station: 1,124.82 Offset: 0.00 Easting: 558,444.38 Northing: 797,536.77</p>	<p>Invert Downstream: 198.26 Upstream: 198.51</p> <p>Rail Height: 2.88 Deck Thickness: 5.00</p>	
<p>Plans Plan Location: Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\BE_RAM_27BR.txt Comments:</p>		

Opening	Left	Right	Type: Vertical Wall
Abutment	1,097.81	1,157.02	
Fill Station	1,097.91	1,156.92	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers: None

Rails

Station	Easting	Northing	Elevation	Height
1,076.38	558,485.15	797,509.31	216.41	3.60
1,098.55	558,468.10	797,523.57	216.61	2.90
1,154.37	558,427.59	797,561.97	216.45	2.87
1,178.73	558,410.12	797,578.94	216.28	2.18

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	558,219.81	795,807.84	91.22	202.55	SPECIAL	BS CK 24A
2	558,218.93	795,808.00	91.97	202.51	SPECIAL	DATE 10-20-2011
3	558,218.93	795,808.00	91.97	202.51	SPECIAL	BE_RAM_24A FLD
4	558,218.94	795,808.08	92.01	202.57	SPECIAL	BE_RAM_24AXS
5	559,032.85	797,450.88	640.39	206.75	SPECIAL	BE_RAM_28AXS
6	559,032.89	797,450.98	640.43	206.78	SPECIAL	BE_RAM_28A FLD
7	558,549.82	797,455.76	992.64	203.21	GR	GR
8	558,549.77	797,455.86	992.74	203.22	GR	GR
9	558,534.77	797,450.69	1,000.00	202.16	SPECIAL	ALPT1
10	558,536.12	797,472.93	1,014.40	205.32	GR	GR
11	558,527.43	797,478.96	1,024.85	206.80	GR	GR
12	558,514.57	797,469.65	1,027.71	207.62	SPECIAL	BE_RAM_27C REF
13	558,507.38	797,491.35	1,047.90	210.31	GR	GR
14	558,501.86	797,500.87	1,058.47	210.76	GR	GR
15	558,491.85	797,512.50	1,073.74	211.98	GR	GR
16	558,485.13	797,517.30	1,081.92	211.74	CB	Channelbank [CB
17	558,476.75	797,518.52	1,088.81	207.48	GR	GR
18	558,473.08	797,522.66	1,094.33	205.10	GR	GR
19	558,467.71	797,526.29	1,100.71	202.68	GR	GR
20	558,464.47	797,528.90	1,104.86	201.89	TE	TE
21	558,459.42	797,532.76	1,111.18	200.39	H2O	H2O
22	558,453.20	797,538.12	1,119.38	198.54	H2O	H2O



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
23	558,439.13	797,530.82	1,124.49	198.26	DS	DS IN
24	558,447.28	797,543.99	1,127.72	198.51	H2O	H2O
25	558,440.76	797,550.02	1,136.60	200.08	H2O	H2O
26	558,446.68	797,564.58	1,142.39	201.37	H2O	H2O
27	558,445.40	797,566.70	1,144.78	201.87	TE	TE
28	558,444.04	797,568.41	1,146.95	202.27	CB	Channelbank [CB
29	558,438.95	797,580.81	1,159.20	203.62	GR	GR
30	558,432.20	797,591.11	1,171.20	205.59	GR	GR
31	558,421.03	797,603.79	1,188.03	207.65	GR	GR
32	558,406.15	797,592.78	1,191.17	213.56	GR	GR
33	558,383.94	797,616.47	1,223.59	214.05	GR	GR
34	558,362.20	797,637.24	1,253.66	215.02	GR	GR
35	558,345.24	797,657.47	1,279.90	215.79	GR	GR
36	558,327.50	797,679.06	1,307.64	215.96	GR	GR
37	558,296.03	797,679.31	1,330.55	218.18	SPECIAL	ALPT2

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	558,534.77	797,450.69	1,000.00	202.16	TR	TR
2	558,530.70	797,457.41	1,007.58	203.95	TR	TR
3	558,524.64	797,463.73	1,016.33	206.02	TR	TR
4	558,506.26	797,480.42	1,041.15	209.44	TR	TR
5	558,499.80	797,486.60	1,050.09	210.60	TR	TR
6	558,487.86	797,496.62	1,065.64	211.70	TR	TR
7	558,473.10	797,509.56	1,085.25	213.72	TR	TR
8	558,464.00	797,518.21	1,097.81	213.71	BEGIN	BEGIN
9	558,420.99	797,558.90	1,157.02	213.57	END	END
10	558,408.54	797,570.55	1,174.06	214.00	TR	TR
11	558,390.65	797,587.16	1,198.48	214.48	TR	TR
12	558,355.69	797,620.39	1,246.71	215.02	TR	TR
13	558,319.87	797,654.59	1,296.23	216.31	TR	TR
14	558,303.03	797,672.49	1,320.78	217.25	TR	TR
15	558,296.04	797,679.30	1,330.53	218.18	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

General
 ID: PA_POM_08
 Road Name: JACKSON AVENUE
 Stream Name:
 County:
 State:
 State Zone:

Material
 Bed: Unknown
 Fill: Unknown

Design
 Designer:
 Contractor:
 Year Built:

Datum
 Horizontal:
 Vertical:

Centerline
 Station: 1,463.25
 Offset: 0.00
 Easting: 552,285.43
 Northing: 778,061.30

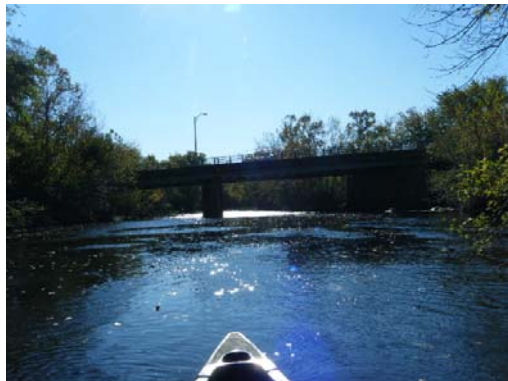
Invert
 Downstream: 159.20
 Upstream: 160.21

Rail Height: 3.41

Deck Thickness: 6.00

Plans
 Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\PA_POM_08.txt
 Comments:

Opening	Left	Right	Type:
Abutment	1,314.21	1,653.64	Spill Through
Fill Station	1,343.02	1,635.30	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face



Looking At: UPSTREAM FACE



Looking At: UPSTREAM CHANNEL



Looking At: DOWNSTREAM CHANNEL



Looking At: DOWNSTREAM FACE



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

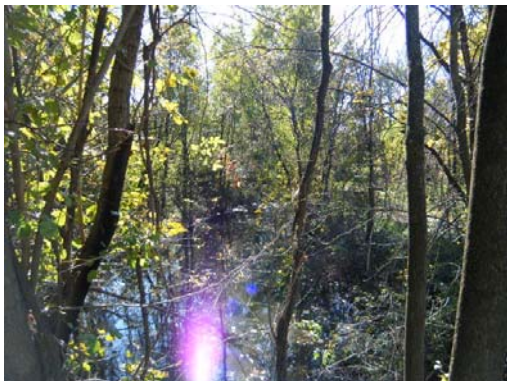
(All Units In Feet)



Looking At: UPSTREAM FACE



Looking At: UPSTREAM CHANNEL



Looking At: DOWNSTREAM CHANNEL



Looking At: DOWNSTREAM FACE

Piers

<u>CL Station</u>	<u>Foundation Type</u>	<u>Shape</u>	<u>Column Count</u>	<u>Width</u>	<u>Cap Height</u>	<u>Cap Top Elev</u>	<u>Foot Width</u>	<u>Foot Top Elev</u>	<u>Comment</u>
1,359.62	FOOTER	Round	1	4.00	0.00	0.00	0.00	0.00	P1 4.0
1,446.57	FOOTER	Round	1	4.00	0.00	0.00	0.00	0.00	P2 4
1,531.58	FOOTER	Round	1	4.00	0.00	0.00	0.00	0.00	P3 4.0
1,618.30	FOOTER	Round	1	4.00	0.00	0.00	0.00	0.00	P4 4

Rails

<u>Station</u>	<u>Easting</u>	<u>Northing</u>	<u>Elevation</u>	<u>Height</u>
1,144.00	552,604.40	778,075.30	185.48	2.44
1,181.32	552,566.98	778,075.98	186.85	2.59
1,239.04	552,508.87	778,080.94	188.41	2.72
1,295.47	552,452.04	778,085.83	189.41	2.05
1,296.84	552,450.73	778,084.82	191.30	3.91
1,373.47	552,374.49	778,075.85	192.62	3.77
1,429.45	552,318.73	778,070.56	193.01	3.79
1,444.75	552,303.49	778,069.09	193.04	3.85



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

Rails

Station	Easting	Northing	Elevation	Height
1,445.64	552,302.61	778,068.97	193.07	3.88
1,460.54	552,287.77	778,067.60	193.11	3.88
1,505.90	552,242.58	778,063.21	192.95	3.82
1,531.58	552,217.00	778,060.85	192.79	3.83
1,538.28	552,210.34	778,060.06	192.75	3.84
1,574.59	552,174.16	778,056.74	192.27	3.79
1,610.53	552,138.36	778,053.25	191.66	3.80
1,617.83	552,131.09	778,052.60	191.52	3.79
1,679.81	552,069.36	778,046.46	190.26	4.16
1,682.43	552,066.78	778,045.75	188.48	2.47
1,715.20	552,034.22	778,041.36	187.26	2.28

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,353.05	778,141.68	392.73	180.98	GR	GR
2	553,340.58	778,114.60	406.79	180.02	SPECIAL	XALPT1
3	553,332.50	778,145.99	412.99	179.83	GR	GR
4	553,310.90	778,147.22	434.48	177.35	GR	GR
5	553,281.61	778,154.05	463.31	176.23	GR	GR
6	553,255.00	778,149.17	490.16	176.30	GR	GR
7	553,232.97	778,150.05	512.09	176.29	GR	GR
8	553,211.04	778,164.97	533.10	175.91	GR	GR
9	553,187.36	778,188.16	555.36	175.17	GR	GR
10	553,170.87	778,172.97	572.72	174.71	GR	GR
11	553,139.94	778,175.38	603.45	174.79	GR	GR
12	553,114.57	778,172.33	628.96	174.42	GR	GR
13	553,109.90	778,060.26	640.30	180.95	SPECIAL	PA_POM_08D NL
14	553,094.43	778,173.18	649.02	174.54	GR	GR
15	553,074.29	778,175.31	668.99	175.16	GR	GR XCB
16	553,070.20	778,128.99	675.84	172.82	SPECIAL	XH2O
17	553,067.86	778,128.55	678.20	172.56	SPECIAL	UIP1 .1
18	553,064.97	778,172.38	678.47	173.59	GR	GR XTE
19	553,062.78	778,172.07	680.68	173.01	GR	GR XH2O
20	553,063.50	778,127.84	682.59	172.50	GR	GR XH2O
21	553,059.50	778,130.68	686.41	173.10	GR	GR XH2O
22	553,059.11	778,044.60	691.94	170.56	SPECIAL	XDS IN
23	553,058.76	778,044.61	692.28	170.58	SPECIAL	DIP1 .1
24	553,038.79	778,167.41	704.90	173.68	GR	GR XTE
25	553,030.14	778,162.73	713.81	176.22	GR	GR XCB
26	553,012.20	778,152.81	732.32	176.94	GR	GR
27	552,995.72	778,143.84	749.30	176.96	GR	GR
28	552,977.52	778,131.71	768.18	178.06	GR	GR
29	552,951.04	778,124.73	795.04	181.07	GR	GR
30	552,927.16	778,133.18	818.37	181.88	GR	GR
31	552,921.86	778,132.90	823.68	180.34	GR	GR
32	552,914.76	778,131.16	830.87	179.99	GR	GR
33	552,883.34	778,122.55	862.75	180.03	GR	GR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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CONTENTS _____

Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
34	552,848.33	778,121.06	897.78	179.96	GR	GR
35	552,827.28	778,076.73	921.44	178.15	SPECIAL	XALPT2
36	552,812.98	778,120.28	933.11	179.85	GR	GR
37	552,779.13	778,121.07	966.86	179.57	GR	GR
38	552,758.31	778,116.69	987.90	178.69	GR	GR
39	552,754.85	778,114.75	991.47	178.60	GR	GR
40	552,751.17	778,110.26	995.41	178.41	GR	GR
41	552,748.65	778,075.45	1,000.00	178.81	SPECIAL	XTR
42	552,748.65	778,075.45	1,000.00	178.81	SPECIAL	ALPT1
43	552,725.22	778,125.59	1,020.40	178.20	GR	GR
44	552,710.71	778,133.60	1,034.41	177.11	GR	GR
45	552,676.63	778,136.98	1,068.22	176.37	GR	GR
46	552,652.84	778,139.31	1,091.84	175.69	GR	GR
47	552,651.90	778,129.43	1,093.37	176.11	GR	GR
48	552,620.92	778,139.95	1,123.67	175.09	GR	GR
49	552,620.18	778,134.19	1,124.75	175.00	GR	GR
50	552,592.34	778,038.11	1,158.26	183.43	SPECIAL	PA_POM_08B FLD
51	552,592.32	778,038.10	1,158.28	183.35	SPECIAL	PA_POM_08B FLD
52	552,592.30	778,038.11	1,158.30	183.39	SPECIAL	PA_POM_08B
53	552,585.43	778,118.25	1,160.38	174.72	GR	GR
54	552,549.58	778,127.40	1,195.63	173.76	GR	GR
55	552,511.95	778,131.47	1,232.95	173.12	GR	GR
56	552,514.66	778,003.65	1,237.86	178.54	SPECIAL	DTE2 10.5 20 2
57	552,505.18	778,103.12	1,241.39	182.76	SPECIAL	UTE2 10.5 20 2
58	552,492.53	778,112.64	1,253.45	173.62	GR	GR
59	552,483.40	778,115.64	1,262.39	175.96	GR	GR
60	552,476.44	778,089.83	1,270.88	186.87	GR	GR
61	552,469.31	778,106.82	1,276.98	185.28	GR	GR
62	552,449.77	778,087.55	1,297.63	185.86	GR	GR
63	552,444.91	778,082.94	1,302.76	188.50	SPECIAL	ERM GAGING STATION
64	552,404.77	778,079.77	1,343.02	171.18	TOE	TOE
65	552,400.73	778,104.45	1,345.58	177.86	GR	GR
66	552,388.29	778,077.13	1,359.62	169.68	P	P1 4.0
67	552,383.98	778,097.96	1,362.68	172.47	GR	GR
68	552,374.49	778,075.85	1,373.47	168.82	SPECIAL	XH2O
69	552,366.14	778,095.96	1,380.62	171.68	GR	GR
70	552,357.04	778,094.26	1,389.80	169.44	CB	Channelbank [CB
71	552,344.61	778,089.71	1,402.47	165.39	TE	TE
72	552,343.99	778,072.95	1,404.10	163.78	H2O	H2O
73	552,341.71	778,088.57	1,405.44	164.84	H2O	H2O
74	552,331.92	778,071.80	1,416.21	163.37	H2O	H2O
75	552,330.40	778,008.75	1,421.49	159.20	DS	DS IN
76	552,318.73	778,070.56	1,429.45	162.21	H2O	H2O
77	552,301.67	778,068.97	1,446.57	162.07	P	P2 4
78	552,286.98	778,067.68	1,461.31	161.79	H2O	H2O
79	552,275.06	778,066.49	1,473.29	163.35	H2O	H2O
80	552,268.51	778,064.52	1,479.94	189.21	SPECIAL	PA_POM_08C



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
81	552,266.63	778,002.58	1,485.51	193.02	SPECIAL	DSSTRUCT
82	552,258.07	778,064.99	1,490.33	160.21	H2O	H2O
83	552,244.17	778,063.69	1,504.29	162.19	H2O	H2O
84	552,231.12	778,062.35	1,517.39	164.10	H2O	H2O
85	552,224.52	778,061.71	1,524.02	165.46	TE	TE
86	552,220.87	778,061.34	1,527.68	165.93	CB	Channelbank [CB
87	552,217.00	778,060.85	1,531.58	192.79	SPECIAL	USSTRUCT
88	552,217.00	778,060.85	1,531.58	165.99	P	P3 4.0
89	552,195.88	778,077.67	1,551.66	167.88	GR	GR
90	552,178.93	778,078.68	1,568.52	168.60	GR	GR
91	552,165.06	778,079.74	1,582.30	169.25	GR	GR
92	552,153.87	778,024.32	1,596.77	187.62	SPECIAL	CLTR
93	552,143.86	778,078.48	1,603.54	169.47	GR	GR
94	552,130.53	778,053.97	1,618.30	167.59	P	P4 4
95	552,122.81	778,081.58	1,624.37	169.78	GR	GR
96	552,113.63	778,051.89	1,635.30	170.20	TOE	TOE
97	552,102.58	778,087.58	1,644.20	170.26	GR	GR
98	552,075.74	778,088.83	1,670.92	181.30	GR	GR
99	552,049.49	778,087.76	1,697.19	180.96	GR	GR
100	552,046.02	778,083.36	1,700.91	181.47	GR	GR
101	552,042.39	777,984.99	1,710.40	185.34	SPECIAL	PA_POM_08A
102	552,042.38	777,984.99	1,710.41	185.41	SPECIAL	PA_POM_08A FLD
103	552,042.38	777,984.99	1,710.41	185.36	SPECIAL	DATE 10-26-2011
104	552,042.38	777,984.99	1,710.41	185.37	SPECIAL	PA_POM_08A FLD
105	552,042.36	777,984.99	1,710.43	185.43	SPECIAL	PA_POM_08A FLD
106	552,042.34	777,984.99	1,710.45	185.38	SPECIAL	PA_POM_08A FLD
107	552,042.34	777,985.01	1,710.45	185.42	SPECIAL	PA_POM_08A BS CH
108	552,042.34	777,985.03	1,710.45	185.42	SPECIAL	BS CK 8A
109	552,042.33	777,985.06	1,710.45	185.35	SPECIAL	BS CK 8A
110	552,030.25	778,060.92	1,718.00	184.48	GR	GR
111	552,025.96	778,075.71	1,721.39	184.36	GR	GR
112	552,025.56	778,075.73	1,721.79	184.38	GR	GR
113	551,982.99	778,038.62	1,766.50	183.96	GR	GR
114	551,918.30	778,025.89	1,831.84	182.72	SPECIAL	ALPT2

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	553,340.58	778,114.60	406.79	180.02	TR	TR
2	553,297.45	778,110.84	450.07	179.37	TR	TR
3	553,256.27	778,104.33	491.56	178.76	TR	TR
4	553,218.47	778,101.72	529.46	178.72	TR	TR
5	553,181.80	778,098.39	566.26	179.36	TR	TR
6	553,138.55	778,094.83	609.64	180.51	TR	TR
7	553,095.37	778,092.04	652.91	181.37	TR	TR
8	553,064.11	778,090.70	684.19	181.30	TR	TR
9	553,030.95	778,089.32	717.38	180.89	TR	TR
10	552,997.22	778,086.82	751.19	180.16	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
11	552,959.66	778,084.03	788.86	179.46	TR	TR
12	552,920.98	778,081.93	827.60	178.94	TR	TR
13	552,873.34	778,078.84	875.34	178.56	TR	TR
14	552,827.28	778,076.73	921.44	178.15	TR	TR
15	552,748.65	778,075.45	1,000.00	178.81	TR	TR
16	552,712.53	778,073.40	1,036.18	179.09	TR	TR
17	552,678.83	778,072.90	1,069.85	180.25	TR	TR
18	552,642.82	778,072.61	1,105.82	181.65	TR	TR
19	552,604.19	778,071.94	1,144.42	183.06	TR	TR
20	552,566.53	778,073.35	1,181.93	184.27	TR	TR
21	552,507.67	778,078.51	1,240.37	185.73	TR	TR
22	552,433.90	778,075.19	1,314.21	187.91	BEGIN	BEGIN
23	552,410.99	778,073.33	1,337.19	188.41	TR	TR
24	552,393.25	778,071.48	1,355.01	188.50	TR	TR
25	552,375.40	778,069.92	1,372.92	188.85	TR	TR
26	552,338.05	778,066.28	1,410.42	189.18	TR	TR
27	552,307.04	778,063.54	1,441.54	189.26	TR	TR
28	552,306.87	778,063.37	1,441.72	189.18	TR	TR
29	552,269.69	778,059.79	1,479.04	189.29	TR	TR
30	552,233.33	778,056.47	1,515.54	189.08	TR	TR
31	552,192.39	778,052.54	1,556.64	188.76	TR	TR
32	552,147.09	778,048.17	1,602.12	188.06	TR	TR
33	552,135.91	778,047.15	1,613.34	187.79	TR	TR
34	552,116.51	778,045.21	1,632.83	187.54	TR	TR
35	552,095.78	778,043.14	1,653.64	186.92	END	END
36	552,030.48	778,036.80	1,719.20	184.85	TR	TR
37	551,991.25	778,033.15	1,758.58	184.01	TR	TR
38	551,954.91	778,029.57	1,795.07	183.37	TR	TR
39	551,918.53	778,025.96	1,831.60	182.73	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

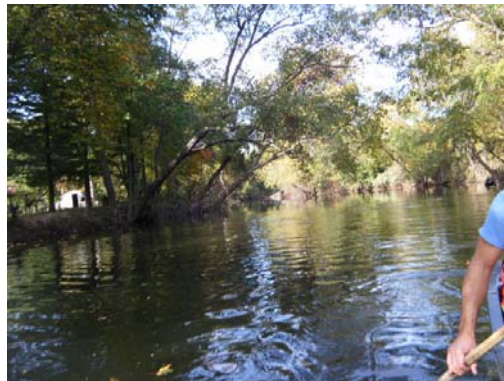
(All Units In Feet)

<p>General ID: PA_RAM_02 Road Name: DAWES HWY Stream Name: County: State: State Zone:</p>	<p>Material Bed: Unknown Fill: Unknown</p> <p>Datum Horizontal: Vertical:</p>	<p>Design Designer: Contractor: Year Built:</p>
<p>Centerline Station: 1,285.52 Offset: 0.00 Easting: 552,964.18 Northing: 784,040.94</p>	<p>Invert Downstream: 166.24 Upstream: 164.00</p> <p>Rail Height: 3.91 Deck Thickness: 4.75</p>	
<p>Plans Plan Location: Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\PA_RAM_02.TXT Comments:</p>		

Opening	Left	Right	Type: Vertical Wall
Abutment	1,239.71	1,334.40	
Fill Station	1,239.81	1,334.30	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers: None

Rails

Station	Easting	Northing	Elevation	Height
1,220.70	553,029.79	784,053.39	190.03	3.76
1,230.63	553,019.87	784,053.90	190.49	3.79
1,231.68	553,018.85	784,054.34	193.79	7.05
1,238.78	553,011.76	784,054.64	193.79	6.74
1,239.66	553,010.86	784,054.50	190.91	3.82
1,277.02	552,973.56	784,056.55	192.53	3.81
1,286.29	552,964.31	784,057.12	192.78	3.70
1,293.99	552,956.62	784,057.61	192.62	3.73
1,312.42	552,938.22	784,058.65	191.92	3.81
1,334.55	552,916.14	784,060.07	190.97	3.91
1,335.45	552,915.25	784,060.31	193.81	6.79
1,342.69	552,908.04	784,060.97	193.82	7.15
1,343.71	552,907.00	784,060.64	190.52	3.90
1,353.22	552,897.52	784,061.41	190.09	3.93
1,353.73	552,897.00	784,061.47	188.51	2.37
1,380.09	552,870.71	784,063.34	187.66	2.63

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,252.64	784,070.82	999.15	187.16	GR	GR
2	553,249.25	784,024.92	1,000.00	185.85	SPECIAL	ALPT1
3	553,219.53	784,071.18	1,032.23	186.55	GR	GR
4	553,188.18	784,068.11	1,063.36	186.14	GR	GR
5	553,174.04	784,067.10	1,077.43	183.56	GR	GR
6	553,140.96	784,074.15	1,110.85	182.71	GR	GR
7	553,108.06	784,071.57	1,143.55	183.54	GR	GR
8	553,090.52	784,139.87	1,164.84	183.83	SPECIAL	DATE 10-10-2011
9	553,090.52	784,139.87	1,164.84	183.83	SPECIAL	PA_RAM_02B FLD
10	553,090.51	784,139.84	1,164.84	183.84	SPECIAL	RAM_02B BS CHK
11	553,090.51	784,139.86	1,164.85	183.81	SPECIAL	PA_RAM_02B



Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
12	553,073.24	784,072.71	1,178.38	184.97	GR	GR
13	553,044.10	784,074.44	1,207.57	186.06	GR	GR
14	553,033.41	784,069.71	1,217.99	185.68	CB	Channelbank [CB
15	553,016.71	784,067.04	1,234.51	175.49	TE	TE
16	553,008.98	784,019.98	1,239.64	184.88	SPECIAL	GAGE PLUS 3
17	553,009.90	784,056.29	1,240.72	171.26	H2O	H2O
18	552,997.54	784,057.19	1,253.11	166.50	H2O	H2O
19	552,984.85	784,057.60	1,265.80	164.00	H2O	H2O
20	552,976.84	784,058.02	1,273.82	165.24	H2O	H2O
21	552,968.16	784,023.89	1,280.61	166.24	DS	DS IN
22	552,966.91	784,058.45	1,283.77	166.21	H2O	H2O
23	552,960.68	784,058.83	1,290.00	166.77	H2O	H2O
24	552,954.31	784,059.59	1,296.41	166.98	H2O	H2O
25	552,944.21	784,061.25	1,306.59	167.32	H2O	H2O
26	552,938.19	784,028.30	1,310.78	188.55	SPECIAL	PA_RAM_02D
27	552,933.00	784,062.46	1,317.84	170.00	H2O	H2O
28	552,925.76	784,062.42	1,325.07	171.27	H2O	H2O
29	552,916.41	784,025.81	1,332.38	173.49	SPECIAL	GAGE TRANS
30	552,915.49	784,025.80	1,333.30	190.88	SPECIAL	GAGE PLUS 3
31	552,917.24	784,063.08	1,333.61	173.56	H2O	H2O
32	552,914.95	784,074.51	1,336.53	175.57	TE	TE
33	552,900.86	784,078.23	1,350.81	180.41	CB	Channelbank [CB
34	552,895.89	784,028.39	1,353.02	190.16	SPECIAL	ERM RR-7
35	552,876.86	784,082.80	1,375.02	180.22	GR	GR
36	552,869.53	784,082.33	1,382.32	181.93	GR	GR
37	552,863.77	784,083.48	1,388.12	181.38	GR	GR
38	552,841.63	784,085.06	1,410.32	182.58	GR	GR
39	552,806.72	784,084.24	1,445.14	183.01	GR	GR
40	552,782.15	784,050.73	1,467.82	182.86	SPECIAL	ALPT2
41	552,779.87	784,088.59	1,472.19	182.82	GR	GR
42	552,771.96	784,077.52	1,479.47	190.86	SPECIAL	STREAM GAGE
43	552,753.12	784,069.68	1,497.85	181.93	SPECIAL	PA_RAM_02A
44	552,753.12	784,069.68	1,497.85	181.90	SPECIAL	PA_RAM_02A FLD
45	552,747.93	784,085.33	1,503.89	181.94	GR	GR
46	552,745.87	784,085.42	1,505.96	181.36	GR	GR
47	552,745.87	784,085.42	1,505.96	181.37	GR	GR
48	552,727.16	784,082.50	1,524.48	181.57	GR	GR
49	552,713.85	784,082.90	1,537.79	181.13	GR	GR
50	552,712.01	784,082.04	1,539.58	181.77	GR	GR
51	552,678.86	784,082.31	1,572.70	182.14	GR	GR

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	553,249.29	784,024.91	999.96	185.86	TR	TR
2	553,213.54	784,026.68	1,035.76	185.45	TR	TR
3	553,179.42	784,028.67	1,069.94	185.08	TR	TR
4	553,145.27	784,030.74	1,104.14	184.78	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
5	553,111.50	784,032.62	1,137.97	184.40	TR	TR
6	553,075.26	784,034.65	1,174.27	184.79	TR	TR
7	553,041.63	784,036.53	1,207.95	185.72	TR	TR
8	553,009.92	784,038.36	1,239.71	187.09	BEGIN	BEGIN
9	552,993.22	784,039.28	1,256.44	187.89	TR	TR
10	552,961.96	784,041.07	1,287.75	189.15	TR	TR
11	552,930.77	784,043.03	1,319.00	187.84	TR	TR
12	552,915.38	784,043.78	1,334.40	187.07	END	END
13	552,882.03	784,045.68	1,367.81	185.47	TR	TR
14	552,849.88	784,047.46	1,400.01	184.33	TR	TR
15	552,815.98	784,049.34	1,433.96	183.50	TR	TR
16	552,782.15	784,050.73	1,467.82	182.86	TR	TR
17	552,746.07	784,046.43	1,503.60	182.24	TR	TR
18	552,710.90	784,039.27	1,538.32	181.77	TR	TR
19	552,678.34	784,035.75	1,570.65	181.56	TR	TR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

General
 ID: PA_RAM_03
 Road Name: HAMBURG TPK
 Stream Name:
 County:
 State:
 State Zone:

Material
 Bed: Unknown
 Fill: Unknown

Design
 Designer:
 Contractor:
 Year Built:

Datum
 Horizontal:
 Vertical:

Centerline
 Station: 1,318.92
 Offset: 0.00
 Easting: 552,784.46
 Northing: 786,408.05

Invert
 Downstream: 173.77
 Upstream: 171.97

Rail Height: 2.22

Deck Thickness: 2.50

Plans
 Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\PA_RAM_03.TXT
 Comments: There is a weir US.

Opening	Left	Right	Type: Vertical Wall
Abutment	1,266.72	1,384.64	
Fill Station	1,266.82	1,384.54	
Side slopes	0.00	0.00	



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Detailed Bridge Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Piers

<u>CL</u> <u>Station</u>	<u>Foundation</u> <u>Type</u>	<u>Shape</u>	<u>Column</u> <u>Count</u>	<u>Width</u>	<u>Cap</u> <u>Height</u>	<u>Cap</u> <u>Top Elev</u>	<u>Foot</u> <u>Width</u>	<u>Foot</u> <u>Top Elev</u>	<u>Comment</u>
1,299.97	FOOTER	Square	1	3.00	0.00	0.00	0.00	0.00	P1 3.0
1,342.11	FOOTER	Square	1	3.00	0.00	0.00	0.00	0.00	P2 3.0

Rails

<u>Station</u>	<u>Easting</u>	<u>Northing</u>	<u>Elevation</u>	<u>Height</u>
1,189.22	552,871.68	786,305.55	191.09	2.09
1,227.07	552,852.99	786,338.61	191.30	2.25
1,233.26	552,850.32	786,344.19	191.49	2.43
1,257.91	552,839.43	786,366.31	191.44	2.27
1,312.63	552,814.77	786,415.19	191.55	2.17
1,385.96	552,780.96	786,480.34	191.85	2.22
1,422.51	552,764.23	786,512.88	191.94	2.12
1,454.70	552,752.62	786,542.98	192.52	2.38

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	555,817.54	787,085.46	656.29	272.53	SPECIAL	PA_HAY_03C
2	553,010.64	786,089.68	934.91	190.14	GR	GR
3	552,987.78	786,123.75	975.43	189.11	GR	GR
4	552,987.10	786,124.01	975.96	188.66	GR	GR
5	552,911.57	786,115.46	1,000.00	188.74	SPECIAL	ALPT1
6	552,975.51	786,150.55	1,004.91	189.05	GR	GR
7	552,967.07	786,167.28	1,023.64	188.70	GR	GR
8	552,966.99	786,167.76	1,024.10	189.04	GR	GR
9	552,954.90	786,192.00	1,051.18	189.06	GR	GR
10	552,944.89	786,229.96	1,089.83	189.31	GR	GR
11	552,943.18	786,231.83	1,092.24	188.92	GR	GR
12	552,905.57	786,233.26	1,109.38	188.69	SPECIAL	PA_RAM_03A
13	552,931.59	786,258.91	1,121.68	188.40	GR	GR
14	552,904.10	786,302.81	1,173.08	188.57	GR	GR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
 CONTENTS _____

Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
15	552,871.93	786,341.10	1,221.36	189.39	GR	GR
16	552,879.14	786,369.78	1,244.33	192.76	SPECIAL	GAGE STATION
17	552,853.81	786,364.59	1,250.29	189.71	GR	GR
18	552,849.15	786,367.11	1,254.54	187.48	GR	GR
19	552,860.99	786,373.59	1,255.44	177.92	SPECIAL	WEIR
20	552,841.35	786,365.29	1,256.18	189.72	SPECIAL	ERM PA_RAM_03
21	552,846.92	786,370.69	1,258.72	187.46	CB	Channelbank [CB
22	552,846.65	786,371.28	1,259.37	176.63	TE	TE
23	552,846.44	786,372.05	1,260.16	174.45	H2O	H2O
24	552,835.35	786,375.69	1,268.13	174.31	H2O	H2O
25	552,828.53	786,389.32	1,283.37	173.08	H2O	H2O
26	552,823.26	786,399.72	1,295.02	173.71	H2O	H2O
27	552,821.51	786,404.37	1,299.97	176.19	P	P1 3.0
28	552,820.92	786,404.22	1,300.09	191.50	SPECIAL	USSTRUCT
29	552,816.90	786,411.87	1,308.72	174.21	H2O	H2O
30	552,756.41	786,392.38	1,316.51	185.24	SPECIAL	DSSTRUCT
31	552,812.90	786,420.48	1,318.22	172.63	H2O	H2O
32	552,805.41	786,436.33	1,335.74	171.97	H2O	H2O
33	552,745.08	786,413.77	1,340.68	173.77	DS	DS IN
34	552,802.59	786,442.04	1,342.11	173.68	P	P2 3.0
35	552,793.82	786,457.33	1,359.66	172.25	H2O	H2O
36	552,837.66	786,492.21	1,372.85	177.78	SPECIAL	WEIR
37	552,786.57	786,471.74	1,375.79	174.14	H2O	H2O
38	552,798.74	786,480.33	1,378.46	176.55	TE	TE
39	552,798.53	786,480.83	1,379.00	187.52	CB	Channelbank [CB
40	552,795.39	786,483.15	1,382.43	187.63	GR	GR
41	552,795.41	786,490.26	1,388.87	190.88	GR	GR
42	552,681.77	786,518.18	1,462.04	189.58	SPECIAL	PA_RAM_03B
43	552,681.73	786,518.20	1,462.08	189.57	SPECIAL	PA_RAM_03B FLD
44	552,681.73	786,518.20	1,462.08	189.57	SPECIAL	DATE 10-18-2011
45	552,681.74	786,518.22	1,462.09	189.57	SPECIAL	PA_RAM_03B BS CH
46	552,783.10	786,569.47	1,465.90	191.24	GR	GR
47	552,773.64	786,600.28	1,497.83	191.94	GR	GR
48	552,766.07	786,616.68	1,515.89	192.19	GR	GR
49	552,760.27	786,632.13	1,532.35	192.02	GR	GR
50	552,760.17	786,632.41	1,532.65	192.42	GR	GR
51	552,757.12	786,642.05	1,542.67	192.51	GR	GR
52	552,757.12	786,642.05	1,542.67	192.51	GR	GR
53	552,674.65	786,625.84	1,562.69	191.99	SPECIAL	ALPT2
54	552,748.27	786,663.38	1,565.75	193.39	GR	GR

Cross Section Data Data type: TOP OF ROAD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	552,911.56	786,115.58	1,000.11	188.74	TR	TR
2	552,896.92	786,167.57	1,053.44	188.67	TR	TR
3	552,869.25	786,237.28	1,128.32	188.88	TR	TR
4	552,854.96	786,269.66	1,163.71	188.90	TR	TR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
5	552,840.25	786,301.61	1,198.88	189.04	TR	TR
6	552,825.85	786,330.55	1,231.19	189.05	TR	TR
7	552,809.82	786,362.27	1,266.72	189.21	BEGIN	BEGIN
8	552,765.10	786,443.01	1,358.78	189.57	TR	TR
9	552,751.84	786,465.37	1,384.64	189.63	END	END
10	552,738.38	786,497.30	1,419.27	189.79	TR	TR
11	552,707.36	786,563.58	1,492.44	190.52	TR	TR
12	552,674.67	786,625.80	1,562.65	192.00	TR	TR



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

General
 ID: PA_RAM_05
 Road Name: JEFFERSON AVE
 Stream Name:
 County:
 State:
 State Zone:

Material
 Bed: Unknown
 Fill: Unknown

Design
 Designer:
 Contractor:
 Year Built:

Datum
 Horizontal:
 Vertical:

Centerline
 Station: 1,444.91
 Offset: 0.00
 Easting: 554,306.23
 Northing: 791,896.15

Invert
 Downstream: 187.46
 Upstream: 187.53

Rail Height: 3.64
Deck Thickness: 3.90

Plans
 Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\PA_RAM_05.TXT
 Comments: There is a 8 foot releif pipe on each side of the bridge. Pipe 1 = 53', Pipe 2 = 69

Opening	Left	Right	Type: Vertical Wall
Abutment	1,340.57	1,545.49	
Fill Station	1,340.67	1,545.39	
Side slopes	0.00	0.00	



Looking At: UPSTREAM FACE



Looking At: UPSTREAM CHANNEL



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)



Looking At: DOWNSTREAM CHANNEL



Looking At: DOWNSTREAM FACE

Piers

<u>CL</u> <u>Station</u>	<u>Foundation</u> <u>Type</u>	<u>Shape</u>	<u>Column</u> <u>Count</u>	<u>Width</u>	<u>Cap</u> <u>Height</u>	<u>Cap</u> <u>Top Elev</u>	<u>Foot</u> <u>Width</u>	<u>Foot</u> <u>Top Elev</u>	<u>Comment</u>
1,408.15	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P1 3
1,477.66	FOOTER	Round	1	3.00	0.00	0.00	0.00	0.00	P2 3

Rails

<u>Station</u>	<u>Easting</u>	<u>Northing</u>	<u>Elevation</u>	<u>Height</u>
1,145.80	554,549.59	791,720.63	214.81	2.28
1,145.80	554,549.59	791,720.63	214.81	2.28
1,166.74	554,533.51	791,734.04	214.27	2.16
1,194.89	554,512.35	791,752.60	214.12	2.47
1,198.11	554,510.33	791,755.21	215.66	4.05
1,204.45	554,505.50	791,759.31	215.63	4.09
1,204.45	554,505.50	791,759.31	215.63	4.09
1,204.68	554,505.36	791,759.50	215.37	3.83
1,262.04	554,461.71	791,796.71	214.75	3.84
1,337.73	554,403.75	791,845.40	214.36	3.90
1,438.74	554,326.94	791,910.99	213.80	3.79
1,548.57	554,243.30	791,982.17	213.10	3.94
1,684.94	554,139.34	792,070.44	211.42	3.27
1,693.58	554,133.81	792,077.27	211.42	3.26
1,693.77	554,133.69	792,077.42	211.69	3.54
1,699.37	554,131.48	792,083.47	211.67	3.51
1,702.12	554,130.12	792,086.12	210.26	2.10

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	554,645.21	791,607.98	1,000.00	219.38	SPECIAL	ALPT1
2	554,699.93	791,678.90	1,004.20	218.34	GR	GR
3	554,695.47	791,677.20	1,006.50	217.46	GR	GR
4	554,685.72	791,682.96	1,017.66	217.33	GR	GR
5	554,684.81	791,683.31	1,018.57	217.12	GR	GR



PROJECT NJDEP Field Survey - Bridges

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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
6	554,662.27	791,697.32	1,044.82	216.63	GR	GR
7	554,650.99	791,704.02	1,057.76	215.39	GR	GR
8	554,640.12	791,711.06	1,070.60	213.71	GR	GR
9	554,610.77	791,726.63	1,103.05	212.52	GR	GR
10	554,588.61	791,748.23	1,133.93	210.40	GR	GR
11	554,575.12	791,754.91	1,148.53	209.13	GR	GR
12	554,568.88	791,756.96	1,154.62	207.60	GR	GR
13	554,556.90	791,767.00	1,170.25	206.76	CB	Channelbank [CB
14	554,553.83	791,774.59	1,177.50	204.64	GR	GR
15	554,546.02	791,785.72	1,190.65	202.42	GR	GR
16	554,496.16	791,768.90	1,217.78	200.82	TE	TE
17	554,488.75	791,776.15	1,228.11	199.45	H2O	H2O
18	554,475.21	791,786.41	1,245.08	199.03	H2O	H2O
19	554,462.97	791,798.68	1,262.35	198.68	H2O	H2O
20	554,419.73	791,766.24	1,274.31	203.87	SPECIAL	DTP1 8.0 0.0
21	554,451.71	791,806.45	1,275.96	195.95	SPECIAL	UIP1 8.0
22	554,444.15	791,813.96	1,286.58	196.74	H2O	H2O
23	554,428.31	791,827.73	1,307.57	195.35	H2O	H2O
24	554,400.83	791,850.83	1,343.47	190.89	H2O	H2O
25	554,375.00	791,872.15	1,376.97	188.32	H2O	H2O
26	554,351.17	791,892.26	1,408.15	188.30	P	P1 3
27	554,347.32	791,894.86	1,412.75	187.54	H2O	H2O
28	554,294.81	791,873.37	1,438.87	213.73	SPECIAL	DSSTRUCT
29	554,327.11	791,911.70	1,439.06	213.80	SPECIAL	USSTRUCT
30	554,322.88	791,917.63	1,446.13	190.34	H2O	H2O
31	554,286.28	791,880.32	1,449.87	187.46	DS	DS IN
32	554,298.68	791,937.85	1,477.66	187.53	P	P2 3
33	554,281.37	791,951.68	1,499.81	188.47	H2O	H2O
34	554,260.53	791,968.43	1,526.54	187.98	H2O	H2O
35	554,240.00	791,988.42	1,555.12	187.92	H2O	H2O
36	554,221.02	792,004.44	1,579.96	191.20	H2O	H2O
37	554,171.05	791,972.64	1,597.47	208.87	SPECIAL	PA_RAM_05A
38	554,152.04	791,970.72	1,610.71	195.90	SPECIAL	DIP2 8.0
39	554,195.48	792,024.24	1,612.24	195.92	SPECIAL	UIP2 8.0
40	554,190.86	792,030.11	1,619.57	194.64	H2O	H2O
41	554,169.58	792,048.13	1,647.45	197.17	H2O	H2O
42	554,062.76	791,936.53	1,656.63	207.40	SPECIAL	ERM RR-5
43	554,154.38	792,060.47	1,667.02	199.58	H2O	H2O
44	554,150.59	792,063.76	1,672.04	200.91	TE	TE
45	554,139.18	792,082.12	1,692.62	206.71	CB	Channelbank [CB
46	554,134.85	792,110.69	1,714.42	208.00	GR	GR
47	554,093.26	792,076.72	1,724.13	207.80	SPECIAL	ALPT2
48	554,121.32	792,131.93	1,738.48	209.30	GR	GR
49	554,094.29	792,183.38	1,792.39	211.28	GR	GR
50	554,075.94	792,224.33	1,832.88	212.10	GR	GR
51	554,051.15	792,248.44	1,867.39	212.91	GR	GR
52	553,784.83	792,067.74	1,953.41	210.31	SPECIAL	PA_RAM_05B



PROJECT NJDEP Field Survey - Bridges

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Bridge Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
53	553,784.79	792,067.69	1,953.41	210.35	SPECIAL	RAM_05B BS CHK
54	553,784.78	792,067.73	1,953.44	210.34	SPECIAL	DATE 10-07-2011
55	553,784.78	792,067.73	1,953.44	210.34	SPECIAL	RAM_05B FLD

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	554,645.19	791,607.99	1,000.02	219.37	TR	TR
2	554,592.21	791,653.33	1,069.75	215.29	TR	TR
3	554,542.43	791,695.52	1,135.00	212.75	TR	TR
4	554,505.91	791,726.53	1,182.92	211.79	TR	TR
5	554,449.87	791,773.60	1,256.10	210.94	TR	TR
6	554,385.67	791,828.49	1,340.57	210.44	BEGIN	BEGIN
7	554,312.51	791,890.76	1,436.63	210.03	TR	TR
8	554,229.88	791,961.62	1,545.49	209.18	END	END
9	554,167.16	792,005.79	1,621.89	208.36	TR	TR
10	554,115.13	792,025.63	1,674.39	208.14	TR	TR
11	554,040.40	792,043.77	1,743.10	208.19	TR	TR
12	553,965.04	792,063.21	1,813.12	209.05	TR	TR
13	553,905.45	792,080.59	1,869.79	209.68	TR	TR

Appendix F
CULVERT SURVEY DATA



PROJECT NJDEP Field Survey - Culverts

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
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Detailed Culvert Report

(All Units In Feet)

ID: PA_POM_08R
 Road Name: JACKSON AVENUE
 Stream Name:
 County:
 State:
 State Zone:

Material
 Bed: Unknown
 Fill: Unknown

Design
 Designer:
 Contractor:
 Year Built:

Datum
 Horizontal:
 Vertical:

Centerline
 Station: 1,283.85
 Offset: 0.00
 Easting: 553,057.74
 Northing: 778,090.44

Invert
 Downstream: 170.56
 Upstream: 172.50

Rail Height: 0.00

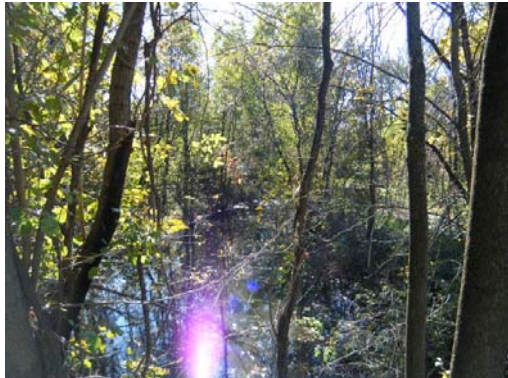
Plans
 Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\PA_POM_08R.txt
 Comments:



Looking At: UPSTREAM FACE



Looking At: UPSTREAM CHANNEL



Looking At: DOWNSTREAM CHANNEL



Looking At: DOWNSTREAM FACE



PROJECT NJDEP Field Survey - Culverts

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
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Detailed Culvert Report

(All Units In Feet)

Culvert Pipes

CL Station	Culvert Type	Material	Inlet Type	Outlet Type	Rise	Width	Pipe Length	Inverts U/S	D/S	Comment
1,270.96	Circular	Unknown	Unknown	Unknown	0.10	0.00	84.43	172.56	170.58	UIP1 .1

Rails: None

Cross Section Data Data type: FIELD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,353.05	778,141.68	985.57	180.98	GR	GR
2	553,340.58	778,114.60	1,000.00	180.02	SPECIAL	ALPT1
3	553,332.50	778,145.99	1,005.75	179.83	GR	GR
4	553,310.90	778,147.22	1,027.21	177.35	GR	GR
5	553,281.61	778,154.05	1,055.91	176.23	GR	GR
6	553,255.00	778,149.17	1,082.81	176.30	GR	GR
7	553,232.97	778,150.05	1,104.71	176.29	GR	GR
8	553,211.04	778,164.97	1,125.48	175.91	GR	GR
9	553,187.36	778,188.16	1,147.40	175.17	GR	GR
10	553,170.87	778,172.97	1,164.96	174.71	GR	GR
11	553,139.94	778,175.38	1,195.63	174.79	GR	GR
12	553,114.57	778,172.33	1,221.15	174.42	GR	GR
13	553,109.90	778,060.26	1,234.06	180.95	SPECIAL	PA_POM_08D NL
14	553,094.43	778,173.18	1,241.18	174.54	GR	GR
15	553,074.29	778,175.31	1,261.10	175.16	CB	Channelbank [CB
16	553,070.20	778,128.99	1,268.59	172.82	SPECIAL	XH2O
17	553,064.97	778,172.38	1,270.62	173.59	TE	TE
18	553,067.86	778,128.55	1,270.96	172.56	SPECIAL	UIP1 .1
19	553,062.78	778,172.07	1,272.83	173.01	H2O	H2O
20	553,063.50	778,127.84	1,275.36	172.50	H2O	H2O
21	553,059.50	778,130.68	1,279.14	173.10	H2O	H2O
22	553,059.11	778,044.60	1,285.86	170.56	DS	DS IN
23	553,058.76	778,044.61	1,286.21	170.58	SPECIAL	DIP1 .1
24	553,038.79	778,167.41	1,297.09	173.68	TE	TE
25	553,030.14	778,162.73	1,306.06	176.22	CB	Channelbank [CB
26	553,012.20	778,152.81	1,324.69	176.94	GR	GR
27	552,995.72	778,143.84	1,341.78	176.96	GR	GR
28	552,977.52	778,131.71	1,360.82	178.06	GR	GR
29	552,951.04	778,124.73	1,387.74	181.07	GR	GR
30	552,927.16	778,133.18	1,410.94	181.88	GR	GR
31	552,921.86	778,132.90	1,416.24	180.34	GR	GR
32	552,914.76	778,131.16	1,423.45	179.99	GR	GR
33	552,883.34	778,122.55	1,455.42	180.03	GR	GR
34	552,848.33	778,121.06	1,490.44	179.96	GR	GR
35	552,827.28	778,076.73	1,514.70	178.15	SPECIAL	ALPT2
36	552,812.98	778,120.28	1,525.75	179.85	GR	GR
37	552,779.13	778,121.07	1,559.46	179.57	GR	GR
38	552,592.34	778,038.16	1,751.84	183.40	SPECIAL	BS CK 8B
39	552,592.34	778,038.11	1,751.84	183.43	SPECIAL	PA_POM_08B FLD
40	552,592.32	778,038.10	1,751.87	183.35	SPECIAL	PA_POM_08B FLD



PROJECT NJDEP Field Survey - Culverts

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
 CONTENTS _____

Detailed Culvert Report

(All Units In Feet)

Cross Section Data Data type: FIELD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
41	552,592.30	778,038.11	1,751.88	183.39	SPECIAL	PA_POM_08B
42	552,268.51	778,064.52	2,072.86	189.21	SPECIAL	PA_POM_08C
43	552,042.39	777,984.99	2,304.21	185.34	SPECIAL	PA_POM_08A
44	552,042.38	777,984.99	2,304.22	185.36	SPECIAL	DATE 10-26-2011
45	552,042.38	777,984.99	2,304.22	185.37	SPECIAL	PA_POM_08A FLD
46	552,042.34	777,985.03	2,304.26	185.42	SPECIAL	BS CK 8A

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	553,340.58	778,114.60	1,000.00	180.02	TR	TR
2	553,297.45	778,110.84	1,043.29	179.37	TR	TR
3	553,256.27	778,104.33	1,084.84	178.76	TR	TR
4	553,218.47	778,101.72	1,122.73	178.72	TR	TR
5	553,181.80	778,098.39	1,159.55	179.36	TR	TR
6	553,138.55	778,094.83	1,202.94	180.51	TR	TR
7	553,095.37	778,092.04	1,246.21	181.37	TR	TR
8	553,064.11	778,090.70	1,277.48	181.30	TR	TR
9	553,030.95	778,089.32	1,310.65	180.89	TR	TR
10	552,997.22	778,086.82	1,344.47	180.16	TR	TR
11	552,959.66	778,084.03	1,382.14	179.46	TR	TR
12	552,920.98	778,081.93	1,420.87	178.94	TR	TR
13	552,873.34	778,078.84	1,468.61	178.56	TR	TR
14	552,827.28	778,076.73	1,514.70	178.15	TR	TR

Appendix G
DAMS SURVEY DATA



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
 CONTENTS _____

Detailed Dam Report

(All Units In Feet)

General

ID: BE_RAM_28XS

Road Name: US OF BOAT RAMP
 Stream Name:
 County:
 State:
 State Zone:

Centerline

Station: 1,270.06
 Offset: 0.00
 Easting: 558,993.38
 Northing: 797,330.89

Design

Designer:
 Contractor:
 Year Built:

Plans

Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\BE_RAM_28XS.txt

Comments:

Material

Bed: Unknown

Fill: Unknown

Datum

Horizontal:
 Vertical:

Invert

Downstream: 194.28
 Upstream: 196.66

Rail Height: 0.00

Dam Detail

Type: Concrete Gravity
 Height: 0.00
 Top Elevation: 0.00
 Shape: Unknown
 Normal Area: 0.00
 Hazard Class:
 Flood Elevation: 0.00
 Flood Volume: 0.00
 Valve East: 0.00
 Valve North: 0.00

Embankment

Class:
 Slope: 1.00
 Type: Concrete



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
 CONTENTS _____

Detailed Dam Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Riser Barrels: None

Spillways

CL Station	Depth	Top Width	Bot. Width	Top Elev	Crest Elev	L/Side Slope	R/Side Slope	Comment
1,276.33	6.89	244.31	215.37	208.83	201.94	2.09	2.12	SPILLWAY 1

Rails: None

Cross Section Data Data type: TOP OF ROAD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	558,931.17	797,067.74	1,000.04	210.55	TR	TR
2	558,938.02	797,091.92	1,025.17	210.67	TR	TR
3	558,943.99	797,118.17	1,052.04	210.84	TR	TR
4	558,948.36	797,142.93	1,077.03	210.41	TR	TR
5	558,950.34	797,154.51	1,088.69	210.66	TR	TR
6	558,955.31	797,165.19	1,100.35	211.31	TR	TR
7	558,960.82	797,184.33	1,120.26	211.50	TR	TR
8	558,963.23	797,201.45	1,137.37	211.58	TR	TR
9	558,964.79	797,213.70	1,149.56	211.18	TR	TR TOP SPY1
10	558,968.25	797,232.57	1,168.65	202.07	TR	TR BOT SPY1
11	559,021.62	797,441.36	1,384.01	201.82	TR	TR BOT SPY1
12	559,026.79	797,450.12	1,393.87	206.48	TR	TR TOP SPY1
13	559,032.89	797,466.83	1,411.62	207.45	TR	TR
14	559,042.41	797,494.14	1,440.51	208.63	TR	TR
15	559,053.04	797,514.96	1,463.48	208.29	TR	TR
16	559,065.02	797,550.61	1,501.06	208.28	TR	TR
17	559,077.71	797,584.58	1,537.23	208.23	TR	TR
18	559,092.19	797,616.23	1,571.68	206.98	TR	TR

Cross Section Data Data type: FIELD-UPSTREAM

Point	Easting	Northing	Station	Elevation	Code	Comment
1	558,218.94	795,808.08	-409.24	202.57	SPECIAL	PA_RAM_24AXS
2	558,931.16	797,067.70	1,000.00	210.56	SPECIAL	ALPT1



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
TYPE _____ PREL. _____ FINAL _____ SHEET _____
CONTENTS _____

Detailed Dam Report

(All Units In Feet)

Cross Section Data Data type: **FIELD-UPSTREAM**

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
3	558,970.50	797,096.52	1,038.73	208.64	GR	GR
4	558,978.38	797,118.26	1,061.81	208.42	GR	GR
5	558,985.83	797,131.03	1,076.17	208.75	GR	GR
6	558,992.42	797,138.99	1,085.66	209.01	GR	GR
7	558,996.88	797,153.35	1,100.69	208.78	GR	GR
8	559,001.67	797,173.43	1,121.31	209.28	GR	GR
9	559,006.20	797,193.72	1,142.06	209.21	GR	GR
10	559,007.22	797,209.88	1,157.85	208.25	CB	Channelbank [CB
11	559,009.02	797,217.91	1,166.06	207.89	GR	GR
12	559,008.94	797,225.99	1,173.79	205.04	GR	GR
13	559,008.88	797,231.60	1,179.16	202.66	TE	TE
14	559,009.72	797,233.56	1,181.27	200.96	H2O	H2O
15	559,009.38	797,235.55	1,183.08	199.62	H2O	H2O
16	559,018.90	797,237.76	1,187.89	199.88	H2O	H2O
17	559,023.56	797,245.37	1,196.50	202.06	H2O	H2O
18	559,024.43	797,253.88	1,204.91	200.69	H2O	H2O
19	559,021.45	797,265.87	1,215.58	198.76	H2O	H2O
20	559,018.52	797,285.80	1,233.88	196.66	H2O	H2O
21	559,023.41	797,309.21	1,257.71	196.85	H2O	H2O
22	558,514.53	797,469.65	1,268.32	207.58	SPECIAL	DATE 10-20-2011
23	558,514.53	797,469.65	1,268.32	207.58	SPECIAL	BE_RAM_27C FLD
24	558,514.57	797,469.65	1,268.33	207.62	SPECIAL	BE_RAM_27C RESEC
25	558,514.54	797,469.87	1,268.53	207.58	SPECIAL	BE_RAM_27C BS
26	559,028.56	797,331.44	1,280.50	197.97	H2O	H2O
27	559,037.24	797,351.27	1,301.97	197.04	H2O	H2O
28	559,035.31	797,364.93	1,314.53	198.29	H2O	H2O
29	559,040.26	797,381.33	1,331.66	198.82	H2O	H2O
30	559,046.54	797,397.70	1,349.14	198.80	H2O	H2O
31	559,053.16	797,413.12	1,365.79	198.98	H2O	H2O
32	559,055.08	797,419.49	1,372.45	200.59	H2O	H2O
33	559,056.20	797,425.81	1,378.83	201.79	H2O	H2O
34	559,056.84	797,428.35	1,381.45	202.67	TE	TE
35	559,057.42	797,432.47	1,385.57	204.03	CB	Channelbank [CB
36	559,059.33	797,440.71	1,394.01	205.65	GR	GR
37	559,032.85	797,450.88	1,396.30	206.75	SPECIAL	PA_RAM_28AXS
38	559,065.68	797,450.30	1,405.00	206.67	GR	GR
39	559,071.46	797,462.46	1,418.29	207.59	GR	GR
40	559,077.05	797,483.49	1,440.05	208.78	GR	GR
41	559,079.87	797,502.05	1,458.65	208.59	GR	GR
42	559,084.64	797,522.98	1,480.08	207.42	GR	GR
43	559,093.36	797,549.16	1,507.65	206.51	GR	GR
44	559,095.31	797,570.98	1,529.14	206.77	GR	GR
45	559,105.18	797,593.37	1,553.40	206.79	GR	GR
46	559,092.21	797,616.27	1,571.72	206.97	SPECIAL	ALPT2
47	559,114.40	797,610.17	1,572.12	206.33	GR	GR



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
TYPE _____ PREL. _____ FINAL _____ SHEET _____
CONTENTS _____

Detailed Dam Report

(All Units In Feet)

Cross Section Data Data type: **FIELD-DOWNSTREAM**

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	558,907.41	797,125.44	1,048.71	201.38	GR DS	GR DS
2	558,910.16	797,143.57	1,066.88	201.43	GR DS	GR DS
3	558,920.16	797,167.46	1,092.62	201.61	GR DS	GR DS
4	558,923.92	797,189.56	1,114.88	201.65	GR DS	GR DS
5	558,930.92	797,216.75	1,142.94	202.15	GR DS	GR DS
6	558,935.11	797,229.29	1,156.16	202.60	CB DS	Channelbank [CB DS
7	558,936.90	797,231.38	1,158.67	201.26	TE DS	TE DS
8	558,937.26	797,232.99	1,160.32	199.66	H2O DS	H2O DS
9	558,928.21	797,246.08	1,170.33	196.76	H2O DS	H2O DS
10	558,924.93	797,254.96	1,177.92	194.95	H2O DS	H2O DS
11	558,916.44	797,269.79	1,189.76	194.28	H2O DS	H2O DS
12	558,921.65	797,288.58	1,209.26	196.99	H2O DS	H2O DS
13	558,919.86	797,302.39	1,222.00	198.46	H2O DS	H2O DS
14	558,925.94	797,330.44	1,250.63	199.14	H2O DS	H2O DS
15	558,930.73	797,365.15	1,285.28	198.22	H2O DS	H2O DS
16	558,929.44	797,383.05	1,302.10	199.32	H2O DS	H2O DS
17	558,937.83	797,402.73	1,323.34	198.15	H2O DS	H2O DS
18	558,951.99	797,424.96	1,348.66	196.37	H2O DS	H2O DS
19	558,957.71	797,438.82	1,363.57	196.86	H2O DS	H2O DS
20	558,967.17	797,452.96	1,379.80	197.84	H2O DS	H2O DS
21	558,978.48	797,459.45	1,389.22	199.69	H2O DS	H2O DS
22	559,001.28	797,454.78	1,391.16	199.49	H2O DS	H2O DS
23	559,002.44	797,456.91	1,393.53	201.27	TE DS	TE DS
24	559,002.65	797,457.95	1,394.59	204.64	CB DS	Channelbank [CB DS
25	559,003.59	797,464.07	1,400.72	205.53	GR DS	GR DS
26	559,008.62	797,480.59	1,417.99	206.41	GR DS	GR DS
27	559,013.51	797,502.86	1,440.74	208.23	GR DS	GR DS
28	559,014.78	797,517.96	1,455.58	208.90	GR DS	GR DS
29	559,019.03	797,543.82	1,481.59	208.29	GR DS	GR DS
30	559,011.22	797,579.64	1,513.76	208.53	GR DS	GR DS



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
 CONTENTS _____

Detailed Dam Report

(All Units In Feet)

General

ID: PA_RAM_01

Road Name: WEIR
 Stream Name:
 County:
 State:
 State Zone:

Centerline

Station: 1,119.35
 Offset: 0.00
 Easting: 553,109.28
 Northing: 778,845.82

Design

Designer:
 Contractor:
 Year Built:

Plans

Plan Location:
 Survey File: N:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Survey\WISE\Structures\PA_RAM_01.txt

Comments:

Material

Bed: Unknown

Fill: Unknown

Datum

Horizontal:
 Vertical:

Invert

Downstream: 161.73
 Upstream: 168.29

Rail Height: 0.00

Dam Detail

Type: Concrete Gravity
 Height: 0.00
 Top Elevation: 0.00
 Shape: Unknown
 Normal Area: 0.00
 Hazard Class:
 Flood Elevation: 0.00
 Flood Volume: 0.00
 Valve East: 0.00
 Valve North: 0.00

Embankment

Class:
 Slope: 1.00
 Type: Concrete



Looking At: Upstream Face



Looking At: Upstream Channel



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
 TYPE _____ PREL. _____ FINAL _____ SHEET _____
 CONTENTS _____

Detailed Dam Report

(All Units In Feet)



Looking At: Downstream Channel



Looking At: Downstream Face

Riser Barrels: None

Spillways

CL Station	Depth	Top Width	Bot. Width	Top Elev	Crest Elev	L/Side Slope	R/Side Slope	Comment
1,134.75	8.49	270.58	269.51	183.07	174.57	0.07	0.05	SPILLWAY 1

Rails: None

Cross Section Data Data type: TOP OF ROAD

Point	Easting	Northing	Station	Elevation	Code	Comment
1	553,001.70	778,656.35	901.78	198.19	TR	TR
2	553,009.51	778,663.69	912.17	192.97	TR	TR
3	553,014.07	778,668.34	918.55	189.07	TR	TR
4	553,017.81	778,674.05	925.38	184.41	TR	TR
5	553,021.43	778,679.20	931.66	180.79	TR	TR
6	553,023.72	778,683.55	936.56	179.02	TR	TR
7	553,024.93	778,685.74	939.06	177.33	TR	TR
8	553,026.85	778,688.28	942.24	177.46	TR	TR
9	553,028.67	778,691.91	946.28	178.88	TR	TR
10	553,031.90	778,696.15	951.59	180.34	TR	TR
11	553,035.46	778,702.37	958.75	179.88	TR	TR
12	553,040.55	778,711.44	969.12	181.31	TR	TR
13	553,043.47	778,715.25	973.91	181.66	TR	TR
14	553,045.28	778,717.00	976.36	182.37	TR	TR
15	553,048.40	778,720.68	981.14	182.53	TR	TR
16	553,052.34	778,726.15	987.88	181.42	TR	TR
17	553,056.86	778,733.12	996.18	181.29	TR	TR
18	553,042.58	778,743.25	997.01	183.08	TR	TR
19	553,043.80	778,745.29	999.38	183.06	TR	TR TOP SPY1
20	553,044.88	778,745.33	1,000.00	174.55	TR	TR BOT SPY1
21	553,190.29	778,972.25	1,269.51	174.59	TR	TR BOT SPY1
22	553,190.50	778,972.65	1,269.96	183.08	TR	TR TOP SPY1
23	553,191.75	778,974.91	1,272.53	183.07	TR	TR



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ **DATE** 23-Feb-2012 **CALC BY** _____ **CHK BY** _____
TYPE _____ **PREL.** _____ **FINAL** _____ **SHEET** _____
CONTENTS _____

Detailed Dam Report

(All Units In Feet)

Cross Section Data Data type: TOP OF ROAD

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
24	553,269.99	778,975.64	1,315.36	182.36	TR	TR
25	553,297.23	779,002.69	1,352.83	182.42	TR	TR
26	553,323.98	779,030.45	1,390.64	182.32	TR	TR
27	553,346.62	779,055.75	1,424.16	182.25	TR	TR

Cross Section Data Data type: FIELD-UPSTREAM

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	552,523.57	778,543.34	548.67	193.80	SPECIAL	PA_RAM_01BXS
2	552,523.57	778,543.34	548.67	193.82	SPECIAL	DATE 10-24-2011
3	552,523.57	778,543.34	548.67	193.81	SPECIAL	PA_RAM_01BXS FLD
4	552,478.43	778,761.17	707.72	197.72	SPECIAL	PA_RAM_01AXS
5	552,478.44	778,761.23	707.77	197.68	SPECIAL	PA_RAM_01AXS FLD
6	552,749.67	778,745.86	841.17	215.47	SPECIAL	BS CK 01C
7	552,749.66	778,745.94	841.24	215.53	SPECIAL	PA_RAM_01CXCS REF
8	552,749.67	778,745.94	841.24	215.47	SPECIAL	PA_RAM_01C FLD
9	553,129.33	778,545.99	877.72	179.90	GR	GR
10	553,093.40	778,569.51	878.14	182.49	SPECIAL	PA_RAM_01E
11	553,125.00	778,566.57	892.71	178.58	GR	GR
12	553,106.00	778,592.95	904.67	176.69	GR	GR
13	553,113.04	778,588.65	904.85	178.13	SPECIAL	XGR
14	553,113.04	778,588.65	904.85	178.13	CB	Channelbank [CB
15	553,107.52	778,592.65	905.25	176.46	GR	GR
16	553,105.70	778,617.83	925.46	175.98	GR	GR
17	553,097.94	778,655.35	952.86	176.35	GR	GR
18	553,090.89	778,684.48	973.58	176.81	GR	GR
19	553,052.35	778,726.14	987.87	181.42	SPECIAL	BS CK 01D FLD
20	553,052.34	778,726.15	987.88	181.42	SPECIAL	PA_RAM_01A NL
21	553,088.57	778,706.30	990.71	175.23	TE	TE
22	553,088.85	778,706.45	990.98	174.91	H2O	H2O
23	553,044.88	778,745.33	1,000.00	174.55	SPECIAL	ALPT1
24	553,095.46	778,716.56	1,003.06	172.35	H2O	H2O
25	553,100.97	778,726.48	1,014.39	172.03	H2O	H2O
26	553,104.58	778,734.71	1,023.26	169.44	H2O	H2O
27	553,111.10	778,744.03	1,034.63	168.29	H2O	H2O
28	553,114.25	778,754.43	1,045.08	168.87	H2O	H2O
29	553,119.75	778,769.28	1,060.55	170.62	H2O	H2O
30	553,130.96	778,783.37	1,078.47	171.59	H2O	H2O
31	553,131.01	778,789.19	1,083.40	172.88	H2O	H2O
32	553,135.85	778,797.91	1,093.35	174.55	H2O	H2O
33	553,144.66	778,809.80	1,108.11	173.58	H2O	H2O
34	553,151.62	778,820.15	1,120.58	172.75	H2O	H2O
35	553,160.65	778,830.28	1,133.98	170.74	H2O	H2O
36	553,168.27	778,846.50	1,151.75	171.12	H2O	H2O
37	553,171.59	778,859.85	1,164.78	171.21	H2O	H2O
38	553,180.87	778,874.12	1,181.80	171.56	H2O	H2O
39	553,191.18	778,889.15	1,200.02	171.79	H2O	H2O
40	553,203.30	778,906.00	1,220.75	171.33	H2O	H2O



Detailed Dam Report

(All Units In Feet)

Cross Section Data Data type: FIELD-UPSTREAM

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
41	553,209.30	778,920.84	1,236.48	171.77	H2O	H2O
42	553,214.59	778,927.73	1,245.14	173.70	H2O	H2O
43	553,215.48	778,929.16	1,246.82	174.25	H2O	H2O
44	553,217.51	778,929.27	1,248.00	175.35	TE	TE
45	553,219.13	778,930.49	1,249.91	175.98	CB	Channelbank [CB
46	553,223.42	778,939.15	1,259.51	176.40	GR	GR
47	553,224.79	778,940.23	1,261.16	175.23	GR	GR XTE
48	553,225.39	778,941.24	1,262.34	174.78	GR	GR XH2O
49	553,190.29	778,972.25	1,269.51	174.59	SPECIAL	ALPT2
50	553,260.77	778,929.00	1,271.12	174.71	GR	GR XH2O
51	553,261.36	778,929.82	1,272.13	175.34	GR	GR XTE
52	553,273.37	778,939.92	1,287.11	175.83	GR	GR
53	553,286.68	778,953.19	1,305.46	176.27	GR	GR
54	553,306.51	778,973.38	1,333.16	175.46	GR	GR
55	553,325.03	778,991.61	1,358.50	175.61	GR	GR
56	553,346.51	779,012.30	1,387.51	175.85	GR	GR
57	553,362.61	779,039.00	1,418.68	176.52	GR	GR

Cross Section Data Data type: FIELD-DOWNSTREAM

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	552,904.42	778,661.16	853.35	178.38	GR DS	GR DS
2	552,909.25	778,666.18	860.18	178.43	GR DS	GR DS
3	552,923.30	778,678.55	878.17	179.15	GR DS	GR DS
4	552,935.94	778,691.26	895.70	178.99	GR DS	GR DS
5	552,953.21	778,690.34	904.24	175.24	GR DS	GR DS
6	552,968.09	778,694.44	915.71	174.69	GR DS	GR DS
7	552,980.96	778,711.92	937.38	176.14	GR DS	GR DS
8	552,987.96	778,727.20	954.02	174.90	GR DS	GR DS
9	552,992.46	778,738.46	965.94	172.06	GR DS	GR DS
10	553,001.84	778,755.27	985.15	170.22	CB DS	Channelbank [CB DS
11	553,008.68	778,764.31	996.45	168.46	TE DS	TE DS
12	553,002.26	778,770.76	998.42	167.82	H2O DS	H2O DS
13	553,002.16	778,776.50	1,003.19	166.01	H2O DS	H2O DS
14	553,005.31	778,783.40	1,010.70	163.12	H2O DS	H2O DS
15	553,020.21	778,800.57	1,033.20	161.73	H2O DS	H2O DS
16	553,030.34	778,816.75	1,052.29	163.00	H2O DS	H2O DS
17	553,030.90	778,841.30	1,073.26	163.26	H2O DS	H2O DS
18	553,042.42	778,864.69	1,099.17	163.28	H2O DS	H2O DS
19	553,047.79	778,880.23	1,115.15	164.00	H2O DS	H2O DS
20	553,058.07	778,892.99	1,131.44	164.50	H2O DS	H2O DS
21	553,077.61	778,913.25	1,159.04	163.72	H2O DS	H2O DS
22	553,085.09	778,928.86	1,176.22	164.90	H2O DS	H2O DS
23	553,101.19	778,944.11	1,197.74	164.74	H2O DS	H2O DS
24	553,114.80	778,957.03	1,215.96	164.11	H2O DS	H2O DS
25	553,131.28	778,975.96	1,240.79	164.73	H2O DS	H2O DS
26	553,143.12	778,984.97	1,254.77	163.92	H2O DS	H2O DS
27	553,150.50	778,998.12	1,269.82	165.23	H2O DS	H2O DS



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
TYPE _____ PREL. _____ FINAL _____ SHEET _____
CONTENTS _____

Detailed Dam Report

(All Units In Feet)

Cross Section Data Data type: FIELD-DOWNSTREAM

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
28	553,156.55	778,999.39	1,274.16	166.83	H2O DS	H2O DS
29	553,157.69	779,002.13	1,277.07	168.46	TE DS	TE DS
30	553,159.10	779,003.76	1,279.21	169.06	GR DS	GR DS
31	553,162.19	779,012.22	1,288.01	169.70	GR DS	GR DS
32	553,164.04	779,016.59	1,292.68	171.30	CB DS	Channelbank [CB DS
33	553,171.75	779,024.82	1,303.77	176.25	GR DS	GR DS
34	553,182.93	779,049.18	1,330.31	176.66	GR DS	GR DS
35	553,193.44	779,072.65	1,355.75	174.04	GR DS	GR DS
36	553,210.45	779,093.66	1,382.61	174.11	GR DS	GR DS
37	553,224.14	779,120.52	1,412.61	174.54	GR DS	GR DS



Detailed Dam Report

(All Units In Feet)

General

ID: MO_PEQ_01
Road Name: WEIR
Stream Name:
County:
State:
State Zone:

Centerline

Station: 684.35
Offset: 0.00
Easting: 552,023.33
Northing: 780,437.28

Design

Designer:
Contractor:
Year Built:

Plans

Plan Location:
Survey File: n:\NewJersey\60223807_NJDEP_WorkOrder_1\PRODUCTION\Engineering\NJDEP_WorkOrder_1\Detailed\Eng\Ram
apo_River_Unsteady\Interim_Models\Pequannock_River\Civil_Dynamics_Survey\Structures\MO_PEQ_01.txt
Comments:

Material

Bed: Unknown
Fill: Unknown

Datum

Horizontal:
Vertical:

Invert

Downstream: 168.37
Upstream: 182.04

Rail Height: 0.00

Dam Detail

Type: Unknown
Height: 0.00
Top Elevation: 0.00
Shape: Unknown
Normal Area: 0.00
Hazard Class:
Flood Elevation: 0.00
Flood Volume: 0.00
Valve East: 0.00
Valve North: 0.00

Embankment

Class:
Slope: 1.00
Type: Unknown

Photographs: None

Riser Barrels: None

Spillways: None

Rails: None

Cross Section Data Data type: TOP OF ROAD

Table with 8 columns: Point, Easting, Northing, Station, Elevation, Code, Comment. Contains 14 rows of data for the TOP OF ROAD cross-section.

Cross Section Data Data type: FIELD-UPSTREAM

Table with 8 columns: Point, Easting, Northing, Station, Elevation, Code, Comment. Contains 2 rows of data for the FIELD-UPSTREAM cross-section.



PROJECT NJDEP Field Survey - Dams

COMM. NO. _____ DATE 23-Feb-2012 CALC BY _____ CHK BY _____
TYPE _____ PREL. _____ FINAL _____ SHEET _____
CONTENTS _____

Detailed Dam Report

(All Units In Feet)

Cross Section Data Data type: FIELD-UPSTREAM

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
3	552,073.18	780,425.42	635.43	182.37	GR	GR
4	552,071.70	780,422.59	637.10	183.94	GR	GR
5	552,069.90	780,423.04	638.87	183.97	GR	GR
6	551,807.19	780,489.14	896.43	183.93	GR	GR
7	551,805.10	780,489.58	898.48	183.86	GR	GR
8	551,789.40	780,504.55	913.12	182.05	CB	Channelbank [CB
9	551,784.49	780,506.06	917.91	182.04	TE	TE
10	551,741.28	780,525.86	959.66	182.80	GR	GR
11	551,699.67	780,542.97	1,000.00	182.62	GR	GR
12	551,699.67	780,542.97	1,000.00	182.62	SPECIAL	ALPT1
13	551,571.93	780,534.19	1,128.04	177.98	SPECIAL	ALPT2

Cross Section Data Data type: FIELD-DOWNSTREAM

<u>Point</u>	<u>Easting</u>	<u>Northing</u>	<u>Station</u>	<u>Elevation</u>	<u>Code</u>	<u>Comment</u>
1	552,211.71	780,392.87	499.46	183.47	GR DS	GR DS
2	552,190.66	780,368.40	522.14	175.81	GR DS	GR DS
3	552,152.75	780,376.45	559.41	176.12	GR DS	GR DS
4	552,131.26	780,381.74	580.49	176.62	GR DS	GR DS
5	552,074.01	780,395.81	636.64	175.60	TE DS	TE DS
6	552,060.13	780,399.22	650.25	169.93	CB DS	Channelbank [CB DS
7	552,036.68	780,404.99	673.25	168.87	GR DS	GR DS
8	552,009.00	780,411.79	700.40	168.97	GR DS	GR DS
9	551,989.13	780,416.95	719.87	168.37	GR DS	GR DS
10	551,953.08	780,426.31	755.19	168.53	GR DS	GR DS
11	551,922.48	780,434.25	785.18	170.86	GR DS	GR DS
12	551,881.60	780,444.86	825.22	169.41	GR DS	GR DS
13	551,845.89	780,454.13	860.22	168.95	GR DS	GR DS
14	551,801.74	780,465.59	903.48	172.95	CB DS	Channelbank [CB DS
15	551,792.73	780,467.93	912.31	175.91	TE DS	TE DS
16	551,741.81	780,483.97	962.01	177.88	GR DS	GR DS
17	551,640.65	780,515.83	1,060.75	177.08	GR DS	GR DS
18	551,571.93	780,534.19	1,128.04	177.98	GR DS	GR DS
19	551,369.14	780,588.38	1,326.63	183.90	GR DS	GR DS

Appendix H

VELOCITY DISTRIBUTION AT HAMBURG TURNPIKE BRIDGE

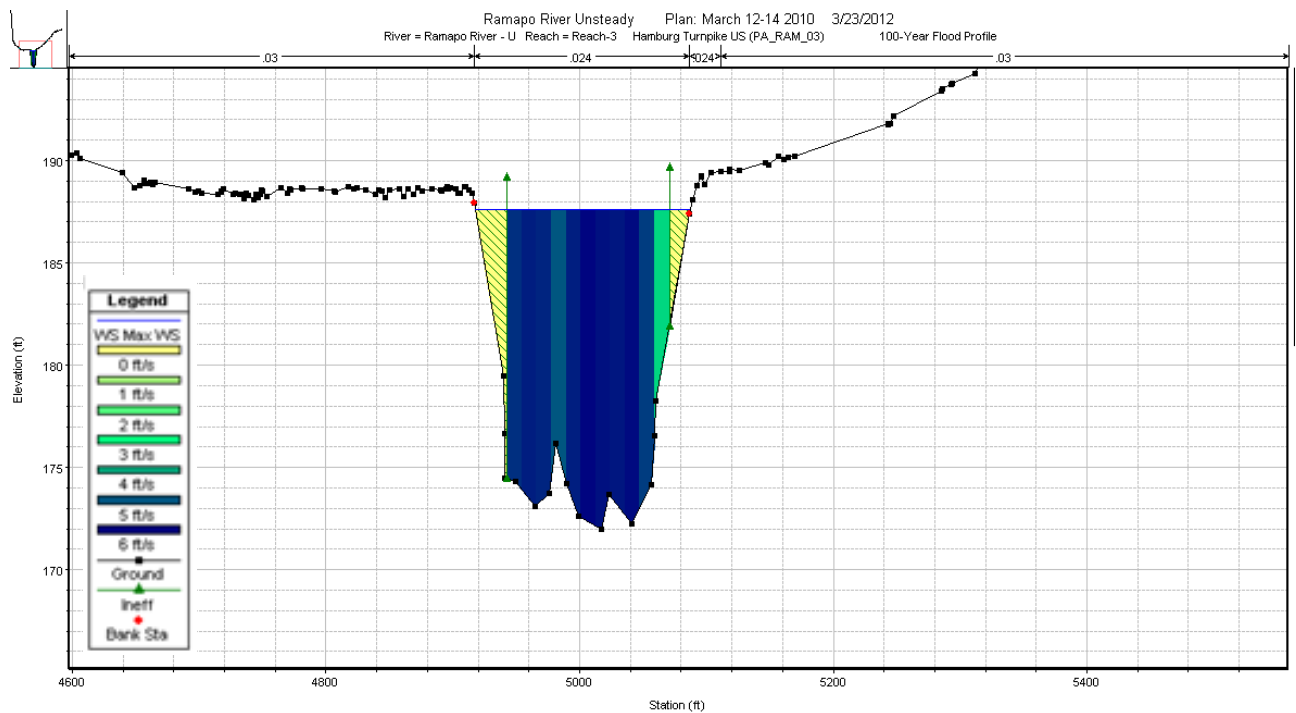
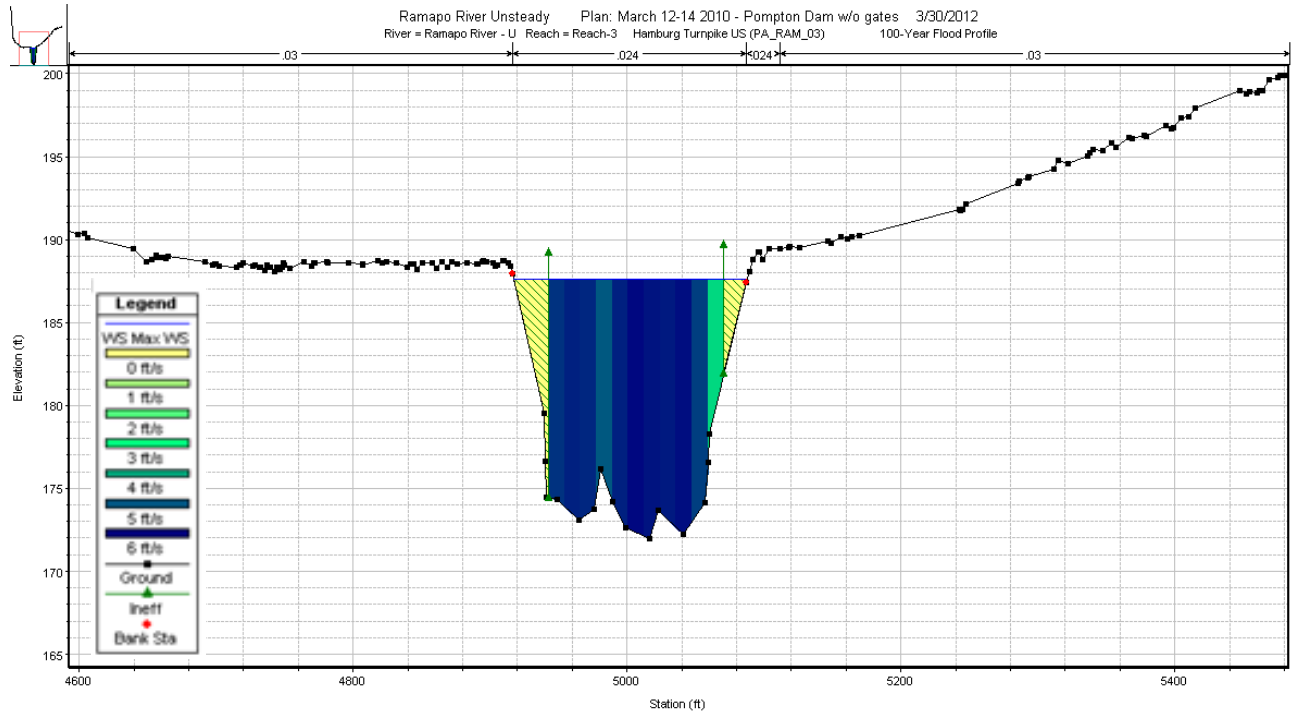


Figure H.1: March 12-14, 2010 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: March 12-14

Plan: March 12-14 Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	4916.70	4929.75	0.00	27.15	12.96	0.00	2.23	0.00	0.03	0.00
2	Chan	4929.75	4942.80	0.00	99.66	17.46	0.00	7.64	0.00	0.09	0.00
3	Chan	4942.80	4954.43	840.98	155.25	11.65	8.84	13.35	5.42	0.21	1.13
4	Chan	4954.43	4966.05	926.78	164.66	11.66	9.74	14.16	5.63	0.22	1.25
5	Chan	4966.05	4977.68	908.40	163.61	11.83	9.55	14.07	5.55	0.22	1.21
6	Chan	4977.68	4989.31	711.37	143.22	12.23	7.48	12.32	4.97	0.18	0.91
7	Chan	4989.31	5000.94	931.53	165.79	11.77	9.79	14.26	5.62	0.22	1.24
8	Chan	5000.94	5012.56	1049.99	177.30	11.64	11.03	15.25	5.92	0.24	1.42
9	Chan	5012.56	5024.19	1007.22	174.25	11.86	10.59	14.99	5.78	0.23	1.33
10	Chan	5024.19	5035.82	960.93	168.30	11.67	10.10	14.47	5.71	0.23	1.29
11	Chan	5035.82	5047.45	1022.55	174.83	11.69	10.75	15.04	5.85	0.23	1.37
12	Chan	5047.45	5059.07	840.04	159.50	12.48	8.83	13.72	5.27	0.20	1.06
13	Chan	5059.07	5070.70	315.76	91.42	13.47	3.32	7.86	3.45	0.11	0.37
14	Chan	5070.70	5086.70	0.00	47.42	16.94	0.00	2.96	0.00	0.04	0.00
15	ROB	5086.70	5163.54	0.00	0.06	0.70	0.00	0.09	0.00	0.00	0.00

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: March 12-14 2010

Plan: March 12-14 2010 Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	4916.70	4929.75	0.00	27.39	13.02	0.00	2.24	0.00	0.03	0.00
2	Chan	4929.75	4942.80	0.00	99.92	17.46	0.00	7.66	0.00	0.09	0.00
3	Chan	4942.80	4954.43	846.59	155.48	11.65	8.84	13.37	5.45	0.21	1.15
4	Chan	4954.43	4966.05	932.82	164.89	11.66	9.74	14.18	5.66	0.22	1.27
5	Chan	4966.05	4977.68	914.34	163.83	11.83	9.55	14.09	5.58	0.22	1.22
6	Chan	4977.68	4989.31	716.25	143.44	12.23	7.48	12.34	4.99	0.19	0.93
7	Chan	4989.31	5000.94	937.59	166.01	11.77	9.79	14.28	5.65	0.22	1.26
8	Chan	5000.94	5012.56	1056.66	177.53	11.64	11.03	15.27	5.95	0.24	1.44
9	Chan	5012.56	5024.19	1013.66	174.48	11.86	10.58	15.01	5.81	0.23	1.35
10	Chan	5024.19	5035.82	967.15	168.53	11.67	10.10	14.49	5.74	0.23	1.31
11	Chan	5035.82	5047.45	1029.08	175.06	11.69	10.74	15.06	5.88	0.24	1.39
12	Chan	5047.45	5059.07	845.58	159.73	12.48	8.83	13.74	5.29	0.20	1.07
13	Chan	5059.07	5070.70	318.40	91.65	13.47	3.32	7.88	3.47	0.11	0.37
14	Chan	5070.70	5086.70	0.00	47.74	16.94	0.00	2.98	0.00	0.04	0.00
15	ROB	5086.70	5163.54	0.00	0.08	0.77	0.00	0.10	0.00	0.00	0.00

Table H.1: March 12-14, 2010 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

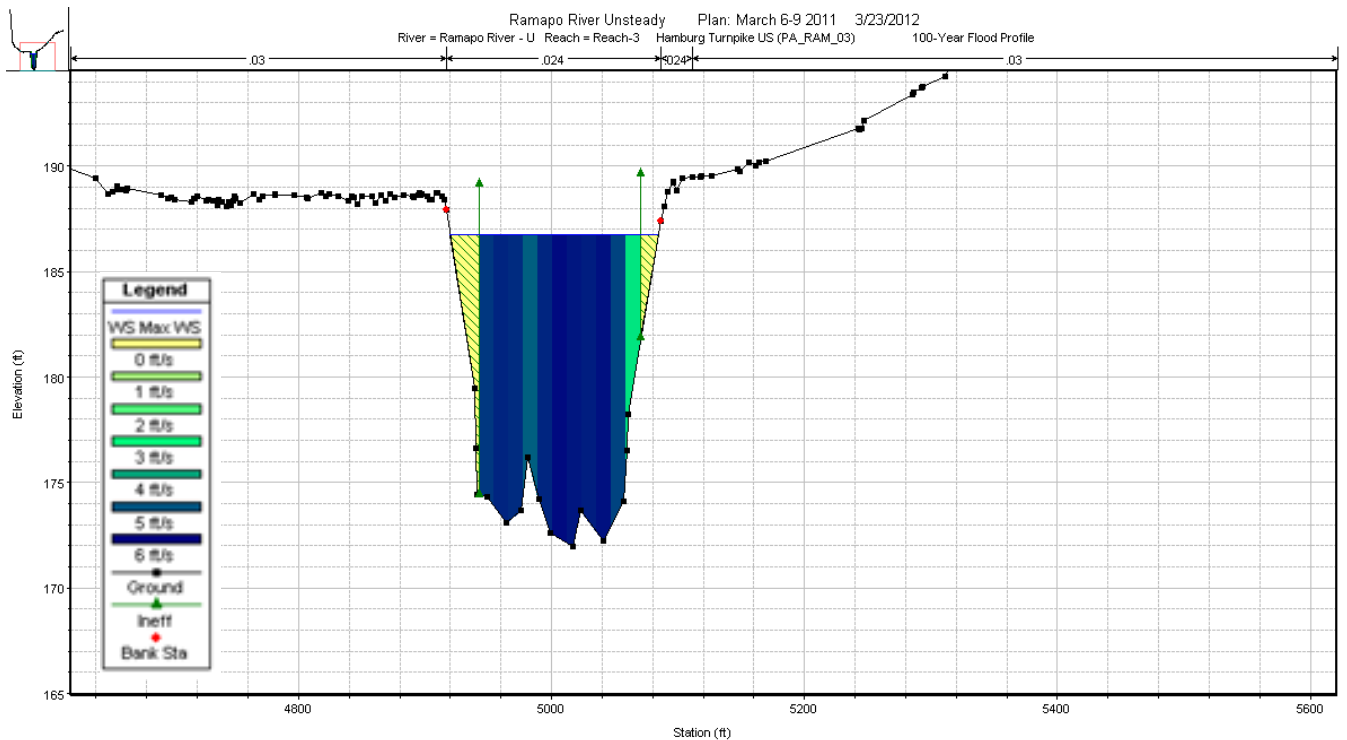
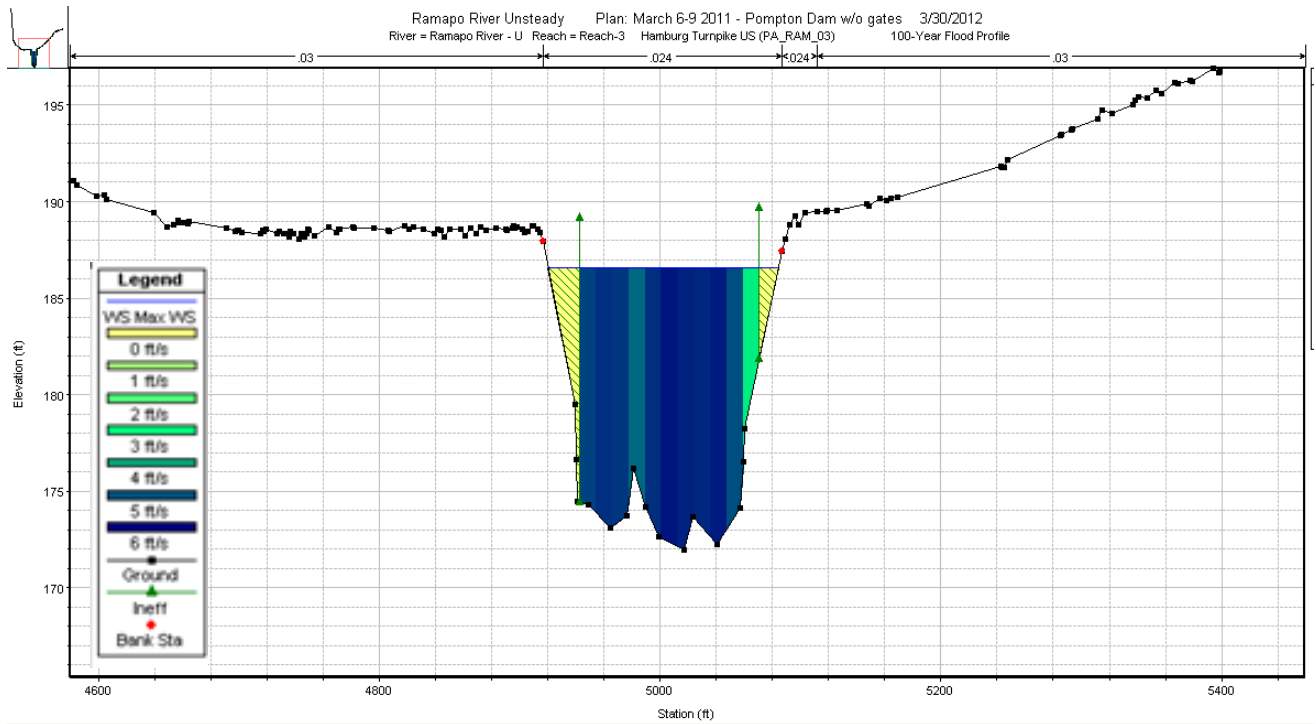


Figure H.2: March 6-9, 2011 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: March 6-9 20

Plan: March 6-9 20 Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	4916.70	4929.75	0.00	16.30	10.04	0.00	1.73	0.00	0.03	0.00
2	Chan	4929.75	4942.80	0.00	86.55	17.46	0.00	6.63	0.00	0.08	0.00
3	Chan	4942.80	4954.43	751.35	143.56	11.65	8.80	12.35	5.23	0.20	1.05
4	Chan	4954.43	4966.05	834.44	152.97	11.66	9.77	13.16	5.45	0.21	1.17
5	Chan	4966.05	4977.68	817.22	151.92	11.83	9.57	13.07	5.38	0.21	1.13
6	Chan	4977.68	4989.31	628.33	131.53	12.23	7.36	11.31	4.78	0.18	0.84
7	Chan	4989.31	5000.94	839.43	154.10	11.77	9.83	13.25	5.45	0.21	1.16
8	Chan	5000.94	5012.56	953.97	165.62	11.64	11.17	14.24	5.76	0.23	1.34
9	Chan	5012.56	5024.19	913.23	162.57	11.86	10.69	13.98	5.62	0.22	1.26
10	Chan	5024.19	5035.82	867.57	156.61	11.67	10.16	13.47	5.54	0.22	1.21
11	Chan	5035.82	5047.45	927.50	163.15	11.69	10.86	14.03	5.68	0.23	1.30
12	Chan	5047.45	5059.07	753.23	147.82	12.48	8.82	12.71	5.10	0.19	0.99
13	Chan	5059.07	5070.70	255.89	79.74	13.47	3.00	6.86	3.21	0.10	0.31
14	Chan	5070.70	5086.70	0.00	32.31	14.44	0.00	2.37	0.00	0.04	0.00

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: March 6-9 2011

Plan: March 6-9 2011 Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	4916.70	4929.75	0.00	17.85	10.51	0.00	1.81	0.00	0.03	0.00
2	Chan	4929.75	4942.80	0.00	88.65	17.46	0.00	6.79	0.00	0.09	0.00
3	Chan	4942.80	4954.43	778.24	145.44	11.65	8.80	12.51	5.35	0.21	1.12
4	Chan	4954.43	4966.05	863.16	154.85	11.66	9.76	13.32	5.57	0.22	1.24
5	Chan	4966.05	4977.68	845.46	153.79	11.83	9.56	13.23	5.50	0.22	1.20
6	Chan	4977.68	4989.31	652.09	133.40	12.23	7.38	11.47	4.89	0.18	0.89
7	Chan	4989.31	5000.94	868.19	155.97	11.77	9.82	13.41	5.57	0.22	1.24
8	Chan	5000.94	5012.56	985.28	167.49	11.64	11.15	14.41	5.88	0.24	1.42
9	Chan	5012.56	5024.19	943.53	164.44	11.86	10.67	14.14	5.74	0.23	1.33
10	Chan	5024.19	5035.82	897.00	158.49	11.67	10.15	13.63	5.66	0.23	1.29
11	Chan	5035.82	5047.45	958.21	165.02	11.69	10.84	14.19	5.81	0.24	1.37
12	Chan	5047.45	5059.07	779.70	149.69	12.48	8.82	12.87	5.21	0.20	1.05
13	Chan	5059.07	5070.70	269.62	81.61	13.47	3.05	7.02	3.30	0.10	0.34
14	Chan	5070.70	5086.70	0.00	34.54	14.94	0.00	2.45	0.00	0.04	0.00

Table H.2: March 6-9, 2011 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

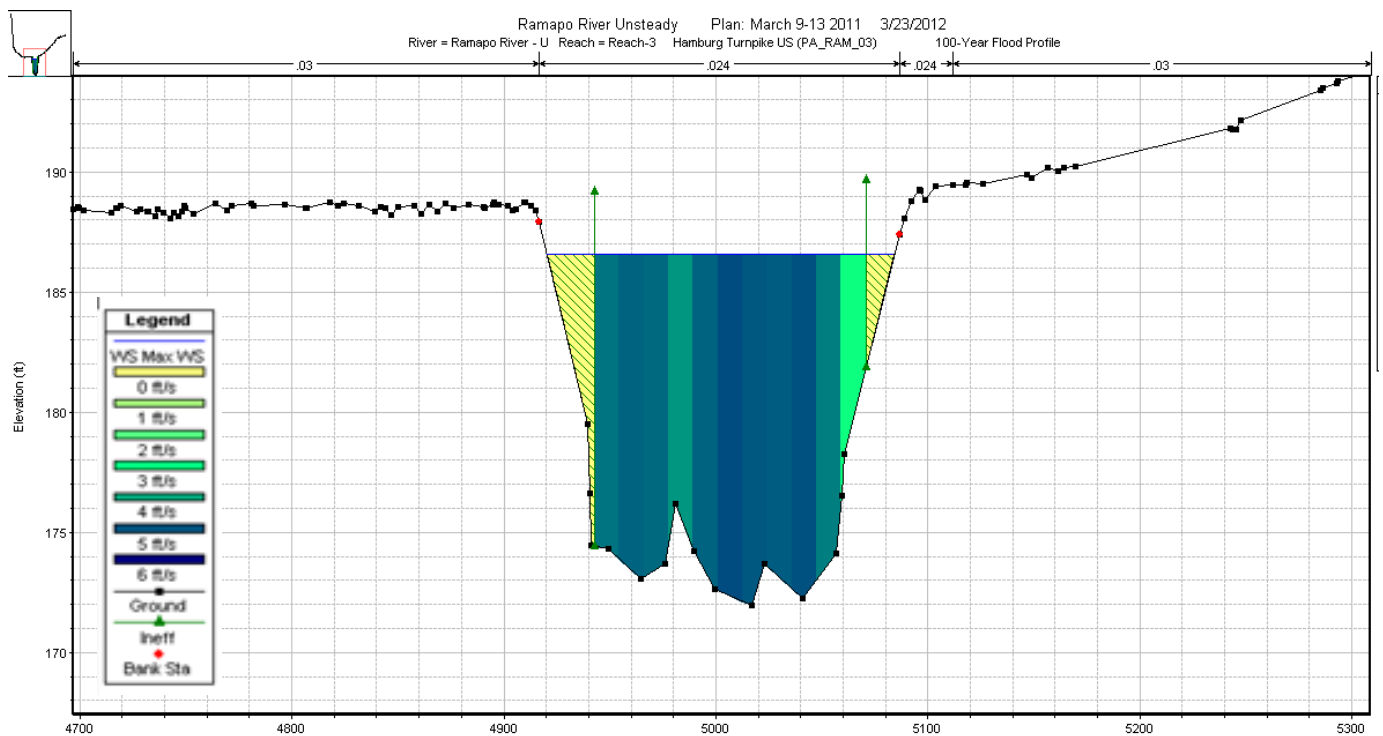
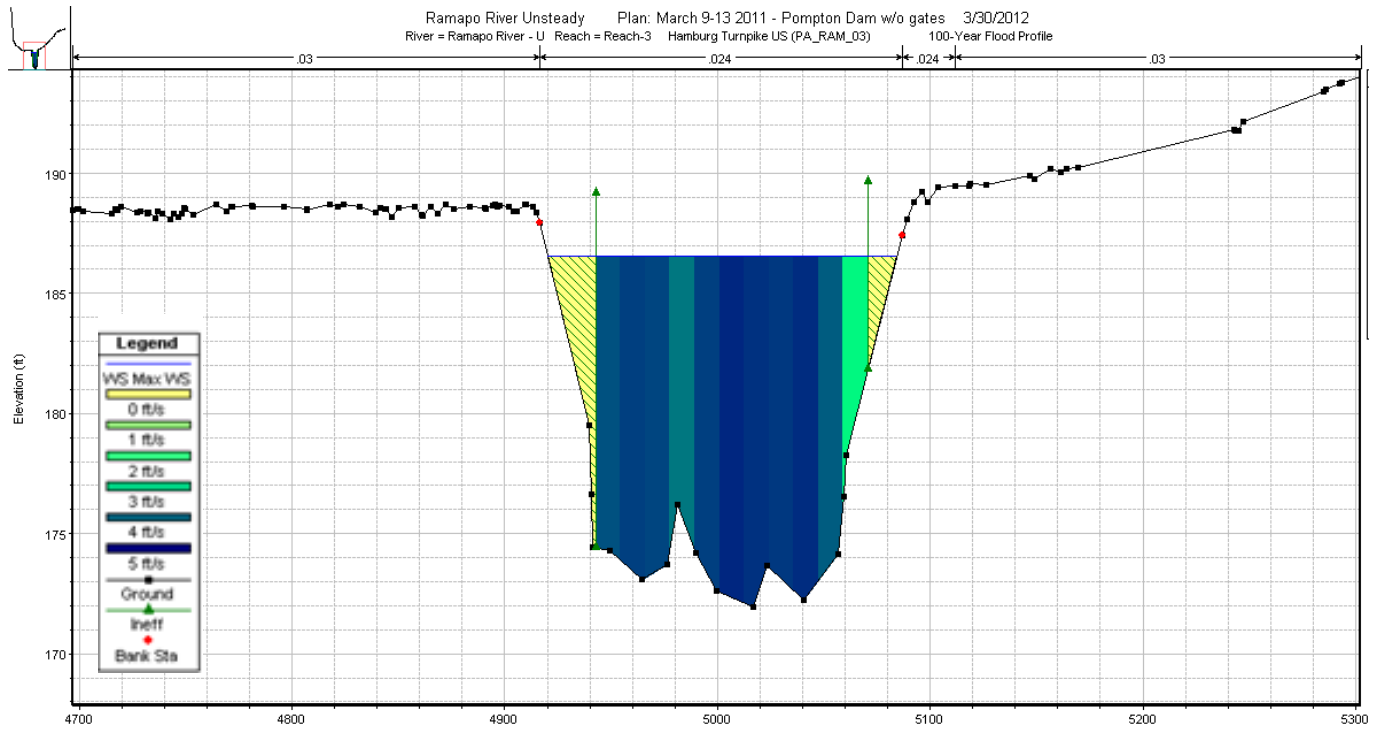


Figure H.3: March 9-13, 2011 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: March 9-13 2

Plan: March 9-13 2 Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity	Shear	Power
		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
1	Chan	4916.70	4929.75	0.00	15.67	9.85	0.00	1.69	0.00	0.02	0.00
2	Chan	4929.75	4942.80	0.00	85.66	17.46	0.00	6.56	0.00	0.05	0.00
3	Chan	4942.80	4954.43	600.37	142.78	11.65	8.79	12.28	4.20	0.13	0.55
4	Chan	4954.43	4966.05	667.14	152.19	11.66	9.77	13.09	4.38	0.14	0.61
5	Chan	4966.05	4977.68	653.33	151.13	11.83	9.57	13.00	4.32	0.14	0.59
6	Chan	4977.68	4989.31	501.65	130.74	12.23	7.35	11.24	3.84	0.11	0.44
7	Chan	4989.31	5000.94	671.18	153.31	11.77	9.83	13.19	4.38	0.14	0.61
8	Chan	5000.94	5012.56	763.21	164.83	11.64	11.18	14.18	4.63	0.15	0.70
9	Chan	5012.56	5024.19	730.50	161.78	11.86	10.70	13.91	4.52	0.14	0.65
10	Chan	5024.19	5035.82	693.77	155.83	11.67	10.16	13.40	4.45	0.14	0.63
11	Chan	5035.82	5047.45	741.94	162.36	11.69	10.87	13.96	4.57	0.15	0.67
12	Chan	5047.45	5059.07	602.03	147.03	12.48	8.82	12.65	4.09	0.13	0.51
13	Chan	5059.07	5070.70	202.97	78.95	13.47	2.97	6.79	2.57	0.06	0.16
14	Chan	5070.70	5086.70	0.00	31.39	14.24	0.00	2.33	0.00	0.02	0.00

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: March 9-13 2011

Plan: March 9-13 2011 Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity	Shear	Power
		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
1	Chan	4916.70	4929.75	0.00	15.97	9.94	0.00	1.71	0.00	0.02	0.00
2	Chan	4929.75	4942.80	0.00	86.09	17.46	0.00	6.60	0.00	0.06	0.00
3	Chan	4942.80	4954.43	664.34	143.15	11.65	8.79	12.31	4.64	0.16	0.74
4	Chan	4954.43	4966.05	738.02	152.56	11.66	9.77	13.12	4.84	0.17	0.82
5	Chan	4966.05	4977.68	722.76	151.51	11.83	9.57	13.03	4.77	0.17	0.79
6	Chan	4977.68	4989.31	555.32	131.12	12.23	7.35	11.28	4.24	0.14	0.59
7	Chan	4989.31	5000.94	742.46	153.69	11.77	9.83	13.22	4.83	0.17	0.81
8	Chan	5000.94	5012.56	844.03	165.21	11.64	11.17	14.21	5.11	0.18	0.94
9	Chan	5012.56	5024.19	807.92	162.16	11.86	10.69	13.95	4.98	0.18	0.88
10	Chan	5024.19	5035.82	767.40	156.20	11.67	10.16	13.43	4.91	0.17	0.85
11	Chan	5035.82	5047.45	820.55	162.74	11.69	10.86	14.00	5.04	0.18	0.91
12	Chan	5047.45	5059.07	666.09	147.41	12.48	8.82	12.68	4.52	0.15	0.69
13	Chan	5059.07	5070.70	225.39	79.33	13.47	2.98	6.82	2.84	0.08	0.22
14	Chan	5070.70	5086.70	0.00	31.83	14.34	0.00	2.35	0.00	0.03	0.00

Table H.3: March 69-13, 2011 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

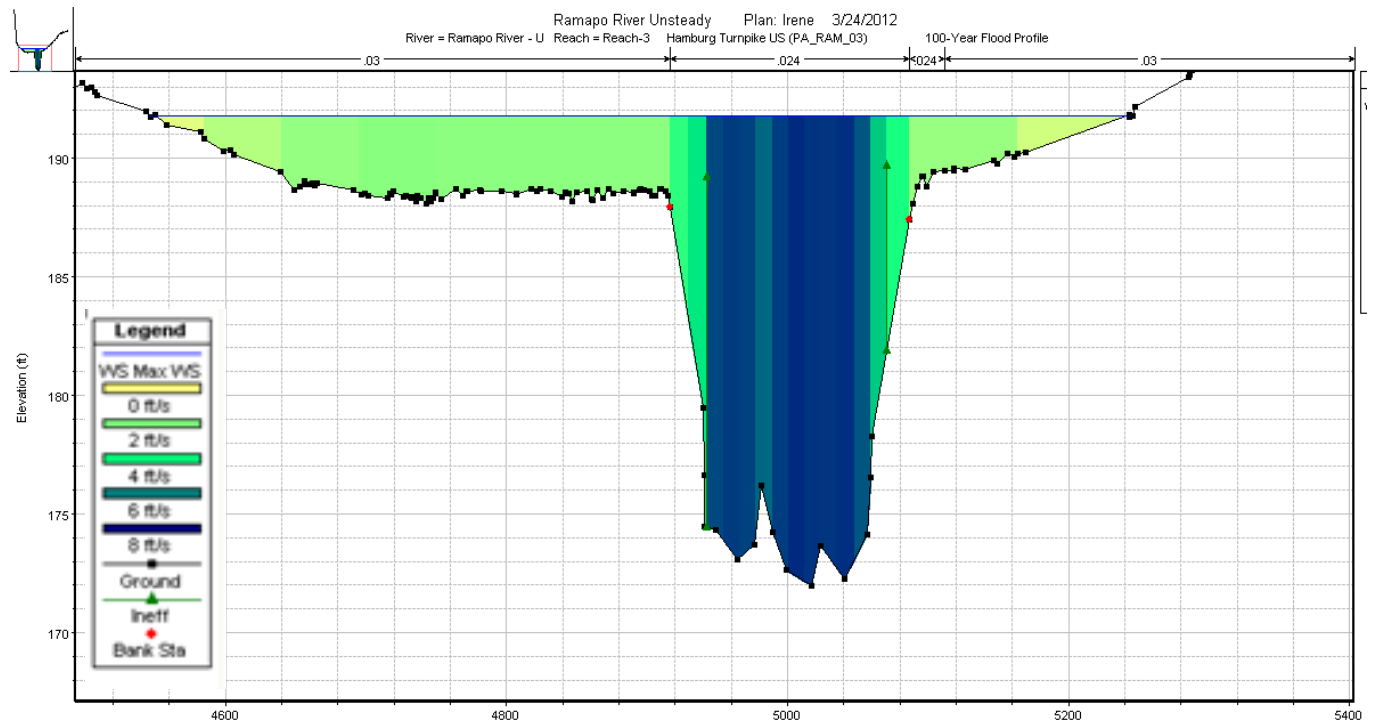
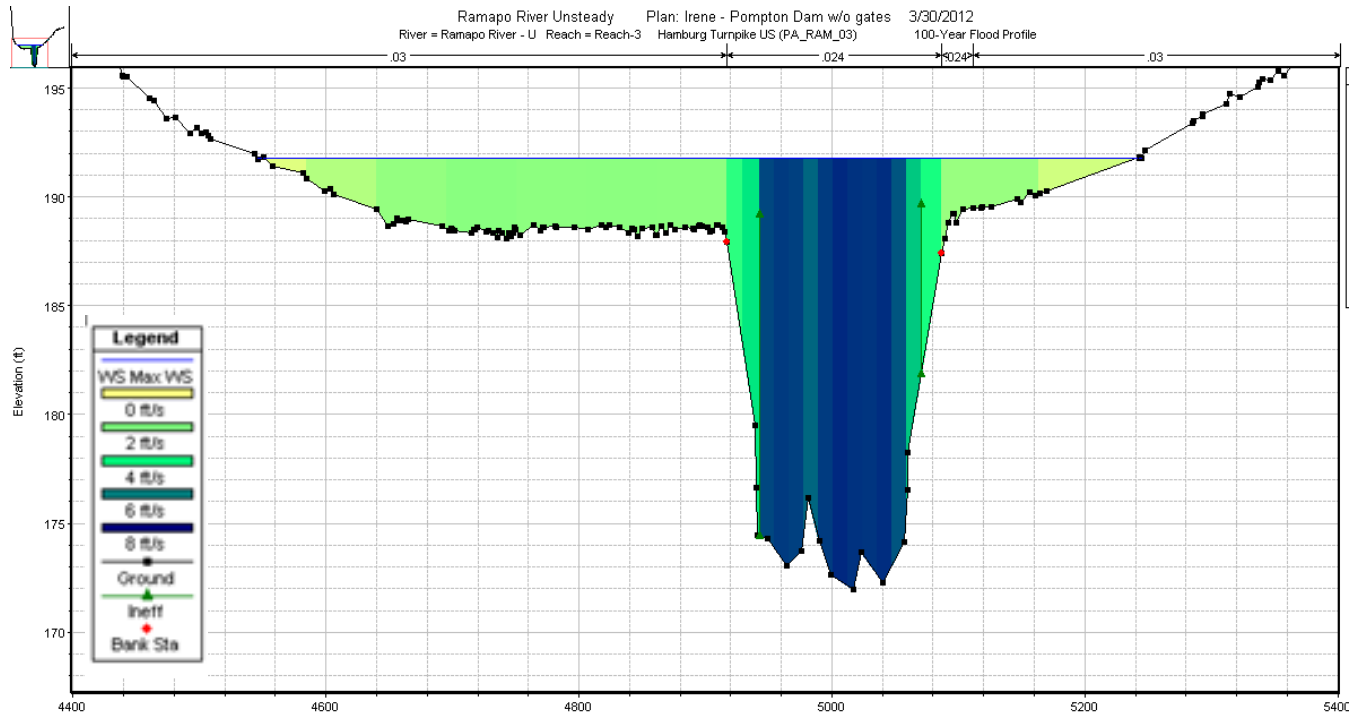


Figure H.4: Hurricane Irene, August 2011 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: Irene - wo gate

Plan: Irene - wo gate Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4529.25	4584.60	8.13	16.98	37.93	0.04	0.45	0.48	0.01	0.00
2	LOB	4584.60	4639.95	115.06	96.84	55.38	0.60	1.75	1.19	0.03	0.04
3	LOB	4639.95	4695.30	275.90	163.71	55.42	1.44	2.96	1.69	0.06	0.10
4	LOB	4695.30	4750.65	350.29	189.01	55.48	1.83	3.41	1.85	0.07	0.12
5	LOB	4750.65	4806.00	321.03	179.24	55.38	1.68	3.24	1.79	0.06	0.11
6	LOB	4806.00	4861.35	323.85	180.24	55.43	1.70	3.26	1.80	0.06	0.11
7	LOB	4861.35	4916.70	322.38	179.85	55.51	1.69	3.25	1.79	0.06	0.11
8	Chan	4916.70	4929.75	272.19	81.81	13.90	1.42	6.27	3.33	0.11	0.38
9	Chan	4929.75	4942.80	674.38	154.46	17.46	3.53	11.84	4.37	0.17	0.75
10	Chan	4942.80	4954.43	1405.18	204.07	11.65	7.36	17.55	6.89	0.34	2.33
11	Chan	4954.43	4966.05	1513.39	213.48	11.66	7.92	18.36	7.09	0.35	2.51
12	Chan	4966.05	4977.68	1487.04	212.43	11.83	7.78	18.27	7.00	0.35	2.43
13	Chan	4977.68	4989.31	1228.70	192.04	12.23	6.43	16.52	6.40	0.30	1.94
14	Chan	4989.31	5000.94	1517.22	214.61	11.77	7.94	18.46	7.07	0.35	2.49
15	Chan	5000.94	5012.56	1668.22	226.13	11.64	8.73	19.45	7.38	0.38	2.77

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: Irene

Plan: Irene Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4529.25	4584.60	7.88	16.51	36.98	0.04	0.45	0.48	0.01	0.00
2	LOB	4584.60	4639.95	113.47	96.16	55.38	0.60	1.74	1.18	0.03	0.04
3	LOB	4639.95	4695.30	273.42	163.03	55.42	1.44	2.95	1.68	0.06	0.09
4	LOB	4695.30	4750.65	347.47	188.32	55.48	1.83	3.40	1.85	0.07	0.12
5	LOB	4750.65	4806.00	318.34	178.56	55.38	1.67	3.23	1.78	0.06	0.11
6	LOB	4806.00	4861.35	321.14	179.56	55.43	1.69	3.24	1.79	0.06	0.11
7	LOB	4861.35	4916.70	319.68	179.17	55.51	1.68	3.24	1.78	0.06	0.11
8	Chan	4916.70	4929.75	270.78	81.65	13.90	1.42	6.26	3.32	0.11	0.37
9	Chan	4929.75	4942.80	671.93	154.30	17.46	3.53	11.82	4.35	0.17	0.74
10	Chan	4942.80	4954.43	1400.89	203.93	11.65	7.36	17.54	6.87	0.34	2.31
11	Chan	4954.43	4966.05	1508.84	213.34	11.66	7.93	18.35	7.07	0.35	2.49
12	Chan	4966.05	4977.68	1482.56	212.29	11.83	7.79	18.26	6.98	0.35	2.41
13	Chan	4977.68	4989.31	1224.85	191.90	12.23	6.44	16.50	6.38	0.30	1.93
14	Chan	4989.31	5000.94	1512.67	214.47	11.77	7.95	18.44	7.05	0.35	2.47
15	Chan	5000.94	5012.56	1663.31	225.98	11.64	8.74	19.44	7.36	0.37	2.75

Table H.4: Hurricane Irene, August 2011 Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

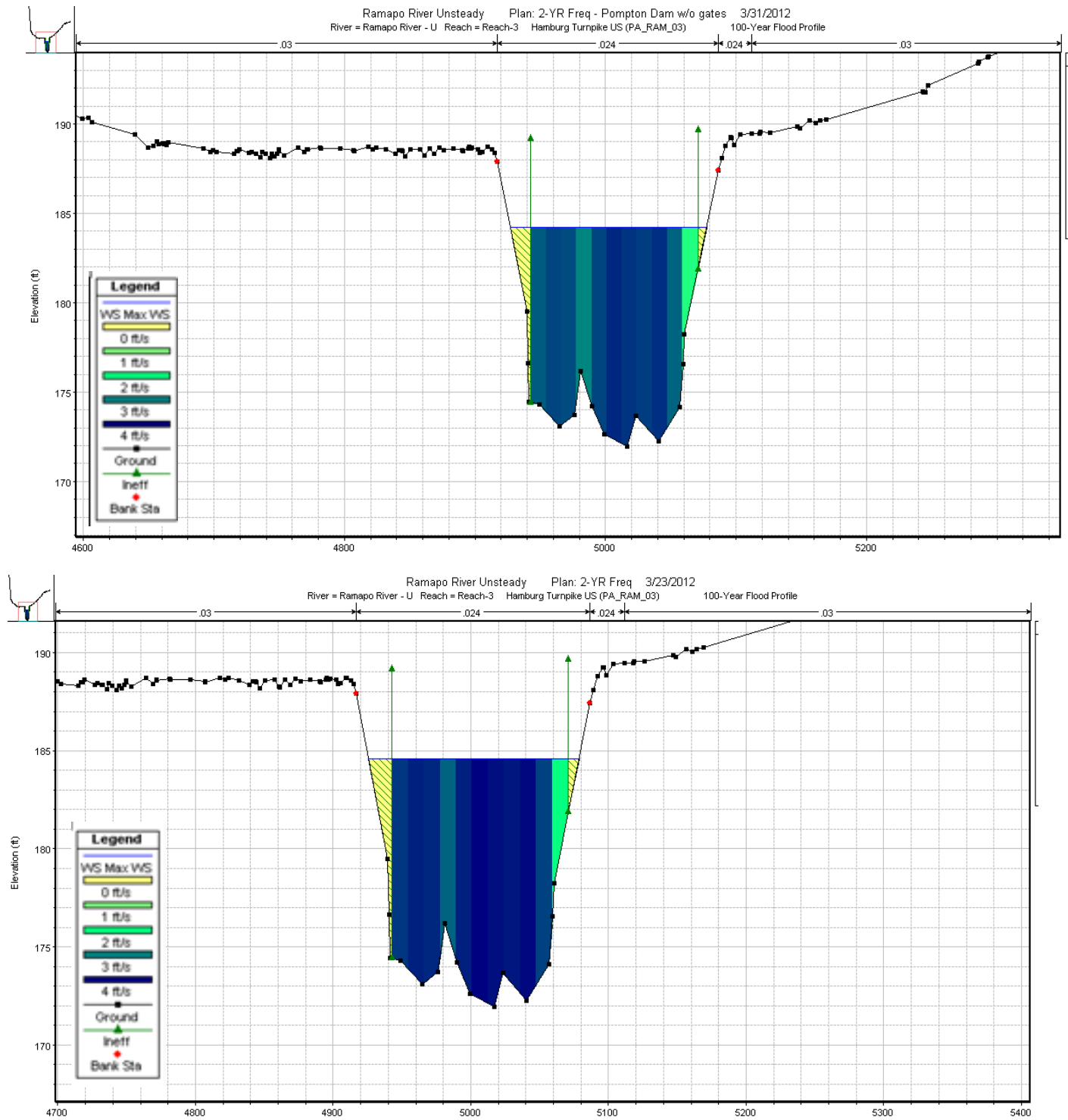


Figure H.5: 2-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 2-YR Freq -

Plan: 2-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	4916.70	4929.75	0.00	1.62	3.17	0.00	0.55	0.00	0.00	0.00
2	Chan	4929.75	4942.80	0.00	55.68	17.46	0.00	4.27	0.00	0.03	0.00
3	Chan	4942.80	4954.43	381.65	116.06	11.65	8.66	9.98	3.29	0.09	0.29
4	Chan	4954.43	4966.05	434.20	125.48	11.66	9.85	10.79	3.46	0.09	0.32
5	Chan	4966.05	4977.68	424.15	124.42	11.83	9.62	10.70	3.41	0.09	0.31
6	Chan	4977.68	4989.31	307.71	104.03	12.23	6.98	8.95	2.96	0.07	0.22
7	Chan	4989.31	5000.94	437.96	126.60	11.77	9.93	10.89	3.46	0.09	0.32
8	Chan	5000.94	5012.56	510.32	138.12	11.64	11.57	11.88	3.69	0.10	0.38
9	Chan	5012.56	5024.19	485.48	135.07	11.86	11.01	11.62	3.59	0.10	0.36
10	Chan	5024.19	5035.82	455.27	129.12	11.67	10.33	11.10	3.53	0.10	0.34
11	Chan	5035.82	5047.45	493.66	135.65	11.69	11.20	11.67	3.64	0.10	0.37
12	Chan	5047.45	5059.07	386.97	120.32	12.48	8.78	10.35	3.22	0.08	0.27
13	Chan	5059.07	5070.70	91.55	52.24	13.47	2.08	4.49	1.75	0.03	0.06
14	Chan	5070.70	5086.70	0.00	8.09	7.23	0.00	1.18	0.00	0.01	0.00

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 2-YR Freq

Plan: 2-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	4916.70	4929.75	0.00	2.94	4.26	0.00	0.73	0.00	0.01	0.00
2	Chan	4929.75	4942.80	0.00	60.59	17.46	0.00	4.64	0.00	0.03	0.00
3	Chan	4942.80	4954.43	429.98	120.44	11.65	8.68	10.36	3.57	0.10	0.36
4	Chan	4954.43	4966.05	486.97	129.85	11.66	9.83	11.17	3.75	0.11	0.41
5	Chan	4966.05	4977.68	475.93	128.79	11.83	9.61	11.08	3.70	0.11	0.39
6	Chan	4977.68	4989.31	349.11	108.40	12.23	7.05	9.32	3.22	0.09	0.28
7	Chan	4989.31	5000.94	490.94	130.97	11.77	9.91	11.26	3.75	0.11	0.41
8	Chan	5000.94	5012.56	569.40	142.49	11.64	11.50	12.26	4.00	0.12	0.48
9	Chan	5012.56	5024.19	542.31	139.44	11.86	10.95	11.99	3.89	0.11	0.45
10	Chan	5024.19	5035.82	509.79	133.49	11.67	10.30	11.48	3.82	0.11	0.43
11	Chan	5035.82	5047.45	551.33	140.02	11.69	11.13	12.04	3.94	0.12	0.46
12	Chan	5047.45	5059.07	435.04	124.70	12.48	8.79	10.72	3.49	0.10	0.34
13	Chan	5059.07	5070.70	110.88	56.61	13.47	2.24	4.87	1.96	0.04	0.08
14	Chan	5070.70	5086.70	0.00	10.87	8.38	0.00	1.37	0.00	0.01	0.00

Table H.5: 2-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

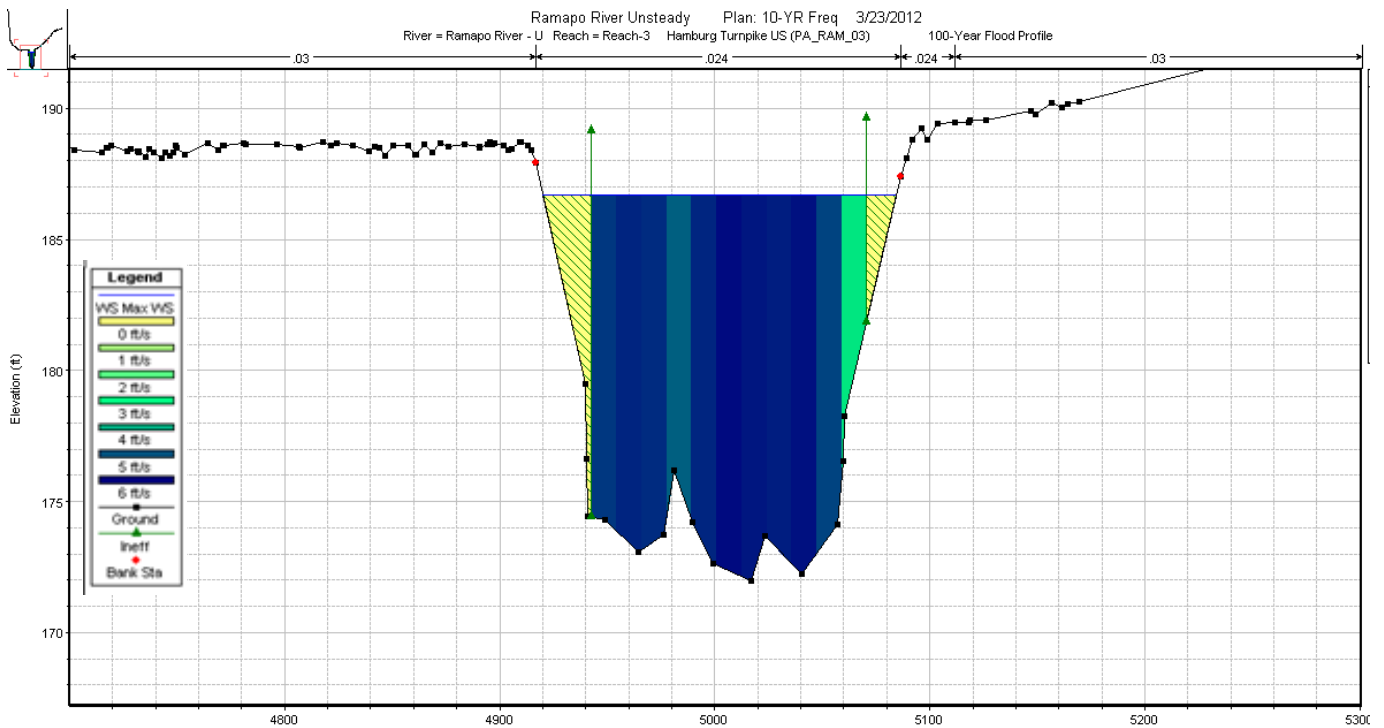
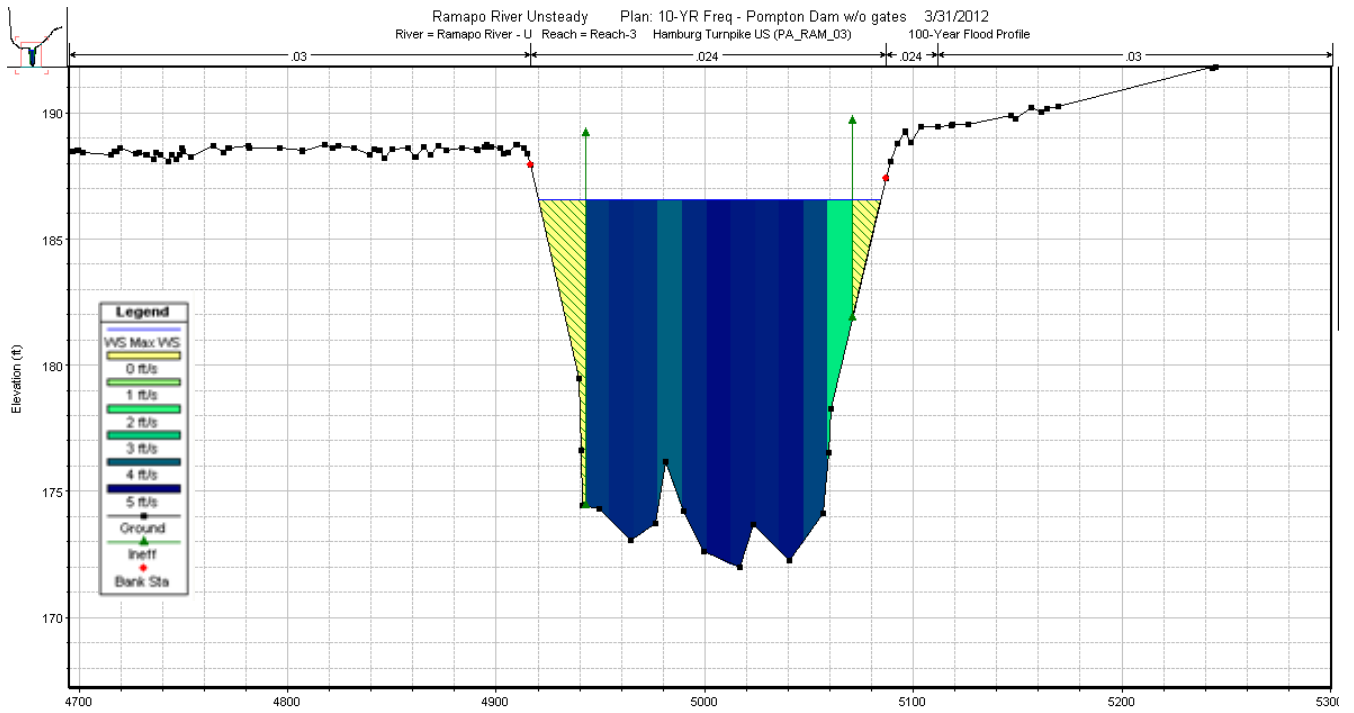


Figure H.6: 10-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 10-YR Freq -

Plan: 10-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity	Shear	Power
		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
1	Chan	4916.70	4929.75	0.00	15.76	9.88	0.00	1.70	0.00	0.02	0.00
2	Chan	4929.75	4942.80	0.00	85.80	17.46	0.00	6.57	0.00	0.06	0.00
3	Chan	4942.80	4954.43	634.65	142.90	11.65	8.79	12.29	4.44	0.15	0.65
4	Chan	4954.43	4966.05	705.17	152.31	11.66	9.77	13.10	4.63	0.15	0.72
5	Chan	4966.05	4977.68	690.58	151.25	11.83	9.57	13.01	4.57	0.15	0.69
6	Chan	4977.68	4989.31	530.36	130.87	12.23	7.35	11.25	4.05	0.13	0.51
7	Chan	4989.31	5000.94	709.43	153.44	11.77	9.83	13.20	4.62	0.15	0.71
8	Chan	5000.94	5012.56	806.63	164.95	11.64	11.18	14.19	4.89	0.17	0.82
9	Chan	5012.56	5024.19	772.08	161.90	11.86	10.70	13.92	4.77	0.16	0.77
10	Chan	5024.19	5035.82	733.29	155.95	11.67	10.16	13.41	4.70	0.16	0.74
11	Chan	5035.82	5047.45	784.16	162.48	11.69	10.86	13.97	4.83	0.16	0.79
12	Chan	5047.45	5059.07	636.38	147.15	12.48	8.82	12.66	4.32	0.14	0.60
13	Chan	5059.07	5070.70	214.81	79.07	13.47	2.98	6.80	2.72	0.07	0.19
14	Chan	5070.70	5086.70	0.00	31.53	14.27	0.00	2.34	0.00	0.03	0.00

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 10-YR Freq

Plan: 10-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity	Shear	Power
		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
1	Chan	4916.70	4929.75	0.00	17.18	10.31	0.00	1.77	0.00	0.03	0.00
2	Chan	4929.75	4942.80	0.00	87.76	17.46	0.00	6.72	0.00	0.08	0.00
3	Chan	4942.80	4954.43	773.92	144.64	11.65	8.80	12.44	5.35	0.21	1.12
4	Chan	4954.43	4966.05	858.85	154.05	11.66	9.77	13.25	5.57	0.22	1.24
5	Chan	4966.05	4977.68	841.18	153.00	11.83	9.56	13.16	5.50	0.22	1.20
6	Chan	4977.68	4989.31	647.93	132.61	12.23	7.37	11.40	4.89	0.18	0.89
7	Chan	4989.31	5000.94	863.91	155.18	11.77	9.82	13.35	5.57	0.22	1.24
8	Chan	5000.94	5012.56	980.99	166.70	11.64	11.15	14.34	5.88	0.24	1.42
9	Chan	5012.56	5024.19	939.29	163.65	11.86	10.68	14.07	5.74	0.23	1.34
10	Chan	5024.19	5035.82	892.70	157.69	11.67	10.15	13.56	5.66	0.23	1.29
11	Chan	5035.82	5047.45	953.93	164.23	11.69	10.85	14.12	5.81	0.24	1.38
12	Chan	5047.45	5059.07	775.58	148.90	12.48	8.82	12.81	5.21	0.20	1.05
13	Chan	5059.07	5070.70	266.21	80.82	13.47	3.03	6.95	3.29	0.10	0.33
14	Chan	5070.70	5086.70	0.00	33.58	14.73	0.00	2.41	0.00	0.04	0.00

Table H.6: 10-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

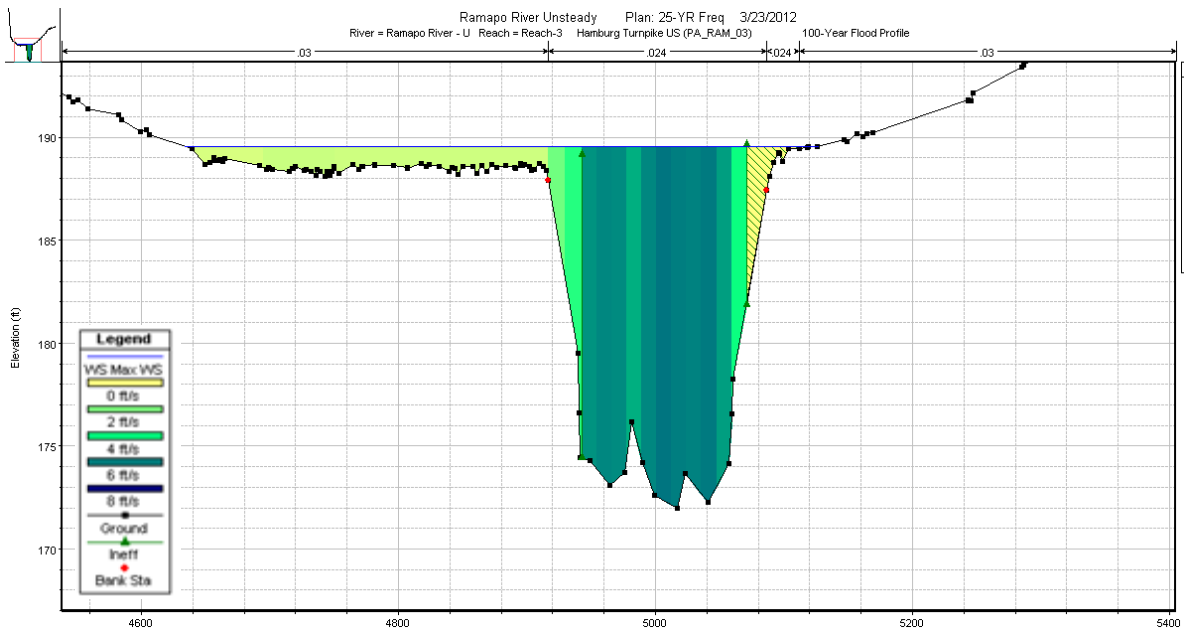
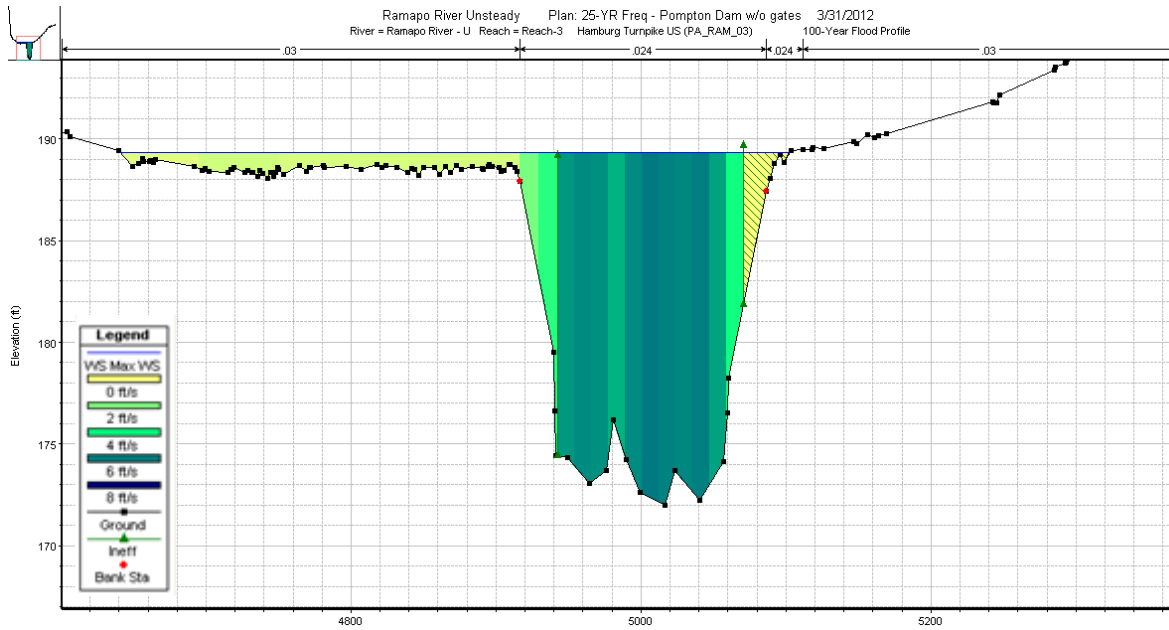


Figure H.7: 25-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 25-YR Freq -

Plan: 25-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4639.95	4695.30	12.24	25.95	54.13	0.10	0.48	0.47	0.01	0.00
2	LOB	4695.30	4750.65	37.34	51.18	55.48	0.32	0.92	0.73	0.01	0.01
3	LOB	4750.65	4806.00	26.27	41.42	55.38	0.22	0.75	0.63	0.01	0.01
4	LOB	4806.00	4861.35	27.32	42.42	55.43	0.23	0.77	0.64	0.01	0.01
5	LOB	4861.35	4916.70	26.88	42.03	55.51	0.23	0.76	0.64	0.01	0.01
6	Chan	4916.70	4929.75	105.80	49.31	13.90	0.90	3.78	2.15	0.06	0.12
7	Chan	4929.75	4942.80	411.10	121.96	17.46	3.51	9.35	3.37	0.11	0.37
8	Chan	4942.80	4954.43	984.01	175.12	11.65	8.40	15.06	5.62	0.24	1.33
9	Chan	4954.43	4966.05	1072.69	184.53	11.66	9.16	15.87	5.81	0.25	1.45
10	Chan	4966.05	4977.68	1052.64	183.48	11.83	8.99	15.78	5.74	0.24	1.40
11	Chan	4977.68	4989.31	845.62	163.09	12.23	7.22	14.03	5.19	0.21	1.09
12	Chan	4989.31	5000.94	1076.88	185.66	11.77	9.20	15.97	5.80	0.25	1.44
13	Chan	5000.94	5012.56	1199.78	197.17	11.64	10.25	16.96	6.08	0.27	1.62
14	Chan	5012.56	5024.19	1154.31	194.12	11.86	9.86	16.70	5.95	0.26	1.53
15	Chan	5024.19	5035.82	1107.92	188.17	11.67	9.46	16.18	5.89	0.25	1.49

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 25-YR Freq

Plan: 25-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4584.60	4639.95	0.04	0.34	5.74	0.00	0.06	0.12	0.00	0.00
2	LOB	4639.95	4695.30	23.98	39.28	55.42	0.20	0.71	0.61	0.01	0.01
3	LOB	4695.30	4750.65	54.87	64.58	55.48	0.45	1.17	0.85	0.02	0.02
4	LOB	4750.65	4806.00	41.80	54.81	55.38	0.34	0.99	0.76	0.02	0.01
5	LOB	4806.00	4861.35	43.06	55.81	55.43	0.35	1.01	0.77	0.02	0.01
6	LOB	4861.35	4916.70	42.52	55.42	55.51	0.35	1.00	0.77	0.02	0.01
7	Chan	4916.70	4929.75	117.68	52.47	13.90	0.97	4.02	2.24	0.06	0.13
8	Chan	4929.75	4942.80	430.27	125.12	17.46	3.54	9.59	3.44	0.11	0.39
9	Chan	4942.80	4954.43	1013.51	177.93	11.65	8.35	15.30	5.70	0.24	1.37
10	Chan	4954.43	4966.05	1103.37	187.34	11.66	9.09	16.11	5.89	0.25	1.49
11	Chan	4966.05	4977.68	1082.90	186.29	11.83	8.92	16.02	5.81	0.25	1.44
12	Chan	4977.68	4989.31	872.67	165.90	12.23	7.19	14.27	5.26	0.21	1.12
13	Chan	4989.31	5000.94	1107.51	188.47	11.77	9.12	16.21	5.88	0.25	1.48
14	Chan	5000.94	5012.56	1232.11	199.99	11.64	10.15	17.20	6.16	0.27	1.67
15	Chan	5012.56	5024.19	1185.85	196.94	11.86	9.77	16.94	6.02	0.26	1.58

Table H.7: 25-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

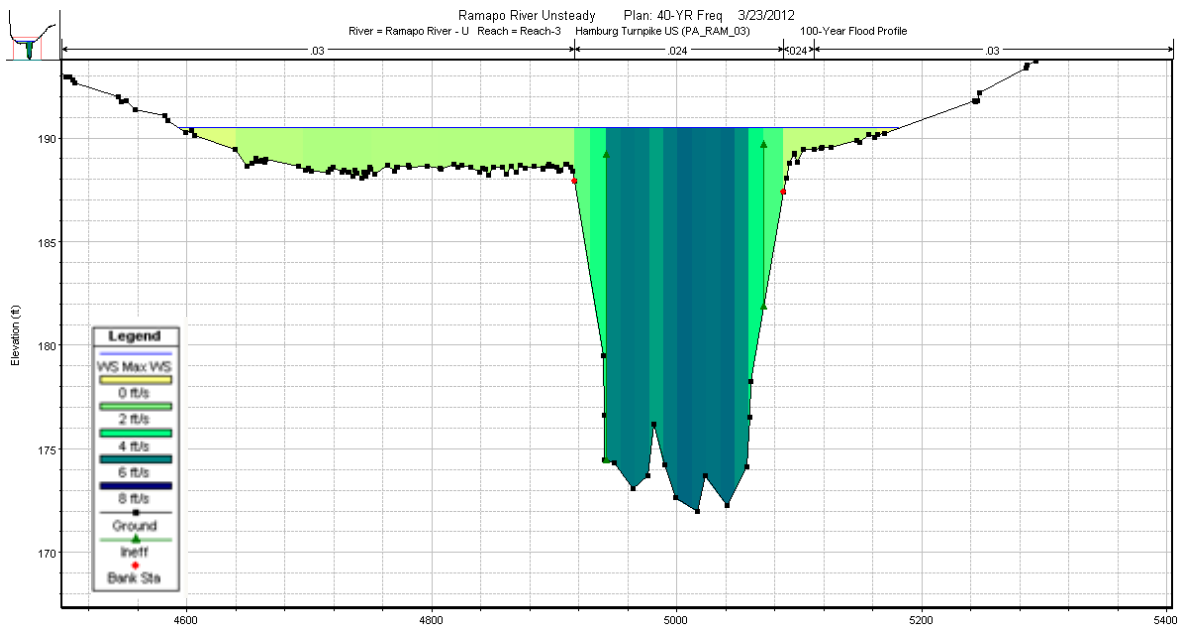
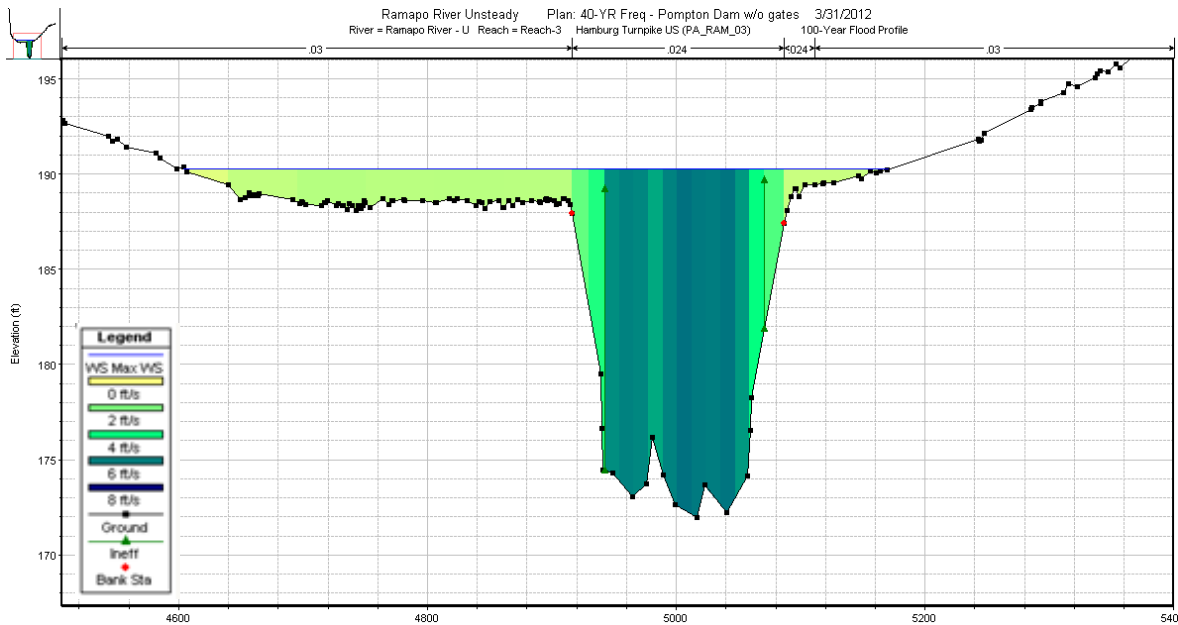


Figure H.8: 40-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 40-YR Freq -

Plan: 40-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4584.60	4639.95	8.15	17.39	35.53	0.06	0.49	0.47	0.01	0.00
2	LOB	4639.95	4695.30	77.20	80.06	55.42	0.57	1.45	0.96	0.02	0.02
3	LOB	4695.30	4750.65	121.91	105.36	55.48	0.90	1.90	1.16	0.03	0.03
4	LOB	4750.65	4806.00	103.79	95.59	55.38	0.77	1.73	1.09	0.03	0.03
5	LOB	4806.00	4861.35	105.55	96.59	55.43	0.78	1.75	1.09	0.03	0.03
6	LOB	4861.35	4916.70	104.74	96.20	55.51	0.77	1.74	1.09	0.03	0.03
7	Chan	4916.70	4929.75	153.09	62.09	13.90	1.13	4.76	2.47	0.07	0.17
8	Chan	4929.75	4942.80	478.38	134.74	17.46	3.54	10.32	3.55	0.12	0.43
9	Chan	4942.80	4954.43	1077.22	186.50	11.65	7.96	16.04	5.78	0.25	1.45
10	Chan	4954.43	4966.05	1168.21	195.91	11.66	8.63	16.85	5.96	0.26	1.57
11	Chan	4966.05	4977.68	1147.01	194.86	11.83	8.48	16.76	5.89	0.26	1.52
12	Chan	4977.68	4989.31	932.67	174.47	12.23	6.89	15.00	5.35	0.22	1.20
13	Chan	4989.31	5000.94	1172.08	197.04	11.77	8.66	16.95	5.95	0.26	1.56
14	Chan	5000.94	5012.56	1298.51	208.55	11.64	9.60	17.94	6.23	0.28	1.75
15	Chan	5012.56	5024.19	1251.09	205.50	11.86	9.25	17.67	6.09	0.27	1.66

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 40-YR Freq

Plan: 40-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4584.60	4639.95	13.77	26.36	46.39	0.10	0.57	0.52	0.01	0.00
2	LOB	4639.95	4695.30	97.58	91.67	55.42	0.69	1.66	1.06	0.03	0.03
3	LOB	4695.30	4750.65	146.37	116.97	55.48	1.03	2.11	1.25	0.03	0.04
4	LOB	4750.65	4806.00	126.73	107.20	55.38	0.89	1.94	1.18	0.03	0.04
5	LOB	4806.00	4861.35	128.63	108.20	55.43	0.91	1.95	1.19	0.03	0.04
6	LOB	4861.35	4916.70	127.74	107.81	55.51	0.90	1.95	1.18	0.03	0.04
7	Chan	4916.70	4929.75	167.47	64.82	13.90	1.18	4.97	2.58	0.08	0.20
8	Chan	4929.75	4942.80	503.62	137.47	17.46	3.54	10.53	3.66	0.13	0.47
9	Chan	4942.80	4954.43	1120.70	188.94	11.65	7.89	16.25	5.93	0.26	1.56
10	Chan	4954.43	4966.05	1214.11	198.35	11.66	8.54	17.06	6.12	0.28	1.69
11	Chan	4966.05	4977.68	1192.21	197.30	11.83	8.39	16.97	6.04	0.27	1.63
12	Chan	4977.68	4989.31	971.76	176.91	12.23	6.84	15.21	5.49	0.23	1.29
13	Chan	4989.31	5000.94	1217.99	199.48	11.77	8.57	17.16	6.11	0.27	1.68
14	Chan	5000.94	5012.56	1347.85	210.99	11.64	9.48	18.15	6.39	0.29	1.88
15	Chan	5012.56	5024.19	1299.00	207.94	11.86	9.14	17.88	6.25	0.28	1.78

Table H.8: 40-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

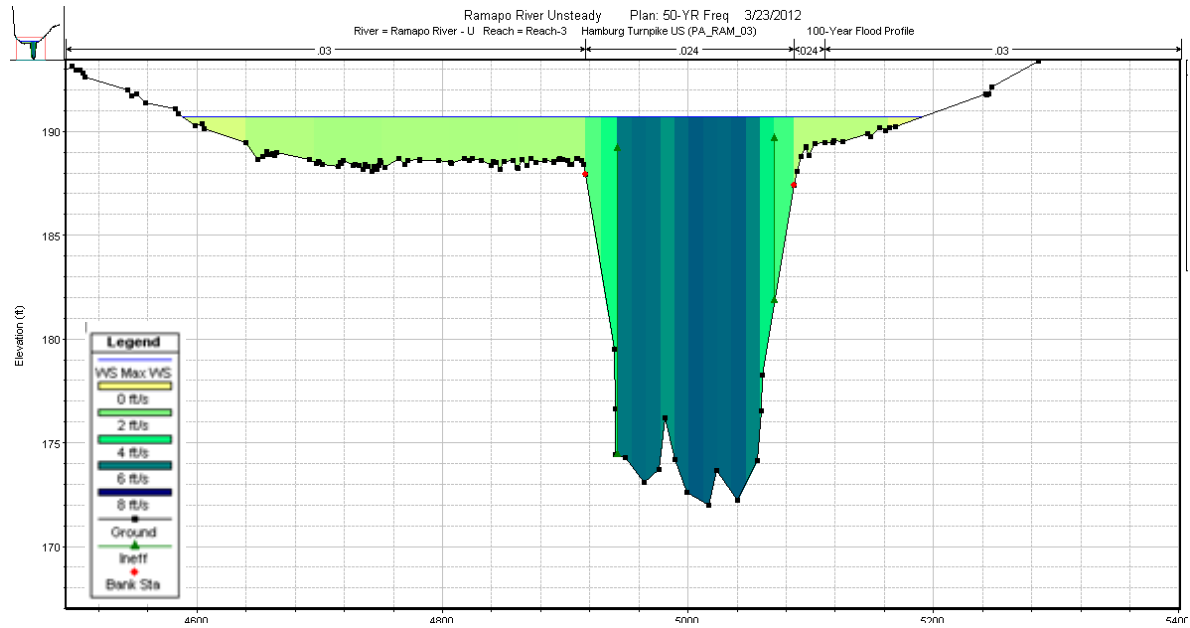
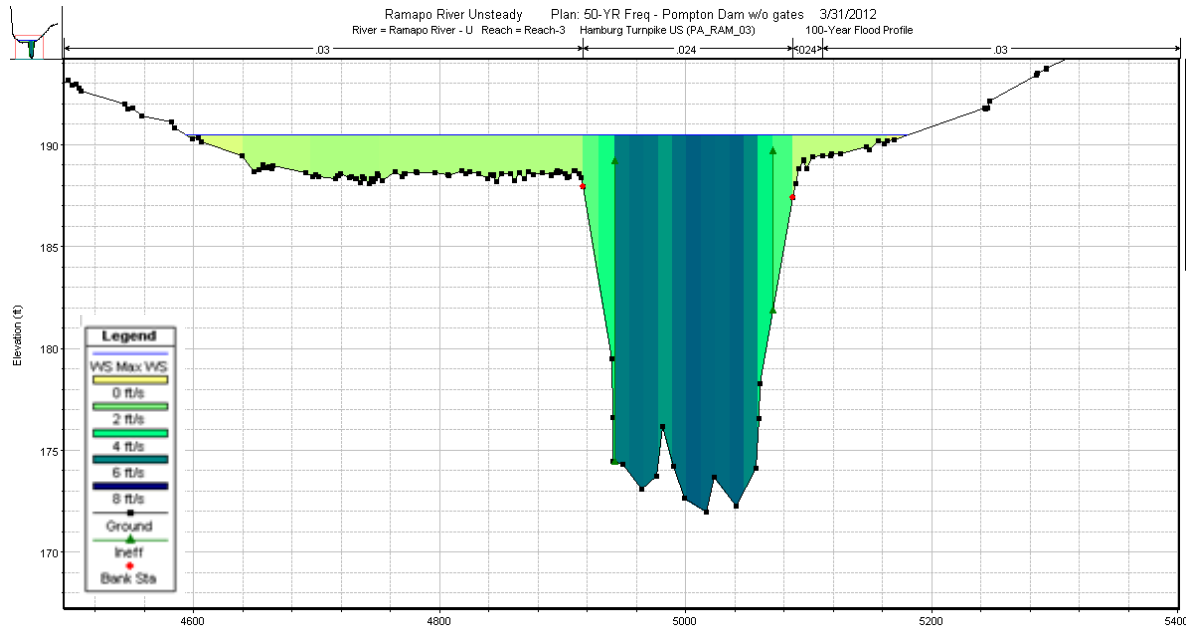


Figure H.9: 50-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top figure) Post Project Condition (bottom figure)

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 50-YR Freq

Plan: 50-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4584.60	4639.95	13.90	26.17	46.28	0.10	0.57	0.53	0.01	0.01
2	LOB	4639.95	4695.30	99.13	91.44	55.42	0.68	1.65	1.08	0.03	0.03
3	LOB	4695.30	4750.65	148.82	116.74	55.48	1.03	2.11	1.27	0.04	0.05
4	LOB	4750.65	4806.00	128.81	106.97	55.38	0.89	1.93	1.20	0.03	0.04
5	LOB	4806.00	4861.35	130.75	107.97	55.43	0.90	1.95	1.21	0.03	0.04
6	LOB	4861.35	4916.70	129.84	107.58	55.51	0.90	1.94	1.21	0.03	0.04
7	Chan	4916.70	4929.75	170.60	64.77	13.90	1.18	4.96	2.63	0.08	0.21
8	Chan	4929.75	4942.80	513.39	137.42	17.46	3.54	10.53	3.74	0.13	0.50
9	Chan	4942.80	4954.43	1142.68	188.89	11.65	7.89	16.25	6.05	0.27	1.66
10	Chan	4954.43	4966.05	1237.95	198.30	11.66	8.55	17.06	6.24	0.29	1.79
11	Chan	4966.05	4977.68	1215.62	197.25	11.83	8.39	16.96	6.16	0.28	1.73
12	Chan	4977.68	4989.31	990.80	176.86	12.23	6.84	15.21	5.60	0.24	1.37
13	Chan	4989.31	5000.94	1241.92	199.43	11.77	8.57	17.15	6.23	0.29	1.78
14	Chan	5000.94	5012.56	1374.36	210.94	11.64	9.49	18.14	6.52	0.31	1.99
15	Chan	5012.56	5024.19	1324.54	207.90	11.86	9.14	17.88	6.37	0.30	1.88

Flow Distribution Output

File Type Options Help

River: Ramapo River - U Profile: Max WS

Reach: Reach-3 RS: 10135 Plan: 50-YR Freq

Plan: 50-YR Freq - Ramapo River - U Reach-3 RS: 10135 Profile: Max WS

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	4584.60	4639.95	22.45	36.46	51.71	0.15	0.71	0.62	0.01	0.01
2	LOB	4639.95	4695.30	121.17	103.07	55.42	0.81	1.86	1.18	0.03	0.04
3	LOB	4695.30	4750.65	174.57	128.37	55.48	1.17	2.32	1.36	0.04	0.05
4	LOB	4750.65	4806.00	153.18	118.60	55.38	1.02	2.14	1.29	0.04	0.05
5	LOB	4806.00	4861.35	155.26	119.60	55.43	1.04	2.16	1.30	0.04	0.05
6	LOB	4861.35	4916.70	154.27	119.21	55.51	1.03	2.15	1.29	0.04	0.05
7	Chan	4916.70	4929.75	183.05	67.51	13.90	1.22	5.17	2.71	0.08	0.22
8	Chan	4929.75	4942.80	531.30	140.16	17.46	3.55	10.74	3.79	0.14	0.51
9	Chan	4942.80	4954.43	1169.02	191.33	11.65	7.81	16.46	6.11	0.28	1.69
10	Chan	4954.43	4966.05	1265.21	200.74	11.66	8.45	17.27	6.30	0.29	1.83
11	Chan	4966.05	4977.68	1242.52	199.69	11.83	8.30	17.17	6.22	0.28	1.77
12	Chan	4977.68	4989.31	1015.10	179.30	12.23	6.78	15.42	5.66	0.25	1.40
13	Chan	4989.31	5000.94	1269.11	201.87	11.77	8.47	17.36	6.29	0.29	1.82
14	Chan	5000.94	5012.56	1402.91	213.39	11.64	9.37	18.35	6.57	0.31	2.03
15	Chan	5012.56	5024.19	1352.44	210.34	11.86	9.03	18.09	6.43	0.30	1.92

Table H.9: 50-Year Rainfall Storm Event – Velocity Distribution at Hamburg Turnpike Bridge – Pre Project Condition (top table) Post Project Condition (bottom table)

Appendix I

**FLOW AND VELOCITY DISTRIBUTION FOR RAMAPO
RIVER CROSS SECTIONS**

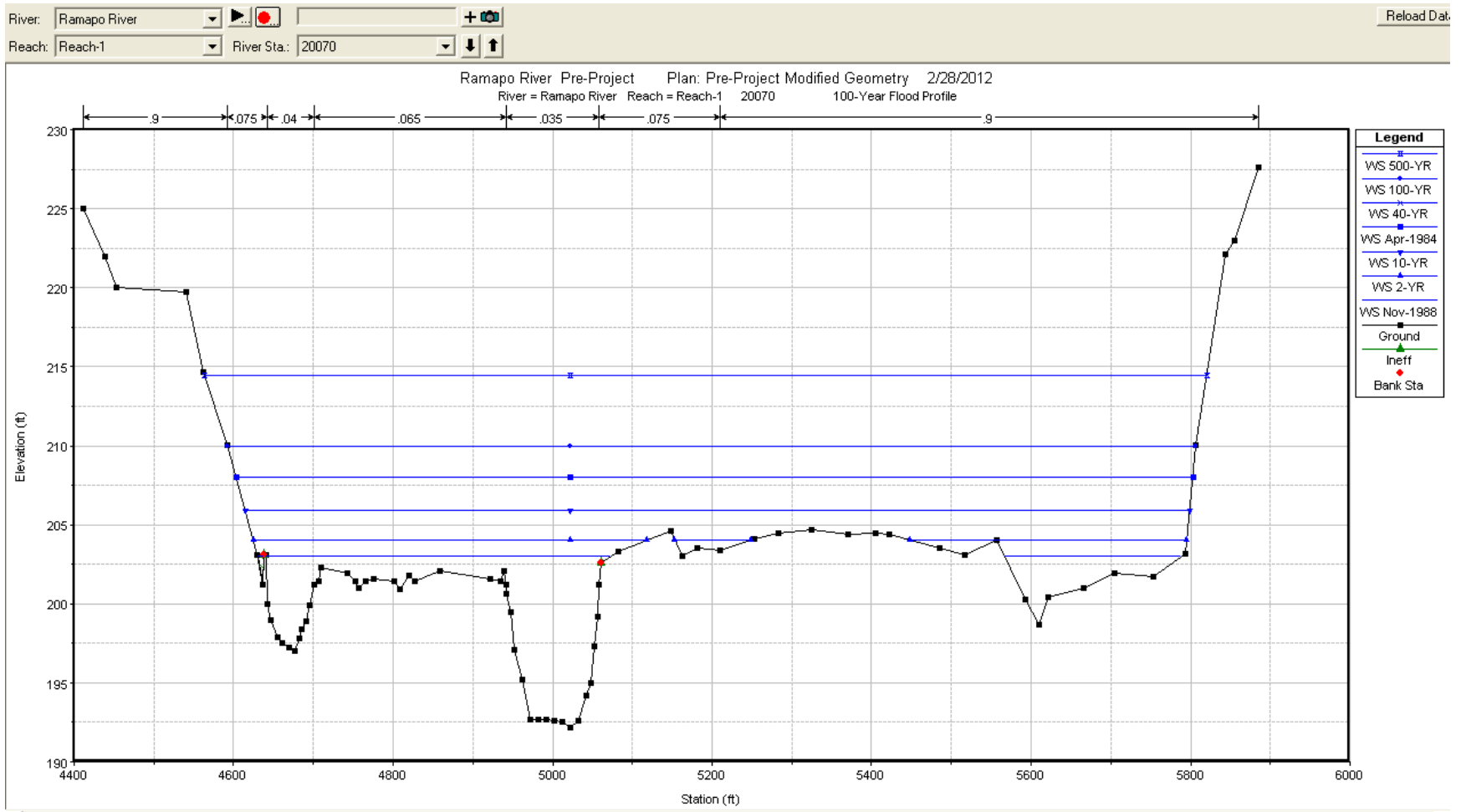


Figure I.1 - Cross Section 20070 Ramapo River Pre-Project Condition

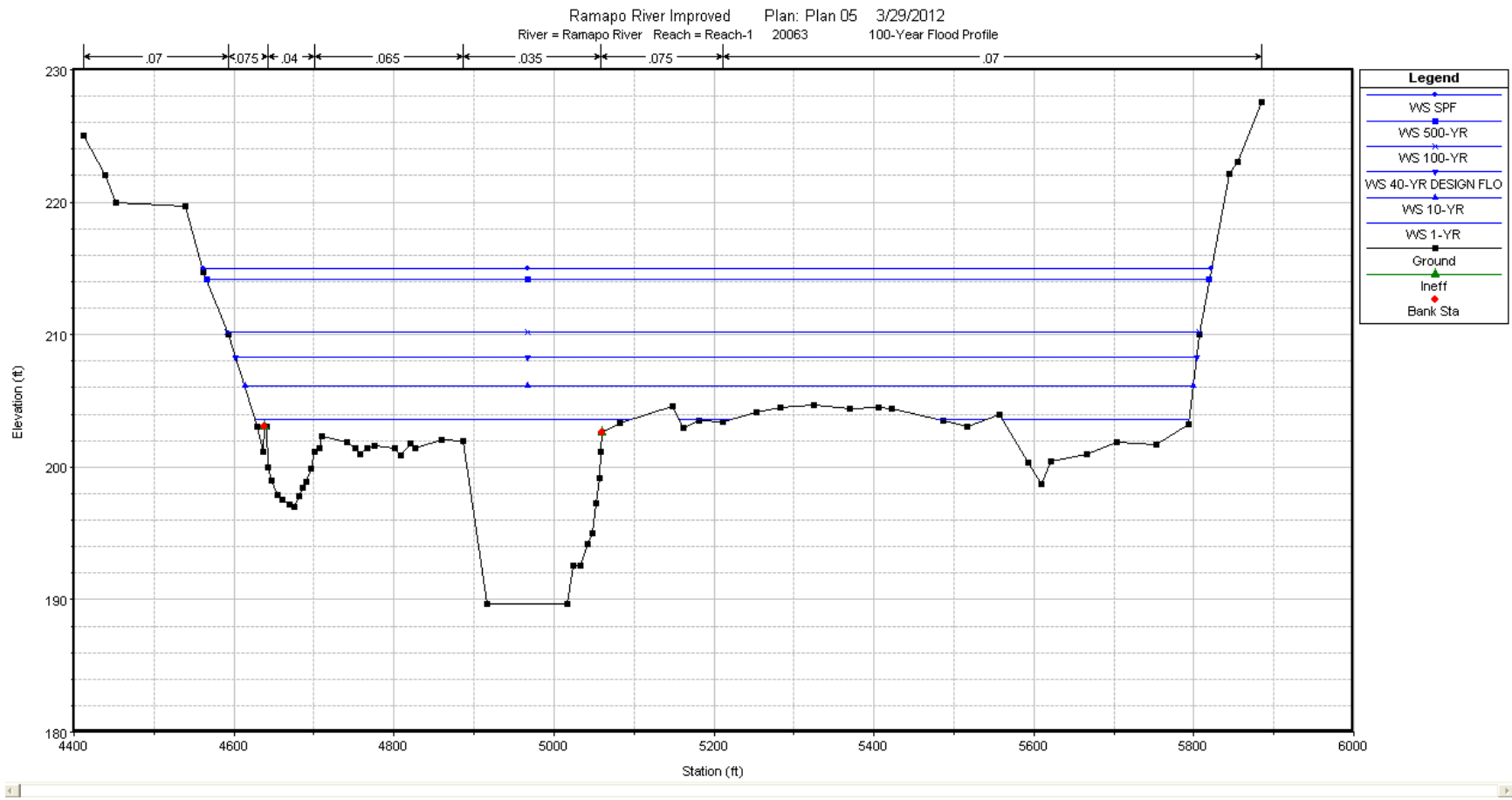


Figure 1.2-Cross Section 20063 Ramapo River Post-Project Condition

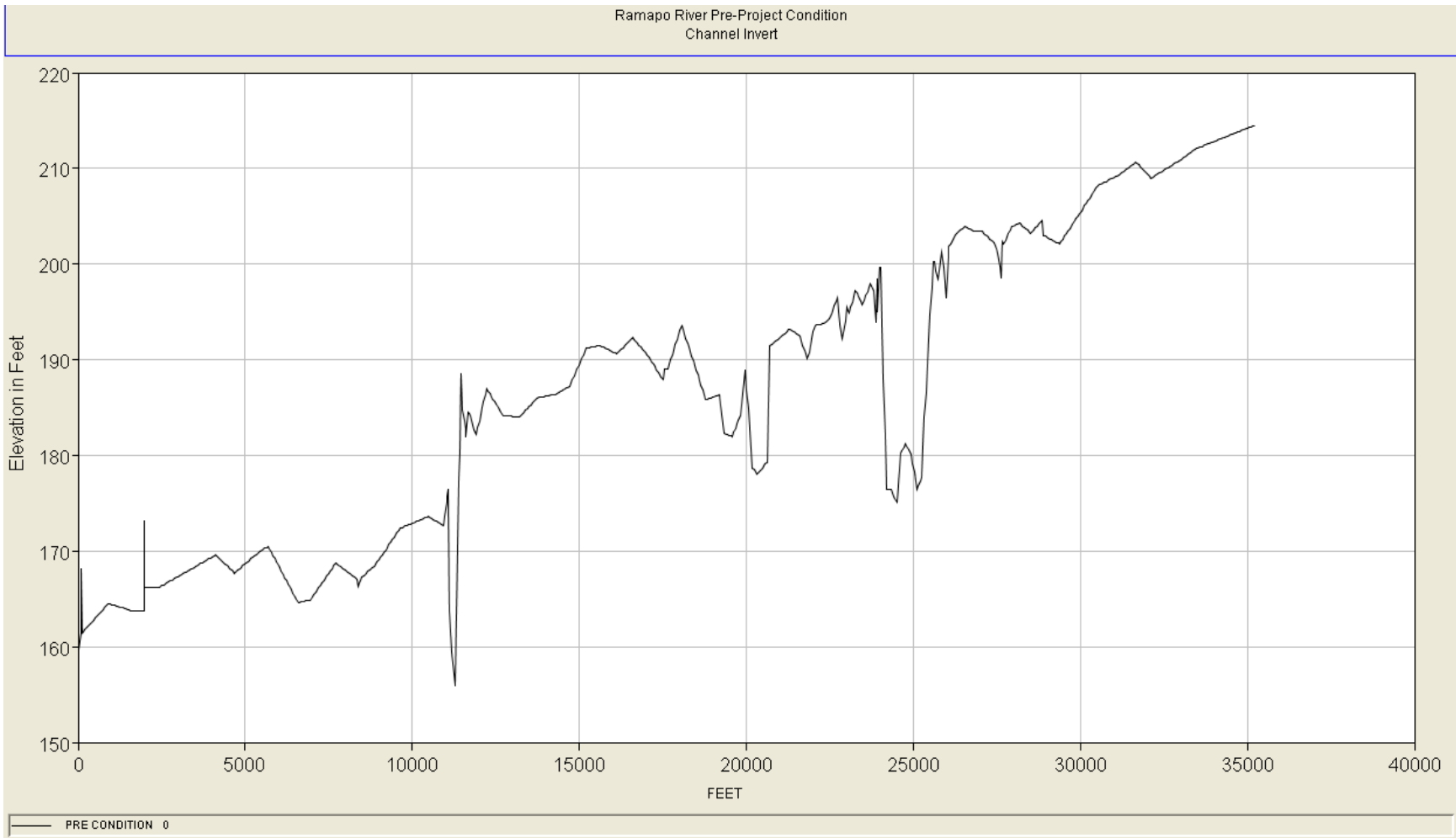


Figure I.3 - Channel Invert for the Ramapo River for Pre-Project Condition

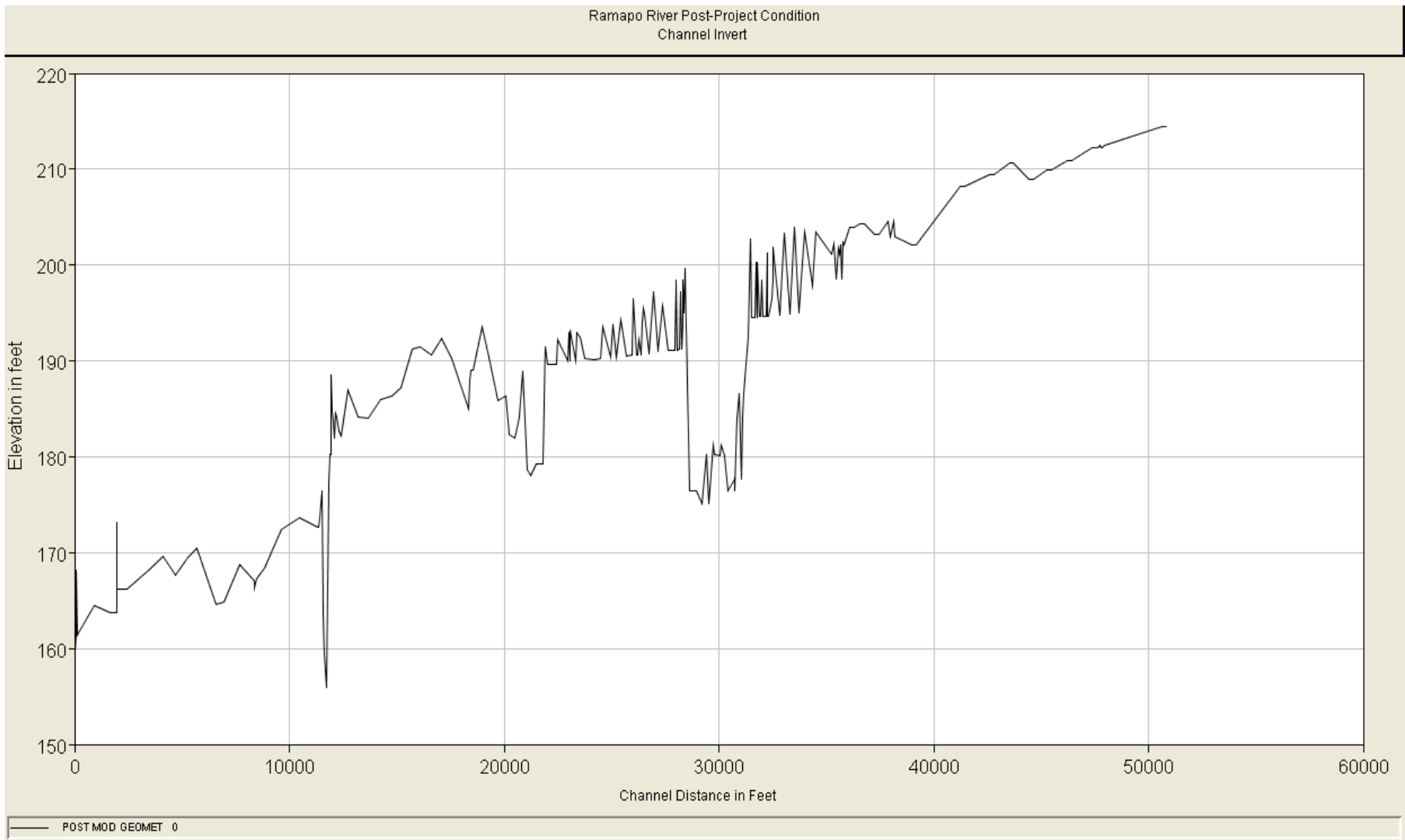


Figure I.4 - Channel Invert for the Ramapo River for Post-Project Condition

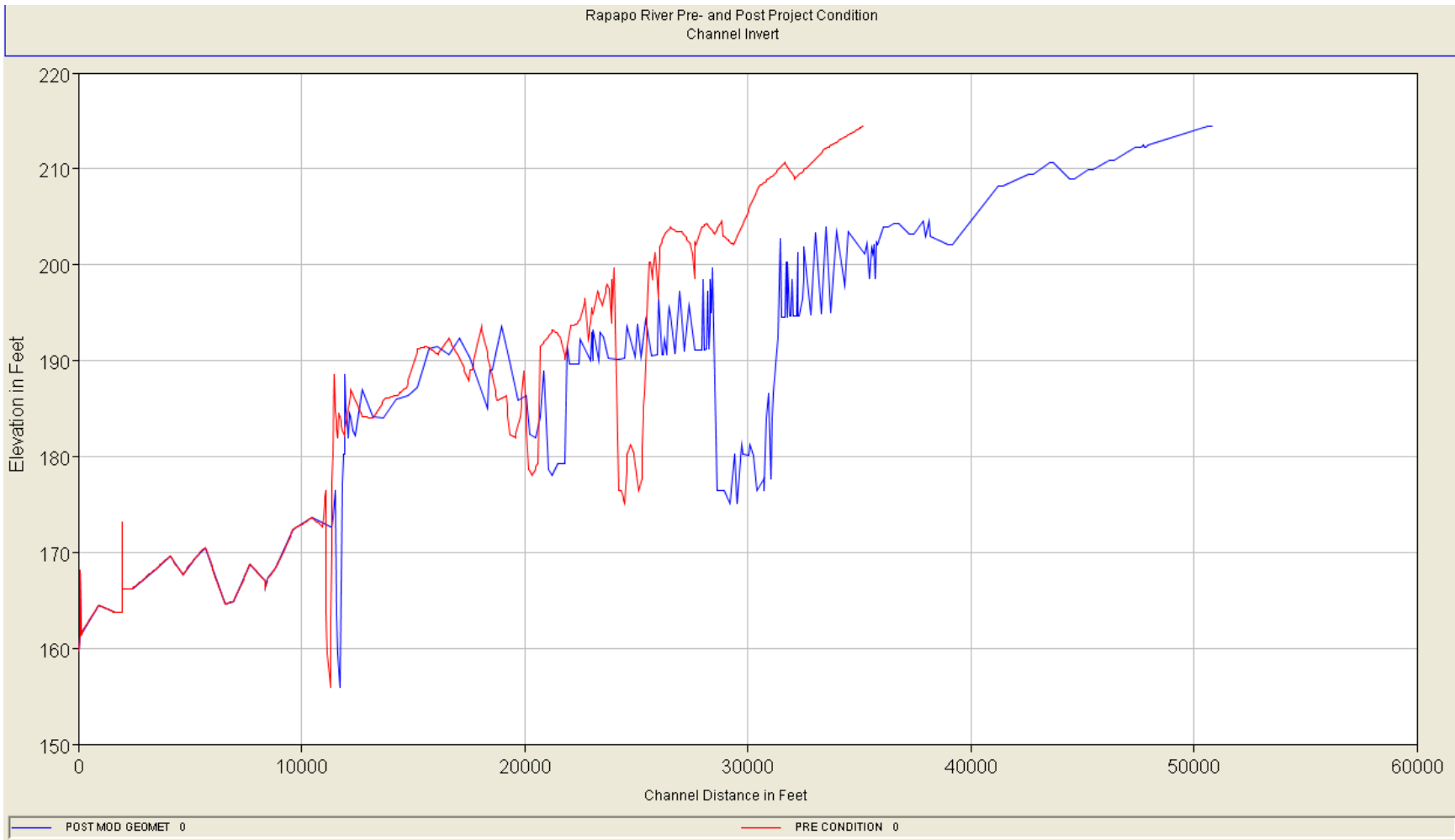


Figure I.5 - Channel Inverts for the Ramapo River for Pre-Project Condition (red line) and Post-Project Condition (blue line)

Table I.1 -Comparison of Pre- and Post Project Conditions at Cross Section 20070

Storm Event	Flow in cfs Pre-Project Condition cfs	Water Surface Elevation Pre-Project Condition	Flow in cfs Post-Project Condition cfs	Water Surface Elevation Post-Project Condition	Difference In feet
10-Year Flood	8,700	205.92	9,700	206.11	0.19
40-Year Flood	14,690	208.03	15,700	208.25	0.22
100-Year Flood	20,000	209.96	21,200	210.16	0.20
500-Year Flood t	34,600	214.43	36,100	214.13	-0.30

Note: The flows are higher for the Post-Project Condition which would result in slightly higher water surface elevations compared to the Pre-Project Condition

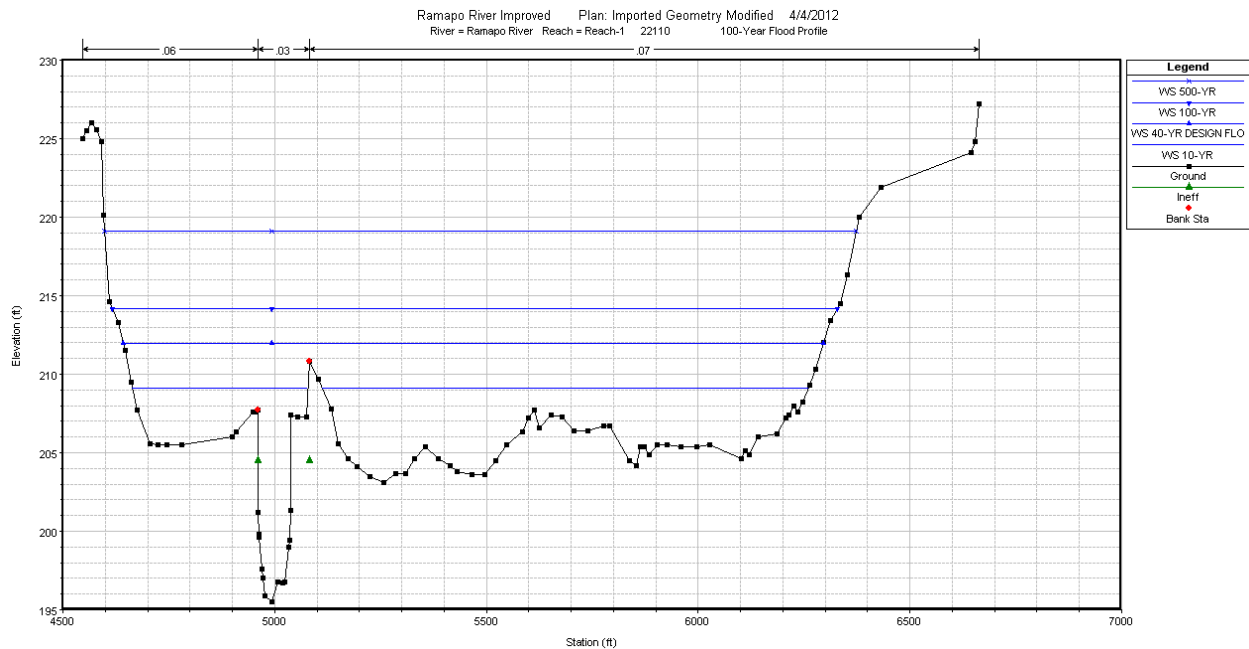
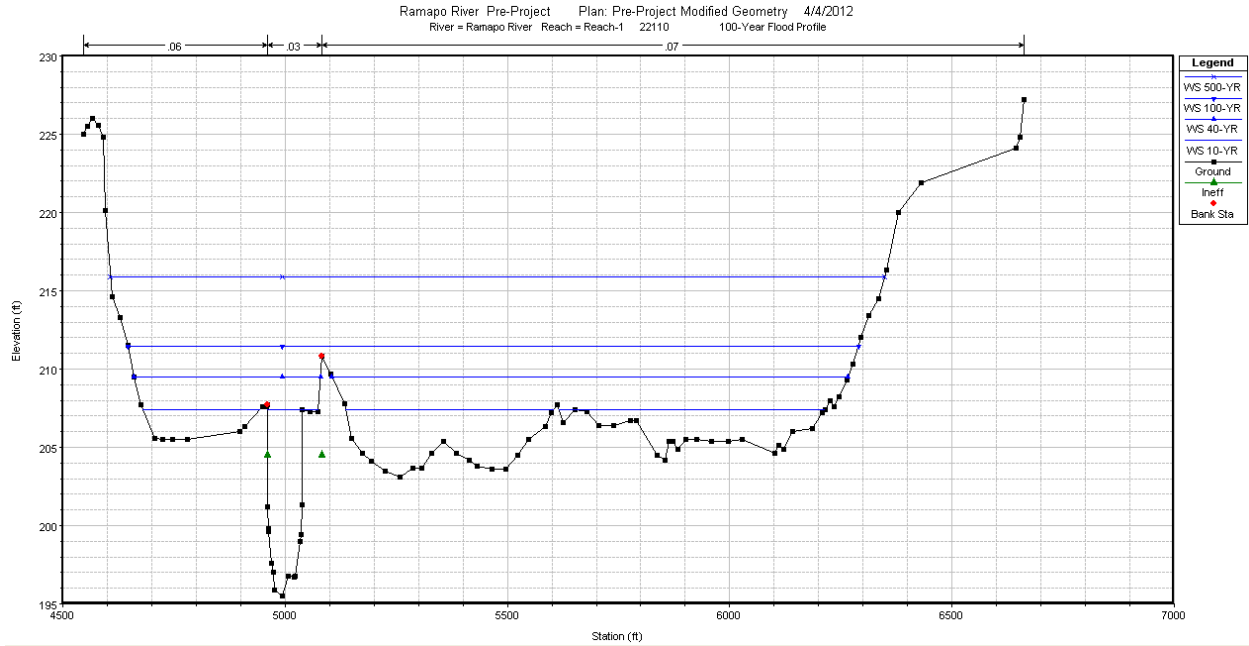


Figure I.6 - Ramapo River Cross Section 22110 for Pre- (top figure) and Post Conditions (bottom figure). (Note that the cross sections are the same).

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Trvl Tme Chl (hrs)
Reach-1	32690		Bridge			
Reach-1	32670	10-YR	8700.00	212.30	222.96	4.90
Reach-1	32670	40-YR	14690.00	212.30	225.71	3.70
Reach-1	32670	100-YR	20000.00	212.30	227.27	3.19
Reach-1	32670	500-YR	34600.00	212.30	228.76	2.45

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Trvl Tme Chl (hrs)
Reach-1	32523		Bridge			
Reach-1	32503	10-YR	9200.00	212.30	225.45	7.00
Reach-1	32503	40-YR DESIGN FLD	15200.00	212.30	227.32	5.71
Reach-1	32503	100-YR	20600.00	212.30	228.07	5.09
Reach-1	32503	500-YR	35400.00	212.30	231.72	3.92

Table I.2 - Average Accumulated Travel Times for the flows at Lapate Lane Bridge to the Jackson Avenue Bridge for Pre- and Post Project Conditions (Note the average travel time is longer for the Post-Project Condition)

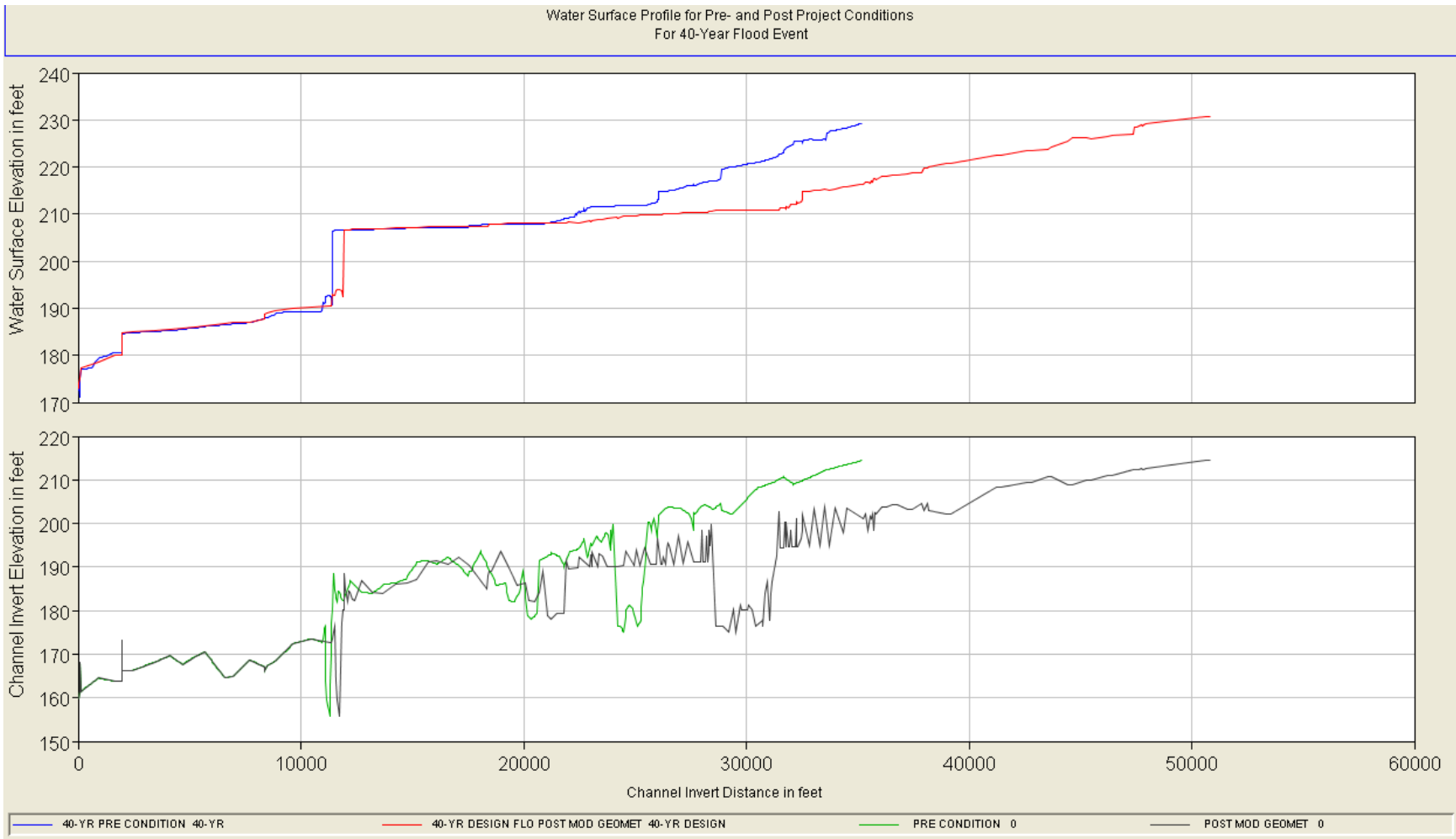


Figure I.7-Water Surface Profiles for the 40-Year Flood Event – Pre- (blue and greent lines) and Post Project Conditions (red and black lines)

Appendix J

HEC-RAS OUTPUT REPORT – PRE AND POST CONDITIONS ANALYSIS

RampoRi verPre. rep

HEC-RAS Version 4.1.0 Jan 2010
U. S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X      X  XXXXXX      XXXX      XXXX      XX      XXXX
X      X  X          X      X          X      X      X
X      X  X          X          X      X      X      X
XXXXXXXX XXXX      X          XXX XXXX      XXXXXX      XXXX
X      X  X          X          X      X      X          X
X      X  X          X      X          X      X      X
X      X  XXXXXX      XXXX      X      X      X      X      XXXXX
```

PROJECT DATA

Project Title: Ramapo River Pre-Project
Project File : RampoRi verPre. prj
Run Date and Time: 4/4/2012 11:49:26 AM

Project in English units

Project Description:
RAMAPO RIVER GDM, OAKLAND, N. J.,
YEAR 2040, WITHOUT PROJECT CONDITIONS

FILE "RAMEX1"; 1 YEAR FLOW

PLAN DATA

Plan Title: Pre-Project Modified Geometry
Plan File : g:\New Jersey Prompton Lake Dam\Pre HEC-2 Conversion\RampoRi verPre. p03

Geometry Title: Pre-Project Modified Geometry
Geometry File : g:\New Jersey Prompton Lake Dam\Pre HEC-2
Conversion\RampoRi verPre. g04

Flow Title : USACE Pre-Project
Flow File : g:\New Jersey Prompton Lake Dam\Pre HEC-2
Conversion\RampoRi verPre. f02

Plan Summary Information:

Number of:	Cross Sections = 138	Multiple Openings = 0
	Culverts = 0	Inline Structures = 1
	Bridges = 7	Lateral Structures = 0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options

Critical depth computed at all cross sections

RampoRi verPre. rep

Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: USACE Pre-Project
 Flow File : g:\New Jersey Prompton Lake Dam\Pre HEC-2 Conversion\RampoRi verPre. f02

Flow Data (cfs)

River 10-YR	Reach 40-YR	RS Apr-1984	Nov-1988 100-YR	500-YR	2-YR
Ramapo River 8700	Reach-1 14690	34312 15460	2430 20000	34600	4200
Ramapo River 8800	Reach-1 14700	28480 15420	2420 20260	34700	4300
Ramapo River 9100	Reach-1 15000	20495 14980	2440 20600	35300	4500
Ramapo River 9100	Reach-1 15000	15696 14980	2440 20600	35300	4500
Ramapo River 14800	Reach-1 25400	4785 26300	3580 36400	61700	7000

Boundary Conditions

River Downstream	Reach	Profile	Upstream
Ramapo River Critical	Reach-1	Nov-1988	Critical
Ramapo River Critical	Reach-1	2-YR	Critical
Ramapo River Critical	Reach-1	10-YR	Critical
Ramapo River Critical	Reach-1	40-YR	Critical
Ramapo River Critical	Reach-1	Apr-1984	Critical
Ramapo River Critical	Reach-1	100-YR	Critical
Ramapo River Critical	Reach-1	500-YR	Critical

GEOMETRY DATA

Geometry Title: Pre-Project Modified Geometry
 Geometry File : g:\New Jersey Prompton Lake Dam\Pre HEC-2
 Conversion\RampoRi verPre. g04

CROSS SECTION

RamporiverPre.rep

RIVER: Ramapo River
 REACH: Reach-1 RS: 34312

INPUT
 Description: 34312

Station		Elevation Data		num=	7						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	250	1079	220	1134	217	1168	214.5	1202	214.5		
1234	217	1450	250								

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1134	.035	1234	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1134 1234 1445.07 1445.07 1445.07 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32867

INPUT
 Description: 32867

Station		Elevation Data		num=	7						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	250	1060	216.1	1085	212.5	1120	212.5	1148	216.1		
1228	220	1578	226								

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1060	.035	1148	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1060 1148 117 117 117 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32750

INPUT
 Description: 32750
 This is a REPEATED section.

Station		Elevation Data		num=	53						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1		
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2		
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1		
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213		
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5		
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5		
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5		
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2		

				Ramp	River	Pre. rep			
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4
5201.3	226.6	5225.8	226.6	5258.5	227.2				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4712 .055 4913.6 .035 5092.8 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913.6 5092.8 40 40 40 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32710

INPUT
 Description: 32710
 LENAPE LANE BRIDGE

Station Elevation Data num= 53									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
4712 243.2 4723.3 242 4736.9 241.1 4737.1 241.1 4750.4 240.1									
4772.5 238 4791.1 236.6 4815.6 232.9 4836.7 231.9 4854 230.2									
4874.7 228.5 4891.4 227.9 4903.9 226 4909.6 226 4913.6 227.1									
4913.7 225.1 4925 216 4925.1 216 4929.6 214.4 4940 213									
4954.8 212.5 4962 212.3 4962.1 212.3 4965 212.5 4965.1 212.5									
4971.4 213.1 4991.4 212.8 5002 212.5 5002.1 212.5 5005 212.5									
5005.1 212.5 5012.7 212.9 5030.8 213.7 5042 213.2 5042.1 213.5									
5045 213.1 5045.1 213.1 5047.2 213.5 5060.2 213.5 5070.4 214.2									
5082 219.5 5082.1 219.5 5092.7 223.8 5092.8 227.1 5096.4 226									
5107.1 226.4 5138.9 226.2 5157.2 225.9 5176.6 224.9 5184.7 226.4									
5201.3 226.6 5225.8 226.6 5258.5 227.2									

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4712 .055 4913.6 .035 5092.8 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913.6 5092.8 40 40 40 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4712 4913.6 243 F
 5092.8 5258.5 227.1 F
 Sediment Elevation = 0

BRIDGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 32690

INPUT
 Description: LENAPE LANE BRIDGE

Distance from Upstream XS = 11
 Deck/Roadway Width = 18
 Weir Coefficient = 2.7
 Upstream Deck/Roadway Coordinates

num= 28									
Sta Hi Cord Lo Cord		Sta Hi Cord Lo Cord		Sta Hi Cord Lo Cord		Sta Hi Cord Lo Cord			

Ramp Over Pre. rep

4712	243.2	243.2	4723	242	242	4736.9	241.1	241.1
4737.1	241.1	241.1	4750.4	240.1	240.1	4772.5	238	238
4791.1	236.6	236.6	4815.6	232.9	232.9	4836.7	231.9	231.9
4854	230.2	230.2	4874.7	229	228.5	4891.4	228	227.9
4903.9	227.6	226	4909.6	227.5	226	4913.6	227.4	227.1
4913.7	227.4	225.1	4925	230	216.6	4925	230	224
4965	230.2	224	5002	230.5	224.5	5042	230.4	224.2
5082	230.1	224	5082.1	230.1	219.5	5092.7	227.1	223.8
5092.8	227.1	227.1	5096.4	227.1	226	5107.1	227.1	226.4
5138.9	227.1	226.2						

Upstream Bridge Cross Section Data

Station Elevation Data num= 53									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4
5201.3	226.6	5225.8	226.6	5258.5	227.2				

Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
4712	.055	4913.6	.035	5092.8	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	4913.6	5092.8	.3	.5	

Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
4712	4913.6	243	F		
5092.8	5258.5	227.1	F		

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates

num= 23									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4712	243.2	243.2	4723	242	242	4736.9	241.1	241.1	
4737.1	241.1	241.1	4750.4	240.1	240.1	4772.5	238	238	
4791.1	236.6	236.6	4815.6	232.9	232.9	4836.7	231.9	231.9	
4854	230.2	230.2	4874.7	229	229	4891.4	228	228	
4913.6	227.4	227.4	4913.7	227.4	225.1	4925	230	224	
4965	230.2	224	5002	230.5	224.5	5042	230.4	224.2	
5082	230.1	224	5092.7	227.3	223.8	5096.4	227.1	227.1	
5107.1	227.1	227.1	5138.9	227.1	227.1				

Downstream Bridge Cross Section Data

Station Elevation Data num= 45									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723	242	4736.9	241.1	4737.1	241.1	4750.4	240.1
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2
4874.7	229	4891.4	228	4913.6	227.4	4916.5	215.9	4920.4	214.4
4933.9	213.2	4952	213.2	4966.2	212.3	4980.1	212.8	5000.8	213.5
5019.7	213.2	5036	212.8	5055.9	213	5079.6	213.9	5084.4	215.6
5092.7	223.8	5096.4	227.1	5107.1	227.1	5138.9	227.1	5167.2	226.2
5175.7	226.7	5195.8	227.2	5217.4	227.2	5233.7	227.1	5249	227.3
5275.1	228.3	5298.2	228.3	5315.2	230	5341.1	232	5383.2	235.7
5399.5	236.8	5418.9	238.5	5439.6	240.2	5463.1	241.1	5499	243.1

Ramp OverPre. rep

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4712 .055 4913.6 .035 5096.4 .055

Bank Sta: Left Right Coeff Contr. Expan.
 4913.6 5096.4 .3 .5

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 4712 4916.4 241 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 227.4
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data
 Pier Station Upstream= 4963.5 Downstream= 4963.5
 Upstream num= 2
 Width Elev Width Elev
 3 210 3 230
 Downstream num= 2
 Width Elev Width Elev
 3 210 3 230

Pier Data
 Pier Station Upstream= 5003.5 Downstream= 5003.5
 Upstream num= 2
 Width Elev Width Elev
 3 210 3 230
 Downstream num= 2
 Width Elev Width Elev
 3 210 3 230

Pier Data
 Pier Station Upstream= 5043.5 Downstream= 5043.5
 Upstream num= 2
 Width Elev Width Elev
 3 210 3 230
 Downstream num= 2
 Width Elev Width Elev
 3 210 3 230

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Momentum Cd = 2
 Yarnell KVal = 1.25

Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .766965
 Max Low Cord = 224.5

Additional Bridge Parameters

RamporiverPre.rep

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32670

INPUT

Description: 32670

Station		Elevation		Data		num= 45		Station		Elevation	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723	242	4736.9	241.1	4737.1	241.1	4750.4	240.1		
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2		
4874.7	229	4891.4	228	4913.6	227.4	4916.5	215.9	4920.4	214.4		
4933.9	213.2	4952	213.2	4966.2	212.3	4980.1	212.8	5000.8	213.5		
5019.7	213.2	5036	212.8	5055.9	213	5079.6	213.9	5084.4	215.6		
5092.7	223.8	5096.4	227.1	5107.1	227.1	5138.9	227.1	5167.2	226.2		
5175.7	226.7	5195.8	227.2	5217.4	227.2	5233.7	227.1	5249	227.3		
5275.1	228.3	5298.2	228.3	5315.2	230	5341.1	232	5383.2	235.7		
5399.5	236.8	5418.9	238.5	5439.6	240.2	5463.1	241.1	5499	243.1		

Manning's n		Values		num= 3	
Station	Value	Station	Value	Station	Value
4712	.055	4913.6	.035	5096.4	.055

Bank	Sta	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.	
	4913.6	5096.4	559.92	570	600	.3	.5				
Ineffective Flow	num= 1										
Station L	Station R	Elev	Permanent								
4712	4916.4	241	F								
Sediment Elevation = 0											

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32100

INPUT

Description: 32100

Station		Elevation		Data		num= 99		Station		Elevation	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3359.9	243.2	3412.3	238.7	3441.9	233.8	3531.2	229.4	3658.2	230.5		
3717.5	229.2	3804.6	217.5	3814.6	216.5	3824.6	215.4	3834.6	214.5		
3844.6	213.3	3854.6	212	3864.6	211.1	3874.6	210.9	3884.6	210.8		
3894.6	210.7	3904.6	210.8	3914.6	211.1	3924.6	211.2	3934.6	211		
3944.6	209.6	3954.6	208.1	3964.6	207.5	3974.6	207.2	3984.6	207.3		
3994.6	207.5	4004.6	208	4014.6	208.3	4024.6	208.1	4034.6	208.1		
4044.6	208.1	4054.6	208.1	4064.6	208.4	4074.6	208.5	4084.6	208.6		
4094.6	208.7	4114.6	208.8	4124.6	208.5	4134.6	208.6	4154.6	208.5		
4194.6	208.5	4204.6	208.5	4214.6	208.5	4224.6	208.3	4234.6	208.1		
4244.6	208	4254.6	208	4264.6	208.1	4274.6	208.9	4284.6	209.7		
4294.6	210	4304.6	210.8	4314.6	211.1	4324.6	211.7	4334.6	212		
4344.6	212.5	4354.6	213	4364.6	213.2	4374.6	213.8	4384.6	214		
4394.6	214.5	4404.6	214.8	4414.6	215.1	4424.6	215.5	4436.6	217.2		
4447	219.1	4452	220.9	4457	221.2	4457.9	222.2	4458	222.8		
4466.8	224	4496.2	229.5	4552.1	237.4	4623.6	235.5	4699.7	225.3		

RampoverPre.rep									
4776.5	225.6	4818.9	223	4854.6	220.8	4872.6	220.1	4892.7	220.2
4910	219.7	4931	218.4	4936	214	4964	211.4	4977	211.1
5002	211	5026	210.9	5039	211.2	5059	213.2	5067	214.8
5076.5	218.3	5086	219.2	5105	219	5107	219.3	5139.3	216.2
5179	217.5	5207	229	5240.4	240	5248	243		

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3359.9	.08	3804.6	.04	4452	.055	4776.5	.035	5179	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	4776.5	5179		450	460		.1	.3	
Ineffective Flow									
Sta L	Sta R	Elev	Permanent						
3359.9	4776.5	238	F						
5179	5248	217.5	F						
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 31640

INPUT
 Description: 31640

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1185.4	243	3281	236	3307.5	235.4	3345.4	232.4	3387.9	232.4
3454.6	233.2	3522.5	231.5	3575.8	231.9	3761.6	230.9	3783	229.7
3796.4	224.1	3833.6	222.6	3844	231.2	3865.2	231.2	3871.3	224.5
3893.6	228.8	3919.1	229.5	3964	228.2	4047.2	224	4677.2	224.2
4704.8	223.9	4721.1	225	4781.2	225.3	4809.7	224	4827.4	223.2
4839.2	221.7	4854.2	221.8	4866.8	221.6	4881.2	221	4895.3	220.8
4919	220.2	4937.8	218.3	4942.8	215.8	4947.3	213.2	4955.8	212
4964.3	211	4974.3	210.1	4984.8	210.2	4994.8	210.3	5003.3	210.3
5012.8	209.9	5019.3	209.9	5026.3	209.9	5034.3	210.3	5042.8	210.8
5052.7	212.3	5052.8	213.2	5058.9	213.5	5124.2	243		

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3185.4	.08	3761.6	.04	3844	.055	3865.2	.035	3893.6	.08
4047.2	.03	4677.2	.07	4964.3	.045	5058.9	.08		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	5003.3	5052.7		50.04	420.03		.1	.3	
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 31220

INPUT
 Description: 31220

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3402.2	243	3540	232.6	3574.4	231.1	3639.7	230.1	3669.5	228.7
3682.7	228.9	3739.2	230.2	3776.9	230.3	3842.6	229	3856.7	230.1
3864	221.5	3879.3	221.5	3887.3	230.7	4064.9	223.6	4075	227

RampoverPre.rep									
4140	222.7	4193.9	219.2	4215	219	4245	216.8	4255	215.1
4275	212	4285	211.1	4305	210	4335	208.8	4355	207.3
4365	207	4375	207.3	4385	208	4395	208	4405	208
4410	207.5	4415	206.6	4425	206.2	4435	206.2	4445	206.3
4455	206.5	4465	206.5	4475	206.5	4485	206.4	4495	206
4505	205.9	4515	205.8	4525	205.7	4535	205.7	4545	205.7
4555	205.8	4565	205.9	4575	206	4585	206	4595	206.8
4605	207	4615	207	4625	208	4635	207.7	4645	208.2
4655	209.9	4665	210.8	4675	211.5	4685	212	4695	212.5
4705	213	4715	213.3	4725	213.7	4735	214	4745	214.5
4755	215	4760	215.8	4765	217.3	4768	218.1	4773.1	219.9
4777.2	221	4777.3	222	4777.4	224.5	4796	225.2	4895	224.5
4913	224	4921	216.5	4927	214.3	4933	213.3	4938	210.5
4944	210.4	4956	210.4	4969	210	4979	209.7	4991	209.3
5001	209.3	5012	209.1	5024	209	5034	209.4	5045	211.7
5057	213.3	5067	219.3	5079	221.3	5087	220.5	5095	220.3
5125	222.6	5151	224	5229.7	240	5269.3	243		

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val
 3402.2 .08 4140 .04 4765 .055 4913 .035 5125 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913 5125 540 464 520 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3402.2 4913 226 F
 5125 5269.3 222.6 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 30756

INPUT
 Description: 30756

Station Elevation Data num= 99									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3449.5	243	3463.6	240.8	3476.6	232.3	3502.5	232.3	3522.2	241.7
3553.3	241.1	3592	240.3	3636.5	239.9	3673.9	237.8	3764.5	238.2
3807.1	240.1	3849.2	238.1	3874.2	238.1	3945.5	240.9	4034.8	237.9
4066.8	240.1	4098.7	240.1	4133.2	237	4137.8	234.6	4157.5	234.5
4174.5	233.5	4263.9	227.8	4304.3	226.2	4310.6	225.3	4321.2	222.1
4365.6	214.1	4380.6	207.1	4410.6	206	4430.6	206.1	4460.6	208
4470.6	208.2	4480.6	208	4490.6	207.1	4560.6	207.2	4580.6	209
4590.6	210.2	4600.6	212.1	4610.6	210	4620.6	209.3	4630.6	209.7
4640.6	209.1	4650.6	209.1	4660.6	209.2	4670.6	209.3	4680.6	209.5
4690.6	209.8	4700.6	210.2	4710.6	210.7	4720.6	211.8	4730.6	213
4740.6	214	4750.6	215	4760.6	216.5	4761.6	216.4	4771.6	218.1
4776.6	219.4	4781.6	220.8	4787.5	222.2	4788.7	223.7	4809.6	224.9
4875.5	227.1	4896.5	225.8	4915	225.1	4928.3	216.1	4939.3	215.6
4945.3	213.1	4956.8	212.7	4968.3	212.3	4980.3	211.8	4990.8	211.6
5000.8	211.3	5011.8	211.3	5023.8	210.9	5036.3	210.7	5047.8	211.5
5054.8	213.1	5059.8	215.5	5072.8	216.2	5078.8	218.1	5082.5	217.5
5110	217.8	5124.8	217.5	5154.6	220.1	5216.9	232.4	5262.1	235.5
5277.3	234.7	5314	238.7	5363.5	239	5397.6	238.2	5473.5	239.8
5553.3	239.6	5732.1	235.9	5793.5	235.3	5846.6	234	5878.3	234
5898.1	237.8	5902.8	234.4	5933	236.4	5983.1	243.1		

Manning's n Values num= 5 Page 9

	Sta		n Val		Sta		n Val		Sta		n Val		Sta		n Val	
	3449.5	.07	4321.2	.04	4781.6	.055	4896.5	.035	5054.8	.07						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4915 5054.8 675 456 350 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3449.5 4915 227 F
 5054.8 5983.1 213.1 F
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 30300

INPUT
 Descri pti on: 30300

Stati on El evati on Data	num=	52								
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev										
4813.5 243 4833.7 242 4866.3 241.7 4902.6 240 4924.5 228.4										
4931.3 214.8 4943.8 214.2 4954.8 212.3 4965.8 211.6 4976.8 210.7										
4987.3 209.4 4998.8 209.5 5008.3 209.8 5019.3 210.3 5031.3 210.8										
5041.3 211.4 5045.3 212.3 5046.8 213.8 5068.8 214.8 5088.8 214.9										
5156.2 218.2 5195 217.6 5237.3 217.9 5270.3 216.7 5301.3 217										
5317.8 217.6 5332.4 215.7 5357.7 218.9 5407.8 225.9 5427.6 226.3										
5443.1 228.5 5463.7 230.3 5483.9 230.3 5487.7 230.8 5496.1 231.6										
5517.5 234.3 5535.9 235.4 5569.2 237.4 5620.2 237.7 5655.9 239.2										
5694.5 240 5725 239.2 5770.3 238.6 5809.6 238.8 5844.6 237.4										
5880.9 236.9 5919.4 237.2 5958.1 237.3 5985.2 237.3 6010.5 237.3										
6028.4 238.9 6043 243.2										

Manni ng' s n Val ues	num=	3			
Sta n Val Sta n Val Sta n Val					
4813.5 .055 4931.3 .035 5156.2 .055					

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.									
4931.3 5156.2 689.92 678.02 570.08 .1 .3									

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4813.5 4931.3 214.8 F
 5156.2 6043 218.2 F
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 29622

INPUT
 Descri pti on: 29622

Stati on El evati on Data	num=	49							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
4861.7 243.2 4873.4 239 4883 231.2 4891 232.4 4911 215.3									
4919 211.8 4920 210.8 4926 208.2 4931 208.4 4936 208.5									
4940 209 4946 208.2 4953 208.5 4962 209.1 4972 209.4									
4983 209.8 4993 210.7 5005 211.3 5019 211.3 5029 211.8									
5044 211.7 5062 211.1 5070 210.8 5078 210.4 5081 210.9									
5095 213.5 5114 216.1 5139 216.8 5149.1 217.2 5182.7 217.7									

RampoverPre.rep									
5219.1	218.5	5252.5	217.7	5279.2	216.7	5320.4	217.5	5360.7	218.8
5393.6	221.3	5432.8	224.1	5465.8	226.4	5504.8	228.8	5550.9	230.8
5598.1	233.2	5645.3	233.8	5688.5	233.6	5738.2	232.4	5769.3	232.3
5790	234.1	5807.5	236.1	5845.4	237.9	5870.9	243.1		

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4861.7	.055	4919	.035	5095	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4919	5095		1055.01	1141.95		1109.98	
Sediment El evati on =	0						.1	.3

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 28480

INPUT
 Descri pti on: 28480

Station El evati on Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4758.5	230	4803.3	214.7	4857.3	213.7	4896.1	215.4	4910.9	216.4
4923	214.5	4931.8	210.2	4946	206.8	4956	205.4	4970	204.6
4985	204.6	4999	204.5	5011	203.4	5023	203.5	5042	203.4
5046	202.1	5054	206.8	5063.5	210.9	5077	215.7	5096.4	223.6
5125.4	230								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4758.5	.055	4946	.035	5054	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4946	5054		480	488		490	
Sediment El evati on =	0						.3	.5

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27992

INPUT
 Descri pti on: 27992
 OAKLAND AVE. BRIDGE

Station El evati on Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4473.5	230	4530.7	226.5	4585.7	224.2	4652.2	221.2	4713.8	220.5
4765.3	220.2	4806.1	220.2	4857.7	220.1	4927.4	221.8	4928.5	206.8
4932	206.8	4932.1	206.8	4936.5	206.7	4947.5	205.2	4957.5	204.9
4967.5	204.8	4977.5	204.8	4987.5	205.2	4997.5	205.2	5007.5	204.5
5012.5	203.6	5012.6	203.6	5014.6	203.4	5014.7	203.4	5017.5	203
5027.5	204.6	5037.5	205.2	5047.5	204.9	5057.5	206	5063.7	206.7
5067.5	208.2	5074.5	209.1	5088.5	214.4	5094	215.7	5094.1	215.7
5096.5	215.7	5097.5	223.3	5143.7	222.2	5221.4	223	5307.1	230

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4473.5	.05	4927.4	.032	5097.5	.05

Ramp River Pre. rep

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4927.4	5097.5		55	55	.3	.5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4473.5 4927.4 221.8 F
 5097.5 5307.1 223.3 F
 Sedi ment El evati on = 0

BRI DGE

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 27964.5

INPUT
 Descri pti on: OAKLAND AVE. BRI DGE

Distance from Upstream XS = 14
 Deck/Roadway Wi dth = 27
 Wei r Coeffi ci ent = 2.7

Upstream Deck/Roadway Coordi nates
 num= 21

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4473.5		230	230		4530.7	226.5	226.5			4585.7	224.2	224.2		
4652.2	221.2	221.2	221.2		4713.8	220.5	220.5			4765.3	220.2	220.2		
4806.1	220.2	220.2	220.2		4857.7	220.1	220.1			4927.4	221.8	221.8		
4928.5	221.8	206.8	206.8		4932	222	206.8			4932.1	222	217		
5012.5	222.6	217.7	217.7		5014.7	222.6	217.8			5094	223.2	218.5		
5094.1	223.2	215.7	215.7		5096.5	223.2	215.7			5097.5	223.3	223.3		
5143.7	222.2	222.2	222.2		5221.4	223	223			5307.1	230	230		

Upstream Bridge Cross Section Data
 Stati on El evati on Data num= 40

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4473.5	230	4530.7	226.5	4585.7	224.2	4652.2	221.2	4713.8	220.5
4765.3	220.2	4806.1	220.2	4857.7	220.1	4927.4	221.8	4928.5	206.8
4932	206.8	4932.1	206.8	4936.5	206.7	4947.5	205.2	4957.5	204.9
4967.5	204.8	4977.5	204.8	4987.5	205.2	4997.5	205.2	5007.5	204.5
5012.5	203.6	5012.6	203.6	5014.6	203.4	5014.7	203.4	5017.5	203
5027.5	204.6	5037.5	205.2	5047.5	204.9	5057.5	206	5063.7	206.7
5067.5	208.2	5074.5	209.1	5088.5	214.4	5094	215.7	5094.1	215.7
5096.5	215.7	5097.5	223.3	5143.7	222.2	5221.4	223	5307.1	230

Manni ng' s n Val ues num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4473.5	.05	4927.4	.032	5097.5	.05

Bank Sta:	Left	Right	Coeff Contr.	Expan.
	4927.4	5097.5	.3	.5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4473.5 4927.4 221.8 F
 5097.5 5307.1 223.3 F
 Sedi ment El evati on = 0

Downstream Deck/Roadway Coordi nates
 num= 14

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4857.7	220.1	220.1	220.1		4927.4	221.8	221.8			4928.5	221.8	206.8		
4932	222	206.8	206.8		4932.1	222	217			5012.5	222.6	217.7		
5014.7	222.6	217.8	217.8		5094	223.2	218.5			5094.1	223.2	215.7		
5096.5	223.2	215.7	215.7		5097.5	223.3	223.3			5143.7	222.2	222.2		
5221.4	223	223	223		5307.1	230	230							

RampORi verPre. rep

Downstream Bridge Cross Section Data

Station Elevation Data		Data num= 33		Sta Elevation		Sta Elevation		Sta Elevation		Sta Elevation	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4456.7	230	4478.3	229.2	4556.2	225.2	4635.7	221.6	4731.4	220.8		
4793.2	220.2	4868.6	220.7	4935.5	222	4936.5	206.7	4936.6	206.2		
4944.5	204.9	4954.5	205.1	4964.5	205.3	4974.5	205.3	4984.5	205		
4994.5	204.5	4998.5	205	5004.5	206.1	5009.5	206.2	5014.5	205.9		
5024.5	205.4	5034.5	205.8	5044.5	206.3	5054.5	205.9	5063.5	206.7		
5065.5	207.7	5066.5	209.5	5093.5	216.1	5094.5	223.5	5155.2	224		
5185.1	225	5229.3	227	5263.2	230						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4456.7	.05	4935.5	.034	5094.5	.05

Bank Sta: Left Right Coeff Contr. Expan.
 4935.5 5094.5 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4456.7 4935.5 222 F
 5094.5 5263.2 223.5 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 220.1
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

Pier Station Upstream= 5013.6 Downstream= 5014.6
 Upstream num= 2
 Width Elev Width Elev
 2 203 2 218.5
 Downstream num= 2
 Width Elev Width Elev
 2 204.5 2 218.5

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Momentum Cd = 1.5
 Yarnell KVal = .9

Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8164966
 Max Low Cord = 218.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

RamporiverPre.rep

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 27937

INPUT
Description: 27937

Station Elevation Data		num= 33	
Sta	Elev	Sta	Elev
4456.7	230	4478.3	229.2
4793.2	220.2	4868.6	220.7
4944.5	204.9	4954.5	205.1
4994.5	204.5	4998.5	205
5024.5	205.4	5034.5	205.8
5065.5	207.7	5066.5	209.5
5185.1	225	5229.3	227

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4456.7	.05	4935.5	.034
		5094.5	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4935.5	5094.5		310.03	317.03		.3	.5
Ineffective Flow	num= 2							
Sta L	Sta R	Elev	Permanent					
4456.7	4935.5	222	F					
5094.5	5263.2	223.5	F					
Sediment Elevation	= 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 27620

INPUT
Description: 27620

Station Elevation Data		num= 37	
Sta	Elev	Sta	Elev
4155.7	230.1	4195.4	221.3
4313.6	219.5	4355.3	221.5
4542.3	217.5	4550.6	217.2
4770.1	213.3	4780.9	213.4
4927.4	213.2	4935.4	208.1
4980	205.1	4998.4	204.8
5048.4	203.2	5057.5	205.5
5106.9	220	5124.6	230

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4155.7	.04	4927.4	.03
		5091.7	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4927.4	5091.7		339.99	347.97		.1	.3
Sediment Elevation	= 0							

CROSS SECTION

RamporiverPre. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 27272

INPUT

Description: 27272

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4355	230	4360	229	4366	228	4528	226	4592	224
4630	222	4682	220	4704	218	4729	216	4754	214
4875	213.5	4903.2	211.8	4926	206.4	4941.5	205.4	4952.3	205.5
4960.4	205.7	4972.4	205.5	4983.2	205.5	4997	204.7	5008.4	204.7
5032.7	204.5	5049	204.4	5063.7	204.3	5074.2	206.5	5082.7	213.5
5105.5	213.5	5125	213.5	5137	214	5169	216	5176	218
5182	220	5205	230						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4355	.04	4875	.03	5082.7	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4875 5082.7 225 225 225 .1 .3
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 27047

INPUT

Description: 27047

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4642	230	4686	220	4694	218	4710	214	4808	214
4850	214.7	4870	214.3	4870.1	213.3	4894	212.7	4908	211.3
4927	206.6	4935	205.9	4945	205.3	4955	205.1	4968	205.3
4982	205.3	4996	205.1	5010	204.9	5020	204.4	5034	204.1
5048	203.9	5060	204.3	5073	206.5	5097	208.8	5100	214.4
5127	213.1	5174	212.6	5243	213.1	5263	214	5283	216
5298	218	5307	220	5322	230				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4642	.04	4935	.03	5073	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4935 5073 170 235 300 .1 .3
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 26812

INPUT

Description: 26812

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4810	230	4840	220	4848	218	4854	216	4862	214

4871	212.5	4890	211.9	4907.3	211.8	4923	206.5	4925	205.3
4937	204.3	4952	204.8	4967	204.4	4999	203.9	5024	203.1
5037	202.1	5053	206.6	5066	204.5	5075	206.2	5087	215.1
5100	215.5	5111	216	5212	216	5224	214	5244	214
5248	216	5250	218	5261	220	5296	230		

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4810	.04	4925	.03	5053	.05

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4925	5053		25	50	55		.1	.3
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26762

INPUT
 Description: 26762
 RAILROAD BRIDGE

Station Elevation Data										num=	33
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4828.23	221.86	4842	217.54	4852	214.5	4852.1	214.5	4866	211.2		
4890	211.4	4900.8	209	4920.1	209	4933.5	206.6	4947	205.8		
4947.1	205.8	4950	205.7	4951.8	204.2	4954	204.2	4954.1	204.2		
4970.6	203.8	4986.9	203.4	5000.6	202.9	5015.8	202.9	5025	202.9		
5035.3	202.4	5049.2	203.3	5049.3	203.3	5057	203.6	5057.1	203.6		
5063.2	203.8	5066.5	206.5	5076.5	210.4	5105.1	212.3	5130.4	213.5		
5139	213.8	5144.6	214.9	5151	224.1						

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4828.23	.04	4950	.03	5066.5	.05

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4950	5066.5		40	41	45		.4	.6
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26721

INPUT
 Description: RAILROAD BRIDGE

Station Elevation Data												num=	29
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4818.67	219.48	4831.93	215.55	4843.1	212.4	4872.8	212	4884.2	211.5				
4891.3	209	4908.1	206.5	4916.6	205.7	4929.3	206.4	4940.3	204.9				
4951.2	204.7	4960.2	206.5	4967.9	206.6	4982.7	205.2	4985.5	203.3				
5002.6	202	5005.2	201.5	5022.4	198.5	5045.5	201.5	5078.2	203.7				
5091.9	206.5	5093.3	209.5	5103.6	213	5110.3	212.7	5118.6	212.5				
5126	213.6	5135.54	215.03	5146.39	218.17	5150.6	219.61						

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4818.67	.04	4908.1	.03	5091.9	.05

RamporiverPre.rep

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4908.1 5091.9 130 89 50 .4 .6
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 26632

INPUT
 Descri pti on: 26632

Station El evati on Data			num= 39								
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4586.3	228	4624.7	221.3	4666.5	220.5	4732.1	220.3	4775.6	221		
4804.1	220.2	4822.5	214.3	4872.5	213.5	4890.5	211.9	4899.5	208.7		
4911	206.3	4922.5	205.3	4934.5	204.8	4946.5	204.3	4959.5	203.5		
4966.5	202.7	4974.5	202.6	4982.5	202.3	4989.5	202.6	4996.5	203		
5004.5	203.7	5012.5	204.6	5018.5	205.4	5025.5	206.3	5033.5	206.9		
5040.5	206.3	5052.5	204.9	5060.5	203.4	5065.5	202.4	5071.5	201.1		
5084.8	203.8	5089.1	206.4	5100.3	213.1	5109.7	212.8	5133	212.8		
5154.2	213.2	5181.5	213.4	5202	220	5238.5	228				

Manni ng' s n Val ues			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4586.3	.07	4872.5	.045	5100.3	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4872.5 5100.3 90 99 120 .4 .6
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 26533

INPUT
 Descri pti on: 26533

Station El evati on Data			num= 36								
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4598.8	228	4653.3	220.6	4718.5	220.6	4798.5	224.4	4840.8	222		
4864.5	217.7	4877	217.7	4891	217.2	4905.1	213.3	4907.5	206.8		
4920.2	206.2	4932.5	206.6	4944.7	206.4	4955.8	205.7	4966.4	205		
4977.6	203.1	4988	203.1	4996.6	203	5011.8	202.8	5028.3	202.3		
5040.9	202.2	5056.8	203.1	5067.5	205.9	5082.4	206.4	5089.7	205.4		
5111	206.3	5139	209.3	5148.4	215.7	5161	215.7	5210.5	212.2		
5278.8	212.3	5357.7	212.3	5411.3	212.4	5450	212.7	5487.1	220		
5517	228										

Manni ng' s n Val ues			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4598.8	.07	4891	.045	5148.4	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4891 5148.4 400 376 340 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RamporiverPre. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 26157

INPUT

Description: 26157

Station		Elevation		Data		num= 29			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4738.4	228	4771.4	224	4812	212.9	4850.7	212	4920.7	213.7
4931.8	206.5	4951.9	203.7	4968.9	204.9	4990.7	204.9	5010.6	203.5
5031.9	203.4	5052.1	204.3	5068.3	206.4	5080.4	209.2	5081.1	212.1
5097.9	212	5183.5	212.2	5204.4	212.5	5219.5	212.3	5303.7	210
5334.3	209.7	5373.6	212.2	5479.2	212.6	5493.5	210.8	5507	210.9
5521.9	210.8	5617.5	210.3	5697	220	5716	228		

Manning's n		Values		num= 3	
Sta	n Val	Sta	n Val	Sta	n Val
4738.4	.07	4920.7	.045	5081.1	.07

Bank Sta: Left 4920.7 Right 5081.1 Lengths: Left Channel 279.96 Right 267 Coeff Contr. .1 Expan. .3
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 25890

INPUT

Description: 25890

Station		Elevation		Data		num= 35			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4337.5	228	4411.1	222	4459.9	218.6	4532.3	213	4575.8	214
4608.3	220.4	4664.1	222.7	4704.5	214.3	4725.2	212.4	4801.4	212.2
4872.4	212.3	4916.4	211.4	4916.5	210.9	4947.4	206.5	4957.4	204.4
4972.4	203.9	4987.4	203.8	4999.4	203.5	5017.4	204	5032.4	204.1
5052.7	206.5	5060.2	211.9	5091.7	212.8	5169.9	212.5	5184.7	212.4
5228.6	212.3	5288	212	5385.8	211.2	5460.8	210.8	5534.7	210.8
5571.5	211.3	5640.5	210.2	5699.6	208	5714	210.3	5754.3	228

Manning's n		Values		num= 3	
Sta	n Val	Sta	n Val	Sta	n Val
4337.5	.07	4947.4	.045	5060.2	.07

Bank Sta: Left 4947.4 Right 5060.2 Lengths: Left Channel 350 Right 233 Coeff Contr. .1 Expan. .3
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 25657

INPUT

Description: 25657

Station		Elevation		Data		num= 50			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3370.3	228	3439.1	222	3524.1	220.5	3575.4	220.5	3602.4	224

RampoverPre.rep									
3641.6	226	3687.7	222	3723.3	216.4	3803.9	214.3	3890.9	212.9
4007.9	211.7	4097.4	211.5	4112.3	210.1	4148.2	210	4228.8	210.2
4304.1	210.7	4404.6	211.5	4561.2	211.4	4691	211.5	4733.7	212.2
4775.6	213.2	4837.8	212.3	4902.2	212.9	4935.7	212.6	4948.7	206.4
4954.7	204.6	4963.7	204.4	4975.7	203.9	4984.7	203.9	4995.7	204.9
5006.7	205.4	5039.7	205.9	5051.3	206.4	5062.8	210.9	5062.9	213.3
5063.5	213	5079.3	212.4	5165.5	210.9	5182	211	5192.9	210.6
5274	210.7	5312.8	210.4	5415.4	210.6	5527	210.4	5541.8	210.5
5555.2	210.2	5574	210.8	5679	210.2	5740.8	210	5780.2	228

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
3370.3	.07	4935.7	.045
		5062.9	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4935.7	5062.9		270	237		.1	.3
Sediment El evati on =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25420

INPUT
 Descri ption: 25420

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3818.06	216.56	3898.13	213.28	3985.9	209.5	4137.2	209.2	4266.8	209.1
4334.8	210.2	4474.4	212.3	4669.9	211.6	4730.7	212.1	4795	211.4
4825.7	212.2	4880	212.2	4933.9	211.9	4938.8	211.9	4938.9	213.5
4949.4	206.2	4949.9	205.2	4956.9	203.3	4965.9	203.4	4979.9	203.8
4995.9	204.4	5016.9	204.9	5037.9	205.2	5050.6	206.2	5052.3	213.3
5053	212.7	5065.3	212.1	5124.8	212.1	5171.3	211	5304.6	210.6
5390.3	210.4	5467.9	210.5	5521.3	210.7	5544.4	210.2	5563.5	210.6
5689.7	210.3	5755.34	210.98	5802.05	212.7	5839.86	214.51	5884.34	216.87

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
3818.06	.07	4938.9	.045
		5052.3	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4938.9	5052.3		180	255		.1	.3
Sediment El evati on =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25165

INPUT
 Descri ption: 25165

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4006.41	216.97	4078.9	206.5	4094.11	210.7	4109.68	208.8	4152.43	208.8
4205.89	209	4223.98	210.1	4260.43	212.2	4290.76	212.4	4345.66	211
4380.31	211.1	4416.49	211.2	4457.8	210.5	4502.89	210.5	4555	210.7
4594.51	210.3	4647.16	210.9	4699.54	211	4749.76	211	4777.48	210.7
4810.24	207.3	4817.71	207.3	4832.29	211	4845.79	211.5	4847.59	213.9
4849.39	210.5	4863.79	212	4876.39	212	4890.79	212	4893.49	212

Ramapo River Pre. rep

4895.29	204.1	4897.09	202.7	4915.99	201.9	4929.49	201.8	4933.99	203.8
4943.89	203.8	4951.99	205	4957.39	205.7	4973.59	206.7	4997.89	206.6
5025.88	206.7	5042.98	207.8	5061.61	211	5079.52	211.5	5101.57	211.8
5109.31	212.6	5126.32	212	5158.72	212	5185	212.8	5206.78	211.8
5229.73	211.5	5240.35	210.5	5259.88	210.7	5288.32	210.3	5334.22	210.8
5401.63	210.5	5439.34	210.6	5495.95	210.4	5555.17	210.9	5582.62	210.6
5601.52	211.5	5635.05	212.52	5665.48	214.41	5715.12	216.97		

Manning's n Values num= 3

Station Val	Station Val	Station Val
4006.41	.06	4847.59
		.045
		5079.52
		.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4847.59	5079.52	15	20	7	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4006.41	4847.59	210	F
5079.52	5715.12	210	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 25145

INPUT
Description: 25145

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2940.9	2283069.435	224.4	3254.59	224.23	425.875	225.1	3473.09		225
3758.47	216.1	3866.2	2203953.125	216	4013.83	206.24	4086.695	208.3	208.3
4203.165	210.9	4324.1	210.9	4431.64	210.6	4614.61	210.7	4733.55	210.6
4789.41	207.8	4822.945	210.9	4833.395	210.8	4850.495	211.7	4851.445	213.9
4852.395	213	4859.995	213	4863.795	213	4882.795	213	4883.745	203.2
4894.195	202.2	4900.845	200.7	4914.145	201.1	4924.595	201.6	4930.295	202.3
4931.245	204.9	4932.195	206.1	4942.645	205.9	4942.74	208.5	5007.245	208.7
5105.855	211.2	5163.045	212.5	5200.095	212.2	5261.655	210.5	5365.015	210.3
5473.695	210.3	5589.12	210.8	5715.09	210.7	5825.385	210.5	5843.815	220.1
5926.75	228								

Manning's n Values num= 3

Station Val	Station Val	Station Val
2940.9	.24	4851.445
		.025
		4942.74
		.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4851.445	4942.74	10	15	7	.7	.9
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2940.9	4851.445	210	F
4942.74	5926.75	210	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 25130

INPUT
Description: 25130

Ramapo River Pre. rep

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3919.7	219.83	21.908	210.4008	404	206.54	091.348	208.7	4202.42	211.2
4384.628	210.74	497.236	210.5	4650.74	210.74	766.132	211.14	790.612	208.2
4830.068	210.64	843.412	208.74	843.508	210.64	858.868	211.48	64.628	204.3
4874.228	201.94	885.748	202.54	891.508	201.54	897.268	198.54	927.988	201.5
4937.588	202.24	941.428	203.24	961.588	203.24	976.948	203.50	002.868	203.7
5022.068	203.75	033.588	203.55	047.988	204.75	057.588	206.50	68.148	206.1
5121.908	211.25	142.068	211.95	189.396	212.15	212.148	212.1	5266.58	210.5
5428.34	210.45	528.756	210.25	597.876	210.95	632.724	211.6	5659.43	212.24
5682.56	213.01	5741.99	214.4	5775.36	215.88	5830.96	217.41		

Manning's n Values

Sta	n Val	Sta	n Val
3919.7	.055	4858.868	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4858.868	5121.908		10	43	90		.7	.9

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 25087

INPUT

Description: 25087

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4017.44	216.74	4059.79	211.14	4102.3	208.4	4141	210	4208.4	210.3
4293	210.6	4422.2	210.1	4559.4	210.2	4688.6	211	4785.6	210.3
4821.6	210.4	4835.2	208.4	4852	211.9	4909	210.5	4912	206.9
4919	204.9	4931	202	4945	199.8	4951	197.7	4965	197.1
4981	196.5	4998	200.6	5018	201.5	5031	203.1	5043	201.8
5051	200.5	5063	199.6	5070	198.9	5079	199.5	5080	204.9
5081	208.5	5124	209.3	5169.2	210.2	5242.6	210.7	5306.3	210.8
5352.8	210.6	5368.1	210.5	5397.51	211.19	5411.21	213.44	5444.84	215.59
5470.46	217.56								

Manning's n Values

Sta	n Val	Sta	n Val
4017.44	.055	4931	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4931	5080		150	137.01	120		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 24950

INPUT

Description: 24950

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3820.82	216.72	3843.24	214.76	3880.07	212.28	3936.6	209	4084.1	210.7
4259.4	210.3	4446.4	210.7	4581.5	210.7	4640	210.6	4671.5	207.8
4731.1	211	4814.5	210.1	4873	210	4913	209.8	4914	204.8

RampoverPre.rep									
4915	202	4926	201.2	4929	202	4940	203.4	4951	204.3
4977	204.8	4993	204.8	5009	204.2	5024	202.8	5032	201.8
5042	201.8	5055	202.8	5067	202.4	5075	202.8	5085	204.8
5103	209.7	5121	210	5232.1	210.6	5260.1	210.3	5293.1	210.4
5400.7	210.2	5439.6	210.5	5469.9	210.5	5505.6	211.3	5542.35	211.97
5572.78	214.03	5621.89	216.03	5668.59	217.17				

Manning's n Values					
Station	Value	Station	Value	Station	Value
3820.82	.055	4915	.04	5024	.055

Bank Station	Left	Right	Lengths	Left Channel	Right	Coeff	Contr.	Expan.
	4915	5024		179.01	128.01		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24822

INPUT
Description: 24822

Station Elevation Data									
Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation
3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	3429.4	210.3
3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	4082.5	209.8
4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	4400	203.3
4450	203.3	4480	208	4550	212.8	4600	209	4637.9	209.8
4701.8	209.3	4754.9	208.9	4833.6	208.4	4903	208.1	4935	207.6
4947	206.4	4949	204.8	4953	199.6	4972	198.4	4981	199.6
4995	200.1	5010	202.8	5024	201.6	5031	201.3	5051	204.8
5069	208.8	5099	209.2	5159	208	5229	206	5248	204
5262	204	5276	206	5294	208	5334	208	5394	208.2
5446.62	208.55	5475.53	209.89	5491.1	212.34	5517.79	214.25	5604.98	216.6

Manning's n Values					
Station	Value	Station	Value	Station	Value
3096	.055	4972	.04	5051	.055

Bank Station	Left	Right	Lengths	Left Channel	Right	Coeff	Contr.	Expan.
	4972	5051		1	87		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24735

INPUT
Description: 24735
This is a REPEATED section.

Station Elevation Data									
Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation
1992.8	228	2124	224.3	2533.6	224.4	2901	215.9	3003.9	215.4
3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	3429.4	210.3
3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	4082.5	209.8
4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	4400	203.3
4450	203.3	4480	208	4550	212.8	4600	209	4637.9	209.8
4701.8	209.3	4754.9	208.9	4833.6	208.4	4895.1	209.2	4932	211.6

RampoverPre.rep									
4946.5	212.1	4952	212.2	4965	203.1	4973	202	4983	200.8
4990	203	5010	203.1	5018	200.8	5024	200.3	5028	201
5035	202.8	5037	203	5109	205	5149	206.3	5160	209.5
5173	209	5179	211.4	5227	212.3	5283	212.7	5303	212.6
5344	212.1	5357	212	5364	207.9	5368	207.7	5390	211.7
5411	211	5425	211	5440	207.8	5484	207.5	5509	205.7
5514	202.1	5521	200.9	5534	200.3	5541	198	5551	198.2
5562	198.2	5572	198.4	5582	198	5590	200	5593	202.1
5597	205.3	5612	217.2	5628	226.3				

Manning's n Values										
num=	6									
Sta n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1992.8	.2	4637.9	.04	4833.6	.055	4965	.04	5037	.055	
5509	.04									

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.									
4965	5035		1	45	50		.3	.5	
Ineffective Flow									
num=	2								
Sta L	Sta R	El ev	Permanent						
1992.8	4965	209	F						
5035	5628	202.3	F						
Sediment El evation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24690

INPUT
 Description: 24690

Station Elevation Data									
num=	73								
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
1992.8	228	2124	224.3	2533.6	224.4	2901	215.9	3003.9	215.4
3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	3429.4	210.3
3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	4082.5	209.8
4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	4400	203.3
4450	203.3	4480	208	4550	212.8	4600	209	4637.9	209.8
4701.8	209.3	4754.9	208.9	4833.6	208.4	4895.1	209.2	4932	211.6
4946.5	212.1	4952	212.2	4965	203.1	4973	202	4983	200.8
4990	203	5010	203.1	5018	200.8	5024	200.3	5028	201
5035	202.8	5037	203	5109	205	5149	206.3	5160	209.5
5173	209	5179	211.4	5227	212.3	5283	212.7	5303	212.6
5344	212.1	5357	212	5364	207.9	5368	207.7	5390	211.7
5411	211	5425	211	5440	207.8	5484	207.5	5509	205.7
5514	202.1	5521	200.9	5534	200.3	5541	198	5551	198.2
5562	198.2	5572	198.4	5582	198	5590	200	5593	202.1
5597	205.3	5612	217.2	5628	226.3				

Manning's n Values										
num=	6									
Sta n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1992.8	.2	4637.9	.04	4833.6	.055	4965	.04	5037	.055	
5509	.04									

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.									
4965	5035		1	213	525		.3	.5	
Ineffective Flow									
num=	2								
Sta L	Sta R	El ev	Permanent						
1992.8	4965	209	F						
5035	5628	205.7	F						
Sediment El evation = 0									

RamporiverPre.rep

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 24477

INPUT

Description: 24477

Station Elevation Data		num= 100		Station Elevation Data		num= 100		Station Elevation Data		num= 100	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2785.5	228	2903.2	225.3	3288.6	224.3	3309.1	225.9	3323.8	216.9		
3337.5	217.3	3727.4	217	3731.3	217.4	3743.4	215.2	3793.7	215.6		
3819.5	216.9	3847	217	3855.8	218.3	3914.9	213	3927.2	207.2		
3939.5	207.2	3963.8	209.1	3980.5	207.3	4010.1	209.6	4082.5	210.7		
4104.9	210.7	4579.9	210.9	4599	210.6	4715.8	205.9	4735.2	210.4		
4767.5	211	4814.7	210	4850.3	210.2	4857	209.3	4915.8	209.7		
4971.1	208.7	4971.6	210.3	4972.5	205.1	5006.7	207.4	5027.5	207.1		
5030.2	210.2	5064.1	210.7	5068.5	212.9	5082.4	213.4	5087.3	213.2		
5093	210	5123	208	5131	206	5151	205	5181	206		
5221	206.5	5254	206	5258	204	5266	202.5	5277	187.6		
5287	186.8	5297	186.6	5307	186.8	5317	186.8	5327	186.8		
5337	187.5	5347	188	5357	188.3	5367	188.8	5377	189.3		
5387	189.8	5397	190.8	5407	191.8	5417	193.3	5427	194.8		
5437	195.8	5447	196.8	5457	196.8	5467	195.3	5477	195.8		
5487	195.5	5497	196.3	5507	197.3	5517	197.7	5527	199.1		
5538	200.5	5542.3	201.9	5548.5	202.8	5572.7	205.6	5592.7	210.8		
5597.9	209.1	5645.8	212	5650.3	213.3	5650.4	213.3	5655	210.8		
5666	206	5666.1	206	5675.3	202.4	5692.6	201.4	5700	201		
5707.4	200.7	5718.1	202.1	5727	205	5727.1	205.1	5759.6	214.1		
5759.7	214.1	5783.9	213.9	5853.6	216.3	5945	223	5955.2	228.1		

Manning's n Values		num= 3		Manning's n Values	
Station	Value	Station	Value	Station	Value
2785.5	.2	5266	.048	5542.3	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5266	5542.3		10	72		.1	.3
Ineffective Flow	num= 2		Permanent					
Station L	Station R	Elev	F					
2785.5	5266	209	F					
5542.3	5955.2	205.7	F					
Sediment Elevation	= 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 24405

INPUT

Description: TIMBER BRIDGE
 TIMBER BRIDGE

Station Elevation Data		num= 100		Station Elevation Data		num= 100		Station Elevation Data		num= 100	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2785.5	228	2903.2	225.3	3288.6	224.3	3309.1	225.9	3323.8	216.9		
3337.5	217.3	3727.4	217	3731.3	217.4	3743.4	215.2	3793.7	215.6		
3819.5	216.9	3847	217	3855.8	218.3	3914.9	213	3927.2	207.2		
3939.5	207.2	3963.8	209.1	3980.5	207.3	4010.1	209.6	4082.5	210.7		
4104.9	210.7	4579.9	210.9	4599	210.6	4715.8	205.9	4735.2	210.4		
4767.5	211	4814.7	210	4850.3	210.2	4857	209.3	4915.8	209.7		
4971.1	208.7	4971.6	210.3	4972.5	205.1	5006.7	207.4	5027.5	207.1		

RampoverPre.rep									
5030.2	210.2	5064.1	210.7	5068.5	212.9	5082.4	213.4	5087.3	213.2
5127.3	193.4	5167	184	5207	191.4	5217	191.8	5227	191
5237	189.6	5247	188.8	5257	188.3	5267	187.8	5277	187.6
5287	186.8	5297	186.6	5307	186.8	5317	186.8	5327	186.8
5337	187.5	5347	188	5357	188.3	5367	188.8	5377	189.3
5387	189.8	5397	190.8	5407	191.8	5417	193.3	5427	194.8
5437	195.8	5447	196.8	5457	196.8	5467	195.3	5477	195.8
5487	195.5	5497	196.3	5507	197.3	5517	197.7	5527	199.1
5538	200.5	5542.3	201.9	5548.5	202.8	5572.7	205.6	5592.7	210.8
5597.9	209.1	5645.8	212	5650.3	213.3	5650.4	213.3	5655	210.8
5666	206	5666.1	206	5675.3	202.4	5692.6	201.4	5700	201
5707.4	200.7	5718.1	202.1	5727	205	5727.1	205.1	5759.6	214.1
5759.7	214.1	5783.9	213.9	5853.6	216.3	5945	223	5955.2	228.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2785.5 .2 5087.3 .048 5548.5 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5087.3 5548.5 55 55 55 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2785.5 5087.3 209 F
 5548.5 5955.2 204.7 F

Cross Section Lid num= 9
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 5650.3 213.3 213.3 5650.4 214.6 213.3 5655 214.6 210.8
 5666 214.6 206 5666.1 214.6 210.8 5700 214.8 210.8
 5727 214.6 210.8 5727.1 214.6 205.1 5759.6 214.6 214.1

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24350

INPUT
 Description: 24350

Stations Elevation Data num= 98									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3173.2	228	3299.3	224.4	3323.8	225.3	3720.7	224.6	3723.4	226.7
3737.8	217.7	4031.1	216.9	4082.4	217.8	4142.5	217.5	4161.5	215.2
4269.7	217.1	4340.3	214.5	4360.6	206.4	4380.6	206.4	4400.6	212.7
4419.1	209.1	4449.6	208.8	4521.5	210.6	4565.2	210.6	4646	210.1
4818.7	211	4854.8	211	4861.1	209.2	4933.6	209.5	4974.8	208.5
4975.5	210.3	4976.1	205.2	5001	206.6	5023.9	206.8	5027.7	209.9
5063.7	210.4	5068	212.8	5079	213.2	5104.1	202.8	5189	177.7
5199	177.7	5222	181.3	5249	182.9	5279	185.8	5299	185.9
5309	186.5	5319	186.6	5329	186.9	5339	187.2	5349	187.6
5379	187.8	5389	188	5409	188.1	5419	189.7	5429	190
5439	190.7	5449	192.2	5459	193.5	5464	194	5469	193.4
5474	192.8	5479	194.3	5484	193.3	5489	193	5496	193.5
5499	193.3	5502	193.5	5506	193.3	5509	193.7	5516	193
5519	193	5529	191.3	5539	190	5541	189.8	5549	191.9
5559	195.3	5564	195.9	5570.3	196.9	5579.6	199.3	5589.6	201.9
5594.1	202.9	5612.2	207	5638	207.3	5650.2	210.3	5655.8	210.6
5662.8	212.5	5669	212.6	5675.8	212.4	5685.6	204.1	5695	201.5
5707.1	201.3	5718.6	200.9	5731.7	201.3	5744	201.6	5756.4	203.1
5779.8	207.1	5834.3	214	5857.4	214.7	5934.7	215.7	5951	220.4
5954	220.3	5999.8	222.8	6010.7	228				

Ramapo River Pre. rep

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3173.2 .2 5104.1 .048 5594.1 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5104.1 5594.1 129.99 140.01 170.01 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3173.2 5104.1 209 F
 5594.1 6010.7 204.7 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24210

INPUT
 Description: 24210

Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2833.9	227	2957.7	224.3	3366.9	224.4	3695.5	216.9	3811.9	218
3978	216.2	4039.4	210	4062.1	206.2	4137.6	209.4	4252.5	209.9
4369	210.2	4465	210.1	4538	211.6	4599	211.3	4660	207.4
4734	204.3	4735	203.9	4739	203.5	4745	202.8	4749	202.5
4759	201.9	4769	201.9	4779	201.9	4789	203.9	4792	204
4797	204.3	4799	210.3	4799.1	205.8	4801	210.4	4801.1	205.9
4881	209.9	4952	208.8	4975.9	207.9	4976	205.5	5006	206.1
5014	205.2	5024	204.4	5035	208.9	5082	210.4	5090	212.4
5101	212.7	5121	202.7	5143	196.4	5146	194.9	5166	188.9
5186	181.9	5206	176.4	5226	177.9	5246	182.1	5266	182.9
5286	183.7	5306	184.6	5326	184.9	5346	185.2	5366	185.4
5386	185.8	5406	185.9	5426	185.9	5446	185.9	5466	186.4
5486	187.4	5506	188.2	5526	188.9	5546	188.9	5566	188.9
5586	189.1	5606	188.9	5626	188.7	5646	189	5666	189.1
5686	188.4	5706	187.4	5726	186.4	5746	184.9	5766	186.9
5786	191.9	5796	194.4	5806	194.4	5826	196.7	5836	202.9
5861	211.9	5881	211.5	5901	201.4	5911	200.3	5923	200.6
5933	201.5	5953	202.6	6070.2	223.4	6088.2	223.5	6103	223.3
6108.8	227								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2833.9 .2 5121 .048 5836 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5121 5836 130 178 315 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2833.9 5121 209 F
 5836 6108.8 204.7 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24032

INPUT

RamporiverPre. rep

Description: 24032

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4408.01	217.78	4419.22	214.48	4451.25	212.72	4492	211.8	4567	212.5
4642	211.4	4682	206.5	4747	204	4757	203.1	4767	202.3
4777	201.2	4787	200.6	4797	199.9	4807	200.3	4817	201.5
4822	202.6	4907	210.2	4967	208.3	4983	203.4	4988	202.2
5002	202.4	5007	202.9	5017	203.5	5024	208.2	5063	208.6
5071	212.1	5083	212.2	5102	202.9	5112	193.9	5120	192.4
5140	188.4	5160	182.4	5180	184.6	5200	186.9	5220	186.9
5240	186.9	5260	187.4	5280	187.9	5300	185.4	5320	184.9
5340	182.9	5360	181.4	5380	180.4	5400	180.1	5420	180.8
5440	184.4	5460	184.8	5480	183.9	5500	183.7	5520	183.9
5540	184.4	5560	184.9	5580	186.7	5590	187.4	5600	186.7
5620	186.7	5640	186.9	5660	187.1	5680	187.1	5700	187.4
5720	187.7	5740	187.4	5760	187.4	5780	188.1	5800	189.3
5820	189.1	5840	186.9	5860	185.9	5880	190.9	5900	192.2
5910	193.4	5920	192.1	5940	191.9	5960	195.9	5963	202.9
5980	210.1	5994	210	6006	203.6	6018	202.9	6029	201.4
6038	200.8	6047	200.1	6059	200.1	6068	201.6	6073	203.9
6090	213.4	6123.13	218.08						

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4408.01	.2	5102	.048	5963	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5102	5963		140	172		.1	.3
Ineffective Flow	num=		2					
Sta L	Sta R	Elev	Permanent					
4408.01	5102	209	F					
5963	6123.13	204.7	F					
Sediment Elevation	= 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23860

INPUT
 Description: 23860

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2891.2	227	2989.9	224.5	3383.7	223.7	3423.9	224.5	3536.2	220.2
3601.7	222.1	3637.3	222.8	3715	221.1	3853	221.8	3879.1	215.2
4068.4	214.1	4150.2	211.3	4324.6	209.1	4416.5	211.4	4449	211.5
4521	211.1	4586	211	4664	210.1	4733	207.2	4796	207
4848	206.1	4869	210.8	4902	210.9	4969	209	4976	203.9
5003	203.4	5024	204.2	5036	211	5053	211.8	5057	212.7
5068	212.7	5084	206.7	5089	207.1	5095	202.7	5115	198
5131	194.2	5142	191.7	5162	187.7	5182	181.9	5192	181.7
5202	182.7	5222	187.4	5242	187.4	5262	187.4	5282	186.7
5302	186.7	5322	185.7	5342	181.2	5362	183.5	5382	183.7
5402	184.2	5422	184.7	5442	185.7	5462	186.5	5482	187.2
5502	188.2	5522	187.7	5542	186.9	5562	186.6	5582	184.7
5602	183.2	5622	182.7	5642	182.7	5662	183.7	5682	184.4
5702	185.6	5722	186.4	5742	185.7	5752	184.4	5762	185.4
5782	185.9	5802	186.8	5822	187.7	5842	187.6	5862	188.7
5872	189.7	5882	188.7	5902	183.7	5922	184.3	5942	190.2
5962	190.9	5982	195.2	5987.4	202.7	5994	209.2	6003	209

6027	203.1	6040	202.6	RampoverPre. rep	6052	201.4	6060	200.7	6070	200.3
6083	200.4	6088	201.6		6092	203.9	6108	213.7	6129.1	227

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2891.2 .2 5095 .048 5987.4 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5095 5987.4 135 144.99 140.01 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2891.2 5095 209 F
 5987.4 6129.1 204.7 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23715

INPUT
 Description: 23715

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3041	227.1	3096.2	224.4	3199.6	228.8	3358.7	224.6	3427.6	223.6
3530.4	224.6	3615.7	224.1	3657.5	223.4	3708.2	223.8	3888.7	222.9
3927.2	215.3	4070.8	214.1	4149.2	213.5	4202.6	210.7	4402	208.9
4476.3	210.1	4535.4	210.3	4585.1	210.7	4626	210.3	4658	210.2
4711	210.8	4744	210.3	4785	210.4	4822	210.3	4855	210.6
4886	210.7	4911	210.2	4937	209.7	4965	205.6	4982	202.9
4989	202.2	4996	201.8	5002	201.4	5009	201.6	5018	203
5027	208.3	5037	207.8	5046	211.2	5079.8	202.6	5080	202.7
5123	189.7	5143	187.7	5163	187.7	5183	187.2	5203	185.2
5223	182.2	5243	181.7	5263	181.7	5283	180.2	5303	180.2
5323	181.2	5343	181.9	5363	182.7	5383	184.2	5403	183.7
5423	183.9	5443	185.2	5463	188.7	5483	188.7	5503	188.4
5523	187.7	5543	187.9	5563	188.3	5583	187.9	5603	187.7
5623	187.5	5643	187.2	5663	186.9	5683	186.8	5703	186.8
5723	186.7	5743	186.7	5763	186.4	5783	187	5803	187
5823	187.5	5843	188.7	5853	189.2	5863	188.7	5883	187.7
5903	185.7	5913	185.2	5923	185.1	5943	188.7	5963	192.1
5983	195.2	5987	202.7	5998	209.1	6012	208.7	6024	202.4
6039	201.5	6050	200.8	6060	200.3	6070	199.8	6080	199.9
6090	201.5	6099	209.8	6110	216.2	6122.3	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3041 .2 5079.8 .048 5987 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5079.8 5987 159.99 114.99 155.01 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3041 5079.8 209 F
 5987 6122.3 205.2 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River

Ramapo River Pre. rep

REACH: Reach-1

RS: 23600

INPUT

Description: 23600

Station		Elevation		Data		num= 94			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3464	227	3580.2	227	3660.1	228	3708.2	226.7	3759.2	226.2
3837.7	225.6	3952.5	223.8	3998.5	223	4035.3	222.9	4100.2	221.6
4186.4	210	4271.7	208.3	4377	207.6	4434.7	208.1	4523.9	208.2
4574.6	209.6	4674	209.6	4741	209.4	4806	210.1	4888	209.9
4964	209.5	4978	203.3	4994	200.9	5016	200.5	5022	203.3
5035	210	5053	210	5069	202.7	5072	196.9	5077	192.1
5087	189.6	5097	189.6	5107	189.6	5127	189.1	5147	189.1
5167	186.6	5187	181.6	5207	178.6	5227	176.6	5247	175.6
5267	175.1	5287	175.1	5307	175.3	5327	175.8	5347	177.6
5367	180.4	5387	183.2	5407	183.8	5427	183.2	5447	183.8
5467	186.6	5487	188.1	5507	188.6	5527	188.6	5547	188.8
5567	189.3	5587	189.3	5607	188.8	5627	188.6	5647	188.1
5667	187.7	5687	187.7	5707	187.6	5727	187.6	5747	187.4
5767	187.6	5787	188.2	5807	191.9	5827	189.4	5847	190.6
5867	186.6	5887	184.6	5907	185.1	5927	189.6	5947	191.1
5967	192.2	5977	194.1	5982	195.9	5987	198.6	5990.3	202.6
6001.8	208.4	6020.1	208.2	6029.3	205.5	6034	204.9	6040.5	201.6
6050.2	200.6	6061.8	199.8	6079.4	199.1	6083.9	199	6087.6	201.6
6091.7	204.8	6117	206	6118.1	202.6	6162.8	227		

Manning's n Values		num= 3	
Station	Value	Station	Value
3464	.2	5069	.048
		5990.3	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5069	5990.3		370	160	145	.1
Ineffective Flow	num= 2						.3
	Sta L	Sta R	Elev	Permanent			
	3464	5069	209	F			
	5990.3	6162.8	205.2	F			

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 23440

INPUT

Description: 23440

Station		Elevation		Data		num= 99			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3330.5	227	3536.3	222.8	3777	211.6	3837.4	210.5	3918.1	209.8
4063	209	4202	207.5	4317.7	207.7	4375.5	209	4404	209.3
4412	209.3	4462	208.9	4512	209.1	4562	208.5	4612	208
4662	208.6	4712	208.7	4762	208.9	4812	208.6	4861.8	206.6
4863	206.7	4883	206.1	4898	205	4911	202.8	4922	202.9
4924	204.9	4940	206	4943	202.8	4946	202.6	4948	202.3
4952	202.6	4955	203	4964	202.6	4971	202	4978	202.6
4985	203.1	4993	202.6	4998	201.5	5003	201.5	5007	202.6
5019	209.1	5024	209.4	5031	209.3	5041.1	202.7	5047	196.9
5062	194.6	5082	191.4	5102	188.9	5122	185.4	5142	181.2
5162	178.4	5182	176.4	5202	177.6	5222	181.9	5242	186.4
5262	191.1	5282	193.4	5302	189.2	5322	186.2	5342	185.6
5362	185.7	5382	186.1	5402	186.9	5422	186.9	5442	186.6
5462	186.9	5482	187.2	5502	187.2	5522	187.2	5542	187.6

RampoverPre.rep									
5562	186.9	5582	187.9	5602	188.9	5622	185.4	5642	184.1
5662	186.2	5682	191.4	5702	190.4	5722	192.2	5732	194.2
5742	202.4	5752	207.3	5766.8	208.3	5786	208.4	5805	204.1
5807	201.3	5817	199.1	5827	198.5	5837	198.3	5847	198.4
5860	201.4	5867	204.9	5887	205.6	5906.4	205	5971.5	220
6000	222	6015.3	221.8	6031	221.1	6050.8	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3330.5 .2 5041.1 .048 5742 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5041.1 5742 .99 140.01 159.99 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3330.5 5041.1 209 F
 5742 6050.8 205.5 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23300

INPUT
 Description: 23300

Station Elevation Data num= 69									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3330.5	227	3536.3	222.8	3777	211.6	3837.4	210.5	3918.1	209.8
4063	209	4202	207.5	4317.7	207.7	4375.5	209	4404	209.3
4412	209.3	4462	208.9	4512	209.1	4562	208.5	4612	208
4662	208.6	4712	208.7	4762	208.9	4812	208.6	4861.8	206.6
4863	206.7	4883	206.1	4898	205	4911	202.8	4922	202.9
4924	204.9	4940	206	4943	202.8	4946	202.6	4948	202.3
4952	202.6	4955	203	4964	202.6	4971	202	4978	202.6
4985	203.1	4993	202.6	4998	201.5	5003	201.5	5007	202.6
5019	209.1	5024	209.4	5031	209.3	5041.1	202.7	5045.1	196.9
5135.7	176.4	5202.8	193.4	5417.7	188.9	5444.6	184.1	5484.8	190.4
5512	202.4	5522	207.3	5536.8	208.3	5556	208.4	5575	204.1
5577	201.3	5587	199.1	5597	198.5	5607	198.3	5617	198.4
5630	201.4	5637	204.9	5657	205.6	5676.4	205	5741.5	220
5770	222	5785.3	221.8	5801	221.1	5820.8	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3330.5 .2 5041.1 .048 5512 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5041.1 5512 180 180 180 .6 .8
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3330.5 5041.1 208 F
 5512 5820.8 205.5 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23120

Ramapo River Pre. rep

INPUT

Description: 23120

This is a REPEATED section.

Station	Elevation	Data	num=	86	Station	Elevation	Data	num=	86	Station	Elevation	Data	num=	86	Station	Elevation	Data	num=	86	
3245	224	3346.1	222.2	3431.5	222.1	3528.6	220.8	3589.7	213.3	3703.1	210.7	3781.9	210.1	3852.2	208.6	3939.6	208.1	4005.5	208.7	
4110.3	209.7	4136.4	209.9	4180.2	208.9	4202.5	209.1	4234.4	208.9	4298	209.2	4348.5	208.3	4398.5	208.3	4448.5	208	4498.5	207.4	
4548.5	206.2	4598.5	206.5	4648.5	205.7	4698	205.4	4748.5	205.1	4798.5	205.5	4848.5	205.5	4898.5	205.2	4948.5	205.4	4971	204.5	
4975	202.6	5023.9	202.7	5027.1	206.5	5048.5	202.6	5068.4	207.8	5086.9	202.8	5095.9	200.7	5100.5	199.8	5125.4	199.7	5130.4	202	
5135.6	202.8	5145.2	205.5	5151	206.1	5173.7	207.5	5176.2	206.6	5192.7	205.9	5197.9	207.5	5224.2	208.2	5256.5	205	5270	206.7	
5272	208.6	5346	208.9	5385.4	208.4	5411.7	206.7	5448.7	208.3	5492.5	209	5504.7	208.7	5507.7	208.7	5511.2	208.3	5523.4	208.3	
5530.4	199.5	5543.3	199.3	5554.5	207.9	5567.3	202.2	5568.4	205	5569.4	203	5586.2	204.4	5611.6	204.2	5623.8	204.2	5625.7	203.9	
5687.4	203.4	5691.5	201.5	5703	201.1	5710	203	5716	200.9	5724	201.5	5726.5	203	5767	203.2	5839.5	206.2	5867.5	209.1	
5907.4	212	5945.5	216.1	5967.1	217.3	5987.6	217.4	5997.4	220.4	6011.2	227									

Manning's n	Values	num=	3
3245	.2	5048.5	.048
			5130.4
			.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5048.5	5130.4		30	30		.6	.8
Ineffective Flow			num=	2				
	Sta L	Sta R	Permanent					
	3245	5048.5	F					
	5130.4	6011.2	F					
Sediment Elevation	= 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 23090

INPUT

Description: 23090

Station	Elevation	Data	num=	86	Station	Elevation	Data	num=	86	Station	Elevation	Data	num=	86	Station	Elevation	Data	num=	86	
3245	224	3346.1	222.2	3431.5	222.1	3528.6	220.8	3589.7	213.3	3703.1	210.7	3781.9	210.1	3852.2	208.6	3939.6	208.1	4005.5	208.7	
4110.3	209.7	4136.4	209.9	4180.2	208.9	4202.5	209.1	4234.4	208.9	4298	209.2	4348.5	208.3	4398.5	208.3	4448.5	208	4498.5	207.4	
4548.5	206.2	4598.5	206.5	4648.5	205.7	4698	205.4	4748.5	205.1	4798.5	205.5	4848.5	205.5	4898.5	205.2	4948.5	205.4	4971	204.5	
4975	202.6	5023.9	202.7	5027.1	206.5	5048.5	202.6	5068.4	207.8	5086.9	202.8	5095.9	200.7	5100.5	199.8	5125.4	199.7	5130.4	202	
5135.6	202.8	5145.2	205.5	5151	206.1	5173.7	207.5	5176.2	206.6	5192.7	205.9	5197.9	207.5	5224.2	208.2	5256.5	205	5270	206.7	
5272	208.6	5346	208.9	5385.4	208.4	5411.7	206.7	5448.7	208.3	5492.5	209	5504.7	208.7	5507.7	208.7	5511.2	208.3	5523.4	208.3	
5530.4	199.5	5543.3	199.3	5554.5	207.9	5567.3	202.2	5568.4	205	5569.4	203	5586.2	204.4	5611.6	204.2	5623.8	204.2	5625.7	203.9	
5687.4	203.4	5691.5	201.5	5703	201.1	5710	203	5716	200.9											

RampoverPre.rep

5724	201.5	5726.5	203	5767	203.2	5839.5	206.2	5867.5	209.1
5907.4	212	5945.5	216.1	5967.1	217.3	5987.6	217.4	5997.4	220.4
6011.2	227								

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
3245 .2	5048.5	.048 5130.4
		.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5048.5 5130.4 63 63 63 .6 .8

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3245	5048.5	207.5	F
5130.4	6011.2	204.9	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23027

INPUT
 Description: 23027

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2952.3	231.2	3083.8	222	3117.6	221.8	3125.1	223.7	3138	223
3148.3	223.6	3315.6	221.6	3329	222.2	3395.9	222.1	3490.6	213.3
3558.8	211.2	3631.2	210.5	3680.9	209.3	3806.5	208	3813.9	208.4
3823.4	208.1	3860.9	208.1	3870.2	208.3	3905.9	209.3	3947.3	209.7
3979.3	210.2	3996.6	210.6	4012.7	210.4	4038.1	210.4	4051.4	209.3
4077.1	209.3	4117.6	209.5	4151.4	209.2	4179	208.9	4238	208.5
4270	208.3	4334	208.5	4383	208	4440	207.7	4488	206.8
4532	207.2	4545	206.8	4599	207.2	4622	206.6	4648	205.3
4698	205	4751	204.7	4794	205.6	4827	204.5	4871	205.5
4890	205.2	4902	206	4919	205.8	4920	203.6	4923	202.5
4929	201.3	4932	200.5	4936	198.5	4942	196.5	4947	195
4955	195	4962	197	4970	198.3	4978	199.2	4988	200.3
4995	201.4	5001	202	5008	200.4	5015	199.6	5022	199
5026	198.8	5029	198.8	5037	199.1	5045	199.3	5052	199.5
5062	200.1	5069	200.9	5077	201.8	5081	202.5	5087	204.2
5102	204.9	5623	204.1	5632.8	203.5	5646	203.8	5649	201.2
5662	199.6	5675	199.6	5694	198.9	5701	198.7	5709	201.2
5710	202.6	5715	205.9	5723	206.3	5723.1	206.3	5748.9	205.4
5761.8	205	5811	205	5844.6	204.7	5859.8	205.8	5875.5	206.2
5884	209.2	5905.7	209.2	5923.4	219.9	5939.6	227		

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
2952.3 .07	4919	.042 5081
		.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4919 5081 22 22 22 .6 .8

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23005

INPUT

Descripti on: TERRACE ISLAND BRIDGE
TERRACE ISLAND BRIDGE

Station Elevation Data									
num= 97									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2966.4	231	3096.4	221.9	3121.1	221.2	3166.4	222.9	3190	222
3267.9	222.1	3308.2	221.5	3412.9	221.5	3442.7	220.3	3494.7	213.2
3534.5	212.6	3649.4	210.4	3813.1	207.9	3875.5	208	4056.9	210.2
4078	209.3	4143.5	209.1	4184.3	209.3	4537.7	207.5	4572	206.9
4623.4	206.2	4676.7	205.3	4715.6	205.6	4744.6	205.4	4773.1	205.4
4790.8	205.5	4811.5	205.9	4840.8	205.4	4870.5	204.9	4913	205.6
4933	205.1	4934	202.5	4934.1	200.7	4937	198.9	4947	196.4
4957	195.8	4967	194	4977	197.5	4987	198.8	4997	201.6
5003	202.5	5007	202.8	5009	202.5	5010	202	5017	201.1
5027	201	5037	200.4	5047	200.6	5057	200.5	5062	201
5065	202.5	5065.5	203.6	5077	204.6	5575	206.9	5595	206.7
5598	204.6	5598.1	204.6	5601	202.8	5604	201.2	5612	199.2
5622	198.4	5635	198.7	5643	201.2	5647	202.5	5648.4	204
5648.5	204	5651	206.6	5651.1	207	5652.5	206.5	5658	206.5
5663.1	206.8	5689.9	205.9	5715	205.6	5733.1	205.7	5789.2	205.1
5821.8	205.3	5846.3	205.3	5879.9	205.4	5925.6	205.2	5955.6	205.7
5977.2	205.2	5999.7	205.1	6037.3	204.7	6043.1	206.1	6062.6	208
6089.8	209.2	6096.6	209.2	6125.6	209.1	6140.3	210.3	6164.5	212
6204.6	213.9	6219.8	214.8	6363.4	214	6422.3	216.4	6442.2	218
6456.1	220.4	6478.2	227						

Manning's n Values					
num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
2966.4	.07	4933	.03	5663.1	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4933	5663.1		15	15	15		.05	.2

Cross Section Lined														
num= 92														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
2966.4	231		231		3096.4	221.9		221.9		3121.1	221.2		221.2	
3166.4	222.9		222.9		3190	222		222		3267.9	222.1		222.1	
3308.2	221.5		221.5		3412.9	221.5		221.5		3442.7	220.3		220.3	
3494.7	213.2		213.2		3534.5	212.6		212.6		3649.4	210.4		210.4	
3813.1	207.9		207.9		3875.5	208		208		4056.9	210.2		210.2	
4078	209.3		209.3		4143.5	209.1		209.1		4184.3	209.3		209.3	
4537.7	207.5		207.5		4572	206.9		206.9		4623.4	206.2		206.2	
4676.7	205.3		205.3		4715.6	205.6		205.6		4744.6	205.4		205.4	
4773.1	205.4		205.4		4790.8	205.5		205.5		4811.5	205.9		205.9	
4840.8	205.4		205.4		4870.5	204.9		204.9		4913	205.6		205.6	
4933	205.1		205.1		4934	202.5		202.5		4934.1	200.7		200.7	
4937	198.9		198.9		4947	196.4		196.4		4957	195.8		195.8	
4967	194		194		4977	197.5		197.5		4987	198.8		198.8	
4997	201.6		201.6		5003	202.5		202.5		5007	202.8		202.8	
5009	202.5		202.5		5010	202		202		5017	201.1		201.1	
5027	201		201		5037	200.4		200.4		5047	200.6		200.6	
5057	200.5		200.5		5062	201		201		5065	202.5		202.5	
5065.5	203.6		203.6		5077	204.6		204.6		5575	206.9		206.9	
5595	207		206.7		5598	207		204.6		5598.1	210		204.6	
5601	210		202.8		5604	210		204.6		5648.4	209.8		204.7	
5648.5	209.8		204		5651	209.8		207		5651.1	207		207	
5652.5	206.5		206.5		5658	206.5		206.5		5663.1	206.8		206.8	
5689.9	205.9		205.9		5715	205.6		205.6		5733.1	205.7		205.7	
5789.2	205.1		205.1		5821.8	205.3		205.3		5846.3	205.3		205.3	
5879.9	205.4		205.4		5925.6	205.2		205.2		5955.6	205.7		205.7	
5977.2	205.2		205.2		5999.7	205.1		205.1		6037.3	204.7		204.7	
6043.1	206.1		206.1		6062.6	208		208		6089.8	209.2		209.2	
6096.6	209.2		209.2		6125.6	209.1		209.1		6140.3	210.3		210.3	

				Ramp	River	Pre. rep			
6164.5	212	212	6204.6	213.9	213.9	6219.8	214.8	214.8	
6363.4	214	214	6422.3	216.4	216.4	6442.2	218	218	
6456.1	220.4	220.4	6478.2	227	227				

Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 22990

INPUT
 Descri pti on: 22990

Stati on El evati on Data			num=	99					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2959.4	231	3110	221.1	3162.7	222.2	3285.1	220.9	3318	221.2
3416.7	220.7	3535	211.7	3784.6	208.9	3861	207.3	3871.6	208.5
3909.3	208	3941.5	208.5	3967	208.7	3989.3	209	4006	209
4023.1	209.8	4048.1	210.2	4067.6	209.2	4092.9	209.1	4126.6	209.1
4169.4	209.3	4176.9	209.2	4202.9	209.2	4244.4	209.1	4306	209.1
4355.9	208.7	4414	208.1	4470.2	207.2	4516.9	207.2	4565.7	207.1
4615.1	206.1	4656.1	205.2	4684.3	205.4	4760	206	4795.7	206.6
4818.1	207	4850.3	205.4	4915	205.5	4935	204.8	4936	202.4
4940	199.8	4945	197.2	4955	195.4	4965	193.9	4975	195.6
4985	197.9	4995	200.5	5000	201.5	5009	202.5	5012	202.7
5015	202.5	5020	201.8	5025	201.8	5031	201.4	5035	200.6
5045	200.5	5055	199.3	5058	199.8	5062	201.9	5085	204.9
5575	207.5	5594	206.7	5601	201.2	5607	199.6	5621	198.9
5633	198.8	5644	201.2	5645	202.6	5652	206.3	5654	206.7
5655.2	206.5	5675	206.5	5704.5	206.2	5735	205.7	5781.6	206
5809.3	205.1	5840.4	205.5	5868.5	205.5	5907.9	205.8	5939.4	205.2
5973.5	205.3	5992.7	205.6	6012.7	204.4	6040.3	204.4	6057.2	205.9
6077.6	208.2	6108.7	209.3	6135.3	209.1	6143	208.2	6160.3	210.1
6200.9	212.6	6234.3	213.9	6255.9	214.1	6304.8	214.4	6369.7	214
6420.7	216	6454.4	218	6464.6	220	6491.6	227.1		

Manni ng' s n Val ues			num=	3
Sta	n Val	Sta	n Val	Sta
2959.4	.06	4935	.028	5655.2

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4935	5655.2		35	60	80	.05		.2

Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 22930

INPUT
 Descri pti on: 22930

Stati on El evati on Data			num=	99					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2996.4	231.4	3110.9	221.3	3151.1	221.3	3160.5	220.7	3190.1	221.7
3215.5	221.7	3291	220.2	3339.8	221.1	3454.2	220	3497.2	214.2
3607.8	211.6	3808.6	209.2	3841.4	208.5	3884.7	208	3948.8	209.2
3987.2	209.3	4074.1	211.2	4093.1	209.8	4187.5	209.5	4194	209
4238	208.5	4291	208.4	4345	208.5	4415	207.9	4475	207.4
4540	206.8	4605	206.5	4654	205.4	4682	205.9	4714.4	205.3
4761	205.3	4812	205.6	4860	205.8	4891	203.6	4902	203.3

RampoverPre. rep

4914	204.5	4922	204.7	4931	203.7	4943	203.3	4944	202.6
4945	201.7	4949	198.6	4956	197.4	4961	197.3	4971	197.2
4981	198.6	4991	199.9	5001	199.9	5011	200.2	5021	200.9
5031	200.7	5041	201.5	5051	201.3	5055	201.9	5055.1	202.6
5058	204.4	5071	204.7	5497	203	5515	203.6	5516	201.2
5521	200.7	5527	199.1	5535	198.8	5545	198	5554	198.3
5561	201.2	5571	207.9	5574	207.7	5596.7	208.6	5672	206.4
5795.6	205.2	5816.4	205.2	5870	205.7	5945.8	204.8	6012	205.9
6034	205.3	6055.8	205.9	6077.3	205.8	6100.4	207.9	6163.8	208.2
6181.8	209.1	6193.3	208.6	6202.9	208.5	6227	210.1	6249.8	211.6
6295.9	213.8	6327.3	215.2	6362.8	215.9	6384.5	216.9	6386.9	218.3
6393.8	218.1	6412.7	220.7	6448.4	221	6453.1	219.2	6463	219.8
6464.7	223.7	6477.6	223.7	6502.2	225.3	6622.8	227		

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
2996.4	.06	4914	.028	5596.7	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4914	5596.7		150	110.01	189.99		.05	.2
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 22820

INPUT
Description: 22820

Station Elevation Data										num=	94
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2960.5	227.9	2963.9	223.7	3005.5	223.7	3010.3	220.3	3031	220.3		
3075.8	222.2	3098.3	221.1	3119.3	220.9	3159.8	222.2	3182.9	222		
3217.2	219	3238.2	220.1	3248.2	220	3266	219.4	3303.7	219.2		
3359.2	217.2	3401	213.6	3431.1	213.8	3470.9	217.8	3513.7	214.1		
3577.3	212	3602.1	212.3	3670.9	209.8	3700.1	210	3794.1	208.3		
3849.9	207.2	4011	208	4047.2	207.3	4086.7	209.5	4110.5	209.5		
4151.2	208.3	4192	209	4242	208.5	4392	208.4	4442	208.2		
4492	207.5	4592	205.6	4603	205.1	4635	206.5	4671	207		
4707	204	4728	205.1	4755	205.3	4792	205.5	4824	205.5		
4881	204.4	4886	202.6	4900	202.7	4919	202	5025	200.1		
5059	204.6	5284.4	203.8	5304.4	203.5	5308.4	201.3	5316.4	199.2		
5328.4	198	5338.4	198	5349.4	198	5362.4	199.3	5369.4	201.3		
5370.4	202.2	5378.4	202.4	5387.4	206.1	5394.4	206	5395.1	206.5		
5408.4	206.5	5426.8	205.6	5474.2	205.4	5486.1	206.1	5524.1	206.6		
5536.6	206.6	5546.3	205.7	5557.8	206.4	5622.5	206.7	5655.2	205.6		
5745	205.5	5760.4	204	5858.4	204.5	5898.7	205.6	5931.7	205.5		
5952.5	204.3	6063.2	204.4	6073.2	206.5	6118.8	207.7	6146.9	206.8		
6176.9	207.8	6198.2	207	6374.6	215.2	6383.3	217.3	6416.9	220.7		
6438.1	217.9	6452.2	222.2	6470.2	223.4	6602.2	227.4				

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
2960.5	.06	4824	.028	5387.4	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4824	5387.4		240	245	150		.05	.2
Sediment	Elevation = 0								

CROSS SECTION

RamporiverPre. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 22575

INPUT

Description: 22575

Station		Elevation		Data		num=		99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3968	227	4042	211	4063	209.5	4088	208.7	4280	207.6
4316	207.2	4411	207.2	4439	207.9	4472	207.5	4500	208.2
4591	208.2	4607.3	206.8	4629	207.2	4674	206.4	4688	206.1
4692	203	4697	202.7	4704	202.6	4711	202.3	4713	202.6
4715	203.9	4720	204.9	4839	205.7	4850	202.9	4896.3	203.4
4920	203.2	4941	203.8	4966	204.3	4972	204.5	4977	198.5
4979	197	4986	195.8	5007	200.3	5024	201.8	5033	202
5041	203.9	5262	203	5272	204.1	5282	203.3	5285	202.4
5289	200.7	5294	200.2	5310	199.9	5324	199.7	5335	199.4
5346.7	201	5346.8	202.3	5347	203.3	5347.9	203.3	5348	206
5381	206.4	5464	205.2	5474	204.3	5486	204.7	5497	204.7
5510	205.8	5536	205.9	5563	205.3	5573	205.9	5584	206.2
5599	205.9	5618	204.6	5641	204.7	5686	206	5700	207.1
5737	207	5746	207.4	5775	207.1	5847	206.3	5865	207.1
5889	206.8	5920	207.4	5964	204.8	5982	205.1	5992	205.9
6011	206	6075	206.1	6103	205.3	6132	205.4	6160	205.9
6233	204.6	6260	207.3	6280	207.7	6309	207.4	6330	207.6
6342	208.4	6353	207.8	6402	211.8	6502	216.3	6522	216.4
6524	219	6550	222.1	6575	221.7	6580	218.9	6592	218.9
6594	224.1	6598	222.1	6630	225.1	6738	227		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
3968	.06	4972	.028	5348	.06

Bank Sta: Left 4972 Right 5348 Lengths: Left 210 Channel 210 Right 160 Coeff Contr. .05 Expan. .2
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 22365

INPUT

Description: 22365

Station		Elevation		Data		num=		99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4362	227.1	4400	210	4431	207.3	4484	206.9	4515	206.6
4542	206.9	4602	207.3	4607	207.1	4622	207.5	4635	207
4640	208.6	4660	208.1	4695	202.9	4718	202.9	4752	208.9
4763	209.8	4777	207.3	4822	206.4	4855	206.2	4866	205.7
4890	206.2	4918	207.3	4936	206.6	4957	204.1	4959	201.4
4962	200.9	4970	199.6	4982	200.1	4992	200.5	5002	200.7
5012	200.7	5022	200.8	5032	201.2	5039	201	5041	201.4
5041.1	203.3	5175	203.3	5195	202.8	5197	201.2	5203	200
5250	197.2	5260	197.2	5273	197.6	5288	198.2	5303	199.8
5307.7	201.2	5307.9	203.9	5400	204.4	5476	204.6	5511	204.9
5525	204	5553	204.5	5577	204.8	5613	205.4	5645	206.5
5666	206.5	5725	207.2	5739	207	5767	207	5805	207.4
5838	207.4	5868	206.5	5895	206.1	5929	206.1	5940	207
5989	204.6	6011	204.6	6028	205	6042	205	6064	205.6

RampoverPre.rep									
6116	204.9	6141	204.7	6182	204.7	6250	205	6292	204.5
6315	204.5	6327	206.3	6353	207.5	6376	207	6415	206.6
6423	207.4	6438	208	6451	207.9	6478	209	6508	210.1
6543	212	6585	214.1	6622	214.8	6631	217.3	6662	219.2
6671	220.1	6691	221.6	6726	221	6732.8	217.5	6742	217.5
6744	222.4	6750	222.4	6915	225.8	6936	227.2		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4362	.06	4936	.028	5307.9	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4936	5307.9		230	192		.05	.2
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 22173

INPUT
 Description: 22173

Station Elevation Data										num= 98
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4552.7	225	4569.6	224.1	4577.8	220	4590	213.4	4600.2	208.1	
4607.4	205.8	4628.7	205.6	4661.1	205.5	4687.2	205.4	4706.6	205.4	
4726.7	205.1	4752.7	205.9	4764.7	205.9	4777.8	205.8	4798.4	205.5	
4811.1	205.6	4820.6	205.6	4830.1	205.5	4855	205.6	4861	205.6	
4898	205.2	4930	205.3	4938	201.2	4949	200	4961	198.8	
4973	198.5	4987	200.1	4999	200.4	5006	197.7	5016	196.3	
5031	194.9	5037	194.9	5055	198.2	5061	201.3	5071	203.9	
5129	204.4	5200	204.5	5240.2	205.2	5277.1	204.6	5295.7	203.8	
5310.4	203.9	5325	204.2	5336.2	204.6	5351.4	205.9	5395.7	205.6	
5409.9	205.3	5435.7	204.6	5457.1	205.5	5486.8	203.6	5520.3	204.6	
5549.5	205.2	5563.7	205.8	5590.5	206.3	5605.5	206.5	5619.7	207.2	
5631.1	207.1	5649.4	207.3	5661.7	207.5	5704.3	207.5	5725.4	207.3	
5742.1	207.2	5767.6	206.5	5783.6	206.2	5812.7	205.7	5838.5	204.9	
5858.2	204.2	5867	205.1	5878.5	205.1	5890.2	205.3	5896.6	205.4	
5962.5	205.5	6002.3	205.2	6029.7	204.9	6062.8	204.7	6092.5	204.3	
6109.9	204.3	6119.5	204.2	6131.9	204.2	6140	205.8	6158	207.6	
6198.3	207.5	6224.7	207.4	6236	207.7	6249.8	207.6	6262.8	208.4	
6283.1	209.5	6295.9	210.7	6312.3	212	6336.5	213.5	6349	214.3	
6369	215.8	6390	218.2	6413.4	220.3	6429.4	221.5	6441	222.1	
6654.2	224.7	6667.1	225.9	6672.7	227.1					

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4552.7	.06	4930	.028	5071	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4930	5071		115	63		.05	.2
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 22110

INPUT
 Description: 22110

DOTY RD. BRIDGE (GRATE BRIDGE DECK, MAY NOT DEVELOP PRES-FLOW)

Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4546.1	225	4555.2	225.5	4566.9	226	4579.5	225.6	4590.9	224.8
4596.7	220.1	4610.7	214.6	4630.1	213.3	4646.9	211.5	4660.2	209.5
4676.3	207.7	4706.7	205.6	4724.1	205.5	4746.1	205.5	4779.5	205.5
4899	206	4910	206.3	4949	207.6	4957	207.6	4957.1	207.6
4960	207.7	4961	201.2	4962	199.8	4962.1	199.6	4962.3	199.6
4970	197.6	4973	197	4977	195.9	4993	195.5	5008	196.8
5020	196.7	5023	196.8	5034	199	5034.1	199	5036	199.4
5036.1	199.4	5038	201.3	5038.1	207.4	5055	207.3	5074.8	207.3
5082.2	210.8	5102.5	209.7	5133.9	207.8	5149.8	205.6	5173.8	204.6
5194.7	204.1	5225.4	203.5	5257.4	203.1	5286.6	203.7	5308.3	203.7
5330.2	204.6	5355.6	205.4	5385.4	204.6	5414	204.2	5431	203.8
5465.5	203.6	5495.5	203.6	5523.1	204.5	5548.7	205.5	5584.5	206.3
5598.5	207.2	5612.3	207.7	5626	206.6	5652.3	207.4	5679	207.3
5705.8	206.4	5739.8	206.4	5776.3	206.7	5789.9	206.7	5836.8	204.5
5855.2	204.2	5862.4	205.4	5873.1	205.4	5883.4	204.9	5902.1	205.5
5926.1	205.5	5959.7	205.4	5996.8	205.4	6027.6	205.5	6101.8	204.6
6110.5	205.1	6121.2	204.9	6141.1	206	6186.7	206.2	6208.1	207.2
6215.1	207.4	6225.1	208	6235.6	207.6	6247	208.2	6262.8	209.3
6276.7	210.3	6295.2	212	6313.2	213.4	6334.8	214.5	6352.8	216.3
6379.5	220	6431.2	221.9	6643.4	224.1	6653.3	224.8	6662.2	227.2

Manning's n Values num= 3

Station	Value	Station	Value	Station	Value
4546.1	.06	4960	.03	5082.2	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4960	5082.2	33	33	33	.5	.7
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4546.1	4960	204.5	F
5082.2	6662.2	204.5	F

Sediment Elevation = 0

BRIDGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 22093.5

INPUT

Description: DOTY RD. BRIDGE (GRATE BRIDGE DECK, MAY NOT DEVELOP PRESS-FLOW)

Distance from Upstream XS = 9
 Deck/Roadway Width = 15
 Weir Coefficient = 2.4

Upstream Deck/Roadway Coordinates num= 53

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4555.2	225.5	225.5	4566.9	226	226	4579.5	225.6	225.6						
4590.9	224.8	224.8	4596.7	220.1	220.1	4610.7	214.6	214.6						
4630.1	213.3	213.3	4646.9	211.5	211.5	4660.2	209.5	209.5						
4676.3	207.7	207.7	4706.7	205.6	205.6	4724.1	205.5	205.5						
4746.1	205.5	205.5	4779.5	205.5	205.5	4899	206	206						
4910	206.3	206.3	4949	210.6	207.6	4957	211	207.6						
4957.1	215	207.6	4960	215	207.7	4962	215							
4962.1	215	199.6	4962.3	215	207	4970	215	207						
4973	217	207	5020	217	207	5023	215	207						
5034	215	207	5034.1	215	199	5036	215	199.4						

Ramp Over Pre. rep									
5036.1	211	199.4	5038	210.7	201.3	5038.1	210.7	207.4	
5074.8	207.3		5082.2	210.8	210.8	5102.5	209.7	209.7	
5133.9	207.8	207.8	5149.8	205.6	205.6	5173.8	204.6	204.6	
5194.7	204.1	204.1	5225.4	203.5	203.5	5257.4	203.1	203.1	
5286.6	203.7	203.7	5308.3	203.7	203.7	5330.2	204.6	204.6	
5355.6	205.4	205.4	5385.4	204.6	204.6	5414	204.2	204.2	
5431	203.8	203.8	5465.5	203.6	203.6	5495.5	203.6	203.6	
5523.1	204.5	204.5	5548.7	205.5	205.5				

Upstream Bridge Cross Section Data
Station Elevation Data num= 100

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4546.1	225	4555.2	225.5	4566.9	226	4579.5	225.6	4590.9	224.8
4596.7	220.1	4610.7	214.6	4630.1	213.3	4646.9	211.5	4660.2	209.5
4676.3	207.7	4706.7	205.6	4724.1	205.5	4746.1	205.5	4779.5	205.5
4899	206	4910	206.3	4949	207.6	4957	207.6	4957.1	207.6
4960	207.7	4961	201.2	4962	199.8	4962.1	199.6	4962.3	199.6
4970	197.6	4973	197	4977	195.9	4993	195.5	5008	196.8
5020	196.7	5023	196.8	5034	199	5034.1	199	5036	199.4
5036.1	199.4	5038	201.3	5038.1	207.4	5055	207.3	5074.8	207.3
5082.2	210.8	5102.5	209.7	5133.9	207.8	5149.8	205.6	5173.8	204.6
5194.7	204.1	5225.4	203.5	5257.4	203.1	5286.6	203.7	5308.3	203.7
5330.2	204.6	5355.6	205.4	5385.4	204.6	5414	204.2	5431	203.8
5465.5	203.6	5495.5	203.6	5523.1	204.5	5548.7	205.5	5584.5	206.3
5598.5	207.2	5612.3	207.7	5626	206.6	5652.3	207.4	5679	207.3
5705.8	206.4	5739.8	206.4	5776.3	206.7	5789.9	206.7	5836.8	204.5
5855.2	204.2	5862.4	205.4	5873.1	205.4	5883.4	204.9	5902.1	205.5
5926.1	205.5	5959.7	205.4	5996.8	205.4	6027.6	205.5	6101.8	204.6
6110.5	205.1	6121.2	204.9	6141.1	206	6186.7	206.2	6208.1	207.2
6215.1	207.4	6225.1	208	6235.6	207.6	6247	208.2	6262.8	209.3
6276.7	210.3	6295.2	212	6313.2	213.4	6334.8	214.5	6352.8	216.3
6379.5	220	6431.2	221.9	6643.4	224.1	6653.3	224.8	6662.2	227.2

Manning's n Values num= 3

Station	Value	Station	Value	Station	Value
4546.1	.06	4960	.03	5082.2	.07

Bank Sta: Left Right Coeff Contr. Expan.

4960	5082.2	.5	.7
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Ineffective Flow num= 2

Sta L	Sta R	El ev	Permanent
4546.1	4960	204.5	F
5082.2	6662.2	204.5	F

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates

num= 20											
Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord
4910	206.3	206.3		4949	210.6			4957	211	207.6	
4957.1	215	207.6		4960	215			4962	215		
4962.1	215			4962.3	215	207		4970	215	207	
4973	217	207		5020	217	207		5023	215	207	
5034	215	207		5034.1	215			5036	215		
5036.1	211			5038	210.7			5038.1	210.7		
5074.8	207.3	207.3		5074.8	207.3	207.3					

Downstream Bridge Cross Section Data
Station Elevation Data num= 99

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4559.3	225	4569	225.2	4580.3	226	4592.5	225.7	4602.8	223.7
4611.1	220	4629.5	210	4653.2	207.9	4667	206.1	4688.9	206.1
4716.9	206.3	4752.9	205.8	4795	206.1	4828.6	206.1	4849.2	206.1
4865.2	206.3	4880.9	206.3	4899.3	206.5	4923.7	206.6	4944.3	207

RampoverPre.rep									
4955.1	208.2	4962.1	207.5	4963	201.2	4963.1	198.8	4979.6	195.2
4995.3	194	5010	195.2	5025.5	197.5	5036.4	199.9	5036.9	201.2
5040.2	207.5	5060.7	207.3	5073.2	206.4	5090.9	206.6	5116.1	203.6
5134.6	203.1	5156.1	202.5	5173	203.8	5198.3	203.6	5228.7	202.5
5247.8	202.8	5274.3	202.5	5295	204.1	5322.5	204	5355.1	204
5385.7	202.9	5411.4	203	5456.8	203.6	5480.1	204.4	5506.9	205
5530.8	205.9	5556.9	205.9	5598.2	206.9	5611.3	207.4	5625.4	206.4
5638.3	206.3	5697.4	206.3	5720.6	206.3	5755.2	206.4	5795.6	205.8
5822.2	205	5845.9	204.7	5857.5	204.5	5868.9	205	5878.9	204.8
5892	205.4	5909.3	204.7	5932.2	204.5	5959.1	204.9	5989.8	204.6
6015.8	205.4	6034.5	204.5	6052	205.4	6082	203.9	6092.4	203.5
6099.9	203.8	6108.5	204.5	6117.7	204	6130.6	206.1	6147.4	206.4
6174	206.1	6189.6	207.2	6204.5	207	6212.3	207.1	6220.9	207.9
6233.1	207	6238.4	207.6	6250.7	209	6267.6	210	6285.8	211.4
6313.1	214.1	6331.6	216	6356.1	219	6369.9	220	6387.5	221.2
6417.4	221.6	6627.8	223.2	6644	221.3	6657.7	227.1		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4559.3 .06 4962.1 .037 5040.2 .06

Bank Sta: Left Right Coeff Contr. Expan.
 4962.1 5040.2 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4559.3 4962.1 204.5 F
 5040.2 6657.7 204.5 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 204.5
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Momentum Cd = 2

Selected Low Flow Methods = Energy

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .745356
 Max Low Cord = 207.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 22077

Ramapo River Pre. rep

INPUT

Description: 22077

Station		Elevation		Data		num= 99			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4559.3	225	4569	225.2	4580.3	226	4592.5	225.7	4602.8	223.7
4611.1	220	4629.5	210	4653.2	207.9	4667	206.1	4688.9	206.1
4716.9	206.3	4752.9	205.8	4795	206.1	4828.6	206.1	4849.2	206.1
4865.2	206.3	4880.9	206.3	4899.3	206.5	4923.7	206.6	4944.3	207
4955.1	208.2	4962.1	207.5	4963	201.2	4963.1	198.8	4979.6	195.2
4995.3	194	5010	195.2	5025.5	197.5	5036.4	199.9	5036.9	201.2
5040.2	207.5	5060.7	207.3	5073.2	206.4	5090.9	206.6	5116.1	203.6
5134.6	203.1	5156.1	202.5	5173	203.8	5198.3	203.6	5228.7	202.5
5247.8	202.8	5274.3	202.5	5295	204.1	5322.5	204	5355.1	204
5385.7	202.9	5411.4	203	5456.8	203.6	5480.1	204.4	5506.9	205
5530.8	205.9	5556.9	205.9	5598.2	206.9	5611.3	207.4	5625.4	206.4
5638.3	206.3	5697.4	206.3	5720.6	206.3	5755.2	206.4	5795.6	205.8
5822.2	205	5845.9	204.7	5857.5	204.5	5868.9	205	5878.9	204.8
5892	205.4	5909.3	204.7	5932.2	204.5	5959.1	204.9	5989.8	204.6
6015.8	205.4	6034.5	204.5	6052	205.4	6082	203.9	6092.4	203.5
6099.9	203.8	6108.5	204.5	6117.7	204	6130.6	206.1	6147.4	206.4
6174	206.1	6189.6	207.2	6204.5	207	6212.3	207.1	6220.9	207.9
6233.1	207	6238.4	207.6	6250.7	209	6267.6	210	6285.8	211.4
6313.1	214.1	6331.6	216	6356.1	219	6369.9	220	6387.5	221.2
6417.4	221.6	6627.8	223.2	6644	221.3	6657.7	227.1		

Manning's n Values		num= 3	
Station	Value	Station	Value
4559.3	.06	4962.1	.037
		5040.2	.06

Bank	Sta: Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4962.1	5040.2		105	120	80.01	.5	.7
Ineffective Flow	num= 2							
	Sta L	Sta R	Elev	Permanent				
	4559.3	4962.1	204.5	F				
	5040.2	6657.7	204.5	F				
Sediment Elevation	= 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 21957

INPUT

Description: 21957

Station		Elevation		Data		num= 85			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4609	225.2	4613.9	225.5	4626.5	225.8	4636.6	225.5	4646.5	223
4657.4	220	4693.2	210	4711.3	206.3	4733.5	203.9	4766.4	204.3
4813.1	203.6	4831.2	204.6	4844.4	204.6	4868.3	205.6	4884.6	205.5
4904	204.2	4929	204.4	4949	202.2	4950	201.3	4953	200.9
4960	198.8	4970	196.4	4985	194.2	4997	193.2	5010	192.2
5025	193.8	5036	196.6	5049	201.2	5051	202.3	5076	203.2
5082	203.7	5107.7	203	5147.2	202.6	5210.1	202.1	5267.1	202.9
5318.1	202.7	5370	202.6	5424.6	202.9	5457.9	203	5480.3	204
5504.9	204.3	5526.2	205.6	5556.9	205.5	5593.4	206.3	5612.1	206.5
5623.1	207.1	5635.2	206.8	5660.7	207.1	5717.5	206.7	5745.7	205.9
5778.9	207.7	5812.8	206.3	5826.2	205.9	5846.5	205	5867.9	205.1
5876.1	205.3	5886.3	204.7	5910.7	204.2	5941.3	203.8	5970.1	203.2
6002.8	203.5	6048.2	203.5	6081.8	203.8	6103.5	204.4	6113.4	204.7
6123.4	204.4	6132.5	204.7	6147.7	206.3	6183.4	206.3	6201.7	207.2

RampoverPre.rep									
6216.3	207.5	6232.3	207.2	6240.9	206.5	6254.4	208.4	6268.4	210.1
6289.3	212	6310.2	215	6332.8	217.7	6362	220	6393.4	221.3
6414.7	221.8	6623.3	219.9	6633.7	219.9	6645	222.6	6654.8	227.1

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4609	.7	4929	.043	5082	.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4929	5082		159.99	132		.1	.3
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21825

INPUT
 Description: 21825

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4683.7	225	4710.3	210	4732.5	203.9	4782.9	203.8	4804.6	203.7
4823.3	203.7	4844	205	4914	203.6	4941	204	4945	201.2
4957	197.3	4970	196.6	4988	196.5	5005	196.6	5020	198.4
5035	198.5	5041	199.9	5054	201.2	5055	202.5	5084	202.8
5110	202.5	5165	202	5182	201.9	5200	201.7	5222	201.2
5226	201	5233	200.4	5235	200.2	5240	199.4	5245	199
5250	198.5	5255	198.1	5265	198	5275	198.4	5285	198.3
5295	198.7	5305	198.7	5315	198.6	5325	198.2	5335	197.6
5345	197.6	5355	197.9	5365	198	5375	198.5	5385	198.3
5395	197.7	5405	197.4	5415	196.5	5425	196	5435	195.7
5445	196.1	5455	197.2	5460	198.4	5464.3	201	5464.4	201.2
5465	203.4	5484.9	204.8	5494.2	204.8	5519	205.1	5555.9	205.9
5591.6	206.8	5604.3	207.4	5616	206.5	5656.1	207	5693.2	206
5733.3	205.7	5771.1	204.8	5805.4	204.7	5828.3	204.4	5841	204.6
5849.7	204.6	5859.7	204.6	5880.6	204.1	5913.2	204.6	5965.6	204.6
5985.6	204.4	6014.6	203.9	6063.3	204.4	6076.2	204.2	6087.1	204.6
6097.3	204.4	6121.9	205.8	6152.4	206.4	6171.5	207.3	6188.3	208
6201.2	207.7	6207.5	207.4	6224.5	209.4	6239.1	210.1	6254.3	211.7
6273.6	214	6292.4	216.3	6317.7	219.7	6369.3	222.1	6585.8	220.5
6606.1	223.6	6609.6	227.2						

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4683.7	.9	4782.9	.075	4945	.037	5054	.09	6207.5	.9

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	4941	5055		250	225		.1	.3	
Ineffective Flow									
	num=		2						
	Sta L	Sta R	Permanent						
	4683.7	4941	F						
	5055	6609.6	F						
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21600

INPUT

Description: 21600

Station Elevation Data		num= 93		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4685.6	225	4693	223.6	4702.5	223.7	4715.8	223.5	4731.8	220		
4743.3	210	4767.5	205.8	4792.3	204.6	4813.6	203.8	4831.1	203.8		
4860.5	203.9	4884.6	203.8	4911.1	203.9	4915	203.3	4942	203.5		
4943	201.3	4953	200.7	4966	198.9	4977	194.9	4995	194.3		
5011	195.2	5028	196.2	5041	197.1	5056	198.1	5056.1	198.7		
5059	201.1	5082	203.1	5114	202.8	5158	202	5184	202.1		
5202	201.2	5204	200.5	5210	200.1	5216	200.6	5221	200.7		
5226	200.8	5231	201.2	5239	201.6	5254	201.9	5270	201.6		
5282	201.3	5297	201.2	5304	200.9	5314	200.8	5321	200.6		
5324	199.9	5334	198.8	5344	198.2	5354	196.9	5364	196.4		
5374	195.7	5384	195.8	5394	196.5	5404	199.5	5409	200.2		
5414	200.8	5419	201.2	5421	203.4	5424	203.8	5449	204.4		
5450.1	205.2	5470	205.2	5488.7	205.2	5552	207	5563.6	207.2		
5599.9	206.3	5640	206.3	5683.1	205.7	5737.1	205.2	5796.4	205.2		
5809.5	205.5	5832.2	204.3	5860	204.3	5905.5	204.4	5953.5	205.1		
6006	204.8	6029.7	205.1	6044	204.9	6089.5	205.7	6132.8	207.5		
6142.9	207.9	6154.5	207.5	6162.7	207.2	6173.2	209.2	6189.4	210		
6207.8	212	6226.2	214.1	6256.1	217.5	6274.1	220.2	6301.2	221.8		
6325.7	221.8	6332.5	221.9	6545.4	227.6						

Manning's n Values		num= 5		Sta		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4685.6	.9	4813.6	.075	4943	.037	5059	.09	6162.7	.9		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.			
	4942	5082		260	183		.1	.3			
Ineffective Flow	num= 2		Permanent								
Sta L	Sta R	El ev									
4685.6	4942	203.5	F								
5082	6545.4	203.1	F								
Sediment Elevation	= 0										

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 21417

INPUT
 Description: 21417

Station Elevation Data		num= 75		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4580.8	225	4590.6	220.3	4601.6	220.6	4617.6	220.7	4622.9	221.3		
4638	216.1	4653.8	210	4688.8	204.3	4719.1	205	4754.4	205.5		
4782.7	205.2	4804.3	205.2	4817.3	205.4	4849.5	205	4865.7	204.6		
4879.1	204.8	4895.7	204.7	4923.6	203.7	4931	203.8	4951	203.3		
4954	202.9	4955	201.2	4962.6	199.7	4962.7	196	4972	195.2		
4982	194.5	4992	194.1	5002	193.8	5012	195	5022	196.2		
5032	198.9	5044	201.1	5046	202.3	5066	202.4	5092	202.3		
5125.5	201.8	5149.5	201.2	5154.5	200.1	5163.5	199.1	5173.5	198.4		
5183.5	198.2	5193.5	198.1	5203.5	198	5213.5	198.3	5223.5	198.4		
5233.5	198.4	5243.5	198.2	5253.5	198	5263.5	197.7	5273.5	196.9		
5283.5	194.9	5293.5	194.4	5303.5	194.4	5313.5	194.4	5323.5	195.2		
5332.5	196.6	5337.5	197.7	5342.4	199.4	5342.5	201.2	5343.5	203.7		
5358	205.3	5368.5	204.9	5388.5	202.2	5431.5	205.4	5603.5	205.8		
5691.5	204.2	5769.5	204.7	5832	203.3	5870	204.2	5992	203.8		
6094	209.7	6118	209.5	6130	208.8	6290	222.8	6516	225.1		

RamporiverPre.rep

Manning's n Values	num=	5							
Sta n Val Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4580.8 .9 4601.6	.075	4955	.038	5044	.09	6130			.9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4951 5046 110.1 264.9 200.1 .3 .5
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21152

INPUT
 Descri pti on: 21152

Station El evati on Data	num=	84							
Sta El ev Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4397.3 225 4407.4	221.2	4410.1	222.1	4415.9	222.7	4428.9	222.7	4428.9	222.7
4435.7 222.4 4445.2	220	4458	210	4477.5	204.5	4497.8	204.7	4497.8	204.7
4524.7 205.1 4549.7	205.4	4581.4	205.8	4602	205.9	4625.3	205.5	4625.3	205.5
4650.6 204.8 4674.9	205.3	4696.1	205	4713.5	203.9	4743.3	203	4743.3	203
4792.7 204.5 4854.7	204.4	4885.4	203.8	4889	201.6	4911	202	4911	202
4912 202.2 4919	201.3	4929	199.6	4939	196.6	4949	195.1	4949	195.1
4959 194.3 4969	193.7	4979	193.6	4989	194.2	4999	195.2	4999	195.2
5009 195.5 5019	194.7	5029	194.5	5039	194.4	5049	194	5049	194
5059 193.8 5069	194.8	5074	195.8	5077	197.3	5079	199.4	5079	199.4
5081 201.3 5083	204.1	5090	204.7	5100.2	204.2	5134.1	205.1	5134.1	205.1
5179 205.7 5206.1	204.7	5225.4	204.1	5237.3	204.6	5249.7	204.3	5249.7	204.3
5276.8 204.3 5314.1	204.2	5351.9	204.5	5373.6	205.2	5390.5	205.1	5390.5	205.1
5438.2 205.8 5461.3	204.5	5472.1	204.8	5485.7	204.5	5505	205.3	5505	205.3
5577.6 206.5 5619.1	206.2	5639.5	208.1	5670.3	208.9	5679.5	208.9	5679.5	208.9
5695.3 212 5713.3	213.2	5751.7	212.1	5780.2	212.4	5800.5	215.6	5800.5	215.6
5814.1 216 5829.6	215.8	5852.8	216.1	5883.4	217.5	5895.3	218.3	5895.3	218.3
5913.3 220 5935.9	221	5952.2	222.5	5999.2	225				

Manning's n Values	num=	5							
Sta n Val Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4397.3 .9 4428.9	.075	4919	.038	5081	.09	5679.5			.9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4911 5090 50 222 270 .3 .5
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20930

INPUT
 Descri pti on: 20930

Station El evati on Data	num=	83							
Sta El ev Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4370.3 225 4382.5	220.8	4393.3	220.7	4407.3	220.8	4415.8	219.7	4415.8	219.7
4433.8 214.1 4446.1	210.1	4459.7	204.8	4485	205	4519	205.3	4519	205.3
4555 205.3 4592.8	205.3	4632.2	205.1	4672.1	203.9	4696.7	202.2	4696.7	202.2
4727.9 202.2 4751.2	202.8	4779.8	203.8	4799.5	203.3	4827.5	203.1	4827.5	203.1
4848.1 203.2 4869.4	203.4	4893.9	202.2	4907	202.1	4914	202.2	4914	202.2
4915 201.4 4922	201.4	4924	201.9	4930	202	4931	201.3	4931	201.3
4931.1 200.7 4937	199.5	4942	198.4	4947	197.4	4957	197.4	4957	197.4

RampoverPre.rep									
4967	197.4	4977	197.4	4987	196.3	4997	195.3	5007	193.3
5017	191.4	5027	190.1	5037	190.6	5047	191.9	5052	194.3
5057	195.3	5062	198	5067	198.8	5069	199.1	5069.1	201.3
5069.2	203	5087	203.7	5092.2	203.1	5111	203.7	5159.5	203.8
5172.5	204.3	5188.1	203.5	5211.9	204.3	5236	204.4	5265.1	205.4
5293.4	204.5	5333.1	205	5377.3	205.8	5394.9	205.8	5408.1	205.9
5420.4	205.9	5442.7	207	5483.3	207.9	5493.7	209.6	5504.5	210.4
5516.6	211.7	5541	212.5	5574	213.1	5598	214.8	5630.7	216.6
5684	216.4	5723.3	217.8	5746.8	221.3	5761.3	222.5	5773.3	222.3
5792.7	223.2	5822.8	223.4	5859.1	225.2				

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4370.3	.9	4415.8	.075	4931	.037	5069.1	.09	5420.4	.9

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4930	5069.2		180	230	280		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20700

INPUT
 Description: 20700

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4402.5	225	4414.1	218.1	4427.7	216.9	4441.7	216.6	4457.3	215.2
4479.7	214.7	4508.8	215	4536.4	214.5	4563.2	213.2	4591.1	210
4608.4	204.9	4683.2	204	4741.3	203.8	4786	203.5	4831.2	202.3
4875.1	203.6	4913.7	204.7	4915.7	204.6	4933.7	202.5	4938.7	201.3
4943.7	200.8	4948.7	199.9	4953.7	198.5	4963.7	196.6	4973.7	194.8
4983.7	194.3	4993.7	194.5	5003.7	193.8	5013.7	193.3	5023.7	192.8
5033.7	192.6	5038.7	192.4	5043.7	193.8	5048.7	193.7	5053.7	195
5058.7	196.5	5060.2	200.9	5061	200.9	5061.1	201.3	5061.7	203.4
5066.7	203.9	5077	203.8	5123	204.7	5150.4	205.1	5173.6	203.8
5187.1	204.2	5198.7	203.9	5222.7	203.5	5256	203.5	5296.5	202.2
5311.4	201.1	5340.9	201.2	5380.6	201.1	5414.6	201.5	5446.3	202.6
5456.8	203.9	5476.2	210	5501.2	213	5516.6	213.8	5537.5	214.3
5565.4	215.3	5597.4	214.7	5625.1	214.7	5645.6	217.5	5663.9	221.2
5706.3	224	5737.3	225						

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4402.5	.9	4441.7	.075	4938.7	.037	5061.1	.09	5256	.9

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4915.7	5066.7		290	205	150		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20495

INPUT
 Description: 20495

Station Elevation Data num= 70

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4428.6	225	4434.7	222	4446.3	222.6	4462.2	221.6	4487.4	220.3
4526.3	219.5	4554.2	218.2	4582.5	214.7	4607.4	210	4642.9	204.8
4706.4	202.8	4746	202.4	4753	202.4	4777	202.4	4782	201.8
4783	201.3	4788	199.8	4797	198.8	4807	199.3	4817	200
4827	200.3	4837	200.3	4847	200.7	4849	201.3	4852	202.4
4862	202.8	4877	202.8	4897	202.8	4908	202.8	4917	203.2
4931	202.9	4934	201.2	4935	201.2	4940	200.4	4948	198.8
4953	197.2	4958	196.7	4968	196.1	4978	193.5	4988	193
4998	193.1	5008	193.3	5018	193.4	5028	193.2	5038	193.8
5043	194	5048	194.1	5053	194.4	5058	195.9	5061	197.9
5065	199.4	5065.1	201.1	5066	202.9	5079.9	203.8	5102.5	203.8
5124.5	203.9	5176.5	204	5199.8	203.9	5223.9	203.6	5261.3	202.6
5305.4	202.6	5362.3	202.6	5426	201	5500.7	201	5519.4	209.8
5536.7	215.7	5586.3	215.8	5601.2	218.2	5620.1	222.4	5661.8	225

Manning's n	Values	num=	7
Sta	n Val	Sta	n Val
4428.6	.9	4526.3	.075
5065.1	.09	5223.9	.9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4782 5066 148.05 147 157.95 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 20348

INPUT
 Descri pti on: 20348
 Thi s i s a REPEATED secti on.

Stati on El evati on Data	num=	78							
Sta El ev	Sta El ev	Sta El ev							
4381.8	225.1	4406.3	220	4437.4	218.2	4511.1	218.7	4544.4	220.1
4576.8	220.2	4599.8	215.9	4657.8	202.8	4686.4	203	4722	202.9
4742	202.8	4745	202.8	4746	201.3	4752	200	4762	199.2
4762.5	198.9	4764	199	4764.1	199	4772	198.8	4783	199.6
4783.5	199.6	4784.5	199.6	4785	199.6	4792	199.8	4802	200.5
4812	200.7	4813	201.3	4818	202.2	4818.1	202.2	4832	202.3
4851	202.7	4872	202.4	4881	202.6	4910.5	203.1	4930.5	202.7
4932.5	201.4	4938.5	200.6	4945.5	198.6	4955.5	197.3	4960.5	196.1
4970.5	194	4980.5	193.7	4990.5	193.6	5000.5	193.4	5010.5	193.6
5020.5	193.4	5030.5	193.2	5040.5	193.4	5050.5	193.8	5055.5	194.4
5060.5	196	5064.5	197.2	5065.5	199.9	5066.5	200.2	5066.6	201.2
5066.7	202.7	5078.5	203.2	5103.1	202.7	5135.8	203.2	5158.4	203.7
5181.6	203.5	5208.8	203.2	5244	203.8	5435.7	199.9	5474.1	200.2
5523.7	200.7	5552.7	200.7	5568.4	201.7	5581.1	202.8	5614.3	214.3
5625.5	214	5640.1	219.6	5658.4	222.1	5682.9	224.4	5694.8	224.4
5733.4	224.8	5765	224.3	5800.7	225				

Manning's n	Values	num=	7
Sta	n Val	Sta	n Val
4381.8	.9	4576.8	.07
5066.6	.075	5208.8	.9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4722 5066.7 16 16 16 .3 .5
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20332

INPUT
 Description: 20332
 This is a REPEATED section.

Station Elevation Data		num= 76		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4374.3	225	4404.8	218.4	4435.8	218.4	4465	218.5	4503.7	218.6		
4542.6	220.3	4568.2	220	4711.8	202.6	4721	202.8	4741	202.8		
4745	202.9	4745.1	201.3	4745.2	199.8	4751	199.1	4764	199		
4764.1	198.7	4765.4	198.7	4765.5	198.6	4771	198.4	4785	199.3		
4785.1	199.3	4786.4	199.3	4786.5	199.3	4791	198.6	4803	199		
4803.1	199	4811	200.6	4818	201.3	4824	202.4	4841	202		
4861	202.2	4881	202.5	4895	202.4	4909	202.9	4931	202.8		
4934	201.1	4939	200.4	4944	198.7	4949	198.1	4954	197.1		
4959	195.8	4969	194	4979	193.8	4989	193.3	4999	193.4		
5009	193.2	5019	193.1	5029	192.9	5039	193.1	5049	193.5		
5054	194.4	5064	196.9	5066	200.2	5066.1	201.1	5066.2	202.6		
5079	203.2	5081.1	202.1	5112.9	202.7	5139.5	203.7	5161.6	203.9		
5172.8	203.7	5184.7	203.1	5201.3	203.4	5233.3	203.2	5263	203		
5299.3	202.2	5337.7	202.1	5373.8	201.1	5418.6	201.1	5447.1	200.4		
5485.5	200	5516.7	200	5546.7	200.6	5594.1	204.8	5609.9	207.2		
5679	225										

Manning's n Values		num= 7		Sta n Val		Sta n Val		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4374.3	.9	4568.2	.075	4745.1	.04	4818	.065	4934	.035		
5066.1	.075	5201.3	.9								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4745 5066.1 2 2 2 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20330

INPUT
 Description: 20330

Station Elevation Data		num= 76		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4374.3	225	4404.8	218.4	4435.8	218.4	4465	218.5	4503.7	218.6		
4542.6	220.3	4568.2	220	4711.8	202.6	4721	202.8	4741	202.8		
4745	202.9	4745.1	201.3	4745.2	199.8	4751	199.1	4764	199		
4764.1	198.7	4765.4	198.7	4765.5	198.6	4771	198.4	4785	199.3		
4785.1	199.3	4786.4	199.3	4786.5	199.3	4791	198.6	4803	199		
4803.1	199	4811	200.6	4818	201.3	4824	202.4	4841	202		
4861	202.2	4881	202.5	4895	202.4	4909	202.9	4931	202.8		
4934	201.1	4939	200.4	4944	198.7	4949	198.1	4954	197.1		
4959	195.8	4969	194	4979	193.8	4989	193.3	4999	193.4		
5009	193.2	5019	193.1	5029	192.9	5039	193.1	5049	193.5		
5054	194.4	5064	196.9	5066	200.2	5066.1	201.1	5066.2	202.6		
5079	203.2	5081.1	202.1	5112.9	202.7	5139.5	203.7	5161.6	203.9		
5172.8	203.7	5184.7	203.1	5201.3	203.4	5233.3	203.2	5263	203		
5299.3	202.2	5337.7	202.1	5373.8	201.1	5418.6	201.1	5447.1	200.4		

5485.5 200 5516.7 200 RampoRiverPre.rep
5679 225

Manning's n Values num= 7
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
4374.3 .9 4568.2 .075 4745.1 .04 4818 .065 4934 .035
5066.1 .075 5201.3 .9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4745.1 5066.1 260.1 260.1 260.1 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
4374.3 4745.1 201.3 F
5066.1 5679 201.1 F
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20070

INPUT
Description: 20070

Station Elevation Data num= 79
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
4411.7 225 4439.1 222 4452.7 220 4539.9 219.7 4562.3 214.7
4592.4 210 4629.7 203.1 4637 201.2 4638 203.1 4641 203.1
4643 200 4647 199 4655 197.9 4661 197.5 4670 197.2
4676 197 4682 197.8 4686 198.4 4691 198.9 4696 199.9
4701 201.2 4707 201.4 4710 202.3 4742 201.9 4752 201.4
4757 201 4766 201.4 4776 201.6 4801 201.4 4809 200.9
4820 201.8 4827 201.4 4859 202.1 4922.5 201.6 4934.5 201.4
4939.5 202.1 4941.5 201.2 4942.5 200.6 4947.5 199.5 4952.5 197.1
4962.5 195.2 4972.5 192.7 4982.5 192.7 4992.5 192.7 5002.5 192.6
5012.5 192.5 5022.5 192.2 5032.5 192.6 5042.5 194.2 5047.5 195
5052.5 197.3 5056.5 199.2 5058.5 201.2 5060.5 202.6 5082.5 203.3
5148 204.6 5162.5 203 5181.3 203.5 5210.5 203.4 5252.9 204.1
5283.7 204.5 5324.3 204.7 5370.6 204.4 5405.6 204.5 5421.7 204.4
5485.9 203.5 5517.2 203.1 5556.9 204 5593.4 200.3 5609.4 198.7
5621.4 200.4 5666.1 201 5704.3 201.9 5753.4 201.7 5794 203.2
5806.7 210 5843.8 222.1 5854.8 223 5884.8 227.6

Manning's n Values num= 7
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
4411.7 .9 4592.4 .075 4643 .04 4701 .065 4941.5 .035
5058.5 .075 5210.5 .9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4638 5060.5 159.9 260.1 245.1 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
4411.7 4638 203.1 F
5060.5 5884.8 202.6 F
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 19810

RamporiverPre. rep

INPUT

Description: 19810

Station Elevation Data		num= 98							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4408.3	225	4426	222.1	4439.8	222	4455	220	4472.5	217.6
4487.1	214.6	4496	215.5	4519	207	4553	202.9	4554	201.2
4555	199.7	4560	199.4	4565	198.4	4575	198.1	4583	197.7
4590	197.7	4595	198.1	4600	198.4	4602	198.9	4609	201.1
4610	203.6	4614	203.7	4623	201.8	4637	201.4	4688	201.5
4697	201.4	4709	200.7	4722	199.4	4782	200	4832	200.6
4872	201.2	4919	201.7	4938	201.8	4939	201.2	4943	200.4
4944	199.4	4949	198	4954	196.6	4959	195	4964	192.5
4969	192.2	4979	192.2	4989	192.5	4999	192.2	5009	192
5019	191.8	5029	191.5	5039	191.6	5049	194.8	5054	196.3
5059	199.9	5061	201.2	5063	202.9	5089	204.6	5177	206.1
5228	204	5297	203.3	5313	202.8	5365	201.2	5375	200.5
5380	198.6	5399	191	5409	188.2	5415	187.3	5423	188.7
5428	188.1	5433	188.4	5439	187.2	5449	184.2	5454	184.2
5459	185.2	5469	186.6	5479	185.7	5485	187.2	5489	186.5
5499	184.9	5509	184	5514	183.6	5521	184	5529	184.1
5539	183.9	5544	184.2	5549	184.2	5554	185.2	5559	184.1
5569	183.4	5579	183.3	5589	183.2	5599	183.1	5604	183
5799	187.3	5847	197.7	5850	198.8	5856	200.4	5857	201.2
5867	204.4	5879	213.4	5910.7	225.8				

Manning's n Values		num= 7							
Station	n Val	Station	n Val	Station	n Val	Station	n Val	Station	n Val
4408.3	.9	4519	.075	4554	.04	4609	.065	4939	.035
5061	.075	5089	.9						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4554	5061		180	90	385	.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 19720

INPUT

Description: 19720

Station Elevation Data		num= 101							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4367	232	4405	220.7	4419	216.9	4428	210.2	4456	200.9
4458	199.9	4464	199.4	4470	199.8	4476	199.8	4483	199.3
4491	198.9	4496	198.4	4506	198.8	4513	198.9	4515	199
4517	201.3	4519	201.7	4528	201.6	4533	202.3	4576	202.1
4614	201.5	4850	201.6	4933	201.4	4934	201.3	4937	200.3
4943	199	4948	196.5	4953	195.9	4958	193.2	4963	192.6
4973	192.1	5033	192.3	5043	193.8	5053	195.1	5058	195.9
5063	200	5066	201.3	5069	203.2	5157	203.2	5173	202.9
5202	201.4	5204	200.6	5205	201.9	5207	201.2	5210	200.7
5215	198.6	5220	193.3	5228	192.1	5238	189.5	5245	188
5250	188	5258	186.1	5263	185.2	5268	186	5272	184.8
5278	184.6	5288	184.5	5298	183.4	5303	182.4	5308	184
5310	184	5318	181.2	5320	181.2	5328	183.2	5332	183.7
5338	181.9	5348	181	5358	180.1	5378	180.1	5386	179.3
5408	179.3	5428	180	5430	180.1	5438	182.3	5448	188.2
5458	192.3	5464	199.2	5493	200	5501	201.2	5550	202.6
5645	203.4	5753	203.1	5796	202.9	5796.5	201.8	5808	203.4

5848	203.7	5880	202.8	5889	201.2	5891	199.9	5899	196.3
5901	194.2	5909	194	5914	196	5919	198.7	5922	200.2
5922.1	201.2	5924	204.8	5939	205.3	5969.57	205.8	5995.2	210.1
6008.01	216								

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
4367	.075	4456	.043
		5501	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4456	5501		435	294.9	159.9		.3	.5
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19425

INPUT
 Description: 19425

Station	Elevation	Data	num=	74					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3799.4	231.2	3819	234.3	3841	219.9	3870.6	201.3	3875.9	200.3
3888.6	199.2	3897.8	198.9	3908.7	199	3920.6	199.3	3934.5	199.5
3944.6	199.9	3955.1	199.8	3962.6	200.5	3970	201.2	3978	204.4
3988.4	205.2	3992.6	204.6	4045.2	204.8	4102.7	204.7	4156	204.8
4218.8	205.3	4245.6	204.8	4256	202	4258	201.2	4261	200.6
4265	199.7	4284	198.8	4295	198.3	4305	199.3	4315	199.8
4327	201.1	4327.5	200.5	4347	200.3	4366	201	4387	200.9
4422	201.1	4446	201.3	4494	200.9	4498	200.7	4504	200.1
4509	199.3	4514	197.5	4519	193.2	4529	193.2	4619	194.1
4629	194.5	4707	195	4779	187.9	4840	187.7	4871	185
4909	180	5020	178	5112	180.1	5149	183.4	5242	201.1
5270.6	202.2	5290.9	202.1	5314.8	202.4	5326.7	201.1	5337	200.8
5347	200.6	5360	200.1	5366	199.3	5370	198.7	5384	197.4
5395	195.3	5409	192.8	5427	188.6	5433	184.6	5507.4	201.2
5534.4	210.5	5564	222.6	6010.4	224.1	6023.2	225.1		

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
3799.4	.075	4258	.043
		5507.4	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4258	5507.4		130.05	145.05	205.05		.3	.5
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19280

INPUT
 Description: 19280

Station	Elevation	Data	num=	57					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4444.84	215.88	4465.12	210.33	4506	201.2	4519	201.2	4524	200.4
4529	200.1	4534	199.5	4544	198.6	4554	197.5	4564	197
4574	197	4584	195.7	4594	194	4604	192.2	4614	192.6
4624	193	4627	193.2	4760	192.2	4825	190.7	4843	190

RampoverPre.rep									
4890	185	4950	180	4970	179.9	5025	180	5025.1	180
5126	180.1	5159	178.7	5167	180.1	5169	179.8	5171	179.7
5177	181.2	5179	181.3	5183	181.2	5189	180.4	5193	180
5199	180.8	5201	180.9	5205	181	5209	180.7	5219	181.5
5228	182.7	5231	184.3	5235	184.4	5289	188.6	5323	184.8
5351	189	5362	186.7	5399	190	5409	190	5459	197.7
5470	198.3	5472	198.9	5476	200.3	5478	200.9	5480	201.3
5532	212.1	5562	219.9						

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4444.84	.075	4825	.043	5478	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4825	5478		475	209		.3	.5
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19071

INPUT

Description: 19071

Station Elevation Data num= 62									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3961	225	3981	224	3999.9	221.8	4020.1	220.9	4053	218.9
4072.6	219.7	4083.2	219.9	4095.7	219.3	4127.6	220.8	4151.1	219.6
4177.6	210.2	4207.5	208.1	4242.5	210.2	4293.7	211.8	4322.6	211.7
4352.5	211	4388.8	210	4412.2	208.3	4436.3	207.9	4452	206.6
4476.1	206.3	4478.8	206.6	4495.2	206.6	4498.7	206	4508.6	201.7
4604	192.8	4615	189.5	4653	188.9	4671	190	4700	193.5
4844	192.5	4870	193.2	4920	190	4986	190	5011	190.7
5165	191.5	5330	191.5	5420	190	5455	190	5460	196
5491.5	201.2	5517.5	208.1	5542.2	215.5	5550.2	216.9	5560	217.7
5581.5	219	5609.5	219.5	5644.2	220.1	5718.2	221.5	5749.4	222
5798.3	222.7	5901.3	224.8	5930.7	223.9	5935.8	223.2	5954.3	223.7
5969.1	222.7	5978.6	223.4	6016.4	223.9	6061.9	224	6107.7	224.5
6144.3	224.5	6181.7	225.9						

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
3961	.075	4508.6	.043	5491.5	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4508.6	5491.5		150.08	155.04		.1	.3
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 18916

INPUT

Description: 18916

Station Elevation Data num= 87									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4374	209.7	4381	201.2	4386	200.5	4391	198.8	4395	198
4407	194.7	4418	194.5	4428	194.3	4438	194.4	4443	194.7
4492	193.5	4518	184.2	4528	184.2	4548	186.5	4561	191.7

RampoverPre.rep									
4642	191.3	4703	192.4	4749	192.8	4758	192.2	4798	184.4
4818	184.1	4828	185.1	4838	185.3	4843	185.4	4865	189.2
4878	189	4898	186.7	4908	189	4932	189.5	4971	189
4990	191.1	5051	188.2	5163	188.4	5168	188.9	5171	189.2
5176	189.1	5178	189	5184	189.1	5188	188	5198	188.2
5208	189.9	5211	189.9	5216	189.3	5218	189.3	5226	189.7
5228	189.5	5234	188.9	5238	188.9	5248	189.2	5258	189.9
5263	190.1	5268	189.9	5276	189.3	5278	189.2	5288	189.2
5298	189.2	5308	189.3	5316	189.8	5318	189.6	5328	188.6
5331	188.4	5338	188.3	5348	187.7	5358	187.6	5365	188.8
5368	188.8	5375	188.4	5378	188.3	5388	188.1	5390	188.1
5398	189.2	5408	188.9	5418	188.6	5428	188.4	5430	188.5
5448	188.8	5450	188.9	5458	188.6	5463	188.5	5468	188.8
5473	189.1	5478	189	5488	188.5	5558	192	5610	198.9
5618	201.2	5625	202.8						

Manning's n Values		num= 3	
Station	Value	Station	Value
4374	.075	4381	.043
		5618	.1

Bank Station	Left	Right	Lengths	Left Channel	Right	Coeff	Contr.	Expan.
	4381	5618		245	234		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 18682

INPUT
 Description: 18682

Station Elevation Data									
Station	Elev	Station	Elev	Station	Elev	Station	Elev	Station	Elev
3948.1	225.1	3968.6	222	3998.4	220.3	4144.1	220.3	4171.5	221.1
4224.6	222	4243.3	222.4	4299.4	222.7	4328.5	221	4356.9	202.2
4361.3	201.2	4384	192.7	4397	192.4	4417	192.4	4427	193
4447	194.6	4457	194.5	4487	184.3	4497	184.7	4507	185.1
4527	186.8	4547	190.4	4571	191.4	4692	190.7	4708	190
4762	185	4798	183.5	4826	185	4871	188	4970	187.5
5070	185.1	5259	185	5267	186.2	5317	188	5327	187.6
5337	187.4	5347	187.4	5357	187.5	5367	187.5	5377	187.7
5387	187.7	5397	187.8	5407	187.9	5417	187.9	5427	187.7
5437	187.7	5441	187.4	5447	188	5457	187.5	5467	187.4
5477	187	5487	186.8	5490	186.8	5495	187.5	5497	187.5
5499	187.5	5506	187.1	5507	187.1	5509	187.4	5517	184.2
5522	182.1	5527	182	5537	182.1	5631.6	200.6	5647.6	201.2
5713.9	205	5737.3	206.9	5794.6	217.8	5821.1	218.1	5849.1	220.8
5885.1	222.9	5902	223.7	5917	222.9	5936.4	223.5	5967.6	223.7
6011.1	224	6054.2	223.3	6092.5	223.6	6124.7	223.4	6137.8	225.1

Manning's n Values		num= 3	
Station	Value	Station	Value
3948.1	.075	4361.3	.043
		5647.6	.1

Bank Station	Left	Right	Lengths	Left Channel	Right	Coeff	Contr.	Expan.
	4361.3	5647.6		260	235		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RamporiverPre. rep

RIVER: Ramapo River
 REACH: Reach-1

RS: 18447

INPUT

Description: 18447

Station Elevation Data				num=	102					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4186	219.7	4193	219.2	4219	203	4233	201.2	4240	199.9	
4245	198.7	4250	198.9	4255	200.4	4260	201.2	4407	201.7	
4433	201.6	4439	199.3	4476	196.6	4492	192.5	4572	191.6	
4674	191.2	4706	190.5	4713	190.7	4758	183.5	4766	183.4	
4776	182.9	4786	182.6	4791	182.5	4796	183	4806	182.3	
4816	182.3	4818	182.3	4826	182.6	4836	183.1	4846	183.7	
4856	184.1	4875	188.2	4930	188.3	4936	188.9	4944	188.3	
4946	188.3	4952	188.3	4956	188.9	4966	188.2	4974	189.1	
4976	188.4	4986	187.2	4989	187.1	4996	187.2	4999	187.4	
5004	187.7	5006	188.2	5008	188.3	5015	187.5	5016	187.3	
5026	187.6	5033	187.7	5036	186.4	5040	186.3	5046	186.4	
5053	186.6	5056	188.2	5065	186.5	5066	186.4	5072	186.1	
5076	186.1	5078	186.2	5086	186.5	5096	186.8	5098	186.9	
5106	186.8	5116	186.4	5120	186.3	5126	186.4	5129	186.5	
5136	186.3	5146	186.1	5156	185.9	5166	185.8	5176	185.9	
5186	186	5194	186.2	5196	186.2	5206	186.3	5216	186.9	
5218	187	5226	187.8	5236	188.1	5246	187.5	5256	187.4	
5264	187.4	5266	187.3	5268	187.2	5276	187.7	5284	187	
5286	186.2	5294	187	5296	186.4	5298	186.3	5306	186.2	
5551	200.9	5561	200.2	5566	201.2	5567	202.4	5652	207.2	
5707.12	211.26	5732.74	215.17							

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4186	.075	4407	.043	5566	.1

Bank Sta: Left 4407 Right 5566 Lengths: Left Channel 150 Right 167 310 Coeff Contr. .1 Expan. .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 18280

INPUT

Description: 18280

Station Elevation Data				num=	79					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4139.6	225.2	4157	222.8	4191.5	219.8	4222.5	219.6	4248.6	219.7	
4272	220.4	4296.9	220.6	4322.2	221.6	4325	221.6	4345	221.1	
4383	202.7	4398	201.2	4403	200.8	4408	200.2	4418	200.4	
4423	201.2	4427	201.8	4442	201.7	4450	201.3	4470	200.9	
4493	200.8	4503	201	4518	201.1	4533	201.1	4548	200.9	
4563	200.8	4583	200.8	4588	200.2	4593	199.7	4598	199.1	
4604	199.8	4694	199	4787	188.9	4794	189.4	4800	191.5	
4865	190.6	4946	191.9	5005	190	5005.1	190	5034	188.3	
5062	187.2	5066	188.5	5074	189.7	5107	190.3	5114	190.4	
5118	190.1	5124	190.9	5134	192.2	5144	194.2	5154	195.2	
5159	195.5	5164	195.4	5174	193.5	5184	190.3	5194	187.9	
5204	186.9	5214	187	5222	187.4	5224	186.7	5264	186.3	
5274	186.4	5284	186.5	5294	186.6	5300	186.7	5304	187.2	
5314	187.4	5324	187.3	5334	187.4	5546	199.2	5549	201.2	

RampoverPre.rep

5613	222.9	5622.6	223.4	5647.8	223.3	5663.7	224.1	5692.1	224.4
5715.5	224.3	5742.3	224.4	5779.5	224.9	5815.7	225.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4139.6	.075	4398	.043	5549	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4398 5549 435.2 396 430 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 17884

INPUT

Descripti on: 17884

Stati on El evati on Data num= 63

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4685.6	220	4703	218.3	4722.7	215.1	4738	212.2	4753.2	208.2
4799	203.5	4803	202.1	4807	201.2	4811	200.2	4816	198.7
4824	198	4830	197.3	4847	197.3	4861	197.4	4875	197.8
4891	197.7	4904	198.4	4919	198.9	4934	199.3	4951	199.2
4967	199.1	4982	198.7	4997	198.4	5011	197.9	5024	197.7
5041	197.7	5059	197.9	5073	197.7	5088	196	5091	195.4
5096	192	5108	188	5121	186.6	5134	185.8	5147	186.2
5160	188.2	5167	190	5173	190.5	5193	190	5200	190
5210	190	5225	190	5245	191.4	5258	191.5	5268	190.1
5289	189.1	5317	190.7	5340	193.9	5347	192.8	5365	193.5
5370	191.8	5396	192	5474	190.7	5540	191.1	5561	193.5
5567	196.3	5586	198.5	5596	198.6	5600	198.4	5606	199.8
5611	201.2	5620.4	206	5702	222.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4685.6	.075	4807	.043	5611	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4807 5611 419.85 417.15 419.85 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 17467

INPUT

Descripti on: 17467

Stati on El evati on Data num= 57

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4691.7	220	4706.3	219.3	4725	220.1	4742.5	214.6	4761	202.1
4766.5	201.2	4771.5	200.2	4777.5	199	4787.5	198.1	4802.5	197.3
4816.5	197.1	4826.5	197.1	4839.5	197.4	4850.5	197.6	4865.5	198.1
4879.5	198.7	4898.5	198.7	4917.5	198.7	4934.5	198.4	4948.5	198.5
4965.5	198.2	4984.5	198.2	4997.5	197.7	5009.5	197.5	5021.5	197.9
5042.5	198.6	5062.5	198.1	5079.5	197.7	5097.5	197.7	5112.5	197.8
5127.5	198	5140.5	197.9	5149.5	197.7	5150.5	197.2	5151.5	195.4
5159.5	192.9	5169.5	191.7	5184.5	191	5196.5	191	5203	190.4
5210	190.4	5220	190.4	5273	190.4	5403	194.9	5430	195

RampoverPre.rep

5640.5	198.6	5650.5	198.8	5657.5	198.8	5663.5	199.5	5668.5	200.2
5669.5	201.1	5670.5	202	5680.5	204.6	5694.3	208.7	5709.7	214.5
5724	216.9	5731.4	220						

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4691.7 .075	4766.5 .043	5669.5 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4766.5 5669.5 299.95 306.95 540.05 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 17160

INPUT
 Descri pti on: 17160

Stati on El evati on Data num= 44

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4606.1	220.2	4631.8	218.3	4665.9	217.6	4690.5	219.2	4725.9	217.1
4748.4	216	4766.6	216.2	4777.5	213.4	4791.8	212.3	4812.1	209.2
4830	207.4	4839	205.5	4847	203.5	4850	201.2	4855	200.2
4865	198	4875	194.6	4880	193.6	4890	193.6	4900	194.1
4915	194.7	4925	194.9	4940	195	4960	195	4980	194.8
5000	195.2	5020	195.2	5040	194.9	5050	194.9	5062	195.4
5080	195.7	5096	195.7	5107	195.8	5118	195.8	5328	197
5349	205.2	5492	206.7	5524	206.3	5539	206.4	5553	208.1
5644	207	5669	208.3	5690	207.5	5722	220		

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4606.1 .075	4850 .043	5669 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4850 5669 409.95 409.95 409.95 .4 .6
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 16750

INPUT
 Descri pti on: 16750
 Thi s i s a REPEATED secti on.

Stati on El evati on Data num= 62

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4537.6	220	4555.8	218.6	4564.9	218.6	4577.6	217.2	4601.4	215.3
4622	214.1	4726	213.1	4746	215.4	4762	202.9	4774	201.5
4802	200.6	4812	200.6	4822	199.9	4852	196.4	4872	195.9
4887.9	195	4888	195	4956	189	4956.1	189	4959.9	189
4960	189	5024	189	5024.1	189	5027.9	189	5028	189
5096	195	5096.1	195	5122	194.1	5132	193.8	5142	193.8
5152	194.1	5202	199	5217	200.4	5222	201.3	5228	202
5231.9	202.2	5236	203.1	5240	212.1	5243.5	212.1	5243.6	209.1
5256.9	208.7	5258.5	208.2	5264.4	208.8	5285.4	209.7	5306.1	209.9
5334.2	211.5	5375.4	212.9	5396.1	213.1	5424	212.9	5457.5	214.2

				Ramp	River	Pre. rep			
5495	214.4	5556	215.1	5567.3	215.5	5611.3	214.5	5635.8	215.3
5690.9	215.2	5719.5	214.5	5738.3	215.2	5779.2	213.5	5802.6	214.3
5823	217.5	5846.7	220.1						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4537.6 .075 4774 .043 5222 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4774 5222 93 93 93 .4 .6
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 16657

INPUT

Description: 16656

LAKESIDE AVE. BRIDGE

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4537.6	220	4555.8	218.6	4564.9	218.6	4577.6	217.2	4601.4	215.3
4622	214.1	4726	213.1	4746	215.4	4762	202.9	4774	201.5
4802	200.6	4812	200.6	4822	199.9	4852	196.4	4872	195.9
4887.9	195	4888	195	4956	189	4956.1	189	4959.9	189
4960	189	5024	189	5024.1	189	5027.9	189	5028	189
5096	195	5096.1	195	5122	194.1	5132	193.8	5142	193.8
5152	194.1	5202	199	5217	200.4	5222	201.3	5228	202
5231.9	202.2	5236	203.1	5243.6	209.1	5256.9	208.7	5258.5	208.2
5264.4	208.8	5285.4	209.7	5306.1	209.9	5334.2	211.5	5375.4	212.9
5396.1	213.1	5424	212.9	5457.5	214.2	5495	214.4	5556	215.1
5567.3	215.5	5611.3	214.5	5635.8	215.3	5690.9	215.2	5719.5	214.5
5738.3	215.2	5779.2	213.5	5802.6	214.3	5823	217.5	5846.7	220.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4537.6 .075 4774 .043 5222 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4774 5222 52 52 52 .4 .6

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4537.6 4774 201.5 F
 5222 5846.7 201.3 F
 Sediment Elevation = 0

BRIDGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 16630.5

INPUT

Description: LAKESIDE AVE. BRIDGE

Distance from Upstream XS = .5
 Deck/Roadway Width = 51
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 38
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

Ramp OverPre. rep

4537.6	220	220	4555.8	218.6	218.6	4564.9	218.6	218.6
4577.6	217.2	217.2	4601.4	215.3	215.3	4622	214.1	214.1
4726	213.1	213.1	4746	215.4	215.4	4762	214	202.9
4774	213.8	201.5	4802	213.5	200.6	4812	213.2	200.6
4822	213	199.7	4852	212.6	196.4	4887.9	212	195
4888	212	208.8	4956	211	207.8	4960	211	207.8
5024	210.4	207.5	5028	210.4	207.5	5096	210	207
5096.1	210	195	5142	209.7	193.8	5152	210.6	194.1
5202	209	199	5217	209	200.4	5232	208.8	202.2
5236	208.7	203.1	5240	208.7		5243.5	209	
5243.6	209.1	209.1	5256.9	209.5	208.7	5258.5	209.5	208.2
5264.4	209.5	208.8	5285	209.7	209.7	5306.1	209.9	209.9
5334.2	211.5	211.5	5375.4	212.9	212.9			

Upstream Bridge Cross Section Data

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4537.6	220	4555.8	218.6	4564.9	218.6	4577.6	217.2	4601.4	215.3
4622	214.1	4726	213.1	4746	215.4	4762	202.9	4774	201.5
4802	200.6	4812	200.6	4822	199.9	4852	196.4	4872	195.9
4887.9	195	4888	195	4956	189	4956.1	189	4959.9	189
4960	189	5024	189	5024.1	189	5027.9	189	5028	189
5096	195	5096.1	195	5122	194.1	5132	193.8	5142	193.8
5152	194.1	5202	199	5217	200.4	5222	201.3	5228	202
5231.9	202.2	5236	203.1	5243.6	209.1	5256.9	208.7	5258.5	208.2
5264.4	208.8	5285.4	209.7	5306.1	209.9	5334.2	211.5	5375.4	212.9
5396.1	213.1	5424	212.9	5457.5	214.2	5495	214.4	5556	215.1
5567.3	215.5	5611.3	214.5	5635.8	215.3	5690.9	215.2	5719.5	214.5
5738.3	215.2	5779.2	213.5	5802.6	214.3	5823	217.5	5846.7	220.1

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4537.6	.075	4774	.043	5222	.1

Bank Sta: Left Right Coeff Contr. Expan.
 4774 5222 .4 .6

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4537.6 4774 201.5 F
 5222 5846.7 201.3 F

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates

num= 21

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4754.9		216	213.2		4762		214	202.9		4774		213.8	201.5	
4802		213.5	200.6		4812		213.2	200.6		4822		213	199.7	
4852		212.6	196.4		4887.9		212	195		4888		212	208.8	
4956		211	207.8		4960		211	207.8		5024		210.4	207.5	
5028		210.4	207.5		5096		210	207		5096.1		210		
5142		209.7			5152		210.6			5202		209		
5217		209	200.4		5232		208.8	202.2		5236		208.7	203.1	

Downstream Bridge Cross Section Data

Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4584.2	220	4613.8	218.1	4634.4	217.4	4657.6	216.9	4681.9	215.5
4703	215.3	4719.4	215.1	4736	213.9	4754.9	216	4755	213.2
4773	211	4786	202.2	4792	202.1	4796	202.3	4816	202.2
4826	201.7	4833	201.3	4836	199.9	4846	198	4856	197.2
4866	196.6	4876	197.1	4886	196.5	4896	196.7	4906	196.7
4916	196.4	4926	197.5	4936	196.8	4946	197.2	4956	197.4
4966	196.4	4976	194.4	4986	192	4996	189.5	5006	188.1

Ramp Over Pre. rep									
5013.9	187.9	5014	188.9	5015.9	188.9	5021	189.9	5026	189.1
5036	188.2	5046	188	5056	188.2	5062.9	188.9	5063	192.6
5064.9	192.6	5069	192.9	5070.9	192.9	5071	188.5	5076	188.1
5086	189.6	5095.9	189.8	5096.82	190.17	5106	192.8	5116	193.4
5126	194.4	5136	193.2	5146	194.1	5156	194.4	5165.8	195
5165.9	201.3	5173	209.8	5186	209.5	5199.9	209.1	5200	209.1
5211	209.4	5245.8	209.5	5287.5	208.9	5328.2	208.5	5341.9	209.7
5362.8	211.4	5392.1	212.9	5420	213.4	5444.4	213.2	5465.2	213.6
5489.7	214.1	5528.9	213.9	5571.4	213.9	5609.8	214.2	5657.7	213.9
5690.7	213	5755.9	212.5	5780.3	213.3	5813.9	213.5	5838.7	213.4
5864.8	215.2	5884.8	216.2	5911.8	218.3	5966.5	220.4	5976.3	220.1

Manning's n Values num= 3
 Sta n Val Sta n Val
 4584.2 .075 4833 .043 5165.9 .1

Bank Sta: Left Right Coeff Contr. Expan.
 4833 5165.9 .4 .6

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4584.2 4833 208.9 F
 5165.9 5976.3 207 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 210
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data
 Pier Station Upstream= 4958 Downstream= 4958
 Upstream num= 2
 Width Elev Width Elev
 4 180 4 220
 Downstream num= 2
 Width Elev Width Elev
 4 180 4 220

Pier Data
 Pier Station Upstream= 5026 Downstream= 5026
 Upstream num= 2
 Width Elev Width Elev
 4 180 4 220
 Downstream num= 2
 Width Elev Width Elev
 4 180 4 220

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Momentum Cd = 1.6
 Yarnell KVal = 1.1

Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd

RamporiverPre.rep
 Submerged Inlet + Outlet Cd = .7559289
 Max Low Cord = 208.4

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 16605

INPUT

Description: 16605

Station Elevation Data		num= 90							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4584.2	220	4613.8	218.1	4634.4	217.4	4657.6	216.9	4681.9	215.5
4703	215.3	4719.4	215.1	4736	213.9	4754.9	216	4755	213.2
4773	211	4786	202.2	4792	202.1	4796	202.3	4816	202.2
4826	201.7	4833	201.3	4836	199.9	4846	198	4856	197.2
4866	196.6	4876	197.1	4886	196.5	4896	196.7	4906	196.7
4916	196.4	4926	197.5	4936	196.8	4946	197.2	4956	197.4
4966	196.4	4976	194.4	4986	192	4996	189.5	5006	188.1
5013.9	187.9	5014	188.9	5015.9	188.9	5021	189.9	5026	189.1
5036	188.2	5046	188	5056	188.2	5062.9	188.9	5063	192.6
5064.9	192.6	5069	192.9	5070.9	192.9	5071	188.5	5076	188.1
5086	189.6	5095.9	189.8	5096.82	190.17	5106	192.8	5116	193.4
5126	194.4	5136	193.2	5146	194.1	5156	194.4	5165.8	195
5165.9	201.3	5173	209.8	5186	209.5	5199.9	209.1	5200	209.1
5211	209.4	5245.8	209.5	5287.5	208.9	5328.2	208.5	5341.9	209.7
5362.8	211.4	5392.1	212.9	5420	213.4	5444.4	213.2	5465.2	213.6
5489.7	214.1	5528.9	213.9	5571.4	213.9	5609.8	214.2	5657.7	213.9
5690.7	213	5755.9	212.5	5780.3	213.3	5813.9	213.5	5838.7	213.4
5864.8	215.2	5884.8	216.2	5911.8	218.3	5966.5	220.4	5976.3	220.1

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4584.2	.075	4833	.043	5165.9	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4833	5165.9		440.1	418.95		.4	.6

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
4584.2	4833	208.9	F
5165.9	5976.3	207	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 16186

INPUT

Description: 16186

Station Elevation Data		num= 100							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
4426.3	220.1	4564	210.1	4594	213.4	4626	209.7	4649	201.1

Rampori verPre. rep

4676	198.3	4716	197.5	4726	197.4	4736	197.4	4746	197.5
4756	197.6	4766	197.7	4776	197.8	4786	198	4796	198.1
4806	198.2	4816	198.2	4826	198.1	4836	198	4846	197.9
4856	197.8	4866	197.7	4876	197.5	4886	197.2	4896	197
4906	196.7	4916	196.2	4926	195.7	4976	191.4	4986	190.9
4996	190.5	5006	190.3	5016	190.7	5026	191.2	5036	192
5046	192.4	5056	192.3	5066	192.2	5076	192.2	5086	192.3
5096	192.7	5106	193	5116	193.2	5126	193.2	5136	193.2
5146	193.2	5156	193.2	5166	193.2	5176	193.3	5186	193.4
5196	193.6	5206	193.7	5216	193.8	5226	193.9	5236	194
5246	193.7	5256	193.3	5266	193.2	5276	193	5286	192.9
5296	192.7	5306	192.6	5316	192.5	5326	192.6	5336	192.8
5346	193.2	5351	201.4	5351.1	202.1	5366	210.1	5368	209.5
5383	209.9	5398	209.6	5398.1	210	5414	211.5	5447.2	212.2
5469.8	212.1	5513.7	212	5552.4	211.8	5583.6	211.4	5620.8	211.8
5652.5	211.5	5686.3	211.2	5714.8	211.5	5761.3	211.6	5801.1	211.7
5821.7	212.2	5859.4	211.6	5888.3	213.3	5911.4	213.8	5953.6	213
5997.7	213.9	6008.3	213.9	6053.3	214.4	6082.8	215.6	6108.8	214.8
6138.2	215.5	6176.7	216	6230.6	216.7	6268.1	217.8	6296.9	220.1

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4426.3	.07	4649	.043	5351	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4649	5351		505	490		.1	.3
Sediment El evati on =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 15696

INPUT
 Descri pti on: 15696

Station El evati on Data			num=	87					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4308.7	220	4335.5	215.7	4358.5	214.6	4390.5	212.3	4407.5	202.8
4411.5	201.4	4430.5	198.4	4450.5	197	4650.5	193.2	4690.5	193.4
4698	193.8	4928	196.1	4968	196.1	5028	193.8	5038	193.6
5048	193.4	5058	193.3	5068	193.2	5078	193.2	5088	193.1
5098	193	5108	192.9	5118	192.8	5128	192.9	5168	193.6
5178	193.7	5258	195.9	5278	195.9	5288	196	5308	196.1
5318	196	5328	195.9	5388	192.5	5398	192.3	5408	192.3
5418	192.5	5428	193.4	5438	196.3	5458	197.5	5478	197.5
5488	197.6	5588.5	201.1	5591.5	201.6	5601.5	203.5	5624.5	205.5
5651.5	206.9	5651.6	204.6	5670.8	206.9	5701.1	208.4	5724.2	208.9
5736.7	208.6	5761.5	209.1	5816.9	208.9	5870.3	208	5915.8	207.8
6001.7	208.2	6089.3	208	6149.4	207.2	6220	208.1	6248.9	208.2
6396.7	218.2	6452	218.4	6536.9	218.2	6595.8	219.2	6684.4	218.4
6771.3	218.8	6847.8	218.8	6915.9	216.6	7062.4	215.4	7116	217.8
7177.2	218.8	7267.4	219.9	7351.4	219.8	7536.4	219.7	7560.8	219.9
7584.7	221.6	7650.9	217.4	7681.8	216.5	7700.9	221.1	7722.9	219.6
7776.5	216.3	7848.5	217	7916.5	218.3	7944.8	218.6	7967.4	218.4
7999.7	218.3	8001.7	220						

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4308.7	.07	4411.5	.043	5591.5	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.

RamporiverPre.rep
505 481 875 .1 .3

4411.5 5591.5
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 15215

INPUT
Description: 15215

Station Elevation Data		num= 85		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3894.9	217.6	3952.3	204.6	3959.7	201	3992.3	197	4032.3	194.8		
4072.3	195	4092.3	195.2	4152.3	195.2	4232.3	195.4	4272.3	193.4		
4292.3	193.2	4332.3	193.2	4352.3	193.6	4392.3	193.6	4412.3	193.4		
4492.3	193.6	4572.3	193	4592.3	193	4632.3	192.7	4652.3	191.7		
4672.3	190.7	4692.3	190.6	4712.3	191.2	4732.3	191.8	4752.3	192.6		
4772.3	193	4792.3	193.2	4812.3	193.4	4832.3	194.2	4852.3	194.6		
4872.3	194.8	4892.3	195	4912.3	195.2	4932.3	195.8	4952.3	195.2		
4972.3	195.4	4992.3	195	5012.3	195.2	5032.3	196.2	5052.3	196.4		
5072.3	196.6	5092.3	196.8	5112.3	196.8	5132.3	196.4	5152.3	197.8		
5172.3	197.8	5192.3	197.7	5212.3	197.6	5232.3	197.6	5252.3	197.5		
5952.3	198.2	5972.3	198.5	5992.3	199.3	6012.3	199.8	6084.9	208.5		
6101	208.7	6116.6	208.7	6131.9	207.8	6140.7	208	6170.6	209		
6189.5	210.3	6340.7	211.2	6402.5	210.9	6458.3	210.1	6514	210.4		
6574.6	212.1	6608.3	211.3	6668	214.4	7091.2	214.9	7237.9	216.2		
7881	216.1	7921.3	216.7	7949.2	215.7	7957.9	212.1	7969.5	215.4		
7988.3	216	8019.7	217	8048.3	218.8	8059.9	218.7	8073.4	217.8		
8097.5	217.4	8127.2	215.7	8167.6	218.5	8245.7	218.6	8273.4	220		

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3894.9	.07	3959.7	.043	6012.3	.07		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
3959.7 6012.3 490 490 490 .1 .3
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 14725

INPUT
Description: 14725

Station Elevation Data		num= 100		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3929.8	220.1	3964.1	209.8	3966.1	210.1	4007	211.7	4030.6	203.1		
4035.2	201.5	4039.2	200.2	4069	195.9	4096	194.5	4106	194.6		
4116	194.7	4126	194.8	4136	195	4146	195	4156	195.1		
4176	195.1	4186	195.2	4226	195.2	4236	195.1	4266	195.3		
4276	195.4	4286	195.5	4296	195.4	4306	195	4316	194.9		
4326	194.7	4336	194.5	4346	194.3	4356	193.6	4366	193.3		
4376	193	4386	192.7	4396	192.4	4426	191.9	4436	191.9		
4446	192	4566	193.3	4586	193.3	4676	194.5	4686	194.6		
4696	194.7	4706	194.7	4716	194.6	4726	194.5	4736	194.1		
4746	193.5	4776	192.5	4786	192.3	4796	192.2	4806	192		
4816	191.7	4826	191.5	4836	191.5	4846	191.6	4856	191.7		
4866	192.1	4876	192.2	4946	194.2	4956	194.3	4976	194.3		

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4986	194.2	5076	193.6	5116	193.2	5166	193.2	5176	193.3
5186	193.5	5246	196.5	5266	196.5	5276	196.4	5286	196.3
5356	196.3	5426	195.7	5508	195.7	5517.4	195.5	5557.4	195.5
5567.4	195.4	5577.4	195.5	5677.4	195.5	5837.4	193.7	5877.4	194.3
5887.4	194.5	5897.4	194.6	5907.4	194.9	5917.4	195.4	5927.4	197.3
5936.2	198.2	5946	199.7	5956.2	200.7	5964.9	201.4	5975.2	205.8
5985.9	207.9	6001.7	209	6004.4	208.1	6057.8	209.4	6124.8	210.6
6145	210.5	6163.8	211.6	6191.3	212.7	6216.1	211.6	6294.8	220.1

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
3929.8	.07	4035.2	.043	5964.9	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4035.2	5964.9		405	405		.1	.3
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 14320

INPUT
 Description: 14320

Station Elevation Data										num=	87
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4099.2	220.3	4137.6	219	4175.3	218.2	4204.5	216.5	4232.2	215.2		
4263.5	213.6	4297.2	212	4334.1	210.4	4356	209.9	4394.8	208.6		
4410.6	207.3	4421	205.1	4427	202	4430	201.2	4435	200.2		
4442	199.2	4450.6	197.2	4470.6	193.2	4490.6	193	4510.6	192.4		
4530.6	192.8	4550.6	193.2	4570.6	193.3	4590.6	193.4	4610.6	193.4		
4630.6	193.3	4650.6	193.2	4670.6	193.4	4690.6	193.6	4710.6	193.6		
4730.6	193.8	4750.6	194	4770.6	194	4790.6	193.9	4810.6	193.9		
4830.6	193.8	4850.6	193.8	4870.6	193.6	4890.6	193.6	4910.6	193.8		
4930.6	193.8	4950.6	194	4970.6	194.2	4990.6	194.2	5010.6	194		
5030.6	194	5050.6	194.2	5070.6	194.2	5090.6	194.3	5110.6	194.4		
5130.6	194.5	5150.6	194.6	5170.6	193.3	5190.6	193.8	5210.6	193.2		
5230.6	192	5250.6	191.7	5270.6	191.2	5290.6	193.6	5310.6	196.2		
5330.6	196.2	5350.6	196.2	5370.6	195.9	5390.6	195.6	5410	195.5		
5430.6	195	5450.6	194.8	5470.6	194.7	5490.6	194.5	5510.6	193.7		
5530.6	193.5	5550.6	193.2	5570.6	193.2	5590.6	193.4	5610.6	193.6		
5630.6	194.4	5650.6	195.2	5678	199.6	5684	200.3	5690	201		
5692	203.9	5697	203.6	5710	205	5730.8	207.2	5758.5	210.1		
5804	218.1	5836.4	220.1								

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4099.2	.07	4430	.043	5690	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4430	5690		310.2	514.8		.3	.5
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 13805

INPUT
 Description: 13805

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Station Elevation Data		num= 33		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4632.3	220	4655.5	215	4674.8	210	4706.4	206	4744.8	205.4		
4751	205	4776	204.4	4791	204.2	4811	201.2	4821	195.7		
4841	196.7	4851	195.2	4861	194.2	4881	192.2	4901	189.2		
4921	190.2	4941	189.3	4961	189.7	4981	190	5001	190.2		
5021	190.7	5041	190.7	5061	189.2	5081	187.2	5101	187.2		
5121	188	5141	188.4	5161	192.4	5181	197.2	5189	201.1		
5219	219.9	5239	221.6	5249	225						

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4632.3	.07	4811	.043	5189	.07		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4811	5189		414.9	413.1	414.9		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 13392

INPUT
Description: 13392

Station Elevation Data		num= 33		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4577.9	220	4600.8	215	4639.5	212.4	4691.7	210.4	4725.4	208.3		
4757.2	205.1	4761	205.1	4786	203.5	4815	202.5	4816	201.4		
4830	199.1	4850	198.2	4870	196.4	4890	194.7	4910	193.4		
4930	192.8	4950	192.2	4970	191.7	4990	190.2	5010	190.3		
5030	187.6	5050	186.6	5070	186.4	5090	186.4	5110	187		
5130	188	5140	191.7	5150	196.7	5184	201.2	5185	202.5		
5195	209.8	5217	218.3	5245	225.4						

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4577.9	.07	4815	.043	5185	.07		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4815	5185		550	547.25	550		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 12845

INPUT
Description: 12845

Station Elevation Data		num= 36		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4771	219.2	4772	217.3	4778	216.6	4785	216.7	4802	209		
4815	203.2	4818	201.4	4835	198.9	4855	196.8	4875	195.2		
4895	193.7	4915	193	4935	192	4955	191.2	4975	189.2		
4995	187	5015	186.4	5035	186.2	5055	186	5075	187		
5095	188	5115	191.6	5135	194	5155	197	5175	199.7		
5182	201	5183	201.9	5212	202.8	5237	204.3	5248.9	205.4		

5266.3 208 5286.6 212.1 5324.3 215.3 5353.9 217.1 5429.9 215.2
 5484.2 220.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4771 .07 4818 .043 5182 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4818 5182 595.1 545.05 499.95 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 12300

INPUT
 Description: 12300

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4617.4	220	4664	216.4	4726.5	210.1	4766	208.3	4797	208.1
4810	201.1	4821	203.6	4824	204.2	4841	206.9	4874	208.1
4884	191.2	4904	190	4924	187	4944	184.8	4964	184
4984	184.7	5004	186.1	5024	188.2	5044	190	5064	191.4
5084	193.2	5104	194.7	5124	196.4	5164	198.6	5184	199.8
5280	201.7	5284	201.2	5291	200.8	5301	200.4	5311	200.2
5320	200	5327.5	199.6	5334	200.2	5338	201.1	5343	201.1
5348.5	201.2	5366	202.1	5385.9	209.2	5417.5	220.1		

Manning's n Values num= 3
 Sta n Val Sta n Val
 4617.4 .07 4874 .043 5366 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4874 5366 475 488 500 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 11812

INPUT
 Description: 11812

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4414.1	220	4441.7	219.6	4451.9	217.9	4469.5	216.7	4483	216.1
4506.6	216.3	4530.3	216.4	4571.1	212.1	4584.9	211.3	4594.5	209.9
4612.2	208.3	4628.8	207	4654	204.3	4673.4	203.9	4687.2	203.4
4709.3	202	4710.4	201	4721	199	4741	197.9	4761	197.2
4781	196	4801	194.5	4821	192.9	4841	191.9	4861	190.8
4881	189.9	4901	188.5	4921	186	4941	184.2	4961	184.2
4981	184.7	5001	185.2	5021	187.1	5041	189.2	5051	192.2
5061	195.2	5071	195.7	5101	195.8	5121	196	5141	196
5161	195.9	5181	195.8	5201	195.5	5221	195.2	5241	195.2
5261	197.1	5281	199	5288.8	201.1	5320.9	212.8	5343.9	226.2

Manning's n Values num= 3
 Sta n Val Sta n Val
 4414.1 .07 4710.4 .043 5288.8 .07

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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4710.4 5288.8 655 488 375 .3 .5
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 11324

INPUT
 Descri pti on: 11324

Station		Elevation Data		num=	43					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
4446.9	220	4469	219.1	4557.7	214.7	4597.9	210	4619.3	210.5	
4636.4	210.5	4673.9	209.1	4685.8	208	4712.6	206	4715	201.6	
4735.1	203.7	4747	201.3	4755.2	198.2	4775.2	193.2	4795.2	192.9	
4815	192.6	4835	192	4855	191.1	4875	190.2	4895	189.2	
4915	190	4935	188.2	4955	190.2	4975	189.2	4995	189.5	
5015	189.6	5035	187	5055	189.5	5058.5	201.2	5065	192.1	
5075	194.4	5095	195.1	5115	195.1	5135	194.8	5155	194.3	
5175	193.6	5195	192.9	5215	192.4	5235	192.9	5245	196	
5253	201.1	5255	198	5283	214.3					

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
4446.9	.07	4747	.043	5255	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4747 5255 374.85 302.05 260.05 .3 .5
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 11022

INPUT
 Descri pti on: 11022

Station		Elevation Data		num=	44					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
4680	210.6	4685	210.6	4706	210.4	4722	210.6	4732	210.4	
4749	201.4	4755	198.9	4765	196.2	4771	192.7	4780	190.4	
4798	187	4814	183.6	4830.7	183.2	4848	182.2	4866	182.2	
4886	184.4	4905	186.4	4923	189.2	4945	190.9	4966	191.6	
4985	190.3	5003	190.5	5021	191.8	5039	192.7	5058	192.7	
5078	192.7	5099	192.7	5117	192.7	5132	192.2	5150	192.2	
5170	192.7	5187	193.2	5207	193.4	5223	193.8	5232	194.9	
5237	196.2	5241	198.2	5244	199.9	5250	201.3	5252	203.1	
5259	206.1	5261	205.8	5267	206.2	5274	206.5			

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
4680	.07	4749	.043	5250	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4749 5250 130 92 55 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10930

INPUT
 Description: 10930

Station		Elevation		Data		num= 47			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4708	212	4713	210	4730	210.1	4747	209.8	4747.1	210
4756	210.8	4770	201.2	4785	200	4787	196.7	4797	189.9
4810	185.2	4824	184	4834	183.6	4853	182.7	4866	182.7
4884	184	4908	187.4	4926	188.8	4942	189.4	4967	190.2
4981	191.6	4997	192.4	5017	192.6	5033	192.2	5051	192.6
5066	192.2	5082	192.2	5097	192.2	5113	192.5	5129	192.6
5146	192.5	5161	193.3	5175	194.2	5188	194	5200	193.9
5210	193.7	5212	193.7	5219	198.2	5224	200.2	5230	201.1
5230.1	203.5	5234	205.1	5236	205.5	5239	205.1	5246	205.4
5253	205.6	5257	207.6						

Manning's n Values		num= 3	
Station	Value	Station	Value
4708	.07	4756	.043
		5230	.07

Bank Sta: Left 4756 Right 5230 Lengths: Left Channel 135 Right 102.96 Coeff Contr. .1 Expan. .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10827

INPUT
 Description: 10827

Station		Elevation		Data num= 32					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4731	211	4736	209.4	4753	209.5	4770	209	4770.1	209
4775	208.9	4783	202.1	4789	201.4	4800	197.1	4810	191.2
4830	185.9	4850	184.8	4870	184.2	4890	184.4	4910	185.4
4930	188.2	4950	190.4	4970	191.2	4990	192.1	5010	192.3
5030	192.7	5050	192.7	5090	193.1	5110	193.5	5130	194.2
5150	194.9	5170	195.2	5190	195.4	5211.1	201.2	5211.2	201.4
5214	205.1	5217.1	205.1						

Manning's n Values		num= 3	
Station	Value	Station	Value
4731	.07	4789	.043
		5214	.07

Bank Sta: Left 4789 Right 5214 Lengths: Left Channel 104.96 Right 74 Coeff Contr. .1 Expan. .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10753

Ramapo River Pre. rep

INPUT

Description: 10753

Station Elevation Data		num= 37	
Sta	Elev	Sta	Elev
4721.5	220	4743	210.2
4782.5	209	4788	208.8
4842.5	185.4	4862.5	184.6
4942.5	188.7	4962.5	189.7
5042.5	194.1	5062.5	193.1
5142.5	195.2	5162.5	195.2
5196.5	197.8	5204.5	205.5
5235.3	210	5247.5	220

Manning's n Values		num= 3	
Station	n Value	Station	n Value
4721.5	.07	4788	.043
5196.5	.07		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4788	5196.5		60	45	.1	.3
Sediment Elevation =	0						

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10708

INPUT

Description: 10708

Station Elevation Data		num= 41	
Sta	Elev	Sta	Elev
4753	209.4	4758	208.7
4800	207.5	4808	201.2
4844	184.9	4855	184.2
4917	183.2	4934	184.7
4994	189.8	5011	190.5
5073	192.6	5090	193.2
5160	194.2	5173	195.7
5193	202.2	5201	207.2
5225	208.9		

Manning's n Values		num= 3	
Station	n Value	Station	n Value
4753	.07	4800	.043
5201	.07		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4800	5201		46.98	51	.1	.3
Sediment Elevation =	0						

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10657

INPUT

Description: 10657

Station Elevation Data		num= 41	
Sta	Elev	Sta	Elev
4765	210.1	4770	208.3
4786	208.4	4801.9	208.1
4802	208.3		

RampoverPre.rep									
4809	208.2	4814	202.4	4818	201.3	4829	197.2	4837	194.6
4846	188.7	4857	185.6	4873	184.2	4888	183.7	4904	184.2
4924	184.5	4945	184.7	4965	184.5	4981	186.4	4995	187.6
5015	189.2	5032	190.4	5051	191.7	5071	192.4	5086	193
5102	193.3	5119	193.8	5137	193.8	5151	194	5163	195.9
5170	198.1	5174	199.9	5182	201.2	5183	201.7	5190	206.2
5192	206.1	5194	207.4	5197	208.8	5201	208.9	5209	208.8
5215	208.8								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4765	.07	4809	.043	5197	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4809	5197		52	45	45		.1	.3
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10612

INPUT
 Description: 10612

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4774	209.2	4779	208.1	4796	208.2	4813	207.9	4820	207.7
4823	209.2	4834	198.7	4842	193	4853	186.6	4866	185.4
4883	185.2	4902	184.7	4918	185	4938	185.2	4958	185.2
4981	184.7	5001	185.8	5022	187.2	5041	189.2	5063	191.6
5085	192.2	5108	193.2	5128	194.4	5145	193.7	5155	194.6
5163	196.2	5166	199.9	5172	200.2	5177	201.2	5178	201.9
5184	202.6	5188	205.2	5202	209.5	5203	209.5	5212	209.5
5223	210.3								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4774	.07	4823	.043	5202	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4823	5202		70	50	70		.1	.3
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10562

INPUT
 Description: 10562

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4739.3	220	4758.8	208	4772.9	208.3	4789.5	206.5	4789.9	206.8
4790	206.5	4800	205.8	4805	205.6	4808	201.5	4810	198.6
4812	196.7	4815	194.4	4821	192.6	4827	190.8	4839	190.9
4848	190.8	4858	192.8	4869	193.4	4880	193.5	4889	193.6
4897	193.8	4911	192.1	4933	191.4	4942	190.6	4950	189.4
4961	188.9	4974	188.5	4983	188.7	4992	188.8	5000	189.1
5008	189.4	5018	189.5	5027	189.4	5029	189.7	5035	189.4

RampoverPre.rep									
5045	189.7	5055	191.3	5065	192.8	5075	191.5	5080	193.6
5085	195	5094	195.7	5097	195.7	5098.5	192.4	5102	191.8
5114	192.5	5123	193.4	5131	194.4	5135	196.1	5145	197.6
5150	198.5	5155	199.9	5163	200.9	5174	201.7	5183	207.6
5205.9	208.2	5239.4	220						

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4739.3	.07	4805	.043	5097	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4805	5097		12	12	12		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10550

INPUT
 Description: 10550

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4739.3	220	4758.8	208	4772.9	208.3	4789.5	206.5	4789.9	206.8
4790	206.5	4800	205.8	4805	205.6	4808	201.5	4810	198.6
4812	196.7	4815	194.4	4821	192.6	4827	190.8	4839	190.9
4848	190.8	4858	192.8	4869	193.4	4880	193.5	4889	193.6
4897	193.8	4911	192.1	4933	191.4	4942	190.6	4950	189.4
4961	188.9	4974	188.5	4983	188.7	4992	188.8	5000	189.1
5008	189.4	5018	189.5	5027	189.4	5029	189.7	5035	189.4
5045	189.7	5055	191.3	5065	192.8	5075	191.5	5080	193.6
5085	195	5094	195.7	5097	195.7	5098.5	192.4	5102	191.8
5114	192.5	5123	193.4	5131	194.4	5135	196.1	5145	197.6
5150	198.5	5155	199.9	5163	200.9	5174	201.7	5183	207.6
5205.9	208.2	5239.4	220						

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4739.3	.07	4805	.02	5097	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4805	5097		9	9	9		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10541

INPUT
 Description: 10541
 POMPTON LAKES DAM

Station Elevation Data									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4801.1	220	4822.8	206.5	4831.5	206.5	4848.8	206.1	4848.9	206.5
4852	206	4861.8	202.8	4865.7	196.2	4879.5	188.9	4886.8	180.9
4896.7	180.9	4906.3	180.5	4912.7	180.6	4921.5	181.5	4925.9	182.1
4933.4	180.2	4944.3	193.8	4950.5	193.6	4953.3	195.3	4961.3	196.9
4962.3	198.3	4970.7	198.3	4981.4	198.3	4982.7	199.7	4992.3	200.3
5006	199.6	5016.4	198.3	5024.6	195.8	5031.3	193	5032.9	192.1

RampoverPre.rep									
5038.9	189.7	5043.3	187.2	5046	185.6	5051.7	185.8	5057	185.9
5062.7	185.6	5072	185.5	5082.4	185.8	5091.5	185.8	5098.4	185.7
5099.4	185.6	5102.1	185.5	5107.7	185.6	5114.2	185.6	5121.2	185.6
5127.8	185.6	5133.7	185.6	5140.2	186.1	5145.7	193.5	5150.5	194.5
5156.6	194.1	5158.5	204.8	5158.7	207.5	5209.3	207.5	5255.7	207.7
5262.9	210.1	5292.7	220						

Manning's n Values num= 3
 Sta n Val Sta n Val
 4801.1 .07 4848.9 .03 5158.5 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4848.9 5158.5 11 11 11 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4801.1 4859 205.3 F
 5161 5292.7 201 F
 Sediment Elevation = 0

INLINE STRUCTURE

RIVER: Ramapo River
 REACH: Reach-1 RS: 10540

INPUT

Description: Pompton Lake Dam
 Distance from Upstream XS = .5
 Deck/Roadway Width = 10
 Weir Coefficient = 3.6
 Weir Embankment Coordinates num = 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4740	220	4760	202.9	4772	207.1	4783	206.7	4834.5	207
4859	205.3	4859	205.3	4866	201	5161	201	5161	201
5161.1	207.5	5210	207.5	5210.1	210.5	5260	210.5	5300	220

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Weir crest shape = Ogee

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10530

INPUT

Description: 10530

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4801.1	220	4822.8	206.5	4831.5	206.5	4848.8	206.1	4848.9	206.5
4852	206	4861.8	202.8	4865.7	196.2	4879.5	188.9	4886.8	180.9
4896.7	180.9	4906.3	180.5	4912.7	180.6	4921.5	181.5	4925.9	182.1
4933.4	180.2	4944.3	193.8	4950.5	193.6	4953.3	195.3	4961.3	196.9
4962.3	198.3	4970.7	198.3	4981.4	198.3	4982.7	199.7	4992.3	200.3
5006	199.6	5016.4	198.3	5024.6	195.8	5031.3	193	5032.9	192.1
5038.9	189.7	5043.3	187.2	5046	185.6	5051.7	185.8	5057	185.9
5062.7	185.6	5072	185.5	5082.4	185.8	5091.5	185.8	5098.4	185.7
5099.4	185.6	5102.1	185.5	5107.7	185.6	5114.2	185.6	5121.2	185.6

RampoverPre.rep

5127.8	185.6	5133.7	185.6	5140.2	186.1	5145.7	193.5	5150.5	194.5
5156.6	194.1	5158.5	204.8	5158.7	207.5	5209.3	207.5	5255.7	207.7
5262.9	210.1	5292.7	220						

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4801.1 .07	4848.9 .03	5158.5 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4848.9 5158.5 42 42 42 .05 .2

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4801.1	4848.9	206.5	F
5158.5	5292.7	204.8	F

Sediment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10488

INPUT
 Descri pti on: 10488

Station El evati on Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4796.1	220	4812.7	206	4827.4	205.9	4839.5	205.7	4861.3	202.8
4865.7	199	4880.6	189	4885.1	182.6	4889.1	179.9	4899	178.6
4903.7	180.6	4907.4	184.3	4916.9	183.5	4931.2	181.2	4942.6	185.2
4963.9	191.1	4984.1	193.1	4993.3	187.3	5000.9	185.9	5017.3	183.6
5037.4	178.8	5051.5	178.9	5063	179.2	5074.7	179.2	5081.9	178.9
5094.9	177.2	5101.5	177.7	5126.8	186.3	5133.3	185.9	5138.6	201.3
5144.7	202	5206.9	207.1	5231.3	207.3	5249.4	210	5260.6	220

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4796.1 .05	4839.5 .028	5144.7 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4839.5 5144.7 102.96 102.96 102.96 .1 .3

Sediment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10385

INPUT
 Descri pti on: 10385

Station El evati on Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4743.3	220	4777.3	202.6	4791.2	202.2	4809.4	201.4	4819.2	200.1
4837.9	186.1	4848	185.3	4861	179.6	4872.3	179.8	4878	179.4
4888	178.7	4898	178.6	4908	178.6	4918	178.8	4928	178.9
4938	178.6	4943	178.2	4948	177.4	4953	176.7	4955	175.6
4958	174.2	4960	171.7	4963	170.3	4968	169.3	4973	167.6
4978	162.8	4985	160.7	4991	160.3	4998	161.1	5005	159.5
5012	158	5020	157.2	5028	155.9	5037	156.1	5043	158
5050	158.2	5055	157.8	5060	159.5	5065	159.6	5070	161.2
5073	163.1	5075	164.7	5078	166.3	5080	166.6	5085	165.8

5090	165.2	5095	166.3	5100	169.7	5103	172	5106	173.2
5111	175.9	5114	177.2	5122	179.4	5141	186.5	5165.5	191.2
5169.5	192.3	5175.5	194.1	5175.6	194.6	5187.8	199	5203.3	206.9
5211.1	206.6	5222.3	210.1	5236.8	220				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
4743.3 .07	4861 .03	5122 .07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4861	5122	120	114.96	110.04		.1	.3
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10270

INPUT

Description: 10270

Station Elevation Data	num=	48
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
4592.4 220 4637.2 203.9 4665.7 198.4 4706.2 194.1 4728.2 193.7		
4754.1 192.7 4758.9 192.6 4778 192 4820 191.7 4828 191.6		
4843 190.8 4853 190.4 4868 188.1 4880 187.6 4891 181.3		
4948 161.7 4953 161.4 4960 161 4968 160.7 4976 159.9		
4984 159.5 4989 160.3 4998 162.3 5009 163.8 5015 164.8		
5025 165.5 5033 166.6 5041 165.6 5051 165.5 5062 165.4		
5069 165.4 5076 168.7 5082 170.1 5085 174.9 5095 178		
5097 179.6 5104 184.4 5108 186 5118 188.3 5128 190.8		
5130 191.7 5139 193.5 5147.3 200 5169.9 207.4 5178.7 206.9		
5190.8 210 5217.4 215.2 5234.8 220		

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
4592.4 .07	4891 .03	5097 .07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4891	5097	45	45	45		.1	.3
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10225

INPUT

Description: 10225

Station Elevation Data	num=	37
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
4853.34 195.06 4860.3 190.6 4870.3 190.4 4880.3 190.3 4885.3 186.8		
4897.3 182.4 4907.3 179.7 4911.3 179.4 4911.4 178 4913.3 177.9		
4918.3 177.7 4921.3 177 4925.3 174.9 4930.3 174.1 4935.3 172.3		
4945.3 169.9 4955.3 168.1 4962.3 167.1 4969.3 164.8 4976.3 164.6		
4982.3 164.3 4995.3 164.2 5006.3 163.8 5009.3 164.5 5019.3 166.3		
5031.3 166.4 5037.3 167.3 5047.3 168.6 5055.3 169 5061.3 170.7		
5065.3 172.9 5072.3 174.3 5076.3 176.1 5079.3 179 5082.3 178.2		
5082.9 179.2 5095.9 187.2		

Manning's n Values	num=	3
--------------------	------	---

RampoverPre.rep

Sta	n Val	Sta	n Val	Sta	n Val				
4853.34	.07	4911.3	.035	5079.3	.07				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4911.3 5079.3 50 43 40 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 10182

INPUT
 Descri pti on: 10182

Station El evati on Data				num=	29				
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4902	187.8	4909	186.6	4923	184.7	4929	185.1	4946	184.3
4953	179.4	4956	178.7	4960	177.6	4962	177.8	4963	178.8
4966	179.1	4970	178.7	4976	178.5	4982	177.8	4983	177.4
4989	178	4999	177.8	5006	177.8	5015	177	5021	176.4
5031	176.6	5038	176.9	5046	178.8	5047	177.7	5047.1	178.5
5050	179.6	5052	179.5	5068	180.1	5078	182.4		

Manni ng' s n Val ues				num=	3				
Sta	n Val	Sta	n Val	Sta	n Val				
4902	.07	4956	.035	5047.1	.07				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4956 5047.1 40.02 55.02 64.98 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 10127

INPUT
 Descri pti on: 10127

Station El evati on Data				num=	28				
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4903.5	189.8	4923.5	189.6	4935.5	189.2	4940.5	189.3	4960.5	177.9
4962.5	177.6	4967.5	177.1	4973.5	175.8	4980.5	176.3	4985.5	176.1
4991.5	176.5	5004.5	176.1	5012.5	176.3	5020.5	176.8	5025.5	176.4
5029.5	176.1	5037.5	176.7	5038.5	177.1	5038.6	178.2	5039.5	179.1
5046.5	179.2	5053.5	178.8	5063.5	177	5067.5	176.1	5071.5	175.1
5078.3	193.1	5079.3	192.1	5103.3	192.8				

Manni ng' s n Val ues				num=	3				
Sta	n Val	Sta	n Val	Sta	n Val				
4903.5	.15	4960.5	.035	5071.5	.15				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4960.5 5071.5 41 41 41 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver

REACH: Reach-1

RS: 10086

INPUT

Description: 10085

PATERSON HAMBURG TURNPIKE

Station		Elevation		Data		num=		55	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4407.4	220	4456.8	196.8	4513	194.2	4513.5	194.2	4544.7	193.3
4586.8	192.1	4624.8	190.9	4677.8	189.3	4756.2	190.1	4789.5	190
4839.1	189.8	4884	190.2	4900	191.1	4933	190.4	4940	188.6
4941	177.2	4941.1	177.3	4942	176.9	4945	177.3	4947	177.5
4950	177.3	4955	176.3	4960	174.3	4970	173.6	4976	175.9
4980	176.9	4980.1	176.9	4984	178.7	4984.1	178.7	4989	176.9
4990	175.7	5000	174.4	5010	174.4	5020	176.6	5022	176.6
5022.1	176.6	5025	178.2	5025.1	178.2	5029	176.5	5030	175.4
5040	173.9	5050	174.2	5060	175	5060.1	176.4	5062	188.5
5065	188.9	5070	191.1	5080	191	5100	191.2	5133.2	190.4
5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4	5432.6	200

Manning's n		Values		num=		5			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val		
4407.4	.2	4544.7	.04	4940	.03	5062	.06	5070	.2

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4940	5062		64	64		.6	.8

Sediment Elevation = 0

BRI DGE

RIVER: Ramapo River

REACH: Reach-1

RS: 10053.5

INPUT

Description: PATERSON HAMBURG TURNPIKE

Distance from Upstream XS = .5
 Deck/Roadway Width = 63
 Weir Coefficient = 2.5

Upstream		Deck/Roadway		Coordinates		num=		32	
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4407.4	220	220	4456.8	196.8	4513.5	194.2	194.2	4544.7	193.3
4544.7	193.3	193.3	4586.8	192.1	4624.8	190.9	190.9	4677.8	189.3
4677.8	189.3	189.3	4756.2	190.1	4789.5	190	190	4839.1	189.8
4839.1	189.8	189.8	4884	190.2	4900	191.1	191.1	4933	193.7
4933	193.7	193.7	4940	193.7	4941	193.8	187.3	4947	177.5
4947	177.5	177.5	4945	176.9	4945	177.3	187.3	4950	177.3
4950	177.3	177.3	4955	176.3	4960	174.3	194	4970	173.6
4970	173.6	173.6	4980	176.9	4980.1	176.9	194	4984	178.7
4984	178.7	178.7	4984.1	178.7	4984.1	178.7	194	4989	176.9
4989	176.9	176.9	5022	176.6	5022	176.6	187.3	5025.1	178.2
5025.1	178.2	178.2	5060.1	176.4	5060.1	176.4	193.7	5065	188.9
5065	188.9	188.9	5070	191.1	5070	191.1	193.6	5100	191
5100	191	191	5133.2	190.4	5133.2	190.4	193.6	5195.5	191.2
5195.5	191.2	191.2	5267.7	193.6	5267.7	193.6	190.4	5353.1	195.2
5353.1	195.2	195.2	5400.5	195.4	5400.5	195.4	195.2	5432.6	200
5432.6	200	200					200		

Upstream		Bridge Cross		Section Data		num=		55	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4407.4	220	4456.8	196.8	4513	194.2	4513.5	194.2	4544.7	193.3
4586.8	192.1	4624.8	190.9	4677.8	189.3	4756.2	190.1	4789.5	190
4839.1	189.8	4884	190.2	4900	191.1	4933	190.4	4940	188.6
4941	177.2	4941.1	177.3	4942	176.9	4945	177.3	4947	177.5
4950	177.3	4955	176.3	4960	174.3	4970	173.6	4976	175.9
4980	176.9	4980.1	176.9	4984	178.7	4984.1	178.7	4989	176.9

Ramp Over Pre. rep									
4990	175.7	5000	174.4	5010	174.4	5020	176.6	5022	176.6
5022.1	176.6	5025	178.2	5025.1	178.2	5029	176.5	5030	175.4
5040	173.9	5050	174.2	5060	175	5060.1	176.4	5062	188.5
5065	188.9	5070	191.1	5080	191	5100	191.2	5133.2	190.4
5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4	5432.6	200

Manning's n Values									
num=	5								
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
4407.4	.2	4544.7	.04	4940	.03	5062	.06	5070	.2

Bank Sta: Left Right Coeff Contr. Expan.
 4940 5062 .6 .8
 Sediment Elevation = 0

Downstream Deck/Roadway Coordinates														
num=	26													
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4677.8	189.3	189.3	4756.2	190.1	190.1	4789.5	190	190						
4839.1	189.8	189.8	4884	190.2	190.2	4900	191.1							
4933	193.7		4940	193.7		4941	193.8	187.3						
4980	194	187.3	4984.1	194	187.3	5022	194	187.3						
5025.1	194	187.3	5060.1	193.7	187.3	5060.1	193.7							
5062	193.7		5065	193.6	188.9	5070	193.6	191.1						
5080	191		5100	191.2		5133.2	190.4							
5195.5	191.2	191.2	5267.7	193.6	193.6	5353.1	195.2	195.2						
5400.5	195.4	195.4	5432.6	200	200									

Downstream Bridge Cross Section Data											
Station	Elevation	Data	num=	36							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4331	220	4360.2	200.3	4422.4	194.2	4480.5	192.7	4544	189.8		
4691.7	190.6	4769.9	190.2	4856.8	191.2	4906	191	4916	191		
4926	183.3	4936	177.2	4946	176.4	4956	176.5	4966	175.5		
4976	174.9	4986	176	4996	175.5	5006	175.3	5016	172.7		
5026	175.3	5036	174.6	5046	173.2	5056	173.3	5060	175.2		
5063	175.7	5063.1	176.5	5064	194.4	5066	191	5086.5	190.1		
5160.7	190.9	5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4		
5432.6	200										

Manning's n Values					
num=	3				
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
4331	.15	4916	.03	5064	.15

Bank Sta: Left Right Coeff Contr. Expan.
 4916 5064 .6 .8

Ineffective Flow				
num=	2			
Sta L	Sta R	El ev	Permanent	
4331	4916	191	F	
5064	5432.6	194.4	F	

Sediment Elevation = 0

Upstream Embankment side slope = 0 hori z. to 1.0 vertical
 Downstream Embankment side slope = 0 hori z. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 189.5
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data			
Pier Station	Upstream=	4982	Downstream= 4982

Ramapo River Pre. rep

Upstream num= 2
 Width Elev Width Elev
 4 150 4 194
 Downstream num= 2
 Width Elev Width Elev
 4 150 4 194

Pier Data
 Pier Station Upstream= 5023.5 Downstream= 5023.5
 Upstream num= 2
 Width Elev Width Elev
 3 150 3 194
 Downstream num= 2
 Width Elev Width Elev
 3 150 3 194

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
 Energy
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method
 Energy Only

Additional Bridge Parameters
 Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10022

INPUT

Description: 10022

Station		Elevation Data		num= 36		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4331	220	4360.2	200.3	4422.4	194.2	4480.5	192.7	4544	189.8				
4691.7	190.6	4769.9	190.2	4856.8	191.2	4906	191	4916	191				
4926	183.3	4936	177.2	4946	176.4	4956	176.5	4966	175.5				
4976	174.9	4986	176	4996	175.5	5006	175.3	5016	172.7				
5026	175.3	5036	174.6	5046	173.2	5056	173.3	5060	175.2				
5063	175.7	5063.1	176.5	5064	194.4	5066	191	5086.5	190.1				
5160.7	190.9	5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4				
5432.6	200												

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4331	.15	4916	.03	5064	.15		

Bank Sta: Left 4916 Right 5064 Lengths: Left Channel 19.98 Right Channel 441.99 Right 700.02 Coeff Contr. .6 Expan. .8

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4331 4916 191 F
 5064 5432.6 194.4 F

Sediment Elevation = 0

RamporiverPre. rep

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 9580

INPUT

Description: 9580

Station Elevation Data

num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4294.2	210	4313.4	198	4429	194.1	4477.9	192.1	4508.5	191.8
4535.3	190.9	4565.1	191.6	4593.3	191.5	4633	190.2	4691	189.7
4702.6	189.6	4740.3	188.5	4771.7	189.1	4836.8	187.8	4847	186.8
4882.4	185.9	4882.5	185.3	4894.5	184.1	4909	177.4	4937	177
4945	176.1	4952	175.3	4962	174.4	4972	173.6	4982	174.3
4992	174.2	5002	174.1	5012	174.3	5022	174	5032	174.2
5042	174.9	5054	176.1	5057	178.3	5070	185.1	5097	186.4
5107.2	187	5147.3	182.1	5186.3	179.5	5212.4	180.9	5246.2	184.4
5267.4	187.2	5285.8	186.6	5302.2	187.1	5331.6	188.9	5389.3	189.5
5427.4	189.5	5474.4	190.1	5534.1	191	5581.9	190.2	5596.6	189.9
5612.8	189.7	5629.9	189.9	5649.2	190.2	5712.1	191.1	5765.1	190.8
5822.4	190.9	5869.6	190.6	5896.4	189.9	5911	189.7	5928	189.9
5951.6	190.5	6027.3	192.4	6046.7	194.7	6062.6	196.1	6120	201.8
6142.1	201.7	6168.1	202	6194.1	201.5				

Manning's n Values

num= 3

Station	n Value	Station	n Value	Station	n Value
4294.2	.065	4882.4	.033	5070	.07

Bank Sta: Left Right
4882.4 5070
Sediment Elevation = 0

Lengths: Left Channel Right
770.1 829.94 819.91

Coeff Contr. Expan.
.1 .3

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 8750

INPUT

Description: 8750

Station Elevation Data

num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4454.9	210	4479.3	199.7	4515.4	195.7	4581	195.4	4622.3	194.4
4671.3	196	4709.6	196.4	4731.4	196.9	4747.8	196.5	4756.6	197.4
4775.9	196.9	4790.2	197.3	4809.9	196.9	4846.8	197	4879.6	193.8
4887.8	191.3	4887.9	191.3	4897	195.8	4897.5	195.2	4898	192.1
4907	190.8	4907.5	188.3	4918	187.1	4923.5	181.7	4932	176
4937	174.5	4947	172.8	4957	172.4	4967	173.1	4977	172.7
4987	172.9	4997	172.6	5007	172.4	5017	172.9	5027	173.3
5037	173.1	5047	174.9	5057	175.4	5068	176.2	5089.1	176.8
5131.9	177.9	5177.1	178.1	5225.1	180.4	5264	181.2	5321.9	181.7
5364	181.8	5412.5	182	5480.4	182.2	5537.9	183.6	5548.1	184.2
5613.9	183.4	5656.1	184.5	5701.5	189.4	5755.1	188.8	5812.7	186.8
5878.8	186.1	5918.1	188.1	5964.1	190.1	5978.9	191	6048.4	190.1
6063.2	188.8	6076.7	187.9	6109.1	187.8	6164.7	188.6	6244	189.1
6305.3	188.5	6356.7	189.8	6371.9	189.9	6382.8	190	6405.5	190.2
6454.2	190.3	6479.3	194	6547.5	195.7	6599.9	195.8	6636.5	196.1
6734.7	194.2	6888.9	194.7	6992.4	193.3	7046.3	194.1	7091.9	192.5
7172.8	194.1	7269.5	194.6	7398.8	194.7	7538.9	193.3	7617.6	194.6
7712.8	192.5	7833.4	194.3	7947.4	194.4	8144.3	192.3	8254.8	194.4
8313.1	195.3								

Ramapo River Pre. rep

Manning's n Values num= 3
 Sta n Val Sta n Val
 4454.9 .065 4898 .05 6479.3 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4898 6479.3 830.08 795.04 680 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 7955

INPUT
 Description: 7955

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4272.3	210	4304.8	203.7	4332.3	198.4	4357.9	198	4415.6	192.3
4490.9	192.3	4557.2	192.7	4621.3	192.9	4688.3	192.8	4711.1	193.2
4731.8	192.7	4784.6	192.1	4837.8	190.4	4869.9	189.9	4896.9	186.5
4907	186.4	4926	185.7	4939	176.2	4941	174.8	4943	174.1
4946	172.8	4949	171.7	4959	170.5	4969	170.4	4979	170.1
4989	169.5	4999	168.4	5009	168.5	5019	168.7	5029	169.6
5039	171.3	5044	172.9	5048	173.6	5054	174.5	5061	176.1
5072	178.2	5105	181.9	5129	182	5139	181.8	5177.9	181.9
5193.8	181.6	5210.9	181.9	5238.7	182.7	5291.3	182.4	5326.9	183.2
5364.1	185.5	5387.2	187.3	5451.3	186.4	5471.4	185.9	5489	185.9
5512.7	186.3	5573.6	187.4	5629.6	187.8	5670.7	188	5696.4	188.3
5737.6	187.8	5761.5	187.1	5774.9	187.3	5793.7	186.8	5824.8	187.6
5878.2	187.8	5935.6	188	6000.8	188.8	6043.7	188.6	6068.1	186.7
6082.7	186.4	6100.3	186.6	6124.8	188	6189	188.1	6274.1	187.3
6287.2	187.4	6350.4	186.8	6379.1	186	6394.5	185.7	6411.8	185.9
6444.7	186.4	6512.6	185.8	6550.4	183.8	6601.2	183.6	6648.5	185.2
6688.9	187.1	6734.7	187.9	6759.6	187.9	6771.5	187.5	6785	187.8
6820	187.8	6918.9	185.9	7012.6	186.8	7112.1	186.7	7261.2	187.5
7400.2	189.6	7496.3	190.4	7617.8	192.8	7782.9	194.3	7884.5	195
8039.6	192.6	8188.8	192.3	8308.6	192.6	8425.4	192.7		

Manning's n Values num= 3
 Sta n Val Sta n Val
 4272.3 .2 4926 .045 5129 .5

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4926 5129 390 355.04 330 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 7600

INPUT
 Description: 7600
 This is a REPEATED section.

Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3935.5	226.1	4007.6	217	4022.6	217.8	4100.6	210.4	4135.6	201.7
4280.9	201.6	4293.5	200.8	4310.2	201	4320.3	200.4	4341.8	200.4

RampoverPre.rep									
4416.8	198.1	4441.4	198.6	4463.1	197.4	4471.1	198.1	4506.5	193.9
4589.1	189.9	4675.4	187.7	4766.4	187.7	4846.9	185.2	4874.7	186.5
4892.9	186.5	4903	187.6	4932	187.6	4932.1	187.6	4941	181.3
4947	177	4950	174.7	4950.1	174.7	4953	172.6	4953.1	172.6
4958	170.6	4963	169.2	4973	167.3	4983	167.6	4993	167.8
4999	168.5	5003	168.9	5013	170	5023	171.2	5028	172.3
5033	174	5043	175.1	5046	175.8	5046.1	175.8	5048	176.3
5049	176.5	5049.1	176.5	5053	177	5054	177.9	5058	180.9
5058.1	181	5066	183.5	5066.1	183.5	5068	184.2	5073	185
5093	185.9	5093.1	185.9	5104.5	186.2	5160	185	5192.9	184.3
5470.3	183.9	5531.1	185	5555.6	186.6	5592.6	185.8	5941.7	186.7
5969.3	187.5	6033.7	187.1	6070.2	186.3	6127.6	188	6174.1	188.5
6238.6	186.6	6316.5	187.1	6342.3	186.6	6352.4	185.7	6380.2	185.6
6389.5	185.6	6403	186	6569.4	181.7	6589.1	182.5	6611.5	183.7
6639.8	185.8	6824.8	186.9	6933.1	187.5	7054.4	187	7087.7	186.2
7195.6	187.7	7312.6	188.7	7436.2	187	7546.6	187.4	7681.4	187.4
7799.1	188.2	7957.2	192.5	8093	193	8247.8	191.1	8369	191.2
8498.9	194								

Manning's n	Values	num=	3
Station	Value	Station	Value
3935.5	.2	4932	.045
		5104.5	.5

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4932 5104.5 110.01 110.01 110.01 .5 .7
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 7490

INPUT
 Description: 7490
 DAWES HIGHWAY

Station Elevation Data									
num=	96								
Station	Elev	Station	Elev	Station	Elev	Station	Elev	Station	Elev
3935.5	225.1	4007.6	216	4022.6	216.8	4100.6	209.4	4135.6	200.7
4280.9	200.6	4293.5	199.8	4310.2	200	4320.3	199.4	4341.8	199.4
4416.8	197.1	4441.4	197.6	4463.1	196.4	4471.1	197.1	4506.5	192.9
4589.1	188.9	4675.4	186.7	4766.4	186.7	4846.9	184.2	4874.7	185.5
4892.9	185.5	4903	186.6	4932	186.6	4932.1	186.6	4941	180.3
4947	176	4950	173.7	4950.1	173.7	4953	171.6	4953.1	171.6
4958	169.6	4963	168.2	4973	166.3	4983	166.6	4993	166.8
4999	167.5	5003	167.9	5013	169	5023	170.2	5028	171.3
5033	173	5043	174.1	5046	174.8	5046.1	174.8	5048	175.3
5049	175.5	5049.1	175.5	5053	176	5054	176.9	5058	179.9
5058.1	180	5066	182.5	5066.1	182.5	5068	183.2	5073	184
5093	184.9	5093.1	184.9	5104.5	185.2	5160	184	5192.9	183.3
5470.3	182.9	5531.1	184	5555.6	185.6	5592.6	184.8	5941.7	185.7
5969.3	186.5	6033.7	186.1	6070.2	185.3	6127.6	187	6174.1	187.5
6238.6	185.6	6316.5	186.1	6342.3	185.6	6352.4	184.7	6380.2	184.6
6389.5	184.6	6403	185	6569.4	180.7	6589.1	181.5	6611.5	182.7
6639.8	184.8	6824.8	185.9	6933.1	186.5	7054.4	186	7087.7	185.2
7195.6	186.7	7312.6	187.7	7436.2	186	7546.6	186.4	7681.4	186.4
7799.1	187.2	7957.2	191.5	8093	192	8247.8	190.1	8369	190.2
8498.9	193								

Manning's n	Values	num=	3
Station	Value	Station	Value
3935.5	.2	4932	.045
		5104.5	.5

RamporiverPre.rep

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4932 5104.5 38 38 38 .5 .7
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3935.5 4932 186.6 F
 5104.5 8498.9 185.2 F
 Sediment Elevation = 0

BRI DGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 7471

INPUT
 Description: DAWES HIGHWAY

Distance from Upstream XS = 7.5
 Deck/Roadway Width = 23
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 65		num= 96												
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4874.7	185.5	185.5	4892.9	185.5	4903	189.5				4903	189.5			
4932	189.5		4932.1	191	4941	200	180.3			4941	200	180.3		
4950	200	173.7	4950.1	191	4953	191.2	171.6			4953	191.2	171.6		
4953.1	191.2	179.8	4958	191.6	4963	192.1	183.5			4963	192.1	183.5		
4973	192.6	185.2	4993	193.5	4999	193.5	187.7			4999	193.5	187.7		
5013	193.5	187	5023	193.2	5033	192.8	183.9			5033	192.8	183.9		
5046	191.8	179.8	5046.1	191.8	5049	191.5	175.5			5049	191.5	175.5		
5049.1	200	175.5	5058	200	5058.1	191				5058.1	191			
5066	191	182.5	5066.1	189.5	5093	189.5	184.9			5093	189.5	184.9		
5093.1	186	184.9	5104.5	185.8	5160	184	184			5160	184	184		
5192.9	183.3	183.3	5470.3	182.9	5531.1	184	184			5531.1	184	184		
5555.6	185.6	185.6	5592.6	184.8	5941.7	185.7	185.7			5941.7	185.7	185.7		
5969.3	186.5	186.5	6033.7	186.1	6070.2	185.3	185.3			6070.2	185.3	185.3		
6127.6	187	187	6174.1	187.5	6238.6	185.6	185.6			6238.6	185.6	185.6		
6316.5	186.1	186.1	6342.3	185.6	6352.4	184.7	184.7			6352.4	184.7	184.7		
6380.2	184.6	184.6	6389.5	184.6	6403	185	185			6403	185	185		
6569.4	180.7	180.7	6589.1	181.5	6611.5	182.7	182.7			6611.5	182.7	182.7		
6639.8	184.8	184.8	6824.8	185.9	6933.1	186.5	186.5			6933.1	186.5	186.5		
7054.4	186	186	7087.7	185.2	7195.6	186.7	186.7			7195.6	186.7	186.7		
7312.6	187.7	187.7	7436.2	186	7546.6	186.4	186.4			7546.6	186.4	186.4		
7681.4	186.4	186.4	7799.1	187.2	7957.2	191.5	191.5			7957.2	191.5	191.5		
8093	192	192	8247.8	190.1										

Upstream Bridge Cross Section Data
 Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3935.5	225.1	4007.6	216	4022.6	216.8	4100.6	209.4	4135.6	200.7
4280.9	200.6	4293.5	199.8	4310.2	200	4320.3	199.4	4341.8	199.4
4416.8	197.1	4441.4	197.6	4463.1	196.4	4471.1	197.1	4506.5	192.9
4589.1	188.9	4675.4	186.7	4766.4	186.7	4846.9	184.2	4874.7	185.5
4892.9	185.5	4903	186.6	4932	186.6	4932.1	186.6	4941	180.3
4947	176	4950	173.7	4950.1	173.7	4953	171.6	4953.1	171.6
4958	169.6	4963	168.2	4973	166.3	4983	166.6	4993	166.8
4999	167.5	5003	167.9	5013	169	5023	170.2	5028	171.3
5033	173	5043	174.1	5046	174.8	5046.1	174.8	5048	175.3
5049	175.5	5049.1	175.5	5053	176	5054	176.9	5058	179.9
5058.1	180	5066	182.5	5066.1	182.5	5068	183.2	5073	184
5093	184.9	5093.1	184.9	5104.5	185.2	5160	184	5192.9	183.3
5470.3	182.9	5531.1	184	5555.6	185.6	5592.6	184.8	5941.7	185.7

				Ramp	River	Pre. rep				
5969.3	186.5	6033.7	186.1	6070.2	185.3	6127.6	187	6174.1	187.5	
6238.6	185.6	6316.5	186.1	6342.3	185.6	6352.4	184.7	6380.2	184.6	
6389.5	184.6	6403	185	6569.4	180.7	6589.1	181.5	6611.5	182.7	
6639.8	184.8	6824.8	185.9	6933.1	186.5	7054.4	186	7087.7	185.2	
7195.6	186.7	7312.6	187.7	7436.2	186	7546.6	186.4	7681.4	186.4	
7799.1	187.2	7957.2	191.5	8093	192	8247.8	190.1	8369	190.2	
8498.9	193									

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
3935.5	.2	4932
	.045	5104.5
		.5

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	4932	5104.5		.5	.7

Ineffective Flow	num=	2
Sta L	Sta R	Elev
3935.5	4932	186.6
5104.5	8498.9	185.2
		F
		F

Sediment Elevation = 0

Downstream Deck/Roadway	Coordinates					
num=	31					
Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	
4874.7	185.5	185.5	4892.9	185.5	4903	189.5
4932	189.5		4932.1	191	4941	200
4950	200	173.7	4950.1	191	4953	191.2
4953.1	191.2	179.8	4958	191.6	4963	192.1
4973	192.6	185.2	4993	193.5	4999	193.5
5013	193.5	187	5023	193.2	5033	192.8
5046	191.8	179.8	5046.1	191.8	5049	191.5
5049.1	200	175.5	5058	200	5058.1	191
5066	191	182.5	5066.1	189.5	5093	189.5
5093.1	186	184.9	5104.5	185.8	5161.76	184
5192.9	183.3					

Downstream Bridge Cross Section Data					
Station Elevation Data	num=	99			
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
3911.5	225	3989.3	210	4009	212.3
4063.7	213.8	4124.2	200	4327.2	199.2
4428.7	197.6	4606	188.1	4719.2	186.8
4893	185.2	4924	184.8	4936	184.5
4949	176	4952	175.4	4955	174.8
4970	169.3	4980	167.1	4990	167.2
5020	170.1	5030	171.4	5039	173.2
5056	180.5	5062	182.3	5067	184.1
5122	184.5	5160.4	183.7	5190.1	182.9
5332.5	182	5378.8	182.7	5414.1	182.4
5619.8	184.3	5712.3	185.6	5733	185.1
5777.5	184.8	5802.8	185.4	5843.4	184.8
6003.7	186.3	6022.6	185.7	6031.4	185.4
6097.1	186.8	6121.5	187.5	6154.5	186.9
6226.3	185	6252.2	185.6	6304.4	185.6
6407	184.7	6514.7	182	6568.7	180.8
6731.8	185.1	6755.1	185.1	6761.9	184.8
6927.7	186.5	7033.8	185.9	7073.9	185
7348.8	186.9	7476.7	184.3	7599.6	185.8
8046	191	8195.4	189.7	8341.8	191.7
					8498.3
					193

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
3911.5	.2	4924
	.045	5070
		.5

Bank Sta: Left Right Coeff Contr. RampoRi verPre. rep
 4924 5070 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3911.5 4924 184.8 F
 5070 8498.3 185.5 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 hori z. to 1.0 verti cal
 Downstream Embankment side slope = 0 hori z. to 1.0 verti cal
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 185
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Momentum Cd = 2
 Selected Low Flow Methods = Energy

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .7352146
 Max Low Cord = 187.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 7452

INPUT

Description: 7452

Station Elevation Data		num= 99							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3911.5	225	3989.3	210	4009	212.3	4020.8	211.1	4040.2	216.5
4063.7	213.8	4124.2	200	4327.2	199.2	4384.9	197.6	4406.6	198
4428.7	197.6	4606	188.1	4719.2	186.8	4807.5	186.2	4858.1	186.1
4893	185.2	4924	184.8	4936	184.5	4943	183.3	4946	176.4
4949	176	4952	175.4	4955	174.8	4960	173.9	4964	172.1
4970	169.3	4980	167.1	4990	167.2	5000	167.2	5010	168
5020	170.1	5030	171.4	5039	173.2	5044	173.8	5050	176
5056	180.5	5062	182.3	5067	184.1	5070	185.5	5090	184.8
5122	184.5	5160.4	183.7	5190.1	182.9	5230	182.9	5278.2	182.7
5332.5	182	5378.8	182.7	5414.1	182.4	5460.1	182.3	5528.4	183.8
5619.8	184.3	5712.3	185.6	5733	185.1	5739.8	184.5	5768.6	184.7
5777.5	184.8	5802.8	185.4	5843.4	184.8	5920	185.3	5962.4	185.2
6003.7	186.3	6022.6	185.7	6031.4	185.4	6058.5	185.6	6067.4	186
6097.1	186.8	6121.5	187.5	6154.5	186.9	6180.8	186.5	6206.1	185.5
6226.3	185	6252.2	185.6	6304.4	185.6	6334	184.2	6368.7	184.2
6407	184.7	6514.7	182	6568.7	180.8	6602.4	182.7	6640.5	184.6
6731.8	185.1	6755.1	185.1	6761.9	184.8	6788.4	185.7	6829.1	186

				Ramp	River	Pre. rep			
6927.7	186.5	7033.8	185.9	7073.9	185	7188.5	186.7	7284.6	187.2
7348.8	186.9	7476.7	184.3	7599.6	185.8	7722.6	186.2	7888.3	189
8046	191	8195.4	189.7	8341.8	191.7	8498.3	193		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3911.5 .2 4924 .045 5070 .5

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4924 5070 650.02 651.98 479.92 .5 .7
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3911.5 4924 184.8 F
 5070 8498.3 185.5 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 6800

INPUT
 Description: 6800

Station Elevation Data num= 97									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
3288.1 232.5 3320 223.3 3354.8 211.4 3382.3 210 3469.7 208.7									
3577.4 208.6 3619.8 205.5 3679.3 205.5 3742.7 207.3 3849.7 207.3									
3906.4 200 3964.2 182.7 4002.5 184.1 4070.1 184.3 4126.4 182.6									
4169.2 181.9 4201.8 181.4 4264 180.6 4298.4 181.6 4331.6 182.4									
4396.5 181.6 4458.4 182.3 4516.5 183 4636.3 183.2 4731.3 182.9									
4779.5 182.8 4830.6 183.1 4881.4 183.1 4901.6 182.9 4911.5 183.5									
4938.5 183.6 4950.5 178.5 4951.5 175.9 4952.5 175.6 4956.5 174.9									
4958.5 173.6 4960.5 171.9 4965.5 170 4970.5 170.2 4980.5 170.2									
4990.5 169.8 5000.5 169.7 5010.5 168.9 5020.5 168.7 5030.5 169.6									
5040.5 171.6 5043.5 173 5045.5 175.1 5048.5 175.4 5048.6 175.9									
5048.7 177.7 5056.5 178.5 5064.5 181.7 5072.5 181.9 5092.5 181.4									
5141.5 180.4 5196.5 179.6 5224.6 179.6 5304.2 180 5346.1 180.1									
5432.9 180.4 5496.2 180.8 5603.6 181.2 5631.6 181.2 5662.7 181.3									
5772.5 183.8 5896.3 183.7 5993.3 182.9 6114.7 184.3 6258.5 182.8									
6290.7 182.7 6351.6 186.7 6469.4 184 6556.9 183.3 6642.6 184.2									
6746.9 183.9 6820.4 184.2 6901 184.6 7005.2 184.3 7099.9 182.6									
7170.1 184.5 7225.1 183 7291.3 183.6 7356.7 185.3 7433.8 187.1									
7497.1 189.2 7593.4 190.3 7623.6 191.1 7659.1 190.3 7725.7 190.5									
7822.8 189.3 7884.6 188.5 7947.4 190 8022 191.3 8097.4 193.9									
8159 191.5 8209.8 191.1									

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3288.1 .2 4938.5 .045 5064.5 .5

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4938.5 5064.5 690 744.9 799.95 .2 .4
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 6055

INPUT

Ramapo River Pre. rep

Description: 6055

Station Elevation Data		num= 81		Station Elevation Data		num= 81		Station Elevation Data		num= 81	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3151.8	210.1	3208.1	208.1	3314.4	205.8	3378.6	204	3438.6	202.4		
3522.3	202.7	3545.8	199	3595.9	199.1	3674	200.5	3754.2	202.5		
3812.3	201.1	3871.8	204.5	4023.8	203.5	4055.1	202.8	4110.1	203.7		
4175.8	201.9	4237.6	196.2	4278.9	178.7	4361.7	178.8	4436.1	179.9		
4546.2	177.4	4633.5	176.4	4695.3	176.4	4776.1	178.5	4841.6	177.4		
4912.1	179.1	4922.5	179.7	4936.5	180.4	4941.5	179.1	4944.5	176.7		
4947.5	176.1	4952.5	175.3	4957.5	174.1	4962.5	173.4	4972.5	171.4		
4982.5	170.6	4992.5	169.6	5002.5	168.7	5012.5	166.1	5022.5	165.2		
5032.5	164.9	5042.5	168.7	5046.5	170.6	5048.5	173.6	5050.5	175.3		
5052.5	176.1	5060.5	180.6	5062.5	180.6	5082.5	181.2	5092.4	181.2		
5152.8	180.3	5259.4	178.8	5329	180.2	5410.5	180.4	5496.4	180.4		
5536.9	180.1	5569.1	180.1	5665.3	180.1	5738.3	178.2	5800.2	181.4		
5853	181.5	5919.4	178.4	5988.5	178.7	5995.7	177.2	6020.3	182.8		
6057.6	183.1	6145.6	180.6	6285.5	179.5	6393.2	178.9	6436.5	179.7		
6530.8	182.6	6613.5	182.8	6747	186.2	6906.3	190.9	6963.7	188.4		
7047.1	191.5	7197.7	190.1	7339.9	191.3	7519.3	192.6	7640.2	191.5		
7689.7	191.6										

Manning's n Values		num= 3	
Station	Value	Station	Value
3151.8	.2	4936.5	.045
		5082.5	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4936.5	5082.5		380	370		.2	.4
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 5685

INPUT
 Description: 5685

Station Elevation Data		num= 79		Station Elevation Data		num= 79		Station Elevation Data		num= 79	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3150.5	210	3225.4	209.1	3248.9	207.9	3280.5	207.7	3321.2	206.3		
3362.1	202.3	3427.9	201.3	3466.3	201.3	3601.7	200	3622.9	198.4		
3659.3	199.5	3715.6	200.4	3752.3	202.4	3797.8	203.4	3861.7	204		
3939	205.3	4015.5	205.2	4062.6	205.2	4124.2	204.9	4215.1	204.7		
4274.5	204.3	4336.4	204.5	4380.5	202.8	4438.9	195.3	4510.9	187.5		
4561.9	179	4606.8	181.9	4711	182.2	4764	181.9	4786	181.7		
4807	181.2	4818.5	180.3	4819	176.2	4890	176	4916	178.7		
4931	178.9	4934	179.2	4938	179.8	4945.5	176.2	4945.6	174.7		
4949	172.6	4951	170.8	4956	170.6	4958	167.1	4966	165.1		
4976	164.6	4986	164.8	4996	165.1	5006	165.3	5026	167.7		
5028	168.8	5033	170.6	5036	172.6	5036.1	174.6	5040	175.9		
5053	180.9	5082.3	182.4	5118.6	184	5300	190	5500	195		
5600	185	5689.2	180.2	5749.6	178.6	5876.2	178.6	6023.6	178.7		
6146.5	178.1	6217.8	177	6362	177.1	6441	180.8	6510.9	178.7		
6610.8	179.7	6723.5	178.5	6836.9	180.4	6920.9	186.6	7013.2	190.1		
7181	190.7	7358.5	190.7	7529.7	191.4	7613.3	193				

Manning's n Values		num= 3	
Station	Value	Station	Value
3150.5	.5	4938	.045
		5082.3	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.

RampoverPre. rep

4938 5082.3 1585.08 900 730.08 .2 .4

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 4785

INPUT
 Description: 4785

Station Elevation Data		num= 101		Station Elevation Data		num= 101		Station Elevation Data		num= 101	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2812.4	210.3	2897.4	206.7	2970.1	191.4	3089.9	181.9	3145.2	183.4		
3314.3	184	3572.1	183.4	3694.4	185.5	3796.2	182.9	4075.1	186.8		
4337.9	186.8	4380.7	186.8	4499	181.5	4613	181	4760.6	180.4		
4833.8	180	4894	180.6	4914	179.9	4936	179.6	4940	177.3		
4942	176	4944	175.1	4949	173.7	4959	171.9	4969	171.3		
4999	171	5009	170.6	5019	170.5	5039	172	5049	173.2		
5055	175.2	5070	177.5	5102.6	178.5	5110.7	177.3	5132	177		
5137	178.3	5165	178.4	5190	178.5	5199	177.6	5240	176.4		
5266	177.1	5270	177.6	5292	177	5319.5	177.1	5321	177.2		
5333	177	5336	176.4	5347	175.6	5358	175	5368	174.9		
5375	175.3	5382	175.5	5389	175.7	5397	176.1	5405	176.3		
5418	175.9	5424	176.2	5428	176.3	5431	175.8	5438	174.9		
5443	174.1	5447	173.4	5457	171.8	5467	173.6	5471	173.9		
5474	176.4	5478	177.1	5499	177.6	5520	177.3	5547	176.9		
5581	177.1	5610	176.9	5645	177	5678	176.3	5685	176.1		
5693	176.4	5714	177.1	5719	175.9	5745	177.4	5779	177.7		
5791.7	178	5826	177.7	5851	177.7	5886	177.4	5933	177		
5941	176.7	5947	176.3	5953	176.7	5960	177.1	5985	177.1		
5996	176.9	6006	176.7	6026	176.7	6038	177.1	6069	177.5		
6113	176.6	6153	177.9	6320.3	178.3	6535.7	177.4	6635.68	183.22		
6741.99	192.13										

Manning's n Values		num= 3	
Station	n Value	Station	n Value
2812.4	.5	4936	.045
		5070	.15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

 4936 5070 270 410.04 950.04 .2 .4

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 4375

INPUT
 Description: 4375

Station Elevation Data		num= 99		Station Elevation Data		num= 99		Station Elevation Data		num= 99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2815.8	211.7	2858.2	205.2	2898.8	204.4	3035.3	182.2	3087.2	181.7		
3254	183	3415.4	181.2	3452.6	182.9	3516.2	182	3581.7	183.8		
3657.7	184	3715.3	183.1	3759	185.1	3809.9	182.7	3973.9	184.4		
4161.4	185	4897.3	183.8	4929.1	183.1	4944.1	182.2	4951.7	179.8		
4954.9	176.5	4956.7	175.5	4960.7	173.2	4970.7	170.2	5015.7	170		
5025.7	169.8	5035.7	169.5	5045.1	175.8	5045.2	176.5	5048.4	178.8		
5094.3	176.3	5111.5	177.4	5209.2	176.9	5252	177.7	5299.2	179.4		
5307.5	179.5	5327.5	171.3	5337.5	171.5	5357.5	170.7	5387.5	173.3		

RampoverPre.rep									
5397.5	173.5	5427.5	173.1	5455.9	178.8	5477.6	178.7	5488.9	177.6
5492.4	176.6	5496.5	175.7	5501.5	174.2	5507.5	172.9	5512.5	173.3
5517.5	172.8	5522.5	173	5527.5	173.7	5532.9	175.4	5535.3	176.1
5536.1	176.6	5539	177.7	5553.4	177.4	5558.1	178.3	5577.2	177.4
5586.9	178.1	5622.2	178.3	5649.5	178.8	5693.6	178.2	5728.9	177.7
5751.6	177.5	5761.8	178.6	5793.1	180.3	5835.2	181.4	5881.1	180.8
5913.2	180.2	5939.6	179.2	5980.6	178.8	6000	176	6014.5	177.1
6027.1	177.1	6044.3	175.7	6123.3	173.2	6149.6	173.2	6193.4	174.6
6270.5	175.5	6636.2	177.5	6841.1	176.1	6885.2	189.7	6954.9	189.6
7040.8	186.9	7074	186.9	7104.3	191.6	7170.1	188.4	7406.1	180.9
7441.8	173.3	7538.9	173.3	7582.1	179.5	7658.3	182.4	7723.7	178.2
7984.8	176.2	8144.3	178	8200	180	8400	200		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2815.8	.5	4929.1	.045	5455.9	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4929.1	5455.9		300	595.08		.2	.4
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 3780

INPUT
 Description: 3780

Station Elevation Data										num= 80
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
2727.5	210.1	2765.7	200.3	2799.1	200.6	2873.4	183.9	2913.5	181.5	
3030.8	181.7	3118	184.6	3170.6	183.2	3296.2	184.8	3437.9	183.7	
3617	184.2	4264.6	183	4342.4	182.3	4422.4	184.5	4586.9	185.6	
4613	185.6	4641	184.9	4661	180	4666	176.9	4676	176.5	
4691	174.3	4703	174.3	4724	175.8	4728	178.6	4735.8	179.1	
4782	178.2	4811	176.2	4876	177.2	4917	175.9	4940	177.2	
4949	175.8	4984	171.5	4994	171.9	5034	167.7	5057	177.7	
5066	178	5106	171.5	5116	171.9	5136	175	5176	173.4	
5186	173.5	5196	173	5206	173.4	5210	175.1	5213	176.4	
5215	177.5	5220	177.9	5238.8	184.1	5625	183.7	5625.9	185.1	
5626.9	176.5	5896.6	176.5	5897.5	185	5898.5	184.6	6318.5	184.6	
6417.5	187.6	6574.7	182.1	6638.6	183.9	6725.5	188.4	6788.7	185.3	
6960.4	186.2	7198.6	188	7357.5	186.8	7456	185.6	7518.5	184	
7642.9	180.9	7731.5	183.5	7833.7	182.1	7962.5	180.1	8136.7	177.8	
8290.4	176.5	8313.9	176.5	8404.5	188.8	8534.6	190	8705.6	190.9	
8798.3	193.1	8914.6	195.1	9027.5	195.4	9146.9	194	9197.9	193.1	

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2727.5	.5	4613	.045	5238.8	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4613	5238.8		320.04	565.08		.2	.4
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 3215

RamporiverPre. rep

INPUT

Description: 3215

Station Elevation Data		num= 98		Station Elevation Data		num= 98		Station Elevation Data		num= 98	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3266.5	210	3379.9	196.8	3404.6	196.6	3457.6	182.5	3513	180.3		
3607.3	179.7	3712.3	182.8	3906.2	182.1	3929.6	184.4	4069.2	183.4		
4144.6	184.2	4643	185.5	4861	184.9	4869	180.4	4884	180		
4888.1	175.8	4903	174.2	4944	174	4954	172.7	4964	173		
4974	172	4984	172	4994	170.6	5004	171.1	5014	170.5		
5044	170.4	5054	170	5064	169.6	5092	174.4	5097	174.6		
5102	175.4	5120	176.9	5130	176.8	5138.9	177.5	5178	177.5		
5204	176.4	5212	175.4	5217	173.3	5227	173.3	5237	172.3		
5254.6	176.3	5255	177.2	5269	183.9	5272.6	183.7	5277	183.6		
5318.7	177.9	5478.5	176.6	5572.6	174.3	5675.5	177.6	5721.1	176.4		
5745.8	177.5	5876.6	177.9	5941.4	176.4	6006.9	177.6	6067.4	176.7		
6097.6	177.6	6115	176.9	6123	171.3	6137	172.2	6151	169.3		
6154	170.1	6158	170.5	6164	169.5	6172	167.7	6205	167.2		
6210	167.5	6215	169.1	6217	170.1	6217.1	171.6	6223	173.8		
6231	176.1	6266	176.2	6277.1	179.6	6367.8	175.2	6404.3	176.5		
6448.8	170.2	6539.2	181.9	6561.2	180.8	6678.7	187.7	6892.1	179.4		
6936.1	184	7095.2	187.5	7138.6	183.4	7243.6	181.5	7326	181.8		
7702.8	187.7	7828.6	187.8	7894.2	187.1	8034.9	184.8	8118	186.2		
8239.6	181.5	8360.3	186.5	8511.4	188.4	8790.2	189.1	9343.8	197.9		
9704.9	199	9872.8	198.1	9918.7	199						

Manning's n Values		num= 3		Manning's n Values	
Station	n Value	Station	n Value	Station	n Value
3266.5	.5	4861	.045	5269	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expansion
	4861	5269		930.02	689.92	.2	.4

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 2525

INPUT

Description: 2525

Station Elevation Data		num= 99		Station Elevation Data		num= 99		Station Elevation Data		num= 99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3524.3	210.1	3546.6	208	3583.6	193.1	3619.3	192.5	3639	187.1		
3684.2	185.9	3702.5	180.2	3716.7	184.5	4102.9	181.6	4144.1	182.3		
4235.8	181.5	4425.3	181.9	4470.7	183.5	4579.2	180.3	4626.1	182.9		
4753	180.5	4773	181.9	4789	181.2	4798	178.2	4799	176.5		
4824	168.8	4834	168.2	4844	169.6	4874	172.5	4885	174.5		
4891	176.5	4893	177.8	4929	176.5	4930	175.2	4934	174.5		
4946	170.3	4966	169.2	4996	170.4	5006	170.2	5016	170.5		
5026	170.8	5036	169.9	5072	176.5	5096	183.6	5103.6	180.5		
5107	183.6	5149.4	176.2	5280.8	174.9	5328.5	176	5704.4	174.2		
5755	175.7	5829.7	173.6	6005.4	175.3	6221.2	174.1	6257.6	176		
6273	176.7	6294	176.2	6307	172.8	6313.1	170	6331	167.9		
6349	167.6	6358	168.1	6368	169.1	6371	170	6377	171.5		
6382	176.4	6391	176.5	6405	175.6	6415	177.1	6483.3	173.3		
6557.3	177.6	6586.1	183.9	6601	187.2	6626.2	177.5	6669.4	175.8		
6737.9	181.4	6790.9	180	6849.3	182.8	6923.4	182.5	7019.2	178.9		
7152.9	187.1	7339	186	7484.8	181.4	7576.3	187.7	7650.8	188.1		
7711.5	189.7	7834.1	188.6	7904.2	189.1	7973.1	189.4	8080.8	187.6		
8188.7	190.5	8299	188.9	8469.6	190	8592.1	189.1	8740.9	188.9		

RampoverPre.rep

8894.2	189.5	9143	190.6	9285.1	192.3	9414.7	194.3	9570.1	196.3
9728.9	198.4	9875.3	198.3	10092.1	196.5	10180	199.2		

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
3524.3 .5	4773 .045	5096 .15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4773	5096	1185.03	1010.1	460.11	.2	.4
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3524.3	4773	181	F
5096	10180	184	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 1515

INPUT

Description: 1515

Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3222	200	3387	187.2	3393	188.5	3430.4	184.2	3505.5	185.9
3613	186.1	3837.2	189.7	4115.7	182.3	4229.8	180.5	4361.9	180.7
4551.7	180.6	4607	181.6	4640	179.8	4666	180.9	4694	170.3
4714	166.2	4724	167.9	4744	168	4753	172.7	4770	179.4
4835	177	4904	176.6	4940	176.9	4944	176.5	4949	170.3
4967	168.5	5013	169.6	5026	169.5	5042	170.3	5057	176.7
5058	177.9	5066	178.5	5081	177.3	5096	183.2	5106	183.2
5112	178.1	5179.8	175.6	5242.1	176.4	5428.2	175.2	5546.3	173.5
5618	175.5	5860.4	174.6	5953.5	176	6087.6	173.1	6156.9	174.5
6166	174.3	6186	174.1	6189	173.8	6201	171.9	6207	167.7
6211	167.4	6216	167.9	6226	168.3	6232	169	6252	169.1
6262	169	6272	168	6282	169.3	6286	169.3	6296	169.3
6306	169	6313	168.8	6315	170.2	6319	175.2	6323	175.3
6326	175.4	6329	173.5	6422.6	187.7	6492.4	178.8	6560.4	178.2
6621.3	180.6	6666.7	179.3	6805.9	184	6860.7	183.8	6927.5	182.1
7259.7	184.6	7328.6	190.1	7393.8	188.5	7589.1	189.8	7744	189.4
7819.7	190.7	7977.7	192.3	8089.1	192.4	8305.4	193	8447	189.9
8571.2	191.9	8646.3	192.3	8757.1	190.4	8852.5	192.2	9107.6	196.1
9230.6	196	9361.5	194.2	9602.1	194.2	9695.7	198	9770.9	197.5
9886.6	198.3	10011.4	196.4	10192.6	198.3				

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
3222 .15	4666 .045	5106 .15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4666	5106	655.02	430.02	15.03	.2	.4
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3222	4666	182	F
5106	10192.6	184	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 1085

Ramapo River Pre. rep

INPUT

Description: 1085

Station Elevation		Data		num= 70					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3222	200	3387	187.2	3393	188.5	3430.4	184.2	3505.5	185.9
3613	186.1	3837.2	189.7	4115.7	182.3	4229.8	180.5	4361.9	180.7
4551.7	180.6	4607	181.6	4640	179.8	4666	180.9	4694	170.3
4714	166.2	4967	168.5	5013	169.5	5042	170.3	5057	176.7
5058	177.9	5066	178.5	5081	177.3	5096	183.2	5106	183.2
5112	178.1	5179.8	175.6	5242.1	176.4	5428.2	175.2	5546.3	173.5
5618	175.5	5860.4	174.6	5953.5	176	6087.6	173.1	6156.9	174.5
6166	174.3	6186	174.1	6189	173.8	6201	171.9	6207	167.7
6211	167.4	6216	167.9	6226	168.3	6232	169	6252	169.1
6262	169	6272	168	6282	169.3	6286	169.3	6296	169.3
6306	169	6313	168.8	6315	170.2	6319	175.2	6323	175.3
6326	175.4	6329	173.5	6422.6	187.7	6492.4	178.8	6560.4	178.2
6621.3	180.6	6666.7	179.3	6805.9	184	6860.7	183.8	6927.5	182.1
7259.7	184.6	7328.6	190.1	7393.8	188.5	7589.1	189.8	7744	189.4

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
3222	.15	4666	.045	5106	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4666	5106		5	5		.4	.6

Ineffective Flow			num= 2	
Sta L	Sta R	Elev	Permanent	
3222	4666	184.7	F	
5106	7744	185	F	

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 1080

INPUT

Description: 1080

Station Elevation		Data		num= 70					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4205	188.1	4475	182.4	4477	188.5	4672	183.2	4862	181.5
4863	184.1	4865	184.2	4865.7	176.5	4865.8	174.6	4880	173.9
4974	173.8	4998	173.1	5072	173.6	5097	174.1	5115	174.3
5123	174.3	5135.6	174.8	5135.7	176.5	5135.8	184.2	5138.3	184.2
5157	182.6	5165	182.7	5175	177	5205	175.3	5245	175.2
5333	176.2	5483	174.8	5583	175.3	5605	174.2	5733.7	174.8
5807.3	174.4	6067	176	6116.7	175.9	6174.1	174.2	6230.9	174.6
6241	174.9	6261.3	174.2	6273	173.8	6280	170.1	6282	168.2
6285	167.5	6295	167.8	6301	168.5	6306	169.2	6316	169.1
6326	169.2	6336	169.3	6346	169.4	6356	169.3	6361	169.1
6369	167.9	6372	168.1	6375.5	170.2	6376	175.1	6382.5	175.2
6385	175	6391	173.4	6397	173.4	6402	174.9	6411.9	174.7
6515.2	182.3	6651.7	177.8	6721.8	180.1	6842.2	179.5	6904.5	184.4
6990.3	182.2	7064.4	183.3	7132.56	184.25	7204.18	185.83	7222.86	186.93

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4205	.15	4865	.025	5138.3	.15

RampoverPre.rep

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4865	5138.3		5	5	5		.4	.6

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4205 4865 184.5 F
 5138.3 7222.86 184.86 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 1075

INPUT
 Description: 1075
 This is a REPEATED section.

Station Elevation Data		num=	79							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
2554.6	200	2754.6	182.3	3561.1	183.3	4037.4	188.1	4151.9	177.9	
4420.9	172	4434	172	4534	171.3	4584	170.6	4634	171.1	
4684	170.4	4734	178.1	4784	177.7	4844	174.9	4884	176.1	
4914	174	4928	172.5	4939	170.2	4939.1	169.7	4941	168.1	
4945	168.2	4951	166.5	4971	164.7	4981	164.7	4991	163.7	
5001	163.7	5011	166.2	5031	166.8	5041	167.4	5051	167.9	
5056	168.2	5061	169.7	5061	170	5067	171.3	5076	176.5	
5102	175.3	5112	175.7	5132	175.5	5172	173.7	5237	174.3	
5299.7	174	5632.7	175.1	5682	176.1	5834.5	176	5912.3	173.9	
5921	174.1	5940.7	174.5	5955	173.9	5960	170.2	5961	168.2	
5965	167.2	5967	166.9	5977	167.4	5987	168.2	5997	168.4	
6007	168	6012	167.9	6015	167.5	6017	167.6	6023	170.1	
6026	172	6033	172.7	6034	170.1	6041	169.8	6044	169.5	
6047	170	6048	170.1	6054.5	171.2	6061	174.3	6081	174.4	
6159.2	179.5	6220	180.6	6333.5	178.1	6489	176.3	6530.2	183.7	
6657.7	182.2	6797.5	184.5	7038.9	183.8	7173.6	186.7			

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
2554.6	.15	4884	.04	5076	.15

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4884	5076		160.02	304.99	24.99		.4	.6

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 770

INPUT
 Description: 770

Station Elevation Data		num=	79							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
2554.6	200	2754.6	182.3	3561.1	183.3	4037.4	188.1	4151.9	177.9	
4420.9	172	4434	172	4534	171.3	4584	170.6	4634	171.1	
4684	170.4	4734	178.1	4784	177.7	4844	174.9	4884	176.1	
4914	174	4928	172.5	4939	170.2	4939.1	169.7	4941	168.1	
4945	168.2	4951	166.5	4971	164.7	4981	164.7	4991	163.7	
5001	163.7	5011	166.2	5031	166.8	5041	167.4	5051	167.9	
5056	168.2	5061	169.7	5061	170	5067	171.3	5076	176.5	
5102	175.3	5112	175.7	5132	175.5	5172	173.7	5237	174.3	

RampoverPre.rep									
5299.7	174	5632.7	175.1	5682	176.1	5834.5	176	5912.3	173.9
5921	174.1	5940.7	174.5	5955	173.9	5960	170.2	5961	168.2
5965	167.2	5967	166.9	5977	167.4	5987	168.2	5997	168.4
6007	168	6012	167.9	6015	167.5	6017	167.6	6023	170.1
6026	172	6033	172.7	6034	170.1	6041	169.8	6044	169.5
6047	170	6048	170.1	6054.5	171.2	6061	174.3	6081	174.4
6159.2	179.5	6220	180.6	6333.5	178.1	6489	176.3	6530.2	183.7
6657.7	182.2	6797.5	184.5	7038.9	183.8	7173.6	186.7		

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
2554.6	.07	4884	.04	5076	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4884	5076		415.04	769.92	.1	.3

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 0

INPUT

Description: 0 Confluence with Pequannock River
 Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2554.6	200	2654.6	185.2	2754.6	182.3	2814.6	182.2	2852.1	180.3
2897.9	182.4	2979.2	182.3	3363.9	185.7	3450.5	184.4	3493.2	184.3
3561.1	183.3	3898.9	184.6	4002.1	188.1	4037.4	188.1	4084.3	185.8
4115.5	180	4151.9	177.9	4176	177.9	4240.2	175.4	4291.8	173.8
4334.1	173	4371.1	172.3	4420.9	172	4452.4	172.6	4506	178.8
4582.2	187	4645.7	186.2	4721.3	182.6	4812.4	175.1	4876.5	176.3
4904.4	182.1	4918	182.4	4934	171.9	4937	171.7	4943	169.6
4945	165.5	4962	164.5	4972	164.6	4982	164.7	4992	164.6
5002	165.6	5012	166.1	5022	166.2	5032	166	5042	166.7
5049	166.9	5052	167.5	5057	169.6	5058	170.4	5074	171.7
5076	175.2	5082	175.3	5085	173.8	5101	174	5107	175.3
5114	175.7	5126.2	176.1	5200	177	5268.8	172.4	5323.6	172.4
5419.6	174.3	5468.1	171	5498.4	171	5535.1	177.8	5586.8	175.9
5615.2	177.7	5685.2	182.3	5759.5	184.4	5844.8	182.4	5927.8	184.4
6023.7	182.7	6125.6	183.6	6208.4	184.1	6272.6	187.8	6378	188.3
6466.4	188.8	6622.5	189.2	6679	189.2	6773.3	188.9	6874.2	191.4
7017.4	192.1	7109.2	192.1	7200.1	193.4	7289.1	190	7321.9	189.4
7407.5	191.9	7531.4	192.6	7633.6	190.9	7729.3	192.2	7859.7	194.1
8015.4	196.1	8151.2	196.1	8354	194.9	8619.9	198	8687	196.7
8804.3	198.3	8922	196.3	9137.4	198.3				

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
2554.6	.065	4918	.033	5082	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4918	5082		790.08	790.08	.1	.3

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -790

INPUT

Description: 790 Pompton River

Station Elevation Data				RampoverPre. rep					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	167.3	4877	167
4877.1	167.1	4880.9	166.5	4882	167.2	4882.1	167.2	4887.9	168.5
4918.6	168.7	4936.7	166.9	4942.8	166.2	4965	161.5	4965.1	161.5
4967.3	161.4	4969	162	4969.1	162	4979.8	164.1	5029.8	163.4
5038.6	166.9	5043.7	165.8	5052.2	166.4	5053	166.8	5053.1	166.8
5057	167.3	5057.1	167.3	5057.2	167.2	5067	168.7	5133.2	169.6
5139	168.5	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027	5201.8	.065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4777.2 5201.8 10 10 10 .1 .3

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -800

INPUT
 Description: 800 Pompton River

Station Elevation Data				num= 75					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	168.5	5067	168.5
5133.2	169.6	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027	5201.8	.065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4777.2 5201.8 20 9 1 .1 .3

RamporiverPre. rep

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -809

INPUT
 Description: 810 Pompton River
 JACKSON AVE. BRIDGE

Station		Elevation		Data		num= 100		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182		
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7		
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8		
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1		
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188		
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	167.3	4877	167		
4877.1	167.1	4880.9	166.5	4882	167.2	4882.1	167.2	4887.9	168.5		
4918.6	168.7	4936.7	166.9	4942.8	166.2	4965	161.5	4965.1	161.5		
4967.3	161.4	4969	162	4969.1	162	4979.8	164.1	5029.8	163.4		
5038.6	166.9	5043.7	165.8	5052.2	166.4	5053	166.8	5053.1	166.8		
5057	167.3	5057.1	167.3	5057.2	167.2	5067	168.7	5133.2	169.6		
5139	168.5	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5		
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5		
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9		
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3		
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2		
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4		
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2		
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1		
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027
5201.8	.065		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.	
	4777.2	5201.8		40	82	60		.3	.5	
Ineffective Flow	num=	2								
Sta L	Sta R	Elev	Permanent							
2717.8	4777.2	188.8	F							
5201.8	8785.3	186.7	F							

BRIDGE

RIVER: Ramapo River
 REACH: Reach-1 RS: -850

INPUT
 Description: Jackson Avenue Bridge - Bridge #1

Distance from Upstream XS = 1
 Deck/Roadway Width = 80
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 71											
Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord
2717.8	200.3	200.3	2809.1	187.3	187.3	3029.2	180.4	180.4			
3037.3	178.6	178.6	3076	182	182	3358.3	180.4	180.4			
3491.7	183.1	183.1	3671	183.9	183.9	3959.7	179.7	179.7			

Ramp Over Pre. rep

4007.3	180.7	180.7	4107.2	182.2	182.2	4153.3	173.9	173.9
4174.5	173.9	173.9	4194.5	177.9	177.9	4217.9	176.8	176.8
4292.9	180.4	180.4	4383.9	180	180	4483.9	179.9	179.9
4681.2	186.6	186.6	4762.5	188.1	188.1	4777.2	188.8	188.8
4792.5	186.8	186.8	4812.5	187.2	187.2	4812.6	187.7	187.7
4816.1	188	188	4839.5	188.2	180.3	4839.6	189	184.5
4877	188.7	185.1	4882.1	188.7	185.1	4965	189.6	185.6
4969.1	189.6	185.6	5053	189.7	185.3	5057.1	189.7	185.2
5139	189.2	184.2	5143.1	189.2	184.2	5182.5	188.5	183.4
5182.6	187.6	100	5201.8	188	100	5221.8	186.7	186.7
5231.9	187.8	187.8	5295.6	185.9	185.9	5347.8	185.2	185.2
5426	185.1	185.1	5509.2	183.9	183.9	5574.3	184	184
5650.4	184.3	184.3	5739.1	183	183	5841.9	183	183
5927.1	183.8	183.8	5994.4	185	185	6068.2	185.2	185.2
6136.3	183.4	183.4	6220.9	181.7	181.7	6308.3	180.9	180.9
6393.9	180.9	180.9	6475.9	181.4	181.4	6553.9	181.2	181.2
6676.2	182.4	182.4	6999.5	182.3	182.3	7093.7	182.4	182.4
7266.9	181.2	181.2	7414.3	180.9	180.9	7515.5	180.4	180.4
7636.1	181.9	181.9	7867.1	182.6	182.6	7965.6	183.1	183.1
8142.1	192.3	192.3	8201.8	193.4	193.4	8339	193.6	193.6
8571.5	193.7	193.7	8785.3	197	197			

Upstream Bridge Cross Section Data

Station Elevation Data num= 100									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	167.3	4877	167
4877.1	167.1	4880.9	166.5	4882	167.2	4882.1	167.2	4887.9	168.5
4918.6	168.7	4936.7	166.9	4942.8	166.2	4965	161.5	4965.1	161.5
4967.3	161.4	4969	162	4969.1	162	4979.8	164.1	5029.8	163.4
5038.6	166.9	5043.7	165.8	5052.2	166.4	5053	166.8	5053.1	166.8
5057	167.3	5057.1	167.3	5057.2	167.2	5067	168.7	5133.2	169.6
5139	168.5	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197

Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027	5201.8	.065

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	4777.2	5201.8	.3	.5	

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
2717.8	4777.2	188.8	F	
5201.8	8785.3	186.7	F	

Downstream Deck/Roadway Coordinates

num= 21									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4792.5	186.8	186.8	4812.5	187.2	187.2	4812.6	187.7	185	
4816.1	188	100	4839.5	188.2	180.3	4839.6	189	184.5	
4877	188.7	185.1	4882.1	188.7	185.1	4965	189.6	185.6	

Ramp Over Pre. rep								
4969.1	189.6	185.6	5053	189.7	185.3	5057.1	189.7	185.2
5139	189.2	184.2	5143.1	189.2	184.2	5182.5	188.5	183.4
5182.6	187.6	100	5201.8	188	100	5221.8	186.7	186.7
5231.9	187.8	187.8	5295.6	185.9	185.9	5347.8	185.2	185.2

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	99	Sta	Elev	Sta	Elev	Sta	Elev
2797.7	200	2940.6	184.2	3032.7	182.3	3120.2	178.3	3129.2	178.3	
3143	181.3	3164.5	182	3219.9	181	3447.3	179.7	3728.6	183.4	
4020.7	179.8	4124	182.8	4179.2	182.3	4214.3	173.9	4224.1	173.9	
4239.8	178.2	4260.7	175.8	4350	183.3	4389.1	181.1	4448	181.8	
4626.1	181	4674.8	180.8	4757.2	183.9	4788.3	187.9	4799.5	187.4	
4809.6	187	4829.6	187.7	4849.1	180.3	4853.3	180.3	4881.2	168.9	
4891.8	168.2	4916.4	168.6	4927.9	167.9	4936.2	168.4	4946.5	166.9	
4952	166.1	4959.3	164.5	4964.3	164	4969.3	164	4972.3	163.2	
4976.3	162.4	4983.3	162.3	4993.3	162.2	5003.3	161.6	5013.3	160.7	
5023	159.7	5033	159.7	5038	161.2	5043.3	162.6	5048.3	164.8	
5051.4	165.6	5054.2	166.9	5064.6	168.4	5084.5	168.5	5111.9	169.1	
5139	169.7	5161.9	169.2	5189	180.3	5194	180.4	5215.3	187.9	
5235.3	187.9	5252.4	189.2	5423.6	184.3	5667.8	184.7	5746.3	183.4	
5790.1	184.1	5819.9	183.5	5874.7	183.5	5964.6	183.6	6008.2	184.2	
6053.3	185	6102.9	185.4	6167.1	184.2	6236.3	182.3	6313.8	180.9	
6348.1	180.6	6385.1	181	6449.6	182	6513.9	181.4	6584.2	182	
6718	182.6	6876.3	184	6985.9	184.1	7084.9	182.7	7228.4	182	
7304.2	181.4	7427.8	180.3	7507	175.5	7539	175.5	7606.9	181.7	
7779.1	181.5	7923.6	183.2	8088.1	186.8	8201.2	193.4	8268.7	192.7	
8391.1	193.6	8517.8	193.7	8658.6	196.1	8852.8	197.1			

Manning's n Values					
Station	n Val	Station	n Val	Station	n Val
2797.7	.065	4829.6	.027	5252.4	.065

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	4829.6	5252.4		.3	.5
Ineffective Flow					
Station L	Station R	Elev	Permanent		
2797.7	4829.6	187.7	F		
5252.4	8852.8	189.2	F		

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 179
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data					
Pier Station	Upstream=	4879.5	Downstream=	4879.5	
Upstream					
Width	Elev	Width	Elev		
5	160	5	188		
Downstream					
Width	Elev	Width	Elev		
5	160	5	188		

Pier Data					
Pier Station	Upstream=	4967	Downstream=	4967	
Upstream					
Width	Elev	Width	Elev		

Ramapo River Pre. rep

4 160 4 188
 Downstream num= 2
 Width Elev Width Elev
 4 160 4 188

Pier Data
 Pier Station Upstream= 5055 Downstream= 5055
 Upstream num= 2
 Width Elev Width Elev
 4 160 4 188
 Downstream num= 2
 Width Elev Width Elev
 4 160 4 188

Pier Data
 Pier Station Upstream= 5141 Downstream= 5141
 Upstream num= 2
 Width Elev Width Elev
 4 160 4 188
 Downstream num= 2
 Width Elev Width Elev
 4 160 4 188

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Momentum Cd = 1.6
 Yarnell KVal = 1.05

Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8164966
 Max Low Cord = 185.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -891

INPUT

Description: 890 Pompton River
 Station Elevati on Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2797.7	200	2940.6	184.2	3032.7	182.3	3120.2	178.3	3129.2	178.3
3143	181.3	3164.5	182	3219.9	181	3447.3	179.7	3728.6	183.4
4020.7	179.8	4124	182.8	4179.2	182.3	4214.3	173.9	4224.1	173.9
4239.8	178.2	4260.7	175.8	4350	183.3	4389.1	181.1	4448	181.8
4626.1	181	4674.8	180.8	4757.2	183.9	4788.3	187.9	4799.5	187.4
4809.6	187	4829.6	187.7	4849.1	180.3	4853.3	180.3	4881.2	168.9
4891.8	168.2	4916.4	168.6	4927.9	167.9	4936.2	168.4	4946.5	166.9
4952	166.1	4959.3	164.5	4964.3	164	4969.3	164	4972.3	163.2
4976.3	162.4	4983.3	162.3	4993.3	162.2	5003.3	161.6	5013.3	160.7

RampoverPre.rep

5023	159.7	5033	159.7	5038	161.2	5043.3	162.6	5048.3	164.8
5051.4	165.6	5054.2	166.9	5064.6	168.4	5084.5	168.5	5111.9	169.1
5139	169.7	5161.9	169.2	5189	180.3	5194	180.4	5215.3	187.9
5235.3	187.9	5252.4	189.2	5423.6	184.3	5667.8	184.7	5746.3	183.4
5790.1	184.1	5819.9	183.5	5874.7	183.5	5964.6	183.6	6008.2	184.2
6053.3	185	6102.9	185.4	6167.1	184.2	6236.3	182.3	6313.8	180.9
6348.1	180.6	6385.1	181	6449.6	182	6513.9	181.4	6584.2	182
6718	182.6	6876.3	184	6985.9	184.1	7084.9	182.7	7228.4	182
7304.2	181.4	7427.8	180.3	7507	175.5	7539	175.5	7606.9	181.7
7779.1	181.5	7923.6	183.2	8088.1	186.8	8201.2	193.4	8268.7	192.7
8391.1	193.6	8517.8	193.7	8658.6	196.1	8852.8	197.1		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2797.7 .065 4829.6 .027 5252.4 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4829.6 5252.4 10 10 10 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2797.7 4829.6 187.7 F
 5252.4 8852.8 189.2 F

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -900

INPUT
 Description: 890 Pompton River

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2797.7	200	2940.6	184.2	3032.7	182.3	3120.2	178.3	3129.2	178.3
3143	181.3	3164.5	182	3219.9	181	3447.3	179.7	3728.6	183.4
4020.7	179.8	4124	182.8	4179.2	182.3	4214.3	173.9	4224.1	173.9
4239.8	178.2	4260.7	175.8	4350	183.3	4389.1	181.1	4448	181.8
4626.1	181	4674.8	180.8	4757.2	183.9	4788.3	187.9	4799.5	187.4
4809.6	187	4829.6	187.7	4849.1	180.3	4853.3	180.3	4881.2	168.9
4891.8	168.2	4916.4	168.6	4927.9	167.9	4936.2	168.4	4946.5	166.9
4952	166.1	4959.3	164.5	4964.3	164	4969.3	164	4972.3	163.2
4976.3	162.4	4983.3	162.3	4993.3	162.2	5003.3	161.6	5013.3	160.7
5023	159.7	5033	159.7	5038	161.2	5043.3	162.6	5048.3	164.8
5051.4	165.6	5054.2	166.9	5064.6	168.4	5084.5	168.5	5111.9	169.1
5139	169.7	5161.9	169.2	5189	180.3	5194	180.4	5215.3	187.9
5235.3	187.9	5252.4	189.2	5423.6	184.3	5667.8	184.7	5746.3	183.4
5790.1	184.1	5819.9	183.5	5874.7	183.5	5964.6	183.6	6008.2	184.2
6053.3	185	6102.9	185.4	6167.1	184.2	6236.3	182.3	6313.8	180.9
6348.1	180.6	6385.1	181	6449.6	182	6513.9	181.4	6584.2	182
6718	182.6	6876.3	184	6985.9	184.1	7084.9	182.7	7228.4	182
7304.2	181.4	7427.8	180.3	7507	175.5	7539	175.5	7606.9	181.7
7779.1	181.5	7923.6	183.2	8088.1	186.8	8201.2	193.4	8268.7	192.7
8391.1	193.6	8517.8	193.7	8658.6	196.1	8852.8	197.1		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2797.7 .065 4829.6 .027 5252.4 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4829.6 5252.4 0 0 0 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent

2797.7 4829.6 187.7
 5252.4 8852.8 189.2

Ramapo River
 Pre. rep
 F
 F

SUMMARY OF MANNING'S N VALUES

River: Ramapo River

Reach n6	Reach n7	River Sta. n8	Sta. n9	n1	n2	n3	n4	n5
Reach-1		34312		.055	.035	.055		
Reach-1		32867		.055	.035	.055		
Reach-1		32750		.055	.035	.055		
Reach-1		32710		.055	.035	.055		
Reach-1		32690		Bri dge				
Reach-1		32670		.055	.035	.055		
Reach-1		32100		.08	.04	.055	.035	.08
Reach-1		31640		.08	.04	.055	.035	.08
Reach-1	.03	31220	.045	.08	.04	.055	.035	.08
Reach-1	.07	30756		.07	.04	.055	.035	.07
Reach-1		30300		.055	.035	.055		
Reach-1		29622		.055	.035	.055		
Reach-1		28480		.055	.035	.055		
Reach-1		27992		.05	.032	.05		
Reach-1		27964.5		Bri dge				
Reach-1		27937		.05	.034	.05		
Reach-1		27620		.04	.03	.05		
Reach-1		27272		.04	.03	.05		
Reach-1		27047		.04	.03	.05		
Reach-1		26812		.04	.03	.05		
Reach-1		26762		.04	.03	.05		
Reach-1		26721		.04	.03	.05		
Reach-1		26632		.07	.045	.07		
Reach-1		26533		.07	.045	.07		
Reach-1		26157		.07	.045	.07		

Rampori verPre. rep

Reach-1	25890	.07	.045	.07		
Reach-1	25657	.07	.045	.07		
Reach-1	25420	.07	.045	.07		
Reach-1	25165	.06	.045	.06		
Reach-1	25145	.2	.025	.1		
Reach-1	25130	.055	.04	.055		
Reach-1	25087	.055	.04	.055		
Reach-1	24950	.055	.04	.055		
Reach-1	24822	.055	.04	.055		
Reach-1	24735	.2	.04	.055	.04	.055
Reach-1	24690	.2	.04	.055	.04	.055
Reach-1	24477	.2	.048	.08		
Reach-1	24405	.2	.048	.08		
Reach-1	24350	.2	.048	.08		
Reach-1	24210	.2	.048	.08		
Reach-1	24032	.2	.048	.08		
Reach-1	23860	.2	.048	.08		
Reach-1	23715	.2	.048	.08		
Reach-1	23600	.2	.048	.08		
Reach-1	23440	.2	.048	.08		
Reach-1	23300	.2	.048	.07		
Reach-1	23120	.2	.048	.07		
Reach-1	23090	.2	.048	.07		
Reach-1	23027	.07	.042	.1		
Reach-1	23005	.07	.03	.06		
Reach-1	22990	.06	.028	.06		
Reach-1	22930	.06	.028	.06		
Reach-1	22820	.06	.028	.06		
Reach-1	22575	.06	.028	.06		
Reach-1	22365	.06	.028	.06		
Reach-1	22173	.06	.028	.06		

Reach-1		Ramp	Pre. rep			
Reach-1	22110		.06	.03	.07	
Reach-1	22093.5	Bridge				
Reach-1	22077		.06	.037	.06	
Reach-1	21957		.7	.043	.09	
Reach-1	21825		.9	.075	.037	.09
Reach-1	21600		.9	.075	.037	.09
Reach-1	21417		.9	.075	.038	.09
Reach-1	21152		.9	.075	.038	.09
Reach-1	20930		.9	.075	.037	.09
Reach-1	20700		.9	.075	.037	.09
Reach-1	20495		.9	.075	.04	.065
Reach-1	20348		.9	.07	.04	.06
Reach-1	20332		.9	.075	.04	.065
Reach-1	20330		.9	.075	.04	.065
Reach-1	20070		.9	.075	.04	.065
Reach-1	19810		.9	.075	.04	.065
Reach-1	19720		.075	.043	.1	
Reach-1	19425		.075	.043	.1	
Reach-1	19280		.075	.043	.1	
Reach-1	19071		.075	.043	.1	
Reach-1	18916		.075	.043	.1	
Reach-1	18682		.075	.043	.1	
Reach-1	18447		.075	.043	.1	
Reach-1	18280		.075	.043	.1	
Reach-1	17884		.075	.043	.1	
Reach-1	17467		.075	.043	.1	
Reach-1	17160		.075	.043	.1	
Reach-1	16750		.075	.043	.1	
Reach-1	16657		.075	.043	.1	
Reach-1	16630.5	Bridge				
Reach-1	16605		.075	.043	.1	
Reach-1	16186		.07	.043	.07	

RampOverPre.rep

Reach-1	15696	.07	.043	.07		
Reach-1	15215	.07	.043	.07		
Reach-1	14725	.07	.043	.07		
Reach-1	14320	.07	.043	.07		
Reach-1	13805	.07	.043	.07		
Reach-1	13392	.07	.043	.07		
Reach-1	12845	.07	.043	.07		
Reach-1	12300	.07	.043	.07		
Reach-1	11812	.07	.043	.07		
Reach-1	11324	.07	.043	.07		
Reach-1	11022	.07	.043	.07		
Reach-1	10930	.07	.043	.07		
Reach-1	10827	.07	.043	.07		
Reach-1	10753	.07	.043	.07		
Reach-1	10708	.07	.043	.07		
Reach-1	10657	.07	.043	.07		
Reach-1	10612	.07	.043	.07		
Reach-1	10562	.07	.043	.07		
Reach-1	10550	.07	.02	.07		
Reach-1	10541	.07	.03	.07		
Reach-1	10540					
		Inl Struct				
Reach-1	10530	.07	.03	.07		
Reach-1	10488	.05	.028	.05		
Reach-1	10385	.07	.03	.07		
Reach-1	10270	.07	.03	.07		
Reach-1	10225	.07	.035	.07		
Reach-1	10182	.07	.035	.07		
Reach-1	10127	.15	.035	.15		
Reach-1	10086	.2	.04	.03	.06	.2
Reach-1	10053.5					
		Bridge				
Reach-1	10022	.15	.03	.15		

		Ramp	River	Pre. rep	
Reach-1	9580	.065	.033	.07	
Reach-1	8750	.065	.05	.065	
Reach-1	7955	.2	.045	.5	
Reach-1	7600	.2	.045	.5	
Reach-1	7490	.2	.045	.5	
Reach-1	7471	Bri dge			
Reach-1	7452	.2	.045	.5	
Reach-1	6800	.2	.045	.5	
Reach-1	6055	.2	.045	.15	
Reach-1	5685	.5	.045	.15	
Reach-1	4785	.5	.045	.15	
Reach-1	4375	.5	.045	.15	
Reach-1	3780	.5	.045	.15	
Reach-1	3215	.5	.045	.15	
Reach-1	2525	.5	.045	.15	
Reach-1	1515	.15	.045	.15	
Reach-1	1085	.15	.045	.15	
Reach-1	1080	.15	.025	.15	
Reach-1	1075	.15	.04	.15	
Reach-1	770	.07	.04	.06	
Reach-1	0	.065	.033	.065	
Reach-1	-790	.065	.027	.065	
Reach-1	-800	.065	.027	.065	
Reach-1	-809	.065	.027	.065	
Reach-1	-850	Bri dge			
Reach-1	-891	.065	.027	.065	
Reach-1	-900	.065	.027	.065	

SUMMARY OF REACH LENGTHS

Ri ver: Ramapo Ri ver

Reach	River Sta.	Ramp Left	River Channel	Pre. rep Right
Reach-1	34312	1445.07	1445.07	1445.07
Reach-1	32867	117	117	117
Reach-1	32750	40	40	40
Reach-1	32710	40	40	40
Reach-1	32690	Bridge		
Reach-1	32670	559.92	570	600
Reach-1	32100	450	460	570
Reach-1	31640	50.04	420.03	414.99
Reach-1	31220	540	464	520
Reach-1	30756	675	456	350
Reach-1	30300	689.92	678.02	570.08
Reach-1	29622	1055.01	1141.95	1109.98
Reach-1	28480	480	488	490
Reach-1	27992	55	55	55
Reach-1	27964.5	Bridge		
Reach-1	27937	310.03	317.03	319.97
Reach-1	27620	339.99	347.97	350
Reach-1	27272	225	225	225
Reach-1	27047	170	235	300
Reach-1	26812	25	50	55
Reach-1	26762	40	41	45
Reach-1	26721	130	89	50
Reach-1	26632	90	99	120
Reach-1	26533	400	376	340
Reach-1	26157	279.96	267	240
Reach-1	25890	350	233	180
Reach-1	25657	270	237	15
Reach-1	25420	180	255	6.96
Reach-1	25165	15	20	7
Reach-1	25145	10	15	7
Reach-1	25130	10	43	90
Reach-1	25087	150	137.01	120
Reach-1	24950	179.01	128.01	240
Reach-1	24822	1	87	650
Reach-1	24735	1	45	50
Reach-1	24690	1	213	525
Reach-1	24477	10	72	72
Reach-1	24405	55	55	55
Reach-1	24350	129.99	140.01	170.01
Reach-1	24210	130	178	315
Reach-1	24032	140	172	175
Reach-1	23860	135	144.99	140.01
Reach-1	23715	159.99	114.99	155.01
Reach-1	23600	370	160	145
Reach-1	23440	.99	140.01	159.99
Reach-1	23300	180	180	180
Reach-1	23120	30	30	30
Reach-1	23090	63	63	63
Reach-1	23027	22	22	22
Reach-1	23005	15	15	15
Reach-1	22990	35	60	80
Reach-1	22930	150	110.01	189.99
Reach-1	22820	240	245	150
Reach-1	22575	210	210	160
Reach-1	22365	230	192	20
Reach-1	22173	115	63	40
Reach-1	22110	33	33	33
Reach-1	22093.5	Bridge		
Reach-1	22077	105	120	80.01
Reach-1	21957	159.99	132	50.01
Reach-1	21825	250	225	90

		Ramp	Over	Pre. rep
Reach-1	21600	260	183	70
Reach-1	21417	110. 1	264. 9	200. 1
Reach-1	21152	50	222	270
Reach-1	20930	180	230	280
Reach-1	20700	290	205	150
Reach-1	20495	148. 05	147	157. 95
Reach-1	20348	16	16	16
Reach-1	20332	2	2	2
Reach-1	20330	260. 1	260. 1	260. 1
Reach-1	20070	159. 9	260. 1	245. 1
Reach-1	19810	180	90	385
Reach-1	19720	435	294. 9	159. 9
Reach-1	19425	130. 05	145. 05	205. 05
Reach-1	19280	475	209	180
Reach-1	19071	150. 08	155. 04	304. 96
Reach-1	18916	245	234	170
Reach-1	18682	260	235	285
Reach-1	18447	150	167	310
Reach-1	18280	435. 2	396	430
Reach-1	17884	419. 85	417. 15	419. 85
Reach-1	17467	299. 95	306. 95	540. 05
Reach-1	17160	409. 95	409. 95	409. 95
Reach-1	16750	93	93	93
Reach-1	16657	52	52	52
Reach-1	16630. 5			
		Bridge		
Reach-1	16605	440. 1	418. 95	450
Reach-1	16186	505	490	510
Reach-1	15696	505	481	875
Reach-1	15215	490	490	490
Reach-1	14725	405	405	405
Reach-1	14320	310. 2	514. 8	745. 25
Reach-1	13805	414. 9	413. 1	414. 9
Reach-1	13392	550	547. 25	550
Reach-1	12845	595. 1	545. 05	499. 95
Reach-1	12300	475	488	500
Reach-1	11812	655	488	375
Reach-1	11324	374. 85	302. 05	260. 05
Reach-1	11022	130	92	55
Reach-1	10930	135	102. 96	65. 04
Reach-1	10827	104. 96	74	44. 96
Reach-1	10753	60	45	30
Reach-1	10708	46. 98	51	49. 98
Reach-1	10657	52	45	45
Reach-1	10612	70	50	70
Reach-1	10562	12	12	12
Reach-1	10550	9	9	9
Reach-1	10541	11	11	11
Reach-1	10540			
		Inl Struct		
Reach-1	10530	42	42	42
Reach-1	10488	102. 96	102. 96	102. 96
Reach-1	10385	120	114. 96	110. 04
Reach-1	10270	45	45	45
Reach-1	10225	50	43	40
Reach-1	10182	40. 02	55. 02	64. 98
Reach-1	10127	41	41	41
Reach-1	10086	64	64	64
Reach-1	10053. 5			
		Bridge		
Reach-1	10022	19. 98	441. 99	700. 02
Reach-1	9580	770. 1	829. 94	819. 91
Reach-1	8750	830. 08	795. 04	680
Reach-1	7955	390	355. 04	330
Reach-1	7600	110. 01	110. 01	110. 01
Reach-1	7490	38	38	38

		Ramp	River	Pre. rep	
Reach-1	7471				
Reach-1	7452	Bri dge			
Reach-1	6800	650.02	651.98	479.92	
Reach-1	6055	690	744.9	799.95	
Reach-1	5685	380	370	360	
Reach-1	4785	1585.08	900	730.08	
Reach-1	4375	270	410.04	950.04	
Reach-1	3780	300	595.08	800.04	
Reach-1	3215	320.04	565.08	500.04	
Reach-1	2525	930.02	689.92	210	
Reach-1	1515	1185.03	1010.1	460.11	
Reach-1	1085	655.02	430.02	15.03	
Reach-1	1080	5	5	5	
Reach-1	1075	5	5	5	
Reach-1	770	160.02	304.99	24.99	
Reach-1	0	415.04	769.92	289.92	
Reach-1	-790	790.08	790.08	790.08	
Reach-1	-800	10	10	10	
Reach-1	-809	20	9	1	
Reach-1	-850	40	82	60	
Reach-1	-891	Bri dge			
Reach-1	-900	10	10	10	
Reach-1		0	0	0	

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
 River: Ramapo River

Reach	River Sta.	Contr.	Expan.
Reach-1	34312	.3	.5
Reach-1	32867	.3	.5
Reach-1	32750	.3	.5
Reach-1	32710	.3	.5
Reach-1	32690	Bri dge	
Reach-1	32670	.3	.5
Reach-1	32100	.1	.3
Reach-1	31640	.1	.3
Reach-1	31220	.1	.3
Reach-1	30756	.1	.3
Reach-1	30300	.1	.3
Reach-1	29622	.1	.3
Reach-1	28480	.3	.5
Reach-1	27992	.3	.5
Reach-1	27964.5	Bri dge	
Reach-1	27937	.3	.5
Reach-1	27620	.1	.3
Reach-1	27272	.1	.3
Reach-1	27047	.1	.3
Reach-1	26812	.1	.3
Reach-1	26762	.4	.6
Reach-1	26721	.4	.6
Reach-1	26632	.4	.6
Reach-1	26533	.1	.3
Reach-1	26157	.1	.3
Reach-1	25890	.1	.3
Reach-1	25657	.1	.3
Reach-1	25420	.1	.3
Reach-1	25165	.3	.5
Reach-1	25145	.7	.9
Reach-1	25130	.7	.9

		Ramp	Order	Pre. rep
Reach-1	25087	.3		.5
Reach-1	24950	.3		.5
Reach-1	24822	.3		.5
Reach-1	24735	.3		.5
Reach-1	24690	.3		.5
Reach-1	24477	.1		.3
Reach-1	24405	.1		.3
Reach-1	24350	.1		.3
Reach-1	24210	.1		.3
Reach-1	24032	.1		.3
Reach-1	23860	.1		.3
Reach-1	23715	.1		.3
Reach-1	23600	.1		.3
Reach-1	23440	.3		.5
Reach-1	23300	.6		.8
Reach-1	23120	.6		.8
Reach-1	23090	.6		.8
Reach-1	23027	.6		.8
Reach-1	23005	.05		.2
Reach-1	22990	.05		.2
Reach-1	22930	.05		.2
Reach-1	22820	.05		.2
Reach-1	22575	.05		.2
Reach-1	22365	.05		.2
Reach-1	22173	.05		.2
Reach-1	22110	.5		.7
Reach-1	22093	.5	Bridge	
Reach-1	22077	.5		.7
Reach-1	21957	.1		.3
Reach-1	21825	.1		.3
Reach-1	21600	.1		.3
Reach-1	21417	.3		.5
Reach-1	21152	.3		.5
Reach-1	20930	.1		.3
Reach-1	20700	.1		.3
Reach-1	20495	.1		.3
Reach-1	20348	.3		.5
Reach-1	20332	.3		.5
Reach-1	20330	.3		.5
Reach-1	20070	.3		.5
Reach-1	19810	.3		.5
Reach-1	19720	.3		.5
Reach-1	19425	.3		.5
Reach-1	19280	.3		.5
Reach-1	19071	.1		.3
Reach-1	18916	.1		.3
Reach-1	18682	.1		.3
Reach-1	18447	.1		.3
Reach-1	18280	.1		.3
Reach-1	17884	.1		.3
Reach-1	17467	.1		.3
Reach-1	17160	.4		.6
Reach-1	16750	.4		.6
Reach-1	16657	.4		.6
Reach-1	16630	.5	Bridge	
Reach-1	16605	.4		.6
Reach-1	16186	.1		.3
Reach-1	15696	.1		.3
Reach-1	15215	.1		.3
Reach-1	14725	.1		.3
Reach-1	14320	.3		.5
Reach-1	13805	.3		.5
Reach-1	13392	.3		.5

		Ramp	Order	Pre. rep
Reach-1	12845	.3		.5
Reach-1	12300	.3		.5
Reach-1	11812	.3		.5
Reach-1	11324	.3		.5
Reach-1	11022	.1		.3
Reach-1	10930	.1		.3
Reach-1	10827	.1		.3
Reach-1	10753	.1		.3
Reach-1	10708	.1		.3
Reach-1	10657	.1		.3
Reach-1	10612	.1		.3
Reach-1	10562	.1		.3
Reach-1	10550	.1		.3
Reach-1	10541	.1		.3
Reach-1	10540		Inl Struct	
Reach-1	10530	.05		.2
Reach-1	10488	.1		.3
Reach-1	10385	.1		.3
Reach-1	10270	.1		.3
Reach-1	10225	.1		.3
Reach-1	10182	.1		.3
Reach-1	10127	.1		.3
Reach-1	10086	.6		.8
Reach-1	10053.5		Bri dge	
Reach-1	10022	.6		.8
Reach-1	9580	.1		.3
Reach-1	8750	.1		.3
Reach-1	7955	.1		.3
Reach-1	7600	.5		.7
Reach-1	7490	.5		.7
Reach-1	7471		Bri dge	
Reach-1	7452	.5		.7
Reach-1	6800	.2		.4
Reach-1	6055	.2		.4
Reach-1	5685	.2		.4
Reach-1	4785	.2		.4
Reach-1	4375	.2		.4
Reach-1	3780	.2		.4
Reach-1	3215	.2		.4
Reach-1	2525	.2		.4
Reach-1	1515	.2		.4
Reach-1	1085	.4		.6
Reach-1	1080	.4		.6
Reach-1	1075	.4		.6
Reach-1	770	.1		.3
Reach-1	0	.1		.3
Reach-1	-790	.1		.3
Reach-1	-800	.1		.3
Reach-1	-809	.3		.5
Reach-1	-850		Bri dge	
Reach-1	-891	.3		.5
Reach-1	-900	.3		.5

RamapoRiverPost.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X      X  XXXXXX      XXXX      XXXX      XX      XXXX
X      X  X          X      X      X  X      X
X      X  X          X          X  X      X
XXXXXXXX XXXX      X      XXX XXXX      XXXXXX      XXXX
X      X  X          X          X  X      X
X      X  X          X      X      X  X      X
X      X  XXXXXX      XXXX      X  X      X      XXXXX

```

PROJECT DATA

Project Title: Ramapo River Improved
Project File : RamapoRiverPost.prj
Run Date and Time: 4/4/2012 11:17:03 AM

Project in English units

Project Description:
RAMAPO RIVER GDM @ OAKLAND, NJ
IMPROVED CONDITION; IMPROVED CHANNEL THROUGH
POTASH LAKE
FILE = "RAMIM1", YEAR 2040, 1 YEAR FLOW

PLAN DATA

Plan Title: Imported Geometry Modified
Plan File : g:\New Jersey Prompton Lake Dam\Pre HEC-2 Conversion\RamapoRiverPost.p05

Geometry Title: Imported Geometry Post Conditions Mod
Geometry File : g:\New Jersey Prompton Lake Dam\Pre HEC-2
Conversion\RamapoRiverPost.g04

Flow Title : USACE Improved
Flow File : g:\New Jersey Prompton Lake Dam\Pre HEC-2
Conversion\RamapoRiverPost.f02

Plan Summary Information:

Number of:	Cross Sections = 214	Multiple Openings = 0
	Culverts = 0	Inline Structures = 3
	Bridges = 8	Lateral Structures = 0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options

Critical depth computed only where necessary

RamapoRiverPost.rep

Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: USACE Improved
 Flow File : g:\New Jersey Prompton Lake Dam\Pre HEC-2 Conversion\RamapoRiverPost.f02

Flow Data (cfs)

River	Reach	RS	1-YR	10-YR
DESIGN FLOW	100-YR	500-YR	SPF	40-YR
Ramapo River	Reach-1	34312	3400	9200
15200	20600	35400	38500	
Ramapo River	Reach-1	34145	3400	9200
15200	20600	35400	38500	
Ramapo River	Reach-1	28313	3500	9400
15400	20800	35600	39000	
Ramapo River	Reach-1	20494	3700	9700
15700	21200	36100	40100	
Ramapo River	Reach-1	15696	3700	9700
15700	21200	36100	40100	
Ramapo River	Reach-1	4785	4600	14800
26300	36400	61700	70000	

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Ramapo River	Reach-1	1-YR	Critical
Critical			
Ramapo River	Reach-1	10-YR	Critical
Critical			
Ramapo River	Reach-1	40-YR DESIGN FLOW	Critical
Critical			
Ramapo River	Reach-1	100-YR	Critical
Critical			
Ramapo River	Reach-1	500-YR	Critical
Critical			
Ramapo River	Reach-1	SPF	Critical
Critical			

GEOMETRY DATA

Geometry Title: Imported Geometry Post Conditions Mod
 Geometry File : g:\New Jersey Prompton Lake Dam\Pre HEC-2
 Conversion\RamapoRiverPost.g04

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
 REACH: Reach-1 RS: 34312

INPUT
 Description: 34312

Station		Elevation Data		num=	7					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
1000	250	1079	220	1134	217	1168	214.5	1202	214.5	
1234	217	1450	250							

Manning's n Values		num=	3	
Sta	n Val	Sta	n Val	Sta
1000	.055	1134	.035	1234
				1234

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1134	1234		199.36	199.36		.3	.5
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 34145

INPUT
 Description: 34145

Station		Elevation Data		num=	7					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
1000	250	1079	220	1134	217	1168	214.5	1202	214.5	
1234	217	1450	250							

Manning's n Values		num=	3	
Sta	n Val	Sta	n Val	Sta
1000	.055	1134	.035	1234
				1234

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1134	1234		2691.35	2691.35		.3	.5
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32867

INPUT
 Description: 32867

Station		Elevation Data		num=	8					
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
1000	250	1060	216.1	1085	212.5	1120	212.5	1148	216.1	
1228	220	1578	226	1592.7	240.34					

Manning's n Values		num=	3	
Sta	n Val	Sta	n Val	Sta
1000	.055	1060	.035	1148
				1148

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1060	1148		117	117		.3	.5
Sediment Elevation =	0							

Ramapo River Post. rep

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32750

INPUT
 Description: 32750
 This is a REPEATED section.

Station		Elevation		Data		num= 54		Station		Elevation	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1		
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2		
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1		
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213		
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5		
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5		
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5		
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2		
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226		
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4		
5201.3	226.6	5225.8	226.6	5258.5	227.2	5289.9	239.57				

Manning's n Values		num= 3	
Station	n Val	Station	n Val
4712	.055	4913.6	.035
		5092.8	.055

Bank Sta: Left 4913.6 Right 5092.8 Lengths: Left Channel 40 Right 40 Coeff Contr. .3 Expan. .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32710

INPUT
 Description: 32710
 LENAPE LANE BRIDGE

Station		Elevation		Data		num= 54		Station		Elevation	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1		
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2		
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1		
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213		
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5		
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5		
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5		
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2		
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226		
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4		
5201.3	226.6	5225.8	226.6	5258.5	227.2	5286.53	238.09				

Manning's n Values		num= 3	
Station	n Val	Station	n Val
4712	.055	4913.6	.035
		5092.8	.055

Bank Sta: Left 4913.6 Right 5092.8 Lengths: Left Channel 40 Right 40 Coeff Contr. .3 Expan. .5

Ramapo River Post. rep

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4712 4913.6 243 F
 5092.8 5286.53 227.1 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32700

INPUT

Description: 32700
 Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	250	1060	216.1	1085	212.5	1120	212.5	1148	216.1
1228	220	1578	226	1594.39	241.11				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1060	.035	1148	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1060 1148 157 117 157 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32670

INPUT

Description: 32670
 Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723	242	4736.9	241.1	4737.1	241.1	4750.4	240.1		
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2		
4874.7	229	4891.4	228	4913.6	227.4	4916.5	215.9	4920.4	214.4		
4933.9	213.2	4952	213.2	4966.2	212.3	4980.1	212.8	5000.8	213.5		
5019.7	213.2	5036	212.8	5055.9	213	5079.6	213.9	5084.4	215.6		
5092.7	223.8	5096.4	227.1	5107.1	227.1	5138.9	227.1	5167.2	226.2		
5175.7	226.7	5195.8	227.2	5217.4	227.2	5233.7	227.1	5249	227.3		
5275.1	228.3	5298.2	228.3	5315.2	230	5341.1	232	5383.2	235.7		
5399.5	236.8	5418.9	238.5	5439.6	240.2	5463.1	241.1	5499	243.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4712	.055	4913.6	.035	5096.4	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913.6 5096.4 93.32 95 100 .3 .5

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 4712 4916.4 241 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 32583

Ramapo River Post. rep

INPUT

Description: 32583

Station Elevation Data

num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4
5201.3	226.6	5225.8	226.6	5258.5	227.2	5357.44	239.7	5371.84	242.32

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4712	.055	4913.6	.035	5092.8	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913.6 5092.8 86.68 87.52 90 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 32543

INPUT

Description: 32543

Station Elevation Data

num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4
5201.3	226.6	5225.8	226.6	5258.5	227.2	5296.07	240.64		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4712	.055	4913.6	.035	5092.8	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913.6 5092.8 86.66 87.5 90 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4712	4913.6	243	F
5092.8	5296.07	227.1	F

Sediment Elevation = 0

BRI DGE

RIVER: Ramapo River

REACH: Reach-1

RS: 32523

INPUT

Description: LENAPE LANE BRIDGE
 Distance from Upstream XS = 11
 Deck/Roadway Width = 18
 Weir Coefficient = 2.7

Upstream Deck/Roadway Coordinates
 num= 37

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4712	243.2	243.2	4723	242	242	4736.9	241.1	241.1
4737	241.1	241.1	4750.4	240.1	240.1	4772.5	238	238
4791.1	236.6	236.6	4815.6	232.9	232.9	4836.7	231.9	231.9
4854	230.2	230.2	4874.7	229	228.5	4891.4	228	227.9
4903.9	227.6	226	4910	227.5	226	4913.6	227.4	227.1
4913.7	227.4	225.1	4925	230	216	4925	230	224
4962	230.1	224	4962.1	230.1	0	4965	230.2	0
4965	230.2	224	5002	230.5	224.5	5002	230.5	0
5005	230.5	0	5005.1	230.5	224.5	5042	230.4	224.2
5042.1	230.4	0	5045	230.3	0	5045.1	230.3	224.2
5082	230.1	224	5082.1	230.1	219.5	5092.7	227.1	223.8
5093	227.1	227.1	5096.4	227.1	226	5107.1	227.1	226.4
5138.9	227.1	226.2						

Upstream Bridge Cross Section Data

Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4712	243.2	4723.3	242	4736.9	241.1	4737.1	241.1	4750.4	240.1
4772.5	238	4791.1	236.6	4815.6	232.9	4836.7	231.9	4854	230.2
4874.7	228.5	4891.4	227.9	4903.9	226	4909.6	226	4913.6	227.1
4913.7	225.1	4925	216	4925.1	216	4929.6	214.4	4940	213
4954.8	212.5	4962	212.3	4962.1	212.3	4965	212.5	4965.1	212.5
4971.4	213.1	4991.4	212.8	5002	212.5	5002.1	212.5	5005	212.5
5005.1	212.5	5012.7	212.9	5030.8	213.7	5042	213.2	5042.1	213.5
5045	213.1	5045.1	213.1	5047.2	213.5	5060.2	213.5	5070.4	214.2
5082	219.5	5082.1	219.5	5092.7	223.8	5092.8	227.1	5096.4	226
5107.1	226.4	5138.9	226.2	5157.2	225.9	5176.6	224.9	5184.7	226.4
5201.3	226.6	5225.8	226.6	5258.5	227.2	5296.07	240.64		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4712	.055	4913.6	.035	5092.8	.055

Bank Sta: Left Right Coeff Contr. Expan.

4913.6	5092.8	.3	.5
--------	--------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4712	4913.6	243	F
5092.8	5296.07	227.1	F

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates

num= 27

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4882.6	228.4	228.4	4891.4	228	227.9	4903.9	227.6	226
4910	227.5	226	4913.6	227.4	227.1	4913.7	227.4	225.1
4925	230		4925	230	224	4962	230.1	224
4962.1	230.1	0	4965	230.2	0	4965	230.2	224
5002	230.5	224.5	5002	230.5	0	5005	230.5	0
5005.1	230.5	224.5	5042	230.4	224.2	5042.1	230.4	0
5045	230.3	0	5045.1	230.3	224.2	5082	230.1	224
5082.1	230.1		5092.7	227.1	223.8	5093	227.1	227.1
5096.4	227.1	226	5107.1	227.1	226.4	5138.9	227.1	226.2

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Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	48	Sta	Elev	Sta	Elev	Sta	Elev
4654.3	243	4676.6	242.3	4692.4	241	4706.2	241.2	4721.8	241.1	
4744.3	239.1	4760.9	239	4781.9	236.8	4800.4	233.6	4809.4	232.5	
4829.2	230.5	4882.6	228.4	4906.2	227.2	4907.4	227.2	4916.4	226.9	
4916.5	215.9	4920.4	214.4	4933.9	213.2	4952	213.2	4966.2	212.3	
4980.1	212.8	5000.8	213.5	5019.7	213.2	5036	212.8	5055.9	213	
5079.6	213.9	5084.4	215.6	5084.5	227.3	5093.9	226	5108.7	226.6	
5125.9	226.5	5140.5	226.8	5167.2	226.2	5175.7	226.7	5195.8	227.2	
5217.4	227.2	5233.7	227.1	5249	227.3	5275.1	228.3	5298.2	228.3	
5315.2	230	5341.1	232	5383.2	235.7	5399.5	236.8	5418.9	238.5	
5439.6	240.2	5463.1	241.1	5499	243.1					

Manning's n	Values	num=	3
Station	Value	Station	Value
4654.3	.055	4916.4	.035
		5084.5	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	4916.4	5084.5		.3	.5

Ineffective Flow	num=	2
Station L	Station R	Elevation
4654.3	4916.4	241
5084.5	5499	227.3

Sediment Elevation = 0

Upstream Embankment side slope = 0 hori z. to 1.0 vertical
 Downstream Embankment side slope = 0 hori z. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 227.4
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data	Upstream=	4963.5	Downstream=	4963.5
Pier Station	num=	2		
Upstream	num=	2		
Width	Elev	Width	Elev	
3	210	3	230	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	210	3	230	

Pier Data	Upstream=	5003.5	Downstream=	5003.5
Pier Station	num=	2		
Upstream	num=	2		
Width	Elev	Width	Elev	
3	210	3	230	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	210	3	230	

Pier Data	Upstream=	5043.5	Downstream=	5043.5
Pier Station	num=	2		
Upstream	num=	2		
Width	Elev	Width	Elev	
3	210	3	230	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	210	3	230	

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Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Yarnell KVal = 1.25

Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =

Submerged Inlet + Outlet Cd = .766965

Max Low Cord = 224.5

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 32503

INPUT

Description: 32503

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4654.3	243	4676.6	242.3	4692.4	241	4706.2	241.2	4721.8	241.1		
4744.3	239.1	4760.9	239	4781.9	236.8	4800.4	233.6	4809.4	232.5		
4829.2	230.5	4882.6	228.4	4906.2	227.2	4907.4	227.2	4916.4	226.9		
4916.5	215.9	4920.4	214.4	4933.9	213.2	4952	213.2	4966.2	212.3		
4980.1	212.8	5000.8	213.5	5019.7	213.2	5036	212.8	5055.9	213		
5079.6	213.9	5084.4	215.6	5084.5	227.3	5093.9	226	5108.7	226.6		
5125.9	226.5	5140.5	226.8	5167.2	226.2	5175.7	226.7	5195.8	227.2		
5217.4	227.2	5233.7	227.1	5249	227.3	5275.1	228.3	5298.2	228.3		
5315.2	230	5341.1	232	5383.2	235.7	5399.5	236.8	5418.9	238.5		
5439.6	240.2	5463.1	241.1	5499	243.1						

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4654.3	.055	4916.4	.035	5084.5	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4916.4 5084.5 933.28 950 1000.16 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4654.3 4916.4 241 F
 5084.5 5499 227.3 F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 32100

INPUT

Description: 32100

Station Elevation Data num= 99

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Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3359.9	243.2	3412.3	238.7	3441.9	233.8	3531.2	229.4	3658.2	230.5
3717.5	229.2	3804.6	217.5	3814.6	216.5	3824.6	215.4	3834.6	214.5
3844.6	213.3	3854.6	212	3864.6	211.1	3874.6	210.9	3884.6	210.8
3894.6	210.7	3904.6	210.8	3914.6	211.1	3924.6	211.2	3934.6	211
3944.6	209.6	3954.6	208.1	3964.6	207.5	3974.6	207.2	3984.6	207.3
3994.6	207.5	4004.6	208	4014.6	208.3	4024.6	208.1	4034.6	208.1
4044.6	208.1	4054.6	208.1	4064.6	208.4	4074.6	208.5	4084.6	208.6
4094.6	208.7	4114.6	208.8	4124.6	208.5	4134.6	208.6	4154.6	208.5
4194.6	208.5	4204.6	208.5	4214.6	208.5	4224.6	208.3	4234.6	208.1
4244.6	208	4254.6	208	4264.6	208.1	4274.6	208.9	4284.6	209.7
4294.6	210	4304.6	210.8	4314.6	211.1	4324.6	211.7	4334.6	212
4344.6	212.5	4354.6	213	4364.6	213.2	4374.6	213.8	4384.6	214
4394.6	214.5	4404.6	214.8	4414.6	215.1	4424.6	215.5	4436.6	217.2
4447	219.1	4452	220.9	4457	221.2	4457.9	222.2	4458	222.8
4466.8	224	4496.2	229.5	4552.1	237.4	4623.6	235.5	4699.7	225.3
4776.5	225.6	4818.9	223	4854.6	220.8	4872.6	220.1	4892.7	220.2
4910	219.7	4931	218.4	4936	214	4964	211.4	4977	211.1
5002	211	5026	210.9	5039	211.2	5059	213.2	5067	214.8
5076.5	218.3	5086	219.2	5105	219	5107	219.3	5139.3	216.2
5179	217.5	5207	229	5240.4	240	5248	243		

Manning's n	Values	num=	5	Sta	n Val	Sta	n Val	Sta	n Val
3359.9	.08	3804.6	.04	4452	.055	4776.5	.035	5179	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4776.5	5179		180	184		.1	.3
Ineffective Flow			num=	2				
Sta L	Sta R	El ev	Permanent					
3359.9	4550.51	237.8	F					
5179	5248	217.5	F					

Sediment El evation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 31933

INPUT

Description: 31933

Station	El evation	Data	num=	99	Sta	El ev	Sta	El ev	Sta	El ev
3359.9	243.2	3412.3	238.7	3441.9	233.8	3531.2	229.4	3658.2	230.5	
3717.5	229.2	3804.6	217.5	3814.6	216.5	3824.6	215.4	3834.6	214.5	
3844.6	213.3	3854.6	212	3864.6	211.1	3874.6	210.9	3884.6	210.8	
3894.6	210.7	3904.6	210.8	3914.6	211.1	3924.6	211.2	3934.6	211	
3944.6	209.6	3954.6	208.1	3964.6	207.5	3974.6	207.2	3984.6	207.3	
3994.6	207.5	4004.6	208	4014.6	208.3	4024.6	208.1	4034.6	208.1	
4044.6	208.1	4054.6	208.1	4064.6	208.4	4074.6	208.5	4084.6	208.6	
4094.6	208.7	4114.6	208.8	4124.6	208.5	4134.6	208.6	4154.6	208.5	
4194.6	208.5	4204.6	208.5	4214.6	208.5	4224.6	208.3	4234.6	208.1	
4244.6	208	4254.6	208	4264.6	208.1	4274.6	208.9	4284.6	209.7	
4294.6	210	4304.6	210.8	4314.6	211.1	4324.6	211.7	4334.6	212	
4344.6	212.5	4354.6	213	4364.6	213.2	4374.6	213.8	4384.6	214	
4394.6	214.5	4404.6	214.8	4414.6	215.1	4424.6	215.5	4436.6	217.2	
4447	219.1	4452	220.9	4457	221.2	4457.9	222.2	4458	222.8	
4466.8	224	4496.2	229.5	4552.1	237.4	4623.6	235.5	4699.7	225.3	
4776.5	225.6	4818.9	223	4854.6	220.8	4872.6	220.1	4892.7	220.2	
4910	219.7	4931	218.4	4936	214	4964	211.4	4977	211.1	
5002	211	5026	210.9	5039	211.2	5059	213.2	5067	214.8	
5076.5	218.3	5086	219.2	5105	219	5107	219.3	5139.3	216.2	

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5179	217.5	5207	229	5240.4	240	5248	243		
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Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3359.9	.08	3804.6	.04	4452	.055	4776.5	.035	5179	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4776.5	5179	720	736.2	912	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3359.9	4552.85	237.87	F
5179	5248	217.5	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 31640

INPUT
 Description: 31640

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3185.4	243	3281	236	3307.5	235.4	3345.4	232.4	3387.9	232.4
3454.6	233.2	3522.5	231.5	3575.8	231.9	3761.6	230.9	3783	229.7
3796.4	224.1	3833.6	222.6	3844	231.2	3865.2	231.2	3871.3	224.5
3893.6	228.8	3919.1	229.5	3964	228.2	4047.2	224	4677.2	224.2
4704.8	223.9	4721.1	225	4781.2	225.3	4809.7	224	4827.4	223.2
4839.2	221.7	4854.2	221.8	4866.8	221.6	4881.2	221	4895.3	220.8
4919	220.2	4937.8	218.3	4942.8	215.8	4947.3	213.2	4955.8	212
4964.3	211	4974.3	210.1	4984.8	210.2	4994.8	210.3	5003.3	210.3
5012.8	209.9	5019.3	209.9	5026.3	209.9	5034.3	210.3	5042.8	210.8
5052.7	212.3	5052.8	213.2	5058.9	213.5	5124.2	243		

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3185.4	.08	3761.6	.04	3844	.055	3865.2	.035	3893.6	.08
4047.2	.03	4677.2	.07	4964.3	.045	5058.9	.08		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

5003.3	5052.7	22.24	186.64	184.47	.1	.3
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
3185.4	3862.96	231.36	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 31473

INPUT
 Description: 31473

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3185.4	243	3281	236	3307.5	235.4	3345.4	232.4	3387.9	232.4
3454.6	233.2	3522.5	231.5	3575.8	231.9	3761.6	230.9	3783	229.7
3796.4	224.1	3833.6	222.6	3844	231.2	3865.2	231.2	3871.3	224.5
3893.6	228.8	3919.1	229.5	3964	228.2	4047.2	222	4073.9	220.5
4096.3	218.1	4146.3	209.9	4166.3	208	4186.3	208.1	4206.3	210

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4236.3	212.2	4266.3	213.9	4286.3	216	4311.7	223.3	4316.8	223.3
4318.5	222	4330.9	220.3	4336.3	219.1	4346.3	219	4356.3	218.3
4366.3	218	4376.3	217.5	4386.3	217.2	4396.3	215.5	4406.3	215.4
4416.3	215.4	4426.3	215.3	4431.3	215.3	4436.3	213.8	4446.3	211.5
4456.3	210.5	4466.3	210	4476.3	210	4486.3	210.1	4496.3	210.2
4506.3	210.3	4516.3	210.6	4526.3	210.8	4536.3	210.9	4546.3	211
4556.3	211.2	4566.3	211.5	4576.3	211.7	4586.3	212	4596.3	212
4606.3	212	4616.3	212.9	4626.3	215.8	4636.3	217.2	4646.3	218.4
4651.4	219.6	4655.3	220.6	4657.6	222.1	4660.6	224	4677.2	224.2
4704.8	223.9	4721.1	225	4781.2	225.3	4809.7	224	4827.4	223.2
4839.2	221.7	4854.2	221.8	4866.8	221.6	4881.2	221	4895.3	220.8
4919	220.2	4937.8	218.3	4942.8	215.8	4947.3	213.2	4955.8	212
4964.3	211	4974.3	210.1	4984.8	210.2	4994.8	210.3	5003.3	210.3
5012.8	209.9	5019.3	209.9	5026.3	209.9	5034.3	210.3	5042.8	210.8
5048.42	211.87	5052.8	213.2	5058.9	213.5	5124.2	243		

Manning's n Values			num=	9						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
3185.4	.08	3761.6	.04	3844	.055	3865.2	.035	3893.6	.08	
4047.2	.03	4660.6	.07	4964.3	.045	5058.9	.08			

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	5003.3	5052.8		77.76	653.4	645.57		.1	.3
Ineffective Flow	num=		1						
Sta L	Sta R	Elev	Permanent						
3185.4	4782.04	225.38	F						
Sediment Elvati on = 0									

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 31220

INPUT
Description: 31220

Station Elevation Data			num=	99					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3402.2	243	3540	232.6	3574.4	231.1	3639.7	230.1	3669.5	228.7
3682.7	228.9	3739.2	230.2	3776.9	230.3	3842.6	229	3856.7	230.1
3864	221.5	3879.3	221.5	3887.3	230.7	4064.9	223.6	4075	227
4140	222.7	4193.9	219.2	4215	219	4245	216.8	4255	215.1
4275	212	4285	211.1	4305	210	4335	208.8	4355	207.3
4365	207	4375	207.3	4385	208	4395	208	4405	208
4410	207.5	4415	206.6	4425	206.2	4435	206.2	4445	206.3
4455	206.5	4465	206.5	4475	206.5	4485	206.4	4495	206
4505	205.9	4515	205.8	4525	205.7	4535	205.7	4545	205.7
4555	205.8	4565	205.9	4575	206	4585	206	4595	206.8
4605	207	4615	207	4625	208	4635	207.7	4645	208.2
4655	209.9	4665	210.8	4675	211.5	4685	212	4695	212.5
4705	213	4715	213.3	4725	213.7	4735	214	4745	214.5
4755	215	4760	215.8	4765	217.3	4768	218.1	4773.1	219.9
4777.2	221	4777.3	222	4777.4	224.5	4796	225.2	4895	224.5
4913	224	4921	216.5	4927	214.3	4933	213.3	4938	210.5
4944	210.4	4956	210.4	4969	210	4979	209.7	4991	209.3
5001	209.3	5012	209.1	5024	209	5034	209.4	5045	211.7
5057	213.3	5067	219.3	5079	221.3	5087	220.5	5095	220.3
5125	222.6	5151	224	5229.7	240	5269.3	243		

Manning's n Values			num=	5					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3402.2	.08	4140	.04	4765	.055	4913	.035	5125	.08

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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913 5125 216 185.6 208 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3402.2 4800.75 225.61 F
 5125 5269.3 222.6 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 31053

INPUT

Description: 31053

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3402.2	243	3540	232.6	3574.4	231.1	3639.7	230.1	3669.5	228.7		
3682.7	228.9	3739.2	230.2	3776.9	230.3	3842.6	229	3856.7	230.1		
3864	221.5	3879.3	221.5	3887.3	230.7	4064.9	223.6	4075	227		
4140	222.7	4193.9	219.2	4215	219	4245	216.8	4255	215.1		
4275	212	4285	211.1	4305	210	4335	208.8	4355	207.3		
4365	207	4375	207.3	4385	208	4395	208	4405	208		
4410	207.5	4415	206.6	4425	206.2	4435	206.2	4445	206.3		
4455	206.5	4465	206.5	4475	206.5	4485	206.4	4495	206		
4505	205.9	4515	205.8	4525	205.7	4535	205.7	4545	205.7		
4555	205.8	4565	205.9	4575	206	4585	206	4595	206.8		
4605	207	4615	207	4625	208	4635	207.7	4645	208.2		
4655	209.9	4665	210.8	4675	211.5	4685	212	4695	212.5		
4705	213	4715	213.3	4725	213.7	4735	214	4745	214.5		
4755	215	4760	215.8	4765	217.3	4768	218.1	4773.1	219.9		
4777.2	221	4777.3	222	4777.4	224.5	4796	225.2	4895	224.5		
4913	224	4921	216.5	4927	214.3	4933	213.3	4938	210.5		
4944	210.4	4956	210.4	4969	210	4979	209.7	4991	209.3		
5001	209.3	5012	209.1	5024	209	5034	209.4	5045	211.7		
5057	213.3	5067	219.3	5079	221.3	5087	220.5	5095	220.3		
5125	222.6	5151	224	5229.7	240	5269.3	243				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3402.2	.08	4140	.04	4765	.055	4913	.035	5125	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4913 5125 864 742.2 832.2 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3402.2 4791.39 225.54 F
 5125 5269.3 222.6 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 30756

INPUT

Description: 30756

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-----	------	-----	------	-----	------	-----	------	-----	------

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3449.5	243	3463.6	240.8	3476.6	232.3	3502.5	232.3	3522.2	241.7
3553.3	241.1	3592	240.3	3636.5	239.9	3673.9	237.8	3764.5	238.2
3807.1	240.1	3849.2	238.1	3874.2	238.1	3945.5	240.9	4034.8	237.9
4066.8	240.1	4098.7	240.1	4133.2	237	4137.8	234.6	4157.5	234.5
4174.5	233.5	4263.9	227.8	4304.3	226.2	4310.6	225.3	4321.2	222.1
4365.6	214.1	4380.6	207.1	4410.6	206	4430.6	206.1	4460.6	208
4470.6	208.2	4480.6	208	4490.6	207.1	4560.6	207.2	4580.6	209
4590.6	210.2	4600.6	212.1	4610.6	210	4620.6	209.3	4630.6	209.7
4640.6	209.1	4650.6	209.1	4660.6	209.2	4670.6	209.3	4680.6	209.5
4690.6	209.8	4700.6	210.2	4710.6	210.7	4720.6	211.8	4730.6	213
4740.6	214	4750.6	215	4760.6	216.5	4761.6	216.4	4771.6	218.1
4776.6	219.4	4781.6	220.8	4787.5	222.2	4788.7	223.7	4809.6	224.9
4875.5	227.1	4896.5	225.8	4915	225.1	4928.3	216.1	4939.3	215.6
4945.3	213.1	4956.8	212.7	4968.3	212.3	4980.3	211.8	4990.8	211.6
5000.8	211.3	5011.8	211.3	5023.8	210.9	5036.3	210.7	5047.8	211.5
5054.8	213.1	5059.8	215.5	5072.8	216.2	5078.8	218.1	5082.5	217.5
5110	217.8	5124.8	217.5	5154.6	220.1	5216.9	232.4	5262.1	235.5
5277.3	234.7	5314	238.7	5363.5	239	5397.6	238.2	5473.5	239.8
5553.3	239.6	5732.1	235.9	5793.5	235.3	5846.6	234	5878.3	234
5898.1	237.8	5902.8	234.4	5933	236.4	5983.1	243.1		

Manning's n Values	num=	5
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val		
3449.5 .07 4321.2 .04 4781.6 .055 4896.5 .035 5054.8 .07		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
4915 5054.8	270 182.4 140	.1	.3

Ineffective Flow	num=	2
Sta L Sta R Elev	Permanent	
3449.5 4874.65 227.22	F	
5054.8 5983.1 213.1	F	

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 30589

INPUT

Description: 30589

Station Elevation Data	num=	99
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
3449.5 243 3463.6 240.8 3476.6 232.3 3502.5 232.3 3522.2 241.7		
3553.3 241.1 3592 240.3 3636.5 239.9 3673.9 237.8 3764.5 238.2		
3807.1 240.1 3849.2 238.1 3874.2 238.1 3945.5 240.9 4034.8 237.9		
4066.8 240.1 4098.7 240.1 4133.2 237 4137.8 234.6 4157.5 234.5		
4174.5 233.5 4263.9 227.8 4304.3 226.2 4310.6 225.3 4321.2 222.1		
4365.6 214.1 4380.6 207.1 4410.6 206 4430.6 206.1 4460.6 208		
4470.6 208.2 4480.6 208 4490.6 207.1 4560.6 207.2 4580.6 209		
4590.6 210.2 4600.6 212.1 4610.6 210 4620.6 209.3 4630.6 209.7		
4640.6 209.1 4650.6 209.1 4660.6 209.2 4670.6 209.3 4680.6 209.5		
4690.6 209.8 4700.6 210.2 4710.6 210.7 4720.6 211.8 4730.6 213		
4740.6 214 4750.6 215 4760.6 216.5 4761.6 216.4 4771.6 218.1		
4776.6 219.4 4781.6 220.8 4787.5 222.2 4788.7 223.7 4809.6 224.9		
4875.5 227.1 4896.5 225.8 4915 225.1 4928.3 216.1 4939.3 215.6		
4945.3 213.1 4956.8 212.7 4968.3 212.3 4980.3 211.8 4990.8 211.6		
5000.8 211.3 5011.8 211.3 5023.8 210.9 5036.3 210.7 5047.8 211.5		
5054.8 213.1 5059.8 215.5 5072.8 216.2 5078.8 218.1 5082.5 217.5		
5110 217.8 5124.8 217.5 5154.6 220.1 5216.9 232.4 5262.1 235.5		
5277.3 234.7 5314 238.7 5363.5 239 5397.6 238.2 5473.5 239.8		
5553.3 239.6 5732.1 235.9 5793.5 235.3 5846.6 234 5878.3 234		
5898.1 237.8 5902.8 234.4 5933 236.4 5983.1 243.1		

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Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val
 3449.5 .07 4321.2 .04 4781.6 .055 4896.5 .035 5054.8 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4915 5054.8 1080 729.6 559.8 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3449.5 4877.46 227.15 F
 5054.8 5983.1 213.1 F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 30300

INPUT
 Description: 30300

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4813.5	243	4833.7	242	4866.3	241.7	4902.6	240	4924.5	228.4
4931.3	214.8	4943.8	214.2	4954.8	212.3	4965.8	211.6	4976.8	210.7
4987.3	209.4	4998.8	209.5	5008.3	209.8	5019.3	210.3	5031.3	210.8
5041.3	211.4	5045.3	212.3	5046.8	213.8	5068.8	214.8	5088.8	214.9
5156.2	218.2	5195	217.6	5237.3	217.9	5270.3	216.7	5301.3	217
5317.8	217.6	5332.4	215.7	5357.7	218.9	5407.8	225.9	5427.6	226.3
5443.1	228.5	5463.7	230.3	5483.9	230.3	5487.7	230.8	5496.1	231.6
5517.5	234.3	5535.9	235.4	5569.2	237.4	5620.2	237.7	5655.9	239.2
5694.5	240	5725	239.2	5770.3	238.6	5809.6	238.8	5844.6	237.4
5880.9	236.9	5919.4	237.2	5958.1	237.3	5985.2	237.3	6010.5	237.3
6028.4	238.9	6043	243.2						

Manning's n Values num= 3
 Sta n Val Sta n Val
 4813.5 .055 4931.3 .035 5156.2 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4931.3 5156.2 197.12 193.76 162.88 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4813.5 4931.3 214.8 F
 5156.2 6043 218.2 F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 30133

INPUT
 Description: 30133

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4813.5	243	4833.7	242	4866.3	241.7	4902.6	240	4924.5	228.4
4931.3	214.8	4943.8	214.2	4954.8	212.3	4965.8	211.6	4976.8	210.7
4987.3	209.4	4998.8	209.5	5008.3	209.8	5019.3	210.3	5031.3	210.8
5041.3	211.4	5045.3	212.3	5046.8	213.8	5068.8	214.8	5088.8	214.9
5156.2	218.2	5195	217.6	5237.3	217.9	5270.3	216.7	5301.3	217

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5317.8	217.6	5332.4	215.7	5357.7	218.9	5407.8	225.9	5427.6	226.3
5443.1	228.5	5463.7	230.3	5483.9	230.3	5487.7	230.8	5496.1	231.6
5517.5	234.3	5535.9	235.4	5569.2	237.4	5620.2	237.7	5655.9	239.2
5694.5	240	5725	239.2	5770.3	238.6	5809.6	238.8	5844.6	237.4
5880.9	236.9	5919.4	237.2	5958.1	237.3	5985.2	237.3	6010.5	237.3
6028.4	238.9	6043	243.2						

Manning's n Values					
Station	Value	Station	Value	Station	Value
4813.5	.055	4931.3	.035	5156.2	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4931.3	5156.2		1182.52	1162.31		.1	.3
Ineffective Flow			num=					
	4813.5	4931.3	2	Permanent				
	5156.2	6043	F	F				

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 29622

INPUT
Description: 29622

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4861.7	243.2	4873.4	239	4883	231.2	4891	232.4	4911	215.3
4919	211.8	4920	210.8	4926	208.2	4931	208.4	4936	208.5
4940	209	4946	208.2	4953	208.5	4962	209.1	4972	209.4
4983	209.8	4993	210.7	5005	211.3	5019	211.3	5029	211.8
5044	211.7	5062	211.1	5070	210.8	5078	210.4	5081	210.9
5095	213.5	5114	216.1	5139	216.8	5149.1	217.2	5182.7	217.7
5219.1	218.5	5252.5	217.7	5279.2	216.7	5320.4	217.5	5360.7	218.8
5393.6	221.3	5432.8	224.1	5465.8	226.4	5504.8	228.8	5550.9	230.8
5598.1	233.2	5645.3	233.8	5688.5	233.6	5738.2	232.4	5769.3	232.3
5790	234.1	5807.5	236.1	5845.4	237.9	5870.9	243.1		

Manning's n Values					
Station	Value	Station	Value	Station	Value
4861.7	.055	4919	.035	5095	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4919	5095		183.44	198.64		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 29455

INPUT
Description: 29455 RAILROAD

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4861.7	243.2	4873.4	239	4883	231.2	4891	232.4	4911	215.3
4919	211.8	4920	210.8	4926	208.2	4931	208.4	4936	208.5
4940	209	4946	208.2	4953	208.5	4962	209.1	4972	209.4
4983	209.8	4993	210.7	5005	211.3	5019	211.3	5029	211.8

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5044	211.7	5062	211.1	5070	210.8	5078	210.4	5081	210.9
5095	213.5	5114	216.1	5139	216.8	5149.1	217.2	5182.7	217.7
5219.1	218.5	5252.5	217.7	5279.2	216.7	5320.4	217.5	5360.7	218.8
5393.6	221.3	5432.8	224.1	5465.8	226.4	5504.8	228.8	5550.9	230.8
5598.1	233.2	5645.3	233.8	5688.5	233.6	5738.2	232.4	5769.3	232.3
5790	234.1	5807.5	236.1	5845.4	237.9	5870.9	243.1		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4861.7	.055	4919	.035	5095	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4919	5095		1926.95	2085.72		.1	.3
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 28480

INPUT
Description: 28480

Station Elevation Data			num= 21						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4758.5	230	4803.3	214.7	4857.3	213.7	4896.1	215.4	4910.9	216.4
4923	214.5	4931.8	210.2	4946	206.8	4956	205.4	4970	204.6
4985	204.6	4999	204.5	5011	203.4	5023	203.5	5042	203.4
5046	202.1	5054	206.8	5063.5	210.9	5077	215.7	5096.4	223.6
5125.4	230								

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4758.5	.055	4946	.035	5054	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4946	5054		192	195.2		.3	.5
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 28313

INPUT
Description: 28313

Station Elevation Data			num= 21						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4758.5	230	4803.3	214.7	4857.3	213.7	4896.1	215.4	4910.9	216.4
4923	214.5	4931.8	210.2	4946	206.8	4956	205.4	4970	204.6
4985	204.6	4999	204.5	5011	203.4	5023	203.5	5042	203.4
5046	202.1	5054	206.8	5063.5	210.9	5077	215.7	5096.4	223.6
5125.4	230								

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4758.5	.055	4946	.035	5054	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4946	5054		768	780.8		.3	.5
Sediment	Elevation = 0							

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CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27992

INPUT
 Description: 27992
 OAKLAND AVE. BRIDGE

Station		Elevation		Data		num= 40					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4473.5	230	4530.7	226.5	4585.7	224.2	4652.2	221.2	4713.8	220.5		
4765.3	220.2	4806.1	220.2	4857.7	220.1	4927.4	221.8	4928.5	206.8		
4932	206.8	4932.1	206.8	4936.5	206.7	4947.5	205.2	4957.5	204.9		
4967.5	204.8	4977.5	204.8	4987.5	205.2	4997.5	205.2	5007.5	204.5		
5012.5	203.6	5012.6	203.6	5014.6	203.4	5014.7	203.4	5017.5	203		
5027.5	204.6	5037.5	205.2	5047.5	204.9	5057.5	206	5063.7	206.7		
5067.5	208.2	5074.5	209.1	5088.5	214.4	5094	215.7	5094.1	215.7		
5096.5	215.7	5097.5	223.3	5143.7	222.2	5221.4	223	5307.1	230		

Manning's n Values		num= 3	
Station	Value	Station	Value
4473.5	.05	4927.4	.032
		5097.5	.05

Bank	Sta: Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4927.4	5097.5		54.99	54.99		.3	.5

Ineffective Flow			num= 2
Sta L	Sta R	Elev	Permanent
4473.5	4927.4	221.8	F
5097.5	5307.1	223.3	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27937

INPUT
 Description: 27937

Station		Elevation		Data		num= 33					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4456.7	230	4478.3	229.2	4556.2	225.2	4635.7	221.6	4731.4	220.8		
4793.2	220.2	4868.6	220.7	4935.5	222	4936.5	206.7	4936.6	206.2		
4944.5	204.9	4954.5	205.1	4964.5	205.3	4974.5	205.3	4984.5	205		
4994.5	204.5	4998.5	205	5004.5	206.1	5009.5	206.2	5014.5	205.9		
5024.5	205.4	5034.5	205.8	5044.5	206.3	5054.5	205.9	5063.5	206.7		
5065.5	207.7	5066.5	209.5	5093.5	216.1	5094.5	223.5	5155.2	224		
5185.1	225	5229.3	227	5263.2	230						

Manning's n Values		num= 3	
Station	Value	Station	Value
4456.7	.05	4935.5	.034
		5094.5	.05

Bank	Sta: Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4935.5	5094.5		132.84	135.84		.3	.5

Ineffective Flow			num= 2
Sta L	Sta R	Elev	Permanent
4456.7	4935.5	222	F
5094.5	5263.2	223.5	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27825

INPUT

Description: 27825

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4473.5	230	4530.7	226.5	4585.7	224.2	4652.2	221.2	4713.8	220.5
4765.3	220.2	4806.1	220.2	4857.7	220.1	4927.4	221.8	4928.5	206.8
4932	206.8	4932.1	206.8	4936.5	206.7	4947.5	205.2	4957.5	204.9
4967.5	204.8	4977.5	204.8	4987.5	205.2	4997.5	205.2	5007.5	204.5
5012.5	203.6	5012.6	203.6	5014.6	203.4	5014.7	203.4	5017.5	203
5027.5	204.6	5037.5	205.2	5047.5	204.9	5057.5	206	5063.7	206.7
5067.5	208.2	5074.5	209.1	5088.5	214.4	5094	215.7	5094.1	215.7
5096.5	215.7	5097.5	223.3	5143.7	222.2	5221.4	223	5307.1	230

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4473.5	.05	4927.4	.032	5097.5	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4927.4	5097.5	99.29	100.29	100.71	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4473.5	4927.4	221.8	F
5097.5	5307.1	223.3	F

Sediment Elevation = 0

BRI DGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 27797.5

INPUT

Description: OAKLAND AVE. BRIDGE
 Distance from Upstream XS = 14
 Deck/Roadway Width = 27
 Weir Coefficient = 2.7

Upstream Deck/Roadway Coordinates num= 21

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4473.5	230	230	4530.7	226.5	226.5	4585.7	224.2	224.2						
4652	221.2	221.2	4713.8	220.5	220.5	4765.3	220.2	220.2						
4806.1	220.2	220.2	4857.7	220.1	220.1	4927.4	221.8	221.8						
4928.5	221.8	206.8	4932	222	206.8	4932.1	222	217						
5012.5	222.6	217.7	5014.7	222.6	217.8	5094	223.2	218.5						
5094.1	223.2	215.7	5096.5	223.2	215.7	5097.5	223.3	223.3						
5143.7	222.2	222.2	5221.4	223	223	5307.1	230	230						

Upstream Bridge Cross Section Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4473.5	230	4530.7	226.5	4585.7	224.2	4652.2	221.2	4713.8	220.5
4765.3	220.2	4806.1	220.2	4857.7	220.1	4927.4	221.8	4928.5	206.8
4932	206.8	4932.1	206.8	4936.5	206.7	4947.5	205.2	4957.5	204.9
4967.5	204.8	4977.5	204.8	4987.5	205.2	4997.5	205.2	5007.5	204.5
5012.5	203.6	5012.6	203.6	5014.6	203.4	5014.7	203.4	5017.5	203

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5027.5	204.6	5037.5	205.2	5047.5	204.9	5057.5	206	5063.7	206.7
5067.5	208.2	5074.5	209.1	5088.5	214.4	5094	215.7	5094.1	215.7
5096.5	215.7	5097.5	223.3	5143.7	222.2	5221.4	223	5307.1	230

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4473.5 .05 4927.4 .032 5097.5 .05

Bank Sta: Left Right Coeff Contr. Expan.
 4927.4 5097.5 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4473.5 4927.4 221.8 F
 5097.5 5307.1 223.3 F
 Sediment Elevation = 0

Downstream Deck/Roadway Coordinates num= 21

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4473.5		230		230	4530.7		226.5		226.5	4585.7		224.2		224.2
4652		221.2		221.2	4713.8		220.5		220.5	4765.3		220.2		220.2
4806.1		220.2		220.2	4857.7		220.1		220.1	4927.4		221.8		221.8
4928.5		221.8		206.8	4932		222		206.8	4932.1		222		217
5012.5		222.6		217.7	5014.7		222.6		217.8	5094		223.2		218.5
5094.1		223.2		215.7	5096.5		223.2		215.7	5097.5		223.3		223.3
5143.7		222.2		222.2	5221.4		223		223	5307.1		230		230

Downstream Bridge Cross Section Data Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4456.7	230	4478.3	229.2	4556.2	225.2	4635.7	221.6	4731.4	220.8		
4793.2	220.2	4868.6	220.7	4935.5	222	4936.5	206.7	4936.6	206.2		
4944.5	204.9	4954.5	205.1	4964.5	205.3	4974.5	205.3	4984.5	205		
4994.5	204.5	4998.5	205	5004.5	206.1	5009.5	206.2	5014.5	205.9		
5024.5	205.4	5034.5	205.8	5044.5	206.3	5054.5	205.9	5063.5	206.7		
5065.5	207.7	5066.5	209.5	5093.5	216.1	5094.5	223.5	5155.2	224		
5185.1	225	5229.3	227	5263.2	230						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4456.7 .05 4935.5 .034 5094.5 .05

Bank Sta: Left Right Coeff Contr. Expan.
 4935.5 5094.5 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4456.7 4935.5 222 F
 5094.5 5263.2 223.5 F
 Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 220.1
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
 Pier Station Upstream= 5012.45 Downstream= 5012.45
 Upstream num= 2

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Width Elev Width Elev
 3 203 3 218.5
 Downstream num= 2
 Width Elev Width Elev
 3 203 3 218.5

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
 Yarnell KVal = .9
 Selected Low Flow Methods = Yarnell

High Flow Method
 Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8164966
 Max Low Cord = 218.5

Additional Bridge Parameters
 Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27770

INPUT

Description: 27770

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4456.7	230	4478.3	229.2	4556.2	225.2	4635.7	221.6	4731.4	220.8
4793.2	220.2	4868.6	220.7	4935.5	222	4936.5	206.7	4936.6	206.2
4944.5	204.9	4954.5	205.1	4964.5	205.3	4974.5	205.3	4984.5	205
4994.5	204.5	4998.5	205	5004.5	206.1	5009.5	206.2	5014.5	205.9
5024.5	205.4	5034.5	205.8	5044.5	206.3	5054.5	205.9	5063.5	206.7
5065.5	207.7	5066.5	209.5	5093.5	216.1	5094.5	223.5	5155.2	224
5185.1	225	5229.3	227	5263.2	230				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4456.7	.05	4935.5	.034	5094.5	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4935.5 5094.5 442.89 452.96 457.14 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4456.7	4935.5	222	F
5094.5	5263.2	223.5	F

 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27620

INPUT

Description: 27620

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Station		Elevation		Data		num= 37			
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4155.7	230.1	4195.4	221.3	4264.3	224.8	4291.8	219.7	4301.8	220.2
4313.6	219.5	4355.3	221.5	4449.8	220.4	4499.1	220.3	4532.4	217.1
4542.3	217.5	4550.6	217.2	4568.4	217.6	4639.9	214.2	4742.8	214.2
4770.1	213.3	4780.9	213.4	4790.8	213	4861.9	213.1	4914.5	213.2
4927.4	213.2	4935.4	208.1	4939.4	206.6	4954	205.8	4967.1	205.4
4980	205.1	4998.4	204.8	4999.9	204.9	5015	204.5	5033.5	204.1
5048.4	203.2	5057.5	205.5	5060.6	206.6	5063.2	211.8	5091.7	214.4
5106.9	220	5124.6	230						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4155.7	.04	4927.4	.03
		5091.7	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4927.4	5091.7		194.24	198.81		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27453

INPUT

Description: 27453

Station		Elevation		Data		num= 37			
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4155.7	230.1	4195.4	221.3	4264.3	224.8	4291.8	219.7	4301.8	220.2
4313.6	219.5	4355.3	221.5	4449.8	220.4	4499.1	220.3	4532.4	217.1
4542.3	217.5	4550.6	217.2	4568.4	217.6	4639.9	214.2	4742.8	214.2
4770.1	213.3	4780.9	213.4	4790.8	213	4861.9	213.1	4914.5	213.2
4927.4	213.2	4935.4	208.1	4939.4	206.6	4954	205.8	4967.1	205.4
4980	205.1	4998.4	204.8	4999.9	204.9	5015	204.5	5033.5	204.1
5048.4	203.2	5057.5	205.5	5060.6	206.6	5063.2	211.8	5091.7	214.4
5106.9	220	5124.6	230						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4155.7	.04	4927.4	.03
		5091.7	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4927.4	5091.7		485.6	497		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 27272

INPUT

Description: 27272

Station		Elevation		Data		num= 32			
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4355	230	4360	229	4366	228	4528	226	4592	224
4630	222	4682	220	4704	218	4729	216	4754	214
4875	213.5	4903.2	211.8	4926	206.4	4941.5	205.4	4952.3	205.5
4960.4	205.7	4972.4	205.5	4983.2	205.5	4997	204.7	5008.4	204.7
5032.7	204.5	5049	204.4	5063.7	204.3	5074.2	206.5	5082.7	213.5

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5105.5	213.5	5125	213.5	5137	214	5169	216	5176	218
5182	220	5205	230						

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4355 .04	4875 .03	5082.7 .05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4875	5082.7	180	180	180	.1	.3	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 27105

INPUT

Description: 27105

Station Elevation Data		num=	32						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4355	230	4360	229	4366	228	4528	226	4592	224
4630	222	4682	220	4704	218	4729	216	4754	214
4875	213.5	4903.2	211.8	4926	206.4	4941.5	205.4	4952.3	205.5
4960.4	205.7	4972.4	205.5	4983.2	205.5	4997	204.7	5008.4	204.7
5032.7	204.5	5049	204.4	5063.7	204.3	5074.2	206.5	5082.7	213.5
5105.5	213.5	5125	213.5	5137	214	5169	216	5176	218
5182	220	5205	230						

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4355 .04	4875 .03	5082.7 .05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4875	5082.7	464.97	270.05	554.95	.1	.3	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 27047

INPUT

Description: 27047

Station Elevation Data		num=	33						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4642	230	4686	220	4694	218	4710	214	4808	214
4850	214.7	4870	214.3	4870.1	213.3	4894	212.7	4908	211.3
4927	206.6	4935	205.9	4945	205.3	4955	205.1	4968	205.3
4982	205.3	4996	205.1	5010	204.9	5020	204.4	5034	204.1
5048	203.9	5060	204.3	5073	206.5	5097	208.8	5100	214.4
5127	213.1	5174	212.6	5243	213.1	5263	214	5283	216
5298	218	5307	220	5322	230				

Manning's n Values num= 3

Sta n Val	Sta n Val	Sta n Val
4642 .04	4935 .03	5073 .05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4935	5073	136	188	240	.1	.3	
Sediment Elevation = 0							

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CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26880

INPUT

Description: 26880

Station		Elevation		Data		num= 33			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4642	230	4686	220	4694	218	4710	214	4808	214
4850	214.7	4870	214.3	4870.1	213.3	4894	212.7	4908	211.3
4927	206.6	4935	205.9	4945	205.3	4955	205.1	4968	205.3
4982	205.3	4996	205.1	5010	204.9	5020	204.4	5034	204.1
5048	203.9	5060	204.3	5073	206.5	5097	208.8	5100	214.4
5127	213.1	5174	212.6	5243	213.1	5263	214	5283	216
5298	218	5307	220	5322	230				

Manning's n		Values		num= 3	
Sta	n Val	Sta	n Val	Sta	n Val
4642	.04	4935	.03	5073	.05

Bank Sta: Left 4935 Right 5073
 Lengths: Left Channel 204 Right 282
 Coeff Contr. .1 Expan. .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26812

INPUT

Description: 26812

Station		Elevation		Data		num= 29			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4810	230	4840	220	4848	218	4854	216	4862	214
4871	212.5	4890	211.9	4907.3	211.8	4923	206.5	4925	205.3
4937	204.3	4952	204.8	4967	204.4	4999	203.9	5024	203.1
5037	202.1	5053	206.6	5066	204.5	5075	206.2	5087	215.1
5100	215.5	5111	216	5212	216	5224	214	5244	214
5248	216	5250	218	5261	220	5296	230		

Manning's n		Values		num= 3	
Sta	n Val	Sta	n Val	Sta	n Val
4810	.04	4925	.03	5053	.05

Bank Sta: Left 4925 Right 5053
 Lengths: Left Channel 25 Right 50
 Coeff Contr. .1 Expan. .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26762

INPUT

Description: 26762
 RAILROAD BRIDGE

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Station		Elevation Data		num=	33		Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev		Sta	Elev	Sta	Elev	Sta	Elev
4828.23	221.86	4842	217.54		4852	214.5	4852.1	214.5	4866	211.2
4890	211.4	4900.8	209		4920.1	209	4933.5	206.6	4947	205.8
4947.1	205.8	4950	205.7		4951.8	204.2	4954	204.2	4954.1	204.2
4970.6	203.8	4986.9	203.4		5000.6	202.9	5015.8	202.9	5025	202.9
5035.3	202.4	5049.2	203.3		5049.3	203.3	5057	203.6	5057.1	203.6
5063.2	203.8	5066.5	206.5		5076.5	210.4	5105.1	212.3	5130.4	213.5
5139	213.8	5144.6	214.9		5151	224.1				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
4828.23	.04	4950	.03	5066.5	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4950 5066.5 40 41 45 .4 .6
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26721

INPUT
 Description: RAILROAD BRIDGE

Station		Elevation Data		num=	30		Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev		Sta	Elev	Sta	Elev	Sta	Elev
4805.99	224.66	4818.67	219.48		4831.93	215.55	4843.1	212.4	4872.8	212
4884.2	211.5	4891.3	209		4908.1	206.5	4916.6	205.7	4929.3	206.4
4940.3	204.9	4951.2	204.7		4960.2	206.5	4967.9	206.6	4982.7	205.2
4985.5	203.3	5002.6	202		5005.2	201.5	5022.4	198.5	5045.5	201.5
5078.2	203.7	5091.9	206.5		5093.3	209.5	5103.6	213	5110.3	212.7
5118.6	212.5	5126	213.6		5135.54	215.03	5146.39	218.17	5150.6	219.61

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
4805.99	.04	4908.1	.03	5091.9	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4908.1 5091.9 130 89 50 .4 .6
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26645

INPUT
 Description: 26645

Station		Elevation Data		num=	29		Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev		Sta	Elev	Sta	Elev	Sta	Elev
4810	230	4840	220		4848	218	4854	216	4862	214
4871	212.5	4890	211.9		4907.3	211.8	4923	206.5	4925	205.3
4937	204.3	4952	204.8		4967	204.4	4999	203.9	5024	203.1
5037	202.1	5053	206.6		5066	204.5	5075	206.2	5087	215.1
5100	215.5	5111	216		5212	216	5224	214	5244	214
5248	216	5250	218		5261	220	5296	230		

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val

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4810 .04 4925

.03 5053 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4925 5053 25 49 55 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 26632

INPUT
 Descri pti on: 26632

Stati on El evati on Data		num= 39							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4586.3	228	4624.7	221.3	4666.5	220.5	4732.1	220.3	4775.6	221
4804.1	220.2	4822.5	214.3	4872.5	213.5	4890.5	211.9	4899.5	208.7
4911	206.3	4922.5	205.3	4934.5	204.8	4946.5	204.3	4959.5	203.5
4966.5	202.7	4974.5	202.6	4982.5	202.3	4989.5	202.6	4996.5	203
5004.5	203.7	5012.5	204.6	5018.5	205.4	5025.5	206.3	5033.5	206.9
5040.5	206.3	5052.5	204.9	5060.5	203.4	5065.5	202.4	5071.5	201.1
5084.8	203.8	5089.1	206.4	5100.3	213.1	5109.7	212.8	5133	212.8
5154.2	213.2	5181.5	213.4	5202	220	5238.5	228		

Manni ng' s n Val ues		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4586.3	.07	4872.5	.045	5100.3	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4872.5 5100.3 45 49.5 60 .4 .6
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 26596

INPUT
 Descri pti on: 26596

Stati on El evati on Data		num= 32							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4840.18	223.32	4852	214.5	4852.1	214.5	4866	211.2	4890	211.4
4900.8	209	4920.1	209	4933.5	206.6	4947	205.8	4947.1	205.8
4950	205.7	4951.8	204.2	4954	204.2	4954.1	204.2	4970.6	203.8
4980	203.5	4985	201.7	5025	201.7	5028	202.7	5035.3	202.4
5049.2	203.3	5049.3	203.3	5057	203.6	5057.1	203.6	5063.2	203.8
5066.5	206.5	5076.5	210.4	5105.1	212.3	5130.4	213.5	5139	213.8
5144.6	214.9	5151	224.1						

Manni ng' s n Val ues		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4840.18	.04	4950	.03	5066.5	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4950 5066.5 85 84.48 105 .4 .6
 Sedi ment El evati on = 0

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 26561

INPUT

Description: 26561

Station		Elevation		Data		num= 26					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4818.01	222.53	4843.1	212.4	4872.8	212	4884.2	211.5	4891.3	209		
4908.1	206.5	4916.6	205.7	4929.3	206.4	4940.3	204.9	4951.2	204.7		
4953	205	4962	201.3	4980	201.3	5002	201.3	5003	201.8		
5005.2	201.5	5022.4	198.5	5045.5	201.5	5078.2	203.7	5091.9	206.5		
5093.3	209.5	5103.6	213	5110.3	212.7	5118.6	212.5	5126	213.6		
5144.43	222.07										

Manning's n		Values		num= 3	
Sta	n Val	Sta	n Val	Sta	n Val
4818.01	.04	4908.1	.03	5091.9	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4908.1	5091.9		130	99		.4	.6

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 26533

INPUT

Description: 26533

Station		Elevation		Data		num= 36					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4598.8	228	4653.3	220.6	4718.5	220.6	4798.5	224.4	4840.8	222		
4864.5	217.7	4877	217.7	4891	217.2	4905.1	213.3	4907.5	206.8		
4920.2	206.2	4932.5	206.6	4944.7	206.4	4955.8	205.7	4966.4	205		
4977.6	203.1	4988	203.1	4996.6	203	5011.8	202.8	5028.3	202.3		
5040.9	202.2	5056.8	203.1	5067.5	205.9	5082.4	206.4	5089.7	205.4		
5111	206.3	5139	209.3	5148.4	215.7	5161	215.7	5210.5	212.2		
5278.8	212.3	5357.7	212.3	5411.3	212.4	5450	212.7	5487.1	220		
5517	228										

Manning's n		Values		num= 3	
Sta	n Val	Sta	n Val	Sta	n Val
4598.8	.07	4891	.045	5148.4	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4891	5148.4		100	94		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 26462

INPUT

Description: 26462

Station		Elevation		Data		num= 34					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4586.3	228	4624.7	221.3	4666.5	220.5	4732.1	220.3	4775.6	221		
4804.1	220.2	4822.5	214.3	4872.5	213.5	4890.5	211.9	4899.5	208.7		
4911	206.3	4922.5	205.3	4941	204.6	4952	204	4992	202.8		

Ramapo River Post. rep									
4998	203.1	5004.5	203.7	5012.5	204.6	5018.5	205.4	5025.5	206.3
5040.5	206.3	5052.5	204.9	5060.5	203.4	5065.5	202.4	5071.5	201.1
5084.8	203.8	5089.1	206.4	5100.3	213.1	5109.7	212.8	5133	212.8
5154.2	213.2	5181.5	213.4	5202	220	5238.5	228		

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4586.3	.055	4872.5	.035	5100.3	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4872.5	5100.3		190	191.04		.4	.6
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26365

INPUT

Description: 26365

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4598.8	228	4653.3	220.6	4718.5	220.6	4798.5	224.4	4840.8	222
4864.5	217.7	4877	217.7	4891	217.2	4905.1	213.3	4907.5	206.8
4917	206.5	4947	201.65	4987	201.65	4990	203	5028.3	202.3
5040.9	202.2	5056.8	203.1	5067.5	205.9	5082.4	206.4	5089.7	205.4
5111	206.3	5139	209.3	5148.4	215.7	5161	215.7	5210.5	212.2
5278.8	212.3	5357.7	212.3	5411.3	212.4	5450	212.7	5487.1	220
5517	228								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4598.8	.055	4891	.035	5148.4	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4891	5148.4		600.07	564.88		.1	.3
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 26157

INPUT

Description: 26157

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4738.4	228	4771.4	224	4812	212.9	4850.7	212	4920.7	213.7
4931.8	206.5	4951.9	203.7	4968.9	204.9	4990.7	204.9	5010.6	203.5
5031.9	203.4	5052.1	204.3	5068.3	206.4	5080.4	209.2	5081.1	212.1
5097.9	212	5183.5	212.2	5204.4	212.5	5219.5	212.3	5303.7	210
5334.3	209.7	5373.6	212.2	5479.2	212.6	5493.5	210.8	5507	210.9
5521.9	210.8	5617.5	210.3	5697	220	5716	228		

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4738.4	.07	4920.7	.045	5081.1	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4920.7	5081.1		186.64	178		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25988

INPUT

Description: 25988

Station Elevation Data		num= 29									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4738.4	228	4771.4	224	4812	212.9	4850.7	212	4920.7	213.7		
4931.8	206.5	4951.9	203.7	4966	204.4	4982	197.88	5022	197.88		
5037	204	5052.1	204.3	5068.3	206.4	5080.4	209.2	5081.1	212.1		
5097.9	212	5183.5	212.2	5204.4	212.5	5219.5	212.3	5303.7	210		
5334.3	209.7	5373.6	212.2	5479.2	212.6	5493.5	210.8	5507	210.9		
5521.9	210.8	5617.5	210.3	5697	220	5716	228				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4738.4	.055	4920.7	.035	5081.1	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4920.7 5081.1 381.29 376.96 368 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25890

INPUT

Description: 25890

Station Elevation Data		num= 35									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4337.5	228	4411.1	222	4459.9	218.6	4532.3	213	4575.8	214		
4608.3	220.4	4664.1	222.7	4704.5	214.3	4725.2	212.4	4801.4	212.2		
4872.4	212.3	4916.4	211.4	4916.5	210.9	4947.4	206.5	4957.4	204.4		
4972.4	203.9	4987.4	203.8	4999.4	203.5	5017.4	204	5032.4	204.1		
5052.7	206.5	5060.2	211.9	5091.7	212.8	5169.9	212.5	5184.7	212.4		
5228.6	212.3	5288	212	5385.8	211.2	5460.8	210.8	5534.7	210.8		
5571.5	211.3	5640.5	210.2	5699.6	208	5714	210.3	5754.3	228		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4337.5	.07	4947.4	.045	5060.2	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4947.4 5060.2 350 233 180 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 4337.5 4663.98 222.82 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25700

Ramapo River Post. rep

INPUT

Description: 25700

Station Elevation Data		num= 30		Station Elevation Data		num= 30		Station Elevation Data		num= 30	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4337.5	228	4411.1	222	4459.9	218.6	4532.3	213	4575.8	214		
4608.3	220.4	4664.1	222.7	4704.5	214.3	4725.2	212.4	4801.4	212.2		
4872.4	212.3	4916.4	211.4	4916.5	210.9	4947.4	206.5	4949	206		
4977	195	5017	195	5060	211.8	5091.7	212.8	5184.7	212.4		
5228.6	212.3	5288	212	5385.8	211.2	5460.8	210.8	5534.7	210.8		
5571.5	211.3	5640.5	210.2	5699.6	208	5714	210.3	5754.3	228		

Manning's n Values		num= 3		Manning's n Values	
Sta	n Val	Sta	n Val	Sta	n Val
4337.5	.055	4947.4	.035	5060	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4947.4	5060		350.01	214.02		.1	.3
Ineffective Flow	num= 1							
Sta L	Sta R	Elev	Permanent					
4337.5	4663.98	222.96	F					
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 25657

INPUT

Description: 25657

Station Elevation Data		num= 50		Station Elevation Data		num= 50		Station Elevation Data		num= 50	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3370.3	228	3439.1	222	3524.1	220.5	3575.4	220.5	3602.4	224		
3641.6	226	3687.7	222	3723.3	216.4	3803.9	214.3	3890.9	212.9		
4007.9	211.7	4097.4	211.5	4112.3	210.1	4148.2	210	4228.8	210.2		
4304.1	210.7	4404.6	211.5	4561.2	211.4	4691	211.5	4733.7	212.2		
4775.6	213.2	4837.8	212.3	4902.2	212.9	4935.7	212.6	4948.7	206.4		
4954.7	204.6	4963.7	204.4	4975.7	203.9	4984.7	203.9	4995.7	204.9		
5006.7	205.4	5039.7	205.9	5051.3	206.4	5062.8	210.9	5062.9	213.3		
5063.5	213	5079.3	212.4	5165.5	210.9	5182	211	5192.9	210.6		
5274	210.7	5312.8	210.4	5415.4	210.6	5527	210.4	5541.8	210.5		
5555.2	210.2	5574	210.8	5679	210.2	5740.8	210	5780.2	228		

Manning's n Values		num= 3		Manning's n Values	
Sta	n Val	Sta	n Val	Sta	n Val
3370.3	.07	4935.7	.045	5062.9	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4935.7	5062.9		216	189.6		.1	.3
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 25486

INPUT

Description: 25486

Station Elevation Data		num= 40		Station Elevation Data		num= 40		Station Elevation Data		num= 40	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3370.3	228	3439.1	222	3524.1	220.5	3575.4	220.5	3602.4	224		

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3641.6	226	3687.7	222	3723.3	216.4	3803.9	214.3	3890.9	212.9
4007.9	211.7	4097.4	211.5	4112.3	210.1	4148.2	210	4228.8	210.2
4304.1	210.7	4404.6	211.5	4561.2	211.4	4691	211.5	4733.7	212.2
4775.6	213.2	4837.8	212.3	4902.2	212.9	4934	212.6	4978	194.9
5018	194.9	5064	213.1	5079.3	212.4	5165.5	210.9	5192.9	210.6
5274	210.7	5312.8	210.4	5415.4	210.6	5527	210.4	5541.8	210.5
5555.2	210.2	5574	210.8	5679	210.2	5740.8	210	5780.2	228

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
3370.3	.055	4934	.035	5064	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4934	5064		324	287.4	18		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 25420

INPUT
Description: 25420

Station Elevation Data			num=	42					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3579.51	219.76	3818.06	216.56	3898.13	213.28	3985.9	209.5	4137.2	209.2
4266.8	209.1	4334.8	210.2	4474.4	212.3	4669.9	211.6	4730.7	212.1
4795	211.4	4825.7	212.2	4880	212.2	4933.9	211.9	4938.8	211.9
4938.9	213.5	4949.4	206.2	4949.9	205.2	4956.9	203.3	4965.9	203.4
4979.9	203.8	4995.9	204.4	5016.9	204.9	5037.9	205.2	5050.6	206.2
5052.3	213.3	5053	212.7	5065.3	212.1	5124.8	212.1	5171.3	211
5304.6	210.6	5390.3	210.4	5467.9	210.5	5521.3	210.7	5544.4	210.2
5563.5	210.6	5689.7	210.3	5755.34	210.98	5802.05	212.7	5839.86	214.51
5884.34	216.87	5964.92	219.72						

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
3579.51	.07	4938.9	.045	5052.3	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4938.9	5052.3		150.03	212.49	5.76		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 25246

INPUT
Description: 25246

Station Elevation Data			num=	28					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3839.29	219.43	3985.9	209.5	4137.2	209.2	4266.8	209.1	4334.8	210.2
4474.4	212.3	4669.9	211.6	4730.7	212.1	4795	211.4	4825.7	212.2
4880	212.2	4920	212	4970	194.8	5010	194.8	5025.44	201.55
5055	212.7	5065.3	212.1	5083.44	202.01	5124.8	212.1	5171.3	211
5304.6	210.6	5390.3	210.4	5467.9	210.5	5521.3	210.7	5544.4	210.2
5563.5	210.6	5689.7	210.3	5822.26	219.31				

Manning's n Values			num=	3
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Ramapo River Post. rep

Sta	n Val	Sta	n Val	Sta	n Val
3839.29	.055	4920	.035	5055	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4920 5055 210 297.48 8.16 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 5057.53 5822.26 212.82 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25165

INPUT
 Description: 25165

Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3944.06	221.41	4006.41	216.97	4078.9	206.5	4094.11	210.7	4109.68	208.8
4152.43	208.8	4205.89	209	4223.98	210.1	4260.43	212.2	4290.76	212.4
4345.66	211	4380.31	211.1	4416.49	211.2	4457.8	210.5	4502.89	210.5
4555	210.7	4594.51	210.3	4647.16	210.9	4699.54	211	4749.76	211
4777.48	210.7	4810.24	207.3	4817.71	207.3	4832.29	211	4845.79	211.5
4847.59	213.9	4849.39	210.5	4863.79	212	4876.39	212	4890.79	212
4893.49	212	4895.29	204.1	4897.09	202.7	4915.99	201.9	4929.49	201.8
4933.99	203.8	4943.89	203.8	4951.99	205	4957.39	205.7	4973.59	206.7
4997.89	206.6	5025.88	206.7	5042.98	207.8	5061.61	211	5079.52	211.5
5101.57	211.8	5109.31	212.6	5126.32	212	5158.72	212	5185	212.8
5206.78	211.8	5229.73	211.5	5240.35	210.5	5259.88	210.7	5288.32	210.3
5334.22	210.8	5401.63	210.5	5439.34	210.6	5495.95	210.4	5555.17	210.9
5582.62	210.6	5601.52	211.5	5635.05	212.52	5665.48	214.41	5715.12	216.97
5777.83	220.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3944.06	.06	4847.59	.045	5079.52	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4847.59 5079.52 15 20 7 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3944.06 4847.59 210 F
 5079.52 5777.83 210 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25145

INPUT
 Description: 25145

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2940.9	2283069.435	224.4	3254.59	224.23	23425.875	225.1	3473.09	225	
3758.47	216.1	3866.2	2203953.125	216	4013.83	206.24	086.695	208.3	
4203.165	210.9	4324.1	210.9	4431.64	210.6	4614.61	210.7	4733.55	210.6
4789.41	207.84	822.945	210.94	833.395	210.84	850.495	211.74	851.445	213.9

			Ramapo River Post. rep			
4852.395	2134859.995	2134863.795	2134882.795	2134883.745	203.2	
4894.195	202.24900.845	200.74914.145	201.14924.595	201.64930.295	202.3	
4931.245	204.94932.195	206.14942.645	205.94942.74	208.55007.245	208.7	
5105.855	211.25163.045	2125200.095	212.25261.655	210.55365.015	210.3	
5473.695	210.35589.12	210.85715.09	210.75825.385	2105843.815	220.1	
5926.75	228					

Manning's n Values	num=	3
Sta n Val Sta	n Val	Sta n Val
2940.9 .24851.445	.025	4942.74 .1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4851.445	4942.74	10	15	7	.7	.9
Ineffective Flow	num=	2				
Sta L Sta R Elev	Permanent					
2940.94851.445	210	F				
4942.745926.75	210	F				
Sediment Elevation =	0					

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25130

INPUT
 Description: 25130

Station Elevation Data	num=	44
Sta Elev Sta	Elev	Sta Elev Sta Elev Sta Elev
3919.7 219.83921.908	2104008.404	206.54091.348 208.74202.42 211.2
4384.628 210.74497.236	210.54650.74	210.74766.132 211.14790.612 208.2
4830.068 210.64843.412	208.74843.508	210.64858.868 2114864.628 204.3
4874.228 201.94885.748	202.54891.508	201.54897.268 198.54927.988 201.5
4937.588 202.24941.428	203.24961.588	203.24976.948 2035002.868 203.7
5022.068 203.75033.588	203.55047.988	204.75057.588 2065068.148 206.1
5121.908 211.25142.068	211.95189.396	212.15212.148 212.15266.58 210.5
5428.34 210.45528.756	210.25597.876	210.95632.724 211.65659.43 212.24
5682.56 213.015741.99	214.45775.36	215.885830.96 217.41

Manning's n Values	num=	3
Sta n Val Sta	n Val	Sta n Val
3919.7 .0554858.868	.045121.908	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4858.8685121.908		10	43	90	.7	.9
Sediment Elevation =	0					

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 25087

INPUT
 Description: 25087

Station Elevation Data	num=	43
Sta Elev Sta	Elev	Sta Elev Sta Elev Sta Elev
4004.49 219.62 4017.44	216.74 4059.79	211.14 4102.3 208.4 4141 210
4208.4 210.3 4293	210.6 4422.2	210.1 4559.4 210.2 4688.6 211
4785.6 210.3 4821.6	210.4 4835.2	208.4 4852 211.9 4909 210.5
4912 206.9 4919	204.9 4931	202 4945 199.8 4951 197.7

Ramapo River Post. rep									
4965	197.1	4981	196.5	4998	200.6	5018	201.5	5031	203.1
5043	201.8	5051	200.5	5063	199.6	5070	198.9	5079	199.5
5080	204.9	5081	208.5	5124	209.3	5169.2	210.2	5242.6	210.7
5306.3	210.8	5352.8	210.6	5368.1	210.5	5397.51	211.19	5411.21	213.44
5444.84	215.59	5470.46	217.56	5502.71	219.38				

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4004.49	.055	4931	.04	5080	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4931	5080		150	136.98	120		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24991

INPUT

Description: 24991

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4013.47	219.31	4078.9	206.5	4095.8	210.7	4113.1	208.8	4160.6	208.8
4220	209	4240.1	210.1	4280.6	212.2	4314.3	212.4	4375.3	211
4413.8	211.1	4454	211.2	4499.9	210.5	4550	210.5	4607.9	210.7
4651.8	210.3	4710.3	210.9	4768.5	211	4824.3	211	4855.1	210.7
4891.5	207.3	4899.8	207.3	4916	211	4931	211.5	4933	213.9
4935	210.5	4951	212	4965	212	4981	212	4984	212
4986	204.1	4988	202.7	5022	201.9	5040	194.69	5080	194.69
5110	206.7	5150.1	207.8	5170.8	211	5190.7	211.5	5215.2	211.8
5223.8	212.6	5242.7	212	5278.7	212	5307.9	212.8	5332.1	211.8
5357.6	211.5	5369.4	210.5	5391.1	210.7	5422.7	210.3	5473.7	210.8
5548.6	210.5	5590.5	210.6	5653.4	210.4	5719.2	210.9	5749.7	210.6
5770.7	211.5	5827.88	218.91						

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
4013.47	.055	4933	.035	5190.7	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4933	5190.7		30	35	22		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24956

INPUT

Description: 24956

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3919.7	219.8	3922	210	4012.1	206.5	4098.5	208.7	4214.2	211.2
4404	210.7	4521.3	210.5	4681.2	210.7	4801.4	211.1	4826.9	208.2
4868	210.6	4881.9	208.7	4882	210.6	4898	211	4904	204.3
4914	201.9	4926	202.5	4932	201.5	4938	198.5	4955	200.5
4970	194.7	4980	194.67	5000	194.67	5010	194.67	5033	203.7
5068	203.7	5080	203.5	5095	204.7	5105	206	5116	206.1
5172	211.2	5193	211.9	5242.3	212.1	5266	212.1	5322.7	210.5
5491.2	210.4	5595.8	210.2	5667.8	210.9	5704.1	211.6	5812.91	219.14

Ramapo River Post. rep

Manning's n Values num= 3
 Sta n Val Sta n Val
 3919.7 .055 4898 .035 5172 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4898 5172 6 26 53 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24950

INPUT
 Description: 24950

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3757.25	219.46	3820.82	216.72	3843.24	214.76	3880.07	212.28	3936.6	209
4084.1	210.7	4259.4	210.3	4446.4	210.7	4581.5	210.7	4640	210.6
4671.5	207.8	4731.1	211	4814.5	210.1	4873	210	4913	209.8
4914	204.8	4915	202	4926	201.2	4929	202	4940	203.4
4951	204.3	4977	204.8	4993	204.8	5009	204.2	5024	202.8
5032	201.8	5042	201.8	5055	202.8	5067	202.4	5075	202.8
5085	204.8	5103	209.7	5121	210	5232.1	210.6	5260.1	210.3
5293.1	210.4	5400.7	210.2	5439.6	210.5	5469.9	210.5	5505.6	211.3
5542.35	211.97	5572.78	214.03	5621.89	216.03	5668.59	217.17	5719.36	219.39

Manning's n Values num= 3
 Sta n Val Sta n Val
 3757.25 .055 4915 .04 5024 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4915 5024 59.66 42.66 80 .3 .5
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24930

INPUT
 Description: 24930

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4053.7	219.02	4102.3	208.4	4141	210	4208.4	210.3	4293	210.6
4422.2	210.1	4559.4	210.2	4688.6	211	4785.6	210.3	4821.6	210.4
4835.2	208.4	4852	211.9	4909	210.5	4912	206.9	4919	204.9
4931	202	4945	199.8	4951	197.7	4965	197.1	4981	196.5
4995	198.8	5005	194.7	5020	194.65	5045	194.65	5058	199.9
5063	199.6	5070	198.9	5079	199.5	5080	204.9	5081	208.5
5124	209.3	5169.2	210.2	5242.6	210.7	5306.3	210.8	5352.8	210.6
5368.1	210.5	5388.21	219.31						

Manning's n Values num= 3
 Sta n Val Sta n Val
 4053.7 .055 4931 .035 5080 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4931 5080 4 17 37 .1 .3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24913

INPUT

Description: 24913

Station Elevation Data		num= 37							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4065.48	219.43	4102.3	208.4	4141	210	4208.4	210.3	4293	210.6
4422.2	210.1	4559.4	210.2	4688.6	211	4785.6	210.3	4821.6	210.4
4835.2	208.4	4852	211.9	4909	210.5	4912	206.9	4919	204.9
4931	202	4945	199.8	4951	197.7	4965	197.1	4981	196.5
4995	198.8	5005	194.7	5020	194.65	5045	194.65	5058	199.9
5063	199.6	5070	198.9	5079	199.5	5080	204.9	5081	208.5
5124	209.3	5169.2	210.2	5242.6	210.7	5306.3	210.8	5352.8	210.6
5368.1	210.5	5393.45	219.14						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
4065.48	.055	4931	.035	5080	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4931	5080		178.38	138.36	202.98		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24860

INPUT

Description: 24860

Station Elevation Data		num= 33							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3867.35	219.6	3936.6	209	4084.1	210.7	4259.4	210.3	4446.4	210.7
4581.5	210.7	4640	210.6	4671.5	207.8	4731.1	211	4814.5	210.1
4873	210	4913	209.8	4914	204.8	4915	202	4926	201.2
4948	203.5	4970	194.6	5010	194.6	5029	202	5055	202.8
5067	202.4	5075	202.8	5085	204.8	5103	209.7	5121	210
5232.1	210.6	5260.1	210.3	5293.1	210.4	5400.7	210.2	5439.6	210.5
5469.9	210.5	5505.6	211.3	5554.54	219.25				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
3867.35	.055	4913	.035	5103	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4913	5103		56	49	42		.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24822

INPUT

Description: 24822

Ramapo River Post. rep

Station		Elevation		Data		num=		52	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3047.71	219.04	3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2
3429.4	210.3	3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8
4082.5	209.8	4196.6	209.1	4248.4	207	4320	211.7	4365	211.5
4400	203.3	4450	203.3	4480	208	4550	212.8	4600	209
4637.9	209.8	4701.8	209.3	4754.9	208.9	4833.6	208.4	4903	208.1
4935	207.6	4947	206.4	4949	204.8	4953	199.6	4972	198.4
4981	199.6	4995	200.1	5010	202.8	5024	201.6	5031	201.3
5051	204.8	5069	208.8	5099	209.2	5159	208	5229	206
5248	204	5262	204	5276	206	5294	208	5334	208
5394	208.2	5446.62	208.55	5475.53	209.89	5491.1	212.34	5517.79	214.25
5604.98	216.6	5671.66	219.09						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
3047.71	.055	4972	.04	5051	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4972	5051		.5	43.5		.3	.5
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24811

INPUT

Description: 24811

Station		Elevation		Data		num=		33	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3850.51	219.08	3936.6	209	4084.1	210.7	4259.4	210.3	4446.4	210.7
4581.5	210.7	4640	210.6	4671.5	207.8	4731.1	211	4814.5	210.1
4873	210	4913	209.8	4914	204.8	4915	202	4926	201.2
4948	203.5	4970	194.6	5010	194.6	5029	202	5055	202.8
5067	202.4	5075	202.8	5085	204.8	5103	209.7	5121	210
5232.1	210.6	5260.1	210.3	5293.1	210.4	5400.7	210.2	5439.6	210.5
5469.9	210.5	5505.6	211.3	5554.54	218.85				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
3850.51	.055	4913	.035	5103	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4913	5103		35.52	78.48		.1	.3
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24776

INPUT

Description: 24776

Station		Elevation		Data		num=		33	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3872.4	219.14	3936.6	209	4084.1	210.7	4259.4	210.3	4446.4	210.7
4581.5	210.7	4640	210.6	4671.5	207.8	4731.1	211	4814.5	210.1
4873	210	4913	209.8	4914	204.8	4915	202	4926	201.2
4939	203.5	4961	194.6	5020	194.6	5039	202	5055	202.8

Ramapo River Post. rep

5067	202.4	5075	202.8	5085	204.8	5103	209.7	5121	210
5232.1	210.6	5260.1	210.3	5293.1	210.4	5400.7	210.2	5439.6	210.5
5469.9	210.5	5505.6	211.3	5559.59	218.56				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
3872.4	.055	4913
		.035
		5103
		.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4913	5103		76	76		.1	.3
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24735

INPUT
 Description: 24735
 This is a REPEATED section.

Station Elevation Data	num=	73
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1992.8 228 2124 224.3 2533.6 224.4 2901 215.9 3003.9 215.4		
3096 216.9 3143.5 210 3211.2 209.3 3314.6 210.2 3429.4 210.3		
3562.7 210.3 3733.8 210.5 3855.1 210.6 3938.5 207.8 4082.5 209.8		
4196.6 209.1 4248.4 207 4320 211.7 4365 211.5 4400 203.3		
4450 203.3 4480 208 4550 212.8 4600 209 4637.9 209.8		
4701.8 209.3 4754.9 208.9 4833.6 208.4 4895.1 209.2 4932 211.6		
4946.5 212.1 4952 212.2 4965 203.1 4973 202 4983 200.8		
4990 203 5010 203.1 5018 200.8 5024 200.3 5028 201		
5035 202.8 5037 203 5109 205 5149 206.3 5160 209.5		
5173 209 5179 211.4 5227 212.3 5283 212.7 5303 212.6		
5344 212.1 5357 212 5364 207.9 5368 207.7 5390 211.7		
5411 211 5425 211 5440 207.8 5484 207.5 5509 205.7		
5514 202.1 5521 200.9 5534 200.3 5541 198 5551 198.2		
5562 198.2 5572 198.4 5582 198 5590 200 5593 202.1		
5597 205.3 5612 217.2 5628 226.3		

Manning's n Values	num=	6
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val		
1992.8 .2 4637.9 .04 4833.6 .055 4965 .04 5037 .055		
5509 .04		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4965	5035		1	45		.3	.5
Ineffective Flow	num= 2							
Sta L Sta R Elev	Permanent							
1992.8 4965 209	F							
5035 5628 202.3	F							
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24700

INPUT
 Description: 24700

Station Elevation Data	num=	33
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		

Ramapo River Post. rep

3860.62	218.91	3936.6	209	4084.1	210.7	4259.4	210.3	4446.4	210.7
4581.5	210.7	4640	210.6	4671.5	207.8	4731.1	211	4814.5	210.1
4873	210	4913	209.8	4914	204.8	4915	202	4923	201.5
4924	201.4	4945	194.6	5035	194.55	5054	202.7	5055	202.8
5067	202.4	5075	202.8	5085	204.8	5103	209.7	5121	210
5232.1	210.6	5260.1	210.3	5293.1	210.4	5400.7	210.2	5439.6	210.5
5469.9	210.5	5505.6	211.3	5573.06	218.85				

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
3860.62	.055	4913	.035	5103	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4913	5103		42	51.99	62.01		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24690

INPUT
Description: 24690

Station Elevation Data			num=	73					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1992.8	228	2124	224.3	2533.6	224.4	2901	215.9	3003.9	215.4
3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	3429.4	210.3
3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	4082.5	209.8
4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	4400	203.3
4450	203.3	4480	208	4550	212.8	4600	209	4637.9	209.8
4701.8	209.3	4754.9	208.9	4833.6	208.4	4895.1	209.2	4932	211.6
4946.5	212.1	4952	212.2	4965	203.1	4973	202	4983	200.8
4990	203	5010	203.1	5018	200.8	5024	200.3	5028	201
5035	202.8	5037	203	5109	205	5149	206.3	5160	209.5
5173	209	5179	211.4	5227	212.3	5283	212.7	5303	212.6
5344	212.1	5357	212	5364	207.9	5368	207.7	5390	211.7
5411	211	5425	211	5440	207.8	5484	207.5	5509	205.7
5514	202.1	5521	200.9	5534	200.3	5541	198	5551	198.2
5562	198.2	5572	198.4	5582	198	5590	200	5593	202.1
5597	205.3	5612	217.2	5628	226.3				

Manning's n Values			num=	6					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1992.8	.2	4637.9	.04	4833.6	.055	4965	.04	5037	.055
5509	.04								

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4965	5035		.2	42.6	105		.3	.5
Ineffective Flow	num= 2								
Sta L	Sta R	Elev	Permanent						
1992.8	4965	209	F						
5035	5628	205.7	F						
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24648

INPUT

Ramapo River Post. rep

Description: 24648

Station Elevation Data			num=							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
3049.11	219.31	3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	
3429.4	210.3	3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	
4082.5	209.8	4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	
4400	203.3	4450	203.3	4480	208	4550	212.8	4600	209	
4637.9	209.8	4701.8	209.3	4754.9	208.9	4833.6	208.4	4898	208	
4932	194.5	5060	194.5	5096	209	5159	208	5229	206	
5248	204	5262	204	5276	206	5294	208	5334	208	
5394	208.2	5443.87	218.91							

Manning's n Values			num=		
Sta	n Val	Sta	n Val	Sta	n Val
3049.11	.055	4898	.035	5096	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4898	5096		1.4	168.21		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24565

INPUT

Description: 24565

Station Elevation Data			num=							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
1992.8	228	2124	224.3	2533.6	224.4	2901	215.9	3003.9	215.4	
3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	3429.4	210.3	
3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	4082.5	209.8	
4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	4400	203.3	
4450	203.3	4480	208	4550	212.8	4600	209	4637.9	209.8	
4701.8	209.3	4754.9	208.9	4833.6	208.4	4895.1	209.2	4932	211.6	
4946.5	212.1	4952	212.2	4954	194.5	4973	194.5	4984	194.5	
5005	194.5	5045	194.5	5127	194.5	5149	206.3	5160	209.5	
5173	209	5179	211.4	5227	212.3	5283	212.7	5303	212.6	
5344	212.1	5357	212	5364	207.9	5368	207.7	5390	211.7	
5411	211	5425	211	5440	207.8	5484	207.5	5509	205.7	
5514	202.1	5521	200.9	5534	200.3	5541	198	5551	198.2	
5562	198.2	5572	198.4	5582	198	5590	200	5593	202.1	
5597	205.3	5612	217.2	5628	226.3					

Manning's n Values			num=		
Sta	n Val	Sta	n Val	Sta	n Val
1992.8	.055	4952	.035	5149	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4952	5149		4.2	46.6		.3	.5
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24561

INPUT

Description: 24561

Station Elevation Data			num=							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	

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1992.8	228	2124	224.3	2533.6	224.4	2901	215.9	3003.9	215.4
3096	216.9	3143.5	210	3211.2	209.3	3314.6	210.2	3429.4	210.3
3562.7	210.3	3733.8	210.5	3855.1	210.6	3938.5	207.8	4082.5	209.8
4196.6	209.1	4248.4	207	4320	211.7	4365	211.5	4400	203.3
4450	203.3	4480	208	4550	212.8	4600	209	4637.9	209.8
4701.8	209.3	4754.9	208.9	4833.6	208.4	4895.1	209.2	4932	211.6
4946.5	212.1	4952	212.2	4953	202.75	4973	202.75	4984	202.75
5005	202.8	5045	202.75	5128	202.75	5149	206.3	5160	209.5
5173	209	5179	211.4	5227	212.3	5283	212.7	5303	212.6
5344	212.1	5357	212	5364	207.9	5368	207.7	5390	211.7
5411	211	5425	211	5440	207.8	5484	207.5	5509	205.7
5514	202.1	5521	200.9	5534	200.3	5541	198	5551	198.2
5562	198.2	5572	198.4	5582	198	5590	200	5593	202.1
5597	205.3	5612	217.2	5628	226.3				

Manning's n Values	num=	5
Sta n Val	Sta n Val	Sta n Val
1992.8	.2	4637.9
.055	4952	.02
5128	.055	5509
.04		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4952	5128	1.2	87.6	155	.3	.5	
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
1992.8	4952	209	F				
5128	5628	202.3	F				
Sediment Elevation	=	0					

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24516

INPUT

Description: 24516

Station Elevation Data	num=	68
Sta Elev	Sta Elev	Sta Elev
1992.8	228	2124
224.3	2533.6	224.4
2901	215.9	3003.9
215.4		
3096	216.9	3143.5
210	3211.2	209.3
3314.6	210.2	3429.4
210.3		
3562.7	210.3	3733.8
210.5	3855.1	210.6
3938.5	207.8	4082.5
209.8		
4196.6	209.1	4248.4
207	4320	211.7
4365	211.5	4400
203.3		
4450	203.3	4480
208	4550	212.8
4600	209	4637.9
209.8		
4701.8	209.3	4754.9
208.9	4833.6	208.4
4895.1	209.2	4932
211.6		
4946.5	212.1	4952
212.2	4953	202.75
4973	202.75	4984
202.75		
5005	192.5	5045
192.5	5075	204.3
5149	206.3	5160
209.5		
5173	209	5179
211.4	5227	212.3
5283	212.7	5303
212.6		
5344	212.1	5357
212	5364	207.9
5368	207.7	5390
211.7		
5411	211	5425
211	5440	207.8
5484	207.5	5509
205.7		
5514	202.1	5521
200.9	5534	200.3
5541	198	5551
198.2		
5562	198.2	5572
198.4	5582	198
5590	200	5593
202.1		
5597	205.3	5612
217.2	5628	226.3

Manning's n Values	num=	5
Sta n Val	Sta n Val	Sta n Val
1992.8	.2	4637.9
.055	4965	.04
5075	.055	5509
.04		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4965	5075	.99	213.03	524.97	.3	.5	
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
1992.8	4965	209	F				
5075	5628	205.7	F				
Sediment Elevation	=	0					

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CROSS SECTION

RIVER: Ramapo Ri ver
REACH: Reach-1

RS: 24477

INPUT

Description: 24477

Station Elevation Data		num= 100									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2785.5	228	2903.2	225.3	3288.6	224.3	3309.1	225.9	3323.8	216.9		
3337.5	217.3	3727.4	217	3731.3	217.4	3743.4	215.2	3793.7	215.6		
3819.5	216.9	3847	217	3855.8	218.3	3914.9	213	3927.2	207.2		
3939.5	207.2	3963.8	209.1	3980.5	207.3	4010.1	209.6	4082.5	210.7		
4104.9	210.7	4579.9	210.9	4599	210.6	4715.8	205.9	4735.2	210.4		
4767.5	211	4814.7	210	4850.3	210.2	4857	209.3	4915.8	209.7		
4971.1	208.7	4971.6	210.3	4972.5	205.1	5006.7	207.4	5027.5	207.1		
5030.2	210.2	5064.1	210.7	5068.5	212.9	5082.4	213.4	5087.3	213.2		
5093	210	5123	208	5131	206	5151	205	5181	206		
5221	206.5	5254	206	5258	204	5266	202.5	5277	187.6		
5287	186.8	5297	186.6	5307	186.8	5317	186.8	5327	186.8		
5337	187.5	5347	188	5357	188.3	5367	188.8	5377	189.3		
5387	189.8	5397	190.8	5407	191.8	5417	193.3	5427	194.8		
5437	195.8	5447	196.8	5457	196.8	5467	195.3	5477	195.8		
5487	195.5	5497	196.3	5507	197.3	5517	197.7	5527	199.1		
5538	200.5	5542.3	201.9	5548.5	202.8	5572.7	205.6	5592.7	210.8		
5597.9	209.1	5645.8	212	5650.3	213.3	5650.4	213.3	5655	210.8		
5666	206	5666.1	206	5675.3	202.4	5692.6	201.4	5700	201		
5707.4	200.7	5718.1	202.1	5727	205	5727.1	205.1	5759.6	214.1		
5759.7	214.1	5783.9	213.9	5853.6	216.3	5945	223	5955.2	228.1		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
2785.5	.2	5266	.048	5542.3	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5266	5542.3		9.99	72		.1	.3
Ineffective Flow	num= 2		Permanent					
Sta L	Sta R	Elev						
2785.5	5266	209	F					
5542.3	5955.2	205.7	F					
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo Ri ver
REACH: Reach-1

RS: 24405

INPUT

Description: TIMBER BRIDGE
TIMBER BRIDGE

Station Elevation Data		num= 100									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2785.5	228	2903.2	225.3	3288.6	224.3	3309.1	225.9	3323.8	216.9		
3337.5	217.3	3727.4	217	3731.3	217.4	3743.4	215.2	3793.7	215.6		
3819.5	216.9	3847	217	3855.8	218.3	3914.9	213	3927.2	207.2		
3939.5	207.2	3963.8	209.1	3980.5	207.3	4010.1	209.6	4082.5	210.7		
4104.9	210.7	4579.9	210.9	4599	210.6	4715.8	205.9	4735.2	210.4		
4767.5	211	4814.7	210	4850.3	210.2	4857	209.3	4915.8	209.7		

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4971.1	208.7	4971.6	210.3	4972.5	205.1	5006.7	207.4	5027.5	207.1
5030.2	210.2	5064.1	210.7	5068.5	212.9	5082.4	213.4	5087.3	213.2
5127.3	193.4	5167	184	5207	191.4	5217	191.8	5227	191
5237	189.6	5247	188.8	5257	188.3	5267	187.8	5277	187.6
5287	186.8	5297	186.6	5307	186.8	5317	186.8	5327	186.8
5337	187.5	5347	188	5357	188.3	5367	188.8	5377	189.3
5387	189.8	5397	190.8	5407	191.8	5417	193.3	5427	194.8
5437	195.8	5447	196.8	5457	196.8	5467	195.3	5477	195.8
5487	195.5	5497	196.3	5507	197.3	5517	197.7	5527	199.1
5538	200.5	5542.3	201.9	5548.5	202.8	5572.7	205.6	5592.7	210.8
5597.9	209.1	5645.8	212	5650.3	213.3	5650.4	213.3	5655	210.8
5666	206	5666.1	206	5675.3	202.4	5692.6	201.4	5700	201
5707.4	200.7	5718.1	202.1	5727	205	5727.1	205.1	5759.6	214.1
5759.7	214.1	5783.9	213.9	5853.6	216.3	5945	223	5955.2	228.1

Manning's n Values

num=	3				
Sta n Val	Sta n Val				
2785.5	.2	5087.3	.048	5548.5	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

5087.3	5548.5	54.99	54.99	54.99	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2785.5	5087.3	209	F
5548.5	5955.2	204.7	F

Cross Section Lid num= 9

Sta Hi	Cord	Lo Cord	Sta Hi	Cord	Lo Cord	Sta Hi	Cord	Lo Cord
5650.3	213.3	213.3	5650.4	214.6	213.3	5655	214.6	210.8
5666	214.6	206	5666.1	214.6	210.8	5700	214.8	210.8
5727	214.6	210.8	5727.1	214.6	205.1	5759.6	214.6	214.1

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 24350

INPUT

Description: 24350

Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3173.2	228	3299.3	224.4	3323.8	225.3	3720.7	224.6	3723.4	226.7
3737.8	217.7	4031.1	216.9	4082.4	217.8	4142.5	217.5	4161.5	215.2
4269.7	217.1	4340.3	214.5	4360.6	206.4	4380.6	206.4	4400.6	212.7
4419.1	209.1	4449.6	208.8	4521.5	210.6	4565.2	210.6	4646	210.1
4818.7	211	4854.8	211	4861.1	209.2	4933.6	209.5	4974.8	208.5
4975.5	210.3	4976.1	205.2	5001	206.6	5023.9	206.8	5027.7	209.9
5063.7	210.4	5068	212.8	5079	213.2	5104.1	202.8	5189	177.7
5199	177.7	5222	181.3	5249	182.9	5279	185.8	5299	185.9
5309	186.5	5319	186.6	5329	186.9	5339	187.2	5349	187.6
5379	187.8	5389	188	5409	188.1	5419	189.7	5429	190
5439	190.7	5449	192.2	5459	193.5	5464	194	5469	193.4
5474	192.8	5479	194.3	5484	193.3	5489	193	5496	193.5
5499	193.3	5502	193.5	5506	193.3	5509	193.7	5516	193
5519	193	5529	191.3	5539	190	5541	189.8	5549	191.9
5559	195.3	5564	195.9	5570.3	196.9	5579.6	199.3	5589.6	201.9
5594.1	202.9	5612.2	207	5638	207.3	5650.2	210.3	5655.8	210.6
5662.8	212.5	5669	212.6	5675.8	212.4	5685.6	204.1	5695	201.5
5707.1	201.3	5718.6	200.9	5731.7	201.3	5744	201.6	5756.4	203.1
5779.8	207.1	5834.3	214	5857.4	214.7	5934.7	215.7	5951	220.4

Ramapo River Post. rep

5954 220.3 5999.8 222.8 6010.7 228

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3173.2 .2 5104.1 .048 5594.1 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5104.1 5594.1 86.68 93.32 113.32 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3173.2 5104.1 209 F
 5594.1 6010.7 204.7 F

Sediment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24303

INPUT

Description: 24303

Station El evati on Data num= 100

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2785.5	228	2903.2	225.3	3288.6	224.3	3309.1	225.9	3323.8	216.9
3337.5	217.3	3727.4	217	3731.3	217.4	3743.4	215.2	3793.7	215.6
3819.5	216.9	3847	217	3855.8	218.3	3914.9	213	3927.2	207.2
3939.5	207.2	3963.8	209.1	3980.5	207.3	4010.1	209.6	4082.5	210.7
4104.9	210.7	4579.9	210.9	4599	210.6	4715.8	205.9	4735.2	210.4
4767.5	211	4814.7	210	4850.3	210.2	4857	209.3	4915.8	209.7
4971.1	208.7	4971.6	210.3	4972.5	205.1	5006.7	207.4	5027.5	207.1
5030.2	210.2	5064.1	210.7	5068.5	212.9	5082.4	213.4	5087.3	213.2
5093	210	5123	208	5131	206	5182	192.2	5190	192.2
5200	192.2	5210	192.2	5242	192.2	5267	202	5277	187.6
5287	186.8	5297	186.6	5307	186.8	5317	186.8	5327	186.8
5337	187.5	5347	188	5357	188.3	5367	188.8	5377	189.3
5387	189.8	5397	190.8	5407	191.8	5417	193.3	5427	194.8
5437	195.8	5447	196.8	5457	196.8	5467	195.3	5477	195.8
5487	195.5	5497	196.3	5507	197.3	5517	197.7	5527	199.1
5538	200.5	5542.3	201.9	5548.5	202.8	5572.7	205.6	5592.7	210.8
5597.9	209.1	5645.8	212	5650.3	213.3	5650.4	213.3	5655	210.8
5666	206	5666.1	206	5675.3	202.4	5692.6	201.4	5700	201
5707.4	200.7	5718.1	202.1	5727	205	5727.1	205.1	5759.6	214.1
5759.7	214.1	5783.9	213.9	5853.6	216.3	5945	223	5955.2	228.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2785.5 .07 5131 .048 5542.3 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5131 5542.3 53.35 118.7 128.65 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2785.5 5131 209 F
 5542.3 5955.2 205.7 F

Sediment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24231

Ramapo River Post. rep

INPUT

Description: 24231 Timber Bridge

Station Elevation Data		num= 100		Station Elevation Data		num= 100		Station Elevation Data		num= 100	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2785.5	228	2903.2	225.3	3288.6	224.3	3309.1	225.9	3323.8	216.9		
3337.5	217.3	3727.4	217	3731.3	217.4	3743.4	215.2	3793.7	215.6		
3819.5	216.9	3847	217	3855.8	218.3	3914.9	213	3927.2	207.2		
3939.5	207.2	3963.8	209.1	3980.5	207.3	4010.1	209.6	4082.5	210.7		
4104.9	210.7	4579.9	210.9	4599	210.6	4715.8	205.9	4735.2	210.4		
4767.5	211	4814.7	210	4850.3	210.2	4857	209.3	4915.8	209.7		
4971.1	208.7	4971.6	210.3	4972.5	205.1	5006.7	207.4	5027.5	207.1		
5030.2	210.2	5064.1	210.7	5068.5	212.9	5082.4	213.4	5087.3	213.2		
5127.3	193.4	5167	184	5207	191.4	5217	191.8	5227	191		
5237	189.6	5247	188.8	5257	188.3	5267	187.8	5277	187.6		
5287	186.8	5297	186.6	5307	186.8	5317	186.8	5327	186.8		
5337	187.5	5347	188	5357	188.3	5367	188.8	5377	189.3		
5387	189.8	5397	190.8	5407	191.8	5417	193.3	5427	194.8		
5437	195.8	5447	196.8	5457	196.8	5467	195.3	5477	195.8		
5487	195.5	5497	196.3	5507	197.3	5517	197.7	5527	199.1		
5538	200.5	5542.3	201.9	5548.5	202.8	5572.7	205.6	5592.7	210.8		
5597.9	209.1	5645.8	212	5650.3	213.3	5650.4	213.3	5655	210.8		
5666	206	5666.1	206	5675.3	202.4	5692.6	201.4	5700	201		
5707.4	200.7	5718.1	202.1	5727	205	5727.1	205.1	5759.6	214.1		
5759.7	214.1	5783.9	213.9	5853.6	216.3	5945	223	5955.2	228.1		

Manning's n Values		num= 3			
Station	Value	Station	Value		
2785.5	.07	5087.3	.048	5548.5	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5087.3	5548.5		54.99	54.99		.1	.3
Ineffective Flow	num= 2		Permanent					
Station L	Station R	Elev						
2785.5	5087.3	209	F					
5548.5	5955.2	204.7	F					

Cross Section List				num= 9				
Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	
5650.3	213.3	213.3	5650.4	214.6	213.3	5655	214.6	210.8
5666	214.6	206	5666.1	214.6	210.8	5700	214.8	210.8
5727	214.6	210.8	5727.1	214.6	205.1	5759.6	214.6	214.1

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 24210

INPUT

Description: 24210

Station Elevation Data		num= 91		Station Elevation Data		num= 91		Station Elevation Data		num= 91	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2833.9	227	2957.7	224.3	3366.9	224.4	3695.5	216.9	3811.9	218		
3978	216.2	4039.4	210	4062.1	206.2	4137.6	209.4	4252.5	209.9		
4369	210.2	4465	210.1	4538	211.6	4599	211.3	4660	207.4		
4734	204.3	4735	203.9	4739	203.5	4745	202.8	4749	202.5		
4759	201.9	4769	201.9	4779	201.9	4789	203.9	4792	204		
4797	204.3	4799	210.3	4799.1	205.8	4801	210.4	4801.1	205.9		
4881	209.9	4952	208.8	4975.9	207.9	4976	205.5	5006	206.1		
5014	205.2	5024	204.4	5035	208.9	5082	210.4	5090	212.4		
5101	212.7	5121	202.7	5143	196.4	5146	194.9	5166	188.9		

Ramapo River Post. rep									
5186	181.9	5206	176.4	5226	177.9	5246	182.1	5266	182.9
5286	183.7	5306	184.6	5326	184.9	5346	185.2	5366	185.4
5386	185.8	5406	185.9	5426	185.9	5446	185.9	5466	186.4
5486	187.4	5506	188.2	5526	188.9	5546	188.9	5566	188.9
5586	189.1	5606	188.9	5626	188.7	5646	189	5666	189.1
5686	188.4	5706	187.4	5726	186.4	5746	184.9	5766	186.9
5786	191.9	5796	194.4	5806	194.4	5826	196.7	5836	202.9
5861	211.9	5881	211.5	5901	201.4	5911	200.3	5923	200.6
5933	201.5	5953	202.6	6070.2	223.4	6088.2	223.5	6103	223.3
6108.8	227								

Manning's n	Station	Value	num=	Station	Value
2833.9	5121	.2	3	5836	.08

Bank Station	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5121	5836		32.5	44.5		.1	.3
Ineffective Flow			num=	2				
Station L	Station R	Elev	Permanent					
2833.9	5121	209	F					
5836	6108.8	204.7	F					
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 24176

INPUT

Description: 24176

Station	Elevation	Data	num=	Station	Elevation	Station	Elevation	Station	Elevation
3173.2	228	3299.3	98	3323.8	225.3	3720.7	224.6	3723.4	226.7
3737.8	217.7	4031.1		4082.4	217.8	4142.5	217.5	4161.5	215.2
4269.7	217.1	4340.3		4360.6	206.4	4380.6	206.4	4400.6	212.7
4419.1	209.1	4449.6		4521.5	210.6	4565.2	210.6	4646	210.1
4818.7	211	4854.8		4861.1	209.2	4933.6	209.5	4974.8	208.5
4975.5	210.3	4976.1		5001	206.6	5023.9	206.8	5027.7	209.9
5063.7	210.4	5068		5079	213.2	5104.1	202.8	5189	177.7
5199	177.7	5222		5249	182.9	5279	185.8	5299	185.9
5309	186.5	5319		5329	186.9	5339	187.2	5349	187.6
5379	187.8	5389		5409	188.1	5419	189.7	5429	190
5439	190.7	5449		5459	193.5	5464	194	5469	193.4
5474	192.8	5479		5484	193.3	5489	193	5496	193.5
5499	193.3	5502		5506	193.3	5509	193.7	5516	193
5519	193	5529		5539	190	5541	189.8	5549	191.9
5559	195.3	5564		5570.3	196.9	5579.6	199.3	5589.6	201.9
5594.1	202.9	5612.2		5638	207.3	5650.2	210.3	5655.8	210.6
5662.8	212.5	5669		5675.8	212.4	5685.6	204.1	5695	201.5
5707.1	201.3	5718.6		5731.7	201.3	5744	201.6	5756.4	203.1
5779.8	207.1	5834.3		5857.4	214.7	5934.7	215.7	5951	220.4
5954	220.3	5999.8		6010.7	228				

Manning's n	Station	Value	num=	Station	Value
3173.2	5104.1	.07	3	5594.1	.08

Bank Station	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5104.1	5594.1		227.48	273.46		.1	.3
Ineffective Flow			num=	2				
Station L	Station R	Elev	Permanent					
3173.2	5104.1	209	F					

5594.1 6010.7 204.7
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24036

INPUT

Description: 24036

Station Elevation Data		num= 91									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2833.9	227	2957.7	224.3	3366.9	224.4	3695.5	216.9	3811.9	218		
3978	216.2	4039.4	210	4062.1	206.2	4137.6	209.4	4252.5	209.9		
4369	210.2	4465	210.1	4538	211.6	4599	211.3	4660	207.4		
4734	204.3	4735	203.9	4739	203.5	4745	202.8	4749	202.5		
4759	201.9	4769	201.9	4779	201.9	4789	203.9	4792	204		
4797	204.3	4799	210.3	4799.1	205.8	4801	210.4	4801.1	205.9		
4881	209.9	4952	208.8	4975.9	207.9	4976	205.5	5006	206.1		
5014	205.2	5024	204.4	5035	208.9	5082	210.4	5090	212.4		
5101	212.7	5121	202.7	5143	196.4	5146	194.9	5166	188.9		
5186	181.9	5206	176.4	5226	177.9	5246	182.1	5266	182.9		
5286	183.7	5306	184.6	5326	184.9	5346	185.2	5366	185.4		
5386	185.8	5406	185.9	5426	185.9	5446	185.9	5466	186.4		
5486	187.4	5506	188.2	5526	188.9	5546	188.9	5566	188.9		
5586	189.1	5606	188.9	5626	188.7	5646	189	5666	189.1		
5686	188.4	5706	187.4	5726	186.4	5746	184.9	5766	186.9		
5786	191.9	5796	194.4	5806	194.4	5826	196.7	5836	202.9		
5861	211.9	5881	211.5	5901	201.4	5911	200.3	5923	200.6		
5933	201.5	5953	202.6	6070.2	223.4	6088.2	223.5	6103	223.3		
6108.8	227										

Manning's n Values		num= 3			
Station	Value	Station	Value	Station	Value
2833.9	.07	5121	.048	5836	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5121	5836		130	178	315.04	.1
Ineffective Flow			num= 2				
	Sta L	Sta R	Elev	Permanent			
	2833.9	5121	209	F			
	5836	6108.8	204.7	F			

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 24032

INPUT

Description: 24032

Station Elevation Data		num= 87									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4408.01	217.78	4419.22	214.48	4451.25	212.72	4492	211.8	4567	212.5		
4642	211.4	4682	206.5	4747	204	4757	203.1	4767	202.3		
4777	201.2	4787	200.6	4797	199.9	4807	200.3	4817	201.5		
4822	202.6	4907	210.2	4967	208.3	4983	203.4	4988	202.2		
5002	202.4	5007	202.9	5017	203.5	5024	208.2	5063	208.6		
5071	212.1	5083	212.2	5102	202.9	5112	193.9	5120	192.4		
5140	188.4	5160	182.4	5180	184.6	5200	186.9	5220	186.9		

Ramapo River Post. rep									
5240	186.9	5260	187.4	5280	187.9	5300	185.4	5320	184.9
5340	182.9	5360	181.4	5380	180.4	5400	180.1	5420	180.8
5440	184.4	5460	184.8	5480	183.9	5500	183.7	5520	183.9
5540	184.4	5560	184.9	5580	186.7	5590	187.4	5600	186.7
5620	186.7	5640	186.9	5660	187.1	5680	187.1	5700	187.4
5720	187.7	5740	187.4	5760	187.4	5780	188.1	5800	189.3
5820	189.1	5840	186.9	5860	185.9	5880	190.9	5900	192.2
5910	193.4	5920	192.1	5940	191.9	5960	195.9	5963	202.9
5980	210.1	5994	210	6006	203.6	6018	202.9	6029	201.4
6038	200.8	6047	200.1	6059	200.1	6068	201.6	6073	203.9
6090	213.4	6123.13	218.08						

Manning's n Values
 Sta n Val Sta n Val num= 3
 4408.01 .2 5102 .048 5963 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5102 5963 140 171.99 175 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4408.01 5102 209 F
 5963 6123.13 204.7 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23860

INPUT
 Description: 23860

Station Elevation Data num= 95									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2891.2	227	2989.9	224.5	3383.7	223.7	3423.9	224.5	3536.2	220.2
3601.7	222.1	3637.3	222.8	3715	221.1	3853	221.8	3879.1	215.2
4068.4	214.1	4150.2	211.3	4324.6	209.1	4416.5	211.4	4449	211.5
4521	211.1	4586	211	4664	210.1	4733	207.2	4796	207
4848	206.1	4869	210.8	4902	210.9	4969	209	4976	203.9
5003	203.4	5024	204.2	5036	211	5053	211.8	5057	212.7
5068	212.7	5084	206.7	5089	207.1	5095	202.7	5115	198
5131	194.2	5142	191.7	5162	187.7	5182	181.9	5192	181.7
5202	182.7	5222	187.4	5242	187.4	5262	187.4	5282	186.7
5302	186.7	5322	185.7	5342	181.2	5362	183.5	5382	183.7
5402	184.2	5422	184.7	5442	185.7	5462	186.5	5482	187.2
5502	188.2	5522	187.7	5542	186.9	5562	186.6	5582	184.7
5602	183.2	5622	182.7	5642	182.7	5662	183.7	5682	184.4
5702	185.6	5722	186.4	5742	185.7	5752	184.4	5762	185.4
5782	185.9	5802	186.8	5822	187.7	5842	187.6	5862	188.7
5872	189.7	5882	188.7	5902	183.7	5922	184.3	5942	190.2
5962	190.9	5982	195.2	5987.4	202.7	5994	209.2	6003	209
6027	203.1	6040	202.6	6052	201.4	6060	200.7	6070	200.3
6083	200.4	6088	201.6	6092	203.9	6108	213.7	6129.1	227

Manning's n Values
 Sta n Val Sta n Val num= 3
 2891.2 .2 5095 .048 5987.4 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5095 5987.4 45 48.34 46.66 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent

Ramapo River Post. rep

2891.2 5095 209
 5987.4 6129.1 204.7
 Sediment Elevation = 0

F
 F

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 23858

INPUT

Description: 23858

Station Elevation Data

num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4492	211.8	4567	212.5	4642	211.4	4682	206.5	4747	204
4757	203.1	4767	202.3	4777	201.2	4787	200.6	4797	199.9
4807	200.3	4817	201.5	4822	202.6	4907	210.2	4967	208.3
4983	203.4	4988	202.2	5002	202.4	5007	202.9	5017	203.5
5024	208.2	5063	208.6	5071	212.1	5083	212.2	5102	202.9
5112	193.9	5120	192.4	5140	188.4	5160	182.4	5180	184.6
5200	186.9	5220	186.9	5240	186.9	5260	187.4	5280	187.9
5300	185.4	5320	184.9	5340	182.9	5360	181.4	5380	180.4
5400	180.1	5420	180.8	5440	184.4	5460	184.8	5480	183.9
5500	183.7	5520	183.9	5540	184.4	5560	184.9	5580	186.7
5590	187.4	5600	186.7	5620	186.7	5640	186.9	5660	187.1
5680	187.1	5700	187.4	5720	187.7	5740	187.4	5760	187.4
5780	188.1	5800	189.3	5820	189.1	5840	186.9	5860	185.9
5880	190.9	5900	192.2	5910	193.4	5920	192.1	5940	191.9
5960	195.9	5963	202.9	5980	210.1	5994	210	6006	203.6
6018	202.9	6029	201.4	6038	200.8	6047	200.1	6059	200.1
6068	201.6	6073	203.9	6090	213.4				

Manning's n Values

num= 3

Station	Value	Station	Value	Station	Value
4492	.07	5102	.048	5963	.08

Bank Sta: Left 5102 Right 5963 Lengths: Left Channel 230.01 Right 268.73 Coeff Contr. .1 Expan. .3

Ineffective Flow num= 2

Permanent

Sta L	Sta R	Elev
4492	5102	209
5963	6090	204.7

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 23715

INPUT

Description: 23715

Station Elevation Data

num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3041	227.1	3096.2	224.4	3199.6	228.8	3358.7	224.6	3427.6	223.6
3530.4	224.6	3615.7	224.1	3657.5	223.4	3708.2	223.8	3888.7	222.9
3927.2	215.3	4070.8	214.1	4149.2	213.5	4202.6	210.7	4402	208.9
4476.3	210.1	4535.4	210.3	4585.1	210.7	4626	210.3	4658	210.2
4711	210.8	4744	210.3	4785	210.4	4822	210.3	4855	210.6
4886	210.7	4911	210.2	4937	209.7	4965	205.6	4982	202.9
4989	202.2	4996	201.8	5002	201.4	5009	201.6	5018	203
5027	208.3	5037	207.8	5046	211.2	5079.8	202.6	5080	202.7

Ramapo River Post. rep									
5123	189.7	5143	187.7	5163	187.7	5183	187.2	5203	185.2
5223	182.2	5243	181.7	5263	181.7	5283	180.2	5303	180.2
5323	181.2	5343	181.9	5363	182.7	5383	184.2	5403	183.7
5423	183.9	5443	185.2	5463	188.7	5483	188.7	5503	188.4
5523	187.7	5543	187.9	5563	188.3	5583	187.9	5603	187.7
5623	187.5	5643	187.2	5663	186.9	5683	186.8	5703	186.8
5723	186.7	5743	186.7	5763	186.4	5783	187	5803	187
5823	187.5	5843	188.7	5853	189.2	5863	188.7	5883	187.7
5903	185.7	5913	185.2	5923	185.1	5943	188.7	5963	192.1
5983	195.2	5987	202.7	5998	209.1	6012	208.7	6024	202.4
6039	201.5	6050	200.8	6060	200.3	6070	199.8	6080	199.9
6090	201.5	6099	209.8	6110	216.2	6122.3	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3041 .2 5079.8 .048 5987 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5079.8 5987 53.34 38.34 51.66 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3041 5079.8 209 F
 5987 6122.3 205.2 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23686

INPUT

Description: 23686

Station Elevation Data num= 95									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2891.2	227	2989.9	224.5	3383.7	223.7	3423.9	224.5	3536.2	220.2
3601.7	222.1	3637.3	222.8	3715	221.1	3853	221.8	3879.1	215.2
4068.4	214.1	4150.2	211.3	4324.6	209.1	4416.5	211.4	4449	211.5
4521	211.1	4586	211	4664	210.1	4733	207.2	4796	207
4848	206.1	4869	210.8	4902	210.9	4969	209	4976	203.9
5003	203.4	5024	204.2	5036	211	5053	211.8	5057	212.7
5068	212.7	5084	206.7	5089	207.1	5095	202.7	5115	198
5131	194.2	5142	191.7	5162	187.7	5182	181.9	5192	181.7
5202	182.7	5222	187.4	5242	187.4	5262	187.4	5282	186.7
5302	186.7	5322	185.7	5342	181.2	5362	183.5	5382	183.7
5402	184.2	5422	184.7	5442	185.7	5462	186.5	5482	187.2
5502	188.2	5522	187.7	5542	186.9	5562	186.6	5582	184.7
5602	183.2	5622	182.7	5642	182.7	5662	183.7	5682	184.4
5702	185.6	5722	186.4	5742	185.7	5752	184.4	5762	185.4
5782	185.9	5802	186.8	5822	187.7	5842	187.6	5862	188.7
5872	189.7	5882	188.7	5902	183.7	5922	184.3	5942	190.2
5962	190.9	5982	195.2	5987.4	202.7	5994	209.2	6003	209
6027	203.1	6040	202.6	6052	201.4	6060	200.7	6070	200.3
6083	200.4	6088	201.6	6092	203.9	6108	213.7	6129.1	227

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2891.2 .07 5095 .048 5987.4 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5095 5987.4 241.65 221.67 243.36 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent

Ramapo River Post. rep

2891.2 5095 209
 5987.4 6129.1 204.7
 Sediment Elevation = 0

F
 F

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 23600

INPUT

Description: 23600

Station Elevation Data

num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3464	227	3580.2	227	3660.1	228	3708.2	226.7	3759.2	226.2
3837.7	225.6	3952.5	223.8	3998.5	223	4035.3	222.9	4100.2	221.6
4186.4	210	4271.7	208.3	4377	207.6	4434.7	208.1	4523.9	208.2
4574.6	209.6	4674	209.6	4741	209.4	4806	210.1	4888	209.9
4964	209.5	4978	203.3	4994	200.9	5016	200.5	5022	203.3
5035	210	5053	210	5069	202.7	5072	196.9	5077	192.1
5087	189.6	5097	189.6	5107	189.6	5127	189.1	5147	189.1
5167	186.6	5187	181.6	5207	178.6	5227	176.6	5247	175.6
5267	175.1	5287	175.1	5307	175.3	5327	175.8	5347	177.6
5367	180.4	5387	183.2	5407	183.8	5427	183.2	5447	183.8
5467	186.6	5487	188.1	5507	188.6	5527	188.6	5547	188.8
5567	189.3	5587	189.3	5607	188.8	5627	188.6	5647	188.1
5667	187.7	5687	187.7	5707	187.6	5727	187.6	5747	187.4
5767	187.6	5787	188.2	5807	191.9	5827	189.4	5847	190.6
5867	186.6	5887	184.6	5907	185.1	5927	189.6	5947	191.1
5967	192.2	5977	194.1	5982	195.9	5987	198.6	5990.3	202.6
6001.8	208.4	6020.1	208.2	6029.3	205.5	6034	204.9	6040.5	201.6
6050.2	200.6	6061.8	199.8	6079.4	199.1	6083.9	199	6087.6	201.6
6091.7	204.8	6117	206	6118.1	202.6	6162.8	227		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3464	.2	5069	.048	5990.3	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5069 5990.3 185 80 72.48 .1 .3

Ineffective Flow

num= 2

Sta L	Sta R	Elev	Permanent
3464	5069	209	F
5990.3	6162.8	205.2	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 23541

INPUT

Description: 23541

Station Elevation Data

num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3041	227.1	3096.2	224.4	3199.6	228.8	3358.7	224.6	3427.6	223.6
3530.4	224.6	3615.7	224.1	3657.5	223.4	3708.2	223.8	3888.7	222.9
3927.2	215.3	4070.8	214.1	4149.2	213.5	4202.6	210.7	4402	208.9
4476.3	210.1	4535.4	210.3	4585.1	210.7	4626	210.3	4658	210.2
4711	210.8	4744	210.3	4785	210.4	4822	210.3	4855	210.6
4886	210.7	4911	210.2	4937	209.7	4965	205.6	4982	202.9
4989	202.2	4996	201.8	5002	201.4	5009	201.6	5018	203

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5027	208.3	5037	207.8	5046	211.2	5079.8	202.6	5080	202.7
5123	189.7	5143	187.7	5163	187.7	5183	187.2	5203	185.2
5223	182.2	5243	181.7	5263	181.7	5283	180.2	5303	180.2
5323	181.2	5343	181.9	5363	182.7	5383	184.2	5403	183.7
5423	183.9	5443	185.2	5463	188.7	5483	188.7	5503	188.4
5523	187.7	5543	187.9	5563	188.3	5583	187.9	5603	187.7
5623	187.5	5643	187.2	5663	186.9	5683	186.8	5703	186.8
5723	186.7	5743	186.7	5763	186.4	5783	187	5803	187
5823	187.5	5843	188.7	5853	189.2	5863	188.7	5883	187.7
5903	185.7	5913	185.2	5923	185.1	5943	188.7	5963	192.1
5983	195.2	5987	202.7	5998	209.1	6012	208.7	6024	202.4
6039	201.5	6050	200.8	6060	200.3	6070	199.8	6080	199.9
6090	201.5	6099	209.8	6110	216.2	6122.3	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3041 .07 5079.8 .048 5987 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5079.8 5987 344.96 195.04 227.52 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3041 5079.8 209 F
 5987 6122.3 205.2 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23440

INPUT
 Description: 23440

Station Elevation Data num= 99

3330.5	227	3536.3	222.8	3777	211.6	3837.4	210.5	3918.1	209.8
4063	209	4202	207.5	4317.7	207.7	4375.5	209	4404	209.3
4412	209.3	4462	208.9	4512	209.1	4562	208.5	4612	208
4662	208.6	4712	208.7	4762	208.9	4812	208.6	4861.8	206.6
4863	206.7	4883	206.1	4898	205	4911	202.8	4922	202.9
4924	204.9	4940	206	4943	202.8	4946	202.6	4948	202.3
4952	202.6	4955	203	4964	202.6	4971	202	4978	202.6
4985	203.1	4993	202.6	4998	201.5	5003	201.5	5007	202.6
5019	209.1	5024	209.4	5031	209.3	5041.1	202.7	5047	196.9
5062	194.6	5082	191.4	5102	188.9	5122	185.4	5142	181.2
5162	178.4	5182	176.4	5202	177.6	5222	181.9	5242	186.4
5262	191.1	5282	193.4	5302	189.2	5322	186.2	5342	185.6
5362	185.7	5382	186.1	5402	186.9	5422	186.9	5442	186.6
5462	186.9	5482	187.2	5502	187.2	5522	187.2	5542	187.6
5562	186.9	5582	187.9	5602	188.9	5622	185.4	5642	184.1
5662	186.2	5682	191.4	5702	190.4	5722	192.2	5732	194.2
5742	202.4	5752	207.3	5766.8	208.3	5786	208.4	5805	204.1
5807	201.3	5817	199.1	5827	198.5	5837	198.3	5847	198.4
5860	201.4	5867	204.9	5887	205.6	5906.4	205	5971.5	220
6000	222	6015.3	221.8	6031	221.1	6050.8	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3330.5 .2 5041.1 .048 5742 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
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5041.1	5742		.34	46.66	53.34	.3	.5
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Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3330.5 5041.1 209 F
 5742 6050.8 205.5 F
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 23426

INPUT

Descripti on: 23426

Stati on El evati on Data		num=	94						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3464	227	3580.2	227	3660.1	228	3708.2	226.7	3759.2	226.2
3837.7	225.6	3952.5	223.8	3998.5	223	4035.3	222.9	4100.2	221.6
4186.4	210	4271.7	208.3	4377	207.6	4434.7	208.1	4523.9	208.2
4574.6	209.6	4674	209.6	4741	209.4	4806	210.1	4888	209.9
4964	209.5	4978	203.3	4994	200.9	5016	200.5	5022	203.3
5035	210	5053	210	5069	202.7	5072	196.9	5077	192.1
5087	189.6	5097	189.6	5107	189.6	5127	189.1	5147	189.1
5167	186.6	5187	181.6	5207	178.6	5227	176.6	5247	175.6
5267	175.1	5287	175.1	5307	175.3	5327	175.8	5347	177.6
5367	180.4	5387	183.2	5407	183.8	5427	183.2	5447	183.8
5467	186.6	5487	188.1	5507	188.6	5527	188.6	5547	188.8
5567	189.3	5587	189.3	5607	188.8	5627	188.6	5647	188.1
5667	187.7	5687	187.7	5707	187.6	5727	187.6	5747	187.4
5767	187.6	5787	188.2	5807	191.9	5827	189.4	5847	190.6
5867	186.6	5887	184.6	5907	185.1	5927	189.6	5947	191.1
5967	192.2	5977	194.1	5982	195.9	5987	198.6	5990.3	202.6
6001.8	208.4	6020.1	208.2	6029.3	205.5	6034	204.9	6040.5	201.6
6050.2	200.6	6061.8	199.8	6079.4	199.1	6083.9	199	6087.6	201.6
6091.7	204.8	6117	206	6118.1	202.6	6162.8	227		

Manni ng' s n Val ues		num=	3
Sta	n Val	Sta	n Val
3464	.07	5069	.048
		5990.3	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
5069	5990.3	370.7	253.33	251.68	.1	.3	

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3464 5069 209 F
 5990.3 6162.8 205.2 F
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 23300

INPUT

Descri pti on: 23300

Stati on El evati on Data		num=	69						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3330.5	227	3536.3	222.8	3777	211.6	3837.4	210.5	3918.1	209.8
4063	209	4202	207.5	4317.7	207.7	4375.5	209	4404	209.3
4412	209.3	4462	208.9	4512	209.1	4562	208.5	4612	208

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4662	208.6	4712	208.7	4762	208.9	4812	208.6	4861.8	206.6
4863	206.7	4883	206.1	4898	205	4911	202.8	4922	202.9
4924	204.9	4940	206	4943	202.8	4946	202.6	4948	202.3
4952	202.6	4955	203	4964	202.6	4971	202	4978	202.6
4985	203.1	4993	202.6	4998	201.5	5003	201.5	5007	202.6
5019	209.1	5024	209.4	5031	209.3	5041.1	202.7	5045.1	196.9
5135.7	176.4	5202.8	193.4	5417.7	188.9	5444.6	184.1	5484.8	190.4
5512	202.4	5522	207.3	5536.8	208.3	5556	208.4	5575	204.1
5577	201.3	5587	199.1	5597	198.5	5607	198.3	5617	198.4
5630	201.4	5637	204.9	5657	205.6	5676.4	205	5741.5	220
5770	222	5785.3	221.8	5801	221.1	5820.8	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3330.5 .2 5041.1 .048 5512 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5041.1 5512 45 45 45 .6 .8
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3330.5 5041.1 208 F
 5512 5820.8 205.5 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 23266

INPUT

Description: 23266

Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3330.5	227	3536.3	222.8	3777	211.6	3837.4	210.5	3918.1	209.8
4063	209	4202	207.5	4317.7	207.7	4375.5	209	4404	209.3
4412	209.3	4462	208.9	4512	209.1	4562	208.5	4612	208
4662	208.6	4712	208.7	4762	208.9	4812	208.6	4861.8	206.6
4863	206.7	4883	206.1	4898	205	4911	202.8	4922	202.9
4924	204.9	4940	206	4943	202.8	4946	202.6	4948	202.3
4952	202.6	4955	203	4964	202.6	4971	202	4978	202.6
4985	203.1	4993	202.6	4998	201.5	5003	201.5	5007	202.6
5019	209.1	5024	209.4	5031	209.3	5041.1	202.7	5047	196.9
5062	194.6	5082	191.4	5102	188.9	5122	185.4	5142	181.2
5162	178.4	5182	176.4	5202	177.6	5222	181.9	5242	186.4
5262	191.1	5282	193.4	5302	189.2	5322	186.2	5342	185.6
5362	185.7	5382	186.1	5402	186.9	5422	186.9	5442	186.6
5462	186.9	5482	187.2	5502	187.2	5522	187.2	5542	187.6
5562	186.9	5582	187.9	5602	188.9	5622	185.4	5642	184.1
5662	186.2	5682	191.4	5702	190.4	5722	192.2	5732	194.2
5742	202.4	5752	207.3	5766.8	208.3	5786	208.4	5805	204.1
5807	201.3	5817	199.1	5827	198.5	5837	198.3	5847	198.4
5860	201.4	5867	204.9	5887	205.6	5906.4	205	5971.5	220
6000	222	6015.3	221.8	6031	221.1	6050.8	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3330.5 .07 5041.1 .048 5742 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5041.1 5742 136.07 275 295.02 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent

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3330.5 5041.1 209
 5742 6050.8 205.5
 Sediment Elevation = 0

F
 F

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 23126

INPUT

Description: 23126

Station Elevation Data

num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3330.5	227	3536.3	222.8	3777	211.6	3837.4	210.5	3918.1	209.8
4063	209	4202	207.5	4317.7	207.7	4375.5	209	4404	209.3
4412	209.3	4462	208.9	4512	209.1	4562	208.5	4612	208
4662	208.6	4712	208.7	4762	208.9	4812	208.6	4861.8	206.6
4863	206.7	4883	206.1	4898	205	4911	202.8	4922	202.9
4924	204.9	4940	206	4943	202.8	4946	202.6	4948	202.3
4952	202.6	4955	203	4964	202.6	4971	202	4978	202.6
4985	203.1	4993	202.6	4998	201.5	5003	201.5	5007	202.6
5019	209.1	5024	209.4	5031	209.3	5041.1	202.7	5045.1	196.9
5135.7	176.4	5202.8	193.4	5417.7	188.9	5444.6	184.1	5484.8	190.4
5512	202.4	5522	207.3	5536.8	208.3	5556	208.4	5575	204.1
5577	201.3	5587	199.1	5597	198.5	5607	198.3	5617	198.4
5630	201.4	5637	204.9	5657	205.6	5676.4	205	5741.5	220
5770	222	5785.3	221.8	5801	221.1	5820.8	227		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3330.5	.07	5041.1	.048	5512	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5041.1 5512 180 180 180 .6 .8

Ineffective Flow

num= 2

Sta L	Sta R	Elev	Permanent
3330.5	5041.1	208	F
5512	5820.8	205.5	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 23120

INPUT

Description: 23120

This is a REPEATED section.

Station Elevation Data

num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3245	224	3346.1	222.2	3431.5	222.1	3528.6	220.8	3589.7	213.3
3703.1	210.7	3781.9	210.1	3852.2	208.6	3939.6	208.1	4005.5	208.7
4110.3	209.7	4136.4	209.9	4180.2	208.9	4202.5	209.1	4234.4	208.9
4298	209.2	4348.5	208.3	4398.5	208.3	4448.5	208	4498.5	207.4
4548.5	206.2	4598.5	206.5	4648.5	205.7	4698	205.4	4748.5	205.1
4798.5	205.5	4848.5	205.5	4898.5	205.2	4948.5	205.4	4971	204.5
4975	202.6	5023.9	202.7	5027.1	206.5	5048.5	202.6	5068.4	207.8
5086.9	202.8	5095.9	200.7	5100.5	199.8	5125.4	199.7	5130.4	202
5135.6	202.8	5145.2	205.5	5151	206.1	5173.7	207.5	5176.2	206.6
5192.7	205.9	5197.9	207.5	5224.2	208.2	5256.5	205	5270	206.7

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5272	208.6	5346	208.9	5385.4	208.4	5411.7	206.7	5448.7	208.3
5492.5	209	5504.7	208.7	5507.7	208.7	5511.2	208.3	5523.4	208.3
5530.4	199.5	5543.3	199.3	5554.5	207.9	5567.3	202.2	5568.4	205
5569.4	203	5586.2	204.4	5611.6	204.2	5623.8	204.2	5625.7	203.9
5687.4	203.4	5691.5	201.5	5703	201.1	5710	203	5716	200.9
5724	201.5	5726.5	203	5767	203.2	5839.5	206.2	5867.5	209.1
5907.4	212	5945.5	216.1	5967.1	217.3	5987.6	217.4	5997.4	220.4
6011.2	227								

Manning's n Values num= 3

Station Val	Station Val	Station Val	Station Val		
3245	.2	5048.5	.048	5130.4	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

5048.5	5130.4	30	30	30	.6	.8
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3245	5048.5	207.9	F
5130.4	6011.2	205	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 23090

INPUT
Description: 23090

Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3245	224	3346.1	222.2	3431.5	222.1	3528.6	220.8	3589.7	213.3
3703.1	210.7	3781.9	210.1	3852.2	208.6	3939.6	208.1	4005.5	208.7
4110.3	209.7	4136.4	209.9	4180.2	208.9	4202.5	209.1	4234.4	208.9
4298	209.2	4348.5	208.3	4398.5	208.3	4448.5	208	4498.5	207.4
4548.5	206.2	4598.5	206.5	4648.5	205.7	4698	205.4	4748.5	205.1
4798.5	205.5	4848.5	205.5	4898.5	205.2	4948.5	205.4	4971	204.5
4975	202.6	5023.9	202.7	5027.1	206.5	5048.5	202.6	5068.4	207.8
5086.9	202.8	5095.9	200.7	5100.5	199.8	5125.4	199.7	5130.4	202
5135.6	202.8	5145.2	205.5	5151	206.1	5173.7	207.5	5176.2	206.6
5192.7	205.9	5197.9	207.5	5224.2	208.2	5256.5	205	5270	206.7
5272	208.6	5346	208.9	5385.4	208.4	5411.7	206.7	5448.7	208.3
5492.5	209	5504.7	208.7	5507.7	208.7	5511.2	208.3	5523.4	208.3
5530.4	199.5	5543.3	199.3	5554.5	207.9	5567.3	202.2	5568.4	205
5569.4	203	5586.2	204.4	5611.6	204.2	5623.8	204.2	5625.7	203.9
5687.4	203.4	5691.5	201.5	5703	201.1	5710	203	5716	200.9
5724	201.5	5726.5	203	5767	203.2	5839.5	206.2	5867.5	209.1
5907.4	212	5945.5	216.1	5967.1	217.3	5987.6	217.4	5997.4	220.4
6011.2	227								

Manning's n Values num= 3

Station Val	Station Val	Station Val	Station Val		
3245	.2	5048.5	.048	5130.4	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

5048.5	5130.4	63	63	63	.6	.8
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3245	5048.5	207.5	F
5130.4	6011.2	204.9	F

Sediment Elevation = 0

Ramapo River Post. rep

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 23027

INPUT

Description: 23027

Station Elevation Data		num= 99		Station Elevation Data		num= 99		Station Elevation Data		num= 99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2952.3	231.2	3083.8	222	3117.6	221.8	3125.1	223.7	3138	223		
3148.3	223.6	3315.6	221.6	3329	222.2	3395.9	222.1	3490.6	213.3		
3558.8	211.2	3631.2	210.5	3680.9	209.3	3806.5	208	3813.9	208.4		
3823.4	208.1	3860.9	208.1	3870.2	208.3	3905.9	209.3	3947.3	209.7		
3979.3	210.2	3996.6	210.6	4012.7	210.4	4038.1	210.4	4051.4	209.3		
4077.1	209.3	4117.6	209.5	4151.4	209.2	4179	208.9	4238	208.5		
4270	208.3	4334	208.5	4383	208	4440	207.7	4488	206.8		
4532	207.2	4545	206.8	4599	207.2	4622	206.6	4648	205.3		
4698	205	4751	204.7	4794	205.6	4827	204.5	4871	205.5		
4890	205.2	4902	206	4919	205.8	4920	203.6	4923	202.5		
4929	201.3	4932	200.5	4936	198.5	4942	196.5	4947	195		
4955	195	4962	197	4970	198.3	4978	199.2	4988	200.3		
4995	201.4	5001	202	5008	200.4	5015	199.6	5022	199		
5026	198.8	5029	198.8	5037	199.1	5045	199.3	5052	199.5		
5062	200.1	5069	200.9	5077	201.8	5081	202.5	5087	204.2		
5102	204.9	5623	204.1	5632.8	203.5	5646	203.8	5649	201.2		
5662	199.6	5675	199.6	5694	198.9	5701	198.7	5709	201.2		
5710	202.6	5715	205.9	5723	206.3	5723.1	206.3	5748.9	205.4		
5761.8	205	5811	205	5844.6	204.7	5859.8	205.8	5875.5	206.2		
5884	209.2	5905.7	209.2	5923.4	219.9	5939.6	227				

Manning's n Values		num= 3		Manning's n Values	
Station	n Value	Station	n Value	Station	n Value
2952.3	.07	4919	.042	5081	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4919	5081		22	22	22		.6	.8

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 23005

INPUT

Description: TERRACE ISLAND BRIDGE
TERRACE ISLAND BRIDGE

Station Elevation Data		num= 97		Station Elevation Data		num= 97		Station Elevation Data		num= 97	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2966.4	231	3096.4	221.9	3121.1	221.2	3166.4	222.9	3190	222		
3267.9	222.1	3308.2	221.5	3412.9	221.5	3442.7	220.3	3494.7	213.2		
3534.5	212.6	3649.4	210.4	3813.1	207.9	3875.5	208	4056.9	210.2		
4078	209.3	4143.5	209.1	4184.3	209.3	4537.7	207.5	4572	206.9		
4623.4	206.2	4676.7	205.3	4715.6	205.6	4744.6	205.4	4773.1	205.4		
4790.8	205.5	4811.5	205.9	4840.8	205.4	4870.5	204.9	4913	205.6		
4933	205.1	4934	202.5	4934.1	200.7	4937	198.9	4947	196.4		
4957	195.8	4967	194	4977	197.5	4987	198.8	4997	201.6		
5003	202.5	5007	202.8	5009	202.5	5010	202	5017	201.1		
5027	201	5037	200.4	5047	200.6	5057	200.5	5062	201		
5065	202.5	5065.5	203.6	5077	204.6	5575	206.9	5595	206.7		

Ramapo River Post. rep									
5598	204.6	5598.1	204.6	5601	202.8	5604	201.2	5612	199.2
5622	198.4	5635	198.7	5643	201.2	5647	202.5	5648.4	204
5648.5	204	5651	206.6	5651.1	207	5652.5	206.5	5658	206.5
5663.1	206.8	5689.9	205.9	5715	205.6	5733.1	205.7	5789.2	205.1
5821.8	205.3	5846.3	205.3	5879.9	205.4	5925.6	205.2	5955.6	205.7
5977.2	205.2	5999.7	205.1	6037.3	204.7	6043.1	206.1	6062.6	208
6089.8	209.2	6096.6	209.2	6125.6	209.1	6140.3	210.3	6164.5	212
6204.6	213.9	6219.8	214.8	6363.4	214	6422.3	216.4	6442.2	218
6456.1	220.4	6478.2	227						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2966.4 .07 4933 .03 5663.1 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4933 5663.1 15 15 15 .05 .2

Cross Section Lid

num= 92									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
2966.4		231		231	3096.4	221.9	221.9	3121.1	221.2
3166.4	222.9	222.9		222.9	3190	222	222	3267.9	222.1
3308.2	221.5	221.5		221.5	3412.9	221.5	221.5	3442.7	220.3
3494.7	213.2	213.2		213.2	3534.5	212.6	212.6	3649.4	210.4
3813.1	207.9	207.9		207.9	3875.5	208	208	4056.9	210.2
4078	209.3	209.3		209.3	4143.5	209.1	209.1	4184.3	209.3
4537.7	207.5	207.5		207.5	4572	206.9	206.9	4623.4	206.2
4676.7	205.3	205.3		205.3	4715.6	205.6	205.6	4744.6	205.4
4773.1	205.4	205.4		205.4	4790.8	205.5	205.5	4811.5	205.9
4840.8	205.4	205.4		205.4	4870.5	204.9	204.9	4913	205.6
4933	205.1	205.1		205.1	4934	202.5	202.5	4934.1	200.7
4937	198.9	198.9		198.9	4947	196.4	196.4	4957	195.8
4967	194	194		194	4977	197.5	197.5	4987	198.8
4997	201.6	201.6		201.6	5003	202.5	202.5	5007	202.8
5009	202.5	202.5		202.5	5010	202	202	5017	201.1
5027	201	201		201	5037	200.4	200.4	5047	200.6
5057	200.5	200.5		200.5	5062	201	201	5065	202.5
5065.5	203.6	203.6		203.6	5077	204.6	204.6	5575	206.9
5595	207	206.7		206.7	5598	207	204.6	5598.1	210
5601	210	202.8		202.8	5604	210	204.6	5648.4	209.8
5648.5	209.8	204		204	5651	209.8	207	5651.1	207
5652.5	206.5	206.5		206.5	5658	206.5	206.5	5663.1	206.8
5689.9	205.9	205.9		205.9	5715	205.6	205.6	5733.1	205.7
5789.2	205.1	205.1		205.1	5821.8	205.3	205.3	5846.3	205.3
5879.9	205.4	205.4		205.4	5925.6	205.2	205.2	5955.6	205.7
5977.2	205.2	205.2		205.2	5999.7	205.1	205.1	6037.3	204.7
6043.1	206.1	206.1		206.1	6062.6	208	208	6089.8	209.2
6096.6	209.2	209.2		209.2	6125.6	209.1	209.1	6140.3	210.3
6164.5	212	212		212	6204.6	213.9	213.9	6219.8	214.8
6363.4	214	214		214	6422.3	216.4	216.4	6442.2	218
6456.1	220.4	220.4		220.4	6478.2	227	227		

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 22990

INPUT
 Description: 22990

Station Elevation Data num= 99
 Sta Elev Sta Elev Sta Elev Sta Elev

Ramapo River Post. rep

2959.4	231	3110	221.1	3162.7	222.2	3285.1	220.9	3318	221.2
3416.7	220.7	3535	211.7	3784.6	208.9	3861	207.3	3871.6	208.5
3909.3	208	3941.5	208.5	3967	208.7	3989.3	209	4006	209
4023.1	209.8	4048.1	210.2	4067.6	209.2	4092.9	209.1	4126.6	209.1
4169.4	209.3	4176.9	209.2	4202.9	209.2	4244.4	209.1	4306	209.1
4355.9	208.7	4414	208.1	4470.2	207.2	4516.9	207.2	4565.7	207.1
4615.1	206.1	4656.1	205.2	4684.3	205.4	4760	206	4795.7	206.6
4818.1	207	4850.3	205.4	4915	205.5	4935	204.8	4936	202.4
4940	199.8	4945	197.2	4955	195.4	4965	193.9	4975	195.6
4985	197.9	4995	200.5	5000	201.5	5009	202.5	5012	202.7
5015	202.5	5020	201.8	5025	201.8	5031	201.4	5035	200.6
5045	200.5	5055	199.3	5058	199.8	5062	201.9	5085	204.9
5575	207.5	5594	206.7	5601	201.2	5607	199.6	5621	198.9
5633	198.8	5644	201.2	5645	202.6	5652	206.3	5654	206.7
5655.2	206.5	5675	206.5	5704.5	206.2	5735	205.7	5781.6	206
5809.3	205.1	5840.4	205.5	5868.5	205.5	5907.9	205.8	5939.4	205.2
5973.5	205.3	5992.7	205.6	6012.7	204.4	6040.3	204.4	6057.2	205.9
6077.6	208.2	6108.7	209.3	6135.3	209.1	6143	208.2	6160.3	210.1
6200.9	212.6	6234.3	213.9	6255.9	214.1	6304.8	214.4	6369.7	214
6420.7	216	6454.4	218	6464.6	220	6491.6	227.1		

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
2959.4	.06	4935	.028	5655.2	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4935	5655.2	35.01	60	80.01	.05	.2	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 22946

INPUT

Description: 22946

Station Elevation Data	num=	76							
Sta El ev	Sta El ev	Sta El ev	Sta El ev	Sta El ev					
3245	224	3346.1	222.2	3431.5	222.1	3528.6	220.8	3589.7	213.3
3703.1	210.7	3781.9	210.1	3852.2	208.6	3939.6	208.1	4005.5	208.7
4110.3	209.7	4136.4	209.9	4180.2	208.9	4202.5	209.1	4234.4	208.9
4298	209.2	4348.5	208.3	4398.5	208.3	4448.5	208	4498.5	207.4
4548.5	206.2	4598.5	206.5	4648.5	205.7	4698	205.4	4748.5	205.1
4798.5	205.5	4848.5	205.5	4898.5	205.2	4948.5	205.4	4971	204.5
4975	202.6	5023.9	202.7	5027.1	206.5	5030	207.8	5072	191.2
5172	191.2	5215	208.2	5224.2	208.2	5256.5	205	5270	206.7
5272	208.6	5346	208.9	5385.4	208.4	5411.7	206.7	5448.7	208.3
5492.5	209	5504.7	208.7	5507.7	208.7	5511.2	208.3	5523.4	208.3
5530.4	199.5	5543.3	199.3	5554.5	207.9	5567.3	202.2	5568.4	205
5569.4	203	5586.2	204.4	5611.6	204.2	5623.8	204.2	5625.7	203.9
5687.4	203.4	5691.5	201.5	5703	201.1	5710	203	5716	200.9
5724	201.5	5726.5	203	5767	203.2	5839.5	206.2	5867.5	209.1
5907.4	212	5945.5	216.1	5967.1	217.3	5987.6	217.4	5997.4	220.4
6011.2	227								

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
3245	.07	5030	.048	5215	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
5030	5215	30	30	30	.6	.8	
Ineffective Flow	num=	2					

Ramapo River Post. rep

Sta L Sta R El ev Permanent
 3245 5030 207.9 F
 5215 6011.2 205 F
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 22930

INPUT
 Descri pti on: 22930

Stati on El evati on Data			num=	99							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2996.4	231.4	3110.9	221.3	3151.1	221.3	3160.5	220.7	3190.1	221.7		
3215.5	221.7	3291	220.2	3339.8	221.1	3454.2	220	3497.2	214.2		
3607.8	211.6	3808.6	209.2	3841.4	208.5	3884.7	208	3948.8	209.2		
3987.2	209.3	4074.1	211.2	4093.1	209.8	4187.5	209.5	4194	209		
4238	208.5	4291	208.4	4345	208.5	4415	207.9	4475	207.4		
4540	206.8	4605	206.5	4654	205.4	4682	205.9	4714.4	205.3		
4761	205.3	4812	205.6	4860	205.8	4891	203.6	4902	203.3		
4914	204.5	4922	204.7	4931	203.7	4943	203.3	4944	202.6		
4945	201.7	4949	198.6	4956	197.4	4961	197.3	4971	197.2		
4981	198.6	4991	199.9	5001	199.9	5011	200.2	5021	200.9		
5031	200.7	5041	201.5	5051	201.3	5055	201.9	5055.1	202.6		
5058	204.4	5071	204.7	5497	203	5515	203.6	5516	201.2		
5521	200.7	5527	199.1	5535	198.8	5545	198	5554	198.3		
5561	201.2	5571	207.9	5574	207.7	5596.7	208.6	5672	206.4		
5795.6	205.2	5816.4	205.2	5870	205.7	5945.8	204.8	6012	205.9		
6034	205.3	6055.8	205.9	6077.3	205.8	6100.4	207.9	6163.8	208.2		
6181.8	209.1	6193.3	208.6	6202.9	208.5	6227	210.1	6249.8	211.6		
6295.9	213.8	6327.3	215.2	6362.8	215.9	6384.5	216.9	6386.9	218.3		
6393.8	218.1	6412.7	220.7	6448.4	221	6453.1	219.2	6463	219.8		
6464.7	223.7	6477.6	223.7	6502.2	225.3	6622.8	227				

Manni ng' s n Val ues			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	
2996.4	.06	4914	.028	5596.7	.06	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4914 5596.7 50 36.66 63.34 .05 .2
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 22916

INPUT
 Descri pti on: 22916

Stati on El evati on Data			num=	76							
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3245	224	3346.1	222.2	3431.5	222.1	3528.6	220.8	3589.7	213.3		
3703.1	210.7	3781.9	210.1	3852.2	208.6	3939.6	208.1	4005.5	208.7		
4110.3	209.7	4136.4	209.9	4180.2	208.9	4202.5	209.1	4234.4	208.9		
4298	209.2	4348.5	208.3	4398.5	208.3	4448.5	208	4498.5	207.4		
4548.5	206.2	4598.5	206.5	4648.5	205.7	4698	205.4	4748.5	205.1		
4798.5	205.5	4848.5	205.5	4898.5	205.2	4948.5	205.4	4971	204.5		
4975	202.6	5023.9	202.7	5027.1	206.5	5030	207.8	5072	191.2		
5172	191.2	5215	208.2	5224.2	208.2	5256.5	205	5270	206.7		

Ramapo River Post. rep

5272	208.6	5346	208.9	5385.4	208.4	5411.7	206.7	5448.7	208.3
5492.5	209	5504.7	208.7	5507.7	208.7	5511.2	208.3	5523.4	208.3
5530.4	199.5	5543.3	199.3	5554.5	207.9	5567.3	202.2	5568.4	205
5569.4	203	5586.2	204.4	5611.6	204.2	5623.8	204.2	5625.7	203.9
5687.4	203.4	5691.5	201.5	5703	201.1	5710	203	5716	200.9
5724	201.5	5726.5	203	5767	203.2	5839.5	206.2	5867.5	209.1
5907.4	212	5945.5	216.1	5967.1	217.3	5987.6	217.4	5997.4	220.4
6011.2	227								

Manning's n Values

num=	3
Sta n Val	Sta n Val
3245 .07	5030 .048
	5215 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

5030	5215	125.04	136.38	476.7	.6	.8
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3245	5030	207.5	F
5215	6011.2	204.9	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 22853

INPUT

Description: 22853

Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2952.3	231.2	3083.8	222	3117.6	221.8	3125.1	223.7	3138	223
3148.3	223.6	3315.6	221.6	3329	222.2	3395.9	222.1	3490.6	213.3
3558.8	211.2	3631.2	210.5	3680.9	209.3	3806.5	208	3813.9	208.4
3823.4	208.1	3860.9	208.1	3870.2	208.3	3905.9	209.3	3947.3	209.7
3979.3	210.2	3996.6	210.6	4012.7	210.4	4038.1	210.4	4051.4	209.3
4077.1	209.3	4117.6	209.5	4151.4	209.2	4179	208.9	4238	208.5
4270	208.3	4334	208.5	4383	208	4440	207.7	4488	206.8
4532	207.2	4545	206.8	4599	207.2	4622	206.6	4648	205.3
4698	205	4751	204.7	4794	205.6	4827	204.5	4871	205
4906	191.1	5006	191.1	5026	199	5045	199.3	5052	199.5
5062	200.1	5069	200.9	5077	201.8	5081	202.5	5087	204.2
5102	204.9	5623	204.1	5632.8	203.5	5646	203.8	5649	201.2
5662	199.6	5675	199.6	5694	198.9	5701	198.7	5709	201.2
5710	202.6	5715	205.9	5723	206.3	5723.1	206.3	5748.9	205.4
5761.8	205	5811	205	5844.6	204.7	5859.8	205.8	5875.5	206.2
5884	209.2	5905.7	209.2	5923.4	219.9	5939.6	227		

Manning's n Values num= 3

Sta n Val	Sta n Val
2952.3 .07	4871 .042
	5081 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4871	5081	20	22	35	.6	.8
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Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 22831

INPUT

Ramapo River Post. rep

Description: 22831 Terrace Island Bridge

Station Elevation Data		num= 82		Station Elevation Data		num= 82		Station Elevation Data		num= 82	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2966.4	231	3096.4	221.9	3121.1	221.2	3166.4	222.9	3190	222		
3267.9	222.1	3308.2	221.5	3412.9	221.5	3442.7	220.3	3494.7	213.2		
3534.5	212.6	3649.4	210.4	3813.1	207.9	3875.5	208	4056.9	210.2		
4078	209.3	4143.5	209.1	4184.3	209.3	4537.7	207.5	4572	206.9		
4623.4	206.2	4676.7	205.3	4715.6	205.6	4744.6	205.4	4773.1	205.4		
4790.8	205.5	4811.5	205.9	4840.8	205.4	4871	205	4906	191.1		
5006	191.1	5030	201	5047	200.6	5057	200.5	5062	201		
5065	202.5	5065.5	203.6	5077	204.6	5575	206.9	5595	206.7		
5598	204.6	5598.1	204.6	5601	202.8	5604	201.2	5612	199.2		
5622	198.4	5635	198.7	5643	201.2	5647	202.5	5648.4	204		
5648.5	204	5651	206.6	5651.1	207	5652.5	206.5	5658	206.5		
5663.1	206.8	5689.9	205.9	5715	205.6	5733.1	205.7	5789.2	205.1		
5821.8	205.3	5846.3	205.3	5879.9	205.4	5925.6	205.2	5955.6	205.7		
5977.2	205.2	5999.7	205.1	6037.3	204.7	6043.1	206.1	6062.6	208		
6089.8	209.2	6096.6	209.2	6125.6	209.1	6140.3	210.3	6164.5	212		
6204.6	213.9	6219.8	214.8	6363.4	214	6422.3	216.4	6442.2	218		
6456.1	220.4	6478.2	227								

Manning's n Values		num= 3	
Station	Value	Station	Value
2966.4	.07	4871	.03
		5663.1	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4871	5663.1		15	15		.05	.2

Cross Section Lid				num= 13				
Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	
5065	202.5	202.5	5065.5	203.6	203.6	5077	204.6	204.6
5575	206.9	206.9	5595	207	206.7	5598	207	204.6
5598.1	210	204.6	5601	210	202.8	5604	210	204.6
5648.4	209.8	204.7	5648.5	209.8	204	5651	209.8	207
5651.1	207	207						

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 22820

INPUT

Description: 22820

Station Elevation Data		num= 94		Station Elevation Data		num= 94		Station Elevation Data		num= 94	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2960.5	227.9	2963.9	223.7	3005.5	223.7	3010.3	220.3	3031	220.3		
3075.8	222.2	3098.3	221.1	3119.3	220.9	3159.8	222.2	3182.9	222		
3217.2	219	3238.2	220.1	3248.2	220	3266	219.4	3303.7	219.2		
3359.2	217.2	3401	213.6	3431.1	213.8	3470.9	217.8	3513.7	214.1		
3577.3	212	3602.1	212.3	3670.9	209.8	3700.1	210	3794.1	208.3		
3849.9	207.2	4011	208	4047.2	207.3	4086.7	209.5	4110.5	209.5		
4151.2	208.3	4192	209	4242	208.5	4392	208.4	4442	208.2		
4492	207.5	4592	205.6	4603	205.1	4635	206.5	4671	207		
4707	204	4728	205.1	4755	205.3	4792	205.5	4824	205.5		
4881	204.4	4886	202.6	4900	202.7	4919	202	5025	200.1		
5059	204.6	5284.4	203.8	5304.4	203.5	5308.4	201.3	5316.4	199.2		
5328.4	198	5338.4	198	5349.4	198	5362.4	199.3	5369.4	201.3		
5370.4	202.2	5378.4	202.4	5387.4	206.1	5394.4	206	5395.1	206.5		
5408.4	206.5	5426.8	205.6	5474.2	205.4	5486.1	206.1	5524.1	206.6		
5536.6	206.6	5546.3	205.7	5557.8	206.4	5622.5	206.7	5655.2	205.6		

Ramapo River Post. rep									
5745	205.5	5760.4	204	5858.4	204.5	5898.7	205.6	5931.7	205.5
5952.5	204.3	6063.2	204.4	6073.2	206.5	6118.8	207.7	6146.9	206.8
6176.9	207.8	6198.2	207	6374.6	215.2	6383.3	217.3	6416.9	220.7
6438.1	217.9	6452.2	222.2	6470.2	223.4	6602.2	227.4		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2960.5	.06	4824	.028	5387.4	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4824	5387.4		48	49		.05	.2
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 22816

INPUT

Description: 22816

Station Elevation Data num= 84									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2959.4	231	3110	221.1	3162.7	222.2	3285.1	220.9	3318	221.2
3416.7	220.7	3535	211.7	3784.6	208.9	3861	207.3	3871.6	208.5
3909.3	208	3941.5	208.5	3967	208.7	3989.3	209	4006	209
4023.1	209.8	4048.1	210.2	4067.6	209.2	4092.9	209.1	4126.6	209.1
4169.4	209.3	4176.9	209.2	4202.9	209.2	4244.4	209.1	4306	209.1
4355.9	208.7	4414	208.1	4470.2	207.2	4516.9	207.2	4565.7	207.1
4615.1	206.1	4656.1	205.2	4684.3	205.4	4760	206	4795.7	206.6
4818.1	207	4850.3	205.4	4871	205	4906	191.1	5006	191.1
5030	201	5055	199.3	5058	199.8	5062	201.9	5085	204.9
5575	207.5	5594	206.7	5601	201.2	5607	199.6	5621	198.9
5633	198.8	5644	201.2	5645	202.6	5652	206.3	5654	206.7
5655.2	206.5	5675	206.5	5704.5	206.2	5735	205.7	5781.6	206
5809.3	205.1	5840.4	205.5	5868.5	205.5	5907.9	205.8	5939.4	205.2
5973.5	205.3	5992.7	205.6	6012.7	204.4	6040.3	204.4	6057.2	205.9
6077.6	208.2	6108.7	209.3	6135.3	209.1	6143	208.2	6160.3	210.1
6200.9	212.6	6234.3	213.9	6255.9	214.1	6304.8	214.4	6369.7	214
6420.7	216	6454.4	218	6464.6	220	6491.6	227.1		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2959.4	.06	4871	.028	5655.2	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4871	5655.2		83	109		.05	.2
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 22756

INPUT

Description: 22756

Station Elevation Data num= 89									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2996.4	231.4	3110.9	221.3	3151.1	221.3	3160.5	220.7	3190.1	221.7
3215.5	221.7	3291	220.2	3339.8	221.1	3454.2	220	3497.2	214.2
3607.8	211.6	3808.6	209.2	3841.4	208.5	3884.7	208	3948.8	209.2
3987.2	209.3	4074.1	211.2	4093.1	209.8	4187.5	209.5	4194	209

Ramapo River Post. rep

4238	208.5	4291	208.4	4345	208.5	4415	207.9	4475	207.4
4540	206.8	4605	206.5	4654	205.4	4682	205.9	4714.4	205.3
4761	205.3	4812	205.6	4845	205.9	4882	191.1	4900	191.1
4925	191.1	4982	191.1	5005	200.2	5011	200.2	5021	200.9
5031	200.7	5041	201.5	5051	201.3	5055	201.9	5055.1	202.6
5058	204.4	5071	204.7	5497	203	5515	203.6	5516	201.2
5521	200.7	5527	199.1	5535	198.8	5545	198	5554	198.3
5561	201.2	5571	207.9	5574	207.7	5596.7	208.6	5672	206.4
5795.6	205.2	5816.4	205.2	5870	205.7	5945.8	204.8	6012	205.9
6034	205.3	6055.8	205.9	6077.3	205.8	6100.4	207.9	6163.8	208.2
6181.8	209.1	6193.3	208.6	6202.9	208.5	6227	210.1	6249.8	211.6
6295.9	213.8	6327.3	215.2	6362.8	215.9	6384.5	216.9	6386.9	218.3
6393.8	218.1	6412.7	220.7	6448.4	221	6453.1	219.2	6463	219.8
6464.7	223.7	6477.6	223.7	6502.2	225.3	6622.8	227		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
2996.4	.06	4845	.028	5596.7	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4845	5596.7	245.97	207.99	250.02	.05	.2
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Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 22646

INPUT

Description: 22646

Station Elevation Data

num=	94								
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2960.5	227.9	2963.9	223.7	3005.5	223.7	3010.3	220.3	3031	220.3
3075.8	222.2	3098.3	221.1	3119.3	220.9	3159.8	222.2	3182.9	222
3217.2	219	3238.2	220.1	3248.2	220	3266	219.4	3303.7	219.2
3359.2	217.2	3401	213.6	3431.1	213.8	3470.9	217.8	3513.7	214.1
3577.3	212	3602.1	212.3	3670.9	209.8	3700.1	210	3794.1	208.3
3849.9	207.2	4011	208	4047.2	207.3	4086.7	209.5	4110.5	209.5
4151.2	208.3	4192	209	4242	208.5	4392	208.4	4442	208.2
4492	207.5	4592	205.6	4603	205.1	4635	206.5	4671	207
4707	204	4728	205.1	4755	205.3	4792	205.5	4798	205
4833	191.1	4883	191.1	4933	191.1	4960	201.8	5025	200.1
5059	204.6	5284.4	203.8	5304.4	203.5	5308.4	201.3	5316.4	199.2
5328.4	198	5338.4	198	5349.4	198	5362.4	199.3	5369.4	201.3
5370.4	202.2	5378.4	202.4	5387.4	206.1	5394.4	206	5395.1	206.5
5408.4	206.5	5426.8	205.6	5474.2	205.4	5486.1	206.1	5524.1	206.6
5536.6	206.6	5546.3	205.7	5557.8	206.4	5622.5	206.7	5655.2	205.6
5745	205.5	5760.4	204	5858.4	204.5	5898.7	205.6	5931.7	205.5
5952.5	204.3	6063.2	204.4	6073.2	206.5	6118.8	207.7	6146.9	206.8
6176.9	207.8	6198.2	207	6374.6	215.2	6383.3	217.3	6416.9	220.7
6438.1	217.9	6452.2	222.2	6470.2	223.4	6602.2	227.4		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
2960.5	.06	4798	.028	5387.4	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4798	5387.4	288	294	180	.05	.2
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Sediment Elevation = 0

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 22575

INPUT

Description: 22575

Station		Elevation		Data		num=		99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3968	227	4042	211	4063	209.5	4088	208.7	4280	207.6
4316	207.2	4411	207.2	4439	207.9	4472	207.5	4500	208.2
4591	208.2	4607.3	206.8	4629	207.2	4674	206.4	4688	206.1
4692	203	4697	202.7	4704	202.6	4711	202.3	4713	202.6
4715	203.9	4720	204.9	4839	205.7	4850	202.9	4896.3	203.4
4920	203.2	4941	203.8	4966	204.3	4972	204.5	4977	198.5
4979	197	4986	195.8	5007	200.3	5024	201.8	5033	202
5041	203.9	5262	203	5272	204.1	5282	203.3	5285	202.4
5289	200.7	5294	200.2	5310	199.9	5324	199.7	5335	199.4
5346.7	201	5346.8	202.3	5347	203.3	5347.9	203.3	5348	206
5381	206.4	5464	205.2	5474	204.3	5486	204.7	5497	204.7
5510	205.8	5536	205.9	5563	205.3	5573	205.9	5584	206.2
5599	205.9	5618	204.6	5641	204.7	5686	206	5700	207.1
5737	207	5746	207.4	5775	207.1	5847	206.3	5865	207.1
5889	206.8	5920	207.4	5964	204.8	5982	205.1	5992	205.9
6011	206	6075	206.1	6103	205.3	6132	205.4	6160	205.9
6233	204.6	6260	207.3	6280	207.7	6309	207.4	6330	207.6
6342	208.4	6353	207.8	6402	211.8	6502	216.3	6522	216.4
6524	219	6550	222.1	6575	221.7	6580	218.9	6592	218.9
6594	224.1	6598	222.1	6630	225.1	6738	227		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
3968	.06	4972	.028	5348	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4972	5348		209.97	160.02	.05	.2

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 22401

INPUT

Description: 22401

Station		Elevation		Data		num=		89	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3968	227	4042	211	4063	209.5	4088	208.7	4280	207.6
4316	207.2	4411	207.2	4439	207.9	4472	207.5	4500	208.2
4591	208.2	4607.3	206.8	4629	207.2	4674	206.4	4688	206.1
4692	203	4697	202.7	4704	202.6	4711	202.3	4713	202.6
4715	203.9	4720	204.9	4839	205.7	4850	202.9	4889	203.3
4920	191	5020	191	5052	203.8	5282	203.3	5285	202.4
5289	200.7	5294	200.2	5310	199.9	5324	199.7	5335	199.4
5346.7	201	5346.8	202.3	5347	203.3	5347.9	203.3	5348	206
5381	206.4	5464	205.2	5474	204.3	5486	204.7	5497	204.7
5510	205.8	5536	205.9	5563	205.3	5573	205.9	5584	206.2
5599	205.9	5618	204.6	5641	204.7	5686	206	5700	207.1
5737	207	5746	207.4	5775	207.1	5847	206.3	5865	207.1
5889	206.8	5920	207.4	5964	204.8	5982	205.1	5992	205.9
6011	206	6075	206.1	6103	205.3	6132	205.4	6160	205.9
6233	204.6	6260	207.3	6280	207.7	6309	207.4	6330	207.6

Ramapo River Post. rep									
6342	208.4	6353	207.8	6402	211.8	6502	216.3	6522	216.4
6524	219	6550	222.1	6575	221.7	6580	218.9	6592	218.9
6594	224.1	6598	222.1	6630	225.1	6738	227		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3968 .06 4889 .028 5348 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4889 5348 209.97 209.97 160.02 .05 .2
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 22365

INPUT
 Descri pti on: 22365

Station El evati on Data num= 99									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4362	227.1	4400	210	4431	207.3	4484	206.9	4515	206.6
4542	206.9	4602	207.3	4607	207.1	4622	207.5	4635	207
4640	208.6	4660	208.1	4695	202.9	4718	202.9	4752	208.9
4763	209.8	4777	207.3	4822	206.4	4855	206.2	4866	205.7
4890	206.2	4918	207.3	4936	206.6	4957	204.1	4959	201.4
4962	200.9	4970	199.6	4982	200.1	4992	200.5	5002	200.7
5012	200.7	5022	200.8	5032	201.2	5039	201	5041	201.4
5041.1	203.3	5175	203.3	5195	202.8	5197	201.2	5203	200
5250	197.2	5260	197.2	5273	197.6	5288	198.2	5303	199.8
5307.7	201.2	5307.9	203.9	5400	204.4	5476	204.6	5511	204.9
5525	204	5553	204.5	5577	204.8	5613	205.4	5645	206.5
5666	206.5	5725	207.2	5739	207	5767	207	5805	207.4
5838	207.4	5868	206.5	5895	206.1	5929	206.1	5940	207
5989	204.6	6011	204.6	6028	205	6042	205	6064	205.6
6116	204.9	6141	204.7	6182	204.7	6250	205	6292	204.5
6315	204.5	6327	206.3	6353	207.5	6376	207	6415	206.6
6423	207.4	6438	208	6451	207.9	6478	209	6508	210.1
6543	212	6585	214.1	6622	214.8	6631	217.3	6662	219.2
6671	220.1	6691	221.6	6726	221	6732.8	217.5	6742	217.5
6744	222.4	6750	222.4	6915	225.8	6936	227.2		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4362 .06 4936 .028 5307.9 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4936 5307.9 230 192 20 .05 .2
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 22191

INPUT
 Descri pti on: 22191

Station El evati on Data num= 83									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4362	227.1	4400	210	4431	207.3	4484	206.9	4515	206.6

Ramapo River Post. rep

4542	206.9	4602	207.3	4607	207.1	4622	207.5	4635	207
4640	208.6	4660	208.1	4695	202.9	4718	202.9	4752	208.9
4763	209.8	4777	207.3	4822	206.4	4855	206.2	4866	205.7
4890	206.2	4910	205.5	4947	190.7	5047	190.7	5083	205
5091	205	5181	204	5190	201.2	5196	200	5243	197.2
5253	197.2	5266	197.6	5281	198.2	5296	199.8	5300.7	201.2
5300.9	203.9	5393	204.4	5469	204.6	5504	204.9	5518	204
5546	204.5	5570	204.8	5606	205.4	5638	206.5	5659	206.5
5718	207.2	5732	207	5760	207	5798	207.4	5831	207.4
5861	206.5	5888	206.1	5922	206.1	5933	207	5982	204.6
6003	204.6	6021	205	6035	205	6057	205.6	6109	204.9
6320	206.3	6346	207.5	6369	207	6408	206.6	6416	207.4
6431	208	6444	207.9	6471	209	6501	210.1	6536	212
6578	214.1	6615	214.8	6624	217.3	6655	219.2	6664	220.1
6684	221.6	6719	221	6725	217.5	6735	217.5	6737	222.4
6743	222.4	6908	225.8	6929	227.2				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
4362 .06	4947 .028	5300.9 .06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4947	5300.9	230	191.04	20		.05	.2
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 22173

INPUT
Description: 22173

Station Elevation Data	num=	98		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
4552.7 225	4569.6 224.1	4577.8 220	4590 213.4	4600.2 208.1
4607.4 205.8	4628.7 205.6	4661.1 205.5	4687.2 205.4	4706.6 205.4
4726.7 205.1	4752.7 205.9	4764.7 205.9	4777.8 205.8	4798.4 205.5
4811.1 205.6	4820.6 205.6	4830.1 205.5	4855 205.6	4861 205.6
4898 205.2	4930 205.3	4938 201.2	4949 200	4961 198.8
4973 198.5	4987 200.1	4999 200.4	5006 197.7	5016 196.3
5031 194.9	5037 194.9	5055 198.2	5061 201.3	5071 203.9
5129 204.4	5200 204.5	5240.2 205.2	5277.1 204.6	5295.7 203.8
5310.4 203.9	5325 204.2	5336.2 204.6	5351.4 205.9	5395.7 205.6
5409.9 205.3	5435.7 204.6	5457.1 205.5	5486.8 203.6	5520.3 204.6
5549.5 205.2	5563.7 205.8	5590.5 206.3	5605.5 206.5	5619.7 207.2
5631.1 207.1	5649.4 207.3	5661.7 207.5	5704.3 207.5	5725.4 207.3
5742.1 207.2	5767.6 206.5	5783.6 206.2	5812.7 205.7	5838.5 204.9
5858.2 204.2	5867 205.1	5878.5 205.1	5890.2 205.3	5896.6 205.4
5962.5 205.5	6002.3 205.2	6029.7 204.9	6062.8 204.7	6092.5 204.3
6109.9 204.3	6119.5 204.2	6131.9 204.2	6140 205.8	6158 207.6
6198.3 207.5	6224.7 207.4	6236 207.7	6249.8 207.6	6262.8 208.4
6283.1 209.5	6295.9 210.7	6312.3 212	6336.5 213.5	6349 214.3
6369 215.8	6390 218.2	6413.4 220.3	6429.4 221.5	6441 222.1
6654.2 224.7	6667.1 225.9	6672.7 227.1		

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
4552.7 .06	4930 .028	5071 .06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4930	5071	114.99	63	39.99		.05	.2

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 22110

INPUT

Description: 22110

DOTY RD. BRIDGE (GRATE BRIDGE DECK, MAY NOT DEVELOP
 PRES-FLOW)

Station Elevation Data		num= 100	
Sta	Elev	Sta	Elev
4546.1	225	4555.2	225.5
4596.7	220.1	4610.7	214.6
4676.3	207.7	4706.7	205.6
4899	206	4910	206.3
4960	207.7	4961	201.2
4970	197.6	4973	197
5020	196.7	5023	196.8
5036.1	199.4	5038	201.3
5082.2	210.8	5102.5	209.7
5194.7	204.1	5225.4	203.5
5330.2	204.6	5355.6	205.4
5465.5	203.6	5495.5	203.6
5598.5	207.2	5612.3	207.7
5705.8	206.4	5739.8	206.4
5855.2	204.2	5862.4	205.4
5926.1	205.5	5959.7	205.4
6110.5	205.1	6121.2	204.9
6215.1	207.4	6225.1	208
6276.7	210.3	6295.2	212
6379.5	220	6431.2	221.9
4566.9	226	4579.5	225.6
4630.1	213.3	4646.9	211.5
4724.1	205.5	4746.1	205.5
4949	207.6	4957	207.6
4962	199.8	4962.1	199.6
4977	195.9	4993	195.5
5034	199	5034.1	199
5038.1	207.4	5055	207.3
5133.9	207.8	5149.8	205.6
5257.4	203.1	5286.6	203.7
5385.4	204.6	5414	204.2
5523.1	204.5	5548.7	205.5
5626	206.6	5652.3	207.4
5776.3	206.7	5789.9	206.7
5873.1	205.4	5883.4	204.9
5996.8	205.4	6027.6	205.5
6141.1	206	6186.7	206.2
6235.6	207.6	6247	208.2
6313.2	213.4	6334.8	214.5
6643.4	224.1	6653.3	224.8
4590.9	224.8	4660.2	209.5
4779.5	205.5	4957.1	207.6
4962.3	199.6	4962.3	199.6
5008	196.8	5008	196.8
5036	199.4	5036	199.4
5074.8	207.3	5074.8	207.3
5173.8	204.6	5173.8	204.6
5308.3	203.7	5308.3	203.7
5431	203.8	5431	203.8
5584.5	206.3	5584.5	206.3
5679	207.3	5679	207.3
5836.8	204.5	5836.8	204.5
5902.1	205.5	5902.1	205.5
6101.8	204.6	6101.8	204.6
6208.1	207.2	6208.1	207.2
6262.8	209.3	6262.8	209.3
6352.8	216.3	6352.8	216.3
6662.2	227.2	6662.2	227.2

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4546.1	.06	4960	.03
		5082.2	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4960	5082.2		33	33		.5	.7

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
4546.1	4960	204.5	F
5082.2	6662.2	204.5	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 22077

INPUT

Description: 22077

Station Elevation Data		num= 99	
Sta	Elev	Sta	Elev
4559.3	225	4569	225.2
4611.1	220	4629.5	210
4716.9	206.3	4752.9	205.8
4865.2	206.3	4880.9	206.3
4580.3	226	4592.5	225.7
4653.2	207.9	4667	206.1
4795	206.1	4828.6	206.1
4899.3	206.5	4923.7	206.6
4602.8	223.7	4602.8	223.7
4688.9	206.1	4688.9	206.1
4849.2	206.1	4849.2	206.1
4944.3	207	4944.3	207

Ramapo River Post. rep									
4955.1	208.2	4962.1	207.5	4963	201.2	4963.1	198.8	4979.6	195.2
4995.3	194	5010	195.2	5025.5	197.5	5036.4	199.9	5036.9	201.2
5040.2	207.5	5060.7	207.3	5073.2	206.4	5090.9	206.6	5116.1	203.6
5134.6	203.1	5156.1	202.5	5173	203.8	5198.3	203.6	5228.7	202.5
5247.8	202.8	5274.3	202.5	5295	204.1	5322.5	204	5355.1	204
5385.7	202.9	5411.4	203	5456.8	203.6	5480.1	204.4	5506.9	205
5530.8	205.9	5556.9	205.9	5598.2	206.9	5611.3	207.4	5625.4	206.4
5638.3	206.3	5697.4	206.3	5720.6	206.3	5755.2	206.4	5795.6	205.8
5822.2	205	5845.9	204.7	5857.5	204.5	5868.9	205	5878.9	204.8
5892	205.4	5909.3	204.7	5932.2	204.5	5959.1	204.9	5989.8	204.6
6015.8	205.4	6034.5	204.5	6052	205.4	6082	203.9	6092.4	203.5
6099.9	203.8	6108.5	204.5	6117.7	204	6130.6	206.1	6147.4	206.4
6174	206.1	6189.6	207.2	6204.5	207	6212.3	207.1	6220.9	207.9
6233.1	207	6238.4	207.6	6250.7	209	6267.6	210	6285.8	211.4
6313.1	214.1	6331.6	216	6356.1	219	6369.9	220	6387.5	221.2
6417.4	221.6	6627.8	223.2	6644	221.3	6657.7	227.1		

Manning's n Values		num= 3	
Station	Value	Station	Value
4559.3	.06	4962.1	.037
		5040.2	.06

Bank Station	Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.	
	4962.1	5040.2	70	80	53.35		.5	.7	
Ineffective Flow	num= 2								
Station	Left	Right	Elev	Permanent					
4559.3	4962.1	204.5	F						
5040.2	6657.7	204.5	F						
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 22000

INPUT

Description: 22000

Station Elevation Data num= 93									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4552.7	225	4569.6	224.1	4577.8	220	4590	213.4	4600.2	208.1
4607.4	205.8	4628.7	205.6	4661.1	205.5	4687.2	205.4	4706.6	205.4
4726.7	205.1	4752.7	205.9	4764.7	205.9	4777.8	205.8	4798.4	205.5
4811.1	205.6	4820.6	205.6	4830.1	205.5	4855	205.6	4861	205.6
4898	205.2	4930	205.3	4938	201.2	4949	200	4961	198.8
4970	198.6	4990	190.6	5090	190.6	5124	204.4	5125	204.4
5129	204.4	5200	204.5	5240.2	205.2	5277.1	204.6	5295.7	203.8
5310.4	203.9	5325	204.2	5336.2	204.6	5351.4	205.9	5395.7	205.6
5409.9	205.3	5435.7	204.6	5457.1	205.5	5486.8	203.6	5520.3	204.6
5549.5	205.2	5563.7	205.8	5590.5	206.3	5605.5	206.5	5619.7	207.2
5631.1	207.1	5649.4	207.3	5661.7	207.5	5704.3	207.5	5725.4	207.3
5742.1	207.2	5767.6	206.5	5783.6	206.2	5812.7	205.7	5838.5	204.9
5858.2	204.2	5867	205.1	5878.5	205.1	5890.2	205.3	5896.6	205.4
5962.5	205.5	6002.3	205.2	6029.7	204.9	6062.8	204.7	6092.5	204.3
6109.9	204.3	6119.5	204.2	6131.9	204.2	6140	205.8	6158	207.6
6198.3	207.5	6224.7	207.4	6236	207.7	6249.8	207.6	6262.8	208.4
6283.1	209.5	6295.9	210.7	6312.3	212	6336.5	213.5	6349	214.3
6369	215.8	6390	218.2	6413.4	220.3	6429.4	221.5	6441	222.1
6654.2	224.7	6667.1	225.9	6672.7	227.1				

Manning's n Values		num= 3	
Station	Value	Station	Value
4552.7	.06	4930	.028
		5124	.06

Ramapo River Post. rep

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4930	5124	150	100	66.68	.05	.2	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21957

INPUT
 Description: 21957

Station Elevation Data	num=	85
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
4609 225.2 4613.9 225.5 4626.5 225.8 4636.6 225.5 4646.5 223		
4657.4 220 4693.2 210 4711.3 206.3 4733.5 203.9 4766.4 204.3		
4813.1 203.6 4831.2 204.6 4844.4 204.6 4868.3 205.6 4884.6 205.5		
4904 204.2 4929 204.4 4949 202.2 4950 201.3 4953 200.9		
4960 198.8 4970 196.4 4985 194.2 4997 193.2 5010 192.2		
5025 193.8 5036 196.6 5049 201.2 5051 202.3 5076 203.2		
5082 203.7 5107.7 203 5147.2 202.6 5210.1 202.1 5267.1 202.9		
5318.1 202.7 5370 202.6 5424.6 202.9 5457.9 203 5480.3 204		
5504.9 204.3 5526.2 205.6 5556.9 205.5 5593.4 206.3 5612.1 206.5		
5623.1 207.1 5635.2 206.8 5660.7 207.1 5717.5 206.7 5745.7 205.9		
5778.9 207.7 5812.8 206.3 5826.2 205.9 5846.5 205 5867.9 205.1		
5876.1 205.3 5886.3 204.7 5910.7 204.2 5941.3 203.8 5970.1 203.2		
6002.8 203.5 6048.2 203.5 6081.8 203.8 6103.5 204.4 6113.4 204.7		
6123.4 204.4 6132.5 204.7 6147.7 206.3 6183.4 206.3 6201.7 207.2		
6216.3 207.5 6232.3 207.2 6240.9 206.5 6254.4 208.4 6268.4 210.1		
6289.3 212 6310.2 215 6332.8 217.7 6362 220 6393.4 221.3		
6414.7 221.8 6623.3 219.9 6633.7 219.9 6645 222.6 6654.8 227.1		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
4609 .7 4929 .043 5082 .09		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4929	5082	53.34	44	16.68	.1	.3	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21940

INPUT
 Description: 21939

Station Elevation Data	num=	85
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
4546.1 225 4555.2 225.5 4566.9 226 4579.5 225.6 4590.9 224.8		
4596.7 220.1 4610.7 214.6 4630.1 213.3 4646.9 211.5 4660.2 209.5		
4676.3 207.7 4706.7 205.6 4724.1 205.5 4746.1 205.5 4779.5 205.5		
4899 206 4906 206.3 4912.7 206.5 4944.5 190.6 4957.1 190.6		
4960 190.6 4961 190.6 5000 190.6 5044.5 190.6 5082 209.4		
5083 210.8 5102.5 209.7 5133.9 207.8 5149.8 205.6 5173.8 204.6		
5194.7 204.1 5225.4 203.5 5257.4 203.1 5286.6 203.7 5308.3 203.7		
5330.2 204.6 5355.6 205.4 5385.4 204.6 5414 204.2 5431 203.8		
5465.5 203.6 5495.5 203.6 5523.1 204.5 5548.7 205.5 5584.5 206.3		
5598.5 207.2 5612.3 207.7 5626 206.6 5652.3 207.4 5679 207.3		
5705.8 206.4 5739.8 206.4 5776.3 206.7 5789.9 206.7 5836.8 204.5		
5855.2 204.2 5862.4 205.4 5873.1 205.4 5883.4 204.9 5902.1 205.5		

Ramapo River Post. rep									
5926.1	205.5	5959.7	205.4	5996.8	205.4	6027.6	205.5	6101.8	204.6
6110.5	205.1	6121.2	204.9	6141.1	206	6186.7	206.2	6208.1	207.2
6215.1	207.4	6225.1	208	6235.6	207.6	6247	208.2	6262.8	209.3
6276.7	210.3	6295.2	212	6313.2	213.4	6334.8	214.5	6352.8	216.3
6379.5	220	6431.2	221.9	6643.4	224.1	6653.3	224.8	6662.2	227.2

Manning's n Values		num=	3
Station	Value	Station	Value
4546.1	.06	4906	.03
		5083	.07

Bank Station	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4906	5083		83.33	79		.2	.4
Ineffective Flow	num=		2					
Station	Left	Right	Elev	Permanent				
	4546.1	4906	204.5	F				
	5083	6662.2	204.5	F				
Sediment Elevation	= 0							

BRI DGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 21922.5

INPUT

Description: DOTY RD. BRIDGE
 Distance from Upstream XS = 1
 Deck/Roadway Width = 33
 Weir Coefficient = 2.8
 Upstream Deck/Roadway Coordinates

num= 43									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4555.2	225.5	225.5	4566.9	226	226	4579.5	225.6	225.6	
4591	224.8	224.8	4596.7	220.1	220.1	4610.7	214.6	214.6	
4630.1	213.3	213.3	4646.9	211.5	211.5	4660.2	209.5	209.5	
4676.3	207.7	207.7	4706.7	206.5	205.6	4724.1	206.5	205.5	
4746.1	206.5	205.5	4780	206.5	205.5	4899	206.5	206	
4906	206.3	206.3	4912.7	218.5	213	4944.5	218.5	213	
4957.1	218.5	213	4960	218.5	213	4961	218.5	213	
5000	218.5	213	5044.5	218.5	213	5082	218.5	213	
5083	210.8	210.8	5102.5	209.7	209.7	5133.9	207.8	207.8	
5149.8	205.6	205.6	5173.8	204.6	204.6	5194.7	204.1	204.1	
5225.4	203.5	203.5	5257.4	203.1	203.1	5286.6	203.7	203.7	
5308	203.7	203.7	5330.2	204.6	204.6	5355.6	205.4	205.4	
5385.4	204.6	204.6	5414	204.2	204.2	5431	203.8	203.8	
5465.5	203.6	203.6	5495.5	203.6	203.6	5523.1	204.5	204.5	
5548.7	205.5	205.5							

Upstream Bridge Cross Section Data

Station Elevation Data num= 85									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4546.1	225	4555.2	225.5	4566.9	226	4579.5	225.6	4590.9	224.8
4596.7	220.1	4610.7	214.6	4630.1	213.3	4646.9	211.5	4660.2	209.5
4676.3	207.7	4706.7	205.6	4724.1	205.5	4746.1	205.5	4779.5	205.5
4899	206	4906	206.3	4912.7	206.5	4944.5	190.6	4957.1	190.6
4960	190.6	4961	190.6	5000	190.6	5044.5	190.6	5082	209.4
5083	210.8	5102.5	209.7	5133.9	207.8	5149.8	205.6	5173.8	204.6
5194.7	204.1	5225.4	203.5	5257.4	203.1	5286.6	203.7	5308.3	203.7
5330.2	204.6	5355.6	205.4	5385.4	204.6	5414	204.2	5431	203.8
5465.5	203.6	5495.5	203.6	5523.1	204.5	5548.7	205.5	5584.5	206.3
5598.5	207.2	5612.3	207.7	5626	206.6	5652.3	207.4	5679	207.3
5705.8	206.4	5739.8	206.4	5776.3	206.7	5789.9	206.7	5836.8	204.5
5855.2	204.2	5862.4	205.4	5873.1	205.4	5883.4	204.9	5902.1	205.5

Ramapo River Post. rep									
5926.1	205.5	5959.7	205.4	5996.8	205.4	6027.6	205.5	6101.8	204.6
6110.5	205.1	6121.2	204.9	6141.1	206	6186.7	206.2	6208.1	207.2
6215.1	207.4	6225.1	208	6235.6	207.6	6247	208.2	6262.8	209.3
6276.7	210.3	6295.2	212	6313.2	213.4	6334.8	214.5	6352.8	216.3
6379.5	220	6431.2	221.9	6643.4	224.1	6653.3	224.8	6662.2	227.2

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4546.1 .06 4906 .03 5083 .07

Bank Sta: Left Right Coeff Contr. Expan.
 4906 5083 .2 .4

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4546.1 4906 204.5 F
 5083 6662.2 204.5 F

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates num= 15

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4706.7	206.5	205.6	4724.1	206.5	205.5	4746.1	206.5	205.5						
4780	206.5	205.5	4899	206.5	206	4906	206.3	206.3						
4912.7	218.5	213	4944.5	218.5	213	4957.1	218.5	213						
4960	218.5	213	4961	218.5	213	5000	218.5	213						
5044.5	218.5	213	5082	218.5	213	5083	210.8							

Downstream Bridge Cross Section Data Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4559.3	225	4569	225.2	4580.3	226	4592.5	225.7	4602.8	223.7
4611.1	220	4629.5	210	4653.2	207.9	4667	206.1	4688.9	206.1
4716.9	206.3	4752.9	205.8	4795	206.1	4828.6	206.1	4849.2	206.1
4865.2	206.3	4880.9	206.3	4899.3	206.5	4912.7	206.5	4944.5	190.6
5000	190.6	5044.5	190.6	5076.3	206.5	5090.9	206.6	5116.1	203.6
5134.6	203.1	5156.1	202.5	5173	203.8	5198.3	203.6	5228.7	202.5
5247.8	202.8	5274.3	202.5	5295	204.1	5322.5	204	5355.1	204
5385.7	202.9	5411.4	203	5456.8	203.6	5480.1	204.4	5506.9	205
5530.8	205.9	5556.9	205.9	5598.2	206.9	5611.3	207.4	5625.4	206.4
5638.3	206.3	5697.4	206.3	5720.6	206.3	5755.2	206.4	5795.6	205.8
5822.2	205	5845.9	204.7	5857.5	204.5	5868.9	205	5878.9	204.8
5892	205.4	5909.3	204.7	5932.2	204.5	5959.1	204.9	5989.8	204.6
6015.8	205.4	6034.5	204.5	6052	205.4	6082	203.9	6092.4	203.5
6099.9	203.8	6108.5	204.5	6117.7	204	6130.6	206.1	6147.4	206.4
6174	206.1	6189.6	207.2	6204.5	207	6212.3	207.1	6220.9	207.9
6233.1	207	6238.4	207.6	6250.7	209	6267.6	210	6285.8	211.4
6313.1	214.1	6331.6	216	6356.1	219	6369.9	220	6387.5	221.2
6417.4	221.6	6627.8	223.2	6644	221.3	6657.7	227.1		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4559.3 .06 4912.7 .037 5076.3 .06

Bank Sta: Left Right Coeff Contr. Expan.
 4912.7 5076.3 .2 .4

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4559.3 4912.7 204.5 F
 5076.3 6657.7 204.5 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 hori z. to 1.0 verti cal
 Downstream Embankment side slope = 0 hori z. to 1.0 verti cal

Ramapo River Post. rep

Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 213
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

Pier Station Upstream= 4994.5 Downstream= 4994.5
 Upstream num= 2
 Width Elev Width Elev
 10.5 190.6 10.5 218.5
 Downstream num= 2
 Width Elev Width Elev
 10.5 190.6 10.5 218.5

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Yarnell KVal = 1.1
 Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .7905694
 Max Low Cord = 218.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 21905

INPUT

Description: 21906

Station Elevation Data		num= 89									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4559.3	225	4569	225.2	4580.3	226	4592.5	225.7	4602.8	223.7		
4611.1	220	4629.5	210	4653.2	207.9	4667	206.1	4688.9	206.1		
4716.9	206.3	4752.9	205.8	4795	206.1	4828.6	206.1	4849.2	206.1		
4865.2	206.3	4880.9	206.3	4899.3	206.5	4912.7	206.5	4944.5	190.6		
5000	190.6	5044.5	190.6	5076.3	206.5	5090.9	206.6	5116.1	203.6		
5134.6	203.1	5156.1	202.5	5173	203.8	5198.3	203.6	5228.7	202.5		
5247.8	202.8	5274.3	202.5	5295	204.1	5322.5	204	5355.1	204		
5385.7	202.9	5411.4	203	5456.8	203.6	5480.1	204.4	5506.9	205		
5530.8	205.9	5556.9	205.9	5598.2	206.9	5611.3	207.4	5625.4	206.4		
5638.3	206.3	5697.4	206.3	5720.6	206.3	5755.2	206.4	5795.6	205.8		
5822.2	205	5845.9	204.7	5857.5	204.5	5868.9	205	5878.9	204.8		
5892	205.4	5909.3	204.7	5932.2	204.5	5959.1	204.9	5989.8	204.6		
6015.8	205.4	6034.5	204.5	6052	205.4	6082	203.9	6092.4	203.5		
6099.9	203.8	6108.5	204.5	6117.7	204	6130.6	206.1	6147.4	206.4		
6174	206.1	6189.6	207.2	6204.5	207	6212.3	207.1	6220.9	207.9		
6233.1	207	6238.4	207.6	6250.7	209	6267.6	210	6285.8	211.4		
6313.1	214.1	6331.6	216	6356.1	219	6369.9	220	6387.5	221.2		

Ramapo River Post. rep

6417.4 221.6 6627.8 223.2 6644 221.3 6657.7 227.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4559.3 .06 4912.7 .037 5076.3 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4912.7 5076.3 158.34 164.01 96.67 .2 .4
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4559.3 4912.7 204.5 F
 5076.3 6657.7 204.5 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21825

INPUT
 Description: 21825

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4683.7	225	4710.3	210	4732.5	203.9	4782.9	203.8	4804.6	203.7
4823.3	203.7	4844	205	4914	203.6	4941	204	4945	201.2
4957	197.3	4970	196.6	4988	196.5	5005	196.6	5020	198.4
5035	198.5	5041	199.9	5054	201.2	5055	202.5	5084	202.8
5110	202.5	5165	202	5182	201.9	5200	201.7	5222	201.2
5226	201	5233	200.4	5235	200.2	5240	199.4	5245	199
5250	198.5	5255	198.1	5265	198	5275	198.4	5285	198.3
5295	198.7	5305	198.7	5315	198.6	5325	198.2	5335	197.6
5345	197.6	5355	197.9	5365	198	5375	198.5	5385	198.3
5395	197.7	5405	197.4	5415	196.5	5425	196	5435	195.7
5445	196.1	5455	197.2	5460	198.4	5464.3	201	5464.4	201.2
5465	203.4	5484.9	204.8	5494.2	204.8	5519	205.1	5555.9	205.9
5591.6	206.8	5604.3	207.4	5616	206.5	5656.1	207	5693.2	206
5733.3	205.7	5771.1	204.8	5805.4	204.7	5828.3	204.4	5841	204.6
5849.7	204.6	5859.7	204.6	5880.6	204.1	5913.2	204.6	5965.6	204.6
5985.6	204.4	6014.6	203.9	6063.3	204.4	6076.2	204.2	6087.1	204.6
6097.3	204.4	6121.9	205.8	6152.4	206.4	6171.5	207.3	6188.3	208
6201.2	207.7	6207.5	207.4	6224.5	209.4	6239.1	210.1	6254.3	211.7
6273.6	214	6292.4	216.3	6317.7	219.7	6369.3	222.1	6585.8	220.5
6606.1	223.6	6609.6	227.2						

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 4683.7 .9 4782.9 .075 4945 .037 5054 .09 6207.5 .9

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4941 5055 50 45 18 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4683.7 4941 204 F
 5055 6609.6 202.5 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21785

Ramapo River Post. rep

INPUT

Description: 21785

Station Elevation Data

num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4609	225.2	4613.9	225.5	4626.5	225.8	4636.6	225.5	4646.5	223
4657.4	220	4693.2	210	4711.3	206.3	4733.5	203.9	4766.4	204.3
4813.1	203.6	4831.2	204.6	4844.4	204.6	4868.3	205.6	4884.6	205.5
4904	204.2	4929	204.4	4949	202.2	4950	201.3	4953	200.9
4960	198.8	4964	198	4982	190.6	5000	190.6	5030	190.6
5082	190.6	5113	202.9	5147.2	202.6	5210.1	202.1	5267.1	202.9
5318.1	202.7	5370	202.6	5424.6	202.9	5457.9	203	5480.3	204
5504.9	204.3	5526.2	205.6	5556.9	205.5	5593.4	206.3	5612.1	206.5
5623.1	207.1	5635.2	206.8	5660.7	207.1	5717.5	206.7	5745.7	205.9
5778.9	207.7	5812.8	206.3	5826.2	205.9	5846.5	205	5867.9	205.1
5876.1	205.3	5886.3	204.7	5910.7	204.2	5941.3	203.8	5970.1	203.2
6002.8	203.5	6048.2	203.5	6081.8	203.8	6103.5	204.4	6113.4	204.7
6123.4	204.4	6132.5	204.7	6147.7	206.3	6183.4	206.3	6201.7	207.2
6216.3	207.5	6232.3	207.2	6240.9	206.5	6254.4	208.4	6268.4	210.1
6289.3	212	6310.2	215	6332.8	217.7	6362	220	6393.4	221.3
6414.7	221.8	6623.3	219.9	6633.7	219.9	6645	222.6	6654.8	227.1

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4609	.06	4929	.037	5113	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4929	5113		309.98	266.97	103.95	.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 21653

INPUT

Description: 21653

Station Elevation Data

num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4683.7	225	4710.3	210	4732.5	203.9	4782.9	203.8	4804.6	203.7
4823.3	203.7	4844	205	4914	203.6	4941	204	4945	201.2
4957	197.3	4964	197	4980	190.5	5030	190.5	5080	190.5
5110	202.5	5165	202	5182	201.9	5200	201.7	5222	201.2
5226	201	5233	200.4	5235	200.2	5240	199.4	5245	199
5250	198.5	5255	198.1	5265	198	5275	198.4	5285	198.3
5295	198.7	5305	198.7	5315	198.6	5325	198.2	5335	197.6
5345	197.6	5355	197.9	5365	198	5375	198.5	5385	198.3
5395	197.7	5405	197.4	5415	196.5	5425	196	5435	195.7
5445	196.1	5455	197.2	5460	198.4	5464.3	201	5464.4	201.2
5465	203.4	5484.9	204.8	5494.2	204.8	5519	205.1	5555.9	205.9
5591.6	206.8	5604.3	207.4	5616	206.5	5656.1	207	5693.2	206
5733.3	205.7	5771.1	204.8	5805.4	204.7	5828.3	204.4	5841	204.6
5849.7	204.6	5859.7	204.6	5880.6	204.1	5913.2	204.6	5965.6	204.6
5985.6	204.4	6014.6	203.9	6063.3	204.4	6076.2	204.2	6087.1	204.6
6097.3	204.4	6121.9	205.8	6152.4	206.4	6171.5	207.3	6188.3	208
6201.2	207.7	6207.5	207.4	6224.5	209.4	6239.1	210.1	6254.3	211.7
6273.6	214	6292.4	216.3	6317.7	219.7	6369.3	222.1	6585.8	220.5
6606.1	223.6	6609.6	227.2						

Manning's n Values

num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4683.7	.07	4782.9	.075	4945	.037	5110	.09
						6207.5	.07

Ramapo River Post. rep

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4941 5110 299.97 257.95 108.02 .1 .3
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21600

INPUT
 Descri pti on: 21600

Station		Elevation Data		num=	93						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4685.6	225	4693	223.6	4702.5	223.7	4715.8	223.5	4731.8	220		
4743.3	210	4767.5	205.8	4792.3	204.6	4813.6	203.8	4831.1	203.8		
4860.5	203.9	4884.6	203.8	4911.1	203.9	4915	203.3	4942	203.5		
4943	201.3	4953	200.7	4966	198.9	4977	194.9	4995	194.3		
5011	195.2	5028	196.2	5041	197.1	5056	198.1	5056.1	198.7		
5059	201.1	5082	203.1	5114	202.8	5158	202	5184	202.1		
5202	201.2	5204	200.5	5210	200.1	5216	200.6	5221	200.7		
5226	200.8	5231	201.2	5239	201.6	5254	201.9	5270	201.6		
5282	201.3	5297	201.2	5304	200.9	5314	200.8	5321	200.6		
5324	199.9	5334	198.8	5344	198.2	5354	196.9	5364	196.4		
5374	195.7	5384	195.8	5394	196.5	5404	199.5	5409	200.2		
5414	200.8	5419	201.2	5421	203.4	5424	203.8	5449	204.4		
5450.1	205.2	5470	205.2	5488.7	205.2	5552	207	5563.6	207.2		
5599.9	206.3	5640	206.3	5683.1	205.7	5737.1	205.2	5796.4	205.2		
5809.5	205.5	5832.2	204.3	5860	204.3	5905.5	204.4	5953.5	205.1		
6006	204.8	6029.7	205.1	6044	204.9	6089.5	205.7	6132.8	207.5		
6142.9	207.9	6154.5	207.5	6162.7	207.2	6173.2	209.2	6189.4	210		
6207.8	212	6226.2	214.1	6256.1	217.5	6274.1	220.2	6301.2	221.8		
6325.7	221.8	6332.5	221.9	6545.4	227.6						

Manning's n Values		num=	5								
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4685.6	.9	4813.6	.075	4943	.037	5059	.09	6162.7	.9		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4942 5082 260 183.04 70 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R El ev Permanent
 4685.6 4942 203.5 F
 5082 6545.4 203.1 F
 Sedi ment El evati on = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 21440

INPUT
 Descri pti on: 21440

Station		Elevation Data		num=	88						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4685.6	225	4693	223.6	4702.5	223.7	4715.8	223.5	4731.8	220		
4743.3	210	4767.5	205.8	4792.3	204.6	4813.6	203.8	4831.1	203.8		
4860.5	203.9	4884.6	203.8	4911.1	203.9	4915	203.3	4942	203.5		
4943	201.3	4953	200.7	4966	198.9	4977	194.9	4995	194.3		
5011	195.2	5026	196.2	5040	190.4	5140	190.4	5169	202		

Ramapo River Post. rep

5202	201.2	5204	200.5	5210	200.1	5216	200.6	5221	200.7
5226	200.8	5231	201.2	5239	201.6	5254	201.9	5270	201.6
5282	201.3	5297	201.2	5304	200.9	5314	200.8	5321	200.6
5324	199.9	5334	198.8	5344	198.2	5354	196.9	5364	196.4
5374	195.7	5384	195.8	5394	196.5	5404	199.5	5409	200.2
5414	200.8	5419	201.2	5421	203.4	5424	203.8	5449	204.4
5450.1	205.2	5470	205.2	5488.7	205.2	5552	207	5563.6	207.2
5599.9	206.3	5640	206.3	5683.1	205.7	5737.1	205.2	5796.4	205.2
5809.5	205.5	5832.2	204.3	5860	204.3	5905.5	204.4	5953.5	205.1
6006	204.8	6029.7	205.1	6044	204.9	6089.5	205.7	6132.8	207.5
6142.9	207.9	6154.5	207.5	6162.7	207.2	6173.2	209.2	6189.4	210
6207.8	212	6226.2	214.1	6256.1	217.5	6274.1	220.2	6301.2	221.8
6325.7	221.8	6332.5	221.9	6545.4	227.6				

Manning's n Values	num=	5							
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
4685.6	.07	4813.6	.075	4943	.037	5169	.09	6162.7	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	4942	5169		260.04	144		.1	.3	
Ineffective Flow	num=	2							
Sta L	Sta R	Elev	Permanent						
4685.6	4942	203.5	F						
5169	6545.4	202	F						
Sediment Elevation	= 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 21417

INPUT
 Description: 21417

Station Elevation Data	num=	75							
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
4580.8	225	4590.6	220.3	4601.6	220.6	4617.6	220.7	4622.9	221.3
4638	216.1	4653.8	210	4688.8	204.3	4719.1	205	4754.4	205.5
4782.7	205.2	4804.3	205.2	4817.3	205.4	4849.5	205	4865.7	204.6
4879.1	204.8	4895.7	204.7	4923.6	203.7	4931	203.8	4951	203.3
4954	202.9	4955	201.2	4962.6	199.7	4962.7	196	4972	195.2
4982	194.5	4992	194.1	5002	193.8	5012	195	5022	196.2
5032	198.9	5044	201.1	5046	202.3	5066	202.4	5092	202.3
5125.5	201.8	5149.5	201.2	5154.5	200.1	5163.5	199.1	5173.5	198.4
5183.5	198.2	5193.5	198.1	5203.5	198	5213.5	198.3	5223.5	198.4
5233.5	198.4	5243.5	198.2	5253.5	198	5263.5	197.7	5273.5	196.9
5283.5	194.9	5293.5	194.4	5303.5	194.4	5313.5	194.4	5323.5	195.2
5332.5	196.6	5337.5	197.7	5342.4	199.4	5342.5	201.2	5343.5	203.7
5358	205.3	5368.5	204.9	5388.5	202.2	5431.5	205.4	5603.5	205.8
5691.5	204.2	5769.5	204.7	5832	203.3	5870	204.2	5992	203.8
6094	209.7	6118	209.5	6130	208.8	6290	222.8	6516	225.1

Manning's n Values	num=	5							
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
4580.8	.9	4601.6	.075	4955	.038	5044	.09	6130	.9

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	4951	5046		55.02	132.42	100.08	.3	.5	
Sediment Elevation	= 0								

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 21296

INPUT

Description: 21296

Station Elevation Data

num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4580.8	225	4590.6	220.3	4601.6	220.6	4617.6	220.7	4622.9	221.3
4638	216.1	4653.8	210	4688.8	204.3	4719.1	205	4754.4	205.5
4782.7	205.2	4804.3	205.2	4817.3	205.4	4849.5	205	4865.7	204.6
4879.1	204.8	4895.7	204.7	4923.6	203.7	4931	203.8	4951	203.3
4954	202.9	4955	201.2	4962.6	199.7	4962.7	196	4972	195.2
4982	194.5	4992	194.1	5001	194	5010	190.4	5110	190.4
5138	201.7	5149.5	201.2	5154.5	200.1	5163.5	199.1	5173.5	198.4
5183.5	198.2	5193.5	198.1	5203.5	198	5213.5	198.3	5223.5	198.4
5233.5	198.4	5243.5	198.2	5253.5	198	5263.5	197.7	5273.5	196.9
5283.5	194.9	5293.5	194.4	5303.5	194.4	5313.5	194.4	5323.5	195.2
5332.5	196.6	5337.5	197.7	5342.4	199.4	5342.5	201.2	5343.5	203.7
5358	205.3	5368.5	204.9	5388.5	202.2	5431.5	205.4	5603.5	205.8
5691.5	204.2	5769.5	204.7	5832	203.3	5870	204.2	5992	203.8
6094	209.7	6118	209.5	6130	208.8	6290	222.8	6516	225.1

Manning's n Values

num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4580.8	.07	4601.6	.075	4955	.038	5149.5	.09	6130	.07

Bank Sta: Left Right
4951 5138

Lengths: Left Channel Right Coeff Contr. Expan.
165 360.45 300.15 .3 .5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 21152

INPUT

Description: 21152

Station Elevation Data

num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4397.3	225	4407.4	221.2	4410.1	222.1	4415.9	222.7	4428.9	222.7
4435.7	222.4	4445.2	220	4458	210	4477.5	204.5	4497.8	204.7
4524.7	205.1	4549.7	205.4	4581.4	205.8	4602	205.9	4625.3	205.5
4650.6	204.8	4674.9	205.3	4696.1	205	4713.5	203.9	4743.3	203
4792.7	204.5	4854.7	204.4	4885.4	203.8	4889	201.6	4911	202
4912	202.2	4919	201.3	4929	199.6	4939	196.6	4949	195.1
4959	194.3	4969	193.7	4979	193.6	4989	194.2	4999	195.2
5009	195.5	5019	194.7	5029	194.5	5039	194.4	5049	194
5059	193.8	5069	194.8	5074	195.8	5077	197.3	5079	199.4
5081	201.3	5083	204.1	5090	204.7	5100.2	204.2	5134.1	205.1
5179	205.7	5206.1	204.7	5225.4	204.1	5237.3	204.6	5249.7	204.3
5276.8	204.3	5314.1	204.2	5351.9	204.5	5373.6	205.2	5390.5	205.1
5438.2	205.8	5461.3	204.5	5472.1	204.8	5485.7	204.5	5505	205.3
5577.6	206.5	5619.1	206.2	5639.5	208.1	5670.3	208.9	5679.5	208.9
5695.3	212	5713.3	213.2	5751.7	212.1	5780.2	212.4	5800.5	215.6
5814.1	216	5829.6	215.8	5852.8	216.1	5883.4	217.5	5895.3	218.3
5913.3	220	5935.9	221	5952.2	222.5	5999.2	225		

Manning's n Values

num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4397.3	.9	4428.9	.075	4919	.038	5081	.09	5679.5	.9

Ramapo River Post. rep

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4911 5090 20 88.8 108 .3 .5
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 21068

INPUT
 Descri pti on: 21068

Stati on El evati on Data			num= 79						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4397.3	225	4407.4	221.2	4410.1	222.1	4415.9	222.7	4428.9	222.7
4435.7	222.4	4445.2	220	4458	210	4477.5	204.5	4497.8	204.7
4524.7	205.1	4549.7	205.4	4581.4	205.8	4602	205.9	4625.3	205.5
4650.6	204.8	4674.9	205.3	4696.1	205	4713.5	203.9	4743.3	203
4792.7	204.5	4809	204.7	4845	190.3	4945	190.3	4955	194.3
4959	194.3	4969	193.7	4979	193.6	4989	194.2	4999	195.2
5009	195.5	5019	194.7	5029	194.5	5039	194.4	5049	194
5059	193.8	5069	194.8	5074	195.8	5077	197.3	5079	199.4
5081	201.3	5083	204.1	5090	204.7	5100.2	204.2	5134.1	205.1
5179	205.7	5206.1	204.7	5225.4	204.1	5237.3	204.6	5249.7	204.3
5276.8	204.3	5314.1	204.2	5351.9	204.5	5373.6	205.2	5390.5	205.1
5438.2	205.8	5461.3	204.5	5472.1	204.8	5485.7	204.5	5505	205.3
5577.6	206.5	5619.1	206.2	5639.5	208.1	5670.3	208.9	5679.5	208.9
5695.3	212	5713.3	213.2	5751.7	212.1	5780.2	212.4	5800.5	215.6
5814.1	216	5829.6	215.8	5852.8	216.1	5883.4	217.5	5895.3	218.3
5913.3	220	5935.9	221	5952.2	222.5	5999.2	225		

Manni ng' s n Val ues			num= 5						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4397.3	.07	4428.9	.075	4809	.038	5081	.09	5679.5	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4809 5090 80.04 279.12 432 .3 .5
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 20930

INPUT
 Descri pti on: 20930

Stati on El evati on Data			num= 83						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4370.3	225	4382.5	220.8	4393.3	220.7	4407.3	220.8	4415.8	219.7
4433.8	214.1	4446.1	210.1	4459.7	204.8	4485	205	4519	205.3
4555	205.3	4592.8	205.3	4632.2	205.1	4672.1	203.9	4696.7	202.2
4727.9	202.2	4751.2	202.8	4779.8	203.8	4799.5	203.3	4827.5	203.1
4848.1	203.2	4869.4	203.4	4893.9	202.2	4907	202.1	4914	202.2
4915	201.4	4922	201.4	4924	201.9	4930	202	4931	201.3
4931.1	200.7	4937	199.5	4942	198.4	4947	197.4	4957	197.4
4967	197.4	4977	197.4	4987	196.3	4997	195.3	5007	193.3
5017	191.4	5027	190.1	5037	190.6	5047	191.9	5052	194.3
5057	195.3	5062	198	5067	198.8	5069	199.1	5069.1	201.3
5069.2	203	5087	203.7	5092.2	203.1	5111	203.7	5159.5	203.8
5172.5	204.3	5188.1	203.5	5211.9	204.3	5236	204.4	5265.1	205.4

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5293.4	204.5	5333.1	205	5377.3	205.8	5394.9	205.8	5408.1	205.9
5420.4	205.9	5442.7	207	5483.3	207.9	5493.7	209.6	5504.5	210.4
5516.6	211.7	5541	212.5	5574	213.1	5598	214.8	5630.7	216.6
5684	216.4	5723.3	217.8	5746.8	221.3	5761.3	222.5	5773.3	222.3
5792.7	223.2	5822.8	223.4	5859.1	225.2				

Manning's n Values			num=	5					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4370.3	.9	4415.8	.075	4931	.037	5069.1	.09	5420.4	.9

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4930	5069.2		36	46	56	.1	.3
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20922

INPUT

Description: 20922

Station Elevation Data			num=	73					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4370.3	225	4382.5	220.8	4393.3	220.7	4407.3	220.8	4415.8	219.7
4433.8	214.1	4446.1	210.1	4459.7	204.8	4485	205	4519	205.3
4555	205.3	4592.8	205.3	4632.2	205.1	4672.1	203.9	4696.7	202.2
4727.9	202.2	4751.2	202.8	4779.8	203.8	4787	203.3	4820	190.2
4920	190.2	4940	198	4942	198.4	4947	197.4	4957	197.4
4967	197.4	4977	197.4	4987	196.3	4997	195.3	5007	193.3
5017	191.4	5027	190.1	5037	190.6	5047	191.9	5052	194.3
5057	195.3	5062	198	5067	198.8	5069	199.1	5069.1	201.3
5069.2	203	5087	203.7	5092.2	203.1	5111	203.7	5159.5	203.8
5172.5	204.3	5188.1	203.5	5211.9	204.3	5236	204.4	5265.1	205.4
5293.4	204.5	5333.1	205	5377.3	205.8	5394.9	205.8	5408.1	205.9
5420.4	205.9	5442.7	207	5483.3	207.9	5493.7	209.6	5504.5	210.4
5516.6	211.7	5541	212.5	5574	213.1	5598	214.8	5630.7	216.6
5684	216.4	5723.3	217.8	5746.8	221.3	5761.3	222.5	5773.3	222.3
5792.7	223.2	5822.8	223.4	5859.1	225.2				

Manning's n Values			num=	5					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4370.3	.07	4415.8	.075	4787	.037	5069.1	.09	5420.4	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4787	5069.2		324.02	403.07	504.05	.1	.3
Sediment	Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20703

INPUT

Description: 20703

Station Elevation Data			num=	57					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4402.5	225	4414.1	218.1	4427.7	216.9	4441.7	216.6	4457.3	215.2
4479.7	214.7	4508.8	215	4536.4	214.5	4563.2	213.2	4591.1	210
4608.4	204.9	4683.2	204	4741.3	203.8	4786	203.5	4831.2	202.3
4871	203.9	4905	190.2	5005	190.2	5013	193.2	5023.7	192.83
5033.7	192.6	5038.7	192.4	5043.7	193.8	5048.7	193.7	5053.7	195

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5058.7	196.5	5060.2	200.9	5061	200.9	5061.1	201.3	5061.7	203.4
5066.7	203.9	5077	203.8	5123	204.7	5150.4	205.1	5173.6	203.8
5187.1	204.2	5198.7	203.9	5222.7	203.5	5256	203.5	5296.5	202.2
5311.4	201.1	5340.9	201.2	5380.6	201.1	5414.6	201.5	5446.3	202.6
5456.8	203.9	5476.2	210	5501.2	213	5516.6	213.8	5537.5	214.3
5565.4	215.3	5597.4	214.7	5625.1	214.7	5645.6	217.5	5663.9	221.2
5706.3	224	5737.3	225						

Manning's n Values			num=	5					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4402.5	.07	4441.7	.075	4871	.037	5061.1	.09	5256	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4871	5066.7		289.98	208.98	150.03		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20700

INPUT
Description: 20700

Station Elevation Data			num=	67					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4402.5	225	4414.1	218.1	4427.7	216.9	4441.7	216.6	4457.3	215.2
4479.7	214.7	4508.8	215	4536.4	214.5	4563.2	213.2	4591.1	210
4608.4	204.9	4683.2	204	4741.3	203.8	4786	203.5	4831.2	202.3
4875.1	203.6	4913.7	204.7	4915.7	204.6	4933.7	202.5	4938.7	201.3
4943.7	200.8	4948.7	199.9	4953.7	198.5	4963.7	196.6	4973.7	194.8
4983.7	194.3	4993.7	194.5	5003.7	193.8	5013.7	193.3	5023.7	192.8
5033.7	192.6	5038.7	192.4	5043.7	193.8	5048.7	193.7	5053.7	195
5058.7	196.5	5060.2	200.9	5061	200.9	5061.1	201.3	5061.7	203.4
5066.7	203.9	5077	203.8	5123	204.7	5150.4	205.1	5173.6	203.8
5187.1	204.2	5198.7	203.9	5222.7	203.5	5256	203.5	5296.5	202.2
5311.4	201.1	5340.9	201.2	5380.6	201.1	5414.6	201.5	5446.3	202.6
5456.8	203.9	5476.2	210	5501.2	213	5516.6	213.8	5537.5	214.3
5565.4	215.3	5597.4	214.7	5625.1	214.7	5645.6	217.5	5663.9	221.2
5706.3	224	5737.3	225						

Manning's n Values			num=	5					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4402.5	.9	4441.7	.075	4938.7	.037	5061.1	.09	5256	.9

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4915.7	5066.7		289.98	205.02	150.03		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20495

INPUT
Description: 20495

Station Elevation Data			num=	70					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4428.6	225	4434.7	222	4446.3	222.6	4462.2	221.6	4487.4	220.3
4526.3	219.5	4554.2	218.2	4582.5	214.7	4607.4	210	4642.9	204.8

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4706.4	202.8	4746	202.4	4753	202.4	4777	202.4	4782	201.8
4783	201.3	4788	199.8	4797	198.8	4807	199.3	4817	200
4827	200.3	4837	200.3	4847	200.7	4849	201.3	4852	202.4
4862	202.8	4877	202.8	4897	202.8	4908	202.8	4917	203.2
4931	202.9	4934	201.2	4935	201.2	4940	200.4	4948	198.8
4953	197.2	4958	196.7	4968	196.1	4978	193.5	4988	193
4998	193.1	5008	193.3	5018	193.4	5028	193.2	5038	193.8
5043	194	5048	194.1	5053	194.4	5058	195.9	5061	197.9
5065	199.4	5065.1	201.1	5066	202.9	5079.9	203.8	5102.5	203.8
5124.5	203.9	5176.5	204	5199.8	203.9	5223.9	203.6	5261.3	202.6
5305.4	202.6	5362.3	202.6	5426	201	5500.7	201	5519.4	209.8
5536.7	215.7	5586.3	215.8	5601.2	218.2	5620.1	222.4	5661.8	225

Manning's n Values			num=	7					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4428.6	.9	4526.3	.075	4783	.04	4849	.065	4931	.035
5065.1	.09	5223.9	.9						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4782	5066		49.34	49	52.66		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20494

INPUT

Description: 20494

Station Elevation Data			num=	55					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4428.6	225	4434.7	222	4446.3	222.6	4462.2	221.6	4487.4	220.3
4526.3	219.5	4554.2	218.2	4582.5	214.7	4607.4	210	4642.9	204.8
4706.4	202.8	4746	202.4	4753	202.4	4777	202.4	4782	201.8
4783	201.3	4788	199.8	4797	198.8	4807	199.3	4817	200
4827	200.3	4837	200.3	4847	200.7	4849	201.3	4852	202.4
4862	202.8	4897	202.8	4898	203	4930	190	5030	190
5040	194	5043	194	5053	194.4	5058	195.9	5061	197.9
5065	199.4	5065.1	201.1	5066	202.9	5079.9	203.8	5102.5	203.8
5124.5	203.9	5176.5	204	5199.8	203.9	5223.9	203.6	5261.3	202.6
5305.4	202.6	5362.3	202.6	5426	201	5500.7	201	5519.4	209.8
5536.7	215.7	5586.3	215.8	5601.2	218.2	5620.1	222.4	5661.8	225

Manning's n Values			num=	7					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4428.6	.07	4526.3	.075	4783	.04	4849	.065	4898	.035
5065	.09	5223.9	.07						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4782	5066		246.7	246	263.3		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20348

INPUT

Description: 20348

This is a REPEATED section.

Ramapo River Post. rep

Station Elevation Data			num=	78						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4381.8	225.1	4406.3	220	4437.4	218.2	4511.1	218.7	4544.4	220.1	
4576.8	220.2	4599.8	215.9	4657.8	202.8	4686.4	203	4722	202.9	
4742	202.8	4745	202.8	4746	201.3	4752	200	4762	199.2	
4762.5	198.9	4764	199	4764.1	199	4772	198.8	4783	199.6	
4783.5	199.6	4784.5	199.6	4785	199.6	4792	199.8	4802	200.5	
4812	200.7	4813	201.3	4818	202.2	4818.1	202.2	4832	202.3	
4851	202.7	4872	202.4	4881	202.6	4910.5	203.1	4930.5	202.7	
4932.5	201.4	4938.5	200.6	4945.5	198.6	4955.5	197.3	4960.5	196.1	
4970.5	194	4980.5	193.7	4990.5	193.6	5000.5	193.4	5010.5	193.6	
5020.5	193.4	5030.5	193.2	5040.5	193.4	5050.5	193.8	5055.5	194.4	
5060.5	196	5064.5	197.2	5065.5	199.9	5066.5	200.2	5066.6	201.2	
5066.7	202.7	5078.5	203.2	5103.1	202.7	5135.8	203.2	5158.4	203.7	
5181.6	203.5	5208.8	203.2	5244	203.8	5435.7	199.9	5474.1	200.2	
5523.7	200.7	5552.7	200.7	5568.4	201.7	5581.1	202.8	5614.3	214.3	
5625.5	214	5640.1	219.6	5658.4	222.1	5682.9	224.4	5694.8	224.4	
5733.4	224.8	5765	224.3	5800.7	225					

Manning's n Values			num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
4381.8	.9	4576.8	.07	4746	.04	4813	.06	4932.5	.035	
5066.6	.075	5208.8	.9							

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4722	5066.7		16	16		.3	.5
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20346

INPUT

Description: 20346

Station Elevation Data			num=	68						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4381.8	225.1	4406.3	220	4437.4	218.2	4511.1	218.7	4544.4	220.1	
4576.8	220.2	4599.8	215.9	4657.8	202.8	4686.4	203	4722	202.9	
4742	202.8	4745	202.8	4746	201.3	4752	200	4762	199.2	
4762.5	198.9	4764	199	4764.1	199	4772	198.8	4783	199.6	
4783.5	199.6	4784.5	199.6	4785	199.6	4792	199.8	4802	200.5	
4812	200.7	4813	201.3	4818	202.2	4818.1	202.2	4832	202.3	
4851	202.7	4872	202.4	4881	202.6	4891.5	203	4923	190	
5023	190	5031	193.4	5040.5	193.4	5050.5	193.8	5055.5	194.4	
5060.5	196	5064.5	197.2	5065.5	199.9	5066.5	200.2	5066.6	201.2	
5066.7	202.7	5078.5	203.2	5103.1	202.7	5135.8	203.2	5158.4	203.7	
5181.6	203.5	5208.8	203.2	5244	203.8	5435.7	199.9	5474.1	200.2	
5523.7	200.7	5552.7	200.7	5568.4	201.7	5581.1	202.8	5614.3	214.3	
5625.5	214	5640.1	219.6	5658.4	222.1	5682.9	224.4	5694.8	224.4	
5733.4	224.8	5765	224.3	5800.7	225					

Manning's n Values			num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
4381.8	.07	4576.8	.07	4746	.04	4813	.06	4891.5	.035	
5066.6	.075	5208.8	.07							

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4722	5066.7		16	16		.1	.3
Sediment Elevation =	0							

BRI DGE

Ramapo River Post. rep

RIVER: Ramapo River
 REACH: Reach-1 RS: 20338

INPUT

Description: CON. PED. BRIDGE
 Distance from Upstream XS = 1
 Deck/Roadway Width = 14
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 20											
Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord
4742	202.8	202.8		4745	202.8	202.8		4746	204.2	202.5	
4752	204.6	202.9		4762	205.9	204.4		4762.5	208	198.9	
4764	208	199		4764.1	206	204.5		4772	205.8	204.5	
4783	205.6	204.2		4783.5	207.7	199.6		4784.5	207.7	199.6	
4785	205.5	204.2		4792	205.3	203.4		4802	204	202	
4812	202.2	201.6		4813	202.2	201.6		4818	202.2	201.6	
4818.1	202.2	202.2		4832	202.3	202.3					

Upstream Bridge Cross Section Data

Station Elevation Data num= 68											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4381.8	225.1	4406.3	220	4437.4	218.2	4511.1	218.7	4544.4	220.1		
4576.8	220.2	4599.8	215.9	4657.8	202.8	4686.4	203	4722	202.9		
4742	202.8	4745	202.8	4746	201.3	4752	200	4762	199.2		
4762.5	198.9	4764	199	4764.1	199	4772	198.8	4783	199.6		
4783.5	199.6	4784.5	199.6	4785	199.6	4792	199.8	4802	200.5		
4812	200.7	4813	201.3	4818	202.2	4818.1	202.2	4832	202.3		
4851	202.7	4872	202.4	4881	202.6	4891.5	203	4923	190		
5023	190	5031	193.4	5040.5	193.4	5050.5	193.8	5055.5	194.4		
5060.5	196	5064.5	197.2	5065.5	199.9	5066.5	200.2	5066.6	201.2		
5066.7	202.7	5078.5	203.2	5103.1	202.7	5135.8	203.2	5158.4	203.7		
5181.6	203.5	5208.8	203.2	5244	203.8	5435.7	199.9	5474.1	200.2		
5523.7	200.7	5552.7	200.7	5568.4	201.7	5581.1	202.8	5614.3	214.3		
5625.5	214	5640.1	219.6	5658.4	222.1	5682.9	224.4	5694.8	224.4		
5733.4	224.8	5765	224.3	5800.7	225						

Manning's n Values num= 7											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4381.8	.07	4576.8	.07	4746	.04	4813	.06	4891.5	.035		
5066.6	.075	5208.8	.07								

Bank Sta: Left Right Coeff Contr. Expan.
 4722 5066.7 .1 .3
 Sediment Elevation = 0

Downstream Deck/Roadway Coordinates num= 19											
Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord
4741	202.8	202.8		4745	202.9	202.9		4745.1	201.3	201.3	
4745.2	204.1	202.4		4751	204.7	203		4764	206	204.5	
4764.1	208	198.7		4765.4	208	198.7		4765.5	206	198.6	
4771	204.9	204.5		4785	205.7	204.3		4785.1	207.7	199.3	
4786.4	207.7	199.3		4786.5	205.6	204.3		4791	205.6	204	
4803	204	201.9		4803.1	202.3	199		4811	202.3	200.6	
4818	202.4	202.4									

Downstream Bridge Cross Section Data Station Elevation Data num= 76											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4374.3	225	4404.8	218.4	4435.8	218.4	4465	218.5	4503.7	218.6		

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4542.6	220.3	4568.2	220	4711.8	202.6	4721	202.8	4741	202.8
4745	202.9	4745.1	201.3	4745.2	199.8	4751	199.1	4764	199
4764.1	198.7	4765.4	198.7	4765.5	198.6	4771	198.4	4785	199.3
4785.1	199.3	4786.4	199.3	4786.5	199.3	4791	198.6	4803	199
4803.1	199	4811	200.6	4818	201.3	4824	202.4	4841	202
4861	202.2	4881	202.5	4895	202.4	4909	202.9	4931	202.8
4934	201.1	4939	200.4	4944	198.7	4949	198.1	4954	197.1
4959	195.8	4969	194	4979	193.8	4989	193.3	4999	193.4
5009	193.2	5019	193.1	5029	192.9	5039	193.1	5049	193.5
5054	194.4	5064	196.9	5066	200.2	5066.1	201.1	5066.2	202.6
5079	203.2	5081.1	202.1	5112.9	202.7	5139.5	203.7	5161.6	203.9
5172.8	203.7	5184.7	203.1	5201.3	203.4	5233.3	203.2	5263	203
5299.3	202.2	5337.7	202.1	5373.8	201.1	5418.6	201.1	5447.1	200.4
5485.5	200	5516.7	200	5546.7	200.6	5594.1	204.8	5609.9	207.2
5679	225								

Manning's n Values										
num=	7									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
4374.3	.9	4568.2	.075	4745.1	.04	4818	.065	4934	.035	
5066.1	.075	5201.3	.9							

Bank Sta: Left Right Coeff Contr. Expan.
 4745 5066.1 .3 .5
 Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
 Energy
 Selected Low Flow Methods = Energy

High Flow Method
 Energy Only

Additional Bridge Parameters
 Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20332

INPUT
 Description: 20332
 This is a REPEATED section.

Station Elevation Data										
num=	76									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4374.3	225	4404.8	218.4	4435.8	218.4	4465	218.5	4503.7	218.6	
4542.6	220.3	4568.2	220	4711.8	202.6	4721	202.8	4741	202.8	

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4745	202.9	4745.1	201.3	4745.2	199.8	4751	199.1	4764	199
4764.1	198.7	4765.4	198.7	4765.5	198.6	4771	198.4	4785	199.3
4785.1	199.3	4786.4	199.3	4786.5	199.3	4791	198.6	4803	199
4803.1	199	4811	200.6	4818	201.3	4824	202.4	4841	202
4861	202.2	4881	202.5	4895	202.4	4909	202.9	4931	202.8
4934	201.1	4939	200.4	4944	198.7	4949	198.1	4954	197.1
4959	195.8	4969	194	4979	193.8	4989	193.3	4999	193.4
5009	193.2	5019	193.1	5029	192.9	5039	193.1	5049	193.5
5054	194.4	5064	196.9	5066	200.2	5066.1	201.1	5066.2	202.6
5079	203.2	5081.1	202.1	5112.9	202.7	5139.5	203.7	5161.6	203.9
5172.8	203.7	5184.7	203.1	5201.3	203.4	5233.3	203.2	5263	203
5299.3	202.2	5337.7	202.1	5373.8	201.1	5418.6	201.1	5447.1	200.4
5485.5	200	5516.7	200	5546.7	200.6	5594.1	204.8	5609.9	207.2
5679	225								

Manning's n Values	num=	7							
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
4374.3	.9	4568.2	.075	4745.1	.04	4818	.065	4934	.035
5066.1	.075	5201.3	.9						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4745	5066.1	2	2	2		.3	.5
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 20330

INPUT
Description: 20330

Station Elevation Data	num=	76							
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
4374.3	225	4404.8	218.4	4435.8	218.4	4465	218.5	4503.7	218.6
4542.6	220.3	4568.2	220	4711.8	202.6	4721	202.8	4741	202.8
4745	202.9	4745.1	201.3	4745.2	199.8	4751	199.1	4764	199
4764.1	198.7	4765.4	198.7	4765.5	198.6	4771	198.4	4785	199.3
4785.1	199.3	4786.4	199.3	4786.5	199.3	4791	198.6	4803	199
4803.1	199	4811	200.6	4818	201.3	4824	202.4	4841	202
4861	202.2	4881	202.5	4895	202.4	4909	202.9	4931	202.8
4934	201.1	4939	200.4	4944	198.7	4949	198.1	4954	197.1
4959	195.8	4969	194	4979	193.8	4989	193.3	4999	193.4
5009	193.2	5019	193.1	5029	192.9	5039	193.1	5049	193.5
5054	194.4	5064	196.9	5066	200.2	5066.1	201.1	5066.2	202.6
5079	203.2	5081.1	202.1	5112.9	202.7	5139.5	203.7	5161.6	203.9
5172.8	203.7	5184.7	203.1	5201.3	203.4	5233.3	203.2	5263	203
5299.3	202.2	5337.7	202.1	5373.8	201.1	5418.6	201.1	5447.1	200.4
5485.5	200	5516.7	200	5546.7	200.6	5594.1	204.8	5609.9	207.2
5679	225								

Manning's n Values	num=	7							
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
4374.3	.9	4568.2	.075	4745.1	.04	4818	.065	4934	.035
5066.1	.075	5201.3	.9						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4745.1	5066.1	43.34	43.34	43.34		.3	.5

Ineffective Flow	num=	2		
Sta L Sta R Elev	Permanent	F	F	
4374.3	4745.1	201.3		
5066.1	5679	201.1		

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 20328

INPUT

Description: 20328

Station Elevation Data

num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4374.3	225	4404.8	218.4	4435.8	218.4	4465	218.5	4503.7	218.6
4542.6	220.3	4568.2	220	4711.8	202.6	4721	202.8	4741	202.8
4745	202.9	4745.1	201.3	4745.2	199.8	4751	199.1	4764	199
4764.1	198.7	4765.4	198.7	4765.5	198.6	4771	198.4	4785	199.3
4785.1	199.3	4786.4	199.3	4786.5	199.3	4791	198.6	4803	199
4803.1	199	4811	200.6	4818	201.3	4824	202.4	4841	202
4861	202.2	4881	202.5	4882	202.5	4892	202.6	4923	190
5023	190	5031	193.1	5032	193.1	5039	193.1	5049	193.5
5054	194.4	5064	196.9	5066	200.2	5066.1	201.1	5066.2	202.6
5079	203.2	5081.1	202.1	5112.9	202.7	5139.5	203.7	5161.6	203.9
5172.8	203.7	5184.7	203.1	5201.3	203.4	5233.3	203.2	5263	203
5299.3	202.2	5337.7	202.1	5373.8	201.1	5418.6	201.1	5447.1	200.4
5485.5	200	5516.7	200	5546.7	200.6	5594.1	204.8	5609.9	207.2
5679	225								

Manning's n Values

num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4374.3	.07	4568.2	.075	4745.1	.04	4818	.065	4892	.035
5066	.075	5201.3	.07						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4745.1 5066.1 489.8 481.8 519.8 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4374.3	4745.1	201.3	F
5066.1	5679	201.1	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 20070

INPUT

Description: 20070

Station Elevation Data

num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4411.7	225	4439.1	222	4452.7	220	4539.9	219.7	4562.3	214.7
4592.4	210	4629.7	203.1	4637	201.2	4638	203.1	4641	203.1
4643	200	4647	199	4655	197.9	4661	197.5	4670	197.2
4676	197	4682	197.8	4686	198.4	4691	198.9	4696	199.9
4701	201.2	4707	201.4	4710	202.3	4742	201.9	4752	201.4
4757	201	4766	201.4	4776	201.6	4801	201.4	4809	200.9
4820	201.8	4827	201.4	4859	202.1	4922.5	201.6	4934.5	201.4
4939.5	202.1	4941.5	201.2	4942.5	200.6	4947.5	199.5	4952.5	197.1
4962.5	195.2	4972.5	192.7	4982.5	192.7	4992.5	192.7	5002.5	192.6
5012.5	192.5	5022.5	192.2	5032.5	192.6	5042.5	194.2	5047.5	195
5052.5	197.3	5056.5	199.2	5058.5	201.2	5060.5	202.6	5082.5	203.3
5148	204.6	5162.5	203	5181.3	203.5	5210.5	203.4	5252.9	204.1

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5283.7	204.5	5324.3	204.7	5370.6	204.4	5405.6	204.5	5421.7	204.4
5485.9	203.5	5517.2	203.1	5556.9	204	5593.4	200.3	5609.4	198.7
5621.4	200.4	5666.1	201	5704.3	201.9	5753.4	201.7	5794	203.2
5806.7	210	5843.8	222.1	5854.8	223	5884.8	227.6		

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4411.7	.9	4592.4	.075	4643	.04	4701	.065	4941.5	.035
5058.5	.075	5210.5	.9						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	4638	5060.5		26.64	43.34		.3	.5	
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
4411.7	4638	203.1	F						
5060.5	5884.8	202.6	F						
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 20063

INPUT

Description: 20063

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4411.7	225	4439.1	222	4452.7	220	4539.9	219.7	4562.3	214.7
4592.4	210	4629.7	203.1	4637	201.2	4638	203.1	4641	203.1
4643	200	4647	199	4655	197.9	4661	197.5	4670	197.2
4676	197	4682	197.8	4686	198.4	4691	198.9	4696	199.9
4701	201.2	4707	201.4	4710	202.3	4742	201.9	4752	201.4
4757	201	4766	201.4	4776	201.6	4801	201.4	4809	200.9
4820	201.8	4827	201.4	4859	202.1	4886	202	4917	189.7
5017	189.7	5024	192.6	5032.5	192.6	5042.5	194.2	5047.5	195
5052.5	197.3	5056.5	199.2	5058.5	201.2	5060.5	202.6	5082.5	203.3
5148	204.6	5162.5	203	5181.3	203.5	5210.5	203.4	5252.9	204.1
5283.7	204.5	5324.3	204.7	5370.6	204.4	5405.6	204.5	5421.7	204.4
5485.9	203.5	5517.2	203.1	5556.9	204	5593.4	200.3	5609.4	198.7
5621.4	200.4	5666.1	201	5704.3	201.9	5753.4	201.7	5794	203.2
5806.7	210	5843.8	222.1	5854.8	223	5884.8	227.6		

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4411.7	.07	4592.4	.075	4643	.04	4701	.065	4886	.035
5059	.075	5210.5	.07						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	4638	5060.5		293.36	467.78		.1	.3	
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
4411.7	4638	203.1	F						
5060.5	5884.8	202.6	F						
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19812

INPUT

Ramapo River Post. rep

Description: 19812

Station Elevation Data		num= 88		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4408.3	225	4426	222.1	4439.8	222	4455	220	4472.5	217.6		
4487.1	214.6	4496	215.5	4519	207	4553	202.9	4554	201.2		
4555	199.7	4560	199.4	4565	198.4	4575	198.1	4583	197.7		
4590	197.7	4595	198.1	4600	198.4	4602	198.9	4609	201.1		
4610	203.6	4614	203.7	4623	201.8	4637	201.4	4688	201.5		
4697	201.4	4709	200.7	4722	199.4	4782	200	4832	200.6		
4872	201.2	4873	201.2	4890	201.5	4920	189.6	5020	189.6		
5025	191.6	5029	191.5	5039	191.6	5049	194.8	5054	196.3		
5059	199.9	5061	201.2	5063	202.9	5089	204.6	5177	206.1		
5228	204	5297	203.3	5313	202.8	5365	201.2	5375	200.5		
5380	198.6	5399	191	5409	188.2	5415	187.3	5423	188.7		
5428	188.1	5433	188.4	5439	187.2	5449	184.2	5454	184.2		
5459	185.2	5469	186.6	5479	185.7	5485	187.2	5489	186.5		
5499	184.9	5509	184	5514	183.6	5521	184	5529	184.1		
5539	183.9	5544	184.2	5549	184.2	5554	185.2	5559	184.1		
5569	183.4	5579	183.3	5589	183.2	5599	183.1	5604	183		
5799	187.3	5847	197.7	5850	198.8	5856	200.4	5857	201.2		
5867	204.4	5879	213.4	5910.7	225.8						

Manning's n Values		num= 7		Sta		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4408.3	.07	4519	.075	4554	.04	4609	.065	4873	.035		
5061	.075	5089	.07								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4554 5061 180 90 385 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19810

INPUT
 Description: 19810

Station Elevation Data		num= 98		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4408.3	225	4426	222.1	4439.8	222	4455	220	4472.5	217.6		
4487.1	214.6	4496	215.5	4519	207	4553	202.9	4554	201.2		
4555	199.7	4560	199.4	4565	198.4	4575	198.1	4583	197.7		
4590	197.7	4595	198.1	4600	198.4	4602	198.9	4609	201.1		
4610	203.6	4614	203.7	4623	201.8	4637	201.4	4688	201.5		
4697	201.4	4709	200.7	4722	199.4	4782	200	4832	200.6		
4872	201.2	4919	201.7	4938	201.8	4939	201.2	4943	200.4		
4944	199.4	4949	198	4954	196.6	4959	195	4964	192.5		
4969	192.2	4979	192.2	4989	192.5	4999	192.2	5009	192		
5019	191.8	5029	191.5	5039	191.6	5049	194.8	5054	196.3		
5059	199.9	5061	201.2	5063	202.9	5089	204.6	5177	206.1		
5228	204	5297	203.3	5313	202.8	5365	201.2	5375	200.5		
5380	198.6	5399	191	5409	188.2	5415	187.3	5423	188.7		
5428	188.1	5433	188.4	5439	187.2	5449	184.2	5454	184.2		
5459	185.2	5469	186.6	5479	185.7	5485	187.2	5489	186.5		
5499	184.9	5509	184	5514	183.6	5521	184	5529	184.1		
5539	183.9	5544	184.2	5549	184.2	5554	185.2	5559	184.1		
5569	183.4	5579	183.3	5589	183.2	5599	183.1	5604	183		
5799	187.3	5847	197.7	5850	198.8	5856	200.4	5857	201.2		
5867	204.4	5879	213.4	5910.7	225.8						

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Manning's n Values	num=	7
Sta n Val Sta	n Val Sta n Val Sta	n Val Sta n Val
4408.3 .9 4519	.075 4554 .04 4609	.065 4939 .035
5061 .075 5089	.9	

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
4554 5061	180 90 385	.3	.5
Sediment Elevation = 0			

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19722

INPUT

Description: 19722

Station Elevation Data	num=	93
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
4367 232 4405 220.7 4419 216.9 4428 210.2 4456 200.9		
4458 199.9 4464 199.4 4470 199.8 4476 199.8 4483 199.3		
4491 198.9 4496 198.4 4506 198.8 4513 198.9 4515 199		
4517 201.3 4519 201.7 4528 201.6 4533 202.3 4576 202.1		
4614 201.5 4850 201.6 4933 201.4 4934 201.3 4937 200.3		
4943 199 4948 196.5 4953 195.9 4958 193.2 4963 192.6		
4973 192.1 5033 192.3 5043 193.8 5053 195.1 5058 195.9		
5063 200 5066 201.3 5068 203.2 5142 203.3 5176 189.6		
5235 189.6 5237 189.5 5238 189.5 5245 188 5250 188		
5258 186.1 5263 185.2 5268 186 5272 184.8 5278 184.6		
5288 184.5 5298 183.4 5303 182.4 5308 184 5310 184		
5318 181.2 5320 181.2 5328 183.2 5332 183.7 5338 181.9		
5348 181 5358 180.1 5378 180.1 5386 179.3 5408 179.3		
5428 180 5430 180.1 5438 182.3 5448 188.2 5458 192.3		
5464 199.2 5493 200 5501 201.2 5550 202.6 5645 203.4		
5753 203.1 5796 202.9 5796.5 201.8 5808 203.4 5848 203.7		
5880 202.8 5889 201.2 5891 199.9 5899 196.3 5901 194.2		
5909 194 5914 196 5919 198.7 5922 200.2 5922.1 201.2		
5924 204.8 5939 205.3 5971.38 221.9		

Manning's n Values	num=	3
Sta n Val Sta	n Val Sta n Val	
4367 .06 4456	.035 5501 .06	

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
4456 5501	435 297 160.07	.1	.3
Sediment Elevation = 0			

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19720

INPUT

Description: 19720

Station Elevation Data	num=	101
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
4367 232 4405 220.7 4419 216.9 4428 210.2 4456 200.9		
4458 199.9 4464 199.4 4470 199.8 4476 199.8 4483 199.3		
4491 198.9 4496 198.4 4506 198.8 4513 198.9 4515 199		
4517 201.3 4519 201.7 4528 201.6 4533 202.3 4576 202.1		
4614 201.5 4850 201.6 4933 201.4 4934 201.3 4937 200.3		

Ramapo River Post. rep

4943	199	4948	196.5	4953	195.9	4958	193.2	4963	192.6
4973	192.1	5033	192.3	5043	193.8	5053	195.1	5058	195.9
5063	200	5066	201.3	5069	203.2	5157	203.2	5173	202.9
5202	201.4	5204	200.6	5205	201.9	5207	201.2	5210	200.7
5215	198.6	5220	193.3	5228	192.1	5238	189.5	5245	188
5250	188	5258	186.1	5263	185.2	5268	186	5272	184.8
5278	184.6	5288	184.5	5298	183.4	5303	182.4	5308	184
5310	184	5318	181.2	5320	181.2	5328	183.2	5332	183.7
5338	181.9	5348	181	5358	180.1	5378	180.1	5386	179.3
5408	179.3	5428	180	5430	180.1	5438	182.3	5448	188.2
5458	192.3	5464	199.2	5493	200	5501	201.2	5550	202.6
5645	203.4	5753	203.1	5796	202.9	5796.5	201.8	5808	203.4
5848	203.7	5880	202.8	5889	201.2	5891	199.9	5899	196.3
5901	194.2	5909	194	5914	196	5919	198.7	5922	200.2
5922.1	201.2	5924	204.8	5939	205.3	5969.57	205.8	5995.2	210.1
6008.01	216								

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
4367 .075	4456 .043	5501 .1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4456	5501	435	294.85	159.85		.3	.5
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 19425

INPUT
 Description: 19425

Station Elevation Data	num=	74		
Sta El ev	Sta El ev	Sta El ev	Sta El ev	Sta El ev
3799.4 231.2	3819 234.3	3841 219.9	3870.6 201.3	3875.9 200.3
3888.6 199.2	3897.8 198.9	3908.7 199	3920.6 199.3	3934.5 199.5
3944.6 199.9	3955.1 199.8	3962.6 200.5	3970 201.2	3978 204.4
3988.4 205.2	3992.6 204.6	4045.2 204.8	4102.7 204.7	4156 204.8
4218.8 205.3	4245.6 204.8	4256 202	4258 201.2	4261 200.6
4265 199.7	4284 198.8	4295 198.3	4305 199.3	4315 199.8
4327 201.1	4327.5 200.5	4347 200.3	4366 201	4387 200.9
4422 201.1	4446 201.3	4494 200.9	4498 200.7	4504 200.1
4509 199.3	4514 197.5	4519 193.2	4529 193.2	4619 194.1
4629 194.5	4707 195	4779 187.9	4840 187.7	4871 185
4909 180	5020 178	5112 180.1	5149 183.4	5242 201.1
5270.6 202.2	5290.9 202.1	5314.8 202.4	5326.7 201.1	5337 200.8
5347 200.6	5360 200.1	5366 199.3	5370 198.7	5384 197.4
5395 195.3	5409 192.8	5427 188.6	5433 184.6	5507.4 201.2
5534.4 210.5	5564 222.6	6010.4 224.1	6023.2 225.1	

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
3799.4 .075	4258 .043	5507.4 .1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4258	5507.4	130.08	145.08	205.08		.3	.5
Sediment Elevation = 0							

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 19280

INPUT

Description: 19280

Station		Elevation		Data		num=		57	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4444.84	215.88	4465.12	210.33	4506	201.2	4519	201.2	4524	200.4
4529	200.1	4534	199.5	4544	198.6	4554	197.5	4564	197
4574	197	4584	195.7	4594	194	4604	192.2	4614	192.6
4624	193	4627	193.2	4760	192.2	4825	190.7	4843	190
4890	185	4950	180	4970	179.9	5025	180	5025.1	180
5126	180.1	5159	178.7	5167	180.1	5169	179.8	5171	179.7
5177	181.2	5179	181.3	5183	181.2	5189	180.4	5193	180
5199	180.8	5201	180.9	5205	181	5209	180.7	5219	181.5
5228	182.7	5231	184.3	5235	184.4	5289	188.6	5323	184.8
5351	189	5362	186.7	5399	190	5409	190	5459	197.7
5470	198.3	5472	198.9	5476	200.3	5478	200.9	5480	201.3
5532	212.1	5562	219.9						

Manning's n Values		num=		3	
Station	n Value	Station	n Value	Station	n Value
4444.84	.075	4825	.043	5478	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4825	5478		475.02	208.98		.3	.5
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 19071

INPUT

Description: 19071

Station		Elevation		Data		num=		62	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3961	225	3981	224	3999.9	221.8	4020.1	220.9	4053	218.9
4072.6	219.7	4083.2	219.9	4095.7	219.3	4127.6	220.8	4151.1	219.6
4177.6	210.2	4207.5	208.1	4242.5	210.2	4293.7	211.8	4322.6	211.7
4352.5	211	4388.8	210	4412.2	208.3	4436.3	207.9	4452	206.6
4476.1	206.3	4478.8	206.6	4495.2	206.6	4498.7	206	4508.6	201.7
4604	192.8	4615	189.5	4653	188.9	4671	190	4700	193.5
4844	192.5	4870	193.2	4920	190	4986	190	5011	190.7
5165	191.5	5330	191.5	5420	190	5455	190	5460	196
5491.5	201.2	5517.5	208.1	5542.2	215.5	5550.2	216.9	5560	217.7
5581.5	219	5609.5	219.5	5644.2	220.1	5718.2	221.5	5749.4	222
5798.3	222.7	5901.3	224.8	5930.7	223.9	5935.8	223.2	5954.3	223.7
5969.1	222.7	5978.6	223.4	6016.4	223.9	6061.9	224	6107.7	224.5
6144.3	224.5	6181.7	225.9						

Manning's n Values		num=		3	
Station	n Value	Station	n Value	Station	n Value
3961	.075	4508.6	.043	5491.5	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4508.6	5491.5		150.08	155.05		.1	.3
Sediment Elevation = 0								

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
 REACH: Reach-1

RS: 18916

INPUT

Description: 18916

Station Elevation Data		num= 89		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4334.71	214.53	4374	209.7	4381	201.2	4386	200.5	4391	198.8		
4395	198	4407	194.7	4418	194.5	4428	194.3	4438	194.4		
4443	194.7	4492	193.5	4518	184.2	4528	184.2	4548	186.5		
4561	191.7	4642	191.3	4703	192.4	4749	192.8	4758	192.2		
4798	184.4	4818	184.1	4828	185.1	4838	185.3	4843	185.4		
4865	189.2	4878	189	4898	186.7	4908	189	4932	189.5		
4971	189	4990	191.1	5051	188.2	5163	188.4	5168	188.9		
5171	189.2	5176	189.1	5178	189	5184	189.1	5188	188		
5198	188.2	5208	189.9	5211	189.9	5216	189.3	5218	189.3		
5226	189.7	5228	189.5	5234	188.9	5238	188.9	5248	189.2		
5258	189.9	5263	190.1	5268	189.9	5276	189.3	5278	189.2		
5288	189.2	5298	189.2	5308	189.3	5316	189.8	5318	189.6		
5328	188.6	5331	188.4	5338	188.3	5348	187.7	5358	187.6		
5365	188.8	5368	188.8	5375	188.4	5378	188.3	5388	188.1		
5390	188.1	5398	189.2	5408	188.9	5418	188.6	5428	188.4		
5430	188.5	5448	188.8	5450	188.9	5458	188.6	5463	188.5		
5468	188.8	5473	189.1	5478	189	5488	188.5	5558	192		
5610	198.9	5618	201.2	5625	202.8	5699.72	214.53				

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4334.71	.075	4381	.043	5618	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4381	5618		245	234		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 18682

INPUT

Description: 18682

Station Elevation Data		num= 80		Sta		El ev		Sta		El ev	
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3948.1	225.1	3968.6	222	3998.4	220.3	4144.1	220.3	4171.5	221.1		
4224.6	222	4243.3	222.4	4299.4	222.7	4328.5	221	4356.9	202.2		
4361.3	201.2	4384	192.7	4397	192.4	4417	192.4	4427	193		
4447	194.6	4457	194.5	4487	184.3	4497	184.7	4507	185.1		
4527	186.8	4547	190.4	4571	191.4	4692	190.7	4708	190		
4762	185	4798	183.5	4826	185	4871	188	4970	187.5		
5070	185.1	5259	185	5267	186.2	5317	188	5327	187.6		
5337	187.4	5347	187.4	5357	187.5	5367	187.5	5377	187.7		
5387	187.7	5397	187.8	5407	187.9	5417	187.9	5427	187.7		
5437	187.7	5441	187.4	5447	188	5457	187.5	5467	187.4		
5477	187	5487	186.8	5490	186.8	5495	187.5	5497	187.5		
5499	187.5	5506	187.1	5507	187.1	5509	187.4	5517	184.2		
5522	182.1	5527	182	5537	182.1	5631.6	200.6	5647.6	201.2		
5713.9	205	5737.3	206.9	5794.6	217.8	5821.1	218.1	5849.1	220.8		
5885.1	222.9	5902	223.7	5917	222.9	5936.4	223.5	5967.6	223.7		
6011.1	224	6054.2	223.3	6092.5	223.6	6124.7	223.4	6137.8	225.1		

Ramapo River Post. rep

Manning's n Values num= 3
 Sta n Val Sta n Val
 3948.1 .075 4361.3 .043 5647.6 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4361.3 5647.6 260 235 285 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 18447

INPUT
 Description: 18447

Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4186	219.7	4193	219.2	4219	203	4233	201.2	4240	199.9
4245	198.7	4250	198.9	4255	200.4	4260	201.2	4407	201.7
4433	201.6	4439	199.3	4476	196.6	4492	192.5	4572	191.6
4674	191.2	4706	190.5	4713	190.7	4758	183.5	4766	183.4
4776	182.9	4786	182.6	4791	182.5	4796	183	4806	182.3
4816	182.3	4818	182.3	4826	182.6	4836	183.1	4846	183.7
4856	184.1	4875	188.2	4930	188.3	4936	188.9	4944	188.3
4946	188.3	4952	188.3	4956	188.9	4966	188.2	4974	189.1
4976	188.4	4986	187.2	4989	187.1	4996	187.2	4999	187.4
5004	187.7	5006	188.2	5008	188.3	5015	187.5	5016	187.3
5026	187.6	5033	187.7	5036	186.4	5040	186.3	5046	186.4
5053	186.6	5056	188.2	5065	186.5	5066	186.4	5072	186.1
5076	186.1	5078	186.2	5086	186.5	5096	186.8	5098	186.9
5106	186.8	5116	186.4	5120	186.3	5126	186.4	5129	186.5
5136	186.3	5146	186.1	5156	185.9	5166	185.8	5176	185.9
5186	186	5194	186.2	5196	186.2	5206	186.3	5216	186.9
5218	187	5226	187.8	5236	188.1	5246	187.5	5256	187.4
5264	187.4	5266	187.3	5268	187.2	5276	187.7	5284	187
5286	186.2	5294	187	5296	186.4	5298	186.3	5306	186.2
5551	200.9	5561	200.2	5566	201.2	5567	202.4	5652	207.2
5707.12	211.26	5732.74	215.17						

Manning's n Values num= 3
 Sta n Val Sta n Val
 4186 .075 4407 .043 5566 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4407 5566 150.01 167.02 310.03 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 18280

INPUT
 Description: 18280

Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4139.6	225.2	4157	222.8	4191.5	219.8	4222.5	219.6	4248.6	219.7
4272	220.4	4296.9	220.6	4322.2	221.6	4325	221.6	4345	221.1

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4383	202.7	4398	201.2	4403	200.8	4408	200.2	4418	200.4
4423	201.2	4427	201.8	4442	201.7	4450	201.3	4470	200.9
4493	200.8	4503	201	4518	201.1	4533	201.1	4548	200.9
4563	200.8	4583	200.8	4588	200.2	4593	199.7	4598	199.1
4604	199.8	4694	199	4787	188.9	4794	189.4	4800	191.5
4865	190.6	4946	191.9	5005	190	5005.1	190	5034	188.3
5062	187.2	5066	188.5	5074	189.7	5107	190.3	5114	190.4
5118	190.1	5124	190.9	5134	192.2	5144	194.2	5154	195.2
5159	195.5	5164	195.4	5174	193.5	5184	190.3	5194	187.9
5204	186.9	5214	187	5222	187.4	5224	186.7	5264	186.3
5274	186.4	5284	186.5	5294	186.6	5300	186.7	5304	187.2
5314	187.4	5324	187.3	5334	187.4	5546	199.2	5549	201.2
5613	222.9	5622.6	223.4	5647.8	223.3	5663.7	224.1	5692.1	224.4
5715.5	224.3	5742.3	224.4	5779.5	224.9	5815.7	225.3		

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
4139.6	.075	4398	.043	5549	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4398	5549	435.2	396	430.08	.1	.3	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 17884

INPUT

Description: 17884

Station Elevation Data	num=	63							
Sta El ev	Sta El ev	Sta El ev	Sta El ev	Sta El ev					
4685.6	220	4703	218.3	4722.7	215.1	4738	212.2	4753.2	208.2
4799	203.5	4803	202.1	4807	201.2	4811	200.2	4816	198.7
4824	198	4830	197.3	4847	197.3	4861	197.4	4875	197.8
4891	197.7	4904	198.4	4919	198.9	4934	199.3	4951	199.2
4967	199.1	4982	198.7	4997	198.4	5011	197.9	5024	197.7
5041	197.7	5059	197.9	5073	197.7	5088	196	5091	195.4
5096	192	5108	188	5121	186.6	5134	185.8	5147	186.2
5160	188.2	5167	190	5173	190.5	5193	190	5200	190
5210	190	5225	190	5245	191.4	5258	191.5	5268	190.1
5289	189.1	5317	190.7	5340	193.9	5347	192.8	5365	193.5
5370	191.8	5396	192	5474	190.7	5540	191.1	5561	193.5
5567	196.3	5586	198.5	5596	198.6	5600	198.4	5606	199.8
5611	201.2	5620.4	206	5702	222.6				

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
4685.6	.075	4807	.043	5611	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4807	5611	419.9	417.18	419.9	.1	.3	
Sediment Elevation = 0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 17467

INPUT

Description: 17467

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Station Elevation Data				num=						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4691.7	220	4706.3	219.3	4725	220.1	4742.5	214.6	4761	202.1	
4766.5	201.2	4771.5	200.2	4777.5	199	4787.5	198.1	4802.5	197.3	
4816.5	197.1	4826.5	197.1	4839.5	197.4	4850.5	197.6	4865.5	198.1	
4879.5	198.7	4898.5	198.7	4917.5	198.7	4934.5	198.4	4948.5	198.5	
4965.5	198.2	4984.5	198.2	4997.5	197.7	5009.5	197.5	5021.5	197.9	
5042.5	198.6	5062.5	198.1	5079.5	197.7	5097.5	197.7	5112.5	197.8	
5127.5	198	5140.5	197.9	5149.5	197.7	5150.5	197.2	5151.5	195.4	
5159.5	192.9	5169.5	191.7	5184.5	191	5196.5	191	5203	190.4	
5210	190.4	5220	190.4	5273	190.4	5403	194.9	5430	195	
5640.5	198.6	5650.5	198.8	5657.5	198.8	5663.5	199.5	5668.5	200.2	
5669.5	201.1	5670.5	202	5680.5	204.6	5694.3	208.7	5709.7	214.5	
5724	216.9	5731.4	220							

Manning's n Values				num=		
Sta	n Val	Sta	n Val	Sta	n Val	
4691.7	.075	4766.5	.043	5669.5	.1	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4766.5	5669.5		299.91	306.93		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 17160

INPUT
 Description: 17160

Station Elevation Data				num=						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4606.1	220.2	4631.8	218.3	4665.9	217.6	4690.5	219.2	4725.9	217.1	
4748.4	216	4766.6	216.2	4777.5	213.4	4791.8	212.3	4812.1	209.2	
4830	207.4	4839	205.5	4847	203.5	4850	201.2	4855	200.2	
4865	198	4875	194.6	4880	193.6	4890	193.6	4900	194.1	
4915	194.7	4925	194.9	4940	195	4960	195	4980	194.8	
5000	195.2	5020	195.2	5040	194.9	5050	194.9	5062	195.4	
5080	195.7	5096	195.7	5107	195.8	5118	195.8	5328	197	
5349	205.2	5492	206.7	5524	206.3	5539	206.4	5553	208.1	
5644	207	5669	208.3	5690	207.5	5722	220			

Manning's n Values				num=		
Sta	n Val	Sta	n Val	Sta	n Val	
4606.1	.075	4850	.043	5669	.1	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4850	5669		409.87	409.87		.4	.6
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 16750

INPUT
 Description: 16750
 This is a REPEATED section.

Ramapo River Post. rep

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4537.6	220	4555.8	218.6	4564.9	218.6	4577.6	217.2	4601.4	215.3
4622	214.1	4726	213.1	4746	215.4	4762	202.9	4774	201.5
4802	200.6	4812	200.6	4822	199.9	4852	196.4	4872	195.9
4887.9	195	4888	195	4956	189	4956.1	189	4959.9	189
4960	189	5024	189	5024.1	189	5027.9	189	5028	189
5096	195	5096.1	195	5122	194.1	5132	193.8	5142	193.8
5152	194.1	5202	199	5217	200.4	5222	201.3	5228	202
5231.9	202.2	5236	203.1	5240	212.1	5243.5	212.1	5243.6	209.1
5256.9	208.7	5258.5	208.2	5264.4	208.8	5285.4	209.7	5306.1	209.9
5334.2	211.5	5375.4	212.9	5396.1	213.1	5424	212.9	5457.5	214.2
5495	214.4	5556	215.1	5567.3	215.5	5611.3	214.5	5635.8	215.3
5690.9	215.2	5719.5	214.5	5738.3	215.2	5779.2	213.5	5802.6	214.3
5823	217.5	5846.7	220.1						

Manning's n Values		
Sta	n Val	Sta
4537.6	.075	4774

num= 3		
Sta	n Val	Sta
5222	.1	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4774	5222		93	93		.4	.6

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 16657

INPUT

Description: 16656

LAKESIDE AVE. BRIDGE

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4537.6	220	4555.8	218.6	4564.9	218.6	4577.6	217.2	4601.4	215.3
4622	214.1	4726	213.1	4746	215.4	4762	202.9	4774	201.5
4802	200.6	4812	200.6	4822	199.9	4852	196.4	4872	195.9
4887.9	195	4888	195	4956	189	4956.1	189	4959.9	189
4960	189	5024	189	5024.1	189	5027.9	189	5028	189
5096	195	5096.1	195	5122	194.1	5132	193.8	5142	193.8
5152	194.1	5202	199	5217	200.4	5222	201.3	5228	202
5231.9	202.2	5236	203.1	5243.6	209.1	5256.9	208.7	5258.5	208.2
5264.4	208.8	5285.4	209.7	5306.1	209.9	5334.2	211.5	5375.4	212.9
5396.1	213.1	5424	212.9	5457.5	214.2	5495	214.4	5556	215.1
5567.3	215.5	5611.3	214.5	5635.8	215.3	5690.9	215.2	5719.5	214.5
5738.3	215.2	5779.2	213.5	5802.6	214.3	5823	217.5	5846.7	220.1

Manning's n Values		
Sta	n Val	Sta
4537.6	.075	4774

num= 3		
Sta	n Val	Sta
5222	.1	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4774	5222		52	52		.4	.6

Ineffective Flow		
Sta L	Sta R	Elev
4537.6	4774	201.5
5222	5846.7	201.3

num= 2	
Permanent	
F	
F	

Sediment Elevation = 0

BRIDGE

Ramapo River Post. rep

RIVER: Ramapo River
 REACH: Reach-1

RS: 16630.5

INPUT

Description: LAKESIDE AVE. BRIDGE
 Distance from Upstream XS = 2
 Deck/Roadway Width = 40
 Weir Coefficient = 2.8

Upstream Deck/Roadway Coordinates
 num= 29

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4537.6		220		220	4555.8	218.6		218.6		4564.9	218.6		218.6	
4578	217.2		217.2		4601.4	215.3		215.3		4622	214.1		214.1	
4726	213.1		213.1		4746	215.4		215.4		4762	214		202.9	
4774	213.8		201.5		4802	213.5		200.6		4812	213.2		200.6	
4822	213		199.7		4852	212.6		196.4		4887.9	212		195	
4888	212		208.8		4956	211		207.8		4960	211		207.8	
5024	210.4		207.5		5028	210.4		207.5		5096	210		207	
5096.1	210		195		5142	209.7		193.8		5152	210.6		194.1	
5202	209		199		5217	209		200.4		5232	208.8		202.2	
5236	208.7		203.1		5240	212.1								

Upstream Bridge Cross Section Data

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4537.6	220	4555.8	218.6	4564.9	218.6	4577.6	217.2	4601.4	215.3
4622	214.1	4726	213.1	4746	215.4	4762	202.9	4774	201.5
4802	200.6	4812	200.6	4822	199.9	4852	196.4	4872	195.9
4887.9	195	4888	195	4956	189	4956.1	189	4959.9	189
4960	189	5024	189	5024.1	189	5027.9	189	5028	189
5096	195	5096.1	195	5122	194.1	5132	193.8	5142	193.8
5152	194.1	5202	199	5217	200.4	5222	201.3	5228	202
5231.9	202.2	5236	203.1	5243.6	209.1	5256.9	208.7	5258.5	208.2
5264.4	208.8	5285.4	209.7	5306.1	209.9	5334.2	211.5	5375.4	212.9
5396.1	213.1	5424	212.9	5457.5	214.2	5495	214.4	5556	215.1
5567.3	215.5	5611.3	214.5	5635.8	215.3	5690.9	215.2	5719.5	214.5
5738.3	215.2	5779.2	213.5	5802.6	214.3	5823	217.5	5846.7	220.1

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4537.6	.075	4774	.043	5222	.1

Bank Sta: Left Right Coeff Contr. Expan.
 4774 5222 .4 .6

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent

4537.6	4774	201.5	F
5222	5846.7	201.3	F

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates

num= 28

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4537.6		220		220	4555.8	218.6		218.6		4564.9	218.6		218.6	
4578	217.2		217.2		4601.4	215.3		215.3		4622	214.1		214.1	
4726	213.1		213.1		4746	215.4		215.4		4762	214		202.9	
4774	213.8		201.5		4802	213.5		200.6		4812	213.2		200.6	
4822	213		199.7		4852	212.6		196.4		4887.9	212		195	
4888	212		208.8		4956	211		207.8		4960	211		207.8	
5024	210.4		207.5		5028	210.4		207.5		5096	210		207	
5096.1	210		195		5142	209.7		193.8		5152	210.6		194.1	
5202	209		199		5217	209		200.4		5232	208.8		202.2	
5236	208.7		203.1											

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Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	90	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4584.2	220	4613.8	218.1	4634.4	217.4	4657.6	216.9	4681.9	215.5			
4703	215.3	4719.4	215.1	4736	213.9	4754.9	216	4755	213.2			
4773	211	4786	202.2	4792	202.1	4796	202.3	4816	202.2			
4826	201.7	4833	201.3	4836	199.9	4846	198	4856	197.2			
4866	196.6	4876	197.1	4886	196.5	4896	196.7	4906	196.7			
4916	196.4	4926	197.5	4936	196.8	4946	197.2	4956	197.4			
4966	196.4	4976	194.4	4986	192	4996	189.5	5006	188.1			
5013.9	187.9	5014	188.9	5015.9	188.9	5021	189.9	5026	189.1			
5036	188.2	5046	188	5056	188.2	5062.9	188.9	5063	192.6			
5064.9	192.6	5069	192.9	5070.9	192.9	5071	188.5	5076	188.1			
5086	189.6	5095.9	189.8	5096.82	190.17	5106	192.8	5116	193.4			
5126	194.4	5136	193.2	5146	194.1	5156	194.4	5165.8	195			
5165.9	201.3	5173	209.8	5186	209.5	5199.9	209.1	5200	209.1			
5211	209.4	5245.8	209.5	5287.5	208.9	5328.2	208.5	5341.9	209.7			
5362.8	211.4	5392.1	212.9	5420	213.4	5444.4	213.2	5465.2	213.6			
5489.7	214.1	5528.9	213.9	5571.4	213.9	5609.8	214.2	5657.7	213.9			
5690.7	213	5755.9	212.5	5780.3	213.3	5813.9	213.5	5838.7	213.4			
5864.8	215.2	5884.8	216.2	5911.8	218.3	5966.5	220.4	5976.3	220.1			

Manning's n	Values	num=	3
4584.2	.075	4833	.043
5165.9			.1

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	4833	5165.9		.4	.6

Ineffective Flow	num=	2
Sta L Sta R Elev		Permanent
4584.2 4833 208.9		F
5165.9 5976.3 207		F

Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 213
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data	Upstream=	4958	Downstream=	4958
Pier Station				
Upstream	num=	2		
Width	Elev	Width	Elev	
4	180	4	220	
Downstream	num=	2		
Width	Elev	Width	Elev	
4	180	4	220	

Pier Data	Upstream=	5026	Downstream=	5026
Pier Station				
Upstream	num=	2		
Width	Elev	Width	Elev	
4	180	4	220	
Downstream	num=	2		
Width	Elev	Width	Elev	
4	180	4	220	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Yarnell KVal = 1.05

Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .7559289
 Max Low Cord = 207

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 16605

INPUT

Description: 16605

Station Elevation Data

num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4584.2	220	4613.8	218.1	4634.4	217.4	4657.6	216.9	4681.9	215.5
4703	215.3	4719.4	215.1	4736	213.9	4754.9	216	4755	213.2
4773	211	4786	202.2	4792	202.1	4796	202.3	4816	202.2
4826	201.7	4833	201.3	4836	199.9	4846	198	4856	197.2
4866	196.6	4876	197.1	4886	196.5	4896	196.7	4906	196.7
4916	196.4	4926	197.5	4936	196.8	4946	197.2	4956	197.4
4966	196.4	4976	194.4	4986	192	4996	189.5	5006	188.1
5013.9	187.9	5014	188.9	5015.9	188.9	5021	189.9	5026	189.1
5036	188.2	5046	188	5056	188.2	5062.9	188.9	5063	192.6
5064.9	192.6	5069	192.9	5070.9	192.9	5071	188.5	5076	188.1
5086	189.6	5095.9	189.8	5096.82	190.17	5106	192.8	5116	193.4
5126	194.4	5136	193.2	5146	194.1	5156	194.4	5165.8	195
5165.9	201.3	5173	209.8	5186	209.5	5199.9	209.1	5200	209.1
5211	209.4	5245.8	209.5	5287.5	208.9	5328.2	208.5	5341.9	209.7
5362.8	211.4	5392.1	212.9	5420	213.4	5444.4	213.2	5465.2	213.6
5489.7	214.1	5528.9	213.9	5571.4	213.9	5609.8	214.2	5657.7	213.9
5690.7	213	5755.9	212.5	5780.3	213.3	5813.9	213.5	5838.7	213.4
5864.8	215.2	5884.8	216.2	5911.8	218.3	5966.5	220.4	5976.3	220.1

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4584.2	.075	4833	.043	5165.9	.1

Bank Sta: Left 4833 Right 5165.9 Lengths: Left 48.9 Channel 46.54 Right 50 Coeff Contr. .4 Expan. .6

Ineffective Flow

num= 2

Sta L	Sta R	Elev	Permanent
4584.2	4833	208.9	F
5165.9	5976.3	207	F

Sediment Elevation = 0

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 16604

INPUT

Description: 16605

Station Elevation Data

num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4584.2	220	4613.8	218.1	4634.4	217.4	4657.6	216.9	4681.9	215.5
4703	215.3	4719.4	215.1	4736	213.9	4754.9	216	4755	213.2
4773	211	4786	202.2	4792	202.1	4796	202.3	4816	202.2
4826	201.7	4833	201.3	4836	199.9	4846	198	4856	197.2
4866	196.6	4876	197.1	4886	196.5	4896	196.7	4906	196.7
4916	196.4	4926	197.5	4936	196.8	5006	185	5076	185
5136	195	5146	194.1	5156	194.4	5165.8	195	5165.9	201.3
5166	213.2	5172.9	213.1	5173	209.8	5186	209.5	5199.9	209.1
5200	209.1	5211	209.4	5245.8	209.5	5287.5	208.9	5328.2	208.5
5341.9	209.7	5362.8	211.4	5392.1	212.9	5420	213.4	5444.4	213.2
5465.2	213.6	5489.7	214.1	5528.9	213.9	5571.4	213.9	5609.8	214.2
5657.7	213.9	5690.7	213	5755.9	212.5	5780.3	213.3	5813.9	213.5
5838.7	213.4	5864.8	215.2	5884.8	216.2	5911.8	218.3	5966.5	220.4
5976.3	220.1								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4584.2	.075	4833	.04	5165.9	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4833 5165.9 831.36 790.4 849.92 .4 .6

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4584.2	4833	208.9	F
5165.9	5976.3	207	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 16186

INPUT

Description: 16186

Station Elevation Data

num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4426.3	220.1	4564	210.1	4594	213.4	4626	209.7	4649	201.1
4676	198.3	4716	197.5	4726	197.4	4736	197.4	4746	197.5
4756	197.6	4766	197.7	4776	197.8	4786	198	4796	198.1
4806	198.2	4816	198.2	4826	198.1	4836	198	4846	197.9
4856	197.8	4866	197.7	4876	197.5	4886	197.2	4896	197
4906	196.7	4916	196.2	4926	195.7	4976	191.4	4986	190.9
4996	190.5	5006	190.3	5016	190.7	5026	191.2	5036	192
5046	192.4	5056	192.3	5066	192.2	5076	192.2	5086	192.3
5096	192.7	5106	193	5116	193.2	5126	193.2	5136	193.2
5146	193.2	5156	193.2	5166	193.2	5176	193.3	5186	193.4
5196	193.6	5206	193.7	5216	193.8	5226	193.9	5236	194
5246	193.7	5256	193.3	5266	193.2	5276	193	5286	192.9
5296	192.7	5306	192.6	5316	192.5	5326	192.6	5336	192.8
5346	193.2	5351	201.4	5351.1	202.1	5366	210.1	5368	209.5
5383	209.9	5398	209.6	5398.1	210	5414	211.5	5447.2	212.2
5469.8	212.1	5513.7	212	5552.4	211.8	5583.6	211.4	5620.8	211.8
5652.5	211.5	5686.3	211.2	5714.8	211.5	5761.3	211.6	5801.1	211.7
5821.7	212.2	5859.4	211.6	5888.3	213.3	5911.4	213.8	5953.6	213

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5997.7	213.9	6008.3	213.9	6053.3	214.4	6082.8	215.6	6108.8	214.8
6138.2	215.5	6176.7	216	6230.6	216.7	6268.1	217.8	6296.9	220.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4426.3	.07	4649	.043	5351	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4649 5351 505 490 510 .1 .3
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 15696

I NPUT
 Descri pti on: 15696

Stati on El evati on Data num= 87

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4308.7	220	4335.5	215.7	4358.5	214.6	4390.5	212.3	4407.5	202.8
4411.5	201.4	4430.5	198.4	4450.5	197	4650.5	193.2	4690.5	193.4
4698	193.8	4928	196.1	4968	196.1	5028	193.8	5038	193.6
5048	193.4	5058	193.3	5068	193.2	5078	193.2	5088	193.1
5098	193	5108	192.9	5118	192.8	5128	192.9	5168	193.6
5178	193.7	5258	195.9	5278	195.9	5288	196	5308	196.1
5318	196	5328	195.9	5388	192.5	5398	192.3	5408	192.3
5418	192.5	5428	193.4	5438	196.3	5458	197.5	5478	197.5
5488	197.6	5588.5	201.1	5591.5	201.6	5601.5	203.5	5624.5	205.5
5651.5	206.9	5651.6	204.6	5670.8	206.9	5701.1	208.4	5724.2	208.9
5736.7	208.6	5761.5	209.1	5816.9	208.9	5870.3	208	5915.8	207.8
6001.7	208.2	6089.3	208	6149.4	207.2	6220	208.1	6248.9	208.2
6396.7	218.2	6452	218.4	6536.9	218.2	6595.8	219.2	6684.4	218.4
6771.3	218.8	6847.8	218.8	6915.9	216.6	7062.4	215.4	7116	217.8
7177.2	218.8	7267.4	219.9	7351.4	219.8	7536.4	219.7	7560.8	219.9
7584.7	221.6	7650.9	217.4	7681.8	216.5	7700.9	221.1	7722.9	219.6
7776.5	216.3	7848.5	217	7916.5	218.3	7944.8	218.6	7967.4	218.4
7999.7	218.3	8001.7	220						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4308.7	.07	4411.5	.043	5591.5	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4411.5 5591.5 505 481 875 .1 .3
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 15215

I NPUT
 Descri pti on: 15215

Stati on El evati on Data num= 85

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
3894.9	217.6	3952.3	204.6	3959.7	201	3992.3	197	4032.3	194.8
4072.3	195	4092.3	195.2	4152.3	195.2	4232.3	195.4	4272.3	193.4
4292.3	193.2	4332.3	193.2	4352.3	193.6	4392.3	193.6	4412.3	193.4

Ramapo River Post. rep

4492.3	193.6	4572.3	193	4592.3	193	4632.3	192.7	4652.3	191.7
4672.3	190.7	4692.3	190.6	4712.3	191.2	4732.3	191.8	4752.3	192.6
4772.3	193	4792.3	193.2	4812.3	193.4	4832.3	194.2	4852.3	194.6
4872.3	194.8	4892.3	195	4912.3	195.2	4932.3	195.8	4952.3	195.2
4972.3	195.4	4992.3	195	5012.3	195.2	5032.3	196.2	5052.3	196.4
5072.3	196.6	5092.3	196.8	5112.3	196.8	5132.3	196.4	5152.3	197.8
5172.3	197.8	5192.3	197.7	5212.3	197.6	5232.3	197.6	5252.3	197.5
5952.3	198.2	5972.3	198.5	5992.3	199.3	6012.3	199.8	6084.9	208.5
6101	208.7	6116.6	208.7	6131.9	207.8	6140.7	208	6170.6	209
6189.5	210.3	6340.7	211.2	6402.5	210.9	6458.3	210.1	6514	210.4
6574.6	212.1	6608.3	211.3	6668	214.4	7091.2	214.9	7237.9	216.2
7881	216.1	7921.3	216.7	7949.2	215.7	7957.9	212.1	7969.5	215.4
7988.3	216	8019.7	217	8048.3	218.8	8059.9	218.7	8073.4	217.8
8097.5	217.4	8127.2	215.7	8167.6	218.5	8245.7	218.6	8273.4	220

Manning's n Values	num=	3
Sta n Val Sta n Val	n Val Sta n Val	
3894.9 .07 3959.7	.043 6012.3	.07

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
3959.7 6012.3	490 490 490	.1	.3
Sediment Elevation = 0			

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 14725

INPUT
Description: 14725

Station Elevation Data	num=	100
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev	Sta Elev Sta Elev Sta Elev Sta Elev	
3929.8 220.1 3964.1 209.8 3966.1 210.1 4007 211.7 4030.6 203.1	4035.2 201.5 4039.2 200.2 4069 195.9 4096 194.5 4106 194.6	
4116 194.7 4126 194.8 4136 195 4146 195 4156 195.1	4176 195.1 4186 195.2 4226 195.2 4236 195.1 4266 195.3	
4276 195.4 4286 195.5 4296 195.4 4306 195 4316 194.9	4326 194.7 4336 194.5 4346 194.3 4356 193.6 4366 193.3	
4376 193 4386 192.7 4396 192.4 4426 191.9 4436 191.9	4446 192 4566 193.3 4586 193.3 4676 194.5 4686 194.6	
4696 194.7 4706 194.7 4716 194.6 4726 194.5 4736 194.1	4746 193.5 4776 192.5 4786 192.3 4796 192.2 4806 192	
4816 191.7 4826 191.5 4836 191.5 4846 191.6 4856 191.7	4866 192.1 4876 192.2 4946 194.2 4956 194.3 4976 194.3	
4986 194.2 5076 193.6 5116 193.2 5166 193.2 5176 193.3	5186 193.5 5246 196.5 5266 196.5 5276 196.4 5286 196.3	
5356 196.3 5426 195.7 5508 195.7 5517.4 195.5 5557.4 195.5	5567.4 195.4 5577.4 195.5 5677.4 195.5 5837.4 193.7 5877.4 194.3	
5887.4 194.5 5897.4 194.6 5907.4 194.9 5917.4 195.4 5927.4 197.3	5936.2 198.2 5946 199.7 5956.2 200.7 5964.9 201.4 5975.2 205.8	
5985.9 207.9 6001.7 209 6004.4 208.1 6057.8 209.4 6124.8 210.6	6145 210.5 6163.8 211.6 6191.3 212.7 6216.1 211.6 6294.8 220.1	

Manning's n Values	num=	3
Sta n Val Sta n Val	n Val Sta n Val	
3929.8 .07 4035.2	.043 5964.9	.07

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
4035.2 5964.9	404.94 404.94 404.94	.1	.3
Sediment Elevation = 0			

Ramapo River Post. rep

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 14320

INPUT

Description: 14320

Station Elevation Data

num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4099.2	220.3	4137.6	219	4175.3	218.2	4204.5	216.5	4232.2	215.2
4263.5	213.6	4297.2	212	4334.1	210.4	4356	209.9	4394.8	208.6
4410.6	207.3	4421	205.1	4427	202	4430	201.2	4435	200.2
4442	199.2	4450.6	197.2	4470.6	193.2	4490.6	193	4510.6	192.4
4530.6	192.8	4550.6	193.2	4570.6	193.3	4590.6	193.4	4610.6	193.4
4630.6	193.3	4650.6	193.2	4670.6	193.4	4690.6	193.6	4710.6	193.6
4730.6	193.8	4750.6	194	4770.6	194	4790.6	193.9	4810.6	193.9
4830.6	193.8	4850.6	193.8	4870.6	193.6	4890.6	193.6	4910.6	193.8
4930.6	193.8	4950.6	194	4970.6	194.2	4990.6	194.2	5010.6	194
5030.6	194	5050.6	194.2	5070.6	194.2	5090.6	194.3	5110.6	194.4
5130.6	194.5	5150.6	194.6	5170.6	193.3	5190.6	193.8	5210.6	193.2
5230.6	192	5250.6	191.7	5270.6	191.2	5290.6	193.6	5310.6	196.2
5330.6	196.2	5350.6	196.2	5370.6	195.9	5390.6	195.6	5410	195.5
5430.6	195	5450.6	194.8	5470.6	194.7	5490.6	194.5	5510.6	193.7
5530.6	193.5	5550.6	193.2	5570.6	193.2	5590.6	193.4	5610.6	193.6
5630.6	194.4	5650.6	195.2	5678	199.6	5684	200.3	5690	201
5692	203.9	5697	203.6	5710	205	5730.8	207.2	5758.5	210.1
5804	218.1	5836.4	220.1						

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4099.2	.07	4430	.043	5690	.07

Bank Sta: Left 4430 Right 5690
Lengths: Left Channel 310.17 Right 514.71
Coeff Contr. .3
Expan. .5
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 13805

INPUT

Description: 13805

Station Elevation Data

num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4632.3	220	4655.5	215	4674.8	210	4706.4	206	4744.8	205.4
4751	205	4776	204.4	4791	204.2	4811	201.2	4821	195.7
4841	196.7	4851	195.2	4861	194.2	4881	192.2	4901	189.2
4921	190.2	4941	189.3	4961	189.7	4981	190	5001	190.2
5021	190.7	5041	190.7	5061	189.2	5081	187.2	5101	187.2
5121	188	5141	188.4	5161	192.4	5181	197.2	5189	201.1
5219	219.9	5239	221.6	5249	225				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4632.3	.07	4811	.043	5189	.07

Bank Sta: Left 4811 Right 5189
Lengths: Left Channel 414.97 Right 413.1
Coeff Contr. .3
Expan. .5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 13392

INPUT
 Description: 13392

Station Elevation Data		num= 33		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4577.9	220	4600.8	215	4639.5	212.4	4691.7	210.4	4725.4	208.3		
4757.2	205.1	4761	205.1	4786	203.5	4815	202.5	4816	201.4		
4830	199.1	4850	198.2	4870	196.4	4890	194.7	4910	193.4		
4930	192.8	4950	192.2	4970	191.7	4990	190.2	5010	190.3		
5030	187.6	5050	186.6	5070	186.4	5090	186.4	5110	187		
5130	188	5140	191.7	5150	196.7	5184	201.2	5185	202.5		
5195	209.8	5217	218.3	5245	225.4						

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4577.9	.07	4815	.043	5185	.07		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4815	5185		550	547.36	550		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 12845

INPUT
 Description: 12845

Station Elevation Data		num= 36		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4771	219.2	4772	217.3	4778	216.6	4785	216.7	4802	209		
4815	203.2	4818	201.4	4835	198.9	4855	196.8	4875	195.2		
4895	193.7	4915	193	4935	192	4955	191.2	4975	189.2		
4995	187	5015	186.4	5035	186.2	5055	186	5075	187		
5095	188	5115	191.6	5135	194	5155	197	5175	199.7		
5182	201	5183	201.9	5212	202.8	5237	204.3	5248.9	205.4		
5266.3	208	5286.6	212.1	5324.3	215.3	5353.9	217.1	5429.9	215.2		
5484.2	220.1										

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4771	.07	4818	.043	5182	.07		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4818	5182		595.1	544.94	500.06		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 12300

Ramapo River Post. rep

INPUT

Description: 12300

Station Elevation Data		num= 39		Station Elevation Data		num= 39		Station Elevation Data		num= 39	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4617.4	220	4664	216.4	4726.5	210.1	4766	208.3	4797	208.1		
4810	201.1	4821	203.6	4824	204.2	4841	206.9	4874	208.1		
4884	191.2	4904	190	4924	187	4944	184.8	4964	184		
4984	184.7	5004	186.1	5024	188.2	5044	190	5064	191.4		
5084	193.2	5104	194.7	5124	196.4	5164	198.6	5184	199.8		
5280	201.7	5284	201.2	5291	200.8	5301	200.4	5311	200.2		
5320	200	5327.5	199.6	5334	200.2	5338	201.1	5343	201.1		
5348.5	201.2	5366	202.1	5385.9	209.2	5417.5	220.1				

Manning's n Values		num= 3		Manning's n Values	
Station	n Value	Station	n Value	Station	n Value
4617.4	.07	4874	.043	5366	.07

Bank Station	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4874	5366		475	488		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 11812

INPUT

Description: 11812

Station Elevation Data		num= 50		Station Elevation Data		num= 50		Station Elevation Data		num= 50	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4414.1	220	4441.7	219.6	4451.9	217.9	4469.5	216.7	4483	216.1		
4506.6	216.3	4530.3	216.4	4571.1	212.1	4584.9	211.3	4594.5	209.9		
4612.2	208.3	4628.8	207	4654	204.3	4673.4	203.9	4687.2	203.4		
4709.3	202	4710.4	201	4721	199	4741	197.9	4761	197.2		
4781	196	4801	194.5	4821	192.9	4841	191.9	4861	190.8		
4881	189.9	4901	188.5	4921	186	4941	184.2	4961	184.2		
4981	184.7	5001	185.2	5021	187.1	5041	189.2	5051	192.2		
5061	195.2	5071	195.7	5101	195.8	5121	196	5141	196		
5161	195.9	5181	195.8	5201	195.5	5221	195.2	5241	195.2		
5261	197.1	5281	199	5288.8	201.1	5320.9	212.8	5343.9	226.2		

Manning's n Values		num= 3		Manning's n Values	
Station	n Value	Station	n Value	Station	n Value
4414.1	.07	4710.4	.043	5288.8	.07

Bank Station	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4710.4	5288.8		655	488		.3	.5

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 11324

INPUT

Description: 11324

Station Elevation Data		num= 43		Station Elevation Data		num= 43		Station Elevation Data		num= 43	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4446.9	220	4469	219.1	4557.7	214.7	4597.9	210	4619.3	210.5		

Ramapo River Post. rep									
4636.4	210.5	4673.9	209.1	4685.8	208	4712.6	206	4715	201.6
4735.1	203.7	4747	201.3	4755.2	198.2	4775.2	193.2	4795.2	192.9
4815	192.6	4835	192	4855	191.1	4875	190.2	4895	189.2
4915	190	4935	188.2	4955	190.2	4975	189.2	4995	189.5
5015	189.6	5035	187	5055	189.5	5058.5	201.2	5065	192.1
5075	194.4	5095	195.1	5115	195.1	5135	194.8	5155	194.3
5175	193.6	5195	192.9	5215	192.4	5235	192.9	5245	196
5253	201.1	5255	198	5283	214.3				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4446.9	.07	4747	.043	5255	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4747	5255		374.79	301.99		.3	.5
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 11022

INPUT
 Description: 11022

Station Elevation Data num= 46									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4666.79	213.52	4680	210.6	4685	210.6	4706	210.4	4722	210.6
4732	210.4	4749	201.4	4755	198.9	4765	196.2	4771	192.7
4780	190.4	4798	187	4814	183.6	4830.7	183.2	4848	182.2
4866	182.2	4886	184.4	4905	186.4	4923	189.2	4945	190.9
4966	191.6	4985	190.3	5003	190.5	5021	191.8	5039	192.7
5058	192.7	5078	192.7	5099	192.7	5117	192.7	5132	192.2
5150	192.2	5170	192.7	5187	193.2	5207	193.4	5223	193.8
5232	194.9	5237	196.2	5241	198.2	5244	199.9	5250	201.3
5252	203.1	5259	206.1	5261	205.8	5267	206.2	5274	206.5
5289.52	212.52								

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4666.79	.07	4749	.043	5250	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4749	5250		130	92		.1	.3
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10930

INPUT
 Description: 10930

Station Elevation Data num= 48									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4708	212	4713	210	4730	210.1	4747	209.8	4747.1	210
4756	210.8	4770	201.2	4785	200	4787	196.7	4797	189.9
4810	185.2	4824	184	4834	183.6	4853	182.7	4866	182.7
4884	184	4908	187.4	4926	188.8	4942	189.4	4967	190.2
4981	191.6	4997	192.4	5017	192.6	5033	192.2	5051	192.6

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5066	192.2	5082	192.2	5097	192.2	5113	192.5	5129	192.6
5146	192.5	5161	193.3	5175	194.2	5188	194	5200	193.9
5210	193.7	5212	193.7	5219	198.2	5224	200.2	5230	201.1
5230.1	203.5	5234	205.1	5236	205.5	5239	205.1	5246	205.4
5253	205.6	5257	207.6	5274.18	213.26				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4708	.07	4756	.043
		5230	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4756	5230		135	102.95	65.05		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10827

INPUT
 Description: 10827

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4731	211	4736	209.4	4753	209.5	4770	209	4770.1	209
4775	208.9	4783	202.1	4789	201.4	4800	197.1	4810	191.2
4830	185.9	4850	184.8	4870	184.2	4890	184.4	4910	185.4
4930	188.2	4950	190.4	4970	191.2	4990	192.1	5010	192.3
5030	192.7	5050	192.7	5090	193.1	5110	193.5	5130	194.2
5150	194.9	5170	195.2	5190	195.4	5211.1	201.2	5211.2	201.4
5214	205.1	5217.1	205.1						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4731	.07	4789	.043
		5214	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4789	5214		104.97	74.01	44.97		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10753

INPUT
 Description: 10753

Station Elevation Data num= 37									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4721.5	220	4743	210.2	4748	209.1	4765	209.1	4782.4	208.8
4782.5	209	4788	208.8	4795	201.4	4802.5	198.2	4822.5	188
4842.5	185.4	4862.5	184.6	4882.5	184.5	4902.5	184.8	4922.5	186.2
4942.5	188.7	4962.5	189.7	4982.5	191	5002.5	191.9	5022.5	192.2
5042.5	194.1	5062.5	193.1	5082.5	193.4	5102.5	194	5122.5	194.6
5142.5	195.2	5162.5	195.2	5172.5	195.2	5182.5	196.2	5191.5	192.8
5196.5	197.8	5204.5	205.5	5214.5	205.3	5218.5	201.3	5220.3	205.7
5235.3	210	5247.5	220						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val

Ramapo River Post. rep

4721.5 .07 4788

.043 5196.5 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4788 5196.5 60 45 30 .1 .3
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 10708

INPUT
 Descri pti on: 10708

Stati on El evati on Data num= 43

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4746.02	213.19	4753	209.4	4758	208.7	4774	208.7	4789.9	208.3
4790	208.4	4800	207.5	4808	201.2	4817	196.8	4824	191.3
4830	187.7	4844	184.9	4855	184.2	4870	182	4886	183.8
4900	183.2	4917	183.2	4934	184.7	4950	185.8	4967	187.6
4980	188.8	4994	189.8	5011	190.5	5026	191.2	5042	191.8
5058	192.2	5073	192.6	5090	193.2	5109	193.6	5128	194.2
5144	194.2	5160	194.2	5173	195.7	5179	197.7	5187	200.2
5192	201.2	5193	202.2	5201	207.2	5205	207.1	5213	206.3
5219	206.7	5225	208.9	5238.82	213.06				

Manni ng' s n Val ues num= 3

Sta n Val	Sta n Val	Sta n Val
4746.02 .07	4800 .043	5201 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4800 5201 46.98 51 49.98 .1 .3
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 10657

INPUT
 Descri pti on: 10657

Stati on El evati on Data num= 43

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4758.37	212.65	4765	210.1	4770	208.3	4786	208.4	4801.9	208.1
4802	208.3	4809	208.2	4814	202.4	4818	201.3	4829	197.2
4837	194.6	4846	188.7	4857	185.6	4873	184.2	4888	183.7
4904	184.2	4924	184.5	4945	184.7	4965	184.5	4981	186.4
4995	187.6	5015	189.2	5032	190.4	5051	191.7	5071	192.4
5086	193	5102	193.3	5119	193.8	5137	193.8	5151	194
5163	195.9	5170	198.1	5174	199.9	5182	201.2	5183	201.7
5190	206.2	5192	206.1	5194	207.4	5197	208.8	5201	208.9
5209	208.8	5215	208.8	5227.6	212.39				

Manni ng' s n Val ues num= 3

Sta n Val	Sta n Val	Sta n Val
4758.37 .07	4809 .043	5197 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4809 5197 52 45 45 .1 .3
 Sedi ment El evati on = 0

Ramapo River Post. rep

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10612

INPUT

Description: 10612

Station		Elevation		Data		num= 38			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4767.35	212.79	4774	209.2	4779	208.1	4796	208.2	4813	207.9
4820	207.7	4823	209.2	4834	198.7	4842	193	4853	186.6
4866	185.4	4883	185.2	4902	184.7	4918	185	4938	185.2
4958	185.2	4981	184.7	5001	185.8	5022	187.2	5041	189.2
5063	191.6	5085	192.2	5108	193.2	5128	194.4	5145	193.7
5155	194.6	5163	196.2	5166	199.9	5172	200.2	5177	201.2
5178	201.9	5184	202.6	5188	205.2	5202	209.5	5203	209.5
5212	209.5	5223	210.3	5230.4	212.72				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4767.35	.07	4823	.043
		5202	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4823	5202		70	50	70		.1	.3
Sediment Elevation =	0								

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10562

INPUT

Description: 10562

Station		Elevation		Data		num= 57			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4739.3	220	4758.8	208	4772.9	208.3	4789.5	206.5	4789.9	206.8
4790	206.5	4800	205.8	4805	205.6	4808	201.5	4810	198.6
4812	196.7	4815	194.4	4821	192.6	4827	190.8	4839	190.9
4848	190.8	4858	192.8	4869	193.4	4880	193.5	4889	193.6
4897	193.8	4911	192.1	4933	191.4	4942	190.6	4950	189.4
4961	188.9	4974	188.5	4983	188.7	4992	188.8	5000	189.1
5008	189.4	5018	189.5	5027	189.4	5029	189.7	5035	189.4
5045	189.7	5055	191.3	5065	192.8	5075	191.5	5080	193.6
5085	195	5094	195.7	5097	195.7	5098.5	192.4	5102	191.8
5114	192.5	5123	193.4	5131	194.4	5135	196.1	5145	197.6
5150	198.5	5155	199.9	5163	200.9	5174	201.7	5183	207.6
5205.9	208.2	5239.4	220						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4739.3	.07	4805	.043
		5097	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4805	5097		12	12	12		.1	.3
Sediment Elevation =	0								

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 10550

INPUT

Description: 10550

Station		Elevation		Data		num= 57			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4739.3	220	4758.8	208	4772.9	208.3	4789.5	206.5	4789.9	206.8
4790	206.5	4800	205.8	4805	205.6	4808	201.5	4810	198.6
4812	196.7	4815	194.4	4821	192.6	4827	190.8	4839	190.9
4848	190.8	4858	192.8	4869	193.4	4880	193.5	4889	193.6
4897	193.8	4911	192.1	4933	191.4	4942	190.6	4950	189.4
4961	188.9	4974	188.5	4983	188.7	4992	188.8	5000	189.1
5008	189.4	5018	189.5	5027	189.4	5029	189.7	5035	189.4
5045	189.7	5055	191.3	5065	192.8	5075	191.5	5080	193.6
5085	195	5094	195.7	5097	195.7	5098.5	192.4	5102	191.8
5114	192.5	5123	193.4	5131	194.4	5135	196.1	5145	197.6
5150	198.5	5155	199.9	5163	200.9	5174	201.7	5183	207.6
5205.9	208.2	5239.4	220						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4739.3	.07	4805	.02
		5097	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4805	5097		9	9		.1	.3
Sediment Elevation =	0							

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10541

INPUT

Description: 10541

POMPTON LAKES DAM

Station		Elevation		Data		num= 57			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4801.1	220	4822.8	206.5	4831.5	206.5	4848.8	206.1	4848.9	206.5
4852	206	4861.8	202.8	4865.7	196.2	4879.5	188.9	4886.8	180.9
4896.7	180.9	4906.3	180.5	4912.7	180.6	4921.5	181.5	4925.9	182.1
4933.4	180.2	4944.3	193.8	4950.5	193.6	4953.3	195.3	4961.3	196.9
4962.3	198.3	4970.7	198.3	4981.4	198.3	4982.7	199.7	4992.3	200.3
5006	199.6	5016.4	198.3	5024.6	195.8	5031.3	193	5032.9	192.1
5038.9	189.7	5043.3	187.2	5046	185.6	5051.7	185.8	5057	185.9
5062.7	185.6	5072	185.5	5082.4	185.8	5091.5	185.8	5098.4	185.7
5099.4	185.6	5102.1	185.5	5107.7	185.6	5114.2	185.6	5121.2	185.6
5127.8	185.6	5133.7	185.6	5140.2	186.1	5145.7	193.5	5150.5	194.5
5156.6	194.1	5158.5	204.8	5158.7	207.5	5209.3	207.5	5255.7	207.7
5262.9	210.1	5292.7	220						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4801.1	.07	4848.9	.03
		5158.5	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4848.9	5158.5		11	11		.1	.3

Ineffective Flow	num= 2
Sta L	Sta R
4801.1	4859
Elev	Permanent F
205.3	

5161 5292.7 201
 Sediment Elevation = 0
 Ramapo River Post. rep
 F

INLINE STRUCTURE

RIVER: Ramapo River
 REACH: Reach-1 RS: 10540

INPUT

Description: Pompton Lake Dam

Distance from Upstream XS = .5

Deck/Roadway Width = 10

Weir Coefficient = 3.6

Weir Embankment Coordinates num = 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4740	220	4760	206.9	4772	207.1	4783	206.7	4834.5	207
4859	205.3	4859	205.3	4866	201	5161	201	5161	201
5161.1	207.5	5210	207.5	5210.1	210.5	5260	210.5	5300	220

Upstream Embankment side slope = 0 hori z. to 1.0 vertical

Downstream Embankment side slope = 0 hori z. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Weir crest shape = Ogee

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10530

INPUT

Description: 10530

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4801.1	220	4822.8	206.5	4831.5	206.5	4848.8	206.1	4848.9	206.5
4852	206	4861.8	202.8	4865.7	196.2	4879.5	188.9	4886.8	180.9
4896.7	180.9	4906.3	180.5	4912.7	180.6	4921.5	181.5	4925.9	182.1
4933.4	180.2	4944.3	193.8	4950.5	193.6	4953.3	195.3	4961.3	196.9
4962.3	198.3	4970.7	198.3	4981.4	198.3	4982.7	199.7	4992.3	200.3
5006	199.6	5016.4	198.3	5024.6	195.8	5031.3	193	5032.9	192.1
5038.9	189.7	5043.3	187.2	5046	185.6	5051.7	185.8	5057	185.9
5062.7	185.6	5072	185.5	5082.4	185.8	5091.5	185.8	5098.4	185.7
5099.4	185.6	5102.1	185.5	5107.7	185.6	5114.2	185.6	5121.2	185.6
5127.8	185.6	5133.7	185.6	5140.2	186.1	5145.7	193.5	5150.5	194.5
5156.6	194.1	5158.5	204.8	5158.7	207.5	5209.3	207.5	5255.7	207.7
5262.9	210.1	5292.7	220						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4801.1	.07	4848.9	.03	5158.5	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4848.9 5158.5 42 42 42 .05 .2

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4801.1	4848.9	206.5	F
5158.5	5292.7	204.8	F

Sediment Elevation = 0

Ramapo River Post. rep

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10529

INPUT

Description: 10530

Station Elevation Data			num=	57						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4801.1	220	4822.8	206.5	4831.5	206.5	4848.8	206.1	4849	206.5	
4852	206	4861.8	202.8	4865.7	196.2	4879.5	188.9	4886.8	180.9	
4896.7	180.9	4906.3	180.5	4912.7	180.6	4921.5	181.5	4925.9	182.1	
4933.4	180.2	4944.3	193.8	4950.5	193.6	4953.3	195.3	4961.3	196.9	
4962.3	198.3	4970.7	198.3	4981.4	198.3	4982.7	199.7	4992.3	200.3	
5006	199.6	5016.4	198.3	5024.6	195.8	5031.3	193	5032.9	192.1	
5038.9	189.7	5043.3	187.2	5046	185.6	5051.7	185.8	5057	185.9	
5062.7	185.6	5072	185.5	5082.4	185.8	5091.5	185.8	5098.4	185.7	
5099.4	185.6	5102.1	185.5	5107.7	185.6	5114.2	185.6	5121.2	185.6	
5127.8	185.6	5133.7	185.6	5140.2	186.1	5145.7	193.5	5150.5	194.5	
5156.6	194.1	5158.5	204.8	5159	207.5	5209.3	207.5	5255.7	207.7	
5262.9	210.1	5292.7	220							

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4801.1	.07	4849	.03	5159	.07

Bank Sta: Left 4849 Right 5159 Lengths: Left 1 Channel 41 Right 12 Coeff Contr. .05 Expan. .2
Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 10488

INPUT

Description: 10488

Station Elevation Data			num=	35						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4796.1	220	4812.7	206	4827.4	205.9	4839.5	205.7	4861.3	202.8	
4865.7	199	4880.6	189	4885.1	182.6	4889.1	179.9	4899	178.6	
4903.7	180.6	4907.4	184.3	4916.9	183.5	4931.2	181.2	4942.6	185.2	
4963.9	191.1	4984.1	193.1	4993.3	187.3	5000.9	185.9	5017.3	183.6	
5037.4	178.8	5051.5	178.9	5063	179.2	5074.7	179.2	5081.9	178.9	
5094.9	177.2	5101.5	177.7	5126.8	186.3	5133.3	185.9	5138.6	201.3	
5144.7	202	5206.9	207.1	5231.3	207.3	5249.4	210	5260.6	220	

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
4796.1	.05	4839.5	.028	5144.7	.05

Bank Sta: Left 4839.5 Right 5144.7 Lengths: Left 102.96 Channel 102.96 Right 102.96 Coeff Contr. .1 Expan. .3
Sediment Elevation = 0

INLINE STRUCTURE

RIVER: Ramapo River
REACH: Reach-1

RS: 10487.5

RamapoRiverPost.rep

INPUT

Description:

Distance from Upstream XS = 1

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Embankment Coordinates num = 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4865.7	199	4880.6	189	4885.1	182.6	4889.1	179.9	4899	178.6
4903.7	180.6	4907.4	184.3	4916.9	183.5	4931.2	181.2	4942.6	185.2
4963.9	191.1	4984.1	193.1	4993.3	187.3	5000.9	185.9	5017.3	183.6
5037.4	178.8	5051.5	178.9	5063	179.2	5074.7	179.2	5081.9	178.9
5094.9	177.2	5101.5	177.7	5126.8	186.3	5133.3	185.9	5138.6	201.3

Upstream Embankment side slope = 0 hori z. to 1.0 vertical

Downstream Embankment side slope = 0 hori z. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 10385

INPUT

Description: 10385

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4743.3	220	4777.3	202.6	4791.2	202.2	4809.4	201.4	4819.2	200.1
4837.9	186.1	4848	185.3	4861	179.6	4872.3	179.8	4878	179.4
4888	178.7	4898	178.6	4908	178.6	4918	178.8	4928	178.9
4938	178.6	4943	178.2	4948	177.4	4953	176.7	4955	175.6
4958	174.2	4960	171.7	4963	170.3	4968	169.3	4973	167.6
4978	162.8	4985	160.7	4991	160.3	4998	161.1	5005	159.5
5012	158	5020	157.2	5028	155.9	5037	156.1	5043	158
5050	158.2	5055	157.8	5060	159.5	5065	159.6	5070	161.2
5073	163.1	5075	164.7	5078	166.3	5080	166.6	5085	165.8
5090	165.2	5095	166.3	5100	169.7	5103	172	5106	173.2
5111	175.9	5114	177.2	5122	179.4	5141	186.5	5165.5	191.2
5169.5	192.3	5175.5	194.1	5175.6	194.6	5187.8	199	5203.3	206.9
5211.1	206.6	5222.3	210.1	5236.8	220				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4743.3	.07	4861	.03	5122	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4861 5122 120 114.95 110.05 .1 .3

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 10270

INPUT

Description: 10270

Station Elevation Data num= 48

Ramapo River Post. rep

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4592.4	220	4637.2	203.9	4665.7	198.4	4706.2	194.1	4728.2	193.7
4754.1	192.7	4758.9	192.6	4778	192	4820	191.7	4828	191.6
4843	190.8	4853	190.4	4868	188.1	4880	187.6	4891	181.3
4948	161.7	4953	161.4	4960	161	4968	160.7	4976	159.9
4984	159.5	4989	160.3	4998	162.3	5009	163.8	5015	164.8
5025	165.5	5033	166.6	5041	165.6	5051	165.5	5062	165.4
5069	165.4	5076	168.7	5082	170.1	5085	174.9	5095	178
5097	179.6	5104	184.4	5108	186	5118	188.3	5128	190.8
5130	191.7	5139	193.5	5147.3	200	5169.9	207.4	5178.7	206.9
5190.8	210	5217.4	215.2	5234.8	220				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4592.4	.07	4891	.03	5097	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4891 5097 45 45 45 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10225

INPUT
 Description: 10225

Station Elevation Data

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4842.7	223.83	4844.04	218.07	4853.34	195.06	4860.3	190.6	4870.3	190.4
4880.3	190.3	4885.3	186.8	4897.3	182.4	4907.3	179.7	4911.3	179.4
4911.4	178	4913.3	177.9	4918.3	177.7	4921.3	177	4925.3	174.9
4930.3	174.1	4935.3	172.3	4945.3	169.9	4955.3	168.1	4962.3	167.1
4969.3	164.8	4976.3	164.6	4982.3	164.3	4995.3	164.2	5006.3	163.8
5009.3	164.5	5019.3	166.3	5031.3	166.4	5037.3	167.3	5047.3	168.6
5055.3	169	5061.3	170.7	5065.3	172.9	5072.3	174.3	5076.3	176.1
5079.3	179	5082.3	178.2	5082.9	179.2	5095.9	187.2	5102.05	205.33
5113.26	220.08								

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4842.7	.07	4911.3	.035	5079.3	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4911.3 5079.3 50 43 40 .1 .3
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10182

INPUT
 Description: 10182

Station Elevation Data

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
4890.48	210.33	4892.26	207.64	4902	187.8	4909	186.6	4923	184.7
4929	185.1	4946	184.3	4953	179.4	4956	178.7	4960	177.6
4962	177.8	4963	178.8	4966	179.1	4970	178.7	4976	178.5

Ramapo River Post. rep									
4982	177.8	4983	177.4	4989	178	4999	177.8	5006	177.8
5015	177	5021	176.4	5031	176.6	5038	176.9	5046	178.8
5047	177.7	5047.1	178.5	5050	179.6	5052	179.5	5068	180.1
5078	182.4	5090.88	198.52	5097.11	211.09				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4890.48	.07	4956	.035	5047.1	.07

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4956	5047.1		40.02	55.02	64.98		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10127

INPUT
 Description: 10127

Station Elevation Data num= 30									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4900.94	198.95	4903.5	189.8	4923.5	189.6	4935.5	189.2	4940.5	189.3
4960.5	177.9	4962.5	177.6	4967.5	177.1	4973.5	175.8	4980.5	176.3
4985.5	176.1	4991.5	176.5	5004.5	176.1	5012.5	176.3	5020.5	176.8
5025.5	176.4	5029.5	176.1	5037.5	176.7	5038.5	177.1	5038.6	178.2
5039.5	179.1	5046.5	179.2	5053.5	178.8	5063.5	177	5067.5	176.1
5071.5	175.1	5078.3	193.1	5079.3	192.1	5103.3	192.8	5114.22	198.47

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4900.94	.15	4960.5	.035	5071.5	.15

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4960.5	5071.5		41	41	41		.1	.3
Sediment	Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 10086

INPUT
 Description: 10085

PATERSON HAMBURG TURNPIKE

Station Elevation Data num= 56									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4407.4	220	4456.8	196.8	4513	194.2	4513.5	194.2	4544.7	193.3
4586.8	192.1	4624.8	190.9	4677.8	189.3	4756.2	190.1	4789.5	190
4839.1	189.8	4884	190.2	4900	191.1	4933	190.4	4940	188.6
4941	177.2	4941.1	177.3	4942	176.9	4945	177.3	4947	177.5
4950	177.3	4955	176.3	4960	174.3	4970	173.6	4976	175.9
4980	176.9	4980.1	176.9	4984	178.7	4984.1	178.7	4989	176.9
4990	175.7	5000	174.4	5010	174.4	5020	176.6	5022	176.6
5022.1	176.6	5025	178.2	5025.1	178.2	5029	176.5	5030	175.4
5040	173.9	5050	174.2	5060	175	5060.1	176.4	5062	188.5
5065	188.9	5070	191.1	5080	191	5100	191.2	5133.2	190.4
5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4	5432.6	200
5457.44	205.63								

Ramapo River Post. rep

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val
 4407.4 .2 4544.7 .04 4940 .03 5062 .06 5070 .2

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4940 5062 64 64 64 .6 .8

Sediment Elevation = 0

BRIDGE

RIVER: Ramapo River
 REACH: Reach-1 RS: 10053.5

INPUT
 Description: PATERSON HAMBURG TURNPIKE

Distance from Upstream XS = .5
 Deck/Roadway Width = 63
 Weir Coefficient = 2.5

Upstream Deck/Roadway Coordinates num= 32

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4407.4		220		220	4456.8	196.8		196.8		4513.5	194.2		194.2	
4544.7	193.3		193.3		4586.8	192.1		192.1		4624.8	190.9		190.9	
4677.8	189.3		189.3		4756.2	190.1		190.1		4789.5	190		190	
4839.1	189.8		189.8		4884	190.2		190.2		4900	191.1			
4933	193.7				4940	193.7				4941	193.8		187.3	
4980	194		187.3		4984.1	194		187.3		5022	194		187.3	
5025.1	194		187.3		5060.1	193.7		187.3		5060.1	193.7			
5062	193.7		188.5		5065	193.6		188.9		5070	193.6		191.1	
5080	191		191		5100	191.2		191.2		5133.2	190.4		190.4	
5195.5	191.2		191.2		5267.7	193.6		193.6		5353.1	195.2		195.2	
5400.5	195.4		195.4		5432.6	200		200						

Upstream Bridge Cross Section Data Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4407.4	220	4456.8	196.8	4513	194.2	4513.5	194.2	4544.7	193.3
4586.8	192.1	4624.8	190.9	4677.8	189.3	4756.2	190.1	4789.5	190
4839.1	189.8	4884	190.2	4900	191.1	4933	190.4	4940	188.6
4941	177.2	4941.1	177.3	4942	176.9	4945	177.3	4947	177.5
4950	177.3	4955	176.3	4960	174.3	4970	173.6	4976	175.9
4980	176.9	4980.1	176.9	4984	178.7	4984.1	178.7	4989	176.9
4990	175.7	5000	174.4	5010	174.4	5020	176.6	5022	176.6
5022.1	176.6	5025	178.2	5025.1	178.2	5029	176.5	5030	175.4
5040	173.9	5050	174.2	5060	175	5060.1	176.4	5062	188.5
5065	188.9	5070	191.1	5080	191	5100	191.2	5133.2	190.4
5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4	5432.6	200
5457.44	205.63								

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val
 4407.4 .2 4544.7 .04 4940 .03 5062 .06 5070 .2

Bank Sta: Left Right Coeff Contr. Expan.
 4940 5062 .6 .8

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates num= 26

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4677.8	189.3		189.3		4756.2	190.1		190.1		4789.5	190		190	

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4839.1	189.8	189.8	4884	190.2	190.2	4900	191.1		
4933	193.7		4940	193.7		4941	193.8	187.3	
4980	194	187.3	4984.1	194	187.3	5022	194	187.3	
5025.1	194	187.3	5060.1	193.7	187.3	5060.1	193.7		
5062	193.7		5065	193.6	188.9	5070	193.6	191.1	
5080	191		5100	191.2		5133.2	190.4		
5195.5	191.2	191.2	5267.7	193.6	193.6	5353.1	195.2	195.2	
5400.5	195.4	195.4	5432.6	200	200				

Downstream Bridge Cross Section Data
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4331	220	4360.2	200.3	4422.4	194.2	4480.5	192.7	4544	189.8
4691.7	190.6	4769.9	190.2	4856.8	191.2	4906	191	4916	191
4926	183.3	4936	177.2	4946	176.4	4956	176.5	4966	175.5
4976	174.9	4986	176	4996	175.5	5006	175.3	5016	172.7
5026	175.3	5036	174.6	5046	173.2	5056	173.3	5060	175.2
5063	175.7	5063.1	176.5	5064	194.4	5066	191	5086.5	190.1
5160.7	190.9	5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4
5432.6	200								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4331	.15	4916	.03	5064	.15

Bank Sta: Left Right Coeff Contr. Expan.
4916 5064 .6 .8

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
4331 4916 191 F
5064 5432.6 194.4 F

Sediment Elevation = 0

Upstream Embankment side slope = 0 hori z. to 1.0 vertical
Downstream Embankment side slope = 0 hori z. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 189.5
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station Upstream= 4982 Downstream= 4982
Upstream num= 2
Width Elev Width Elev
4 150 4 194
Downstream num= 2
Width Elev Width Elev
4 150 4 194

Pier Data

Pier Station Upstream= 5023.5 Downstream= 5023.5
Upstream num= 2
Width Elev Width Elev
3 150 3 194
Downstream num= 2
Width Elev Width Elev
3 150 3 194

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 10022

INPUT

Description: 10022

Station Elevation Data

num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4331	220	4360.2	200.3	4422.4	194.2	4480.5	192.7	4544	189.8
4691.7	190.6	4769.9	190.2	4856.8	191.2	4906	191	4916	191
4926	183.3	4936	177.2	4946	176.4	4956	176.5	4966	175.5
4976	174.9	4986	176	4996	175.5	5006	175.3	5016	172.7
5026	175.3	5036	174.6	5046	173.2	5056	173.3	5060	175.2
5063	175.7	5063.1	176.5	5064	194.4	5066	191	5086.5	190.1
5160.7	190.9	5195.5	191.2	5267.7	193.6	5353.1	195.2	5400.5	195.4
5432.6	200								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4331	.15	4916	.03	5064	.15

Bank Sta: Left 4916 Right 5064 Lengths: Left 2.22 Channel 49.12 Right 77.78 Coeff Contr. .6 Expan. .8

Ineffective Flow

num= 2

Sta L	Sta R	Elev	Permanent
4331	4916	191	F
5064	5432.6	194.4	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: 10021

INPUT

Description: 10022

Station Elevation Data

num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4331	220	4360.2	200.3	4422.4	194.2	4480.5	192.7	4544	189.8
4691.7	190.6	4769.9	190.2	4856.8	191.2	4906	191	4916	191
4926	183.3	4936	177.2	4946	176.4	4956	176.5	4966	175.5
4976	174.9	4986	176	4996	175.5	5006	175.3	5016	172.7
5026	175.3	5036	174.6	5046	173.2	5056	173.3	5060	175.2
5063	175.7	5063.1	176.5	5064	194.4	5066	191	5086.5	190.1
5160.7	190.9	5183.16	205.34						

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Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4331	.15	4916	.03	5064	.15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4916	5064	37.74	833.68	1322.26	.6	.8
------	------	-------	--------	---------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4331	4916	191	F
5064	5183.16	194.4	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 9580

INPUT
Description: 9580

Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4294.2	210	4313.4	198	4429	194.1	4477.9	192.1	4508.5	191.8
4535.3	190.9	4565.1	191.6	4593.3	191.5	4633	190.2	4691	189.7
4702.6	189.6	4740.3	188.5	4771.7	189.1	4836.8	187.8	4847	186.8
4882.4	185.9	4882.5	185.3	4894.5	184.1	4909	177.4	4937	177
4945	176.1	4952	175.3	4962	174.4	4972	173.6	4982	174.3
4992	174.2	5002	174.1	5012	174.3	5022	174	5032	174.2
5042	174.9	5054	176.1	5057	178.3	5070	185.1	5097	186.4
5107.2	187	5147.3	182.1	5186.3	179.5	5212.4	180.9	5246.2	184.4
5267.4	187.2	5285.8	186.6	5302.2	187.1	5331.6	188.9	5389.3	189.5
5427.4	189.5	5474.4	190.1	5534.1	191	5581.9	190.2	5596.6	189.9
5612.8	189.7	5629.9	189.9	5649.2	190.2	5712.1	191.1	5765.1	190.8
5822.4	190.9	5869.6	190.6	5896.4	189.9	5911	189.7	5928	189.9
5951.6	190.5	6027.3	192.4	6046.7	194.7	6062.6	196.1	6120	201.8
6142.1	201.7	6168.1	202	6194.1	201.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4294.2	.065	4882.4	.033	5070	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4882.4	5070	770.1	829.94	819.74	.1	.3
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Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 8750

INPUT
Description: 8750

Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4454.9	210	4479.3	199.7	4515.4	195.7	4581	195.4	4622.3	194.4
4671.3	196	4709.6	196.4	4731.4	196.9	4747.8	196.5	4756.6	197.4
4775.9	196.9	4790.2	197.3	4809.9	196.9	4846.8	197	4879.6	193.8
4887.8	191.3	4887.9	191.3	4897	195.8	4897.5	195.2	4898	192.1
4907	190.8	4907.5	188.3	4918	187.1	4923.5	181.7	4932	176
4937	174.5	4947	172.8	4957	172.4	4967	173.1	4977	172.7
4987	172.9	4997	172.6	5007	172.4	5017	172.9	5027	173.3

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5037	173.1	5047	174.9	5057	175.4	5068	176.2	5089.1	176.8
5131.9	177.9	5177.1	178.1	5225.1	180.4	5264	181.2	5321.9	181.7
5364	181.8	5412.5	182	5480.4	182.2	5537.9	183.6	5548.1	184.2
5613.9	183.4	5656.1	184.5	5701.5	189.4	5755.1	188.8	5812.7	186.8
5878.8	186.1	5918.1	188.1	5964.1	190.1	5978.9	191	6048.4	190.1
6063.2	188.8	6076.7	187.9	6109.1	187.8	6164.7	188.6	6244	189.1
6305.3	188.5	6356.7	189.8	6371.9	189.9	6382.8	190	6405.5	190.2
6454.2	190.3	6479.3	194	6547.5	195.7	6599.9	195.8	6636.5	196.1
6734.7	194.2	6888.9	194.7	6992.4	193.3	7046.3	194.1	7091.9	192.5
7172.8	194.1	7269.5	194.6	7398.8	194.7	7538.9	193.3	7617.6	194.6
7712.8	192.5	7833.4	194.3	7947.4	194.4	8144.3	192.3	8254.8	194.4
8313.1	195.3	8546.3	201.65						

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4454.9	.065	4898	.05	6479.3	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4898	6479.3		830.08	794.89		.1	.3
Sediment	Elevation = 0				680			

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 7955

INPUT
Description: 7955

Station Elevation Data			num= 99						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4272.3	210	4304.8	203.7	4332.3	198.4	4357.9	198	4415.6	192.3
4490.9	192.3	4557.2	192.7	4621.3	192.9	4688.3	192.8	4711.1	193.2
4731.8	192.7	4784.6	192.1	4837.8	190.4	4869.9	189.9	4896.9	186.5
4907	186.4	4926	185.7	4939	176.2	4941	174.8	4943	174.1
4946	172.8	4949	171.7	4959	170.5	4969	170.4	4979	170.1
4989	169.5	4999	168.4	5009	168.5	5019	168.7	5029	169.6
5039	171.3	5044	172.9	5048	173.6	5054	174.5	5061	176.1
5072	178.2	5105	181.9	5129	182	5139	181.8	5177.9	181.9
5193.8	181.6	5210.9	181.9	5238.7	182.7	5291.3	182.4	5326.9	183.2
5364.1	185.5	5387.2	187.3	5451.3	186.4	5471.4	185.9	5489	185.9
5512.7	186.3	5573.6	187.4	5629.6	187.8	5670.7	188	5696.4	188.3
5737.6	187.8	5761.5	187.1	5774.9	187.3	5793.7	186.8	5824.8	187.6
5878.2	187.8	5935.6	188	6000.8	188.8	6043.7	188.6	6068.1	186.7
6082.7	186.4	6100.3	186.6	6124.8	188	6189	188.1	6274.1	187.3
6287.2	187.4	6350.4	186.8	6379.1	186	6394.5	185.7	6411.8	185.9
6444.7	186.4	6512.6	185.8	6550.4	183.8	6601.2	183.6	6648.5	185.2
6688.9	187.1	6734.7	187.9	6759.6	187.9	6771.5	187.5	6785	187.8
6820	187.8	6918.9	185.9	7012.6	186.8	7112.1	186.7	7261.2	187.5
7400.2	189.6	7496.3	190.4	7617.8	192.8	7782.9	194.3	7884.5	195
8039.6	192.6	8188.8	192.3	8308.6	192.6	8425.4	192.7		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
4272.3	.2	4926	.045	5129	.5

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4926	5129		390	355.05		.1	.3
Sediment	Elevation = 0				330			

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
REACH: Reach-1

RS: 7600

INPUT

Description: 7600
This is a REPEATED section.

Station Elevation Data			num=	97						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
3935.5	226.1	4007.6	217	4022.6	217.8	4100.6	210.4	4135.6	201.7	
4280.9	201.6	4293.5	200.8	4310.2	201	4320.3	200.4	4341.8	200.4	
4416.8	198.1	4441.4	198.6	4463.1	197.4	4471.1	198.1	4506.5	193.9	
4589.1	189.9	4675.4	187.7	4766.4	187.7	4846.9	185.2	4874.7	186.5	
4892.9	186.5	4903	187.6	4932	187.6	4932.1	187.6	4941	181.3	
4947	177	4950	174.7	4950.1	174.7	4953	172.6	4953.1	172.6	
4958	170.6	4963	169.2	4973	167.3	4983	167.6	4993	167.8	
4999	168.5	5003	168.9	5013	170	5023	171.2	5028	172.3	
5033	174	5043	175.1	5046	175.8	5046.1	175.8	5048	176.3	
5049	176.5	5049.1	176.5	5053	177	5054	177.9	5058	180.9	
5058.1	181	5066	183.5	5066.1	183.5	5068	184.2	5073	185	
5093	185.9	5093.1	185.9	5104.5	186.2	5160	185	5192.9	184.3	
5470.3	183.9	5531.1	185	5555.6	186.6	5592.6	185.8	5941.7	186.7	
5969.3	187.5	6033.7	187.1	6070.2	186.3	6127.6	188	6174.1	188.5	
6238.6	186.6	6316.5	187.1	6342.3	186.6	6352.4	185.7	6380.2	185.6	
6389.5	185.6	6403	186	6569.4	181.7	6589.1	182.5	6611.5	183.7	
6639.8	185.8	6824.8	186.9	6933.1	187.5	7054.4	187	7087.7	186.2	
7195.6	187.7	7312.6	188.7	7436.2	187	7546.6	187.4	7681.4	187.4	
7799.1	188.2	7957.2	192.5	8093	193	8247.8	191.1	8369	191.2	
8498.9	194	8573.43	205.46							

Manning's n Values			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	
3935.5	.2	4932	.045	5104.5	.5	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4932 5104.5 110 110 110 .5 .7
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 7490

INPUT

Description: 7490
DAWES HIGHWAY

Station Elevation Data			num=	97						
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	
3935.5	225.1	4007.6	216	4022.6	216.8	4100.6	209.4	4135.6	200.7	
4280.9	200.6	4293.5	199.8	4310.2	200	4320.3	199.4	4341.8	199.4	
4416.8	197.1	4441.4	197.6	4463.1	196.4	4471.1	197.1	4506.5	192.9	
4589.1	188.9	4675.4	186.7	4766.4	186.7	4846.9	184.2	4874.7	185.5	
4892.9	185.5	4903	186.6	4932	186.6	4932.1	186.6	4941	180.3	
4947	176	4950	173.7	4950.1	173.7	4953	171.6	4953.1	171.6	
4958	169.6	4963	168.2	4973	166.3	4983	166.6	4993	166.8	
4999	167.5	5003	167.9	5013	169	5023	170.2	5028	171.3	
5033	173	5043	174.1	5046	174.8	5046.1	174.8	5048	175.3	
5049	175.5	5049.1	175.5	5053	176	5054	176.9	5058	179.9	
5058.1	180	5066	182.5	5066.1	182.5	5068	183.2	5073	184	
5093	184.9	5093.1	184.9	5104.5	185.2	5160	184	5192.9	183.3	

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5470.3	182.9	5531.1	184	5555.6	185.6	5592.6	184.8	5941.7	185.7	
5969.3	186.5	6033.7	186.1	6070.2	185.3	6127.6	187	6174.1	187.5	
6238.6	185.6	6316.5	186.1	6342.3	185.6	6352.4	184.7	6380.2	184.6	
6389.5	184.6	6403	185	6569.4	180.7	6589.1	181.5	6611.5	182.7	
6639.8	184.8	6824.8	185.9	6933.1	186.5	7054.4	186	7087.7	185.2	
7195.6	186.7	7312.6	187.7	7436.2	186	7546.6	186.4	7681.4	186.4	
7799.1	187.2	7957.2	191.5	8093	192	8247.8	190.1	8369	190.2	
8498.9	193	8612.72	202.64							

Manning's n Values			num=	3	
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	
3935.5	.2	4932	.045	5104.5	.5

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4932	5104.5		38	38	38		.5	.7
Ineffective Flow	num=	2	Permanent						
Sta L	Sta R	Elev							
3935.5	4932	186.6	F						
5104.5	8612.72	185.2	F						

Sediment El evati on = 0

BRI DGE

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 7471

I NPUT

Descripti on: DAWES HI GHWAY
 Di stance from Upstream XS = 7.5
 Deck/Roadway Wi dth = 23
 Wei r Coeffi ci ent = 2.6

Upstream Deck/Roadway Coordi nates														
num= 79														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4280.9	200.6	200.6	4293.5	199.8	199.8	4310.2	200	200						
4320.3	199.4	199.4	4341.8	199.4	199.4	4416.8	197.1	197.1						
4441.4	197.6	197.6	4463.1	196.4	196.4	4471.1	197.1	197.1						
4506.5	192.9	192.9	4589.1	188.9	188.9	4675.4	186.7	186.7						
4766.4	186.7	186.7	4846.9	184.2	184.2	4874.7	185.5	185.5						
4892.9	185.5	185.5	4903	189.5	186.6	4932	189.5							
4932.1	191		4941	200	180.3	4950	200	173.7						
4950.1	191	173.7	4953	191.2	171.6	4953	191.2	179.8						
4958	191.6	181.8	4963	192.1	183.5	4973	192.6	185.2						
4993	193.5	187.5	4999	193.5	187.7	5013	193.5	187						
5023	193.2	185.8	5033	192.8	183.9	5046	191.8	179.8						
5046.1	191.8	174.8	5049	191.5	175.5	5049.1	200	175.5						
5058	200	180	5058.1	191	180	5066	191	182.5						
5066.1	189.5	182.5	5093	189.5	184.9	5093.1	186	184.9						
5104.5	185.8	185.2	5160	184	184	5192.9	183.3	183.3						
5470.3	182.9	182.9	5531.1	184	184	5555.6	185.6	185.6						
5592.6	184.8	184.8	5941.7	185.7	185.7	5969.3	186.5	186.5						
6033.7	186.1	186.1	6070.2	185.3	185.3	6127.6	187	187						
6174.1	187.5	187.5	6238.6	185.6	185.6	6316.5	186.1	186.1						
6342.3	185.6	185.6	6352.4	184.7	184.7	6380.2	184.6	184.6						
6389.5	184.6	184.6	6403	185	185	6569.4	180.7	180.7						
6589.1	181.5	181.5	6611.5	182.7	182.7	6639.8	184.8	184.8						
6824.8	185.9	185.9	6933.1	186.5	186.5	7054.4	186	186						
7087.7	185.2	185.2	7195.6	186.7	186.7	7312.6	187.7	187.7						
7436.2	186	186	7546.6	186.4	186.4	7681.4	186.4	186.4						
7799.1	187.2	187.2	7957.2	191.5	191.5	8093	192	192						
8247.8	190.1	190.1												

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Upstream Bridge Cross Section Data

Station Elevation Data num= 97									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3935.5	225.1	4007.6	216	4022.6	216.8	4100.6	209.4	4135.6	200.7
4280.9	200.6	4293.5	199.8	4310.2	200	4320.3	199.4	4341.8	199.4
4416.8	197.1	4441.4	197.6	4463.1	196.4	4471.1	197.1	4506.5	192.9
4589.1	188.9	4675.4	186.7	4766.4	186.7	4846.9	184.2	4874.7	185.5
4892.9	185.5	4903	186.6	4932	186.6	4932.1	186.6	4941	180.3
4947	176	4950	173.7	4950.1	173.7	4953	171.6	4953.1	171.6
4958	169.6	4963	168.2	4973	166.3	4983	166.6	4993	166.8
4999	167.5	5003	167.9	5013	169	5023	170.2	5028	171.3
5033	173	5043	174.1	5046	174.8	5046.1	174.8	5048	175.3
5049	175.5	5049.1	175.5	5053	176	5054	176.9	5058	179.9
5058.1	180	5066	182.5	5066.1	182.5	5068	183.2	5073	184
5093	184.9	5093.1	184.9	5104.5	185.2	5160	184	5192.9	183.3
5470.3	182.9	5531.1	184	5555.6	185.6	5592.6	184.8	5941.7	185.7
5969.3	186.5	6033.7	186.1	6070.2	185.3	6127.6	187	6174.1	187.5
6238.6	185.6	6316.5	186.1	6342.3	185.6	6352.4	184.7	6380.2	184.6
6389.5	184.6	6403	185	6569.4	180.7	6589.1	181.5	6611.5	182.7
6639.8	184.8	6824.8	185.9	6933.1	186.5	7054.4	186	7087.7	185.2
7195.6	186.7	7312.6	187.7	7436.2	186	7546.6	186.4	7681.4	186.4
7799.1	187.2	7957.2	191.5	8093	192	8247.8	190.1	8369	190.2
8498.9	193	8612.72	202.64						

Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
3935.5	.2	4932	.045	5104.5	.5

Bank Sta: Left Right Coeff Contr. Expan.
 4932 5104.5 .5 .7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
3935.5	4932	186.6	F
5104.5	8612.72	185.2	F

Sediment Elevation = 0

Downstream Deck/Roadway Coordinates

num= 79														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4280.9	200.6				4293.5	199.8				4310.2	200			
4320.3	199.4				4341.8	199.4				4416.8	197.1			
4441.4	197.6				4463.1	196.4				4471.1	197.1			
4506.5	192.9				4589.1	188.9				4675.4	186.7			
4766.4	186.7				4846.9	184.2	184.2			4874.7	185.5	185.5		
4892.9	185.5	185.5			4903	189.5				4932	189.5			
4932.1	191				4941	200	180.3			4950	200	173.7		
4950.1	191	173.7			4953	191.2	171.6			4953	191.2	179.8		
4958	191.6	181.8			4963	192.1	183.5			4973	192.6	185.2		
4993	193.5	187.5			4999	193.5	187.7			5013	193.5	187		
5023	193.2	185.8			5033	192.8	183.9			5046	191.8	179.8		
5046.1	191.8	174.8			5049	191.5	175.5			5049.1	200	175.5		
5058	200	180			5058.1	191	180			5066	191	182.5		
5066.1	189.5	182.5			5093	189.5	184.9			5093.1	186			
5104.5	185.8				5160	184				5192.9	183.3			
5470.3	182.9				5531.1	184				5555.6	185.6			
5592.6	184.8				5941.7	185.7				5969.3	186.5			
6033.7	186.1				6070.2	185.3				6127.6	187			
6174.1	187.5				6238.6	185.6				6316.5	186.1			
6342.3	185.6				6352.4	184.7				6380.2	184.6			
6389.5	184.6				6403	185				6569.4	180.7			
6589.1	181.5				6611.5	182.7				6639.8	184.8			
6824.8	185.9				6933.1	186.5				7054.4	186			
7087.7	185.2				7195.6	186.7				7312.6	187.7			

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7436.2	186	7546.6	186.4	7681.4	186.4
7799.1	187.2	7957.2	191.5	8093	192
8247.8	190.1				

Downstream Bridge Cross Section Data

Station Elevation		Data		num= 99							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3911.5	225	3989.3	210	4009	212.3	4020.8	211.1	4040.2	216.5		
4063.7	213.8	4124.2	200	4327.2	199.2	4384.9	197.6	4406.6	198		
4428.7	197.6	4606	188.1	4719.2	186.8	4807.5	186.2	4858.1	186.1		
4893	185.2	4924	184.8	4936	184.5	4943	183.3	4946	176.4		
4949	176	4952	175.4	4955	174.8	4960	173.9	4964	172.1		
4970	169.3	4980	167.1	4990	167.2	5000	167.2	5010	168		
5020	170.1	5030	171.4	5039	173.2	5044	173.8	5050	176		
5056	180.5	5062	182.3	5067	184.1	5070	185.5	5090	184.8		
5122	184.5	5160.4	183.7	5190.1	182.9	5230	182.9	5278.2	182.7		
5332.5	182	5378.8	182.7	5414.1	182.4	5460.1	182.3	5528.4	183.8		
5619.8	184.3	5712.3	185.6	5733	185.1	5739.8	184.5	5768.6	184.7		
5777.5	184.8	5802.8	185.4	5843.4	184.8	5920	185.3	5962.4	185.2		
6003.7	186.3	6022.6	185.7	6031.4	185.4	6058.5	185.6	6067.4	186		
6097.1	186.8	6121.5	187.5	6154.5	186.9	6180.8	186.5	6206.1	185.5		
6226.3	185	6252.2	185.6	6304.4	185.6	6334	184.2	6368.7	184.2		
6407	184.7	6514.7	182	6568.7	180.8	6602.4	182.7	6640.5	184.6		
6731.8	185.1	6755.1	185.1	6761.9	184.8	6788.4	185.7	6829.1	186		
6927.7	186.5	7033.8	185.9	7073.9	185	7188.5	186.7	7284.6	187.2		
7348.8	186.9	7476.7	184.3	7599.6	185.8	7722.6	186.2	7888.3	189		
8046	191	8195.4	189.7	8341.8	191.7	8498.3	193				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
3911.5	.2	4924	.045	5070	.5

Bank Sta: Left 4924 Right 5070 Coeff Contr. .5 Expan. .7

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
3911.5	4924	184.8	F
5070	8498.3	185.5	F

Sediment Elevation = 0

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 185
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Selected Low Flow Methods = Energy

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .7352146
 Max Low Cord = 187.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum

Ramapo River Post. rep
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 7452

INPUT

Description: 7452

Station		Elevation		Data		num=		99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3911.5	225	3989.3	210	4009	212.3	4020.8	211.1	4040.2	216.5
4063.7	213.8	4124.2	200	4327.2	199.2	4384.9	197.6	4406.6	198
4428.7	197.6	4606	188.1	4719.2	186.8	4807.5	186.2	4858.1	186.1
4893	185.2	4924	184.8	4936	184.5	4943	183.3	4946	176.4
4949	176	4952	175.4	4955	174.8	4960	173.9	4964	172.1
4970	169.3	4980	167.1	4990	167.2	5000	167.2	5010	168
5020	170.1	5030	171.4	5039	173.2	5044	173.8	5050	176
5056	180.5	5062	182.3	5067	184.1	5070	185.5	5090	184.8
5122	184.5	5160.4	183.7	5190.1	182.9	5230	182.9	5278.2	182.7
5332.5	182	5378.8	182.7	5414.1	182.4	5460.1	182.3	5528.4	183.8
5619.8	184.3	5712.3	185.6	5733	185.1	5739.8	184.5	5768.6	184.7
5777.5	184.8	5802.8	185.4	5843.4	184.8	5920	185.3	5962.4	185.2
6003.7	186.3	6022.6	185.7	6031.4	185.4	6058.5	185.6	6067.4	186
6097.1	186.8	6121.5	187.5	6154.5	186.9	6180.8	186.5	6206.1	185.5
6226.3	185	6252.2	185.6	6304.4	185.6	6334	184.2	6368.7	184.2
6407	184.7	6514.7	182	6568.7	180.8	6602.4	182.7	6640.5	184.6
6731.8	185.1	6755.1	185.1	6761.9	184.8	6788.4	185.7	6829.1	186
6927.7	186.5	7033.8	185.9	7073.9	185	7188.5	186.7	7284.6	187.2
7348.8	186.9	7476.7	184.3	7599.6	185.8	7722.6	186.2	7888.3	189
8046	191	8195.4	189.7	8341.8	191.7	8498.3	193		

Manning's n		Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3911.5	.2	4924	.045	5070	.5		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4924	5070		649.89	652.05	479.79		.5	.7
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
3911.5	4924	184.8	F						
5070	8498.3	185.5	F						
Sediment Elevation = 0									

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 6800

INPUT

Description: 6800

Station		Elevation		Data		num=		98	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3288.1	232.5	3320	223.3	3354.8	211.4	3382.3	210	3469.7	208.7
3577.4	208.6	3619.8	205.5	3679.3	205.5	3742.7	207.3	3849.7	207.3
3906.4	200	3964.2	182.7	4002.5	184.1	4070.1	184.3	4126.4	182.6
4169.2	181.9	4201.8	181.4	4264	180.6	4298.4	181.6	4331.6	182.4
4396.5	181.6	4458.4	182.3	4516.5	183	4636.3	183.2	4731.3	182.9

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4779.5	182.8	4830.6	183.1	4881.4	183.1	4901.6	182.9	4911.5	183.5
4938.5	183.6	4950.5	178.5	4951.5	175.9	4952.5	175.6	4956.5	174.9
4958.5	173.6	4960.5	171.9	4965.5	170	4970.5	170.2	4980.5	170.2
4990.5	169.8	5000.5	169.7	5010.5	168.9	5020.5	168.7	5030.5	169.6
5040.5	171.6	5043.5	173	5045.5	175.1	5048.5	175.4	5048.6	175.9
5048.7	177.7	5056.5	178.5	5064.5	181.7	5072.5	181.9	5092.5	181.4
5141.5	180.4	5196.5	179.6	5224.6	179.6	5304.2	180	5346.1	180.1
5432.9	180.4	5496.2	180.8	5603.6	181.2	5631.6	181.2	5662.7	181.3
5772.5	183.8	5896.3	183.7	5993.3	182.9	6114.7	184.3	6258.5	182.8
6290.7	182.7	6351.6	186.7	6469.4	184	6556.9	183.3	6642.6	184.2
6746.9	183.9	6820.4	184.2	6901	184.6	7005.2	184.3	7099.9	182.6
7170.1	184.5	7225.1	183	7291.3	183.6	7356.7	185.3	7433.8	187.1
7497.1	189.2	7593.4	190.3	7623.6	191.1	7659.1	190.3	7725.7	190.5
7822.8	189.3	7884.6	188.5	7947.4	190	8022	191.3	8097.4	193.9
8159	191.5	8209.8	191.1	8214.22	200.31				

Manning's n Values num= 3

Station	Value	Station	Value	Station	Value
3288.1	.2	4938.5	.045	5064.5	.5

Bank Station: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4938.5	5064.5	690	744.9	799.8	.2	.4
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Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 6055

INPUT
 Description: 6055

Station Elevation Data num= 82

Station	Elev	Station	Elev	Station	Elev	Station	Elev	Station	Elev
3151.8	210.1	3208.1	208.1	3314.4	205.8	3378.6	204	3438.6	202.4
3522.3	202.7	3545.8	199	3595.9	199.1	3674	200.5	3754.2	202.5
3812.3	201.1	3871.8	204.5	4023.8	203.5	4055.1	202.8	4110.1	203.7
4175.8	201.9	4237.6	196.2	4278.9	178.7	4361.7	178.8	4436.1	179.9
4546.2	177.4	4633.5	176.4	4695.3	176.4	4776.1	178.5	4841.6	177.4
4912.1	179.1	4922.5	179.7	4936.5	180.4	4941.5	179.1	4944.5	176.7
4947.5	176.1	4952.5	175.3	4957.5	174.1	4962.5	173.4	4972.5	171.4
4982.5	170.6	4992.5	169.6	5002.5	168.7	5012.5	166.1	5022.5	165.2
5032.5	164.9	5042.5	168.7	5046.5	170.6	5048.5	173.6	5050.5	175.3
5052.5	176.1	5060.5	180.6	5062.5	180.6	5082.5	181.2	5092.4	181.2
5152.8	180.3	5259.4	178.8	5329	180.2	5410.5	180.4	5496.4	180.4
5536.9	180.1	5569.1	180.1	5665.3	180.1	5738.3	178.2	5800.2	181.4
5853	181.5	5919.4	178.4	5988.5	178.7	5995.7	177.2	6020.3	182.8
6057.6	183.1	6145.6	180.6	6285.5	179.5	6393.2	178.9	6436.5	179.7
6530.8	182.6	6613.5	182.8	6747	186.2	6906.3	190.9	6963.7	188.4
7047.1	191.5	7197.7	190.1	7339.9	191.3	7519.3	192.6	7640.2	191.5
7689.7	191.6	7724.04	195.52						

Manning's n Values num= 3

Station	Value	Station	Value	Station	Value
3151.8	.2	4936.5	.045	5082.5	.15

Bank Station: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

4936.5	5082.5	379.95	370.05	360	.2	.4
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Sediment Elevation = 0

CROSS SECTION

Ramapo River Post. rep

RIVER: Ramapo River
 REACH: Reach-1

RS: 5685

INPUT

Description: 5685

Station		Elevation		Data		num= 79					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3150.5	210	3225.4	209.1	3248.9	207.9	3280.5	207.7	3321.2	206.3		
3362.1	202.3	3427.9	201.3	3466.3	201.3	3601.7	200	3622.9	198.4		
3659.3	199.5	3715.6	200.4	3752.3	202.4	3797.8	203.4	3861.7	204		
3939	205.3	4015.5	205.2	4062.6	205.2	4124.2	204.9	4215.1	204.7		
4274.5	204.3	4336.4	204.5	4380.5	202.8	4438.9	195.3	4510.9	187.5		
4561.9	179	4606.8	181.9	4711	182.2	4764	181.9	4786	181.7		
4807	181.2	4818.5	180.3	4819	176.2	4890	176	4916	178.7		
4931	178.9	4934	179.2	4938	179.8	4945.5	176.2	4945.6	174.7		
4949	172.6	4951	170.8	4956	170.6	4958	167.1	4966	165.1		
4976	164.6	4986	164.8	4996	165.1	5006	165.3	5026	167.7		
5028	168.8	5033	170.6	5036	172.6	5036.1	174.6	5040	175.9		
5053	180.9	5082.3	182.4	5118.6	184	5300	190	5500	195		
5600	185	5689.2	180.2	5749.6	178.6	5876.2	178.6	6023.6	178.7		
6146.5	178.1	6217.8	177	6362	177.1	6441	180.8	6510.9	178.7		
6610.8	179.7	6723.5	178.5	6836.9	180.4	6920.9	186.6	7013.2	190.1		
7181	190.7	7358.5	190.7	7529.7	191.4	7613.3	193				

Manning's n Values		num= 3			
Station	Value	Station	Value	Station	Value
3150.5	.5	4938	.045	5082.3	.15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4938 5082.3 1585.08 900 730.08 .2 .4
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1

RS: 4785

INPUT

Description: 4785

Station		Elevation		Data		num= 101					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2812.4	210.3	2897.4	206.7	2970.1	191.4	3089.9	181.9	3145.2	183.4		
3314.3	184	3572.1	183.4	3694.4	185.5	3796.2	182.9	4075.1	186.8		
4337.9	186.8	4380.7	186.8	4499	181.5	4613	181	4760.6	180.4		
4833.8	180	4894	180.6	4914	179.9	4936	179.6	4940	177.3		
4942	176	4944	175.1	4949	173.7	4959	171.9	4969	171.3		
4999	171	5009	170.6	5019	170.5	5039	172	5049	173.2		
5055	175.2	5070	177.5	5102.6	178.5	5110.7	177.3	5132	177		
5137	178.3	5165	178.4	5190	178.5	5199	177.6	5240	176.4		
5266	177.1	5270	177.6	5292	177	5319.5	177.1	5321	177.2		
5333	177	5336	176.4	5347	175.6	5358	175	5368	174.9		
5375	175.3	5382	175.5	5389	175.7	5397	176.1	5405	176.3		
5418	175.9	5424	176.2	5428	176.3	5431	175.8	5438	174.9		
5443	174.1	5447	173.4	5457	171.8	5467	173.6	5471	173.9		
5474	176.4	5478	177.1	5499	177.6	5520	177.3	5547	176.9		
5581	177.1	5610	176.9	5645	177	5678	176.3	5685	176.1		
5693	176.4	5714	177.1	5719	175.9	5745	177.4	5779	177.7		
5791.7	178	5826	177.7	5851	177.7	5886	177.4	5933	177		
5941	176.7	5947	176.3	5953	176.7	5960	177.1	5985	177.1		

Ramapo River Post. rep

5996	176.9	6006	176.7	6026	176.7	6038	177.1	6069	177.5
6113	176.6	6153	177.9	6320.3	178.3	6535.7	177.4	6635.68	183.22
6741.99	192.13								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2812.4	.5	4936	.045	5070	.15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4936 5070 269.96 410.04 950.13 .2 .4
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 4375

INPUT
 Descri pti on: 4375

Stati on El evati on Data num= 99

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2815.8	211.7	2858.2	205.2	2898.8	204.4	3035.3	182.2	3087.2	181.7
3254	183	3415.4	181.2	3452.6	182.9	3516.2	182	3581.7	183.8
3657.7	184	3715.3	183.1	3759	185.1	3809.9	182.7	3973.9	184.4
4161.4	185	4897.3	183.8	4929.1	183.1	4944.1	182.2	4951.7	179.8
4954.9	176.5	4956.7	175.5	4960.7	173.2	4970.7	170.2	5015.7	170
5025.7	169.8	5035.7	169.5	5045.1	175.8	5045.2	176.5	5048.4	178.8
5094.3	176.3	5111.5	177.4	5209.2	176.9	5252	177.7	5299.2	179.4
5307.5	179.5	5327.5	171.3	5337.5	171.5	5357.5	170.7	5387.5	173.3
5397.5	173.5	5427.5	173.1	5455.9	178.8	5477.6	178.7	5488.9	177.6
5492.4	176.6	5496.5	175.7	5501.5	174.2	5507.5	172.9	5512.5	173.3
5517.5	172.8	5522.5	173	5527.5	173.7	5532.9	175.4	5535.3	176.1
5536.1	176.6	5539	177.7	5553.4	177.4	5558.1	178.3	5577.2	177.4
5586.9	178.1	5622.2	178.3	5649.5	178.8	5693.6	178.2	5728.9	177.7
5751.6	177.5	5761.8	178.6	5793.1	180.3	5835.2	181.4	5881.1	180.8
5913.2	180.2	5939.6	179.2	5980.6	178.8	6000	176	6014.5	177.1
6027.1	177.1	6044.3	175.7	6123.3	173.2	6149.6	173.2	6193.4	174.6
6270.5	175.5	6636.2	177.5	6841.1	176.1	6885.2	189.7	6954.9	189.6
7040.8	186.9	7074	186.9	7104.3	191.6	7170.1	188.4	7406.1	180.9
7441.8	173.3	7538.9	173.3	7582.1	179.5	7658.3	182.4	7723.7	178.2
7984.8	176.2	8144.3	178	8200	180	8400	200		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2815.8	.5	4929.1	.045	5455.9	.15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4929.1 5455.9 300 595.19 799.92 .2 .4
 Sedi ment El evati on = 0

CROSS SECTI ON

RIVER: Ramapo Ri ver
 REACH: Reach-1 RS: 3780

INPUT
 Descri pti on: 3780

Stati on El evati on Data num= 80

Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
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Ramapo River Post. rep									
2727.5	210.1	2765.7	200.3	2799.1	200.6	2873.4	183.9	2913.5	181.5
3030.8	181.7	3118	184.6	3170.6	183.2	3296.2	184.8	3437.9	183.7
3617	184.2	4264.6	183	4342.4	182.3	4422.4	184.5	4586.9	185.6
4613	185.6	4641	184.9	4661	180	4666	176.9	4676	176.5
4691	174.3	4703	174.3	4724	175.8	4728	178.6	4735.8	179.1
4782	178.2	4811	176.2	4876	177.2	4917	175.9	4940	177.2
4949	175.8	4984	171.5	4994	171.9	5034	167.7	5057	177.7
5066	178	5106	171.5	5116	171.9	5136	175	5176	173.4
5186	173.5	5196	173	5206	173.4	5210	175.1	5213	176.4
5215	177.5	5220	177.9	5238.8	184.1	5625	183.7	5625.9	185.1
5626.9	176.5	5896.6	176.5	5897.5	185	5898.5	184.6	6318.5	184.6
6417.5	187.6	6574.7	182.1	6638.6	183.9	6725.5	188.4	6788.7	185.3
6960.4	186.2	7198.6	188	7357.5	186.8	7456	185.6	7518.5	184
7642.9	180.9	7731.5	183.5	7833.7	182.1	7962.5	180.1	8136.7	177.8
8290.4	176.5	8313.9	176.5	8404.5	188.8	8534.6	190	8705.6	190.9
8798.3	193.1	8914.6	195.1	9027.5	195.4	9146.9	194	9197.9	193.1

Manning's n Values		num= 3	
Station	Value	Station	Value
2727.5	.5	4613	.045
		5238.8	.15

Bank Station	Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	4613	5238.8	319.93	565.11	500.02		.2	.4
Sediment Elevation = 0								

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1
 RS: 3215

INPUT
 Description: 3215

Station Elevation Data									
Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation
3266.5	210	3379.9	196.8	3404.6	196.6	3457.6	182.5	3513	180.3
3607.3	179.7	3712.3	182.8	3906.2	182.1	3929.6	184.4	4069.2	183.4
4144.6	184.2	4643	185.5	4861	184.9	4869	180.4	4884	180
4888.1	175.8	4903	174.2	4944	174	4954	172.7	4964	173
4974	172	4984	172	4994	170.6	5004	171.1	5014	170.5
5044	170.4	5054	170	5064	169.6	5092	174.4	5097	174.6
5102	175.4	5120	176.9	5130	176.8	5138.9	177.5	5178	177.5
5204	176.4	5212	175.4	5217	173.3	5227	173.3	5237	172.3
5254.6	176.3	5255	177.2	5269	183.9	5272.6	183.7	5277	183.6
5318.7	177.9	5478.5	176.6	5572.6	174.3	5675.5	177.6	5721.1	176.4
5745.8	177.5	5876.6	177.9	5941.4	176.4	6006.9	177.6	6067.4	176.7
6097.6	177.6	6115	176.9	6123	171.3	6137	172.2	6151	169.3
6154	170.1	6158	170.5	6164	169.5	6172	167.7	6205	167.2
6210	167.5	6215	169.1	6217	170.1	6217.1	171.6	6223	173.8
6231	176.1	6266	176.2	6277.1	179.6	6367.8	175.2	6404.3	176.5
6448.8	170.2	6539.2	181.9	6561.2	180.8	6678.7	187.7	6892.1	179.4
6936.1	184	7095.2	187.5	7138.6	183.4	7243.6	181.5	7326	181.8
7702.8	187.7	7828.6	187.8	7894.2	187.1	8034.9	184.8	8118	186.2
8239.6	181.5	8360.3	186.5	8511.4	188.4	8790.2	189.1	9343.8	197.9
9704.9	199	9872.8	198.1	9918.7	199				

Manning's n Values		num= 3	
Station	Value	Station	Value
3266.5	.5	4861	.045
		5269	.15

Bank Station	Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	4861	5269	930.15	689.92	210		.2	.4

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 2525

INPUT

Description: 2525

Station Elevation Data		num= 99		Station Elevation Data		num= 99		Station Elevation Data		num= 99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3524.3	210.1	3546.6	208	3583.6	193.1	3619.3	192.5	3639	187.1		
3684.2	185.9	3702.5	180.2	3716.7	184.5	4102.9	181.6	4144.1	182.3		
4235.8	181.5	4425.3	181.9	4470.7	183.5	4579.2	180.3	4626.1	182.9		
4753	180.5	4773	181.9	4789	181.2	4798	178.2	4799	176.5		
4824	168.8	4834	168.2	4844	169.6	4874	172.5	4885	174.5		
4891	176.5	4893	177.8	4929	176.5	4930	175.2	4934	174.5		
4946	170.3	4966	169.2	4996	170.4	5006	170.2	5016	170.5		
5026	170.8	5036	169.9	5072	176.5	5096	183.6	5103.6	180.5		
5107	183.6	5149.4	176.2	5280.8	174.9	5328.5	176	5704.4	174.2		
5755	175.7	5829.7	173.6	6005.4	175.3	6221.2	174.1	6257.6	176		
6273	176.7	6294	176.2	6307	172.8	6313.1	170	6331	167.9		
6349	167.6	6358	168.1	6368	169.1	6371	170	6377	171.5		
6382	176.4	6391	176.5	6405	175.6	6415	177.1	6483.3	173.3		
6557.3	177.6	6586.1	183.9	6601	187.2	6626.2	177.5	6669.4	175.8		
6737.9	181.4	6790.9	180	6849.3	182.8	6923.4	182.5	7019.2	178.9		
7152.9	187.1	7339	186	7484.8	181.4	7576.3	187.7	7650.8	188.1		
7711.5	189.7	7834.1	188.6	7904.2	189.1	7973.1	189.4	8080.8	187.6		
8188.7	190.5	8299	188.9	8469.6	190	8592.1	189.1	8740.9	188.9		
8894.2	189.5	9143	190.6	9285.1	192.3	9414.7	194.3	9570.1	196.3		
9728.9	198.4	9875.3	198.3	10092.1	196.5	10180	199.2				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
3524.3	.5	4773	.045
		5096	.15

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4773	5096		1184.9	1010.24	460.02	.2	.4

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
3524.3	4773	181	F
5096	10180	184	F

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1

RS: 1515

INPUT

Description: 1515

Station Elevation Data		num= 98		Station Elevation Data		num= 98		Station Elevation Data		num= 98	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3222	200	3387	187.2	3393	188.5	3430.4	184.2	3505.5	185.9		
3613	186.1	3837.2	189.7	4115.7	182.3	4229.8	180.5	4361.9	180.7		
4551.7	180.6	4607	181.6	4640	179.8	4666	180.9	4694	170.3		
4714	166.2	4724	167.9	4744	168	4753	172.7	4770	179.4		
4835	177	4904	176.6	4940	176.9	4944	176.5	4949	170.3		
4967	168.5	5013	169.6	5026	169.5	5042	170.3	5057	176.7		
5058	177.9	5066	178.5	5081	177.3	5096	183.2	5106	183.2		

Ramapo River Post. rep

5112	178.1	5179.8	175.6	5242.1	176.4	5428.2	175.2	5546.3	173.5
5618	175.5	5860.4	174.6	5953.5	176	6087.6	173.1	6156.9	174.5
6166	174.3	6186	174.1	6189	173.8	6201	171.9	6207	167.7
6211	167.4	6216	167.9	6226	168.3	6232	169	6252	169.1
6262	169	6272	168	6282	169.3	6286	169.3	6296	169.3
6306	169	6313	168.8	6315	170.2	6319	175.2	6323	175.3
6326	175.4	6329	173.5	6422.6	187.7	6492.4	178.8	6560.4	178.2
6621.3	180.6	6666.7	179.3	6805.9	184	6860.7	183.8	6927.5	182.1
7259.7	184.6	7328.6	190.1	7393.8	188.5	7589.1	189.8	7744	189.4
7819.7	190.7	7977.7	192.3	8089.1	192.4	8305.4	193	8447	189.9
8571.2	191.9	8646.3	192.3	8757.1	190.4	8852.5	192.2	9107.6	196.1
9230.6	196	9361.5	194.2	9602.1	194.2	9695.7	198	9770.9	197.5
9886.6	198.3	10011.4	196.4	10192.6	198.3				

Manning's n Values
 Sta n Val Sta n Val
 3222 .15 4666 .045 5106 .15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4666 5106 655.02 430.02 15.12 .2 .4
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3222 4666 182 F
 5106 10192.6 184 F
 Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 1085

INPUT
 Description: 1085

Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3222	200	3387	187.2	3393	188.5	3430.4	184.2	3505.5	185.9
3613	186.1	3837.2	189.7	4115.7	182.3	4229.8	180.5	4361.9	180.7
4551.7	180.6	4607	181.6	4640	179.8	4666	180.9	4694	170.3
4714	166.2	4967	168.5	5013	169.5	5042	170.3	5057	176.7
5058	177.9	5066	178.5	5081	177.3	5096	183.2	5106	183.2
5112	178.1	5179.8	175.6	5242.1	176.4	5428.2	175.2	5546.3	173.5
5618	175.5	5860.4	174.6	5953.5	176	6087.6	173.1	6156.9	174.5
6166	174.3	6186	174.1	6189	173.8	6201	171.9	6207	167.7
6211	167.4	6216	167.9	6226	168.3	6232	169	6252	169.1
6262	169	6272	168	6282	169.3	6286	169.3	6296	169.3
6306	169	6313	168.8	6315	170.2	6319	175.2	6323	175.3
6326	175.4	6329	173.5	6422.6	187.7	6492.4	178.8	6560.4	178.2
6621.3	180.6	6666.7	179.3	6805.9	184	6860.7	183.8	6927.5	182.1
7259.7	184.6	7328.6	190.1	7393.8	188.5	7589.1	189.8	7744	189.4

Manning's n Values
 Sta n Val Sta n Val
 3222 .15 4666 .045 5106 .15

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4666 5106 5 5 5 .4 .6
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 3222 4666 184.7 F
 5106 7744 185 F
 Pilot Channel Invert = 161.189

Ramapo River Post. rep

Width = 1
Manning's n = 0.03

Sediment Elevation = 0

CROSS SECTION

RIVER: Ramapo River
REACH: Reach-1 RS: 1080

INPUT
Description: 1080

Station Elevation Data		num= 70									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4205	188.1	4475	182.4	4477	188.5	4672	183.2	4862	181.5		
4863	184.1	4865	184.2	4865.7	176.5	4865.8	174.6	4880	173.9		
4974	173.8	4998	173.1	5072	173.6	5097	174.1	5115	174.3		
5123	174.3	5135.6	174.8	5135.7	176.5	5135.8	184.2	5138.3	184.2		
5157	182.6	5165	182.7	5175	177	5205	175.3	5245	175.2		
5333	176.2	5483	174.8	5583	175.3	5605	174.2	5733.7	174.8		
5807.3	174.4	6067	176	6116.7	175.9	6174.1	174.2	6230.9	174.6		
6241	174.9	6261.3	174.2	6273	173.8	6280	170.1	6282	168.2		
6285	167.5	6295	167.8	6301	168.5	6306	169.2	6316	169.1		
6326	169.2	6336	169.3	6346	169.4	6356	169.3	6361	169.1		
6369	167.9	6372	168.1	6375.5	170.2	6376	175.1	6382.5	175.2		
6385	175	6391	173.4	6397	173.4	6402	174.9	6411.9	174.7		
6515.2	182.3	6651.7	177.8	6721.8	180.1	6842.2	179.5	6904.5	184.4		
6990.3	182.2	7064.4	183.3	7132.56	184.25	7204.18	185.83	7222.86	186.93		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
4205	.15	4865	.025
		5138.3	.15

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.	
	4865	5138.3		5	5	5		.4	.6	
Ineffective Flow	num= 2									
	Sta L	Sta R	Elev	Permanent						
	4205	4865	184.5	F						
	5138.3	7222.86	184.86	F						
Pilot Channel	Invert		= 161.186							
	Width		= 1							
	Manning's n		= 0.03							

Sediment Elevation = 0

INLINE STRUCTURE

RIVER: Ramapo River
REACH: Reach-1 RS: 1079.9

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 1
Weir Coefficient = 2.6

Weir Embankment Coordinates		num= 11									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4865.7	176.5	4865.8	174.6	4880	173.9	4974	173.8	4998	173.1		
5072	173.6	5097	174.1	5115	174.3	5123	174.3	5135.6	174.8		
5135.7	176.5										

RamapoRi verPost. rep

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Weir crest shape = Broad Crested

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 1075

INPUT
 Description: 1075
 This is a REPEATED section.

Station Elevation Data		num= 80		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2554.6	200	2754.6	182.3	3561.1	183.3	4037.4	188.1	4151.9	177.9		
4420.9	172	4434	172	4534	171.3	4584	170.6	4634	171.1		
4684	170.4	4734	178.1	4784	177.7	4844	174.9	4884	176.1		
4914	174	4928	172.5	4939	170.2	4939.1	169.7	4941	168.1		
4945	168.2	4951	166.5	4971	164.7	4981	164.7	4991	163.7		
5001	163.7	5011	166.2	5031	166.8	5041	167.4	5051	167.9		
5056	168.2	5061	169.7	5061	170	5067	171.3	5076	176.5		
5102	175.3	5112	175.7	5132	175.5	5172	173.7	5237	174.3		
5299.7	174	5632.7	175.1	5682	176.1	5834.5	176	5912.3	173.9		
5921	174.1	5940.7	174.5	5955	173.9	5960	170.2	5961	168.2		
5965	167.2	5967	166.9	5977	167.4	5987	168.2	5997	168.4		
6007	168	6012	167.9	6015	167.5	6017	167.6	6023	170.1		
6026	172	6033	172.7	6034	170.1	6041	169.8	6044	169.5		
6047	170	6048	170.1	6054.5	171.2	6061	174.3	6081	174.4		
6159.2	179.5	6220	180.6	6333.5	178.1	6489	176.3	6530.2	183.7		
6657.7	182.2	6797.5	184.5	7038.9	183.8	7173.6	186.7	7231.06	191.57		

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2554.6	.15	4884	.04	5076	.15		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4884 5076 = 160.03 304.98 24.96 .4 .6
 Pilot Channel Invert = 161.184
 Width = 1
 Manning's n = 0.03

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 770

INPUT
 Description: 770

Station Elevation Data		num= 79		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2554.6	200	2754.6	182.3	3561.1	183.3	4037.4	188.1	4151.9	177.9		
4420.9	172	4434	172	4534	171.3	4584	170.6	4634	171.1		
4684	170.4	4734	178.1	4784	177.7	4844	174.9	4884	176.1		
4914	174	4928	172.5	4939	170.2	4939.1	169.7	4941	168.1		

Ramapo River Post. rep									
4945	168.2	4951	166.5	4971	164.7	4981	164.7	4991	163.7
5001	163.7	5011	166.2	5031	166.8	5041	167.4	5051	167.9
5056	168.2	5061	169.7	5061	170	5067	171.3	5076	176.5
5102	175.3	5112	175.7	5132	175.5	5172	173.7	5237	174.3
5299.7	174	5632.7	175.1	5682	176.1	5834.5	176	5912.3	173.9
5921	174.1	5940.7	174.5	5955	173.9	5960	170.2	5961	168.2
5965	167.2	5967	166.9	5977	167.4	5987	168.2	5997	168.4
6007	168	6012	167.9	6015	167.5	6017	167.6	6023	170.1
6026	172	6033	172.7	6034	170.1	6041	169.8	6044	169.5
6047	170	6048	170.1	6054.5	171.2	6061	174.3	6081	174.4
6159.2	179.5	6220	180.6	6333.5	178.1	6489	176.3	6530.2	183.7
6657.7	182.2	6797.5	184.5	7038.9	183.8	7173.6	186.7		

Manning's n Values num= 3
 Sta n Val Sta n Val
 2554.6 .07 4884 .04 5076 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4884 5076 415.09 770.04 289.85 .1 .3
 Pilot Channel Invert = 161.001
 Width = 1
 Manning's n = 0.03

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: 0

INPUT

Description: 0 Confluence with Pequannock River
 Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2554.6	200	2654.6	185.2	2754.6	182.3	2814.6	182.2	2852.1	180.3
2897.9	182.4	2979.2	182.3	3363.9	185.7	3450.5	184.4	3493.2	184.3
3561.1	183.3	3898.9	184.6	4002.1	188.1	4037.4	188.1	4084.3	185.8
4115.5	180	4151.9	177.9	4176	177.9	4240.2	175.4	4291.8	173.8
4334.1	173	4371.1	172.3	4420.9	172	4452.4	172.6	4506	178.8
4582.2	187	4645.7	186.2	4721.3	182.6	4812.4	175.1	4876.5	176.3
4904.4	182.1	4918	182.4	4934	171.9	4937	171.7	4943	169.6
4945	165.5	4962	164.5	4972	164.6	4982	164.7	4992	164.6
5002	165.6	5012	166.1	5022	166.2	5032	166	5042	166.7
5049	166.9	5052	167.5	5057	169.6	5058	170.4	5074	171.7
5076	175.2	5082	175.3	5085	173.8	5101	174	5107	175.3
5114	175.7	5126.2	176.1	5200	177	5268.8	172.4	5323.6	172.4
5419.6	174.3	5468.1	171	5498.4	171	5535.1	177.8	5586.8	175.9
5615.2	177.7	5685.2	182.3	5759.5	184.4	5844.8	182.4	5927.8	184.4
6023.7	182.7	6125.6	183.6	6208.4	184.1	6272.6	187.8	6378	188.3
6466.4	188.8	6622.5	189.2	6679	189.2	6773.3	188.9	6874.2	191.4
7017.4	192.1	7109.2	192.1	7200.1	193.4	7289.1	190	7321.9	189.4
7407.5	191.9	7531.4	192.6	7633.6	190.9	7729.3	192.2	7859.7	194.1
8015.4	196.1	8151.2	196.1	8354	194.9	8619.9	198	8687	196.7
8804.3	198.3	8922	196.3	9137.4	198.3				

Manning's n Values num= 3
 Sta n Val Sta n Val
 2554.6 .065 4918 .033 5082 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4918 5082 790.08 790.08 790.08 .1 .3
 Pilot Channel Invert = 160.54
 Width = 1

Manning's n = 0.03

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -790

INPUT
 Description: 790 Pompton River

Station Elevation Data		num= 100		Station Elevation Data		num= 100		Station Elevation Data		num= 100	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182		
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7		
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8		
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1		
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188		
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	167.3	4877	167		
4877.1	167.1	4880.9	166.5	4882	167.2	4882.1	167.2	4887.9	168.5		
4918.6	168.7	4936.7	166.9	4942.8	166.2	4965	161.5	4965.1	161.5		
4967.3	161.4	4969	162	4969.1	162	4979.8	164.1	5029.8	163.4		
5038.6	166.9	5043.7	165.8	5052.2	166.4	5053	166.8	5053.1	166.8		
5057	167.3	5057.1	167.3	5057.2	167.2	5067	168.7	5133.2	169.6		
5139	168.5	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5		
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5		
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9		
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3		
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2		
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4		
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2		
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1		
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197		

Manning's n Values		num= 3		Manning's n Values	
Sta	n Val	Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027	5201.8	.065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4777.2 5201.8 = 10 10 = 10 .1 .3
 Pilot Channel Invert = 160.067
 Width = 1
 Manning's n = 0.03

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -800

INPUT
 Description: 800 Pompton River

Station Elevation Data		num= 75		Station Elevation Data		num= 75		Station Elevation Data		num= 75	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182		
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7		
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8		
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1		
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188		
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	168.5	5067	168.5		

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5133.2	169.6	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027	5201.8	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4777.2	5201.8		20	9		.1	.3
Pilot Channel	Invert		= 160.061					
	Width		= 1					
	Manning's n		= 0.03					

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -809

INPUT
 Description: 810 Pompton River
 JACKSON AVE. BRIDGE

Station Elevation Data num= 100									
Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev	Sta	El ev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	167.3	4877	167
4877.1	167.1	4880.9	166.5	4882	167.2	4882.1	167.2	4887.9	168.5
4918.6	168.7	4936.7	166.9	4942.8	166.2	4965	161.5	4965.1	161.5
4967.3	161.4	4969	162	4969.1	162	4979.8	164.1	5029.8	163.4
5038.6	166.9	5043.7	165.8	5052.2	166.4	5053	166.8	5053.1	166.8
5057	167.3	5057.1	167.3	5057.2	167.2	5067	168.7	5133.2	169.6
5139	168.5	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
2717.8	.065	4777.2	.027	5201.8	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4777.2	5201.8		40	82		.3	.5
Ineffective Flow	num= 2		Permanent					
	Sta L	Sta R	Elev					
	2717.8	4777.2	188.8					
			F					

Ramapo River Post. rep

5201.8 8785.3 186.7 F
 Pilot Channel Invert = 160.055
 Width = 1
 Manning's n = 0.03

BRI DGE

RIVER: Ramapo River
 REACH: Reach-1 RS: -850

INPUT

Description: Jackson Avenue Bridge - Bridge #1

Distance from Upstream XS = 1
 Deck/Roadway Width = 80
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 71														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
2717.8	200.3	200.3	2809.1	187.3	187.3	3029.2	180.4	180.4						
3037.3	178.6	178.6	3076	182	182	3358.3	180.4	180.4						
3491.7	183.1	183.1	3671	183.9	183.9	3959.7	179.7	179.7						
4007.3	180.7	180.7	4107.2	182.2	182.2	4153.3	173.9	173.9						
4174.5	173.9	173.9	4194.5	177.9	177.9	4217.9	176.8	176.8						
4292.9	180.4	180.4	4383.9	180	180	4483.9	179.9	179.9						
4681.2	186.6	186.6	4762.5	188.1	188.1	4777.2	188.8	188.8						
4792.5	186.8	186.8	4812.5	187.2	187.2	4812.6	187.7	187.7						
4816.1	188	188	4839.5	188.2	180.3	4839.6	189	184.5						
4877	188.7	185.1	4882.1	188.7	185.1	4965	189.6	185.6						
4969.1	189.6	185.6	5053	189.7	185.3	5057.1	189.7	185.2						
5139	189.2	184.2	5143.1	189.2	184.2	5182.5	188.5	183.4						
5182.6	187.6	100	5201.8	188	100	5221.8	186.7	186.7						
5231.9	187.8	187.8	5295.6	185.9	185.9	5347.8	185.2	185.2						
5426	185.1	185.1	5509.2	183.9	183.9	5574.3	184	184						
5650.4	184.3	184.3	5739.1	183	183	5841.9	183	183						
5927.1	183.8	183.8	5994.4	185	185	6068.2	185.2	185.2						
6136.3	183.4	183.4	6220.9	181.7	181.7	6308.3	180.9	180.9						
6393.9	180.9	180.9	6475.9	181.4	181.4	6553.9	181.2	181.2						
6676.2	182.4	182.4	6999.5	182.3	182.3	7093.7	182.4	182.4						
7266.9	181.2	181.2	7414.3	180.9	180.9	7515.5	180.4	180.4						
7636.1	181.9	181.9	7867.1	182.6	182.6	7965.6	183.1	183.1						
8142.1	192.3	192.3	8201.8	193.4	193.4	8339	193.6	193.6						
8571.5	193.7	193.7	8785.3	197	197									

Upstream Bridge Cross Section Data

Stati on Elevati on Data num= 100									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2717.8	200.3	2809.1	187.3	3029.2	180.4	3037.3	178.6	3076	182
3358.3	180.4	3491.7	183.1	3671	183.9	3959.7	179.7	4007.3	180.7
4107.2	182.2	4153.3	173.9	4174.5	173.9	4194.5	177.9	4217.9	176.8
4292.9	180.4	4383.9	180	4483.9	179.9	4681.2	186.6	4762.5	188.1
4777.2	188.8	4792.5	186.8	4812.5	187.2	4812.6	187.7	4816.1	188
4839.5	180.3	4839.6	180.3	4842.2	180.4	4875.9	167.3	4877	167
4877.1	167.1	4880.9	166.5	4882	167.2	4882.1	167.2	4887.9	168.5
4918.6	168.7	4936.7	166.9	4942.8	166.2	4965	161.5	4965.1	161.5
4967.3	161.4	4969	162	4969.1	162	4979.8	164.1	5029.8	163.4
5038.6	166.9	5043.7	165.8	5052.2	166.4	5053	166.8	5053.1	166.8
5057	167.3	5057.1	167.3	5057.2	167.2	5067	168.7	5133.2	169.6
5139	168.5	5139.1	168.5	5139.5	168.2	5143	168.5	5143.1	168.5
5150.3	169	5177.6	180.4	5180.8	180.4	5182.5	181.5	5182.6	181.5
5191	185.1	5201.8	186.7	5221.8	186.7	5231.9	187.8	5295.6	185.9

Ramapo River Post. rep									
5347.8	185.2	5426	185.1	5509.2	183.9	5574.3	184	5650.4	184.3
5739.1	183	5841.9	183	5927.1	183.8	5994.4	185	6068.2	185.2
6136.3	183.4	6220.9	181.7	6308.3	180.9	6393.9	180.9	6475.9	181.4
6553.9	181.2	6676.2	182.4	6999.5	182.3	7093.7	182.4	7266.9	181.2
7414.3	180.9	7515.5	180.4	7636.1	181.9	7867.1	182.6	7965.6	183.1
8142.1	192.3	8201.8	193.4	8339	193.6	8571.5	193.7	8785.3	197

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2717.8 .065 4777.2 .027 5201.8 .065

Bank Sta: Left Right Coeff Contr. Expan.
 4777.2 5201.8 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2717.8 4777.2 188.8 F
 5201.8 8785.3 186.7 F

Pilot Channel Invert = 160.055
 Width = 1
 Manning's n = 0.03

Downstream Deck/Roadway Coordinates
 num= 21

Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord	Sta	Hi	Cord	Lo Cord
4792.5	186.8	186.8	4812.5	187.2	187.2	4812.6	187.7	185			
4816.1	188	100	4839.5	188.2	180.3	4839.6	189	184.5			
4877	188.7	185.1	4882.1	188.7	185.1	4965	189.6	185.6			
4969.1	189.6	185.6	5053	189.7	185.3	5057.1	189.7	185.2			
5139	189.2	184.2	5143.1	189.2	184.2	5182.5	188.5	183.4			
5182.6	187.6	100	5201.8	188	100	5221.8	186.7	186.7			
5231.9	187.8	187.8	5295.6	185.9	185.9	5347.8	185.2	185.2			

Downstream Bridge Cross Section Data
 Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
2797.7	200	2940.6	184.2	3032.7	182.3	3120.2	178.3	3129.2	178.3		
3143	181.3	3164.5	182	3219.9	181	3447.3	179.7	3728.6	183.4		
4020.7	179.8	4124	182.8	4179.2	182.3	4214.3	173.9	4224.1	173.9		
4239.8	178.2	4260.7	175.8	4350	183.3	4389.1	181.1	4448	181.8		
4626.1	181	4674.8	180.8	4757.2	183.9	4788.3	187.9	4799.5	187.4		
4809.6	187	4829.6	187.7	4849.1	180.3	4853.3	180.3	4881.2	168.9		
4891.8	168.2	4916.4	168.6	4927.9	167.9	4936.2	168.4	4946.5	166.9		
4952	166.1	4959.3	164.5	4964.3	164	4969.3	164	4972.3	163.2		
4976.3	162.4	4983.3	162.3	4993.3	162.2	5003.3	161.6	5013.3	160.7		
5023	159.7	5033	159.7	5038	161.2	5043.3	162.6	5048.3	164.8		
5051.4	165.6	5054.2	166.9	5064.6	168.4	5084.5	168.5	5111.9	169.1		
5139	169.7	5161.9	169.2	5189	180.3	5194	180.4	5215.3	187.9		
5235.3	187.9	5252.4	189.2	5423.6	184.3	5667.8	184.7	5746.3	183.4		
5790.1	184.1	5819.9	183.5	5874.7	183.5	5964.6	183.6	6008.2	184.2		
6053.3	185	6102.9	185.4	6167.1	184.2	6236.3	182.3	6313.8	180.9		
6348.1	180.6	6385.1	181	6449.6	182	6513.9	181.4	6584.2	182		
6718	182.6	6876.3	184	6985.9	184.1	7084.9	182.7	7228.4	182		
7304.2	181.4	7427.8	180.3	7507	175.5	7539	175.5	7606.9	181.7		
7779.1	181.5	7923.6	183.2	8088.1	186.8	8201.2	193.4	8268.7	192.7		
8391.1	193.6	8517.8	193.7	8658.6	196.1	8852.8	197.1				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2797.7 .065 4829.6 .027 5252.4 .065

Bank Sta: Left Right Coeff Contr. Expan.
 4829.6 5252.4 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2797.7 4829.6 187.7 F
 5252.4 8852.8 189.2 F
 Pilot Channel Invert = 160.006
 Width = 1
 Manning's n = 0.03

Upstream Embankment side slope = 0 hori z. to 1.0 vertical
 Downstream Embankment side slope = 0 hori z. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins = 179
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data
 Pier Station Upstream= 4879.5 Downstream= 4879.5
 Upstream num= 2
 Width Elev Width Elev
 5 160 5 188
 Downstream num= 2
 Width Elev Width Elev
 5 160 5 188

Pier Data
 Pier Station Upstream= 4967 Downstream= 4967
 Upstream num= 2
 Width Elev Width Elev
 4 160 4 188
 Downstream num= 2
 Width Elev Width Elev
 4 160 4 188

Pier Data
 Pier Station Upstream= 5055 Downstream= 5055
 Upstream num= 2
 Width Elev Width Elev
 4 160 4 188
 Downstream num= 2
 Width Elev Width Elev
 4 160 4 188

Pier Data
 Pier Station Upstream= 5141 Downstream= 5141
 Upstream num= 2
 Width Elev Width Elev
 4 160 4 188
 Downstream num= 2
 Width Elev Width Elev
 4 160 4 188

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
 Energy
 Momentum Cd = 1.6
 Yarnell KVal = 1.05
 Selected Low Flow Methods = Yarnell

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8164966
 Max Low Cord = 185.5

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Ramapo River
 REACH: Reach-1 RS: -891

INPUT

Description: 890 Pompton River
 Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2797.7	200	2940.6	184.2	3032.7	182.3	3120.2	178.3	3129.2	178.3
3143	181.3	3164.5	182	3219.9	181	3447.3	179.7	3728.6	183.4
4020.7	179.8	4124	182.8	4179.2	182.3	4214.3	173.9	4224.1	173.9
4239.8	178.2	4260.7	175.8	4350	183.3	4389.1	181.1	4448	181.8
4626.1	181	4674.8	180.8	4757.2	183.9	4788.3	187.9	4799.5	187.4
4809.6	187	4829.6	187.7	4849.1	180.3	4853.3	180.3	4881.2	168.9
4891.8	168.2	4916.4	168.6	4927.9	167.9	4936.2	168.4	4946.5	166.9
4952	166.1	4959.3	164.5	4964.3	164	4969.3	164	4972.3	163.2
4976.3	162.4	4983.3	162.3	4993.3	162.2	5003.3	161.6	5013.3	160.7
5023	159.7	5033	159.7	5038	161.2	5043.3	162.6	5048.3	164.8
5051.4	165.6	5054.2	166.9	5064.6	168.4	5084.5	168.5	5111.9	169.1
5139	169.7	5161.9	169.2	5189	180.3	5194	180.4	5215.3	187.9
5235.3	187.9	5252.4	189.2	5423.6	184.3	5667.8	184.7	5746.3	183.4
5790.1	184.1	5819.9	183.5	5874.7	183.5	5964.6	183.6	6008.2	184.2
6053.3	185	6102.9	185.4	6167.1	184.2	6236.3	182.3	6313.8	180.9
6348.1	180.6	6385.1	181	6449.6	182	6513.9	181.4	6584.2	182
6718	182.6	6876.3	184	6985.9	184.1	7084.9	182.7	7228.4	182
7304.2	181.4	7427.8	180.3	7507	175.5	7539	175.5	7606.9	181.7
7779.1	181.5	7923.6	183.2	8088.1	186.8	8201.2	193.4	8268.7	192.7
8391.1	193.6	8517.8	193.7	8658.6	196.1	8852.8	197.1		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2797.7 .065 4829.6 .027 5252.4 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4829.6 5252.4 10 10 10 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 2797.7 4829.6 187.7 F
 5252.4 8852.8 189.2 F

Pilot Channel Invert = 160.006
 Width = 1
 Manning's n = 0.03

CROSS SECTION

RIVER: Ramapo River

REACH: Reach-1

RS: -900

INPUT

Description: 890 Pompton River

Station		Elevation		Data		num=		99	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2797.7	200	2940.6	184.2	3032.7	182.3	3120.2	178.3	3129.2	178.3
3143	181.3	3164.5	182	3219.9	181	3447.3	179.7	3728.6	183.4
4020.7	179.8	4124	182.8	4179.2	182.3	4214.3	173.9	4224.1	173.9
4239.8	178.2	4260.7	175.8	4350	183.3	4389.1	181.1	4448	181.8
4626.1	181	4674.8	180.8	4757.2	183.9	4788.3	187.9	4799.5	187.4
4809.6	187	4829.6	187.7	4849.1	180.3	4853.3	180.3	4881.2	168.9
4891.8	168.2	4916.4	168.6	4927.9	167.9	4936.2	168.4	4946.5	166.9
4952	166.1	4959.3	164.5	4964.3	164	4969.3	164	4972.3	163.2
4976.3	162.4	4983.3	162.3	4993.3	162.2	5003.3	161.6	5013.3	160.7
5023	159.7	5033	159.7	5038	161.2	5043.3	162.6	5048.3	164.8
5051.4	165.6	5054.2	166.9	5064.6	168.4	5084.5	168.5	5111.9	169.1
5139	169.7	5161.9	169.2	5189	180.3	5194	180.4	5215.3	187.9
5235.3	187.9	5252.4	189.2	5423.6	184.3	5667.8	184.7	5746.3	183.4
5790.1	184.1	5819.9	183.5	5874.7	183.5	5964.6	183.6	6008.2	184.2
6053.3	185	6102.9	185.4	6167.1	184.2	6236.3	182.3	6313.8	180.9
6348.1	180.6	6385.1	181	6449.6	182	6513.9	181.4	6584.2	182
6718	182.6	6876.3	184	6985.9	184.1	7084.9	182.7	7228.4	182
7304.2	181.4	7427.8	180.3	7507	175.5	7539	175.5	7606.9	181.7
7779.1	181.5	7923.6	183.2	8088.1	186.8	8201.2	193.4	8268.7	192.7
8391.1	193.6	8517.8	193.7	8658.6	196.1	8852.8	197.1		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
2797.7	.065	4829.6	.027	5252.4	.065

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4829.6	5252.4		0	0	0		.3	.5

Ineffective Flow		num=		2	
Sta L	Sta R	Elev	Permanent		
2797.7	4829.6	187.7	F		
5252.4	8852.8	189.2	F		

Pilot Channel Invert = 160
 Width = 1
 Manning's n = 0.03

SUMMARY OF MANNING'S N VALUES

River: Ramapo River

Reach	n6	n7	River Sta. n8	n9	n1	n2	n3	n4	n5
Reach-1			34312		.055	.035	.055		
Reach-1			34145		.055	.035	.055		
Reach-1			32867		.055	.035	.055		
Reach-1			32750		.055	.035	.055		
Reach-1			32710		.055	.035	.055		

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Reach-1		32700		.055	.035	.055		
Reach-1		32670		.055	.035	.055		
Reach-1		32583		.055	.035	.055		
Reach-1		32543		.055	.035	.055		
Reach-1		32523						
				Bri dge				
Reach-1		32503		.055	.035	.055		
Reach-1		32100		.08	.04	.055	.035	.08
Reach-1		31933		.08	.04	.055	.035	.08
Reach-1		31640		.08	.04	.055	.035	.08
Reach-1	.03	.07	.045	.08	.04	.055	.035	.08
Reach-1	.03	.07	.045	.08	.04	.055	.035	.08
Reach-1		31220		.08	.04	.055	.035	.08
Reach-1		31053		.08	.04	.055	.035	.08
Reach-1		30756		.07	.04	.055	.035	.07
Reach-1		30589		.07	.04	.055	.035	.07
Reach-1		30300		.055	.035	.055		
Reach-1		30133		.055	.035	.055		
Reach-1		29622		.055	.035	.055		
Reach-1		29455		.055	.035	.055		
Reach-1		28480		.055	.035	.055		
Reach-1		28313		.055	.035	.055		
Reach-1		27992		.05	.032	.05		
Reach-1		27937		.05	.034	.05		
Reach-1		27825		.05	.032	.05		
Reach-1		27797.5						
				Bri dge				
Reach-1		27770		.05	.034	.05		
Reach-1		27620		.04	.03	.05		
Reach-1		27453		.04	.03	.05		
Reach-1		27272		.04	.03	.05		
Reach-1		27105		.04	.03	.05		
Reach-1		27047		.04	.03	.05		
Reach-1		26880		.04	.03	.05		

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Reach-1	26812	.04	.03	.05		
Reach-1	26762	.04	.03	.05		
Reach-1	26721	.04	.03	.05		
Reach-1	26645	.04	.03	.05		
Reach-1	26632	.07	.045	.07		
Reach-1	26596	.04	.03	.05		
Reach-1	26561	.04	.03	.05		
Reach-1	26533	.07	.045	.07		
Reach-1	26462	.055	.035	.055		
Reach-1	26365	.055	.035	.055		
Reach-1	26157	.07	.045	.07		
Reach-1	25988	.055	.035	.055		
Reach-1	25890	.07	.045	.07		
Reach-1	25700	.055	.035	.055		
Reach-1	25657	.07	.045	.07		
Reach-1	25486	.055	.035	.055		
Reach-1	25420	.07	.045	.07		
Reach-1	25246	.055	.035	.055		
Reach-1	25165	.06	.045	.06		
Reach-1	25145	.2	.025	.1		
Reach-1	25130	.055	.04	.055		
Reach-1	25087	.055	.04	.055		
Reach-1	24991	.055	.035	.055		
Reach-1	24956	.055	.035	.055		
Reach-1	24950	.055	.04	.055		
Reach-1	24930	.055	.035	.055		
Reach-1	24913	.055	.035	.055		
Reach-1	24860	.055	.035	.055		
Reach-1	24822	.055	.04	.055		
Reach-1	24811	.055	.035	.055		
Reach-1	24776	.055	.035	.055		
Reach-1	24735	.2	.04	.055	.04	.055

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.04 Reach-1	24700	.055	.035	.055		
Reach-1	24690	.2	.04	.055	.04	.055
.04 Reach-1	24648	.055	.035	.055		
Reach-1	24565	.055	.035	.055		
Reach-1	24561	.2	.055	.02	.055	.04
Reach-1	24516	.2	.055	.04	.055	.04
Reach-1	24477	.2	.048	.08		
Reach-1	24405	.2	.048	.08		
Reach-1	24350	.2	.048	.08		
Reach-1	24303	.07	.048	.08		
Reach-1	24231	.07	.048	.08		
Reach-1	24210	.2	.048	.08		
Reach-1	24176	.07	.048	.08		
Reach-1	24036	.07	.048	.08		
Reach-1	24032	.2	.048	.08		
Reach-1	23860	.2	.048	.08		
Reach-1	23858	.07	.048	.08		
Reach-1	23715	.2	.048	.08		
Reach-1	23686	.07	.048	.08		
Reach-1	23600	.2	.048	.08		
Reach-1	23541	.07	.048	.08		
Reach-1	23440	.2	.048	.08		
Reach-1	23426	.07	.048	.08		
Reach-1	23300	.2	.048	.07		
Reach-1	23266	.07	.048	.08		
Reach-1	23126	.07	.048	.07		
Reach-1	23120	.2	.048	.07		
Reach-1	23090	.2	.048	.07		
Reach-1	23027	.07	.042	.1		
Reach-1	23005	.07	.03	.06		
Reach-1	22990	.06	.028	.06		

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Reach-1	22946	.07	.048	.07			
Reach-1	22930	.06	.028	.06			
Reach-1	22916	.07	.048	.07			
Reach-1	22853	.07	.042	.07			
Reach-1	22831	.07	.03	.06			
Reach-1	22820	.06	.028	.06			
Reach-1	22816	.06	.028	.06			
Reach-1	22756	.06	.028	.06			
Reach-1	22646	.06	.028	.06			
Reach-1	22575	.06	.028	.06			
Reach-1	22401	.06	.028	.06			
Reach-1	22365	.06	.028	.06			
Reach-1	22191	.06	.028	.06			
Reach-1	22173	.06	.028	.06			
Reach-1	22110	.06	.03	.07			
Reach-1	22077	.06	.037	.06			
Reach-1	22000	.06	.028	.06			
Reach-1	21957	.7	.043	.09			
Reach-1	21940	.06	.03	.07			
Reach-1	21922.5						
		Bri dge					
Reach-1	21905	.06	.037	.06			
Reach-1	21825	.9	.075	.037	.09	.9	
Reach-1	21785	.06	.037	.06			
Reach-1	21653	.07	.075	.037	.09	.07	
Reach-1	21600	.9	.075	.037	.09	.9	
Reach-1	21440	.07	.075	.037	.09	.07	
Reach-1	21417	.9	.075	.038	.09	.9	
Reach-1	21296	.07	.075	.038	.09	.07	
Reach-1	21152	.9	.075	.038	.09	.9	
Reach-1	21068	.07	.075	.038	.09	.07	
Reach-1	20930	.9	.075	.037	.09	.9	
Reach-1	20922	.07	.075	.037	.09	.07	

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Reach-1		20703	.07	.075	.037	.09	.07	
Reach-1		20700	.9	.075	.037	.09	.9	
Reach-1		20495	.9	.075	.04	.065	.035	
Reach-1	.09	20494	.07	.075	.04	.065	.035	
Reach-1	.07	20348	.9	.07	.04	.06	.035	
Reach-1	.075	20346	.07	.07	.04	.06	.035	
Reach-1	.07	20338						
			Bri dge					
Reach-1		20332	.9	.075	.04	.065	.035	
Reach-1	.075	20330	.9	.075	.04	.065	.035	
Reach-1	.075	20328	.07	.075	.04	.065	.035	
Reach-1	.07	20070	.9	.075	.04	.065	.035	
Reach-1	.075	20063	.07	.075	.04	.065	.035	
Reach-1	.07	19812	.07	.075	.04	.065	.035	
Reach-1	.07	19810	.9	.075	.04	.065	.035	
Reach-1	.075	19722	.06	.035	.06			
Reach-1		19720	.075	.043	.1			
Reach-1		19425	.075	.043	.1			
Reach-1		19280	.075	.043	.1			
Reach-1		19071	.075	.043	.1			
Reach-1		18916	.075	.043	.1			
Reach-1		18682	.075	.043	.1			
Reach-1		18447	.075	.043	.1			
Reach-1		18280	.075	.043	.1			
Reach-1		17884	.075	.043	.1			
Reach-1		17467	.075	.043	.1			
Reach-1		17160	.075	.043	.1			
Reach-1		16750	.075	.043	.1			
Reach-1		16657	.075	.043	.1			
Reach-1		16630.5						
			Bri dge					
Reach-1		16605	.075	.043	.1			
Reach-1		16604	.075	.04	.1			

		RamapoRi	verPost.	rep			
Reach-1	16186		.07	.043			.07
Reach-1	15696		.07	.043			.07
Reach-1	15215		.07	.043			.07
Reach-1	14725		.07	.043			.07
Reach-1	14320		.07	.043			.07
Reach-1	13805		.07	.043			.07
Reach-1	13392		.07	.043			.07
Reach-1	12845		.07	.043			.07
Reach-1	12300		.07	.043			.07
Reach-1	11812		.07	.043			.07
Reach-1	11324		.07	.043			.07
Reach-1	11022		.07	.043			.07
Reach-1	10930		.07	.043			.07
Reach-1	10827		.07	.043			.07
Reach-1	10753		.07	.043			.07
Reach-1	10708		.07	.043			.07
Reach-1	10657		.07	.043			.07
Reach-1	10612		.07	.043			.07
Reach-1	10562		.07	.043			.07
Reach-1	10550		.07	.02			.07
Reach-1	10541		.07	.03			.07
Reach-1	10540	Inl Struct					
Reach-1	10530		.07	.03			.07
Reach-1	10529		.07	.03			.07
Reach-1	10488		.05	.028			.05
Reach-1	10487.5	Inl Struct					
Reach-1	10385		.07	.03			.07
Reach-1	10270		.07	.03			.07
Reach-1	10225		.07	.035			.07
Reach-1	10182		.07	.035			.07
Reach-1	10127		.15	.035			.15
Reach-1	10086		.2	.04			.03

RamapoRi verPost. rep

Reach-1	10053.5	Bri dge			
Reach-1	10022		.15	.03	.15
Reach-1	10021		.15	.03	.15
Reach-1	9580		.065	.033	.07
Reach-1	8750		.065	.05	.065
Reach-1	7955		.2	.045	.5
Reach-1	7600		.2	.045	.5
Reach-1	7490		.2	.045	.5
Reach-1	7471	Bri dge			
Reach-1	7452		.2	.045	.5
Reach-1	6800		.2	.045	.5
Reach-1	6055		.2	.045	.15
Reach-1	5685		.5	.045	.15
Reach-1	4785		.5	.045	.15
Reach-1	4375		.5	.045	.15
Reach-1	3780		.5	.045	.15
Reach-1	3215		.5	.045	.15
Reach-1	2525		.5	.045	.15
Reach-1	1515		.15	.045	.15
Reach-1	1085		.15	.045	.15
Reach-1	1080		.15	.025	.15
Reach-1	1079.9	Inl Struct			
Reach-1	1075		.15	.04	.15
Reach-1	770		.07	.04	.06
Reach-1	0		.065	.033	.065
Reach-1	-790		.065	.027	.065
Reach-1	-800		.065	.027	.065
Reach-1	-809		.065	.027	.065
Reach-1	-850	Bri dge			
Reach-1	-891		.065	.027	.065
Reach-1	-900		.065	.027	.065

Ramapo River Post. rep

SUMMARY OF REACH LENGTHS

River: Ramapo River

Reach	River Sta.	Left	Channel	Right
Reach-1	34312	199.36	199.36	199.36
Reach-1	34145	2691.35	2691.35	2691.35
Reach-1	32867	117	117	117
Reach-1	32750	40	40	40
Reach-1	32710	40	40	40
Reach-1	32700	157	117	157
Reach-1	32670	93.32	95	100
Reach-1	32583	86.68	87.52	90
Reach-1	32543	86.66	87.5	90
Reach-1	32523	Bri dge		
Reach-1	32503	933.28	950	1000.16
Reach-1	32100	180	184	228
Reach-1	31933	720	736.2	912
Reach-1	31640	22.24	186.64	184.47
Reach-1	31473	77.76	653.4	645.57
Reach-1	31220	216	185.6	208
Reach-1	31053	864	742.2	832.2
Reach-1	30756	270	182.4	140
Reach-1	30589	1080	729.6	559.8
Reach-1	30300	197.12	193.76	162.88
Reach-1	30133	1182.52	1162.31	977.13
Reach-1	29622	183.44	198.64	193.04
Reach-1	29455	1926.95	2085.72	2026.92
Reach-1	28480	192	195.2	196
Reach-1	28313	768	780.8	784
Reach-1	27992	54.99	54.99	54.99
Reach-1	27937	132.84	135.84	137.16
Reach-1	27825	99.29	100.29	100.71
Reach-1	27797.5	Bri dge		
Reach-1	27770	442.89	452.96	457.14
Reach-1	27620	194.24	198.81	200
Reach-1	27453	485.6	497	500
Reach-1	27272	180	180	180
Reach-1	27105	464.97	270.05	554.95
Reach-1	27047	136	188	240
Reach-1	26880	204	282	360
Reach-1	26812	25	50	55
Reach-1	26762	40	41	45
Reach-1	26721	130	89	50
Reach-1	26645	25	49	55
Reach-1	26632	45	49.5	60
Reach-1	26596	85	84.48	105
Reach-1	26561	130	99	50
Reach-1	26533	100	94	85
Reach-1	26462	190	191.04	204.96
Reach-1	26365	600.07	564.88	509.91
Reach-1	26157	186.64	178	160
Reach-1	25988	381.29	376.96	368
Reach-1	25890	350	233	180
Reach-1	25700	350.01	214.02	180
Reach-1	25657	216	189.6	12
Reach-1	25486	324	287.4	18

		Ramapo	River	Post. rep	
Reach-1	25420	150.03	212.49	5.76	
Reach-1	25246	210	297.48	8.16	
Reach-1	25165	15	20	7	
Reach-1	25145	10	15	7	
Reach-1	25130	10	43	90	
Reach-1	25087	150	136.98	120	
Reach-1	24991	30	35	22	
Reach-1	24956	6	26	53	
Reach-1	24950	59.66	42.66	80	
Reach-1	24930	4	17	37	
Reach-1	24913	178.38	138.36	202.98	
Reach-1	24860	56	49	42	
Reach-1	24822	.5	43.5	325	
Reach-1	24811	35.52	78.48	360	
Reach-1	24776	76	76	76	
Reach-1	24735	1	45	50	
Reach-1	24700	42	51.99	62.01	
Reach-1	24690	.2	42.6	105	
Reach-1	24648	1.4	168.21	860.02	
Reach-1	24565	4.2	46.6	109	
Reach-1	24561	1.2	87.6	155	
Reach-1	24516	.99	213.03	524.97	
Reach-1	24477	9.99	72	72	
Reach-1	24405	54.99	54.99	54.99	
Reach-1	24350	86.68	93.32	113.32	
Reach-1	24303	53.35	118.7	128.65	
Reach-1	24231	54.99	54.99	54.99	
Reach-1	24210	32.5	44.5	78.76	
Reach-1	24176	227.48	273.46	406.23	
Reach-1	24036	130	178	315.04	
Reach-1	24032	140	171.99	175	
Reach-1	23860	45	48.34	46.66	
Reach-1	23858	230.01	268.73	268.29	
Reach-1	23715	53.34	38.34	51.66	
Reach-1	23686	241.65	221.67	243.36	
Reach-1	23600	185	80	72.48	
Reach-1	23541	344.96	195.04	227.52	
Reach-1	23440	.34	46.66	53.34	
Reach-1	23426	370.7	253.33	251.68	
Reach-1	23300	45	45	45	
Reach-1	23266	136.07	275	295.02	
Reach-1	23126	180	180	180	
Reach-1	23120	30	30	30	
Reach-1	23090	63	63	63	
Reach-1	23027	22	22	22	
Reach-1	23005	15	15	15	
Reach-1	22990	35.01	60	80.01	
Reach-1	22946	30	30	30	
Reach-1	22930	50	36.66	63.34	
Reach-1	22916	125.04	136.38	476.7	
Reach-1	22853	20	22	35	
Reach-1	22831	15	15	15	
Reach-1	22820	48	49	30	
Reach-1	22816	83	109	110	
Reach-1	22756	245.97	207.99	250.02	
Reach-1	22646	288	294	180	
Reach-1	22575	209.97	209.97	160.02	
Reach-1	22401	209.97	209.97	160.02	
Reach-1	22365	230	192	20	
Reach-1	22191	230	191.04	20	
Reach-1	22173	114.99	63	39.99	
Reach-1	22110	33	33	33	
Reach-1	22077	70	80	53.35	

		Ramapo	River	Post. rep	
Reach-1	22000	150	100	66.68	
Reach-1	21957	53.34	44	16.68	
Reach-1	21940	83.33	79	26.67	
Reach-1	21922.5	Bri dge			
Reach-1	21905	158.34	164.01	96.67	
Reach-1	21825	50	45	18	
Reach-1	21785	309.98	266.97	103.95	
Reach-1	21653	299.97	257.95	108.02	
Reach-1	21600	260	183.04	70	
Reach-1	21440	260.04	144	69.96	
Reach-1	21417	55.02	132.42	100.08	
Reach-1	21296	165	360.45	300.15	
Reach-1	21152	20	88.8	108	
Reach-1	21068	80.04	279.12	432	
Reach-1	20930	36	46	56	
Reach-1	20922	324.02	403.07	504.05	
Reach-1	20703	289.98	208.98	150.03	
Reach-1	20700	289.98	205.02	150.03	
Reach-1	20495	49.34	49	52.66	
Reach-1	20494	246.7	246	263.3	
Reach-1	20348	16	16	16	
Reach-1	20346	16	16	16	
Reach-1	20338	Bri dge			
Reach-1	20332	2	2	2	
Reach-1	20330	43.34	43.34	43.34	
Reach-1	20328	489.8	481.8	519.8	
Reach-1	20070	26.64	43.34	40.84	
Reach-1	20063	293.36	467.78	449.35	
Reach-1	19812	180	90	385	
Reach-1	19810	180	90	385	
Reach-1	19722	435	297	160.07	
Reach-1	19720	435	294.85	159.85	
Reach-1	19425	130.08	145.08	205.08	
Reach-1	19280	475.02	208.98	180	
Reach-1	19071	150.08	155.05	304.99	
Reach-1	18916	245	234	170	
Reach-1	18682	260	235	285	
Reach-1	18447	150.01	167.02	310.03	
Reach-1	18280	435.2	396	430.08	
Reach-1	17884	419.9	417.18	419.9	
Reach-1	17467	299.91	306.93	540.02	
Reach-1	17160	409.87	409.87	409.87	
Reach-1	16750	93	93	93	
Reach-1	16657	52	52	52	
Reach-1	16630.5	Bri dge			
Reach-1	16605	48.9	46.54	50	
Reach-1	16604	831.36	790.4	849.92	
Reach-1	16186	505	490	510	
Reach-1	15696	505	481	875	
Reach-1	15215	490	490	490	
Reach-1	14725	404.94	404.94	404.94	
Reach-1	14320	310.17	514.71	745.29	
Reach-1	13805	414.97	413.1	414.97	
Reach-1	13392	550	547.36	550	
Reach-1	12845	595.1	544.94	500.06	
Reach-1	12300	475	488	500	
Reach-1	11812	655	488	375	
Reach-1	11324	374.79	301.99	260	
Reach-1	11022	130	92	55	
Reach-1	10930	135	102.95	65.05	
Reach-1	10827	104.97	74.01	44.97	
Reach-1	10753	60	45	30	
Reach-1	10708	46.98	51	49.98	

		Ramapo	River	Post. rep	
Reach-1	10657		52	45	45
Reach-1	10612		70	50	70
Reach-1	10562		12	12	12
Reach-1	10550		9	9	9
Reach-1	10541		11	11	11
Reach-1	10540	Inl Struct			
Reach-1	10530		42	42	42
Reach-1	10529		1	41	12
Reach-1	10488		102.96	102.96	102.96
Reach-1	10487.5	Inl Struct			
Reach-1	10385		120	114.95	110.05
Reach-1	10270		45	45	45
Reach-1	10225		50	43	40
Reach-1	10182		40.02	55.02	64.98
Reach-1	10127		41	41	41
Reach-1	10086		64	64	64
Reach-1	10053.5	Bridge			
Reach-1	10022		2.22	49.12	77.78
Reach-1	10021		37.74	833.68	1322.26
Reach-1	9580		770.1	829.94	819.74
Reach-1	8750		830.08	794.89	680
Reach-1	7955		390	355.05	330
Reach-1	7600		110	110	110
Reach-1	7490		38	38	38
Reach-1	7471	Bridge			
Reach-1	7452		649.89	652.05	479.79
Reach-1	6800		690	744.9	799.8
Reach-1	6055		379.95	370.05	360
Reach-1	5685		1585.08	900	730.08
Reach-1	4785		269.96	410.04	950.13
Reach-1	4375		300	595.19	799.92
Reach-1	3780		319.93	565.11	500.02
Reach-1	3215		930.15	689.92	210
Reach-1	2525		1184.9	1010.24	460.02
Reach-1	1515		655.02	430.02	15.12
Reach-1	1085		5	5	5
Reach-1	1080		5	5	5
Reach-1	1079.9	Inl Struct			
Reach-1	1075		160.03	304.98	24.96
Reach-1	770		415.09	770.04	289.85
Reach-1	0		790.08	790.08	790.08
Reach-1	-790		10	10	10
Reach-1	-800		20	9	1
Reach-1	-809		40	82	60
Reach-1	-850	Bridge			
Reach-1	-891		10	10	10
Reach-1	-900		0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
 River: Ramapo River

Reach	River Sta.	Contr.	Expan.
Reach-1	34312	.3	.5
Reach-1	34145	.3	.5
Reach-1	32867	.3	.5
Reach-1	32750	.3	.5
Reach-1	32710	.3	.5
Reach-1	32700	.3	.5

		Ramapo	River	Post.	rep
Reach-1	32670	.3		.5	
Reach-1	32583	.3		.5	
Reach-1	32543	.3		.5	
Reach-1	32523		Bridge		
Reach-1	32503	.3		.5	
Reach-1	32100	.1		.3	
Reach-1	31933	.1		.3	
Reach-1	31640	.1		.3	
Reach-1	31473	.1		.3	
Reach-1	31220	.1		.3	
Reach-1	31053	.1		.3	
Reach-1	30756	.1		.3	
Reach-1	30589	.1		.3	
Reach-1	30300	.1		.3	
Reach-1	30133	.1		.3	
Reach-1	29622	.1		.3	
Reach-1	29455	.1		.3	
Reach-1	28480	.3		.5	
Reach-1	28313	.3		.5	
Reach-1	27992	.3		.5	
Reach-1	27937	.3		.5	
Reach-1	27825	.3		.5	
Reach-1	27797	.5	Bridge		
Reach-1	27770	.3		.5	
Reach-1	27620	.1		.3	
Reach-1	27453	.1		.3	
Reach-1	27272	.1		.3	
Reach-1	27105	.1		.3	
Reach-1	27047	.1		.3	
Reach-1	26880	.1		.3	
Reach-1	26812	.1		.3	
Reach-1	26762	.4		.6	
Reach-1	26721	.4		.6	
Reach-1	26645	.1		.3	
Reach-1	26632	.4		.6	
Reach-1	26596	.4		.6	
Reach-1	26561	.4		.6	
Reach-1	26533	.1		.3	
Reach-1	26462	.4		.6	
Reach-1	26365	.1		.3	
Reach-1	26157	.1		.3	
Reach-1	25988	.1		.3	
Reach-1	25890	.1		.3	
Reach-1	25700	.1		.3	
Reach-1	25657	.1		.3	
Reach-1	25486	.1		.3	
Reach-1	25420	.1		.3	
Reach-1	25246	.1		.3	
Reach-1	25165	.3		.5	
Reach-1	25145	.7		.9	
Reach-1	25130	.7		.9	
Reach-1	25087	.3		.5	
Reach-1	24991	.1		.3	
Reach-1	24956	.1		.3	
Reach-1	24950	.3		.5	
Reach-1	24930	.1		.3	
Reach-1	24913	.1		.3	
Reach-1	24860	.1		.3	
Reach-1	24822	.3		.5	
Reach-1	24811	.1		.3	
Reach-1	24776	.1		.3	
Reach-1	24735	.3		.5	
Reach-1	24700	.1		.3	

Ramapo River Post. rep

Reach-1	24690	.3	.5
Reach-1	24648	.1	.3
Reach-1	24565	.3	.5
Reach-1	24561	.3	.5
Reach-1	24516	.3	.5
Reach-1	24477	.1	.3
Reach-1	24405	.1	.3
Reach-1	24350	.1	.3
Reach-1	24303	.1	.3
Reach-1	24231	.1	.3
Reach-1	24210	.1	.3
Reach-1	24176	.1	.3
Reach-1	24036	.1	.3
Reach-1	24032	.1	.3
Reach-1	23860	.1	.3
Reach-1	23858	.1	.3
Reach-1	23715	.1	.3
Reach-1	23686	.1	.3
Reach-1	23600	.1	.3
Reach-1	23541	.1	.3
Reach-1	23440	.3	.5
Reach-1	23426	.1	.3
Reach-1	23300	.6	.8
Reach-1	23266	.3	.5
Reach-1	23126	.6	.8
Reach-1	23120	.6	.8
Reach-1	23090	.6	.8
Reach-1	23027	.6	.8
Reach-1	23005	.05	.2
Reach-1	22990	.05	.2
Reach-1	22946	.6	.8
Reach-1	22930	.05	.2
Reach-1	22916	.6	.8
Reach-1	22853	.6	.8
Reach-1	22831	.05	.2
Reach-1	22820	.05	.2
Reach-1	22816	.05	.2
Reach-1	22756	.05	.2
Reach-1	22646	.05	.2
Reach-1	22575	.05	.2
Reach-1	22401	.05	.2
Reach-1	22365	.05	.2
Reach-1	22191	.05	.2
Reach-1	22173	.05	.2
Reach-1	22110	.5	.7
Reach-1	22077	.5	.7
Reach-1	22000	.05	.2
Reach-1	21957	.1	.3
Reach-1	21940	.2	.4
Reach-1	21922.5	Bri dge	
Reach-1	21905	.2	.4
Reach-1	21825	.1	.3
Reach-1	21785	.1	.3
Reach-1	21653	.1	.3
Reach-1	21600	.1	.3
Reach-1	21440	.1	.3
Reach-1	21417	.3	.5
Reach-1	21296	.3	.5
Reach-1	21152	.3	.5
Reach-1	21068	.3	.5
Reach-1	20930	.1	.3
Reach-1	20922	.1	.3
Reach-1	20703	.1	.3

		Ramapo	River	Post.	rep
Reach-1	20700	.1		.3	
Reach-1	20495	.1		.3	
Reach-1	20494	.1		.3	
Reach-1	20348	.3		.5	
Reach-1	20346	.1		.3	
Reach-1	20338		Bridge		
Reach-1	20332	.3		.5	
Reach-1	20330	.3		.5	
Reach-1	20328	.1		.3	
Reach-1	20070	.3		.5	
Reach-1	20063	.1		.3	
Reach-1	19812	.1		.3	
Reach-1	19810	.3		.5	
Reach-1	19722	.1		.3	
Reach-1	19720	.3		.5	
Reach-1	19425	.3		.5	
Reach-1	19280	.3		.5	
Reach-1	19071	.1		.3	
Reach-1	18916	.1		.3	
Reach-1	18682	.1		.3	
Reach-1	18447	.1		.3	
Reach-1	18280	.1		.3	
Reach-1	17884	.1		.3	
Reach-1	17467	.1		.3	
Reach-1	17160	.4		.6	
Reach-1	16750	.4		.6	
Reach-1	16657	.4		.6	
Reach-1	16630	.5	Bridge		
Reach-1	16605	.4		.6	
Reach-1	16604	.4		.6	
Reach-1	16186	.1		.3	
Reach-1	15696	.1		.3	
Reach-1	15215	.1		.3	
Reach-1	14725	.1		.3	
Reach-1	14320	.3		.5	
Reach-1	13805	.3		.5	
Reach-1	13392	.3		.5	
Reach-1	12845	.3		.5	
Reach-1	12300	.3		.5	
Reach-1	11812	.3		.5	
Reach-1	11324	.3		.5	
Reach-1	11022	.1		.3	
Reach-1	10930	.1		.3	
Reach-1	10827	.1		.3	
Reach-1	10753	.1		.3	
Reach-1	10708	.1		.3	
Reach-1	10657	.1		.3	
Reach-1	10612	.1		.3	
Reach-1	10562	.1		.3	
Reach-1	10550	.1		.3	
Reach-1	10541	.1		.3	
Reach-1	10540		Inl Struct		
Reach-1	10530	.05		.2	
Reach-1	10529	.05		.2	
Reach-1	10488	.1		.3	
Reach-1	10487	.5	Inl Struct		
Reach-1	10385	.1		.3	
Reach-1	10270	.1		.3	
Reach-1	10225	.1		.3	
Reach-1	10182	.1		.3	
Reach-1	10127	.1		.3	
Reach-1	10086	.6		.8	
Reach-1	10053	.5	Bridge		

		Ramapo	River	Post.	rep
Reach-1	10022	.6		.8	
Reach-1	10021	.6		.8	
Reach-1	9580	.1		.3	
Reach-1	8750	.1		.3	
Reach-1	7955	.1		.3	
Reach-1	7600	.5		.7	
Reach-1	7490	.5		.7	
Reach-1	7471		Bridge		
Reach-1	7452	.5		.7	
Reach-1	6800	.2		.4	
Reach-1	6055	.2		.4	
Reach-1	5685	.2		.4	
Reach-1	4785	.2		.4	
Reach-1	4375	.2		.4	
Reach-1	3780	.2		.4	
Reach-1	3215	.2		.4	
Reach-1	2525	.2		.4	
Reach-1	1515	.2		.4	
Reach-1	1085	.4		.6	
Reach-1	1080	.4		.6	
Reach-1	1079.9		Inl Struct		
Reach-1	1075	.4		.6	
Reach-1	770	.1		.3	
Reach-1	0	.1		.3	
Reach-1	-790	.1		.3	
Reach-1	-800	.1		.3	
Reach-1	-809	.3		.5	
Reach-1	-850		Bridge		
Reach-1	-891	.3		.5	
Reach-1	-900	.3		.5	