Bell Bend Nuclear Power Plant
Flood Study Report
Susquehanna River

Salem Township, Luzerne County, PA
LSI Doc. No. FS-SR-001




Prepared for:
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Land Studies

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Rev 3, August 16, 2011

Susquehanna River Flood Study Report

PPL Bell Bend Nuclear Power Plant
Salem Township, Luzerne County, PA
August 16, 2011

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Revision Notes:

REV 1: Replaced the duplicate effective model, which was previously based on the HEC-2 flood model used for the FEMA FIS, with the more recent HEC-RAS model developed by the US Army Corps of Engineers and adopted by FEMA.

Rev 2: Replaced intake structure figures in Appendix H with updated figures from the Joint Permit Plan set by Pennoni Associates, dated May 2011

Rev 3: Address comments received from FEMA dated June 30, 2011; these revisions included reverting back to the Current Effective Model used in Rev0, as well as other technical revisions

PPL Bell Bend Nuclear Power Plant

Susquehanna River Flood Study Report

Rev. 3, August 16, 2011

1 Introduction

PPL is proposing a new facility, the Bell Bend Nuclear Power Plant (BBNPP), on a site near Berwick, PA. The site is located in Salem Township, Luzerne County, northeast of Berwick near the existing Susquehanna Steam Electric Station (SSES) nuclear power plant. The water intake structure for the proposed facility will be located directly east of the proposed site along the Susquehanna River, downstream of the intake structure of the existing plant. The location is approximately 22 miles downstream of Wilkes-Barre, PA and 5 miles upstream of Berwick, PA. A FEMA Flood Study exists for the section of the Susquehanna River that will be impacted by the proposed intake structure. The FEMA study cross-sections were used as a basis for the flood analysis.

The objectives of this study are to determine the hydraulic effect of the proposed intake structure on the Susquehanna River and to determine the extent of the 100-year floodplain. This report presents the existing (pre-construction) floodplain characteristics modeled in HEC-RAS and how they compare to both the original FEMA floodplain characteristics taken from the HEC-2 model and to the proposed (post-construction) floodplain characteristics modeled in HEC-RAS.

2 Hydrology

Soils information and geology at the proposed BBNPP site and surrounding area were determined from Penn State University's online soil map tool (www.soilmap.psu.edu). Soils existing in the region of the proposed intake structure include Pope soils and Holly Silt Loams (hydrologic soil groups "B" and "D", respectively). A soils map is included in Appendix A.

The Hamilton Group geologic formation exists beneath the proposed intake structure site. It is an east to west trending band of the lower and middle Devonian-age Hamilton Group and is made up of two formations: the Mahantango Formation and the Marcellus Formation. The Mahantango Formation is composed of gray, brown and olive shale and siltstone while the Marcellus Formation is composed of black, carbonaceous shale. See the geologic map in Appendix A.

The Susquehanna River is 444 miles long, with its headwaters in New York. The entire Susquehanna River Basin covers 27,510 mi^2; however, the drainage area to the location of the proposed intake structure equals approximately 10,600 mi^2. The 100-year peak flow used in the FEMA Flood Insurance Study (FIS) for this drainage area is 260,000 cfs. The maximum recorded flow rate was 345,000 cfs at the Wilkes-Barre gauging station (24 miles

upstream) and 363,000 cfs at the Danville gauging station (28 mi downstream) during Hurricane Agnes, which is similar to the 500 year flow rate (340,000 cfs) used in the FIS.

3 Hydraulics

3.1 General Description

The US Army Corps of Engineers HEC-RAS Version 4.1.0 software was used for the hydraulic analysis. HEC-RAS is intended for calculating water-surface profiles for steady or unsteady flow in natural or man-made channels. The computational procedure is based on the solution of the one-dimensional energy equation with energy loss due to friction computed using Manning's equation. The computational procedure is generally known as the Standard Step Method and can be used for subcritical as well as supercritical flow conditions. For this project, the water-surface profile for steady, subcritical flow was calculated.

The original FEMA FIS study was conducted in the vertical datum NGVD 29; therefore, the Existing and Proposed HEC-RAS Conditions were both modeled in the NGVD 29 vertical datum for comparison purposes. To illustrate the 100-year floodplain line in planform, however, the water surface elevations from each study were converted to vertical datum NAVD 88 to correspond to the most recent topographical information available. The conversion factor from NGVD 29 to NAVD 88 is -0.7 ft.

3.2 FEMA Flood Insurance Study (FIS) HEC-2 Model (Duplicate Effective Model A)

The FEMA FIS HEC-2 input data text file was acquired from the Susquehanna River Basin Commission (SRBC), which conducted the original study. The HEC-2 Input file was truncated to only include the cross sections included in this study. These included Cross Sections CP to CU from the FIS, which were labeled Cross Sections 6 through 12 in the HEC-2 Model. The HEC-2 input file was then run in HEC-2, as required by FEMA to create a "Duplicate Effective Model." The intent of this model was to recreate the original study, with the original software, on our equipment. Because Cross Section CP was the downstream limit of Duplicate Effective Model A, downstream boundary conditions at Section CP were set to match the modeled water surface elevations from the original FIS at this cross section for each profile. The HEC-2 input data and output text files for Duplicate Effective Model A are located in Appendix E.

3.3 FEMA (FIS) HEC-RAS Model (Duplicate Effective Model B)

The FEMA FIS HEC-2 input data was entered into HEC-RAS to develop a "control" model for comparison with the more detailed existing and proposed models to be discussed later. The model includes HEC-2 cross-sections extending from Station 1278+00 (FEMA FIS XS "CP"; HEC-2 cross section 6) to Station 1396+00 (FEMA FIS XS "CU"; HEC-2 cross section 12). The 100-year peak flow used in the FEMA FIS was applied to the model and the 100-year water surface elevation of 510.5 ft was used as the 100-year downstream boundary condition. A

subcritical flow regime was selected, as used in the HEC-2 analysis. HEC-RAS data for Duplicate Effective Model B is provided in Appendix F.

3.4 Corrected Effective Model

The Duplicate Effective Model B geometry was enhanced with more accurate topographic data to create a Corrected Effective Model. The FEMA cross-sections were enhanced on the west side of the Susquehanna River with existing topography from and aerial survey supplemented with available GIS data. The river bottom of each cross-section (except Station 1396+00, for lack of data) was also supplemented with bathymetry data from the Ecology III report entitled "Ecological Studies of the Susquehanna River in the vicinity of the Susquehanna Steam Electric Station" (August, 1983). The 1983 bathymetry data by Ecology III (formerly Ichthyological Associates, Inc.) was used in this flood study over other bathymetry reports for its accuracy, detail and long span of studied river in the area of the SSES and proposed BBNPP facilities (see Appendix J). The corrected effective model included the same cross sections as the duplicate effective model and utilized more accurate geometry data, but did not include any man-made features.

3.5 Existing Conditions

The existing conditions model is the basis for comparison for the evaluation of potential changes that could be caused by the proposed BBNPP intake structure. To accurately model the river hydraulics for comparison, two cross sections were added to the corrected effective model. One cross section was added at the location of the existing intake structure for SSES, and one cross section was added at the location of the proposed BBNPP intake. These cross sections were generated initially with the interpolation feature in HEC-RAS and then adjusted based on bathymetry data and available one-foot topographical data. The existing intake structure was modeled as a flow obstruction. The structure dimensions and invert for the water intake were determined from PPL Drawing M-57-3, Rev. 4. Design drawings and photographs of the existing intake structure are provided in Appendix K. Existing Manning's 'n' values were kept consistent with the FEMA FIS Manning's 'n' values.

The 100-year peak flow from the FEMA FIS of 260,000 cfs was used in the HEC-RAS existing conditions model. The downstream boundary condition was the known 100-year water surface elevation taken from the FEMA FIS (510.5 ft). A subcritical flow regime was assumed in the HEC-RAS analysis, consistent with the original model. Based on the model output, the subcritical flow assumption was verified. An encroachment analysis was also included in the Existing Conditions Model to establish the Floodway based on the more accurate geometry data used in this study. The Existing Conditions data is located in Appendix H).

3.6 Proposed Conditions

In the Proposed Conditions model, the existing conditions geometry was altered at Station 1331+38 to reflect the proposed intake structure conditions. The proposed structure was represented by an obstructed area within the cross-sectional geometry. The grading near the structure was also altered in the model; specifically the river bottom elevation was lowered to

correctly represent the dredging to occur for the structure's intake invert, and fill was added to reflect the access drive and pad behind the structure. For details of the proposed intake structure, see Appendix K. Floodplain Manning's 'n' values were decreased from existing condition's values to reflect the parking lot/impervious surfaces in proposed conditions.

The same flow information and boundary condition used in the existing conditions model were used in proposed conditions (Q_{100} = 260,000 cfs, downstream $WSEL_{100}$ = 510.5 ft). An encroachment analysis was also included in the Proposed Conditions Model for comparison with the Existing conditions Floodway. Proposed Conditions data can be found in Appendix I.

4 Results and Conclusions

A summary of 100-year flood elevations and velocities for all of the above models is provided in Appendix D. Duplicate Effective Model A successfully duplicates the flood elevations reported in the current FIS. Duplicate Effective Model B reports higher water surface elevations and lower velocities. It would appear that this is a result of slightly different modeling routines in HEC-2 and HEC-RAS. The Corrected Effective Model is reasonably consistent with the Duplicate Effective Model B, but the BFE does deviate by up to 0.50 ft (higher) in some locations.

The Existing Conditions model results are essentially identical to the Corrected Effective Model below the existing and proposed intake structures, where cross sections were added. Above the existing structure there is a slight increase in the BFE (+/- 0.10 ft). This increase is a result of the obstruction created by the existing intake structure.

The Proposed Conditions Model was compared to the Existing Conditions Model to determine the effect of the proposed intake structure on the 100-year flood elevation. Below the proposed intake structure, the BFE is identical to the Existing Conditions. At the proposed intake structure, the model actually shows a 100-year WSE decrease of 0.01 ft, and a velocity decrease of 0.12 ft/s. This is a result of the increased volume provided by the pool to be excavated in front of the structure. The intake structure itself, although modeled as an obstruction, is located primarily in a located that was modeled as ineffective flow area in the Existing Conditions model. The decrease in water surface elevation transitions to -0.05 ft at the existing intake structure (with a slight increase in velocity) and then stabilizes at -0.04 ft for the remainder of the upstream reach.

Since the proposed water surface elevations are equal to or lower than the existing water surface elevations, it can be concluded that the proposed intake structure for the BBNPP will have no negative hydraulic effect on the Susquehanna River and its floodplain. The elevation and extent of the 100-year floodplain will not be measurably increased at any location as a result of this project.

The Floodway in the Proposed Condition model is identical to that of the Existing Conditions model with the exception of Station 133138, where the Floodway shifts inward slightly to match the face of the proposed intake structure.

The existing and proposed 100-year and 500-year floodplain as well as the Floodway are plotted on the Floodplain Map in Appendix B. The plan vertical datum is NAVD 88. Because all models were prepared based on the NGVD 29 vertical datum, a conversion table is provided in Appendix D.

Appendix A:
Maps

- Location Map
- Soils Map
- Geology Map

Source: Berwick, PA USGS 7.5-minute topographic quadrangle

Location	Scale
41°05'17" N, 76°07'54" W	1" = 2000'

Project Location Map

BBNPP Intake Structure on the Susquehanna River

Land Studies

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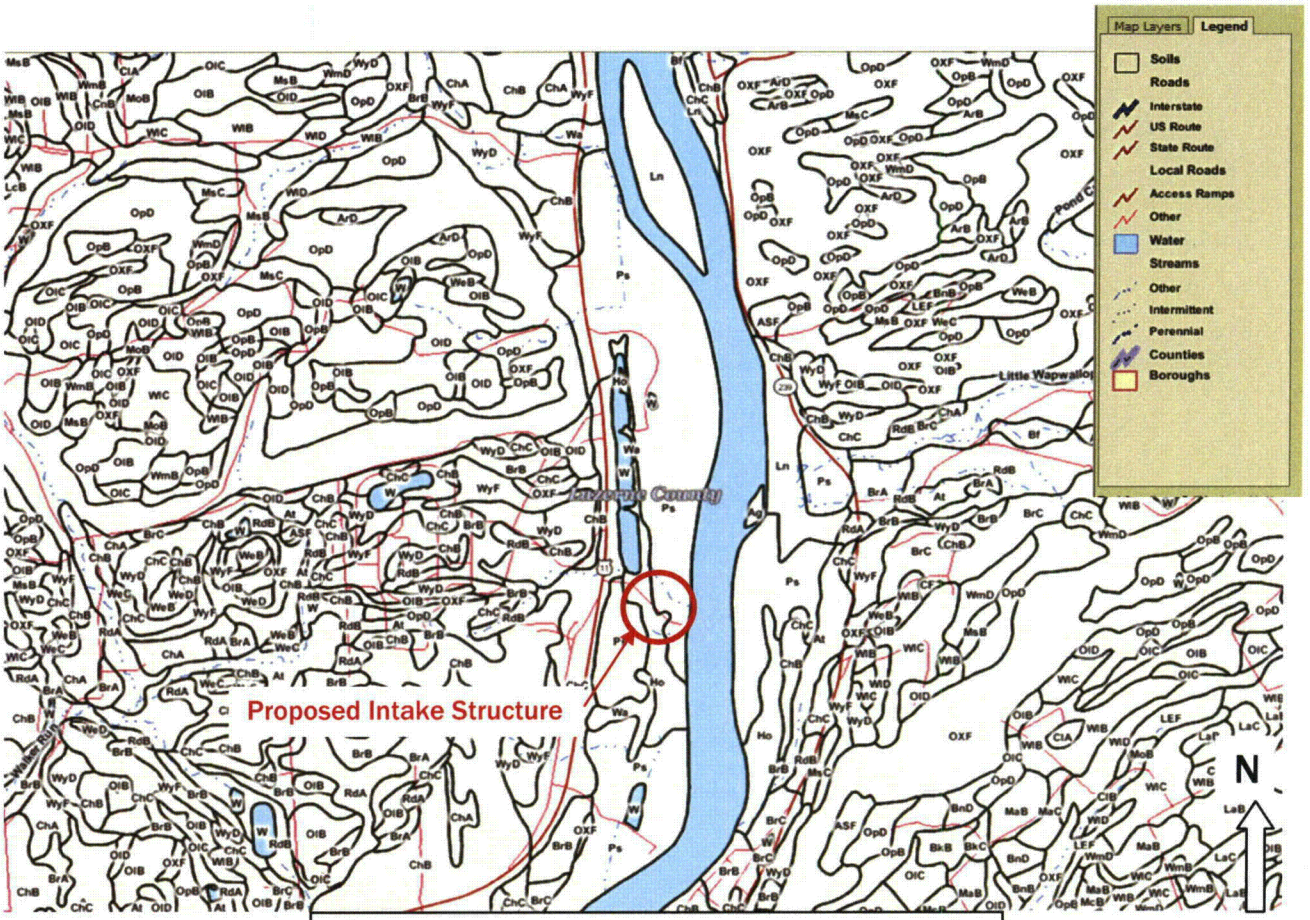
November 2010



Source: http://soilmap.psu.edu

Location	Scale
41˚05'17" N, 76˚07'54" W	1" = 2000'

Soils Location Map

BBNPP Intake Structure on the Susquehanna River

Land studies

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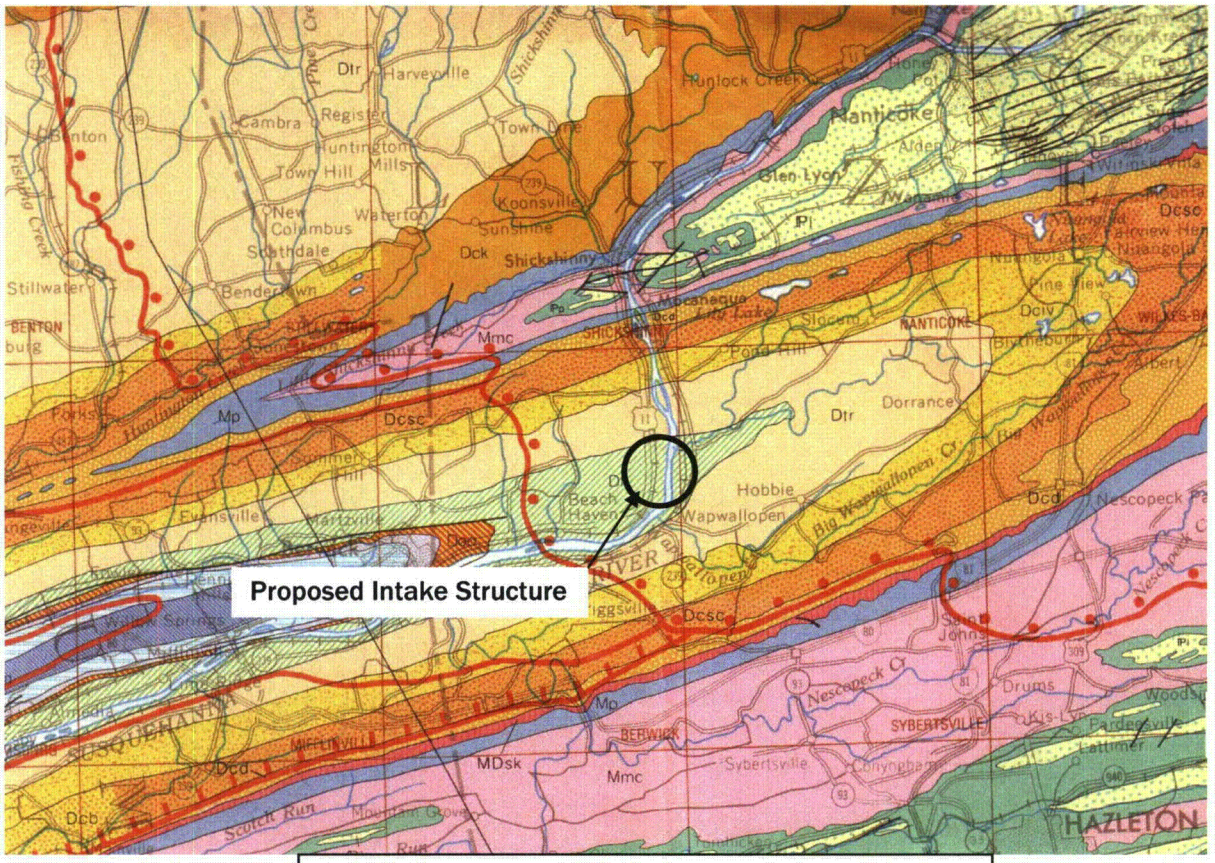

Source: Geologic Map of Pennsylvania. 1980.

Geologic Formation

Dh = Hamilton Group

Location

41˚05'17" N, 76˚07'54" W

Scale

1:250,000

Geology Map

BBNPP Intake Structure on the Susquehanna River

Land studies

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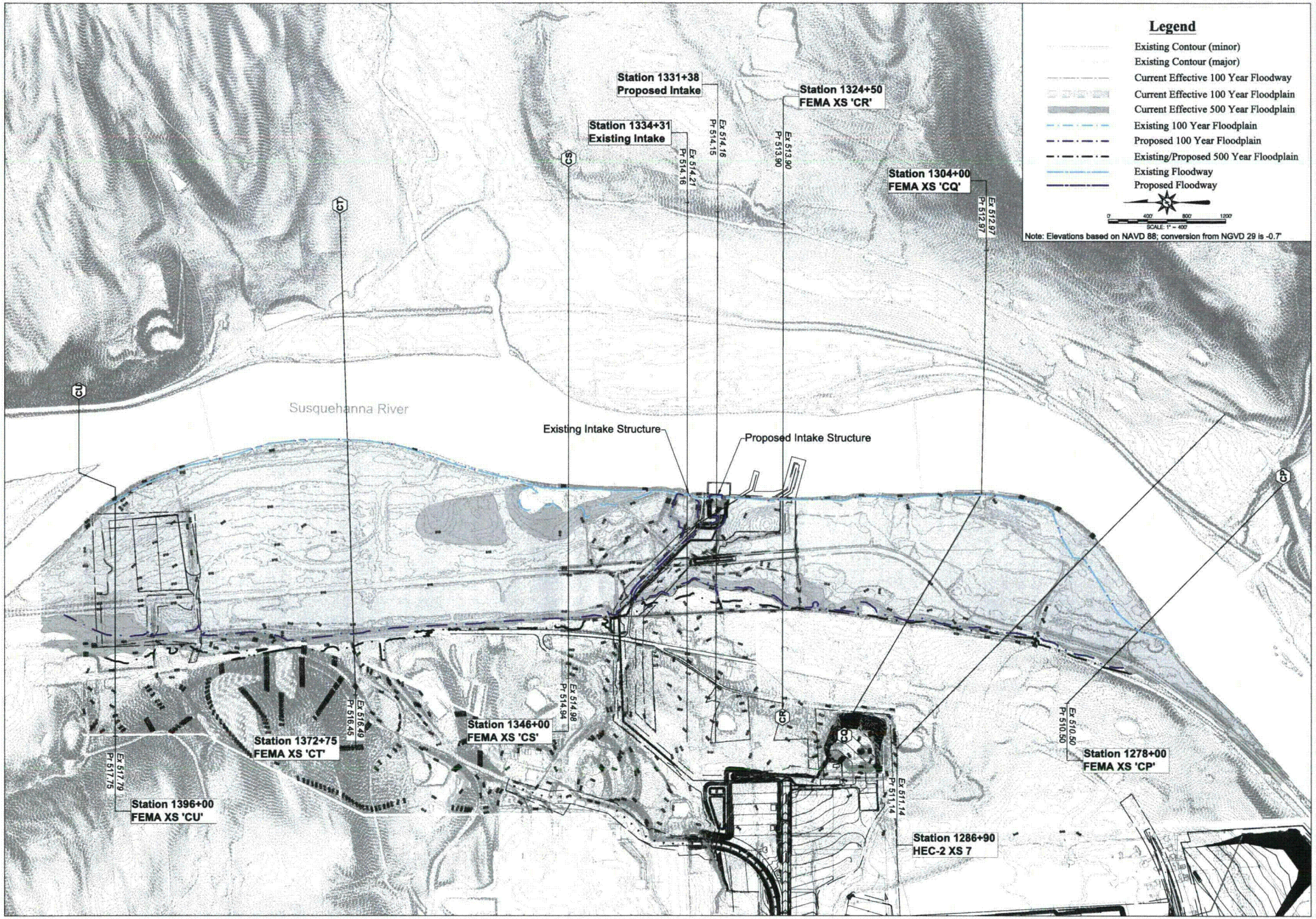
November 2010

Appendix B:
Floodplain Map



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PROJECT:
BELL BEND NUCLEAR POWER PLANT
PPL BELL BEND, LLC.
38 BOMBOY LANE, SUITE 2
BERWICK, PENNSYLVANIA 18603

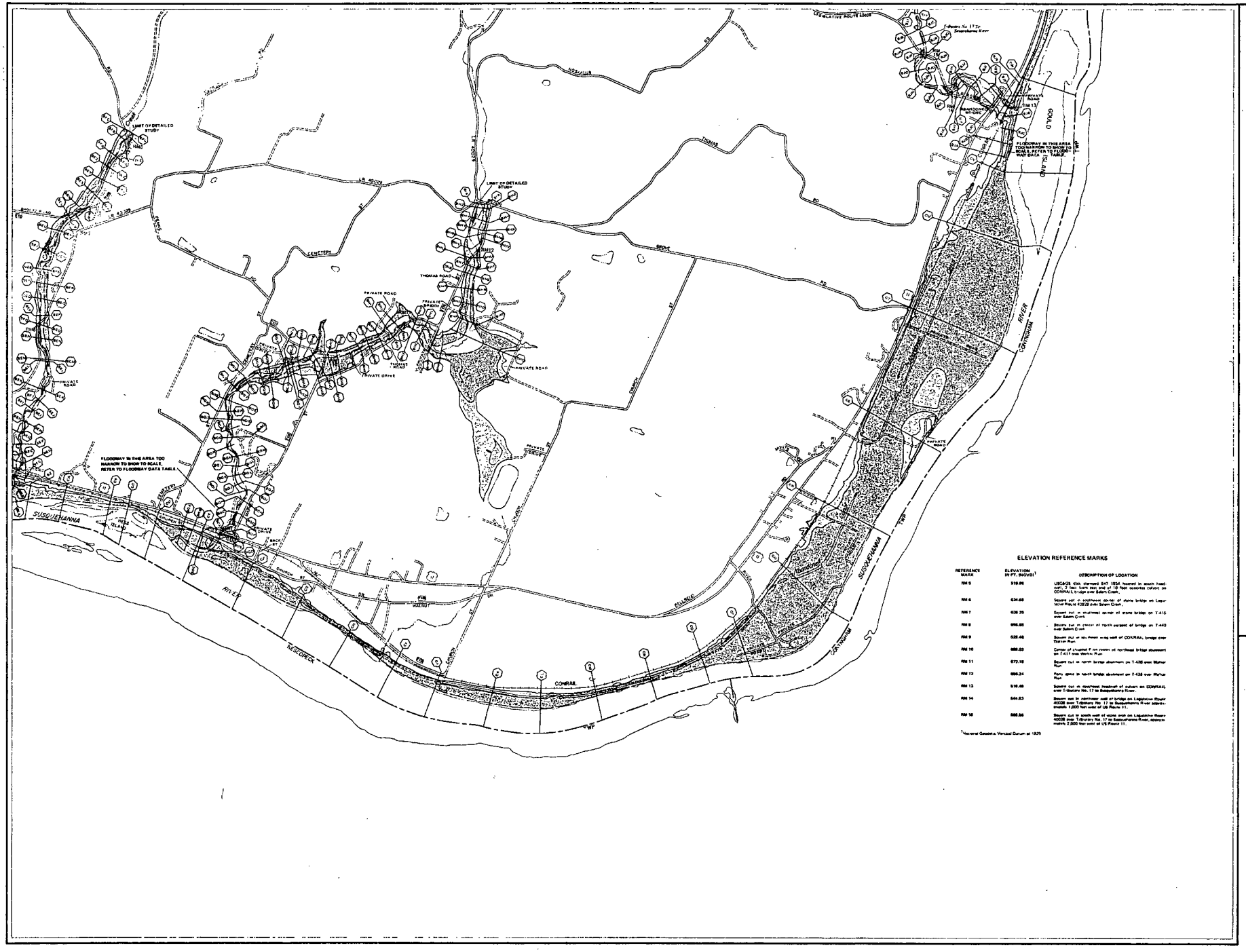
SHEET TITLE:
100 YEAR FLOODPLAIN MAP
FLOOD STUDY - SUSQUEHANNA RIVER
SALEM TOWNSHIP
LUZERNE COUNTY, PENNSYLVANIA

Revisions		
No.	Date	Description
1	11/19/10	Per study finalization
2	8/18/11	FEMA comments

Project Number:	E-726-L8
Drawn By:	EPJ
Checked By:	BE
Date:	AUGUST 2011
Scale:	1" = 400'
Drawing Number:	FS-SR-P1

Sheet Number:
1
OF 1

Appendix C:
Annotated FIRM



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 5	519.86	USCAGS disk stamped 847 1934 located in south head wall, 7 feet from exit end of 18 foot concrete culvert on CONRAIL bridge over Salem Creek.
RM 6	634.68	Square cut in southwest corner of stone bridge on Legislative Route 40028 over Salem Creek.
RM 7	638.26	Square cut in southeast corner of stone bridge on T-416 over Salem Creek.
RM 8	666.88	Square cut in corner of north parapet of bridge on T-440 over Salem Creek.
RM 9	628.48	Square cut in southwest wing wall of CONRAIL bridge over Walker Run.
RM 10	668.03	Corner of chiseled P on corner of northeast bridge abutment on T-411 over Walker Run.
RM 11	672.18	Square cut in north bridge abutment on T-438 over Walker Run.
RM 12	666.24	Harry spike in north bridge abutment on T-438 over Walker Run.
RM 13	516.46	Square cut in southeast headwall of culvert on CONRAIL over Tributary No. 17 to Susquehanna River.
RM 14	544.83	Square cut in northeast wall of bridge on Legislative Route 40038 over Tributary No. 17 to Susquehanna River, approximately 1,000 feet west of US Route 11.
RM 15	666.86	Square cut in south wall of stone arch on Legislative Route 40038 over Tributary No. 17 to Susquehanna River, approximately 2,000 feet west of US Route 11.

[1]National Geodetic Vertical Datum of 1929

KEY TO MAP

100-Year Flood Boundary
100-Year Flood Boundary
FLOODWAY FRINGE
FLOODWAY
100-Year Flood Boundary
500-Year Flood Boundary
Approximate 100-Year Flood Boundary
Cross Section Line
Elevation Reference Mark RM7 ×
River Mile ●M1.5

NOTES TO USER

Boundaries of the floodways were computed at cross-sections, and interpolated between cross-sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Insurance Administration.

This map was drawn so as to depict minimum flood plain management regulations; it may not show all areas subject to flooding or the combination of all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

APPROXIMATE SCALE
400 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY
FLOOD BOUNDARY AND FLOODWAY MAP

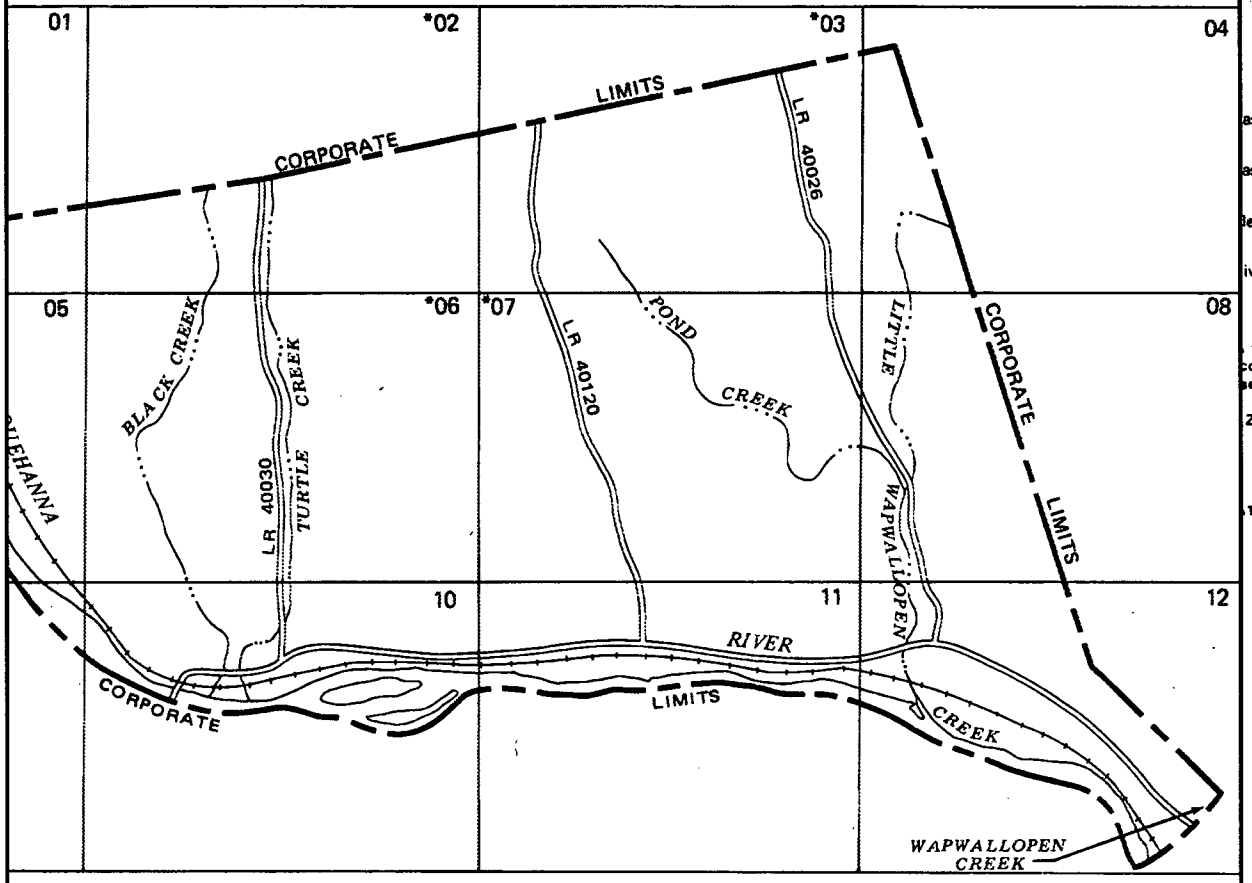
TOWNSHIP OF
SALEM,
PENNSYLVANIA
LUZERNE COUNTY

PANEL 20 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
420825 0020 B

EFFECTIVE DATE:
MARCH 18, 1980

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION



IN ZONE C

REFERENCE MARKS

OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

ZARD BOUNDARY MAP H - 01 - 12
SURANCE RATE MAP I - 01 - 12

MAP INDEX

HIP OF CONYNGHAM, PA

(LUZERNE CO.)

MMUNITY NO. 420600B

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This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix D:
Flood Model Summary Table

Flood Model Summary Table

(all elevations are NGVD 1929)

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
139600	FEMA (FIS)	260000		515.6		N/A	
HEC-2 XS 12, CU	Duplicate Effective A (HEC-2)	260000		515.58	0.0	8.12	N/A
	Duplicate Effective B (HEC-RAS)	260000		517.20	1.62	7.62	-0.50
	Corrected Effective	260000		517.70	0.50	7.46	-0.16
	Existing Conditions	260000	481.50	517.79	0.09	7.43	-0.03
	Proposed Conditions	260000	481.50	517.75	-0.04	7.46	0.03
137275	FEMA (FIS)	260000		514.6		N/A	
HEC-2 XS 11, CT	Duplicate Effective A (HEC-2)	260000		514.58	0.0	8.94	N/A
	Duplicate Effective B (HEC-RAS)	260000		516.13	1.55	8.11	-0.83
	Corrected Effective	260000		516.40	0.27	8.18	0.07
	Existing Conditions	260000	476.20	516.49	0.09	8.14	-0.04
	Proposed Conditions	260000	476.20	516.45	-0.04	8.16	0.02
134600	FEMA (FIS)	260000		513.7		N/A	
HEC-2 XS 10, CS	Duplicate Effective A (HEC-2)	260000		513.73	0.0	8.28	N/A
	Duplicate Effective B (HEC-RAS)	260000		514.87	1.14	7.98	-0.30
	Corrected Effective	260000		514.87	0.00	8.29	0.31
	Existing Conditions	260000	480.20	514.98	0.11	8.25	-0.04
	Proposed Conditions	260000	480.20	514.94	-0.04	8.26	0.01
133431	Existing Conditions	260000	472.50	514.21		8.90	
(Existing Intake)	Proposed Conditions	260000	472.50	514.16	-0.05	8.91	0.01
133138	Existing Conditions	260000	474.40	514.16		8.24	
(Proposed Intake)	Proposed Conditions	260000	474.40	514.15	-0.01	8.12	-0.12
132450	FEMA (FIS)	260000		512.9		N/A	
HEC-2 XS 9, CR	Duplicate Effective A (HEC-2)	260000		512.85	0.0	8.71	N/A
	Duplicate Effective B (HEC-RAS)	260000		513.77	0.92	8.27	-0.44
	Corrected Effective	260000		513.90	0.13	7.93	-0.34
	Existing Conditions	260000	470.20	513.90	0.00	7.93	0.00
	Proposed Conditions	260000	470.20	513.90	0.00	7.93	0.00
130400	FEMA (FIS)	260000		512.3		N/A	
HEC-2 XS 8, CQ	Duplicate Effective A (HEC-2)	260000		512.25	0.0	7.92	N/A
	Duplicate Effective B (HEC-RAS)	260000		512.85	0.60	7.64	-0.28
	Corrected Effective	260000		512.97	0.12	7.84	0.20
	Existing Conditions	260000	482.20	512.97	0.00	7.84	0.00
	Proposed Conditions	260000	482.20	512.97	0.00	7.84	0.00
128690	FEMA (FIS)	260000		510.7	*	N/A	
HEC-2 XS 7	Duplicate Effective A (HEC-2)	260000		510.72	0.0	10.46	N/A
	Duplicate Effective B (HEC-RAS)	260000		511.00	0.28	10.26	-0.20
	Corrected Effective	260000		511.14	0.14	10.17	-0.09
	Existing Conditions	260000	476.20	511.14	0.00	10.17	0.00
	Proposed Conditions	260000	476.20	511.14	0.00	10.17	0.00
127800	FEMA (FIS)	260000		510.5		N/A	
HEC-2 XS 6, CP	Duplicate Effective A (HEC-2)	260000		510.50	0.00	9.33	N/A
	Duplicate Effective B (HEC-RAS)	260000		510.50	0.00	9.28	-0.05
	Corrected Effective	260000		510.50	0.00	9.69	0.41
	Existing Conditions	260000	476.20	510.50	0.00	9.69	0.00
	Proposed Conditions	260000	476.20	510.50	0.00	9.69	0.00

* XS-7 elevation estimated here, not included in FIS

Vertical Datum Conversion Table

(100-yr WSE)

River Station/ Cross Section	Plan	NGVD 29 W.S. Elev (ft)	NAVD 88 W.S. Elev (ft)
139600 HEC-2 XS 12, CU	Existing Conditions	517.79	517.09
	Proposed Conditions	517.75	517.05
137275 HEC-2 XS 11, CT	Existing Conditions	516.49	515.79
	Proposed Conditions	516.45	515.75
134600 HEC-2 XS 10, CS	Existing Conditions	514.98	514.28
	Proposed Conditions	514.94	514.24
133431 (Existing Intake)	Existing Conditions	514.21	513.51
	Proposed Conditions	514.16	513.46
133138 (Proposed Intake)	Existing Conditions	514.16	513.46
	Proposed Conditions	514.15	513.45
132450 HEC-2 XS 9, CR	Existing Conditions	513.90	513.20
	Proposed Conditions	513.90	513.20
130400 HEC-2 XS 8, CQ	Existing Conditions	512.97	512.27
	Proposed Conditions	512.97	512.27
128690 HEC-2 XS 7	Existing Conditions	511.14	510.44
	Proposed Conditions	511.14	510.44
127800 HEC-2 XS 6, CP	Existing Conditions	510.50	509.80
	Proposed Conditions	510.50	509.80

Appendix E:
Duplicate Effective Model A

- HEC-2 Input Data
- HEC-2 Output Data

SUSQUEHANNA RIVER - INPUT

```
T1      SRBC   SHICKSHINNY PA SITE UPDATE        EAA PROJECT NO  16213.02
T2      SECTIONS  1 THRU 12                      AUGUST 11, 2011
T3      SUSQUEHANNA RIVER      100-YEAR
J1              4                                                   510.5
J2  +1.0        0    -1.0                       -.80
J3    38       43       1       8      26          3      51      52       4      39
J3     0      201
NC   0.1     .060    .040    0.10    0.30
QT     4   167000  232000  260000  340000
ET     6                                         9.1                    1074    1957
X1     6       56    1074    1957    1015        960     945
GR 562.0     0000   559.0    0104   554.9       0200   553.7    0304   549.9    0402
GR 546.8     0505   544.6    0605   543.0       0703   541.2    0753   541.2    0773
GR 539.2     0838   517.5    0877   518.0       0892   518.0    0897   516.1    0906
GR 507.4     0929   504.9    0985   501.0       1020   499.9    1074   487.0    1098
GR 479.7     1115   479.7    1920   487.0       1929   501.4    1957   503.2    2008
GR 505.1     2080   505.1    2105   505.1       2116   504.4    2167   504.8    2188
GR 506.2     2242   504.9    2272   495.2       2297   492.3    2339   495.2    2391
GR 503.6     2439   506.0    2510   505.0       2582   504.2    2601   510.5    2629
GR 510.5     2642   504.7    2654   504.7       2687   510.9    2710   512.1    2760
GR 520.0     2787   520.7    2803   520.7       2808   520.1    2819   530.1    2843
GR 542.4     2894   554.8    2958   560.7       3032   566.9    3131   570.2    3221
GR 575.0     3274
NC           .070
ET     7                                         9.1                     852    1713
X1     7       83     852    1713     970        900     890
GR 575.0     0000   571.1    0060   568.2       0110   554.9    0196   555.6    0217
GR 553.2     0234   550.7    0272   550.7       0284   549.1    0355   547.2    0435
GR 543.6     0499   542.1    0563   542.1       0577   540.2    0629   538.8    0724
GR 536.1     0750   536.1    0769   536.2       0793   517.0    0823   517.0    0831
GR 516.1     0852   487.1    0923   480.7       0940   480.7    1659   487.1    1670
GR 501.4     1713   506.0    1787   505.8       1841   505.8    1857   505.1    1913
GR 505.1     1935   506.3    1994   508.1       2062   508.1    2090   507.2    2160
GR 506.6     2253   505.9    2348   503.0       2414   500.8    2422   500.8    2461
GR 503.8     2487   504.8    2547   504.8       2568   501.2    2594   499.9    2676
GR 501.1     2709   507.0    2732   506.3       2790   510.7    2839   510.7    2866
GR 509.9     2879   504.8    2892   504.8       2926   511.1    2943   517.2    2973
GR 517.2     2993   519.9    3002   520.5       3014   520.5    3023   520.0    3033
GR 527.2     3063   535.0    3141   542.1       3232   547.3    3303   550.8    3402
GR 553.2     3481   557.1    3558   559.8       3603   565.8    3703   566.7    3784
GR 566.0     3825   566.3    3852   567.3       3882   567.0    3940   566.3    4007
GR 565.8     4047   565.5    4076   564.3       4115   563.8    4124   565.2    4166
GR 558.1     4273   550.4    4382   575.0       4477
NC  .080     .080
ET     8                                         9.1                    1418    2483
X1     8       90    1418    2483    2400       1120    1705
GR 575.0     0000   555.6    0101   541.2       0198   532.5    0289   525.5    0371
GR 527.0     0385   527.0    0419   524.6       0441   518.0    0534   514.3    0614
GR 509.8     0697   506.1    0775   504.0       0807   508.3    0849   510.8    0940
GR 516.4     1007   513.5    1019   516.4       1037   516.4    1046   516.4    1055
GR 502.3     1090   499.3    1172   491.1       1209   502.3    1288   506.2    1355
GR 499.9     1418   488.0    1443   487.3       1514   487.2    1557   482.0    1600
GR 482.0     2430   487.2    2443   500.9       2483   504.9    2552   506.2    2642
GR 508.5     2693   508.5    2706   508.0       2753   508.4    2817   508.1    2897
GR 508.1     2985   507.9    3059   507.2       3132   505.1    3160   506.7    3225
GR 507.0     3304   504.7    3367   504.7       3434   505.2    3464   509.5    3486
GR 504.9     3500   504.9    3542   511.1       3559   505.1    3570   504.9    3580
GR 504.9     3629   505.1    3692   506.6       3775   507.0    3832   519.0    3890
GR 519.5     3905   519.5    3908   519.5       3911   519.0    3922   516.0    3943
GR 520.1     3993   520.9    4056   525.0       4128   525.7    4189   526.3    4233
GR 528.2     4302   530.0    4353   530.0       4392   531.9    4457   535.1    4532
GR 542.6     4559   543.5    4573   543.5       4612   543.2    4620   541.1    4687
GR 545.8     4730   560.0    4771   563.2       4827   564.0    4855   564.0    4871
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GR 564.2    4914    564.2    4962    562.1    5028    563.4    5074    575.0    5110
ET     9                                      9.1                       1758    2869
X1     9      86     1921    2869     2030    1650     2050
GR 575.0    0000    553.9    0056    553.9    0072    544.9    0107    531.8    0190
GR 522.2    0263    518.7    0331    514.0    0404    509.6    0451    509.6    0526
GR 509.6    0595    514.9    0625    518.8    0686    520.6    0743    529.0    0821
GR 530.9    0892    531.8    0979    531.7    1003    516.4    1045    516.9    1052
GR 516.9    1053    516.9    1057    515.2    1074    503.1    1103    501.9    1146
GR 501.9    1210    503.5    1244    503.4    1324    504.9    1410    504.9    1513
GR 503.0    1548    504.7    1602    505.2    1661    505.2    1712    504.0    1794
GR 502.2    1856    505.5    1921    503.2    1950    487.5    1978    481.4    1988
GR 481.1    2798    487.5    2816    507.6    2869    507.6    2956    509.8    3016
GR 506.5    3089    505.7    3175    506.8    3264    506.2    3321    505.1    3387
GR 511.8    3395    511.8    3402    504.9    3421    504.9    3451    510.0    3472
GR 512.1    3541    512.2    3637    511.5    3716    513.3    3819    517.5    3918
GR 520.4    3964    520.0    3975    520.7    3981    520.7    3983    520.7    3987
GR 520.4    3996    521.4    4026    524.9    4107    526.9    4175    527.5    4213
GR 527.5    4223    530.8    4305    534.2    4377    537.0    4473    540.1    4535
GR 541.9    4547    541.9    4584    541.0    4596    544.1    4602    546.6    4648
GR 556.2    4740    565.0    4831    570.9    4862    573.5    4908    573.5    4923
GR 575.0    4933
NC  .060    .060
ET    10                                     9.1                       2139    3228
X1    10      86     2278    3228     2075    2160     2125
GR 575.0    0000    571.9    0049    570.1    0102    562.3    0168    540.0    0251
GR 540.0    0266    531.1    0335    522.3    0421    516.0    0493    510.8    0554
GR 510.5    0592    510.5    0605    510.9    0679    513.1    0770    512.9    0868
GR 513.3    0969    513.3    1056    513.1    1157    512.1    1228    511.4    1248
GR 511.4    1264    512.9    1282    512.4    1339    515.1    1356    515.5    1362
GR 515.1    1370    514.8    1395    510.3    1406    509.1    1489    508.0    1576
GR 506.2    1679    506.2    1720    506.1    1826    508.1    1946    505.9    2005
GR 504.8    2073    501.1    2140    500.9    2200    500.7    2278    493.7    2301
GR 487.7    2348    480.0    2489    480.0    3141    487.7    3174    517.0    3228
GR 517.9    3247    517.9    3255    517.7    3323    517.5    3401    516.4    3492
GR 516.0    3602    512.9    3701    510.1    3806    507.3    3870    505.4    3951
GR 504.0    3990    504.0    4013    505.2    4034    512.1    4041    512.1    4049
GR 504.9    4064    504.9    4089    513.9    4110    513.9    4115    512.5    4123
GR 512.5    4529    516.6    4541    515.1    4555    517.5    4567    518.0    4572
GR 517.5    4580    513.1    4594    515.8    4602    513.2    4618    522.6    4660
GR 525.4    4698    525.6    4700    525.6    4737    525.1    4761    522.9    4819
GR 530.9    4881    544.1    4943    547.5    4985    550.1    5023    563.2    5096
GR 575.0    5162
ET    11                                     7.1      777    1625
X1    11      62      777    1622     2785    2485     2690
GR 575.0    0000    556.1    0076    523.0    0160    512.0    0208    504.5    0278
GR 504.5    0293    515.5    0341    515.5    0352    515.9    0366    515.9    0387
GR 510.2    0416    510.9    0495    510.5    0580    512.1    0663    513.3    0739
GR 510.2    0777    503.0    0802    502.4    0812    488.0    0848    480.6    0864
GR 480.6    1555    488.0    1579    499.7    1622    501.2    1683    509.2    1725
GR 507.8    1797    509.8    1882    504.5    1951    504.8    2036    506.5    2127
GR 509.2    2239    513.7    2339    510.2    2460    510.7    2537    510.3    2635
GR 508.4    2727    508.8    2824    508.9    2902    511.0    2989    507.9    3058
GR 509.3    3124    504.9    3141    504.9    3169    509.5    3182    509.0    3210
GR 508.5    3282    513.9    3298    509.7    3314    509.7    3552    513.5    3589
GR 514.5    3597    513.5    3600    512.0    3614    518.0    3651    517.9    3656
GR 517.2    3700    518.7    3731    520.8    3801    525.1    3867    540.0    3911
GR 540.0    3924    575.0    4010
NH     5    .080     106    .040     640    .055     754    .040    1118    .060
NH  3289
ET    12                                     7.1      106    1118
X1    12      51      106    1118     2375    2065     2340
GR 575.0    0000    521.0    0042    522.1    0060    522.1    0072    522.7    0083
GR 522.7    0089    521.0    0106    481.5    0176    481.5    0180    481.5    0640
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SUSQUEHANNA RIVER - INPUT

GR	506.2	0678	481.5	0754	481.5	1040	511.2	1118	510.5	1190
GR	509.9	1274	509.9	1357	508.2	1464	507.0	1545	510.1	1627
GR	510.8	1697	509.2	1758	511.3	1824	511.3	1914	510.2	1999
GR	508.7	2029	512.0	2081	514.2	2127	507.0	2166	507.0	2212
GR	514.2	2239	515.4	2331	517.0	2417	517.0	2519	516.7	2566
GR	518.6	2575	518.6	2584	517.0	2604	518.2	2676	521.1	2771
GR	524.8	2844	532.0	2876	532.0	2889	532.0	2926	530.2	2945
GR	533.3	2947	536.2	3011	539.0	3058	552.7	3123	559.1	3196
GR	600.0	3289								
EJ										
ER										

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *  RUN DATE    11AUG11    TIME   15:49:00 *
 *****************************************
```

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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1

11AUG11 15:49:00

THIS RUN EXECUTED 11AUG11 15:49:00

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
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```
T1      SRBC   SHICKSHINNY PA SITE UPDATE       EAA PROJECT NO  16213.02
T2      SECTIONS  1 THRU 12                     AUGUST 11, 2011
T3      SUSQUEHANNA RIVER      100-YEAR

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
                 4                                                                  510.5

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
   +1.0          0      -1.0                          -.80

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         8        26         3        51        52         4        39
      0       201

NC      0.1       .060      .040      0.10      0.30
QT        4     167000    232000    260000    340000
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ET	6					9.1			1074	1957
X1	6	56	1074	1957	1015	960	945			
GR	562.0	0000	559.0	0104	554.9	0200	553.7	0304	549.9	0402
GR	546.8	0505	544.6	0605	543.0	0703	541.2	0753	541.2	0773
GR	539.2	0838	517.5	0877	518.0	0892	518.0	0897	516.1	0906
GR	507.4	0929	504.9	0985	501.0	1020	499.9	1074	487.0	1098
GR	479.7	1115	479.7	1920	487.0	1929	501.4	1957	503.2	2008
GR	505.1	2080	505.1	2105	505.1	2116	504.4	2167	504.8	2188
GR	506.2	2242	504.9	2272	495.2	2297	492.3	2339	495.2	2391
GR	503.6	2439	506.0	2510	505.0	2582	504.2	2601	510.5	2629
GR	510.5	2642	504.7	2654	504.7	2687	510.9	2710	512.1	2760
GR	520.0	2787	520.7	2803	520.7	2808	520.1	2819	530.1	2843
GR	542.4	2894	554.8	2958	560.7	3032	566.9	3131	570.2	3221
GR	575.0	3274								
NC		.070								
ET	7					9.1			852	1713
X1	7	83	852	1713	970	900	890			
GR	575.0	0000	571.1	0060	568.2	0110	554.9	0196	555.6	0217
GR	553.2	0234	550.7	0272	550.7	0284	549.1	0355	547.2	0435
GR	543.6	0499	542.1	0563	542.1	0577	540.2	0629	538.8	0724
GR	536.1	0750	536.1	0769	536.2	0793	517.0	0823	517.0	0831
GR	516.1	0852	487.1	0923	480.7	0940	480.7	1659	487.1	1670
GR	501.4	1713	506.0	1787	505.8	1841	505.8	1857	505.1	1913
GR	505.1	1935	506.3	1994	508.1	2062	508.1	2090	507.2	2160

GR	506.6	2253	505.9	2348	503.0	2414	500.8	2422	500.8	2461
GR	503.8	2487	504.8	2547	504.8	2568	501.2	2594	499.9	2676
GR	501.1	2709	507.0	2732	506.3	2790	510.7	2839	510.7	2866
GR	509.9	2879	504.8	2892	504.8	2926	511.1	2943	517.2	2973
GR	517.2	2993	519.9	3002	520.5	3014	520.5	3023	520.0	3033
GR	527.2	3063	535.0	3141	542.1	3232	547.3	3303	550.8	3402
GR	553.2	3481	557.1	3558	559.8	3603	565.8	3703	566.7	3784
GR	566.0	3825	566.3	3852	567.3	3882	567.0	3940	566.3	4007
GR	565.8	4047	565.5	4076	564.3	4115	563.8	4124	565.2	4166
GR	558.1	4273	550.4	4382	575.0	4477				
NC	.080	.080								
ET	8					9.1			1418	2483
X1	8	90	1418	2483	2400	1120	1705			
GR	575.0	0000	555.6	0101	541.2	0198	532.5	0289	525.5	0371
GR	527.0	0385	527.0	0419	524.6	0441	518.0	0534	514.3	0614
GR	509.8	0697	506.1	0775	504.0	0807	508.3	0849	510.8	0940
GR	516.4	1007	513.5	1019	516.4	1037	516.4	1046	516.4	1055
GR	502.3	1090	499.3	1172	491.1	1209	502.3	1288	506.2	1355
GR	499.9	1418	488.0	1443	487.3	1514	487.2	1557	482.0	1600
GR	482.0	2430	487.2	2443	500.9	2483	504.9	2552	506.2	2642
GR	508.5	2693	508.5	2706	508.0	2753	508.4	2817	508.1	2897
GR	508.1	2985	507.9	3059	507.2	3132	505.1	3160	506.7	3225
GR	507.0	3304	504.7	3367	504.7	3434	505.2	3464	509.5	3486
GR	504.9	3500	504.9	3542	511.1	3559	505.1	3570	504.9	3580
GR	504.9	3629	505.1	3692	506.6	3775	507.0	3832	519.0	3890

GR	519.5	3905	519.5	3908	519.5	3911	519.0	3922	516.0	3943
GR	520.1	3993	520.9	4056	525.0	4128	525.7	4189	526.3	4233
GR	528.2	4302	530.0	4353	530.0	4392	531.9	4457	535.1	4532
GR	542.6	4559	543.5	4573	543.5	4612	543.2	4620	541.1	4687
GR	545.8	4730	560.0	4771	563.2	4827	564.0	4855	564.0	4871
GR	564.2	4914	564.2	4962	562.1	5028	563.4	5074	575.0	5110
ET	9					9.1			1758	2869
X1	9	86	1921	2869	2030	1650	2050			
GR	575.0	0000	553.9	0056	553.9	0072	544.9	0107	531.8	0190
GR	522.2	0263	518.7	0331	514.0	0404	509.6	0451	509.6	0526
GR	509.6	0595	514.9	0625	518.8	0686	520.6	0743	529.0	0821
GR	530.9	0892	531.8	0979	531.7	1003	516.4	1045	516.9	1052
GR	516.9	1053	516.9	1057	515.2	1074	503.1	1103	501.9	1146
GR	501.9	1210	503.5	1244	503.4	1324	504.9	1410	504.9	1513
GR	503.0	1548	504.7	1602	505.2	1661	505.2	1712	504.0	1794
GR	502.2	1856	505.5	1921	503.2	1950	487.5	1978	481.4	1988
GR	481.1	2798	487.5	2816	507.6	2869	507.6	2956	509.8	3016
GR	506.5	3089	505.7	3175	506.8	3264	506.2	3321	505.1	3387
GR	511.8	3395	511.8	3402	504.9	3421	504.9	3451	510.0	3472
GR	512.1	3541	512.2	3637	511.5	3716	513.3	3819	517.5	3918
GR	520.4	3964	520.0	3975	520.7	3981	520.7	3983	520.7	3987
GR	520.4	3996	521.4	4026	524.9	4107	526.9	4175	527.5	4213
GR	527.5	4223	530.8	4305	534.2	4377	537.0	4473	540.1	4535
GR	541.9	4547	541.9	4584	541.0	4596	544.1	4602	546.6	4648
GR	556.2	4740	565.0	4831	570.9	4862	573.5	4908	573.5	4923
GR	575.0	4933								

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NC	.060	.060								
ET	10					9.1			2139	3228
X1	10	86	2278	3228	2075	2160	2125			
GR	575.0	0000	571.9	0049	570.1	0102	562.3	0168	540.0	0251
GR	540.0	0266	531.1	0335	522.3	0421	516.0	0493	510.8	0554
GR	510.5	0592	510.5	0605	510.9	0679	513.1	0770	512.9	0868
GR	513.3	0969	513.3	1056	513.1	1157	512.1	1228	511.4	1248
GR	511.4	1264	512.9	1282	512.4	1339	515.1	1356	515.5	1362
GR	515.1	1370	514.8	1395	510.3	1406	509.1	1489	508.0	1576
GR	506.2	1679	506.2	1720	506.1	1826	508.1	1946	505.9	2005
GR	504.8	2073	501.1	2140	500.9	2200	500.7	2278	493.7	2301
GR	487.7	2348	480.0	2489	480.0	3141	487.7	3174	517.0	3228
GR	517.9	3247	517.9	3255	517.7	3323	517.5	3401	516.4	3492
GR	516.0	3602	512.9	3701	510.1	3806	507.3	3870	505.4	3951
GR	504.0	3990	504.0	4013	505.2	4034	512.1	4041	512.1	4049
GR	504.9	4064	504.9	4089	513.9	4110	513.9	4115	512.5	4123
GR	512.5	4529	516.6	4541	515.1	4555	517.5	4567	518.0	4572
GR	517.5	4580	513.1	4594	515.8	4602	513.2	4618	522.6	4660
GR	525.4	4698	525.6	4700	525.6	4737	525.1	4761	522.9	4819
GR	530.9	4881	544.1	4943	547.5	4985	550.1	5023	563.2	5096
GR	575.0	5162								
ET	11					7.1	777	1625		

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X1       11         62        777       1622       2785       2485       2690
GR    575.0       0000      556.1       0076      523.0       0160      512.0       0208      504.5       0278
GR    504.5       0293      515.5       0341      515.5       0352      515.9       0366      515.9       0387
GR    510.2       0416      510.9       0495      510.5       0580      512.1       0663      513.3       0739
GR    510.2       0777      503.0       0802      502.4       0812      488.0       0848      480.6       0864
GR    480.6       1555      488.0       1579      499.7       1622      501.2       1683      509.2       1725
GR    507.8       1797      509.8       1882      504.5       1951      504.8       2036      506.5       2127
GR    509.2       2239      513.7       2339      510.2       2460      510.7       2537      510.3       2635
GR    508.4       2727      508.8       2824      508.9       2902      511.0       2989      507.9       3058
GR    509.3       3124      504.9       3141      504.9       3169      509.5       3182      509.0       3210
GR    508.5       3282      513.9       3298      509.7       3314      509.7       3552      513.5       3589
GR    514.5       3597      513.5       3600      512.0       3614      518.0       3651      517.9       3656
GR    517.2       3700      518.7       3731      520.8       3801      525.1       3867      540.0       3911
GR    540.0       3924      575.0       4010

NH        5       .080        106       .040        640       .055        754       .040       1118       .060
NH     3289
ET       12                                                     7.1        106       1118
X1       12         51        106       1118       2375       2065       2340
GR    575.0       0000      521.0       0042      522.1       0060      522.1       0072      522.7       0083
GR    522.7       0089      521.0       0106      481.5       0176      481.5       0180      481.5       0640
GR    506.2       0678      481.5       0754      481.5       1040      511.2       1118      510.5       1190
GR    509.9       1274      509.9       1357      508.2       1464      507.0       1545      510.1       1627
GR    510.8       1697      509.2       1758      511.3       1824      511.3       1914      510.2       1999
GR    508.7       2029      512.0       2081      514.2       2127      507.0       2166      507.0       2212
GR    514.2       2239      515.4       2331      517.0       2417      517.0       2519      516.7       2566
GR    518.6       2575      518.6       2584      517.0       2604      518.2       2676      521.1       2771
GR    524.8       2844      532.0       2876      532.0       2889      532.0       2926      530.2       2945
GR    533.3       2947      536.2       3011      539.0       3058      552.7       3123      559.1       3196
GR    600.0       3289
1
```



```
    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 *PROF 1
0

 CCHV=      .100 CEHV=      .300
 *SECNO 6.000

 3265 DIVIDED FLOW

      6.000      30.80     510.50        .00     510.50     511.78       1.28        .00        .00     499.90
   260000.0     1315.2  246044.9   12639.9     1063.3   26365.5     5527.6         .0         .0     501.40
       .00       1.24       9.33       2.29       .100       .032       .060       .000     479.70     920.80
    .000443     1015.      945.       960.          0          0          0        .00    1774.71    2708.52


 *SECNO 7.000
```

7.000	30.02	510.72	.00	.00	512.34	1.62	.46	.10	516.10
260000.0	.0	248098.0	11902.1	.0	23728.1	6651.5	649.4	39.7	501.40
.02	.00	10.46	1.79	.000	.032	.070	.000	480.70	865.17
.000606	970.	890.	900.	2	0	0	.00	2076.81	2941.98

*SECNO 8.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

8.000	30.25	512.25	.00	.00	513.16	.91	.74	.07	499.90
260000.0	8340.1	242799.4	8860.5	5170.3	30659.7	7873.7	2043.0	128.7	500.90
.09	1.61	7.92	1.13	.080	.032	.080	.000	482.00	651.87
.000332	2400.	1705.	1120.	2	0	0	.00	3097.49	3857.36

*SECNO 9.000

3265 DIVIDED FLOW

9.000	31.75	512.85	.00	.00	513.95	1.10	.73	.06	505.50
260000.0	12228.3	243327.8	4443.8	7993.4	27937.1	3852.3	3950.6	259.2	507.60
.16	1.53	8.71	1.15	.080	.032	.080	.000	481.10	416.33
.000392	2030.	2050.	1650.	2	0	0	.00	2910.39	3793.00

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 10.000

3265 DIVIDED FLOW

10.000	33.73	513.73	.00	.00	514.72	.99	.76	.01	500.70
260000.0	13637.0	242280.3	4082.7	7921.0	29277.7	2879.7	5892.1	415.0	517.00
.23	1.72	8.28	1.42	.060	.032	.060	.000	480.00	519.63
.000330	2075.	2125.	2160.	2	0	0	.00	3513.31	4620.37

*SECNO 11.000

3265 DIVIDED FLOW

11.000	33.98	514.58	.00	.00	515.71	1.14	.95	.04	510.20
260000.0	2693.7	237639.0	19667.3	2047.7	26594.8	11593.4	8348.8	623.4	499.70

```
      .32       1.32       8.94       1.70       .060       .032       .060       .000     480.60     196.76
   .000377    2785.      2690.      2485.          2          0          0        .00    3376.35    3629.88


1490 NH CARD USED
*SECNO 12.000
    12.000      34.08     515.58        .00        .00     516.56        .98        .83        .02     521.00
  260000.0         .0  248251.9   11748.1          .0   30562.0     6393.1   10366.2      763.9     511.20
       .40        .00       8.12       1.84       .000       .032       .048       .000     481.50     115.61
   .000337    2375.      2340.      2065.          2          0          0        .00    2224.83    2340.44
```



```
**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUSQUEHANNA RIVER      1

SUMMARY PRINTOUT
```

SECNO	Q	CWSEL	DEPTH	VCH	EG	DIFWSX	DIFKWS	TOPWID	XLCH
6.000	260000.00	510.50	30.80	9.33	511.78	.00	.00	1774.71	.00
7.000	260000.00	510.72	30.02	10.46	512.34	.22	.00	2076.81	890.00
8.000	260000.00	512.25	30.25	7.92	513.16	1.52	.00	3097.49	1705.00
9.000	260000.00	512.85	31.75	8.71	513.95	.60	.00	2910.39	2050.00
10.000	260000.00	513.73	33.73	8.28	514.72	.88	.00	3513.31	2125.00
11.000	260000.00	514.58	33.98	8.94	515.71	.85	.00	3376.35	2690.00
12.000	260000.00	515.58	34.08	8.12	516.56	1.00	.00	2224.83	2340.00

SUMMARY OF ERRORS AND SPECIAL NOTES

1

11AUG11 15:49:00 PAGE 8

FLOOD INSURANCE ZONE DATA FOR SUSQUEHANNA RIVER 1

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 10	2	0.2
6.000	0.	510.50	.00	.00
7.000	890.	510.72	.00	.00
8.000	2595.	512.25	.00	.00
9.000	4645.	512.85	.00	.00
10.000	6770.	513.73	.00	.00
11.000	9460.	514.58	.00	.00
12.000	11800.	515.58	.00	.00
WEIGHTED AVG FOR REACH		513.24	.00	.00

FHF FOR THE REACH = 005 WITH 18.0 PERCENT OF THE REACH WITHIN .5 FEET
ZONE FOR THE REACH = A 1

CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	AVG ELEVATION DATA 10	1	DIFF.	WTD. AVG.	FHF	PERCENT WITHIN
	0.				SEC.		6.000
1	890.	510.61	.00	510.61	510.61	005	100.
	890.				SEC.		7.000
2	1780.	511.12	.00	511.12	510.86	005	100.
	2595.				SEC.		8.000
3	2670.	511.89	.00	511.89	511.21	005	33.
4	3560.	512.40	.00	512.40	511.51	005	50.
5	4450.	512.66	.00	512.66	511.74	005	20.
	4645.				SEC.		9.000
6	5340.	512.96	.00	512.96	511.94	005	33.
7	6230.	513.32	.00	513.32	512.14	005	29.
	6770.				SEC.		10.000
8	7120.	513.67	.00	513.67	512.33	005	38.

```
  9     8010.  513.98     .00  513.98     512.51    005        33.
 10     8900.  514.26     .00  514.26     512.69    005        30.
        9460.                                SEC.     11.000
 11     9790.  514.56     .00  514.56     512.86    005        36.
 12    10680.  514.91     .00  514.91     513.03    005        25.
 13    11570.  515.29     .00  515.29     513.20    005        23.
        11800.                               SEC.     12.000
1
```



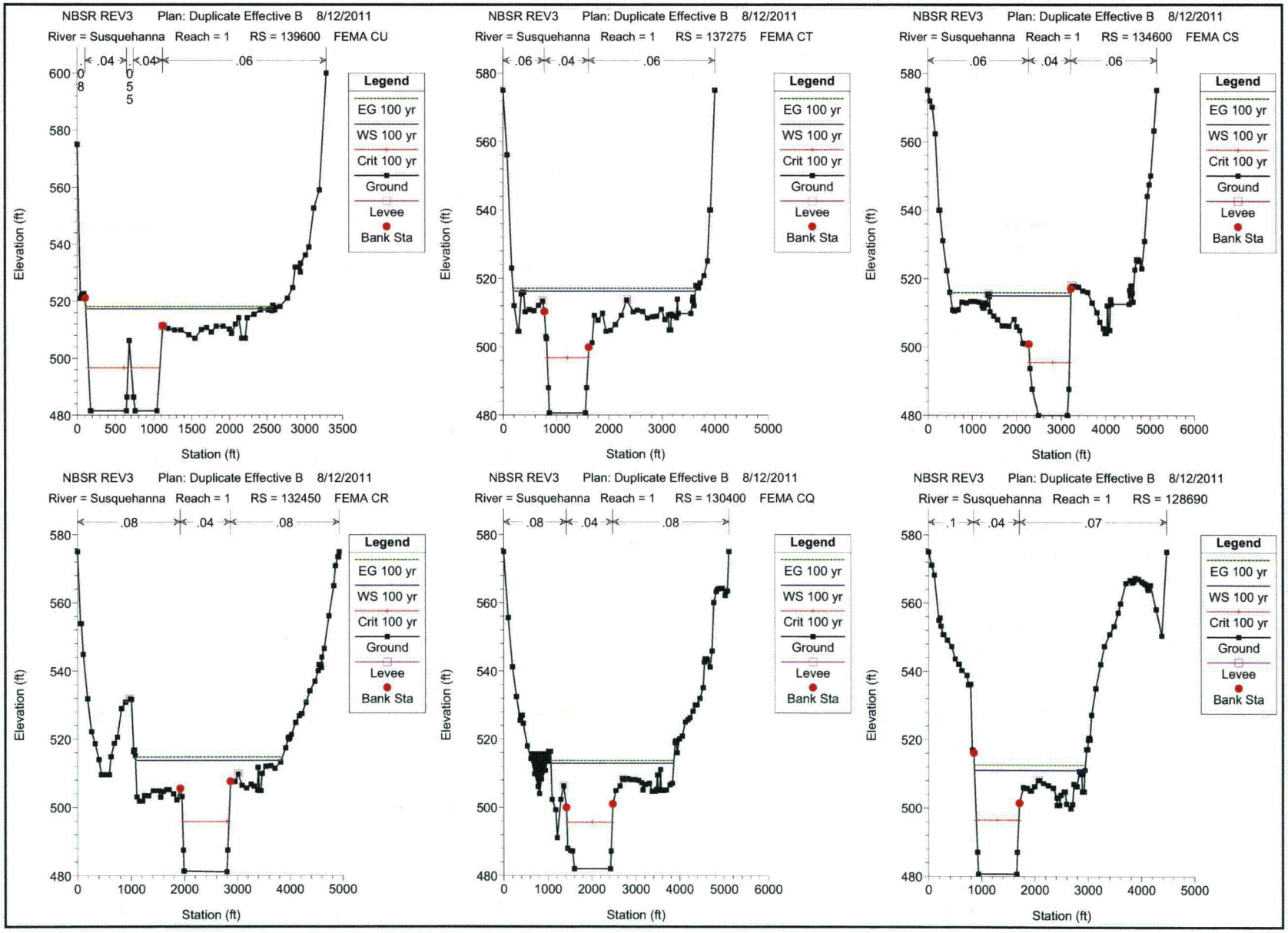
```
THIS REACH CAN BE SUBDIVIDED BY INC NO. TO MEET FIA REQUIREMENTS
INPUT 20N WHERE N IS THE NUMBER OF REACHES AND THEN INPUT THE END
OF EACH REACH BY INC NO.  FOR EXAMPLE  202   2  13
A NEGATIVE INC NO. WILL SUPPRESS INTERMEDIATE INC OUTPUT.



CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS


INC     TOTAL     WEIGHTED AVG DIFFERENCE
NO.     LENGTH     BETWEEN BASE FLOOD AND
                   10       2        0.2

  2     1780.  510.86      .00      .00

FHF FOR REACH   1 = 005 WITH  100. PERCENT OF THE REACH WITHIN  .5 FEET
ZONE FOR THE REACH = A 1
==========================================================================

  5     4450.  512.32      .00      .00

FHF FOR REACH   2 = 005 WITH  100. PERCENT OF THE REACH WITHIN  .5 FEET
ZONE FOR THE REACH = A 1
==========================================================================

  8     7120.  513.32      .00      .00

FHF FOR REACH   3 = 005 WITH  100. PERCENT OF THE REACH WITHIN  .5 FEET
ZONE FOR THE REACH = A 1
==========================================================================

 12    10680.  514.43      .00      .00

FHF FOR REACH   4 = 005 WITH  100. PERCENT OF THE REACH WITHIN  .5 FEET
ZONE FOR THE REACH = A 1
==========================================================================

 13    11570.  515.29      .00      .00

FHF FOR REACH   5 = 005 WITH  100. PERCENT OF THE REACH WITHIN  .5 FEET
ZONE FOR THE REACH = A 1
```

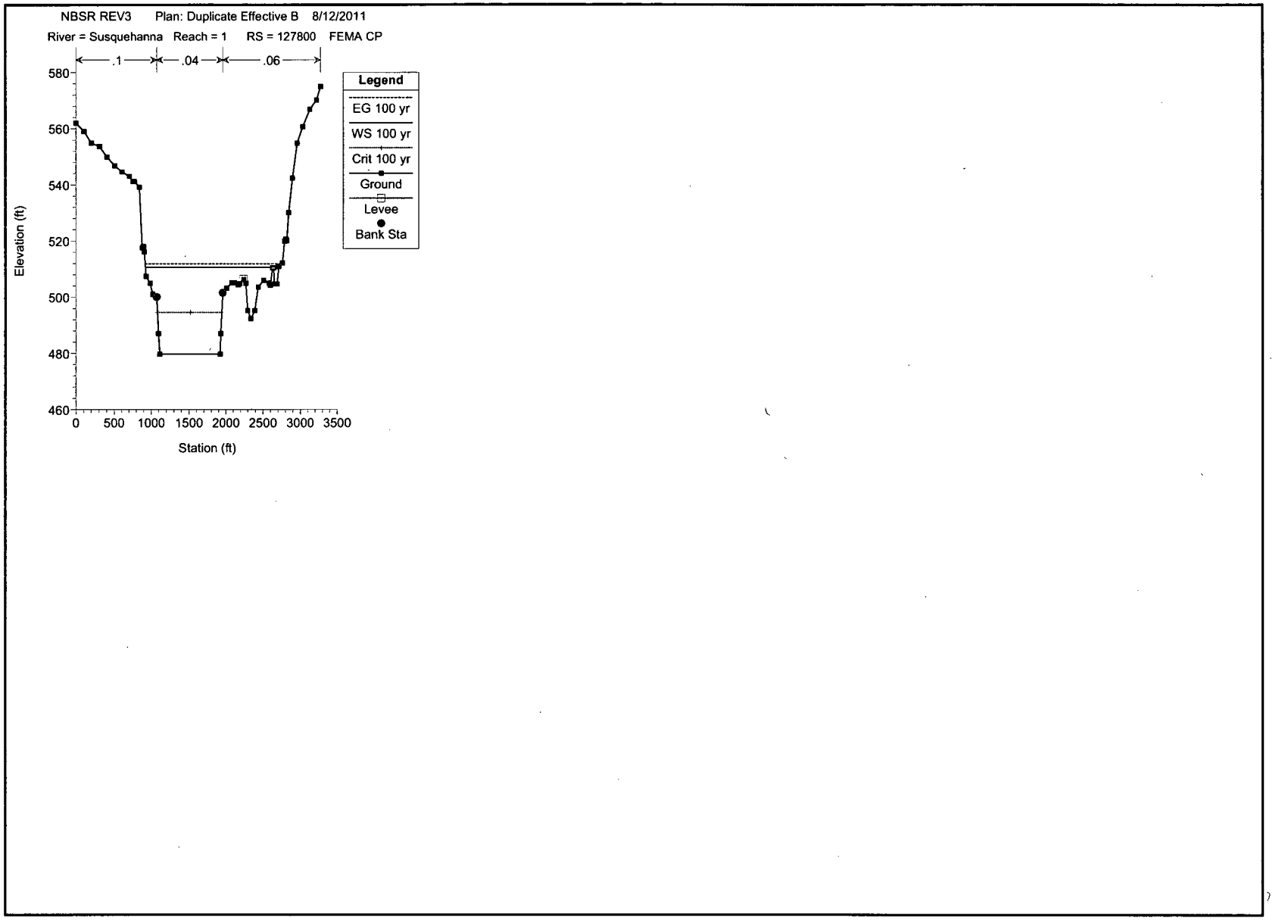
Appendix F:
Duplicate Effective Model B

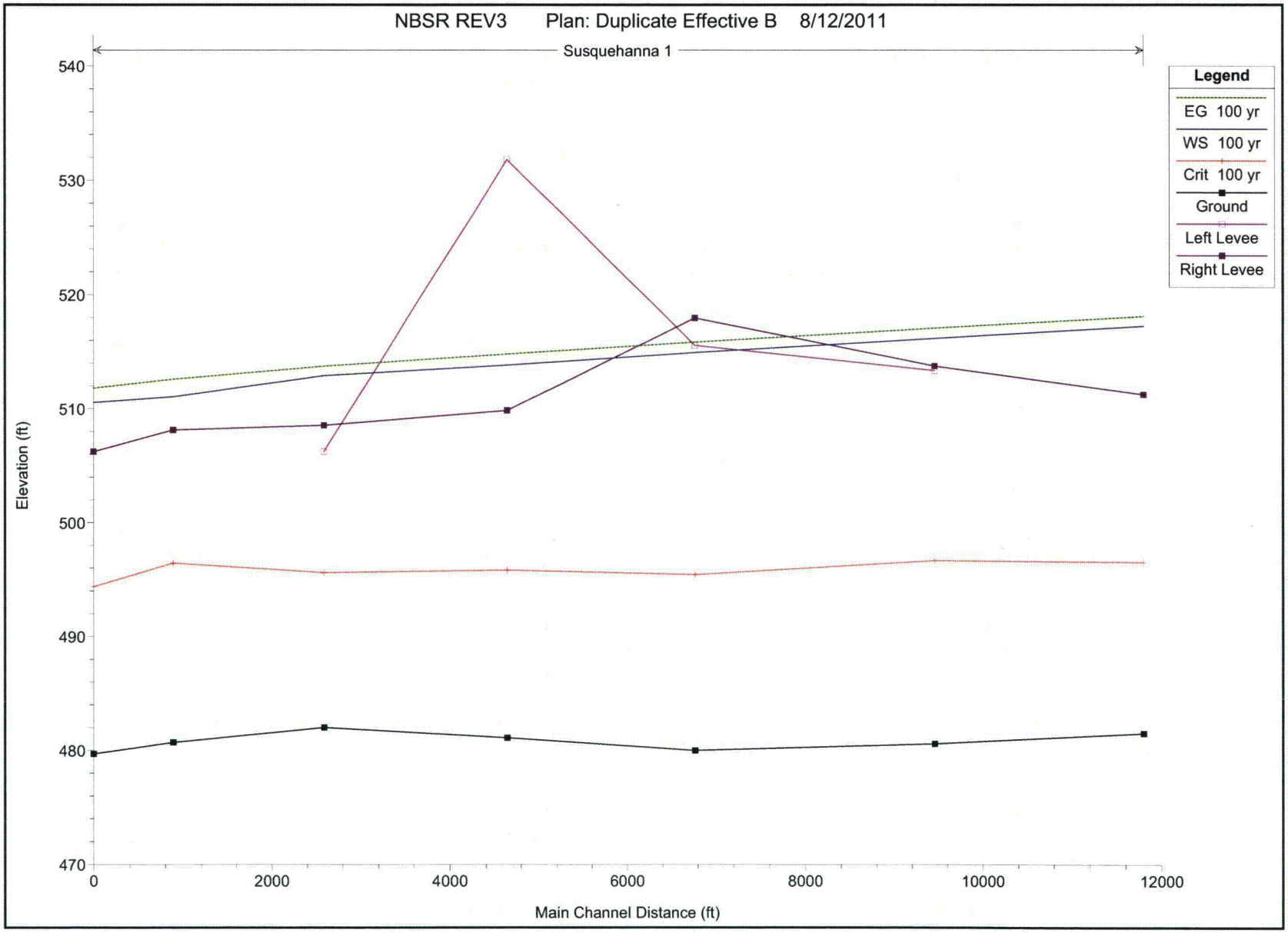
- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

HEC-RAS Plan: Dupl. EffectiveB River: Susquehanna Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.07	492.75	511.70	0.000387	6.39	26130.95	994.06	0.22
1	139600	50 yr	232000.00	481.50	515.53	495.43	516.32	0.000416	7.27	36915.58	2222.13	0.23
1	139600	100 yr	260000.00	481.50	517.20	496.49	518.05	0.000429	7.62	40736.70	2455.61	0.24
1	139600	500 yr	340000.00	481.50	521.44	499.31	522.42	0.000444	8.36	51651.41	2683.56	0.25
1	137275	10 yr	167000.00	480.60	509.87	492.62	510.68	0.000482	7.26	24832.17	1475.85	0.25
1	137275	50 yr	232000.00	480.60	514.38	495.50	515.28	0.000471	7.96	39587.07	3371.22	0.25
1	137275	100 yr	260000.00	480.60	516.13	496.64	517.02	0.000456	8.11	45511.95	3449.45	0.25
1	137275	500 yr	340000.00	480.60	520.50	499.71	521.40	0.000422	8.48	60960.07	3620.12	0.24
1	134600	10 yr	167000.00	480.00	508.76	491.71	509.44	0.000416	6.67	27196.79	1696.99	0.23
1	134600	50 yr	232000.00	480.00	513.17	494.35	514.03	0.000449	7.63	35114.02	1821.97	0.24
1	134600	100 yr	260000.00	480.00	514.87	495.40	515.79	0.000459	7.98	38207.27	1834.66	0.25
1	134600	500 yr	340000.00	480.00	519.42	498.16	520.29	0.000402	8.14	62114.85	4191.91	0.24
1	132450	10 yr	167000.00	481.10	507.67	492.11	508.44	0.000529	7.11	26147.60	1865.76	0.25
1	132450	50 yr	232000.00	481.10	512.07	494.73	512.99	0.000531	7.96	37152.01	2555.50	0.26
1	132450	100 yr	260000.00	481.10	513.77	495.80	514.74	0.000530	8.27	41752.06	2752.58	0.26
1	132450	500 yr	340000.00	481.10	518.23	498.59	519.31	0.000514	8.92	54331.59	2889.54	0.27
1	130400	10 yr	167000.00	482.00	506.70	492.33	507.37	0.000482	6.62	27244.70	1574.11	0.24
1	130400	50 yr	232000.00	482.00	511.13	494.66	511.93	0.000477	7.39	39455.45	2783.88	0.25
1	130400	100 yr	260000.00	482.00	512.85	495.58	513.69	0.000470	7.64	44252.76	2796.46	0.25
1	130400	500 yr	340000.00	482.00	517.31	498.08	518.28	0.000467	8.37	57278.68	3358.23	0.25
1	128690	10 yr	167000.00	480.70	505.02	492.46	506.22	0.000888	8.82	19037.51	892.08	0.33
1	128690	50 yr	232000.00	480.70	509.29	495.28	510.77	0.000911	9.93	27482.55	2012.27	0.34
1	128690	100 yr	260000.00	480.70	511.00	496.42	512.55	0.000901	10.26	30951.43	2078.23	0.34
1	128690	500 yr	340000.00	480.70	515.53	499.40	517.19	0.000850	10.91	40441.86	2111.38	0.34
1	127800	10 yr	167000.00	479.70	504.50	490.62	505.47	0.000671	7.91	21486.01	1081.21	0.29
1	127800	50 yr	232000.00	479.70	508.80	493.29	509.99	0.000684	8.92	29957.90	1752.84	0.30
1	127800	100 yr	260000.00	479.70	510.50	494.35	511.76	0.000685	9.28	32956.34	1774.71	0.30
1	127800	500 yr	340000.00	479.70	515.00	497.18	516.46	0.000677	10.13	41223.56	1861.00	0.30


NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 139600 FEMA CU
.04
.04
.06
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 137275 FEMA CT
.06
.04
.06
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 134600 FEMA CS
.06
.04
.06
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 132450 FEMA CR
.08
.04
.08
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 130400 FEMA CQ
.08
.04
.08
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 128690
.1
.04
.07
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 127800 FEMA CP
.1
.04
.06
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Levee
Bank Sta
Elevation (ft)
580
560
540
520
500
480
460
0
500
1000
1500
2000
2500
3000
3500
Station (ft)


NBSR REV3 Plan: Duplicate Effective B 8/12/2011
Susquehanna 1
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Left Levee
Right Levee
Elevation (ft)
540
530
520
510
500
490
480
470
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)

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    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        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: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 3:38:22 PM

Project in English units

FLOW DATA

Flow Title: FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr	100 yr	500 yr	100-yr encroachment
Susquehanna	1	139600	167000	232000	260000	340000	260000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Susquehanna	1	10 yr	Critical	Known WS = 504.5
Susquehanna	1	50 yr	Critical	Known WS = 508.8
Susquehanna	1	100 yr	Critical	Known WS = 510.5
Susquehanna	1	500 yr	Critical	Known WS = 515
Susquehanna	1	100-yr encroachment	Critical	Known WS = 511.5

GEOMETRY DATA

Geometry Title: Existing HEC2 FEMA
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g12

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139600

INPUT
Description: FEMA CU
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	106	.04	647	.055	733	.04	1118	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
106	1118	2375	2340	2065	.1	.3

Right Levee Station= 1118 Elevation= 511.2
Blocked Obstructions num= 1

Sta L	Sta R	Elev
2575	3289	518.6

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137275

INPUT
Description: FEMA CT
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3
777	510.2	802	503	812	502.4	848	488	864	480.6
1555	480.6	1579	488	1622	499.7	1683	501.2	1725	509.2
1797	507.8	1882	509.8	1951	504.5	2036	504.8	2127	506.5
2239	509.2	2339	513.7	2460	510.2	2537	510.7	2635	510.3
2727	508.4	2824	508.8	2902	508.9	2989	511	3058	507.9
3124	509.3	3141	504.9	3169	504.9	3182	509.5	3210	509
3282	508.5	3298	513.9	3314	509.7	3552	509.7	3589	513.5
3597	514.5	3600	513.5	3614	512	3651	518	3656	517.9
3700	517.2	3731	518.7	3801	520.8	3867	525.1	3911	540
3924	540	4010	575						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	777	.04	1622	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
777	1622	2785	2690	2485	.1	.3

Left Levee Station= 739 Elevation= 513.3
Right Levee Station= 2339 Elevation= 513.7

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 134600

INPUT
Description: FEMA CS
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2489	480	3141	480	3174	487.7	3228	517
3247	517.9	3255	517.9	3323	517.7	3401	517.5	3492	516.4
3602	516	3701	512.9	3806	510.1	3870	507.3	3951	505.4
3990	504	4013	504	4034	505.2	4041	512.1	4049	512.1
4064	504.9	4089	504.9	4110	513.9	4115	513.9	4123	512.5
4529	512.5	4541	516.6	4555	515.1	4567	517.5	4572	518
4580	517.5	4594	513.1	4602	515.8	4618	513.2	4660	522.6
4698	525.4	4700	525.6	4737	525.6	4761	525.1	4819	522.9
4881	530.9	4943	544.1	4985	547.5	5023	550.1	5096	563.2
5162	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2278	.04	3228	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2278	3228	2075	2125	2160	.1	.3

Left Levee Station= 1362 Elevation= 515.5
Right Levee Station= 3247 Elevation= 517.9

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132450

INPUT
Description: FEMA CR
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	56	553.9	72	553.9	107	544.9	190	531.8
263	522.2	331	518.7	404	514	451	509.6	526	509.6
595	509.6	625	514.9	686	518.8	743	520.6	821	529
892	530.9	979	531.8	1003	531.7	1045	516.4	1052	516.9
1053	516.9	1057	516.9	1074	515.2	1103	503.1	1146	501.9

1210	501.9	1244	503.5	1324	503.4	1410	504.9	1513	504.9
1548	503	1602	504.7	1661	505.2	1712	505.2	1794	504
1856	502.2	1921	505.5	1950	503.2	1978	487.5	1988	481.4
2798	481.1	2816	487.5	2869	507.6	2956	507.6	3016	509.8
3089	506.5	3175	505.7	3264	506.8	3321	506.2	3387	505.1
3395	511.8	3402	511.8	3421	504.9	3451	504.9	3472	510
3541	512.1	3637	512.2	3716	511.5	3819	513.3	3918	517.5
3964	520.4	3975	520	3981	520.7	3983	520.7	3987	520.7
3996	520.4	4026	521.4	4107	524.9	4175	526.9	4213	527.5
4223	527.5	4305	530.8	4377	534.2	4473	537	4535	540.1
4547	541.9	4584	541.9	4596	541	4602	544.1	4648	546.6
4740	556.2	4831	565	4862	570.9	4908	573.5	4923	573.5
4933	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1921	.04	2869	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1921	2869	2030.01	2050	1650	.1	.3

Left Levee Station= 979 Elevation= 531.8
Right Levee Station= 3016 Elevation= 509.8

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130400

INPUT
Description: FEMA CQ
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1514	487.3	1557	487.2	1600	482
2430	482	2443	487.2	2483	500.9	2552	504.9	2642	506.2
2693	508.5	2706	508.5	2753	508	2817	508.4	2897	508.1
2985	508.1	3059	507.9	3132	507.2	3160	505.1	3225	506.7
3304	507	3367	504.7	3434	504.7	3464	505.2	3486	509.5
3500	504.9	3542	504.9	3559	511.1	3570	505.1	3580	504.9
3629	504.9	3692	505.1	3775	506.6	3832	507	3890	519
3905	519.5	3908	519.5	3911	519.5	3922	519	3943	516
3993	520.1	4056	520.9	4128	525	4189	525.7	4233	526.3
4302	528.2	4353	530	4392	530	4457	531.9	4532	535.1
4559	542.6	4573	543.5	4612	543.5	4620	543.2	4687	541.1
4730	545.8	4771	560	4827	563.2	4855	564	4871	564
4914	564.2	4962	564.2	5028	562.1	5074	563.4	5110	575

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1418	.04	2483	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1418	2483	2400	1705	1120	.1	.3

Left Levee Station= 1355 Elevation= 506.2
Right Levee Station= 2693 Elevation= 508.5
Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	1046	516.4

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 128690

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	940	480.7	1659	480.7	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	852	.04	1713	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
852	1713	970	890	900	.1	.3

Right Levee Station= 2062 Elevation= 508.1

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 127800

INPUT
Description: FEMA CP
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1115	479.7	1920	479.7	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	1074	.04	1957	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1074	1957		1015	945	960	.1	.3

Right Levee Station= 2242 Elevation= 506.2

Profile Output Table - Standard Table 1

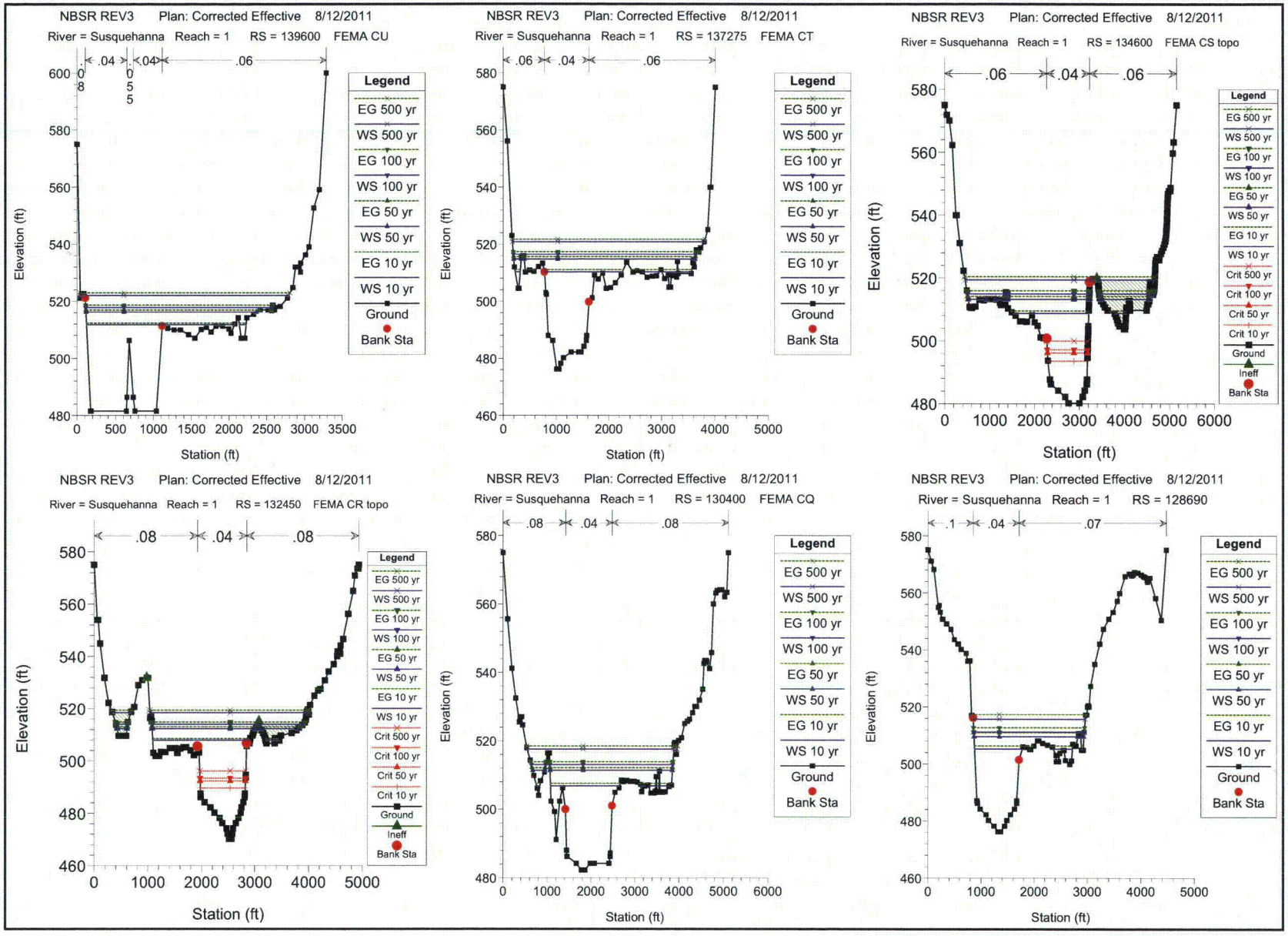
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S. E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl (ft)	
1	139600	100 yr	260000.00	481.50	517.20	
496.49	518.05	0.000429	7.62	40736.70	2455.61	0.24
1	137275	100 yr	260000.00	480.60	516.13	
496.64	517.02	0.000456	8.11	45511.95	3449.45	0.25
1	134600	100 yr	260000.00	480.00	514.87	
495.40	515.79	0.000459	7.98	38207.27	1834.66	0.25
1	132450	100 yr	260000.00	481.10	513.77	
495.80	514.74	0.000530	8.27	41752.06	2752.58	0.26
1	130400	100 yr	260000.00	482.00	512.85	
495.58	513.69	0.000470	7.64	44252.76	2796.46	0.25
1	128690	100 yr	260000.00	480.70	511.00	
496.42	512.55	0.000901	10.26	30951.43	2078.23	0.34
1	127800	100 yr	260000.00	479.70	510.50	
494.35	511.76	0.000685	9.28	32956.34	1774.71	0.30

Appendix G:
Corrected Effective Model

- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

HEC-RAS Plan: Correct Effectiv River: Susquehanna Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.61		512.20	0.000356	6.21	28635.68	2040.35	0.21
1	139600	50 yr	232000.00	481.50	516.07		516.82	0.000389	7.11	38120.82	2252.04	0.22
1	139600	100 yr	260000.00	481.50	517.70		518.52	0.000403	7.46	41979.43	2458.90	0.23
1	139600	500 yr	340000.00	481.50	521.88		522.83	0.000422	8.22	52843.65	2704.31	0.24
1	137275	10 yr	167000.00	476.20	510.19		511.01	0.000515	7.38	25783.76	2415.84	0.25
1	137275	50 yr	232000.00	476.20	514.69		515.60	0.000494	8.03	39795.30	3378.69	0.26
1	137275	100 yr	260000.00	476.20	516.40		517.30	0.000476	8.18	45612.57	3452.31	0.25
1	137275	500 yr	340000.00	476.20	520.75		521.65	0.000437	8.52	61018.59	3629.44	0.25
1	134600	10 yr	167000.00	480.20	508.66	493.47	509.44	0.000519	7.13	25493.07	1934.54	0.25
1	134600	50 yr	232000.00	480.20	513.16	496.07	514.10	0.000534	8.02	34154.00	3528.34	0.26
1	134600	100 yr	260000.00	480.20	514.87	497.11	515.85	0.000531	8.29	38687.77	3815.97	0.26
1	134600	500 yr	340000.00	480.20	519.28	499.87	520.36	0.000519	8.91	50831.84	4100.61	0.27
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32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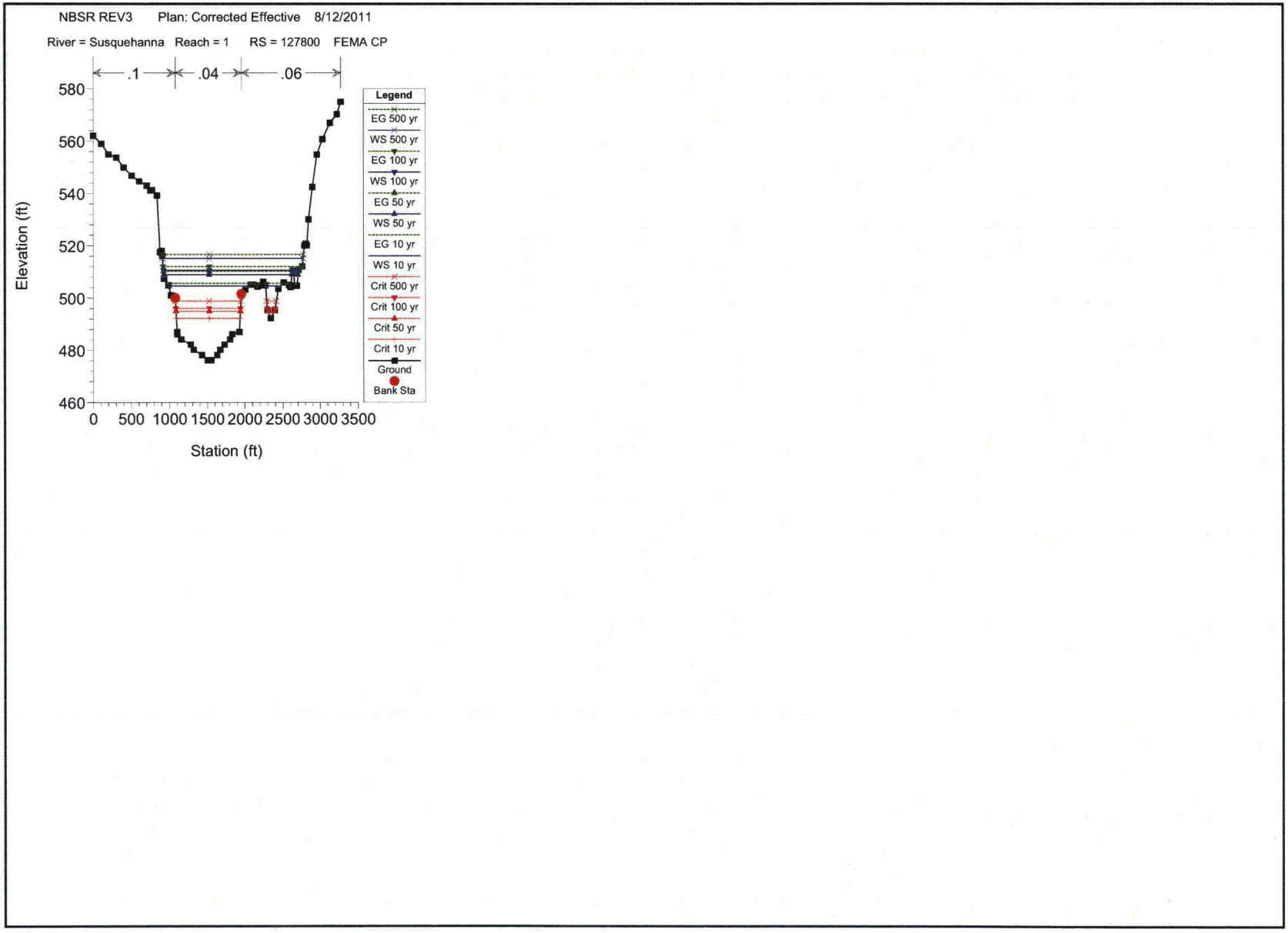
River = Susquehanna Reach = 1 RS = 139600 FEMA CU
.04 .04 .06
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Corrected Effective 8/12/2011
River = Susquehanna Reach = 1 RS = 137275 FEMA CT
.06 .04 .06
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Corrected Effective 8/12/2011
River = Susquehanna Reach = 1 RS = 134600 FEMA CS topo
.06 .04 .06
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Corrected Effective 8/12/2011
River = Susquehanna Reach = 1 RS = 132450 FEMA CR topo
.08 .04 .08
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Corrected Effective 8/12/2011
River = Susquehanna Reach = 1 RS = 130400 FEMA CQ
.08 .04 .08
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
NBSR REV3 Plan: Corrected Effective 8/12/2011
River = Susquehanna Reach = 1 RS = 128690
.1 .04 .07
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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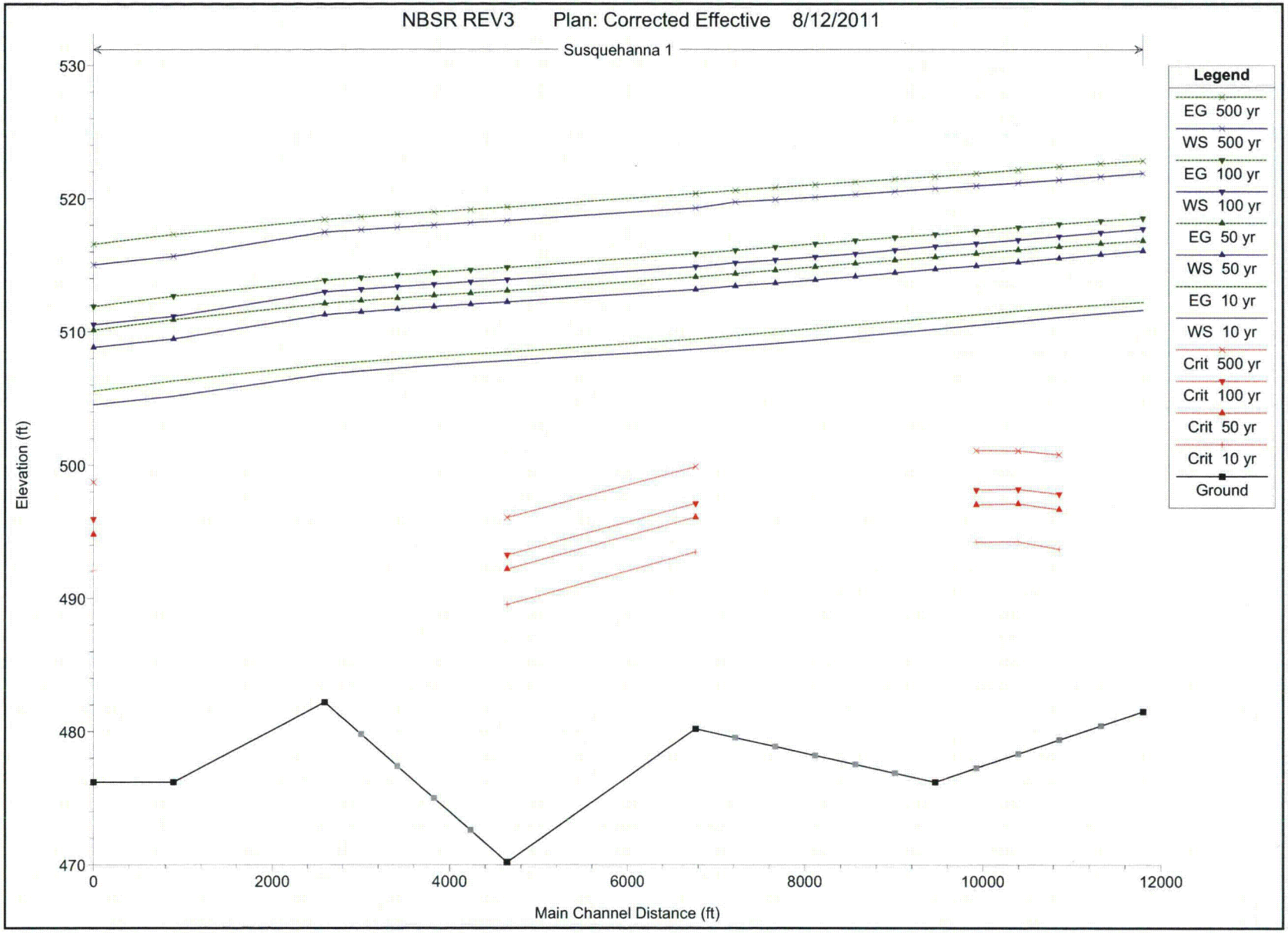
River = Susquehanna Reach = 1 RS = 127800 FEMA CP
.1
.04
.06
Elevation (ft)
580
560
540
520
500
480
460
0 500 1000 1500 2000 2500 3000 3500
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Bank Sta


NBSR REV3 Plan: Corrected Effective 8/12/2011
Susquehanna 1
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Elevation (ft)
530
520
510
500
490
480
470
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)

CorEff.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    X    X    X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
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X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
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PROJECT DATA
Project Title: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 3:45:23 PM

Project in English units

PLAN DATA

Plan Title: Corrected Effective
Plan File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.p13

Geometry Title: Corrected Effective
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g13

Flow Title : FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Plan Summary Information:

Number of:	Cross Sections	= 20	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	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
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FEMA Ex Flow

Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr	100 yr	500 yr	100-yr encroachment
Susquehanna	1	139600	167000	232000	260000	340000	260000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Susquehanna	1	10 yr	Critical	Known WS = 504.5
Susquehanna	1	50 yr	Critical	Known WS = 508.8
Susquehanna	1	100 yr	Critical	Known WS = 510.5
Susquehanna	1	500 yr	Critical	Known WS = 515
Susquehanna	1	100-yr encroachment	Critical	Known WS = 511.5

GEOMETRY DATA

Geometry Title: Corrected Effective
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g13

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139600

INPUT
Description: FEMA CU
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

0	.08	106	.04	647	.055	733	.04	1118	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
106 1118 475.01 468 412.99 .1 .3
Blocked Obstructions num= 1

Sta L	Sta R	Elev
2575	3289	518.6

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139135.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	23.49	560.56	49.46	542.15	64.3	533.21	85.94	521.89
90.58	519.79	95.17	518.38	105.42	520.12	108.82	520.19	113.14	520.37
119.64	520.51	128.6	519.56	135.96	519.76	153.02	519.86	163.15	519.83
179.3	520.09	188.08	520.37	201.68	520.54	204.96	520.46	228.45	519.87
240.2	518.84	251.25	513.99	255.67	512.5	271.59	504.7	309.32	492.68
342.47	480.44	345.72	480.44	719.04	480.44	724.72	484.33	749.88	500.2
794.52	484.33	811.56	480.44	1043.67	480.44	1052.99	482.1	1068.53	484.61
1113.58	491.12	1157.08	497.03	1172.62	499.13	1189.71	501.85	1203.69	504.15
1205.44	504.75	1218.8	508.9	1275.37	508.77	1292.24	509.33	1314.31	510.12
1377.92	509.49	1381.08	509.48	1459.9	509.88	1462.58	509.84	1523.88	508.06
1571.72	507.5	1602.7	507.16	1654.34	506.77	1687.09	507.87	1737.98	509.64
1790.95	510.34	1809.37	510.66	1871.59	509.98	1883.68	510.4	1938.91	511.44
1995.88	511.08	2030.71	511.13	2067.28	510.81	2117.41	510.26	2148.01	509.03
2158.16	509.53	2201.05	511.47	2243.47	512.87	2247.97	513.04	2287.75	507.32
2333.42	507.36	2334.67	507.36	2362.21	513.13	2405.75	513.59	2456.05	514.36
2486.42	514.96	2543.77	515.24	2550.41	515.18	2611.61	515.46	2627.37	514.58
2647.81	514.58	2653.34	514.55	2665.39	515.41	2691.36	515.18	2695.75	515.15
2704.93	516.66	2714.11	516.65	2734.51	515.34	2758.12	515.61	2772.96	516.88
2787.8	516.24	2807.95	516.5	2904.84	518.82	2979.3	521.78	3008.5	526.93
3011.94	527.62	3025.2	527.91	3042.81	528.3	3050.22	528.5	3053.01	528.3
3062.94	528.07	3065.99	527.77	3082.32	527.13	3084.36	529.68	3100.3	530.81
3104.93	530.95	3145.74	532.26	3149.64	532.44	3174.48	533.86	3197.58	535.09
3239.39	542.27	3263.88	546.66	3300.6	549.7	3338.34	555.06	3341.4	556.33
3353.45	560.49	3433.2	595						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.076	240.2	.04	763.34	.054	846.51	.042	1218.8	.06
3433.2	.06								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
240.2 1218.8 475.01 468 412.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 138670.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	36.62	559.44	77.1	537.36	100.23	527.91	133.96	517.54
141.18	515.96	148.35	515.76	164.31	518.97	169.61	519.02	176.36	519.25

186.48	519.36	200.45	517.22	211.92	517.42	238.52	517.62	254.31	517.56
279.47	517.69	293.16	518.04	314.35	518.38	319.47	518.37	356.09	518.23
374.4	516.68	388.94	511.24	394.75	509.97	415.69	500.53	465.33	491.06
508.94	479.38	511.44	479.38	798.08	479.38	802.45	482.3	821.76	494.2
856.04	482.3	869.12	479.38	1047.34	479.38	1061.83	481.13	1085.99	483.51
1156.03	488.89	1223.65	493.32	1247.8	494.9	1274.37	497.44	1296.11	499.66
1298.83	500.56	1319.6	506.6	1377.27	506.88	1394.48	508.17	1416.98	509.89
1481.84	509.09	1485.06	509.06	1565.42	509.86	1568.16	509.77	1630.66	507.17
1679.43	506.79	1711.03	506.57	1763.67	506.54	1797.07	507.53	1848.95	509.19
1902.96	510.05	1921.75	510.52	1985.19	510.77	1997.51	511.23	2053.83	511.57
2111.91	510.86	2147.43	510.96	2184.71	510.78	2235.82	510.31	2267.02	509.36
2277.37	509.72	2321.1	510.94	2364.35	511.75	2368.94	511.89	2409.5	507.64
2456.06	507.72	2457.34	507.72	2485.42	512.06	2529.81	512.41	2581.1	513.32
2612.07	513.97	2670.54	513.49	2677.31	513.36	2739.71	513.92	2755.78	512.16
2776.61	512.16	2782.25	512.14	2794.54	513.93	2821.02	513.64	2825.49	513.61
2834.85	514.72	2844.21	514.69	2865.01	513.67	2889.09	513.83	2904.22	516.14
2919.35	514.6	2939.89	514.8	3038.69	516.54	3114.61	518.76	3144.37	522.62
3147.89	523.23	3161.41	523.82	3179.35	524.6	3186.92	525	3189.75	524.6
3199.89	524.14	3202.99	523.83	3219.65	524.06	3221.73	526.07	3237.97	527.6
3242.7	527.69	3284.3	528.5	3288.29	528.68	3313.61	530.07	3337.16	531.18
3379.8	536.9	3404.76	540.63	3442.2	543.55	3480.68	551.01	3483.8	552.25
3496.09	555.37	3577.4	590						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	374.4	.04	1047.34	.045	1319.6	.06	3577.4	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
374.4	1319.6	475.01	468	412.99	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	314.35	518.38	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 138205.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49.75	558.33	104.73	532.57	136.15	522.61	181.97	513.2
191.79	512.14	201.52	513.14	223.21	517.81	230.41	517.85	239.57	518.13
253.32	518.2	272.3	514.88	287.89	515.09	324.01	515.38	345.46	515.29
379.65	515.3	398.24	515.71	427.03	516.22	433.98	516.28	483.73	516.59
508.6	514.52	526.63	508.49	533.84	507.45	559.79	496.35	621.34	489.44
675.42	478.32	677.15	478.32	877.13	478.32	880.17	480.26	893.65	488.2
917.56	480.26	926.69	478.32	1051.02	478.32	1070.68	480.15	1103.44	482.41
1198.47	486.66	1290.22	489.61	1322.99	490.67	1359.03	493.03	1388.52	495.17
1392.22	496.37	1420.4	504.3	1479.18	504.98	1496.72	507	1519.66	509.66
1585.76	508.68	1589.04	508.64	1670.95	509.84	1673.73	509.71	1737.44	506.28
1787.15	506.09	1819.35	505.98	1873.01	506.3	1907.04	507.19	1959.93	508.73
2014.97	509.77	2034.12	510.38	2098.78	511.55	2111.34	512.05	2168.74	511.71
2227.94	510.64	2264.14	510.79	2302.14	510.75	2354.24	510.37	2386.03	509.69
2396.58	509.91	2441.15	510.41	2485.23	510.64	2489.91	510.73	2531.25	507.96
2578.71	508.08	2580.01	508.08	2608.63	510.98	2653.87	511.24	2706.15	512.29
2737.71	512.98	2797.3	511.73	2804.2	511.54	2867.8	512.38	2884.19	509.74
2905.42	509.74	2911.17	509.73	2923.7	512.46	2950.68	512.09	2955.24	512.06
2964.78	512.78	2974.32	512.74	2995.52	512.01	3020.06	512.05	3035.48	515.39
3050.9	512.97	3071.84	513.1	3172.53	514.26	3249.91	515.74	3280.25	518.32
3283.83	518.85	3297.61	519.73	3315.9	520.9	3323.61	521.5	3326.5	520.9

3336.83	520.21	3339.99	519.89	3356.97	520.99	3359.09	522.45	3375.65	524.4
3380.47	524.43	3422.87	524.73	3426.93	524.92	3452.74	526.28	3476.75	527.27
3520.2	531.54	3545.64	534.59	3583.8	537.4	3623.02	546.97	3626.2	548.17
3638.73	550.25	3721.6	585						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.068	508.6	.04	1051.02	.052	1103.44	.047	1420.4	.06
3721.6	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
508.6	1420.4	475.01	468	412.99	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	253.32	518.2	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137740.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	62.87	557.21	132.37	527.79	172.08	517.3	229.99	508.85
242.39	508.32	254.69	510.53	282.1	516.66	291.2	516.67	302.79	517.02
320.16	517.05	344.15	512.54	363.85	512.75	409.51	513.14	436.62	513.02
479.82	512.9	503.32	513.38	539.71	514.06	548.49	514.19	611.36	514.94
642.8	512.36	664.31	505.75	672.92	504.92	703.9	492.18	777.35	487.82
841.89	477.26	842.87	477.26	956.17	477.26	957.89	478.23	965.53	482.2
979.08	478.23	984.25	477.26	1054.69	477.26	1079.52	479.18	1120.9	481.3
1240.92	484.43	1356.79	485.91	1398.17	486.43	1443.7	488.61	1480.94	490.69
1485.61	492.19	1521.2	502	1581.09	503.09	1598.96	505.83	1622.33	509.43
1689.67	508.27	1693.02	508.22	1776.47	509.82	1779.31	509.64	1844.22	505.39
1894.87	505.39	1927.68	505.39	1982.34	506.07	2017.02	506.84	2070.9	508.28
2126.99	509.48	2146.5	510.24	2212.38	512.33	2225.17	512.88	2283.65	511.84
2343.97	510.42	2380.85	510.62	2419.57	510.73	2472.65	510.42	2505.05	510.02
2515.79	510.11	2561.2	509.88	2606.12	509.52	2610.88	509.58	2653	508.28
2701.35	508.44	2702.68	508.44	2731.84	509.91	2777.94	510.07	2831.2	511.25
2863.36	511.99	2924.07	509.98	2931.1	509.72	2995.9	510.84	3012.59	507.32
3034.23	507.32	3040.08	507.31	3052.85	510.98	3080.34	510.55	3084.99	510.51
3094.71	510.84	3104.43	510.78	3126.03	510.34	3151.03	510.28	3166.74	514.65
3182.45	511.33	3203.78	511.4	3306.38	511.98	3385.22	512.72	3416.12	514.01
3419.78	514.47	3433.81	515.64	3452.45	517.2	3460.31	518	3463.25	517.2
3473.77	516.28	3477	515.94	3494.29	517.93	3496.45	518.83	3513.32	521.2
3518.23	521.16	3561.43	520.97	3565.57	521.16	3591.87	522.49	3616.33	523.36
3660.6	526.17	3686.53	528.56	3725.4	531.25	3765.36	542.93	3768.6	544.08
3781.36	545.12	3865.8	580						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.064	642.8	.04	1120.9	.052	1240.92	.05	1521.2	.06
3865.8	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
642.8	1521.2	475.01	468	412.99	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	320.16	517.05	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137275

INPUT
Description: FEMA CT
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3
777	510.2	802	503	812	502.4	848	488	933.36	486.2
1008.36	476.2	1058.36	476.2	1088.36	478.2	1138.36	480.2	1283.36	482.2
1423.36	482.2	1473.36	482.2	1528.36	484.2	1573.36	486.2	1579	488
1622	499.7	1683	501.2	1725	509.2	1797	507.8	1882	509.8
1951	504.5	2036	504.8	2127	506.5	2239	509.2	2339	513.7
2460	510.2	2537	510.7	2635	510.3	2727	508.4	2824	508.8
2902	508.9	2989	511	3058	507.9	3124	509.3	3141	504.9
3169	504.9	3182	509.5	3210	509	3282	508.5	3298	513.9
3314	509.7	3552	509.7	3589	513.5	3597	514.5	3600	513.5
3614	512	3651	518	3656	517.9	3700	517.2	3731	518.7
3801	520.8	3867	525.1	3911	540	3924	540	4010	575

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	777	.04	1622	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
777	1622	464.22	448.38	414.27	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 136829.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	22.09	571.02	45.99	566.97	75.75	561.01	100.47	554.68
113.18	550.26	119.94	548.58	151.05	539.37	189.83	528.27	211.51	522.18
222.3	520.28	249.8	515.44	266.94	512.91	272.8	512.06	274.97	511.75
306.17	509.71	347.2	507.3	367.51	505.92	387.34	505.9	391.39	506.49
436.93	513.13	450.79	515.13	465.33	515.13	476.16	515.33	483.84	515.46
511.6	515.44	521.7	514.18	549.94	510.54	553.71	510.54	562.73	510.47
569.95	510.51	578.06	510.81	603.76	510.87	611.43	511.36	614.14	511.44
617.74	511.4	629.02	511.41	633.98	510.69	654.37	510.69	671.4	510.55
710.63	510.25	757.07	509.81	766.74	509.78	775.56	509.89	823.36	510.45
876.46	511.43	877.47	511.44	904.07	511.34	934.73	511.46	964.94	511.15
976.93	511.25	992	510.46	1027.17	508.62	1040.08	504.84	1056.8	500.82
1066.46	500.04	1068.65	499.91	1079.68	496.6	1111.32	487.58	1169.49	486.5
1212.5	485.71	1259.3	481.15	1301.39	476.87	1383.06	476.87	1410.08	478.59
1455.12	480.34	1550.03	481.74	1585.73	482.33	1639.08	482.53	1711.84	482.78
1739.27	482.87	1755.83	483.12	1756.88	483.18	1774.76	484.88	1779.21	485.2
1783.66	485.52	1788.11	485.83	1792.57	486.15	1797.02	486.47	1801.47	486.78
1805.92	487.1	1806.42	487.14	1810.38	487.45	1814.83	487.8	1819.28	488.15
1841.54	489.89	1846.89	490.28	1846.96	490.29	1852.04	491.94	1852.32	492.02
1858.11	493.65	1863.54	495.18	1869.04	496.73	1874.47	498.26	1879.9	499.8
1885.34	501.33	1890.77	502.87	1949.81	504.21	1990.46	510.95	1991.15	510.94
2060.14	509.78	2078.96	510.16	2107.22	510.57	2120.99	510.68	2128.2	510.66
2135.87	510.65	2142.41	510.66	2144.96	510.45	2159.85	509.3	2191.17	507.06

2209.19	505.81	2247.5	505.82	2291.46	505.79	2293.07	505.81	2365.93	506.81
2379.53	507.02	2487.93	509.17	2552.42	511.62	2584.72	512.7	2585.26	512.69
2615.56	511.77	2639.55	511	2681.86	509.78	2701.83	509.25	2776.35	509.56
2795.71	509.47	2829.15	509.35	2838	509.48	2841.46	509.64	2844.91	509.79
2847.28	509.95	2850.52	510.11	2853.54	510.26	2856.35	510.42	2871.2	510.37
2872.53	510.34	2874.37	510.14	2924.9	509.25	2927.39	509.37	2929.29	509.5
2931.28	509.63	2947.17	509.35	2951.59	509.1	2956.14	508.86	2960.25	508.62
2960.27	508.62	3054.13	508.95	3129.62	509.03	3213.82	510.78	3280.6	508.2
3344.48	509.37	3360.94	505.7	3388.04	505.7	3400.62	509.53	3407.92	509.59
3415.46	509.64	3427.72	509.45	3433.14	509.42	3447.05	509.33	3476.75	509.32
3479.86	509.47	3482.96	509.62	3486.15	509.77	3489.18	509.92	3492.11	510.06
3494.79	510.22	3497.4	510.2	3506.43	512.82	3512.89	514.65	3528.37	511.04
3529.89	511.03	3538.67	510.87	3547.8	510.7	3557.44	510.53	3569.81	510.53
3588.05	510.7	3602.47	510.87	3608.97	511.03	3614.58	511.2	3618.6	511.37
3621.98	511.53	3624.91	511.7	3627.77	511.87	3630.64	512.03	3633.31	512.2
3649.31	512.37	3676.74	512.53	3683.86	512.53	3718.97	512.37	3735.05	512.37
3742.17	512.53	3758.72	512.6	3782.96	514.84	3794.53	515.94	3802.28	516.82
3805.18	516	3810.81	515.51	3818.73	514.82	3847.72	519	3854.54	519.99
3859.38	519.93	3876.56	519.8	3898.83	519.66	3901.97	519.65	3912.78	520.23
3921.27	520.75	3926.45	521.14	3931.4	521.51	3931.97	521.55	3936.24	521.81
3940.41	522.08	3944.69	522.36	3948.18	522.62	3951.1	522.86	3954.03	523.1
3956.92	523.34	3959.81	523.59	3962.81	523.83	3966.03	524.08	3973.42	524.44
3998.82	525.26	3999.72	525.28	4024.08	526.65	4035.89	527.31	4041.05	527.77
4063.6	529.76	4097.77	540.83	4106.18	543.48	4118.76	543.77	4122.86	545.3
4202	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1027.17	.04	1890.77	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1027.17	1890.77	464.22	448.38	414.27	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 136383.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	27.48	571.2	57.19	567.6	94.2	561.27	124.94	553.26
140.74	548.21	149.15	546.86	187.84	537.71	236.07	527.08	263.03	521.36
276.44	519.42	310.64	514.51	331.95	512.43	339.24	511.75	341.94	511.51
380.73	509.95	431.76	508.46	457.01	507.34	481.67	507.31	486.71	507.77
543.34	513.16	560.58	514.77	578.66	514.77	592.13	514.92	601.68	515.02
636.2	514.98	648.76	513.97	683.87	510.87	688.57	510.85	699.79	510.66
708.76	510.69	718.85	511.23	750.81	511.17	760.34	512.11	763.71	512.25
768.19	512.14	782.21	512.09	788.38	510.61	813.75	510.48	834.92	510.26
883.7	509.8	941.46	509.09	953.48	509.07	964.45	509.15	1023.89	509.58
1089.93	510.75	1091.17	510.77	1124.26	510.25	1162.38	510.13	1199.95	509.14
1214.86	509.2	1233.6	508.55	1277.33	507.03	1292.26	502.61	1311.6	498.63
1322.77	497.57	1325.3	497.42	1338.06	494.52	1374.64	487.17	1441.9	486.04
1491.63	485.21	1545.75	481.36	1594.43	477.53	1707.76	477.53	1731.81	478.97
1771.88	480.49	1856.34	481.84	1888.11	482.47	1935.58	482.87	2000.32	483.35
2024.73	483.53	2039.47	484.03	2040.4	484.16	2056.3	486.85	2060.27	487.3
2064.23	487.75	2068.19	488.21	2072.15	488.66	2076.11	489.11	2080.08	489.57
2084.04	490.02	2084.48	490.07	2088	490.5	2091.96	490.98	2095.93	491.46
2115.74	493.86	2120.49	494.36	2120.55	494.37	2125.07	495.88	2125.32	495.96
2130.47	497.46	2135.31	498.88	2140.2	500.32	2145.04	501.75	2149.87	503.18
2154.7	504.61	2159.54	506.03	2216.61	507.23	2255.91	512.7	2256.58	512.69

2323.29	511.77	2341.48	512.07	2368.79	512.2	2382.11	512.09	2389.08	511.87
2396.5	511.66	2402.82	511.53	2405.29	511.3	2419.68	510.18	2449.96	508.19
2467.38	507.13	2504.42	506.99	2546.92	506.78	2548.48	506.79	2618.92	507.39
2632.07	507.54	2736.87	509.15	2799.21	511.03	2830.44	511.71	2830.96	511.69
2860.25	510.75	2883.45	509.94	2924.35	508.76	2943.66	508.31	3015.71	508.42
3034.42	508.31	3066.75	508.22	3075.31	508.53	3078.65	508.85	3081.99	509.17
3084.28	509.5	3087.41	509.82	3090.33	510.15	3093.05	510.48	3107.41	510.43
3108.68	510.41	3110.47	510.05	3159.32	509.34	3161.72	509.63	3163.57	509.94
3165.49	510.25	3180.85	510.02	3185.12	509.62	3189.52	509.23	3193.49	508.84
3193.51	508.83	3284.25	509.1	3357.24	509.17	3438.65	510.57	3503.21	508.5
3564.97	509.43	3580.87	506.5	3607.07	506.5	3619.24	509.57	3626.3	509.81
3633.59	510.05	3645.44	509.9	3650.68	509.87	3664.13	509.81	3692.84	510
3695.85	510.32	3698.85	510.64	3701.93	510.95	3704.85	511.27	3707.69	511.59
3710.28	511.91	3712.81	511.9	3721.54	514	3727.78	515.41	3742.75	512.39
3744.21	512.37	3752.7	512.03	3761.53	511.7	3770.85	511.37	3782.81	511.37
3800.44	511.7	3814.39	512.03	3820.67	512.37	3826.1	512.7	3829.98	513.03
3833.25	513.37	3836.08	513.7	3838.85	514.03	3841.62	514.37	3844.2	514.7
3859.67	515.03	3886.18	515.37	3893.07	515.37	3927.01	515.03	3942.56	515.03
3949.45	515.37	3965.45	515.5	3988.88	517.41	4000.07	518.37	4007.55	519.13
4010.36	518.5	4015.81	518.15	4023.46	517.64	4051.49	521.14	4058.08	521.98
4062.76	521.97	4079.37	521.98	4100.9	522.07	4103.93	522.11	4114.38	522.73
4122.59	523.34	4127.6	523.85	4132.39	524.35	4132.94	524.41	4137.07	524.79
4141.09	525.21	4145.23	525.63	4148.61	526.03	4151.44	526.43	4154.26	526.82
4157.06	527.22	4159.85	527.61	4162.75	528	4165.87	528.4	4173.01	528.89
4197.56	529.75	4198.44	529.77	4221.99	530.86	4233.41	531.39	4238.4	531.95
4260.19	534.42	4293.23	544.6	4301.37	546.96	4313.53	547.54	4317.48	548.88
4394	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1277.33	.04	2159.54	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1277.33	2159.54	464.22	448.38	414.27	.1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135937.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	32.86	571.37	68.4	568.22	112.65	561.52	149.41	551.84
168.31	546.16	178.36	545.15	224.63	536.06	282.3	525.88	314.54	520.55
330.58	518.57	371.48	513.58	396.96	511.95	405.68	511.44	408.91	511.26
455.3	510.19	516.32	509.62	546.52	508.75	576.01	508.71	582.03	509.05
649.76	513.2	670.37	514.4	691.99	514.4	708.09	514.52	719.52	514.58
760.8	514.52	775.82	513.75	817.81	511.21	823.43	511.16	836.84	510.84
847.57	510.87	859.64	511.64	897.86	511.48	909.26	512.86	913.28	513.07
918.65	512.88	935.41	512.77	942.79	510.53	973.12	510.27	998.44	509.97
1056.78	509.35	1125.84	508.37	1140.22	508.35	1153.34	508.41	1224.41	508.71
1303.39	510.08	1304.88	510.11	1344.44	509.16	1390.04	508.8	1434.96	507.13
1452.8	507.16	1475.2	506.64	1527.5	505.45	1544.45	500.38	1566.4	496.45
1579.07	495.11	1581.95	494.93	1596.43	492.44	1637.96	486.75	1714.32	485.58
1770.77	484.72	1832.2	481.57	1887.46	478.2	2032.46	478.2	2053.53	479.36
2088.64	480.63	2162.64	481.93	2190.48	482.6	2232.07	483.2	2288.8	483.93
2310.19	484.2	2323.1	484.95	2323.92	485.14	2337.85	488.81	2341.32	489.4
2344.8	489.99	2348.27	490.58	2351.74	491.17	2355.21	491.76	2358.68	492.35
2362.15	492.94	2362.54	493.01	2365.63	493.55	2369.1	494.16	2372.57	494.77
2389.93	497.82	2394.09	498.45	2394.15	498.46	2398.11	499.82	2398.33	499.89

2402.84	501.27	2407.08	502.59	2411.36	503.92	2415.6	505.24	2419.83	506.56
2424.07	507.88	2428.31	509.2	2483.42	510.24	2521.37	514.45	2522.02	514.44
2586.43	513.75	2604	513.98	2630.37	513.82	2643.24	513.49	2649.96	513.08
2657.13	512.67	2663.23	512.39	2665.61	512.15	2679.51	511.06	2708.75	509.32
2725.58	508.44	2761.34	508.17	2802.38	507.77	2803.88	507.77	2871.9	507.97
2884.6	508.06	2985.8	509.12	3046.01	510.45	3076.16	510.71	3076.66	510.69
3104.95	509.74	3127.35	508.88	3166.84	507.75	3185.49	507.36	3255.06	507.29
3273.13	507.16	3304.35	507.09	3312.61	507.57	3315.84	508.06	3319.06	508.56
3321.28	509.05	3324.3	509.54	3327.12	510.04	3329.74	510.53	3343.61	510.5
3344.84	510.49	3346.57	509.97	3393.74	509.43	3396.06	509.9	3397.84	510.38
3399.7	510.86	3414.53	510.69	3418.65	510.14	3422.91	509.59	3426.74	509.05
3426.76	509.05	3514.38	509.25	3584.86	509.3	3663.47	510.35	3725.81	508.8
3785.45	509.5	3800.81	507.3	3826.11	507.3	3837.85	509.6	3844.67	510.03
3851.71	510.46	3863.15	510.35	3868.22	510.33	3881.2	510.28	3908.93	510.67
3911.83	511.16	3914.73	511.65	3917.71	512.14	3920.53	512.63	3923.27	513.12
3925.77	513.61	3928.21	513.6	3936.64	515.17	3942.67	516.16	3957.12	513.73
3958.54	513.7	3966.73	513.2	3975.26	512.7	3984.26	512.2	3995.8	512.2
4012.83	512.7	4026.3	513.2	4032.37	513.7	4037.61	514.2	4041.36	514.7
4044.51	515.2	4047.25	515.7	4049.92	516.2	4052.6	516.7	4055.09	517.2
4070.03	517.7	4095.63	518.2	4102.28	518.2	4135.06	517.7	4150.07	517.7
4156.72	518.2	4172.17	518.4	4194.79	519.99	4205.6	520.81	4212.83	521.45
4215.54	521	4220.8	520.79	4228.19	520.46	4255.26	523.28	4261.62	523.97
4266.14	524	4282.18	524.16	4302.97	524.48	4305.9	524.56	4315.99	525.22
4323.92	525.93	4328.75	526.56	4333.38	527.19	4333.91	527.26	4337.9	527.77
4341.78	528.33	4345.78	528.9	4349.04	529.45	4351.77	530	4354.5	530.54
4357.2	531.09	4359.9	531.63	4362.69	532.18	4365.71	532.73	4372.6	533.34
4396.31	534.24	4397.16	534.25	4419.9	535.07	4430.93	535.47	4435.74	536.14
4456.79	539.09	4488.69	548.38	4496.55	550.44	4508.29	551.31	4512.11	552.46
4586	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1527.5	.04	2428.31	.06

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
1527.5	2428.31	464.22	448.38	414.27	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135491.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	38.24	571.55	79.6	568.85	131.1	561.78	173.88	550.41
195.87	544.1	207.58	543.43	261.42	534.41	328.53	524.69	366.06	519.73
384.72	517.71	432.32	512.65	461.97	511.46	472.12	511.13	475.87	511.02
529.87	510.42	600.88	510.78	636.02	510.17	670.34	510.11	677.35	510.33
756.17	513.23	780.16	514.03	805.33	514.03	824.06	514.11	837.36	514.14
885.4	514.06	902.88	513.53	951.75	511.55	958.29	511.48	973.89	511.03
986.38	511.04	1000.43	512.06	1044.91	511.79	1058.17	513.6	1062.85	513.88
1069.1	513.62	1088.61	513.44	1097.19	510.45	1132.49	510.06	1161.96	509.68
1229.85	508.9	1310.23	507.64	1326.96	507.63	1342.22	507.68	1424.94	507.84
1516.85	509.41	1518.59	509.44	1564.63	508.08	1617.69	507.47	1669.98	505.12
1690.73	505.11	1716.8	504.72	1777.67	503.87	1796.63	498.15	1821.19	494.26
1835.38	492.64	1838.61	492.43	1854.81	490.36	1901.29	486.33	1986.73	485.12
2049.91	484.23	2118.65	481.78	2180.49	478.87	2357.16	478.87	2375.25	479.75
2405.41	480.78	2468.95	482.02	2492.85	482.73	2528.57	483.53	2577.28	484.5
2595.64	484.87	2606.73	485.87	2607.43	486.12	2619.4	490.77	2622.38	491.5
2625.36	492.23	2628.35	492.95	2631.33	493.68	2634.31	494.41	2637.29	495.13

2640.27	495.86	2640.6	495.94	2643.25	496.6	2646.23	497.34	2649.21	498.08
2664.12	501.78	2667.69	502.53	2667.74	502.54	2671.14	503.77	2671.33	503.83
2675.21	505.08	2678.84	506.29	2682.53	507.51	2686.16	508.73	2689.8	509.94
2693.44	511.15	2697.07	512.37	2750.23	513.26	2786.83	516.2	2787.45	516.2
2849.57	515.73	2866.52	515.89	2891.95	515.45	2904.36	514.89	2910.85	514.28
2917.76	513.68	2923.64	513.25	2925.94	513	2939.34	511.94	2967.54	510.44
2983.77	509.75	3018.26	509.35	3057.84	508.76	3059.29	508.74	3124.89	508.55
3137.14	508.58	3234.73	509.1	3292.8	509.87	3321.87	509.71	3322.36	509.69
3349.64	508.73	3371.25	507.82	3409.34	506.73	3427.31	506.42	3494.41	506.15
3511.84	506.01	3541.95	505.96	3549.92	506.61	3553.03	507.28	3556.14	507.94
3558.28	508.6	3561.19	509.26	3563.91	509.92	3566.44	510.59	3579.81	510.57
3581	510.56	3582.66	509.88	3628.16	509.52	3630.4	510.17	3632.11	510.82
3633.91	511.47	3648.21	511.36	3652.18	510.66	3656.29	509.96	3659.98	509.27
3660	509.27	3744.51	509.4	3812.48	509.43	3888.29	510.13	3948.42	509.1
4005.93	509.57	4020.74	508.1	4045.14	508.1	4056.47	509.63	4063.05	510.26
4069.84	510.88	4080.87	510.8	4085.75	510.79	4098.28	510.75	4125.02	511.35
4127.82	512.01	4130.61	512.67	4133.49	513.33	4136.21	513.99	4138.85	514.65
4141.26	515.31	4143.61	515.3	4151.74	516.35	4157.56	516.92	4171.5	515.08
4172.86	515.03	4180.76	514.37	4188.99	513.7	4197.67	513.03	4208.8	513.03
4225.22	513.7	4238.21	514.37	4244.06	515.03	4249.12	515.7	4252.73	516.37
4255.78	517.03	4258.41	517.7	4260.99	518.37	4263.57	519.03	4265.98	519.7
4280.38	520.37	4305.08	521.03	4311.49	521.03	4343.1	520.37	4357.58	520.37
4363.99	521.03	4378.89	521.3	4400.71	522.56	4411.14	523.24	4418.11	523.76
4420.72	523.5	4425.79	523.43	4432.92	523.28	4459.02	525.42	4465.16	525.96
4469.52	526.04	4484.99	526.34	4505.04	526.88	4507.86	527.02	4517.6	527.71
4525.24	528.52	4529.9	529.27	4534.36	530.02	4534.88	530.11	4538.73	530.74
4542.47	531.45	4546.33	532.16	4549.47	532.87	4552.1	533.56	4554.74	534.26
4557.34	534.96	4559.94	535.65	4562.64	536.35	4565.54	537.05	4572.19	537.79
4595.06	538.72	4595.88	538.73	4617.81	539.28	4628.45	539.55	4633.09	540.33
4653.39	543.75	4684.16	552.15	4691.73	553.92	4703.06	555.09	4706.74	556.04
4778	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1777.67	.04	2697.07	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1777.67	2697.07	464.22	448.38 414.27	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135045.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	43.62	571.72	90.8	569.47	149.55	562.04	198.35	548.99
223.44	542.05	236.79	541.72	298.21	532.75	374.77	523.49	417.57	518.91
438.86	516.86	493.16	511.73	526.99	510.98	538.56	510.81	542.84	510.77
604.43	510.66	685.44	511.94	725.53	511.59	764.68	511.52	772.68	511.62
862.59	513.27	889.95	513.67	918.66	513.67	940.03	513.71	955.2	513.71
1010	513.6	1029.94	513.32	1085.69	511.88	1093.14	511.79	1110.95	511.21
1125.19	511.22	1141.21	512.48	1191.95	512.09	1207.09	514.35	1212.43	514.69
1219.55	514.36	1241.8	514.12	1251.6	510.38	1291.86	509.86	1325.48	509.39
1402.93	508.45	1494.61	506.92	1513.7	506.92	1531.11	506.94	1625.47	506.97
1730.31	508.74	1732.29	508.77	1784.81	506.99	1845.35	506.13	1904.99	503.11
1928.66	503.06	1958.4	502.81	2027.83	502.28	2048.82	495.93	2075.99	492.08
2091.69	490.17	2095.26	489.94	2113.18	488.28	2164.61	485.91	2259.15	484.66
2329.05	483.74	2405.11	481.99	2473.53	479.53	2681.86	479.53	2696.98	480.14
2722.17	480.92	2775.25	482.11	2795.22	482.87	2825.06	483.87	2865.76	485.08

2881.1	485.53	2890.37	486.78	2890.95	487.11	2900.95	492.74	2903.44	493.6
2905.93	494.46	2908.42	495.33	2910.91	496.19	2913.4	497.05	2915.89	497.92
2918.38	498.78	2918.66	498.88	2920.88	499.65	2923.37	500.52	2925.86	501.39
2938.31	505.74	2941.3	506.62	2941.33	506.63	2944.18	507.71	2944.34	507.76
2947.57	508.89	2950.61	510	2953.69	511.11	2956.73	512.21	2959.76	513.32
2962.8	514.43	2965.84	515.53	3017.04	516.27	3052.29	517.94	3052.89	517.95
3112.71	517.72	3129.03	517.79	3153.53	517.07	3165.48	516.3	3171.73	515.49
3178.38	514.69	3184.05	514.12	3186.26	513.85	3199.17	512.82	3226.33	511.57
3241.96	511.07	3275.18	510.52	3313.3	509.75	3314.69	509.72	3377.87	509.12
3389.67	509.11	3483.67	509.07	3539.59	509.28	3567.59	508.71	3568.06	508.7
3594.34	507.71	3615.14	506.76	3651.83	505.72	3669.14	505.47	3733.77	505.01
3750.55	504.85	3779.55	504.83	3787.22	505.66	3790.22	506.49	3793.21	507.32
3795.27	508.15	3798.08	508.98	3800.7	509.81	3803.13	510.64	3816.01	510.63
3817.16	510.63	3818.76	509.79	3862.58	509.61	3864.73	510.43	3866.39	511.26
3868.11	512.09	3881.89	512.03	3885.72	511.18	3889.67	510.33	3893.23	509.49
3893.25	509.48	3974.64	509.55	4040.1	509.57	4113.11	509.92	4171.02	509.4
4226.41	509.63	4240.68	508.9	4264.18	508.9	4275.09	509.67	4281.42	510.48
4287.96	511.29	4298.59	511.25	4303.29	511.24	4315.35	511.23	4341.11	512.02
4343.8	512.85	4346.5	513.68	4349.26	514.51	4351.88	515.34	4354.43	516.17
4356.75	517	4359.02	517	4366.85	517.52	4372.45	517.67	4385.87	516.42
4387.19	516.37	4394.8	515.53	4402.72	514.7	4411.08	513.87	4421.8	513.87
4437.62	514.7	4450.13	515.53	4455.76	516.37	4460.63	517.2	4464.11	518.03
4467.04	518.87	4469.58	519.7	4472.07	520.53	4474.55	521.37	4476.87	522.2
4490.74	523.03	4514.52	523.87	4520.7	523.87	4551.15	523.03	4565.09	523.03
4571.27	523.87	4585.62	524.2	4606.63	525.13	4616.67	525.68	4623.38	526.08
4625.9	526	4630.79	526.06	4637.65	526.1	4662.79	527.56	4668.7	527.95
4672.9	528.07	4687.8	528.52	4707.11	529.29	4709.83	529.47	4719.2	530.21
4726.57	531.11	4731.06	531.99	4735.35	532.86	4735.85	532.96	4739.55	533.72
4743.16	534.58	4746.87	535.43	4749.9	536.28	4752.44	537.13	4754.97	537.98
4757.48	538.83	4759.99	539.68	4762.58	540.53	4765.38	541.38	4771.79	542.25
4793.81	543.21	4794.59	543.22	4815.72	543.49	4825.96	543.62	4830.43	544.51
4849.99	548.41	4879.62	555.93	4886.91	557.39	4897.82	558.86	4901.37	559.62
4970	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2027.83	.04	2965.84	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2027.83	2965.84	464.22	448.38	414.27	.1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 134600

INPUT
Description: FEMA CS topo
Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2371.56	486.2	2531.56	484.2	2691.56	482.2	2766.56	480.2
3006.56	480.2	3081.56	482.2	3121.56	484.2	3166.56	486.2	3174	487.7
3182.5	494.7	3184.5	495.7	3186.5	496.7	3188.5	497.7	3190.5	498.7
3192.5	499.7	3194.5	500.7	3196.5	501.7	3198.5	502.7	3200.5	503.7

3202.5	504.7	3212.5	509.7	3214.9	510.7	3217.34	511.7	3219.94	512.7
3222.38	513.7	3224.85	514.7	3227.29	515.7	3229.73	516.7	3232.17	517.7
3234.61	518.7	3318.32	519.7	3391.55	519.7	3415.11	518.7	3426.6	517.7
3432.61	516.7	3439.01	515.7	3446.59	514.7	3459	513.7	3485.12	512.7
3532.1	511.7	3570.1	510.7	3630.86	509.7	3786.38	508.7	3813.76	507.7
3839.03	506.7	3859.04	505.7	3894.32	504.7	3989.26	503.7	4017.15	503.7
4024.53	504.7	4027.41	505.7	4030.29	506.7	4032.27	507.7	4034.97	508.7
4037.49	509.7	4039.83	510.7	4053.32	510.7	4054.86	509.7	4097	509.7
4099.07	510.7	4100.66	511.7	4102.32	512.7	4115.57	512.7	4119.25	511.7
4123.05	510.7	4126.49	509.7	4493.71	509.7	4499.8	510.7	4506.09	511.7
4520.83	511.7	4532.43	511.7	4557.2	512.7	4559.79	513.7	4562.38	514.7
4565.04	515.7	4567.56	516.7	4570.01	517.7	4572.24	518.7	4581.95	518.7
4601.51	517.7	4608.83	516.7	4616.45	515.7	4624.49	514.7	4634.8	514.7
4650.01	515.7	4662.04	516.7	4667.46	517.7	4672.14	518.7	4675.49	519.7
4678.31	520.7	4680.75	521.7	4683.14	522.7	4685.53	523.7	4687.76	524.7
4701.1	525.7	4723.97	526.7	4729.91	526.7	4759.19	525.7	4772.6	525.7
4778.54	526.7	4812.55	527.7	4835.78	528.7	4866.56	529.7	4890.61	530.7
4909.18	531.7	4920.81	532.7	4927.89	533.7	4932.21	534.7	4936.34	535.7
4940.38	536.7	4943.85	537.7	4947.42	538.7	4950.33	539.7	4952.77	540.7
4955.21	541.7	4957.62	542.7	4960.03	543.7	4962.53	544.7	4965.22	545.7
4971.38	546.7	4992.56	547.7	5013.63	547.7	5023.48	547.7	5027.78	548.7
5075.08	559.7	5096	563.2	5162	575				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2278	.04	3234.61	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2278	3234.61	2075	2125	2160	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
3391.55	5162	519.7	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132450

INPUT
Description: FEMA CR topo
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	56	553.9	72	553.9	107	544.9	190	531.8
263	522.2	331	518.7	404	514	451	509.6	526	509.6
595	509.6	625	514.9	686	518.8	743	520.6	821	529
892	530.9	979	531.8	1003	531.7	1045	516.4	1052	516.9
1053	516.9	1057	516.9	1074	515.2	1103	503.1	1146	501.9
1210	501.9	1244	503.5	1324	503.4	1410	504.9	1513	504.9
1548	503	1602	504.7	1661	505.2	1712	505.2	1794	504
1856	502.2	1921	505.5	1950	503.2	1978	487.5	1980	486.2
2051.61	484.2	2161.61	482.2	2236.61	480.2	2336.61	478.2	2386.61	476.2
2466.61	474.2	2486.61	472.2	2511.61	470.2	2566.61	470.2	2581.61	472.2
2596.61	474.2	2646.61	476.2	2696.61	478.2	2736.61	480.2	2751.61	482.2
2786.61	484.2	2811.61	486.2	2816	487.5	2831	493.7	2832.37	494.7
2846.86	505.7	2849.12	506.7	2895.98	506.7	2898.51	506.7	2909.09	507.7
2919.39	508.7	2957.66	509.7	2974.43	510.7	2991.15	511.7	3019.84	512.7
3078.44	512.7	3125.14	511.7	3154.27	510.7	3176.64	509.7	3192.45	508.7
3203.88	507.7	3215.51	506.7	3367.67	506.7	3373.19	507.7	3377.33	508.7
3392.87	508.7	3396.25	507.7	3449.4	507.7	3451.23	508.7	3483.19	509.7
3679.6	510.7	3772.97	511.7	3816.173	512.7	3880.26	513.7	3927.32	514.7
3946.35	515.7	3951.57	516.7	3955.62	517.7	3965.1	518.7	3971.56	518.7
3975.93	518.7	3981.62	519.7	3983.08	519.7	3993.16	518.7	3996.51	517.7

4002.79	517.7	4026	521.4	4107	524.9	4175	526.9	4213	527.5
4223	527.5	4305	530.8	4377	534.2	4473	537	4535	540.1
4547	541.9	4584	541.9	4596	541	4602	544.1	4648	546.6
4740	556.2	4831	565	4862	570.9	4908	573.5	4923	573.5
4933	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1921	.04	2849.12	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1921 2849.12 406 410 329.99 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	979	531.8	F
3078.44	4933	515	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132040.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	53.07	556.53	68.23	556.08	101.4	547.89	129.66	543.27
180.05	535.39	249.23	526.11	254.19	525.78	313.67	522.31	371.01	518.34
382.84	517.54	427.38	513.43	476.28	512.78	494.26	513.08	498.45	513.08
537.9	513.08	563.84	512.64	566.15	512.94	592.27	516.55	650.08	519.03
685.54	519.59	704.09	519.95	778.01	526.13	788.24	526.29	845.29	527.1
894.79	527.11	927.73	527.16	950.47	526.91	990.27	514.37	994.93	514.62
996.91	514.72	997.86	514.71	1001.65	514.67	1017.76	513.15	1036.01	506.53
1045.24	503.43	1085.99	503.12	1089.93	503.18	1146.63	503.42	1178.85	504.84
1206.75	504.93	1254.66	505.5	1292.77	506.56	1308.17	506.21	1331.28	507.13
1336.16	507.2	1342.83	507.2	1354.39	507.2	1399.32	504.38	1433.77	504.18
1466.93	502.47	1504.59	503.26	1518.11	503.15	1552.09	502.22	1574.02	502.86
1622.34	503.93	1653.51	504.23	1700.05	504.08	1739.52	503.47	1758.8	502.7
1820.4	504.38	1847.21	500.82	1857.56	495.14	1873.09	487.3	1874.94	486.22
1875.91	486.18	1941.14	484.52	2042.82	482.79	2112.15	481.1	2188.01	479.69
2204.59	479.36	2250.81	477.66	2324.76	475.89	2343.25	474.25	2366.36	472.6
2425.36	472.6	2443.97	474.31	2462.58	476.02	2492.92	476.98	2524.62	477.8
2549.21	478.43	2586.66	479.4	2636.29	481	2654.91	482.6	2698.33	484.2
2729.35	485.8	2734.8	486.84	2735	486.89	2751.89	491.79	2753.38	492.39
2753.41	492.4	2755.11	493.41	2773.09	504.4	2775.9	505.54	2825.2	506.22
2827.86	506.26	2833.48	506.74	2838.99	507.16	2849.83	508	2890.09	508.94
2907.74	509.8	2908.6	509.84	2925.33	510.78	2951.16	511.74	2955.51	511.86
2962.01	511.86	3001.24	511.76	3017.17	511.78	3054.65	511.23	3066.3	511.03
3096.95	510.2	3120.49	509.38	3121.42	509.34	3137.12	508.58	3149.15	507.78
3161.38	506.98	3194.87	506.98	3256.63	506.94	3317.55	506.8	3321.48	506.73
3327.28	507.43	3331.64	508.15	3340.92	507.98	3347.99	508.02	3351.55	507.24
3395.17	507.5	3407.47	507.51	3409.39	508.31	3443.02	509.14	3461.11	509.23
3513.69	508.97	3569.6	509.19	3594.64	509.39	3613	510.32	3624.69	509.44
3649.67	509.54	3659.74	509.62	3673.93	510.98	3683.11	509.85	3691.46	509.88
3732.35	510.21	3747.9	510.35	3784.93	511.03	3793.36	511.22	3854.2	512.2
3860.79	512.29	3901.78	513.02	3910.3	513.58	3930.32	515.38	3935.81	516.45
3940.07	517.46	3950.05	518.75	3950.18	518.76	3956.84	518.81	3961.44	518.85
3962.7	519.03	3965.21	519.36	3967.43	519.66	3967.71	519.66	3968.96	519.65
3976.89	518.96	3979.57	518.67	3983.09	517.75	3989.7	517.52	3994.42	517.93
4014.12	520.71	4036.15	521.86	4088.73	523.75	4099.34	524.24	4148.82	526.03
4170.89	526.58	4199.73	527.01	4210.87	527.18	4221.39	527.21	4236.45	527.72
4294.04	529.86	4307.67	530.4	4336.6	531.68	4369.15	532.85	4383.42	533.46

4423.4	534.63	4484.42	536.6	4486	536.68	4508.53	539.04	4520.22	539.66
4549.65	540.78	4552.77	541.14	4559.44	541.84	4562.28	542.14	4601.21	541.85
4613.83	541.03	4615.36	541.62	4620.15	543.63	4651.25	545.73	4668.54	547.88
4685.47	550.62	4732.21	554.97	4755.58	556.99	4765.34	557.76	4768.93	558.02
4804.82	560.7	4844.88	563.65	4861.08	564.72	4893.7	569.19	4899.96	569.41
4938.35	571.32	4942.1	571.77	4957.88	572.99	4968.4	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1820.4	.04	2775.9	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1820.4	2775.9	406	410	329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 131630.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	50.13	559.16	64.46	558.26	95.79	550.87	122.5	546.36
170.1	538.99	235.45	530.03	240.14	529.64	296.33	525.93	350.51	521.88
361.69	521.09	403.76	517.26	449.96	515.96	466.94	516.56	470.91	516.56
508.18	516.56	532.68	515.68	534.86	515.86	559.54	518.2	614.15	519.26
647.65	519.19	665.18	519.29	735.01	523.27	744.68	523.29	798.57	523.3
845.35	522.78	876.46	522.51	897.95	522.12	935.55	512.35	939.95	512.49
941.82	512.54	942.71	512.52	946.29	512.44	961.51	511.09	978.76	505.9
987.47	503.75	1025.97	504.33	1029.7	504.46	1083.27	504.95	1113.71	506.18
1140.06	506.4	1185.33	507.61	1221.32	509.02	1235.88	508.03	1257.71	509.45
1262.32	509.5	1268.63	509.5	1279.54	509.5	1321.99	503.86	1354.53	503.47
1385.87	501.95	1421.44	502.27	1434.21	501.61	1466.32	499.44	1487.03	500.53
1532.69	502.66	1562.13	503.75	1606.1	504.16	1643.39	504.15	1661.61	503.2
1719.8	503.26	1744.42	498.45	1753.92	493.35	1768.18	487.09	1769.88	486.24
1770.77	486.18	1830.66	484.83	1924.03	483.37	1987.69	481.99	2057.35	480.82
2072.57	480.53	2115.01	479.12	2182.91	477.59	2199.89	476.3	2221.11	475
2284.11	475	2306.33	476.42	2328.55	477.84	2364.77	478.79	2402.63	479.4
2432	479.88	2476.71	480.6	2535.98	481.8	2558.2	483	2610.06	484.2
2647.1	485.4	2653.6	486.18	2653.83	486.22	2674	490.39	2675.78	491.09
2675.83	491.11	2677.86	492.12	2699.32	503.1	2702.67	504.38	2754.42	505.75
2757.21	505.82	2763.11	506.28	2768.89	506.62	2780.27	507.29	2822.53	508.17
2841.05	508.89	2841.95	508.93	2859.51	509.86	2886.62	510.93	2891.19	511.02
2898.01	511.02	2939.18	510.82	2955.9	510.87	2995.24	510.52	3007.47	510.36
3039.63	509.7	3064.34	509.06	3065.32	509.03	3081.79	508.46	3094.42	507.86
3107.26	507.26	3142.4	507.26	3207.22	507.18	3271.17	506.9	3275.28	506.76
3281.38	507.15	3285.95	507.59	3295.69	507.26	3303.11	507.34	3306.84	506.79
3352.63	507.3	3365.53	507.32	3367.55	507.93	3402.84	508.59	3421.83	508.67
3477.01	507.91	3535.7	508.07	3561.98	508.34	3581.25	510.11	3593.52	508.31
3619.73	508.38	3630.31	508.44	3645.2	511.01	3654.83	508.66	3663.59	508.64
3706.51	508.89	3722.83	509	3761.7	509.55	3770.54	509.73	3834.4	510.8
3841.31	510.88	3884.33	511.52	3893.28	512.47	3914.29	515.05	3920.05	516.19
3924.53	517.22	3934.99	518.81	3935.14	518.82	3942.13	518.93	3946.95	519
3948.28	519.15	3950.9	519.4	3953.24	519.62	3953.53	519.62	3954.85	519.59
3963.17	518.97	3965.98	518.64	3969.68	517.8	3976.61	517.34	3981.56	517.45
4002.24	520.01	4025.36	521.42	4080.55	523.04	4091.69	523.59	4143.61	525.77
4166.78	526.26	4197.05	526.68	4208.74	526.85	4219.78	526.92	4235.59	527.37
4296.03	529.45	4310.33	529.99	4340.7	531.26	4374.87	532.14	4389.84	532.72
4431.8	533.95	4495.84	536.21	4497.5	536.28	4521.15	539.93	4533.41	540.62
4564.31	541.46	4567.58	541.73	4574.58	542.18	4577.56	542.38	4618.42	541.79
4631.67	541.06	4633.27	541.49	4638.29	543.15	4670.94	545.74	4689.09	549.15

4706.85	552.97	4755.91	557.03	4780.43	558.74	4790.68	559.32	4794.45	559.52
4832.11	561.58	4874.16	563.79	4891.17	564.43	4925.4	567.48	4931.97	567.58
4972.27	569.34	4976.19	570.04	4992.76	572.48	5003.8	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1719.8	.04	2702.67	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1719.8	2702.67	406	410	329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 131220.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	47.2	561.8	60.69	560.43	90.19	553.86	115.33	549.44
160.15	542.58	221.68	533.94	226.09	533.49	279	529.54	330.01	525.42
340.53	524.63	380.15	521.09	423.64	519.14	439.63	520.04	443.36	520.04
478.45	520.04	501.52	518.72	503.57	518.77	526.81	519.85	578.23	519.5
609.77	518.79	626.27	518.64	692.02	520.4	701.12	520.3	751.86	519.49
795.9	518.46	825.19	517.87	845.42	517.33	880.82	510.32	884.96	510.36
886.72	510.36	887.57	510.33	890.94	510.21	905.27	509.04	921.51	505.27
929.71	504.08	965.96	505.55	969.46	505.74	1019.9	506.47	1048.56	507.52
1073.38	507.87	1115.99	509.71	1149.88	511.48	1163.59	509.85	1184.14	511.76
1188.48	511.8	1194.42	511.8	1204.69	511.8	1244.66	503.34	1275.3	502.75
1304.8	501.42	1338.3	501.28	1350.32	500.06	1380.54	496.66	1400.05	498.19
1443.04	501.4	1470.75	503.27	1512.15	504.25	1547.26	504.84	1564.41	503.7
1619.2	502.14	1641.62	496.07	1650.28	491.57	1663.27	486.89	1664.82	486.26
1665.63	486.19	1720.19	485.15	1805.24	483.96	1863.23	482.89	1926.68	481.94
1940.55	481.69	1979.21	480.58	2041.06	479.28	2056.52	478.36	2075.85	477.4
2142.85	477.4	2168.69	478.53	2194.53	479.66	2236.63	480.59	2280.65	481
2314.78	481.32	2366.77	481.8	2435.66	482.6	2461.5	483.4	2521.78	484.2
2564.84	485	2572.4	485.52	2572.67	485.55	2596.12	489	2598.19	489.8
2598.24	489.81	2600.6	490.83	2625.56	501.8	2629.45	503.22	2683.64	505.27
2686.56	505.39	2692.74	505.82	2698.8	506.08	2710.71	506.59	2754.96	507.41
2774.35	507.99	2775.3	508.02	2793.69	508.94	2822.08	510.12	2826.86	510.18
2834.01	510.18	2877.12	509.88	2894.63	509.95	2935.83	509.81	2948.63	509.69
2982.32	509.21	3008.18	508.74	3009.21	508.72	3026.47	508.34	3039.68	507.94
3053.13	507.54	3089.93	507.54	3157.81	507.42	3224.78	507	3229.09	506.79
3235.47	506.88	3240.26	507.04	3250.46	506.54	3258.23	506.67	3262.14	506.33
3310.09	507.1	3323.6	507.13	3325.71	507.54	3362.67	508.03	3382.55	508.12
3440.34	506.84	3501.8	506.95	3529.32	507.29	3549.5	509.91	3562.34	507.17
3589.8	507.22	3600.87	507.26	3616.46	511.04	3626.56	507.48	3635.73	507.39
3680.68	507.56	3697.77	507.66	3738.47	508.07	3747.73	508.25	3814.6	509.4
3821.84	509.47	3866.89	510.01	3876.25	511.35	3898.26	514.73	3904.3	515.94
3908.98	516.98	3919.94	518.86	3920.09	518.88	3927.41	519.04	3932.47	519.15
3933.85	519.26	3936.6	519.43	3939.05	519.58	3939.35	519.58	3940.73	519.54
3949.45	518.98	3952.39	518.6	3956.26	517.84	3963.53	517.16	3968.71	516.97
3990.37	519.32	4014.57	520.98	4072.36	522.33	4084.03	522.93	4138.41	525.51
4162.67	525.94	4194.37	526.35	4206.61	526.53	4218.17	526.63	4234.73	527.01
4298.02	529.03	4312.99	529.59	4344.8	530.84	4380.58	531.42	4396.25	531.98
4440.2	533.26	4507.27	535.81	4509	535.89	4533.77	540.82	4546.61	541.58
4578.96	542.14	4582.38	542.32	4589.72	542.52	4592.84	542.62	4635.62	541.74
4649.5	541.09	4651.18	541.36	4656.44	542.68	4690.63	545.76	4709.63	550.43
4728.23	555.31	4779.6	559.09	4805.29	560.49	4816.02	560.88	4819.96	561.01
4859.41	562.45	4903.44	563.92	4921.25	564.15	4957.1	565.76	4963.98	565.75
5006.18	567.36	5010.29	568.31	5027.64	571.96	5039.2	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1619.2	.04	2629.45	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1619.2	2629.45	406	410 329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130810.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	44.27	564.43	56.92	562.61	84.59	556.84	108.17	552.52
150.2	546.18	207.91	537.86	212.05	537.35	261.66	533.16	309.5	528.96
319.37	528.17	356.53	524.92	397.32	522.32	412.31	523.52	415.82	523.52
448.73	523.52	470.36	521.76	472.29	521.69	494.08	521.5	542.3	519.73
571.88	518.4	587.36	517.99	649.02	517.54	657.56	517.3	705.15	515.69
746.45	514.13	773.92	513.23	792.9	512.53	826.1	508.3	829.98	508.23
831.63	508.18	832.42	508.14	835.59	507.99	849.02	506.99	864.25	504.63
871.95	504.41	905.94	506.77	909.23	507.02	956.54	507.99	983.41	508.86
1006.69	509.33	1046.66	511.82	1078.44	513.94	1091.29	511.68	1110.57	514.08
1114.64	514.1	1120.21	514.1	1129.85	514.1	1167.33	502.82	1196.07	502.03
1223.73	500.9	1255.15	500.29	1266.42	498.51	1294.77	493.88	1313.06	495.86
1353.38	500.13	1379.38	502.78	1418.2	504.33	1451.13	505.52	1467.22	504.2
1518.6	501.02	1538.83	493.69	1546.64	489.78	1558.36	486.68	1559.76	486.28
1560.49	486.19	1609.71	485.47	1686.45	484.54	1738.77	483.79	1796.02	483.07
1808.52	482.85	1843.4	482.04	1899.21	480.97	1913.16	480.41	1930.6	479.8
2001.6	479.8	2031.05	480.64	2060.5	481.48	2108.49	482.4	2158.66	482.6
2197.57	482.76	2256.82	483	2335.34	483.4	2364.79	483.8	2433.5	484.2
2482.58	484.6	2491.2	484.86	2491.51	484.87	2518.23	487.6	2520.59	488.5
2520.65	488.52	2523.34	489.54	2551.79	500.5	2556.22	502.06	2612.85	504.8
2615.91	504.95	2622.37	505.36	2628.7	505.54	2641.15	505.89	2687.39	506.64
2707.66	507.09	2708.65	507.11	2727.87	508.02	2757.54	509.31	2762.54	509.34
2770	509.34	2815.06	508.94	2833.36	509.04	2876.41	509.11	2889.79	509.02
2925	508.71	2952.03	508.42	2953.11	508.41	2971.14	508.22	2984.95	508.02
2999.01	507.82	3037.47	507.82	3108.41	507.66	3178.39	507.1	3182.89	506.82
3189.56	506.6	3194.57	506.49	3205.23	505.82	3213.35	505.99	3217.43	505.87
3267.54	506.9	3281.66	506.94	3283.88	507.15	3322.5	507.47	3343.28	507.56
3403.67	505.77	3467.9	505.82	3496.66	506.25	3517.75	509.7	3531.17	506.04
3559.86	506.06	3571.44	506.08	3587.73	511.07	3598.28	506.29	3607.86	506.15
3654.84	506.23	3672.7	506.31	3715.23	506.58	3724.91	506.77	3794.8	508
3802.36	508.06	3849.44	508.51	3859.23	510.23	3882.23	514.4	3888.54	515.69
3893.43	516.73	3904.89	518.91	3905.05	518.94	3912.7	519.15	3917.98	519.3
3919.43	519.38	3922.3	519.47	3924.85	519.54	3925.18	519.54	3926.62	519.49
3935.72	518.99	3938.8	518.57	3942.85	517.89	3950.44	516.99	3955.85	516.48
3978.49	518.63	4003.79	520.54	4064.18	521.61	4076.38	522.28	4133.2	525.26
4158.55	525.62	4191.68	526.03	4204.48	526.21	4216.56	526.34	4233.86	526.66
4300.01	528.62	4315.66	529.18	4348.9	530.42	4386.29	530.71	4402.67	531.24
4448.6	532.58	4518.69	535.42	4520.5	535.49	4546.38	541.71	4559.8	542.54
4593.62	542.82	4597.19	542.91	4604.86	542.86	4608.12	542.85	4652.83	541.69
4667.33	541.13	4669.09	541.23	4674.59	542.2	4710.31	545.78	4730.18	551.7
4749.62	557.66	4803.3	561.14	4830.14	562.25	4841.36	562.44	4845.48	562.51
4886.7	563.33	4932.72	564.06	4951.33	563.87	4988.8	564.05	4995.99	563.93
5040.09	565.38	5044.39	566.58	5062.51	571.45	5074.6	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0	.08	1518.6	.04	2556.22	.08				

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1518.6	2556.22	406	410	329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130400

INPUT
Description: FEMA CQ
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1455.35	486.2	1665.35	484.2	1785.35	482.2
1860.35	482.2	1980.35	484.2	2080.35	484.2	2410.35	484.2	2440.35	486.2
2443	487.2	2483	500.9	2552	504.9	2642	506.2	2693	508.5
2706	508.5	2753	508	2817	508.4	2897	508.1	2985	508.1
3059	507.9	3132	507.2	3160	505.1	3225	506.7	3304	507
3367	504.7	3434	504.7	3464	505.2	3486	509.5	3500	504.9
3542	504.9	3559	511.1	3570	505.1	3580	504.9	3629	504.9
3692	505.1	3775	506.6	3832	507	3890	519	3905	519.5
3908	519.5	3911	519.5	3922	519	3943	516	3993	520.1
4056	520.9	4128	525	4189	525.7	4233	526.3	4302	528.2
4353	530	4392	530	4457	531.9	4532	535.1	4559	542.6
4573	543.5	4612	543.5	4620	543.2	4687	541.1	4730	545.8
4771	560	4827	563.2	4855	564	4871	564	4914	564.2
4962	564.2	5028	562.1	5074	563.4	5110	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1418	.04	2483	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1418	2483	2400 1704.99	1200	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 128690

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	933.06	486.2	983.06	484.2	1093.06	482.2
1143.06	480.2	1243.06	478.2	1318.06	476.2	1368.06	476.2	1443.06	478.2
1483.06	480.2	1553.06	482.2	1628.06	484.2	1668.06	486.2	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9

2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	852	.04	1713	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
852	1713	970	890	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 127800

INPUT
Description: FEMA CP
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1100	486.2	1150	484.2	1275	482.2	1315	480.2	1425	478.2
1500	476.2	1550	476.2	1630	478.2	1670	480.2	1730	482.2
1805	484.2	1835	486.2	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	1074	.04	1957	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1074	1957	1015	945	960	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.
			Flow Area	Top Width	Froude # Chl	
E.G. Elev	E.G. Slope	Vel Chnl	(cfs)	(ft)	(ft)	
(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		
1	139600	10 yr	167000.00	481.50	511.61	
512.20	0.000356	6.21	28635.68	2040.35	0.21	
1	139600	50 yr	232000.00	481.50	516.07	
516.82	0.000389	7.11	38120.82	2252.04	0.22	
1	139600	100 yr	260000.00	481.50	517.70	
518.52	0.000403	7.46	41979.43	2458.90	0.23	

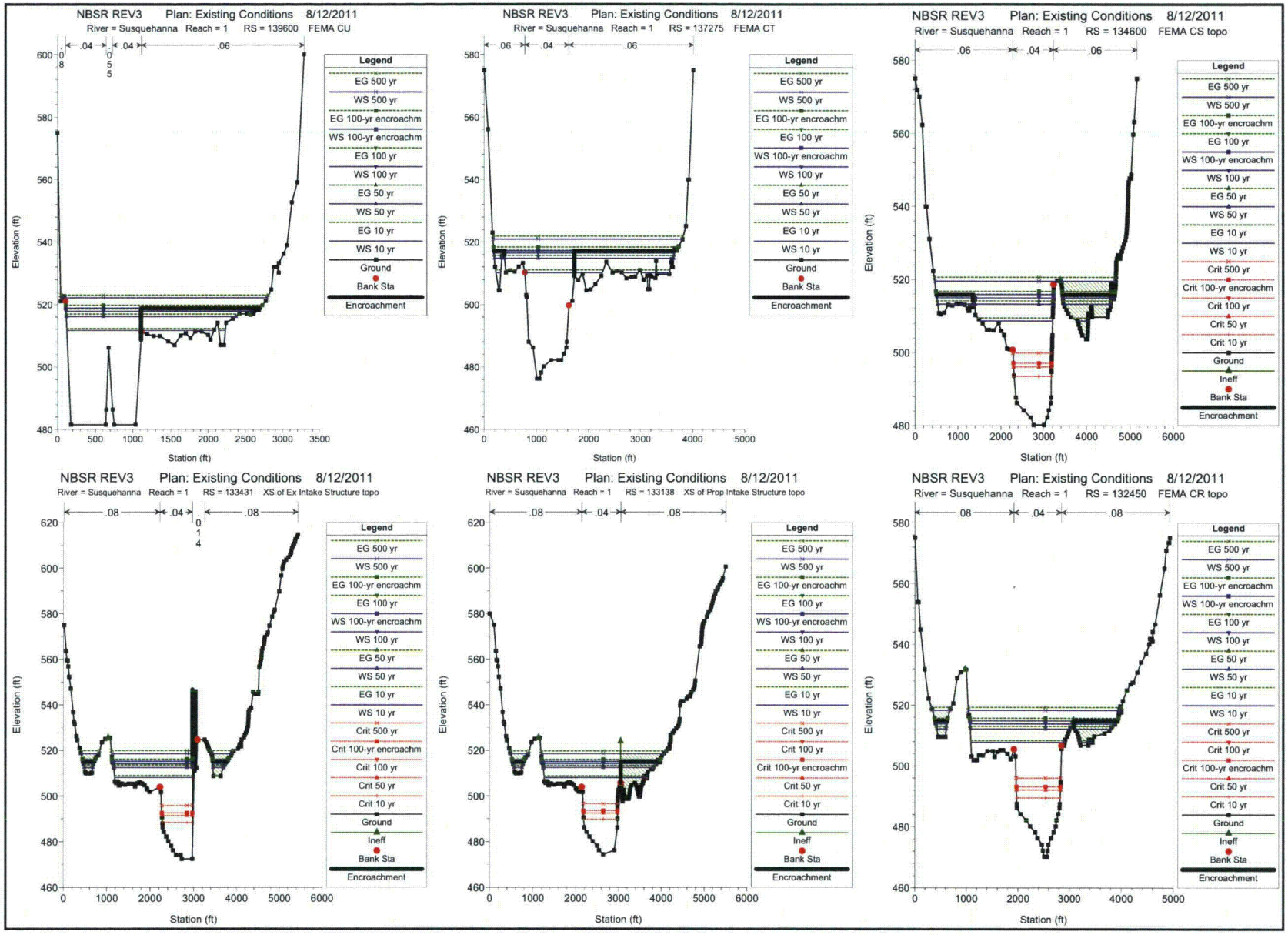
1	139600	500 yr	340000.00	481.50	521.88		522.83	0.000422	8.22	52843.65	2704.31	0.24
1	137275	10 yr	167000.00	476.20	510.19		511.01	0.000515	7.38	25783.76	2415.84	0.25
1	137275	50 yr	232000.00	476.20	514.69		515.60	0.000494	8.03	39795.30	3378.69	0.26
1	137275	100 yr	260000.00	476.20	516.40		517.30	0.000476	8.18	45612.57	3452.31	0.25
1	137275	500 yr	340000.00	476.20	520.75		521.65	0.000437	8.52	61018.59	3629.44	0.25
1	134600	10 yr	167000.00	480.20	508.66	493.47	509.44	0.000519	7.13	25493.07	1934.54	0.25
1	134600	50 yr	232000.00	480.20	513.16	496.07	514.10	0.000534	8.02	34154.00	3528.34	0.26
1	134600	100 yr	260000.00	480.20	514.87	497.11	515.85	0.000531	8.29	38687.77	3815.97	0.26
1	134600	500 yr	340000.00	480.20	519.28	499.87	520.36	0.000519	8.91	50831.84	4100.61	0.27
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32

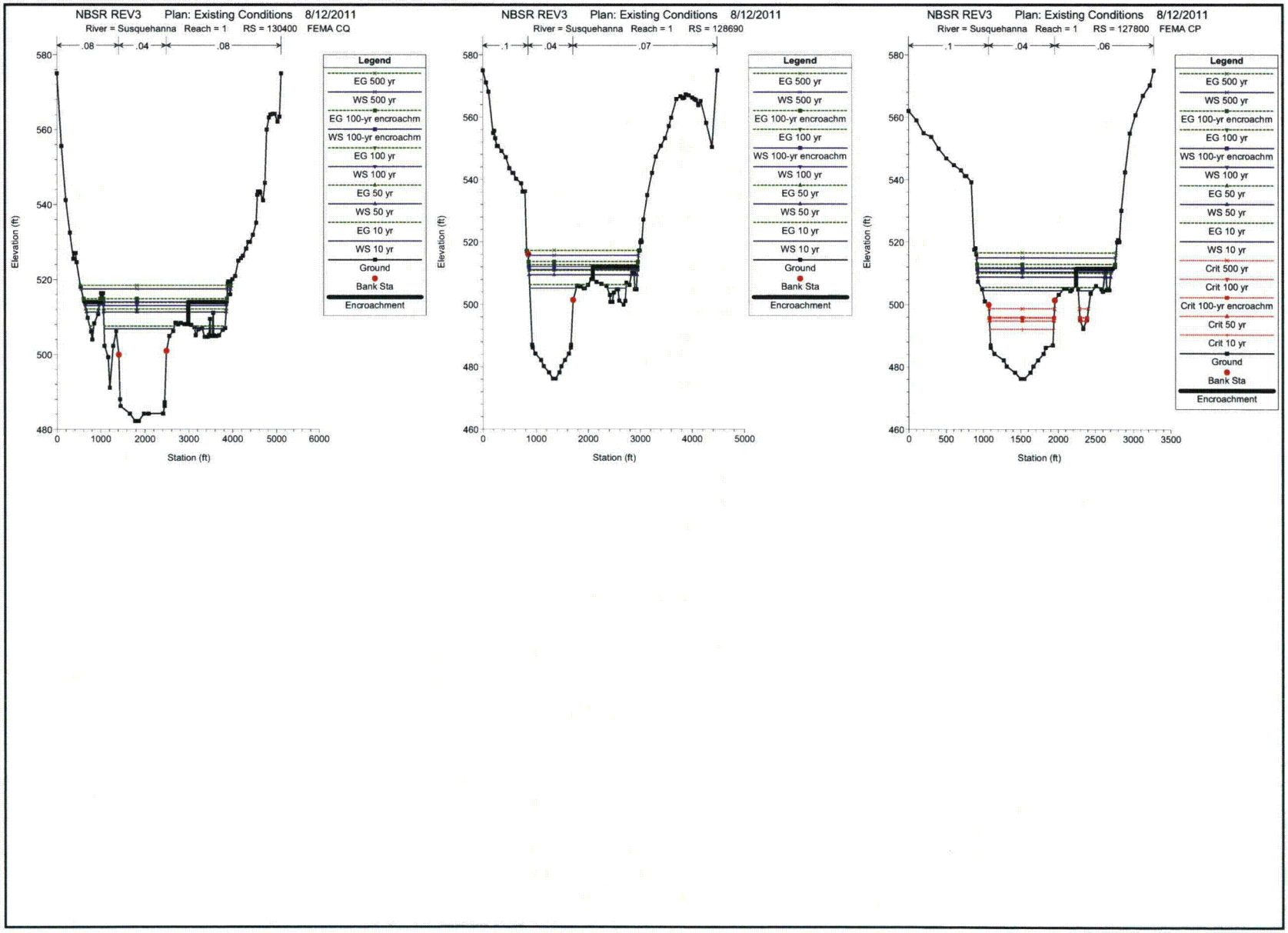
Appendix H:
Existing Conditions Model

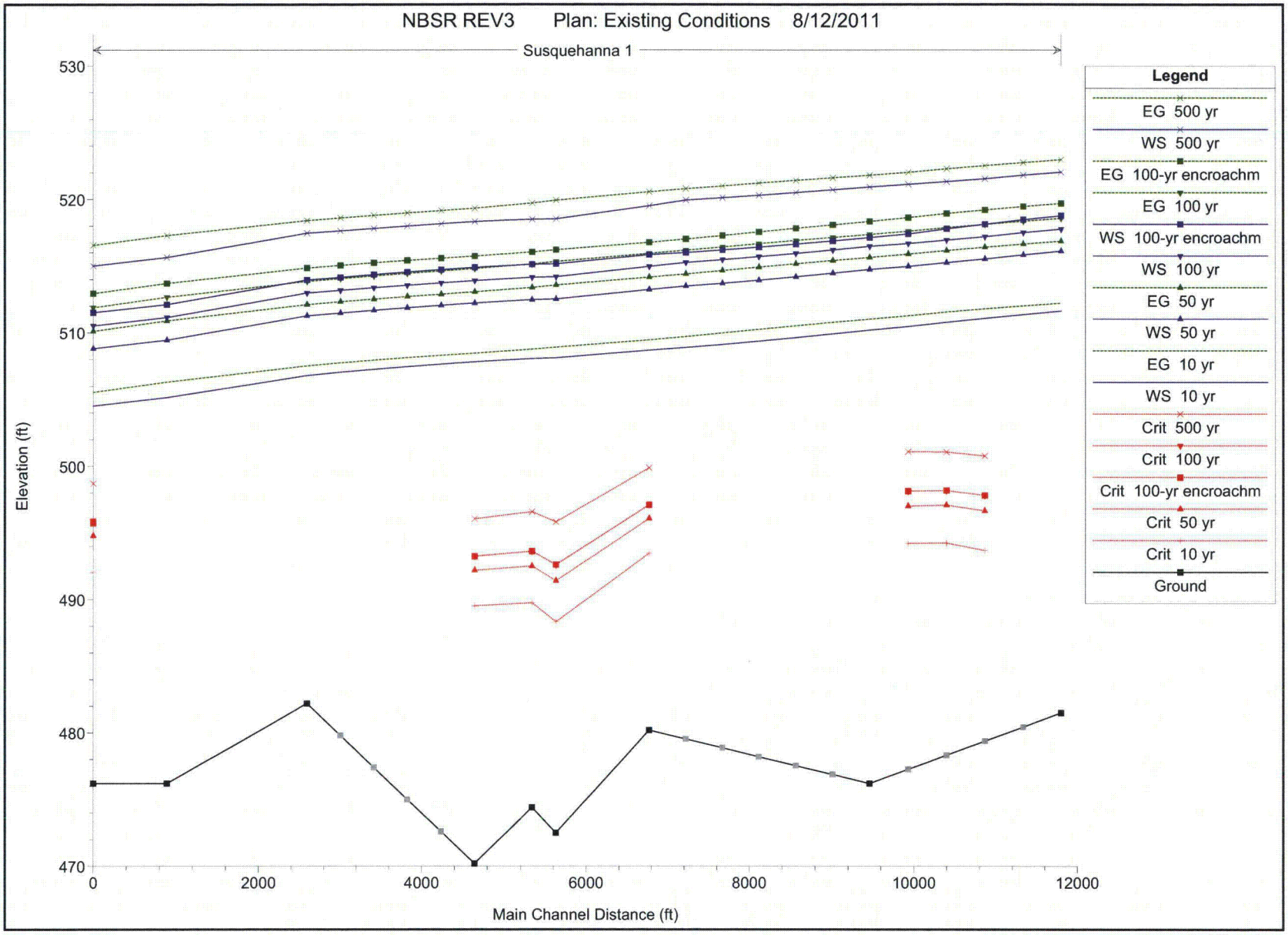
- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

HEC-RAS Plan: Existing River: Susquehanna Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.63		512.22	0.000355	6.20	28687.18	2041.02	0.21
1	139600	50 yr	232000.00	481.50	516.13		516.87	0.000386	7.09	38262.09	2255.52	0.22
1	139600	100 yr	260000.00	481.50	517.79		518.60	0.000398	7.43	42192.71	2459.46	0.23
1	139600	500 yr	340000.00	481.50	522.06		522.99	0.000413	8.16	53331.33	2712.75	0.24
1	139600	100-yr encroachm	260000.00	481.50	518.79		519.71	0.000414	7.69	33801.48	1001.09	0.23
1	137275	10 yr	167000.00	476.20	510.20		511.02	0.000514	7.37	25811.93	2417.80	0.25
1	137275	50 yr	232000.00	476.20	514.75		515.65	0.000489	8.01	39995.78	3379.88	0.25
1	137275	100 yr	260000.00	476.20	516.49		517.38	0.000470	8.14	45914.56	3453.23	0.25
1	137275	500 yr	340000.00	476.20	520.94		521.82	0.000425	8.44	61733.54	3634.26	0.24
1	137275	100-yr encroachm	260000.00	476.20	517.14		518.35	0.000557	8.98	31659.19	1338.00	0.28
1	134600	10 yr	167000.00	480.20	508.68	493.47	509.45	0.000518	7.12	25516.86	1936.11	0.25
1	134600	50 yr	232000.00	480.20	513.23	496.07	514.17	0.000528	7.99	34337.93	3588.54	0.26
1	134600	100 yr	260000.00	480.20	514.98	497.11	515.95	0.000524	8.25	38981.17	3830.95	0.26
1	134600	500 yr	340000.00	480.20	519.52	499.87	520.58	0.000503	8.81	51514.63	4129.96	0.26
1	134600	100-yr encroachm	260000.00	480.20	515.85	497.11	516.78	0.000479	8.03	38503.16	1877.66	0.25
1	133431	10 yr	167000.00	472.50	508.11	488.34	508.91	0.000429	7.25	26294.47	1781.35	0.23
1	133431	50 yr	232000.00	472.50	512.53	491.41	513.58	0.000491	8.45	34198.19	2232.55	0.25
1	133431	100 yr	260000.00	472.50	514.21	492.61	515.35	0.000512	8.90	37217.72	2331.86	0.26
1	133431	500 yr	340000.00	472.50	518.55	495.82	519.94	0.000562	10.01	45198.92	2737.63	0.28
1	133431	100-yr encroachm	260000.00	472.50	515.17	492.61	516.23	0.000463	8.60	38973.73	1837.44	0.25
1	133138	10 yr	167000.00	474.40	508.05	489.76	508.76	0.000435	6.81	26970.08	2392.96	0.23
1	133138	50 yr	232000.00	474.40	512.48	492.51	513.40	0.000470	7.85	34942.32	2761.19	0.25
1	133138	100 yr	260000.00	474.40	514.16	493.62	515.16	0.000482	8.24	37986.67	2871.94	0.25
1	133138	500 yr	340000.00	474.40	518.51	496.58	519.73	0.000512	9.23	46028.69	3276.41	0.27
1	133138	100-yr encroachm	260000.00	474.40	515.13	493.62	516.06	0.000438	7.96	39759.26	1846.64	0.24
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	132450	100-yr encroachm	260000.00	470.20	514.90	493.24	515.75	0.000386	7.63	42052.75	2003.73	0.23
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	130400	100-yr encroachm	260000.00	482.20	513.95		514.85	0.000497	7.84	39326.96	1923.92	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	128690	100-yr encroachm	260000.00	476.20	512.10		513.69	0.000847	10.22	27356.42	1228.21	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32
1	127800	100-yr encroachm	260000.00	476.20	511.50	495.74	512.93	0.000760	9.72	29288.21	1323.84	0.32


NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 139600 FEMA CU
.04 .04 .06
0.08 0.05 0.05
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
WS 100-yr encroachm
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 137275 FEMA CT
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 134600 FEMA CS topo
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100-yr encroachm
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 133431 XS of Ex Intake Structure topo
.08 .04 .08
0.14
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100-yr encroachm
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 133138 XS of Prop Intake Structure topo
.08 .04 .08
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 132450 FEMA CR topo
.08 .04 .08
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
WS 100-yr encroachm
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment


NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 130400 FEMA CQ
.08
.04
.08
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
WS 100-yr encroachm
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 128690
.1
.04
.07
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Existing Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 127800 FEMA CP
.1
.04
.06
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground
Bank Sta
Encroachment


NBSR REV3 Plan: Existing Conditions 8/12/2011
Susquehanna 1
Elevation (ft)
530
520
510
500
490
480
470
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground

Existing.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    X    X    X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        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
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PROJECT DATA
Project Title: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 10:16:35 AM

Project in English units

PLAN DATA

Plan Title: Existing Conditions
Plan File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.p10

Geometry Title: Existing Conditions
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g10

Flow Title : FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Plan Summary Information:

Number of:	Cross Sections	= 22	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	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
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = False
Left Offset = 0
Right Offset = 0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	50 yr	0	0	0
139135.*	50 yr	0	0	0
138670.*	50 yr	0	0	0
138205.*	50 yr	0	0	0
137740.*	50 yr	0	0	0
137275	50 yr	0	0	0
136829.*	50 yr	0	0	0
136383.*	50 yr	0	0	0
135937.*	50 yr	0	0	0
135491.*	50 yr	0	0	0
135045.*	50 yr	0	0	0
134600	50 yr	0	0	0
133431	50 yr	0	0	0
133138	50 yr	0	0	0
132450	50 yr	0	0	0
132040.*	50 yr	0	0	0
131630.*	50 yr	0	0	0
131220.*	50 yr	0	0	0
130810.*	50 yr	0	0	0
130400	50 yr	0	0	0
128690	50 yr	0	0	0
127800	50 yr	0	0	0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	100 yr	0		
139135.*	100 yr	0		
138670.*	100 yr	0		
138205.*	100 yr	0		
137740.*	100 yr	0		
137275	100 yr	0		
136829.*	100 yr	0		
136383.*	100 yr	0		
135937.*	100 yr	0		
135491.*	100 yr	0		
135045.*	100 yr	0		
134600	100 yr	0		
133431	100 yr	0		
133138	100 yr	0		
132450	100 yr	0		
132040.*	100 yr	0		
131630.*	100 yr	0		
131220.*	100 yr	0		
130810.*	100 yr	0		
130400	100 yr	0		
128690	100 yr	0		
127800	100 yr	0		

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	500 yr	0	0	0
139135.*	500 yr	0	0	0
138670.*	500 yr	0	0	0
138205.*	500 yr	0	0	0
137740.*	500 yr	0	0	0
137275	500 yr	0	0	0
136829.*	500 yr	0	0	0
136383.*	500 yr	0	0	0
135937.*	500 yr	0	0	0
135491.*	500 yr	0	0	0
135045.*	500 yr	0	0	0
134600	500 yr	0	0	0

			Existing.rep
133431	500 yr	0	0	0
133138	500 yr	0	0	0
132450	500 yr	0	0	0
132040.*	500 yr	0	0	0
131630.*	500 yr	0	0	0
131220.*	500 yr	0	0	0
130810.*	500 yr	0	0	0
130400	500 yr	0	0	0
128690	500 yr	0	0	0
127800	500 yr	0	0	0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	100-yr encroachment	1	89	1111
139135.*	100-yr encroachment	1	210	1314.31
138670.*	100-yr encroachment	1	319.47	1416.98
138205.*	100-yr encroachment	1	490	1519.66
137740.*	100-yr encroachment	1	612	1622.33
137275	100-yr encroachment	1	387	1725
136829.*	100-yr encroachment	1	515	1990.46
136383.*	100-yr encroachment	1	635	2255.91
135937.*	100-yr encroachment	1	770	2521.37
135491.*	100-yr encroachment	1	885	2790
135045.*	100-yr encroachment	1	1210	3050
134600	100-yr encroachment	1	1350	3310
133431	100-yr encroachment	1	1075	2965.8
133138	100-yr encroachment	1	1165	3054
132450	100-yr encroachment	1	1065	3078.44
132040.*	100-yr encroachment	1	950.47	3017.17
131630.*	100-yr encroachment	1	925	2955.9
131220.*	100-yr encroachment	1	875	2935.83
130810.*	100-yr encroachment	1	1125	2889.79
130400	100-yr encroachment	1	1060	2985
128690	100-yr encroachment	1	860	2090
127800	100-yr encroachment	1	892	2242

FLOW DATA

Flow Title: FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr	100 yr	500 yr
Susquehanna	1	139600	167000	232000	260000	340000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Susquehanna	1	10 yr	Critical	Known WS = 504.5

Susquehanna	1	50 yr	Critical
Known WS = 508.8			
Susquehanna	1	100 yr	Critical
Known WS = 510.5			
Susquehanna	1	500 yr	Critical
Known WS = 515			
Susquehanna	1	100-yr encroachment	Critical
Known WS = 511.5			

GEOMETRY DATA

Geometry Title: Existing Conditions
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g10

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139600

INPUT
Description: FEMA CU
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	106	.04	647	.055	733	.04	1118	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
106	1118	475	468	413	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
2575	3289	518.6

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139135.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	23.49	560.56	49.46	542.15	64.3	533.21	85.94	521.89
90.58	519.79	95.17	518.38	105.42	520.12	108.82	520.19	113.14	520.37
119.64	520.51	128.6	519.56	135.96	519.76	153.02	519.86	163.15	519.83

179.3	520.09	188.08	520.37	201.68	520.54	204.96	520.46	228.45	519.87
240.2	518.84	251.25	513.99	255.67	512.5	271.59	504.7	309.32	492.68
342.47	480.44	345.72	480.44	719.04	480.44	724.72	484.33	749.88	500.2
794.52	484.33	811.56	480.44	1043.67	480.44	1052.99	482.1	1068.53	484.61
1113.58	491.12	1157.08	497.03	1172.62	499.13	1189.71	501.85	1203.69	504.15
1205.44	504.75	1218.8	508.9	1275.37	508.77	1292.24	509.33	1314.31	510.12
1377.92	509.49	1381.08	509.48	1459.9	509.88	1462.58	509.84	1523.88	508.06
1571.72	507.5	1602.7	507.16	1654.34	506.77	1687.09	507.87	1737.98	509.64
1790.95	510.34	1809.37	510.66	1871.59	509.98	1883.68	510.4	1938.91	511.44
1995.88	511.08	2030.71	511.13	2067.28	510.81	2117.41	510.26	2148.01	509.03
2158.16	509.53	2201.05	511.47	2243.47	512.87	2247.97	513.04	2287.75	507.32
2333.42	507.36	2334.67	507.36	2362.21	513.13	2405.75	513.59	2456.05	514.36
2486.42	514.96	2543.77	515.24	2550.41	515.18	2611.61	515.46	2627.37	514.58
2647.81	514.58	2653.34	514.55	2665.39	515.41	2691.36	515.18	2695.75	515.15
2704.93	516.66	2714.11	516.65	2734.51	515.34	2758.12	515.61	2772.96	516.88
2787.8	516.24	2807.95	516.5	2904.84	518.82	2979.3	521.78	3008.5	526.93
3011.94	527.62	3025.2	527.91	3042.81	528.3	3050.22	528.5	3053.01	528.3
3062.94	528.07	3065.99	527.77	3082.32	527.13	3084.36	529.68	3100.3	530.81
3104.93	530.95	3145.74	532.26	3149.64	532.44	3174.48	533.86	3197.58	535.09
3239.39	542.27	3263.88	546.66	3300.6	549.7	3338.34	555.06	3341.4	556.33
3353.45	560.49	3433.2	595						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.076	240.2	.04	794.52	.054	1043.67	.042	1218.8	.06
3433.2	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
240.2	1218.8	475	468	413	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 138670.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	36.62	559.44	77.1	537.36	100.23	527.91	133.96	517.54
141.18	515.96	148.35	515.76	164.31	518.97	169.61	519.02	176.36	519.25
186.48	519.36	200.45	517.22	211.92	517.42	238.52	517.62	254.31	517.56
279.47	517.69	293.16	518.04	314.35	518.38	319.47	518.37	356.09	518.23
374.4	516.68	388.94	511.24	394.75	509.97	415.69	500.53	465.33	491.06
508.94	479.38	511.44	479.38	798.08	479.38	802.45	482.3	821.76	494.2
856.04	482.3	869.12	479.38	1047.34	479.38	1061.83	481.13	1085.99	483.51
1156.03	488.89	1223.65	493.32	1247.8	494.9	1274.37	497.44	1296.11	499.66
1298.83	500.56	1319.6	506.6	1377.27	506.88	1394.48	508.17	1416.98	509.89
1481.84	509.09	1485.06	509.06	1565.42	509.86	1568.16	509.77	1630.66	507.17
1679.43	506.79	1711.03	506.57	1763.67	506.54	1797.07	507.53	1848.95	509.19
1902.96	510.05	1921.75	510.52	1985.19	510.77	1997.51	511.23	2053.83	511.57
2111.91	510.86	2147.43	510.96	2184.71	510.78	2235.82	510.31	2267.02	509.36
2277.37	509.72	2321.1	510.94	2364.35	511.75	2368.94	511.89	2409.5	507.64
2456.06	507.72	2457.34	507.72	2485.42	512.06	2529.81	512.41	2581.1	513.32
2612.07	513.97	2670.54	513.49	2677.31	513.36	2739.71	513.92	2755.78	512.16
2776.61	512.16	2782.25	512.14	2794.54	513.93	2821.02	513.64	2825.49	513.61
2834.85	514.72	2844.21	514.69	2865.01	513.67	2889.09	513.83	2904.22	516.14
2919.35	514.6	2939.89	514.8	3038.69	516.54	3114.61	518.76	3144.37	522.62
3147.89	523.23	3161.41	523.82	3179.35	524.6	3186.92	525	3189.75	524.6
3199.89	524.14	3202.99	523.83	3219.65	524.06	3221.73	526.07	3237.97	527.6
3242.7	527.69	3284.3	528.5	3288.29	528.68	3313.61	530.07	3337.16	531.18
3379.8	536.9	3404.76	540.63	3442.2	543.55	3480.68	551.01	3483.8	552.25

3496.09	555.37	3577.4	590

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	374.4	.04	1047.34	.045	1319.6	.06	3577.4	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
374.4	1319.6	475	468	413	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	314.35	518.38	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 138205.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49.75	558.33	104.73	532.57	136.15	522.61	181.97	513.2
191.79	512.14	201.52	513.14	223.21	517.81	230.41	517.85	239.57	518.13
253.32	518.2	272.3	514.88	287.89	515.09	324.01	515.38	345.46	515.29
379.65	515.3	398.24	515.71	427.03	516.22	433.98	516.28	483.73	516.59
508.6	514.52	526.63	508.49	533.84	507.45	559.79	496.35	621.34	489.44
675.42	478.32	677.15	478.32	877.13	478.32	880.17	480.26	893.65	488.2
917.56	480.26	926.69	478.32	1051.02	478.32	1070.68	480.15	1103.44	482.41
1198.47	486.66	1290.22	489.61	1322.99	490.67	1359.03	493.03	1388.52	495.17
1392.22	496.37	1420.4	504.3	1479.18	504.98	1496.72	507	1519.66	509.66
1585.76	508.68	1589.04	508.64	1670.95	509.84	1673.73	509.71	1737.44	506.28
1787.15	506.09	1819.35	505.98	1873.01	506.3	1907.04	507.19	1959.93	508.73
2014.97	509.77	2034.12	510.38	2098.78	511.55	2111.34	512.05	2168.74	511.71
2227.94	510.64	2264.14	510.79	2302.14	510.75	2354.24	510.37	2386.03	509.69
2396.58	509.91	2441.15	510.41	2485.23	510.64	2489.91	510.73	2531.25	507.96
2578.71	508.08	2580.01	508.08	2608.63	510.98	2653.87	511.24	2706.15	512.29
2737.71	512.98	2797.3	511.73	2804.2	511.54	2867.8	512.38	2884.19	509.74
2905.42	509.74	2911.17	509.73	2923.7	512.46	2950.68	512.09	2955.24	512.06
2964.78	512.78	2974.32	512.74	2995.52	512.01	3020.06	512.05	3035.48	515.39
3050.9	512.97	3071.84	513.1	3172.53	514.26	3249.91	515.74	3280.25	518.32
3283.83	518.85	3297.61	519.73	3315.9	520.9	3323.61	521.5	3326.5	520.9
3336.83	520.21	3339.99	519.89	3356.97	520.99	3359.09	522.45	3375.65	524.4
3380.47	524.43	3422.87	524.73	3426.93	524.92	3452.74	526.28	3476.75	527.27
3520.2	531.54	3545.64	534.59	3583.8	537.4	3623.02	546.97	3626.2	548.17
3638.73	550.25	3721.6	585						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.068	508.6	.04	1051.02	.052	1103.44	.047	1420.4	.06
3721.6	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
508.6	1420.4	475	468	413	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	253.32	518.2	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137740.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	62.87	557.21	132.37	527.79	172.08	517.3	229.99	508.85
242.39	508.32	254.69	510.53	282.1	516.66	291.2	516.67	302.79	517.02
320.16	517.05	344.15	512.54	363.85	512.75	409.51	513.14	436.62	513.02
479.82	512.9	503.32	513.38	539.71	514.06	548.49	514.19	611.36	514.94
642.8	512.36	664.31	505.75	672.92	504.92	703.9	492.18	777.35	487.82
841.89	477.26	842.87	477.26	956.17	477.26	957.89	478.23	965.53	482.2
979.08	478.23	984.25	477.26	1054.69	477.26	1079.52	479.18	1120.9	481.3
1240.92	484.43	1356.79	485.91	1398.17	486.43	1443.7	488.61	1480.94	490.69
1485.61	492.19	1521.2	502	1581.09	503.09	1598.96	505.83	1622.33	509.43
1689.67	508.27	1693.02	508.22	1776.47	509.82	1779.31	509.64	1844.22	505.39
1894.87	505.39	1927.68	505.39	1982.34	506.07	2017.02	506.84	2070.9	508.28
2126.99	509.48	2146.5	510.24	2212.38	512.33	2225.17	512.88	2283.65	511.84
2343.97	510.42	2380.85	510.62	2419.57	510.73	2472.65	510.42	2505.05	510.02
2515.79	510.11	2561.2	509.88	2606.12	509.52	2610.88	509.58	2653	508.28
2701.35	508.44	2702.68	508.44	2731.84	509.91	2777.94	510.07	2831.2	511.25
2863.36	511.99	2924.07	509.98	2931.1	509.72	2995.9	510.84	3012.59	507.32
3034.23	507.32	3040.08	507.31	3052.85	510.98	3080.34	510.55	3084.99	510.51
3094.71	510.84	3104.43	510.78	3126.03	510.34	3151.03	510.28	3166.74	514.65
3182.45	511.33	3203.78	511.4	3306.38	511.98	3385.22	512.72	3416.12	514.01
3419.78	514.47	3433.81	515.64	3452.45	517.2	3460.31	518	3463.25	517.2
3473.77	516.28	3477	515.94	3494.29	517.93	3496.45	518.83	3513.32	521.2
3518.23	521.16	3561.43	520.97	3565.57	521.16	3591.87	522.49	3616.33	523.36
3660.6	526.17	3686.53	528.56	3725.4	531.25	3765.36	542.93	3768.6	544.08
3781.36	545.12	3865.8	580						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.064	642.8	.04	1120.9	.052	1240.92	.05	1521.2	.06
3865.8	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
642.8	1521.2	475	468	413	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	320.16	517.05	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137275

INPUT
Description: FEMA CT
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3
777	510.2	802	503	812	502.4	848	488	933.36	486.2
1008.36	476.2	1058.36	476.2	1088.36	478.2	1138.36	480.2	1283.36	482.2
1423.36	482.2	1473.36	482.2	1528.36	484.2	1573.36	486.2	1579	488
1622	499.7	1683	501.2	1725	509.2	1797	507.8	1882	509.8
1951	504.5	2036	504.8	2127	506.5	2239	509.2	2339	513.7
2460	510.2	2537	510.7	2635	510.3	2727	508.4	2824	508.8
2902	508.9	2989	511	3058	507.9	3124	509.3	3141	504.9
3169	504.9	3182	509.5	3210	509	3282	508.5	3298	513.9
3314	509.7	3552	509.7	3589	513.5	3597	514.5	3600	513.5

3614	512	3651	518	3656	517.9	3700	517.2	3731	518.7
3801	520.8	3867	525.1	3911	540	3924	540	4010	575

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	777	.04	1622	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
777	1622	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 136829.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	22.09	571.02	45.99	566.97	75.75	561.01	100.47	554.68
113.18	550.26	119.94	548.58	151.05	539.37	189.83	528.27	211.51	522.18
222.3	520.28	249.8	515.44	266.94	512.91	272.8	512.06	274.97	511.75
306.17	509.71	347.2	507.3	367.51	505.92	387.34	505.9	391.39	506.49
436.93	513.13	450.79	515.13	465.33	515.13	476.16	515.33	483.84	515.46
511.6	515.44	521.7	514.18	549.94	510.54	553.71	510.54	562.73	510.47
569.95	510.51	578.06	510.81	603.76	510.87	611.43	511.36	614.14	511.44
617.74	511.4	629.02	511.41	633.98	510.69	654.37	510.69	671.4	510.55
710.63	510.25	757.07	509.81	766.74	509.78	775.56	509.89	823.36	510.45
876.46	511.43	877.47	511.44	904.07	511.34	934.73	511.46	964.94	511.15
976.93	511.25	992	510.46	1027.17	508.62	1040.08	504.84	1056.8	500.82
1066.46	500.04	1068.65	499.91	1079.68	496.6	1111.32	487.58	1169.49	486.5
1212.5	485.71	1259.3	481.15	1301.39	476.87	1383.06	476.87	1410.08	478.59
1455.12	480.34	1550.03	481.74	1585.73	482.33	1639.08	482.53	1711.84	482.78
1739.27	482.87	1755.83	483.12	1756.88	483.18	1774.76	484.88	1779.21	485.2
1783.66	485.52	1788.11	485.83	1792.57	486.15	1797.02	486.47	1801.47	486.78
1805.92	487.1	1806.42	487.14	1810.38	487.45	1814.83	487.8	1819.28	488.15
1841.54	489.89	1846.89	490.28	1846.96	490.29	1852.04	491.94	1852.32	492.02
1858.11	493.65	1863.54	495.18	1869.04	496.73	1874.47	498.26	1879.9	499.8
1885.34	501.33	1890.77	502.87	1949.81	504.21	1990.46	510.95	1991.15	510.94
2060.14	509.78	2078.96	510.16	2107.22	510.57	2120.99	510.68	2128.2	510.66
2135.87	510.65	2142.41	510.66	2144.96	510.45	2159.85	509.3	2191.17	507.06
2209.19	505.81	2247.5	505.82	2291.46	505.79	2293.07	505.81	2365.93	506.81
2379.53	507.02	2487.93	509.17	2552.42	511.62	2584.72	512.7	2585.26	512.69
2615.56	511.77	2639.55	511	2681.86	509.78	2701.83	509.25	2776.35	509.56
2795.71	509.47	2829.15	509.35	2838	509.48	2841.46	509.64	2844.91	509.79
2847.28	509.95	2850.52	510.11	2853.54	510.26	2856.35	510.42	2871.2	510.37
2872.53	510.34	2874.37	510.14	2924.9	509.25	2927.39	509.37	2929.29	509.5
2931.28	509.63	2947.17	509.35	2951.59	509.1	2956.14	508.86	2960.25	508.62
2960.27	508.62	3054.13	508.95	3129.62	509.03	3213.82	510.78	3280.6	508.2
3344.48	509.37	3360.94	505.7	3388.04	505.7	3400.62	509.53	3407.92	509.59
3415.46	509.64	3427.72	509.45	3433.14	509.42	3447.05	509.33	3476.75	509.32
3479.86	509.47	3482.96	509.62	3486.15	509.77	3489.18	509.92	3492.11	510.06
3494.79	510.22	3497.4	510.2	3506.43	512.82	3512.89	514.65	3528.37	511.04
3529.89	511.03	3538.67	510.87	3547.8	510.7	3557.44	510.53	3569.81	510.53
3588.05	510.7	3602.47	510.87	3608.97	511.03	3614.58	511.2	3618.6	511.37
3621.98	511.53	3624.91	511.7	3627.77	511.87	3630.64	512.03	3633.31	512.2
3649.31	512.37	3676.74	512.53	3683.86	512.53	3718.97	512.37	3735.05	512.37
3742.17	512.53	3758.72	512.6	3782.96	514.84	3794.53	515.94	3802.28	516.82
3805.18	516	3810.81	515.51	3818.73	514.82	3847.72	519	3854.54	519.99
3859.38	519.93	3876.56	519.8	3898.83	519.66	3901.97	519.65	3912.78	520.23
3921.27	520.75	3926.45	521.14	3931.4	521.51	3931.97	521.55	3936.24	521.81
3940.41	522.08	3944.69	522.36	3948.18	522.62	3951.1	522.86	3954.03	523.1

3956.92	523.34	3959.81	523.59	3962.81	523.83	3966.03	524.08	3973.42	524.44
3998.82	525.26	3999.72	525.28	4024.08	526.65	4035.89	527.31	4041.05	527.77
4063.6	529.76	4097.77	540.83	4106.18	543.48	4118.76	543.77	4122.86	545.3
4202	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1027.17	.04	1890.77	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1027.17	1890.77	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 136383.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	27.48	571.2	57.19	567.6	94.2	561.27	124.94	553.26
140.74	548.21	149.15	546.86	187.84	537.71	236.07	527.08	263.03	521.36
276.44	519.42	310.64	514.51	331.95	512.43	339.24	511.75	341.94	511.51
380.73	509.95	431.76	508.46	457.01	507.34	481.67	507.31	486.71	507.77
543.34	513.16	560.58	514.77	578.66	514.77	592.13	514.92	601.68	515.02
636.2	514.98	648.76	513.97	683.87	510.87	688.57	510.85	699.79	510.66
708.76	510.69	718.85	511.23	750.81	511.17	760.34	512.11	763.71	512.25
768.19	512.14	782.21	512.09	788.38	510.61	813.75	510.48	834.92	510.26
883.7	509.8	941.46	509.09	953.48	509.07	964.45	509.15	1023.89	509.58
1089.93	510.75	1091.17	510.77	1124.26	510.25	1162.38	510.13	1199.95	509.14
1214.86	509.2	1233.6	508.55	1277.33	507.03	1292.26	502.61	1311.6	498.63
1322.77	497.57	1325.3	497.42	1338.06	494.52	1374.64	487.17	1441.9	486.04
1491.63	485.21	1545.75	481.36	1594.43	477.53	1707.76	477.53	1731.81	478.97
1771.88	480.49	1856.34	481.84	1888.11	482.47	1935.58	482.87	2000.32	483.35
2024.73	483.53	2039.47	484.03	2040.4	484.16	2056.3	486.85	2060.27	487.3
2064.23	487.75	2068.19	488.21	2072.15	488.66	2076.11	489.11	2080.08	489.57
2084.04	490.02	2084.48	490.07	2088	490.5	2091.96	490.98	2095.93	491.46
2115.74	493.86	2120.49	494.36	2120.55	494.37	2125.07	495.88	2125.32	495.96
2130.47	497.46	2135.31	498.88	2140.2	500.32	2145.04	501.75	2149.87	503.18
2154.7	504.61	2159.54	506.03	2216.61	507.23	2255.91	512.7	2256.58	512.69
2323.29	511.77	2341.48	512.07	2368.79	512.2	2382.11	512.09	2389.08	511.87
2396.5	511.66	2402.82	511.53	2405.29	511.3	2419.68	510.18	2449.96	508.19
2467.38	507.13	2504.42	506.99	2546.92	506.78	2548.48	506.79	2618.92	507.39
2632.07	507.54	2736.87	509.15	2799.21	511.03	2830.44	511.71	2830.96	511.69
2860.25	510.75	2883.45	509.94	2924.35	508.76	2943.66	508.31	3015.71	508.42
3034.42	508.31	3066.75	508.22	3075.31	508.53	3078.65	508.85	3081.99	509.17
3084.28	509.5	3087.41	509.82	3090.33	510.15	3093.05	510.48	3107.41	510.43
3108.68	510.41	3110.47	510.05	3159.32	509.34	3161.72	509.63	3163.57	509.94
3165.49	510.25	3180.85	510.02	3185.12	509.62	3189.52	509.23	3193.49	508.84
3193.51	508.83	3284.25	509.1	3357.24	509.17	3438.65	510.57	3503.21	508.5
3564.97	509.43	3580.87	506.5	3607.07	506.5	3619.24	509.57	3626.3	509.81
3633.59	510.05	3645.44	509.9	3650.68	509.87	3664.13	509.81	3692.84	510
3695.85	510.32	3698.85	510.64	3701.93	510.95	3704.85	511.27	3707.69	511.59
3710.28	511.91	3712.81	511.9	3721.54	514	3727.78	515.41	3742.75	512.39
3744.21	512.37	3752.7	512.03	3761.53	511.7	3770.85	511.37	3782.81	511.37
3800.44	511.7	3814.39	512.03	3820.67	512.37	3826.1	512.7	3829.98	513.03
3833.25	513.37	3836.08	513.7	3838.85	514.03	3841.62	514.37	3844.2	514.7
3859.67	515.03	3886.18	515.37	3893.07	515.37	3927.01	515.03	3942.56	515.03
3949.45	515.37	3965.45	515.5	3988.88	517.41	4000.07	518.37	4007.55	519.13
4010.36	518.5	4015.81	518.15	4023.46	517.64	4051.49	521.14	4058.08	521.98
4062.76	521.97	4079.37	521.98	4100.9	522.07	4103.93	522.11	4114.38	522.73

4122.59	523.34	4127.6	523.85	4132.39	524.35	4132.94	524.41	4137.07	524.79
4141.09	525.21	4145.23	525.63	4148.61	526.03	4151.44	526.43	4154.26	526.82
4157.06	527.22	4159.85	527.61	4162.75	528	4165.87	528.4	4173.01	528.89
4197.56	529.75	4198.44	529.77	4221.99	530.86	4233.41	531.39	4238.4	531.95
4260.19	534.42	4293.23	544.6	4301.37	546.96	4313.53	547.54	4317.48	548.88
4394	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1277.33	.04	2159.54	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1277.33	2159.54	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135937.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	32.86	571.37	68.4	568.22	112.65	561.52	149.41	551.84
168.31	546.16	178.36	545.15	224.63	536.06	282.3	525.88	314.54	520.55
330.58	518.57	371.48	513.58	396.96	511.95	405.68	511.44	408.91	511.26
455.3	510.19	516.32	509.62	546.52	508.75	576.01	508.71	582.03	509.05
649.76	513.2	670.37	514.4	691.99	514.4	708.09	514.52	719.52	514.58
760.8	514.52	775.82	513.75	817.81	511.21	823.43	511.16	836.84	510.84
847.57	510.87	859.64	511.64	897.86	511.48	909.26	512.86	913.28	513.07
918.65	512.88	935.41	512.77	942.79	510.53	973.12	510.27	998.44	509.97
1056.78	509.35	1125.84	508.37	1140.22	508.35	1153.34	508.41	1224.41	508.71
1303.39	510.08	1304.88	510.11	1344.44	509.16	1390.04	508.8	1434.96	507.13
1452.8	507.16	1475.2	506.64	1527.5	505.45	1544.45	500.38	1566.4	496.45
1579.07	495.11	1581.95	494.93	1596.43	492.44	1637.96	486.75	1714.32	485.58
1770.77	484.72	1832.2	481.57	1887.46	478.2	2032.46	478.2	2053.53	479.36
2088.64	480.63	2162.64	481.93	2190.48	482.6	2232.07	483.2	2288.8	483.93
2310.19	484.2	2323.1	484.95	2323.92	485.14	2337.85	488.81	2341.32	489.4
2344.8	489.99	2348.27	490.58	2351.74	491.17	2355.21	491.76	2358.68	492.35
2362.15	492.94	2362.54	493.01	2365.63	493.55	2369.1	494.16	2372.57	494.77
2389.93	497.82	2394.09	498.45	2394.15	498.46	2398.11	499.82	2398.33	499.89
2402.84	501.27	2407.08	502.59	2411.36	503.92	2415.6	505.24	2419.83	506.56
2424.07	507.88	2428.31	509.2	2483.42	510.24	2521.37	514.45	2522.02	514.44
2586.43	513.75	2604	513.98	2630.37	513.82	2643.24	513.49	2649.96	513.08
2657.13	512.67	2663.23	512.39	2665.61	512.15	2679.51	511.06	2708.75	509.32
2725.58	508.44	2761.34	508.17	2802.38	507.77	2803.88	507.77	2871.9	507.97
2884.6	508.06	2985.8	509.12	3046.01	510.45	3076.16	510.71	3076.66	510.69
3104.95	509.74	3127.35	508.88	3166.84	507.75	3185.49	507.36	3255.06	507.29
3273.13	507.16	3304.35	507.09	3312.61	507.57	3315.84	508.06	3319.06	508.56
3321.28	509.05	3324.3	509.54	3327.12	510.04	3329.74	510.53	3343.61	510.5
3344.84	510.49	3346.57	509.97	3393.74	509.43	3396.06	509.9	3397.84	510.38
3399.7	510.86	3414.53	510.69	3418.65	510.14	3422.91	509.59	3426.74	509.05
3426.76	509.05	3514.38	509.25	3584.86	509.3	3663.47	510.35	3725.81	508.8
3785.45	509.5	3800.81	507.3	3826.11	507.3	3837.85	509.6	3844.67	510.03
3851.71	510.46	3863.15	510.35	3868.22	510.33	3881.2	510.28	3908.93	510.67
3911.83	511.16	3914.73	511.65	3917.71	512.14	3920.53	512.63	3923.27	513.12
3925.77	513.61	3928.21	513.6	3936.64	515.17	3942.67	516.16	3957.12	513.73
3958.54	513.7	3966.73	513.2	3975.26	512.7	3984.26	512.2	3995.8	512.2
4012.83	512.7	4026.3	513.2	4032.37	513.7	4037.61	514.2	4041.36	514.7
4044.51	515.2	4047.25	515.7	4049.92	516.2	4052.6	516.7	4055.09	517.2
4070.03	517.7	4095.63	518.2	4102.28	518.2	4135.06	517.7	4150.07	517.7
4156.72	518.2	4172.17	518.4	4194.79	519.99	4205.6	520.81	4212.83	521.45

4215.54	521	4220.8	520.79	4228.19	520.46	4255.26	523.28	4261.62	523.97
4266.14	524	4282.18	524.16	4302.97	524.48	4305.9	524.56	4315.99	525.22
4323.92	525.93	4328.75	526.56	4333.38	527.19	4333.91	527.26	4337.9	527.77
4341.78	528.33	4345.78	528.9	4349.04	529.45	4351.77	530	4354.5	530.54
4357.2	531.09	4359.9	531.63	4362.69	532.18	4365.71	532.73	4372.6	533.34
4396.31	534.24	4397.16	534.25	4419.9	535.07	4430.93	535.47	4435.74	536.14
4456.79	539.09	4488.69	548.38	4496.55	550.44	4508.29	551.31	4512.11	552.46
4586	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1527.5	.04	2428.31	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1527.5	2428.31	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135491.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	38.24	571.55	79.6	568.85	131.1	561.78	173.88	550.41
195.87	544.1	207.58	543.43	261.42	534.41	328.53	524.69	366.06	519.73
384.72	517.71	432.32	512.65	461.97	511.46	472.12	511.13	475.87	511.02
529.87	510.42	600.88	510.78	636.02	510.17	670.34	510.11	677.35	510.33
756.17	513.23	780.16	514.03	805.33	514.03	824.06	514.11	837.36	514.14
885.4	514.06	902.88	513.53	951.75	511.55	958.29	511.48	973.89	511.03
986.38	511.04	1000.43	512.06	1044.91	511.79	1058.17	513.6	1062.85	513.88
1069.1	513.62	1088.61	513.44	1097.19	510.45	1132.49	510.06	1161.96	509.68
1229.85	508.9	1310.23	507.64	1326.96	507.63	1342.22	507.68	1424.94	507.84
1516.85	509.41	1518.59	509.44	1564.63	508.08	1617.69	507.47	1669.98	505.12
1690.73	505.11	1716.8	504.72	1777.67	503.87	1796.63	498.15	1821.19	494.26
1835.38	492.64	1838.61	492.43	1854.81	490.36	1901.29	486.33	1986.73	485.12
2049.91	484.23	2118.65	481.78	2180.49	478.87	2357.16	478.87	2375.25	479.75
2405.41	480.78	2468.95	482.02	2492.85	482.73	2528.57	483.53	2577.28	484.5
2595.64	484.87	2606.73	485.87	2607.43	486.12	2619.4	490.77	2622.38	491.5
2625.36	492.23	2628.35	492.95	2631.33	493.68	2634.31	494.41	2637.29	495.13
2640.27	495.86	2640.6	495.94	2643.25	496.6	2646.23	497.34	2649.21	498.08
2664.12	501.78	2667.69	502.53	2667.74	502.54	2671.14	503.77	2671.33	503.83
2675.21	505.08	2678.84	506.29	2682.53	507.51	2686.16	508.73	2689.8	509.94
2693.44	511.15	2697.07	512.37	2750.23	513.26	2786.83	516.2	2787.45	516.2
2849.57	515.73	2866.52	515.89	2891.95	515.45	2904.36	514.89	2910.85	514.28
2917.76	513.68	2923.64	513.25	2925.94	513	2939.34	511.94	2967.54	510.44
2983.77	509.75	3018.26	509.35	3057.84	508.76	3059.29	508.74	3124.89	508.55
3137.14	508.58	3234.73	509.1	3292.8	509.87	3321.87	509.71	3322.36	509.69
3349.64	508.73	3371.25	507.82	3409.34	506.73	3427.31	506.42	3494.41	506.15
3511.84	506.01	3541.95	505.96	3549.92	506.61	3553.03	507.28	3556.14	507.94
3558.28	508.6	3561.19	509.26	3563.91	509.92	3566.44	510.59	3579.81	510.57
3581	510.56	3582.66	509.88	3628.16	509.52	3630.4	510.17	3632.11	510.82
3633.91	511.47	3648.21	511.36	3652.18	510.66	3656.29	509.96	3659.98	509.27
3660	509.27	3744.51	509.4	3812.48	509.43	3888.29	510.13	3948.42	509.1
4005.93	509.57	4020.74	508.1	4045.14	508.1	4056.47	509.63	4063.05	510.26
4069.84	510.88	4080.87	510.8	4085.75	510.79	4098.28	510.75	4125.02	511.35
4127.82	512.01	4130.61	512.67	4133.49	513.33	4136.21	513.99	4138.85	514.65
4141.26	515.31	4143.61	515.3	4151.74	516.35	4157.56	516.92	4171.5	515.08
4172.86	515.03	4180.76	514.37	4188.99	513.7	4197.67	513.03	4208.8	513.03
4225.22	513.7	4238.21	514.37	4244.06	515.03	4249.12	515.7	4252.73	516.37
4255.78	517.03	4258.41	517.7	4260.99	518.37	4263.57	519.03	4265.98	519.7

4280.38	520.37	4305.08	521.03	4311.49	521.03	4343.1	520.37	4357.58	520.37
4363.99	521.03	4378.89	521.3	4400.71	522.56	4411.14	523.24	4418.11	523.76
4420.72	523.5	4425.79	523.43	4432.92	523.28	4459.02	525.42	4465.16	525.96
4469.52	526.04	4484.99	526.34	4505.04	526.88	4507.86	527.02	4517.6	527.71
4525.24	528.52	4529.9	529.27	4534.36	530.02	4534.88	530.11	4538.73	530.74
4542.47	531.45	4546.33	532.16	4549.47	532.87	4552.1	533.56	4554.74	534.26
4557.34	534.96	4559.94	535.65	4562.64	536.35	4565.54	537.05	4572.19	537.79
4595.06	538.72	4595.88	538.73	4617.81	539.28	4628.45	539.55	4633.09	540.33
4653.39	543.75	4684.16	552.15	4691.73	553.92	4703.06	555.09	4706.74	556.04
4778	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1777.67	.04	2697.07	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1777.67	2697.07	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135045.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	43.62	571.72	90.8	569.47	149.55	562.04	198.35	548.99
223.44	542.05	236.79	541.72	298.21	532.75	374.77	523.49	417.57	518.91
438.86	516.86	493.16	511.73	526.99	510.98	538.56	510.81	542.84	510.77
604.43	510.66	685.44	511.94	725.53	511.59	764.68	511.52	772.68	511.62
862.59	513.27	889.95	513.67	918.66	513.67	940.03	513.71	955.2	513.71
1010	513.6	1029.94	513.32	1085.69	511.88	1093.14	511.79	1110.95	511.21
1125.19	511.22	1141.21	512.48	1191.95	512.09	1207.09	514.35	1212.43	514.69
1219.55	514.36	1241.8	514.12	1251.6	510.38	1291.86	509.86	1325.48	509.39
1402.93	508.45	1494.61	506.92	1513.7	506.92	1531.11	506.94	1625.47	506.97
1730.31	508.74	1732.29	508.77	1784.81	506.99	1845.35	506.13	1904.99	503.11
1928.66	503.06	1958.4	502.81	2027.83	502.28	2048.82	495.93	2075.99	492.08
2091.69	490.17	2095.26	489.94	2113.18	488.28	2164.61	485.91	2259.15	484.66
2329.05	483.74	2405.11	481.99	2473.53	479.53	2681.86	479.53	2696.98	480.14
2722.17	480.92	2775.25	482.11	2795.22	482.87	2825.06	483.87	2865.76	485.08
2881.1	485.53	2890.37	486.78	2890.95	487.11	2900.95	492.74	2903.44	493.6
2905.93	494.46	2908.42	495.33	2910.91	496.19	2913.4	497.05	2915.89	497.92
2918.38	498.78	2918.66	498.88	2920.88	499.65	2923.37	500.52	2925.86	501.39
2938.31	505.74	2941.3	506.62	2941.33	506.63	2944.18	507.71	2944.34	507.76
2947.57	508.89	2950.61	510	2953.69	511.11	2956.73	512.21	2959.76	513.32
2962.8	514.43	2965.84	515.53	3017.04	516.27	3052.29	517.94	3052.89	517.95
3112.71	517.72	3129.03	517.79	3153.53	517.07	3165.48	516.3	3171.73	515.49
3178.38	514.69	3184.05	514.12	3186.26	513.85	3199.17	512.82	3226.33	511.57
3241.96	511.07	3275.18	510.52	3313.3	509.75	3314.69	509.72	3377.87	509.12
3389.67	509.11	3483.67	509.07	3539.59	509.28	3567.59	508.71	3568.06	508.7
3594.34	507.71	3615.14	506.76	3651.83	505.72	3669.14	505.47	3733.77	505.01
3750.55	504.85	3779.55	504.83	3787.22	505.66	3790.22	506.49	3793.21	507.32
3795.27	508.15	3798.08	508.98	3800.7	509.81	3803.13	510.64	3816.01	510.63
3817.16	510.63	3818.76	509.79	3862.58	509.61	3864.73	510.43	3866.39	511.26
3868.11	512.09	3881.89	512.03	3885.72	511.18	3889.67	510.33	3893.23	509.49
3893.25	509.48	3974.64	509.55	4040.1	509.57	4113.11	509.92	4171.02	509.4
4226.41	509.63	4240.68	508.9	4264.18	508.9	4275.09	509.67	4281.42	510.48
4287.96	511.29	4298.59	511.25	4303.29	511.24	4315.35	511.23	4341.11	512.02
4343.8	512.85	4346.5	513.68	4349.26	514.51	4351.88	515.34	4354.43	516.17
4356.75	517	4359.02	517	4366.85	517.52	4372.45	517.67	4385.87	516.42
4387.19	516.37	4394.8	515.53	4402.72	514.7	4411.08	513.87	4421.8	513.87

4437.62	514.7	4450.13	515.53	4455.76	516.37	4460.63	517.2	4464.11	518.03
4467.04	518.87	4469.58	519.7	4472.07	520.53	4474.55	521.37	4476.87	522.2
4490.74	523.03	4514.52	523.87	4520.7	523.87	4551.15	523.03	4565.09	523.03
4571.27	523.87	4585.62	524.2	4606.63	525.13	4616.67	525.68	4623.38	526.08
4625.9	526	4630.79	526.06	4637.65	526.1	4662.79	527.56	4668.7	527.95
4672.9	528.07	4687.8	528.52	4707.11	529.29	4709.83	529.47	4719.2	530.21
4726.57	531.11	4731.06	531.99	4735.35	532.86	4735.85	532.96	4739.55	533.72
4743.16	534.58	4746.87	535.43	4749.9	536.28	4752.44	537.13	4754.97	537.98
4757.48	538.83	4759.99	539.68	4762.58	540.53	4765.38	541.38	4771.79	542.25
4793.81	543.21	4794.59	543.22	4815.72	543.49	4825.96	543.62	4830.43	544.51
4849.99	548.41	4879.62	555.93	4886.91	557.39	4897.82	558.86	4901.37	559.62
4970	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2027.83	.04	2965.84	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2027.83	2965.84	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 134600

INPUT
Description: FEMA CS topo
Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2371.56	486.2	2531.56	484.2	2691.56	482.2	2766.56	480.2
3006.56	480.2	3081.56	482.2	3121.56	484.2	3166.56	486.2	3174	487.7
3182.5	494.7	3184.5	495.7	3186.5	496.7	3188.5	497.7	3190.5	498.7
3192.5	499.7	3194.5	500.7	3196.5	501.7	3198.5	502.7	3200.5	503.7
3202.5	504.7	3212.5	509.7	3214.9	510.7	3217.34	511.7	3219.94	512.7
3222.38	513.7	3224.85	514.7	3227.29	515.7	3229.73	516.7	3232.17	517.7
3234.61	518.7	3318.32	519.7	3391.55	519.7	3415.11	518.7	3426.6	517.7
3432.61	516.7	3439.01	515.7	3446.59	514.7	3459	513.7	3485.12	512.7
3532.1	511.7	3570.1	510.7	3630.86	509.7	3786.38	508.7	3813.76	507.7
3839.03	506.7	3859.04	505.7	3894.32	504.7	3989.26	503.7	4017.15	503.7
4024.53	504.7	4027.41	505.7	4030.29	506.7	4032.27	507.7	4034.97	508.7
4037.49	509.7	4039.83	510.7	4053.32	510.7	4054.86	509.7	4097	509.7
4099.07	510.7	4100.66	511.7	4102.32	512.7	4115.57	512.7	4119.25	511.7
4123.05	510.7	4126.49	509.7	4493.71	509.7	4499.8	510.7	4506.09	511.7
4520.83	511.7	4532.43	511.7	4557.2	512.7	4559.79	513.7	4562.38	514.7
4565.04	515.7	4567.56	516.7	4570.01	517.7	4572.24	518.7	4581.95	518.7
4601.51	517.7	4608.83	516.7	4616.45	515.7	4624.49	514.7	4634.8	514.7
4650.01	515.7	4662.04	516.7	4667.46	517.7	4672.14	518.7	4675.49	519.7
4678.31	520.7	4680.75	521.7	4683.14	522.7	4685.53	523.7	4687.76	524.7
4701.1	525.7	4723.97	526.7	4729.91	526.7	4759.19	525.7	4772.6	525.7
4778.54	526.7	4812.55	527.7	4835.78	528.7	4866.56	529.7	4890.61	530.7
4909.18	531.7	4920.81	532.7	4927.89	533.7	4932.21	534.7	4936.34	535.7
4940.38	536.7	4943.85	537.7	4947.42	538.7	4950.33	539.7	4952.77	540.7
4955.21	541.7	4957.62	542.7	4960.03	543.7	4962.53	544.7	4965.22	545.7
4971.38	546.7	4992.56	547.7	5013.63	547.7	5023.48	547.7	5027.78	548.7

5075.08	559.7	5096	563.2	5162	575

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2278	.04	3234.61	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2278	3234.61	1080.55	1139.54 1175.03	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
3391.55	5162	519.7	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 133431

INPUT
Description: XS of Ex Intake Structure topo
Station Elevation Data num= 179

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20	575	63.88	563.59	79.47	559.7	96.46	559.49	111.34	556.9
133.63	552.32	170.45	547.05	221.77	536.83	244.78	532.63	258.21	531.53
299.29	526.16	320	524.5	371.5	520.87	397.01	518.87	449.03	515.07
461.49	513.93	498.94	510.55	516.12	510	550.15	509.9	561.79	509.9
578.58	509.93	628.06	510.03	651.86	510.25	683.72	514.07	709.55	515.34
748.5	516.87	797.31	517.8	809.03	518.05	887.76	523.49	891.86	523.77
965.67	525.01	967.26	525.03	1056.12	525.54	1059.65	525.55	1085.13	525.35
1119.7	517.26	1129.73	514.84	1137.17	515.07	1137.61	515.07	1138.23	515.07
1142.48	515.07	1151.94	514.47	1160.53	514.2	1168.06	512.46	1191.33	506.29
1219.1	505.71	1234.33	506.35	1236.99	506.37	1239.7	506.43	1246.87	506.3
1269.25	506.2	1279.1	504.7	1304.96	504.56	1341.06	505.43	1353.43	505.36
1426.02	504.96	1431.34	504.99	1517.35	505.37	1523.58	505.33	1560.3	505.33
1626.73	505.31	1655.22	504.33	1663.89	504.09	1721.24	505.58	1762.69	506.05
1783.89	505.87	1815.52	505.43	1838.05	505.3	1876.42	504.71	1925.13	503.27
1936.42	502.83	1990.15	501.78	1990.97	501.77	2225.73	503.9	2247.39	501.66
2268.3	490.51	2282.3	488	2285.8	486.2	2310.8	484.2	2370.8	482.2
2415.8	480.2	2475.8	478.2	2525.8	476.2	2590.8	474.2	2700	474.2
2722	472.5	2965.8	472.5	3010.97	510.98	3025.05	511.32	3069.71	512.4
3089.8	524.7	3261.44	524.7	3296.35	523.7	3315.96	522.7	3334.18	521.7
3352.9	520.7	3377.31	519.7	3416.45	518.7	3434.16	517.7	3438.84	516.7
3441.75	515.7	3464.95	508.7	3635.39	508.7	3695.47	512.7	3729.89	513.7
3760.07	514.7	3797.72	515.7	3823.61	516.7	3870.15	517.7	3894.18	518.7
3926.25	519.7	4036.52	520.7	4062.59	521.7	4072.83	522.7	4079.04	522.7
4081.99	521.7	4088.88	521.7	4101.51	521.7	4105.95	521.7	4108.63	522.7
4111.08	523.7	4121.65	524.7	4170.67	525.7	4193.46	526.7	4216	527.7
4237.77	528.7	4254.01	529.7	4266.02	530.7	4270.48	531.7	4272.86	532.7
4274.9	533.7	4276.76	534.7	4278.69	535.7	4280.47	536.7	4297.21	537.7
4337.33	538.7	4381.16	545.7	4439.94	544.7	4471.96	544.7	4480.4	544.7
4503.16	544.7	4504.55	545.7	4525.95	556.7	4546.76	557.7	4550.01	558.7
4566.02	559.7	4573.83	560.7	4581.25	561.7	4584.25	562.7	4587.63	563.7
4605.2	564.7	4636.09	566.7	4643.17	567.7	4652.1	568.7	4659.08	569.7
4709.38	570.7	4728.91	571.7	4767.71	574.7	4826.02	578.7	4866.76	580.7
4889.06	581.7	4990.46	589.7	5039.94	596.7	5065.73	599.7	5079.67	600.7
5091.75	601.7	5109.58	602.7	5159.72	603.7	5208.74	604.7	5248.85	605.7
5272.62	606.7	5283.39	607.7	5295.65	608.7	5321.28	609.7	5344.31	610.7
5365.7	611.7	5380.05	612.7	5410.31	613.7	5434.83	614.7		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
20	.08	2225.73	.04	2965.8	.014	3261.44	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
2225.73 3089.8 305.73 294.78 300.13 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
20	1036.12	525.54	F
3089.8	5434.83	524.7	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
2965.8	3089.8	546.76

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 133138

INPUT
Description: XS of Prop Intake Structure topo
Station Elevation Data num= 226

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	580	98.84	575	142.72	563.59	158.31	559.7	175.3	559.49
190.18	556.9	212.47	552.32	249.29	547.05	300.61	536.83	323.62	532.63
337.05	531.53	378.13	526.16	398.84	524.5	450.34	520.87	475.85	518.87
527.87	515.07	540.33	513.93	577.78	510.55	594.96	510	628.99	509.9
640.63	509.9	657.42	509.93	706.9	510.03	730.7	510.25	762.56	514.07
788.39	515.34	827.34	516.87	876.15	517.8	887.87	518.05	966.6	523.49
970.7	523.77	1044.51	525.01	1046.1	525.03	1134.96	525.54	1138.49	525.55
1163.97	525.35	1198.54	517.26	1208.57	514.84	1216.01	515.07	1216.45	515.07
1217.07	515.07	1221.32	515.07	1230.78	514.47	1239.37	514.2	1246.9	512.46
1270.17	506.29	1297.94	505.71	1313.17	506.35	1315.83	506.37	1318.54	506.43
1325.71	506.3	1348.09	506.2	1357.94	504.7	1383.8	504.56	1419.9	505.43
1432.27	505.36	1504.86	504.96	1510.18	504.99	1596.19	505.37	1602.42	505.33
1639.14	505.33	1705.57	505.31	1734.06	504.33	1742.73	504.09	1800.08	505.58
1841.53	506.05	1862.73	505.87	1894.36	505.43	1916.89	505.3	1955.26	504.71
2003.97	503.27	2015.26	502.83	2068.99	501.78	2069.81	501.77	2138.84	503.9
2160.5	501.66	2181.41	490.51	2198.91	486.2	2248.91	484.2	2318.91	482.2
2398.91	480.2	2498.91	478.2	2543.91	476.2	2643.91	474.4	2903.91	476.2
2973.91	486.2	2976.86	490	2978.86	493.7	2980.32	494.7	2981.8	495.7
2983.4	496.7	2985.27	497.7	2987.36	498.7	2989.67	499.7	2992.05	500.7
2995.31	501.7	3003.52	502.7	3023.06	503.7	3029.04	504.7	3033.24	505.7
3054.64	505.7	3064.74	504.7	3073.57	503.7	3086	502.7	3088.68	501.7
3090.68	500.7	3092.23	499.7	3093.87	498.7	3095.51	497.7	3097.66	497.7
3098.77	498.7	3099.95	499.7	3101.11	500.7	3102.22	501.7	3103.38	502.7
3120.1	502.7	3124.47	501.7	3133.93	500.7	3150.68	499.7	3186.35	498.7
3238.01	498.7	3249.73	499.7	3256.95	500.7	3263.57	501.7	3270.79	502.7
3281.85	503.7	3300.95	504.7	3384.78	505.7	3392.28	505.7	3421.51	504.7
3433.64	503.7	3444.23	502.7	3455.37	501.7	3465.85	500.7	3489.02	499.7
3506.45	499.7	3511.98	500.7	3517.93	501.7	3523.46	502.7	3528.3	503.7
3545.04	504.7	3572.29	505.7	3587.37	506.7	3595.95	507.7	3607.43	508.7
3614.76	508.7	3618.22	507.7	3672.45	507.7	3675.63	508.7	3678.81	509.7
3695.96	510.7	3774.53	511.7	3799.9	511.7	3819.44	512.7	3875.92	513.7
3895.52	514.7	3919.17	515.7	3947.84	515.7	3955.56	514.7	3971.24	514.7
3977.73	515.7	3988.88	516.7	4017.67	517.7	4064.78	518.7	4119.33	519.7
4149.71	520.7	4186.51	520.7	4194.94	521.7	4197.66	522.7	4213.41	523.7
4215.79	524.7	4218.26	525.7	4220.73	526.7	4267.72	527.7	4295.73	528.7
4343.39	529.7	4388.9	530.7	4408.11	531.7	4421.63	532.7	4423.45	533.7
4434.29	539.7	4443.63	540.7	4464.88	541.7	4485.38	541.7	4514.79	541.7
4587.03	542.7	4622.7	543.7	4663.66	543.7	4676.66	544.7	4699.94	545.7
4738.93	546.7	4770.52	547.7	4776.57	548.7	4783.67	549.7	4790.77	550.7
4894.9	565.7	4931.02	566.7	4934.35	567.7	4937.98	568.7	4941.31	569.7
4944.79	570.7	4949.17	571.7	4953.86	572.7	4959.45	573.7	4963.98	574.7
4972.29	575.7	5002.27	576.7	5059.83	578.7	5073.48	579.7	5101.8	580.7
5145.44	581.7	5161.37	582.7	5176.5	583.7	5191.22	584.7	5206.88	585.7

5220.4	586.7	5232.98	587.7	5256.94	588.7	5271.66	589.7	5310.61	590.7
5322.52	591.7	5359.54	592.7	5387.25	593.7	5422.32	594.7	5435.44	595.7
5508.65	600.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	2138.84	.04	3054.64	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2138.84	3054.64	688.72	690.68	684.84	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	1134.96	525.54	F
3054.64	5508.65	524	T

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132450

INPUT
Description: FEMA CR topo
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	56	553.9	72	553.9	107	544.9	190	531.8
263	522.2	331	518.7	404	514	451	509.6	526	509.6
595	509.6	625	514.9	686	518.8	743	520.6	821	529
892	530.9	979	531.8	1003	531.7	1045	516.4	1052	516.9
1053	516.9	1057	516.9	1074	515.2	1103	503.1	1146	501.9
1210	501.9	1244	503.5	1324	503.4	1410	504.9	1513	504.9
1548	503	1602	504.7	1661	505.2	1712	505.2	1794	504
1856	502.2	1921	505.5	1950	503.2	1978	487.5	1980	486.2
2051.61	484.2	2161.61	482.2	2236.61	480.2	2336.61	478.2	2386.61	476.2
2466.61	474.2	2486.61	472.2	2511.61	470.2	2566.61	470.2	2581.61	472.2
2596.61	474.2	2646.61	476.2	2696.61	478.2	2736.61	480.2	2751.61	482.2
2786.61	484.2	2811.61	486.2	2816	487.5	2831	493.7	2832.37	494.7
2846.86	505.7	2849.12	506.7	2895.98	506.7	2898.51	506.7	2909.09	507.7
2919.39	508.7	2957.66	509.7	2974.43	510.7	2991.15	511.7	3019.84	512.7
3078.44	512.7	3125.14	511.7	3154.27	510.7	3176.64	509.7	3192.45	508.7
3203.88	507.7	3215.51	506.7	3367.67	506.7	3373.19	507.7	3377.33	508.7
3392.87	508.7	3396.25	507.7	3449.4	507.7	3451.23	508.7	3483.19	509.7
3679.6	510.7	3772.97	511.7	3816.173	512.7	3880.26	513.7	3927.32	514.7
3946.35	515.7	3951.57	516.7	3955.62	517.7	3965.1	518.7	3971.56	518.7
3975.93	518.7	3981.62	519.7	3983.08	519.7	3993.16	518.7	3996.51	517.7
4002.79	517.7	4026	521.4	4107	524.9	4175	526.9	4213	527.5
4223	527.5	4305	530.8	4377	534.2	4473	537	4535	540.1
4547	541.9	4584	541.9	4596	541	4602	544.1	4648	546.6
4740	556.2	4831	565	4862	570.9	4908	573.5	4923	573.5
4933	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1921	.04	2849.12	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1921	2849.12	406	410	329.99	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	979	531.8	F
3078.44	4933	515	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132040.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	53.07	556.53	68.23	556.08	101.4	547.89	129.66	543.27
180.05	535.39	249.23	526.11	254.19	525.78	313.67	522.31	371.01	518.34
382.84	517.54	427.38	513.43	476.28	512.78	494.26	513.08	498.45	513.08
537.9	513.08	563.84	512.64	566.15	512.94	592.27	516.55	650.08	519.03
685.54	519.59	704.09	519.95	778.01	526.13	788.24	526.29	845.29	527.1
894.79	527.11	927.73	527.16	950.47	526.91	990.27	514.37	994.93	514.62
996.91	514.72	997.86	514.71	1001.65	514.67	1017.76	513.15	1036.01	506.53
1045.24	503.43	1085.99	503.12	1089.93	503.18	1146.63	503.42	1178.85	504.84
1206.75	504.93	1254.66	505.5	1292.77	506.56	1308.17	506.21	1331.28	507.13
1336.16	507.2	1342.83	507.2	1354.39	507.2	1399.32	504.38	1433.77	504.18
1466.93	502.47	1504.59	503.26	1518.11	503.15	1552.09	502.22	1574.02	502.86
1622.34	503.93	1653.51	504.23	1700.05	504.08	1739.52	503.47	1758.8	502.7
1820.4	504.38	1847.21	500.82	1857.56	495.14	1873.09	487.3	1874.94	486.22
1875.91	486.18	1941.14	484.52	2042.82	482.79	2112.15	481.1	2188.01	479.69
2204.59	479.36	2250.81	477.66	2324.76	475.89	2343.25	474.25	2366.36	472.6
2425.36	472.6	2443.97	474.31	2462.58	476.02	2492.92	476.98	2524.62	477.8
2549.21	478.43	2586.66	479.4	2636.29	481	2654.91	482.6	2698.33	484.2
2729.35	485.8	2734.8	486.84	2735	486.89	2751.89	491.79	2753.38	492.39
2753.41	492.4	2755.11	493.41	2773.09	504.4	2775.9	505.54	2825.2	506.22
2827.86	506.26	2833.48	506.74	2838.99	507.16	2849.83	508	2890.09	508.94
2907.74	509.8	2908.6	509.84	2925.33	510.78	2951.16	511.74	2955.51	511.86
2962.01	511.86	3001.24	511.76	3017.17	511.78	3054.65	511.23	3066.3	511.03
3096.95	510.2	3120.49	509.38	3121.42	509.34	3137.12	508.58	3149.15	507.78
3161.38	506.98	3194.87	506.98	3256.63	506.94	3317.55	506.8	3321.48	506.73
3327.28	507.43	3331.64	508.15	3340.92	507.98	3347.99	508.02	3351.55	507.24
3395.17	507.5	3407.47	507.51	3409.39	508.31	3443.02	509.14	3461.11	509.23
3513.69	508.97	3569.6	509.19	3594.64	509.39	3613	510.32	3624.69	509.44
3649.67	509.54	3659.74	509.62	3673.93	510.98	3683.11	509.85	3691.46	509.88
3732.35	510.21	3747.9	510.35	3784.93	511.03	3793.36	511.22	3854.2	512.2
3860.79	512.29	3901.78	513.02	3910.3	513.58	3930.32	515.38	3935.81	516.45
3940.07	517.46	3950.05	518.75	3950.18	518.76	3956.84	518.81	3961.44	518.85
3962.7	519.03	3965.21	519.36	3967.43	519.66	3967.71	519.66	3968.96	519.65
3976.89	518.96	3979.57	518.67	3983.09	517.75	3989.7	517.52	3994.42	517.93
4014.12	520.71	4036.15	521.86	4088.73	523.75	4099.34	524.24	4148.82	526.03
4170.89	526.58	4199.73	527.01	4210.87	527.18	4221.39	527.21	4236.45	527.72
4294.04	529.86	4307.67	530.4	4336.6	531.68	4369.15	532.85	4383.42	533.46
4423.4	534.63	4484.42	536.6	4486	536.68	4508.53	539.04	4520.22	539.66
4549.65	540.78	4552.77	541.14	4559.44	541.84	4562.28	542.14	4601.21	541.85
4613.83	541.03	4615.36	541.62	4620.15	543.63	4651.25	545.73	4668.54	547.88
4685.47	550.62	4732.21	554.97	4755.58	556.99	4765.34	557.76	4768.93	558.02
4804.82	560.7	4844.88	563.65	4861.08	564.72	4893.7	569.19	4899.96	569.41
4938.35	571.32	4942.1	571.77	4957.88	572.99	4968.4	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1820.4	.04	2775.9	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1820.4	2775.9	406	410 329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna

REACH: 1 RS: 131630.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	50.13	559.16	64.46	558.26	95.79	550.87	122.5	546.36
170.1	538.99	235.45	530.03	240.14	529.64	296.33	525.93	350.51	521.88
361.69	521.09	403.76	517.26	449.96	515.96	466.94	516.56	470.91	516.56
508.18	516.56	532.68	515.68	534.86	515.86	559.54	518.2	614.15	519.26
647.65	519.19	665.18	519.29	735.01	523.27	744.68	523.29	798.57	523.3
845.35	522.78	876.46	522.51	897.95	522.12	935.55	512.35	939.95	512.49
941.82	512.54	942.71	512.52	946.29	512.44	961.51	511.09	978.76	505.9
987.47	503.75	1025.97	504.33	1029.7	504.46	1083.27	504.95	1113.71	506.18
1140.06	506.4	1185.33	507.61	1221.32	509.02	1235.88	508.03	1257.71	509.45
1262.32	509.5	1268.63	509.5	1279.54	509.5	1321.99	503.86	1354.53	503.47
1385.87	501.95	1421.44	502.27	1434.21	501.61	1466.32	499.44	1487.03	500.53
1532.69	502.66	1562.13	503.75	1606.1	504.16	1643.39	504.15	1661.61	503.2
1719.8	503.26	1744.42	498.45	1753.92	493.35	1768.18	487.09	1769.88	486.24
1770.77	486.18	1830.66	484.83	1924.03	483.37	1987.69	481.99	2057.35	480.82
2072.57	480.53	2115.01	479.12	2182.91	477.59	2199.89	476.3	2221.11	475
2284.11	475	2306.33	476.42	2328.55	477.84	2364.77	478.79	2402.63	479.4
2432	479.88	2476.71	480.6	2535.98	481.8	2558.2	483	2610.06	484.2
2647.1	485.4	2653.6	486.18	2653.83	486.22	2674	490.39	2675.78	491.09
2675.83	491.11	2677.86	492.12	2699.32	503.1	2702.67	504.38	2754.42	505.75
2757.21	505.82	2763.11	506.28	2768.89	506.62	2780.27	507.29	2822.53	508.17
2841.05	508.89	2841.95	508.93	2859.51	509.86	2886.62	510.93	2891.19	511.02
2898.01	511.02	2939.18	510.82	2955.9	510.87	2995.24	510.52	3007.47	510.36
3039.63	509.7	3064.34	509.06	3065.32	509.03	3081.79	508.46	3094.42	507.86
3107.26	507.26	3142.4	507.26	3207.22	507.18	3271.17	506.9	3275.28	506.76
3281.38	507.15	3285.95	507.59	3295.69	507.26	3303.11	507.34	3306.84	506.79
3352.63	507.3	3365.53	507.32	3367.55	507.93	3402.84	508.59	3421.83	508.67
3477.01	507.91	3535.7	508.07	3561.98	508.34	3581.25	510.11	3593.52	508.31
3619.73	508.38	3630.31	508.44	3645.2	511.01	3654.83	508.66	3663.59	508.64
3706.51	508.89	3722.83	509	3761.7	509.55	3770.54	509.73	3834.4	510.8
3841.31	510.88	3884.33	511.52	3893.28	512.47	3914.29	515.05	3920.05	516.19
3924.53	517.22	3934.99	518.81	3935.14	518.82	3942.13	518.93	3946.95	519
3948.28	519.15	3950.9	519.4	3953.24	519.62	3953.53	519.62	3954.85	519.59
3963.17	518.97	3965.98	518.64	3969.68	517.8	3976.61	517.34	3981.56	517.45
4002.24	520.01	4025.36	521.42	4080.55	523.04	4091.69	523.59	4143.61	525.77
4166.78	526.26	4197.05	526.68	4208.74	526.85	4219.78	526.92	4235.59	527.37
4296.03	529.45	4310.33	529.99	4340.7	531.26	4374.87	532.14	4389.84	532.72
4431.8	533.95	4495.84	536.21	4497.5	536.28	4521.15	539.93	4533.41	540.62
4564.31	541.46	4567.58	541.73	4574.58	542.18	4577.56	542.38	4618.42	541.79
4631.67	541.06	4633.27	541.49	4638.29	543.15	4670.94	545.74	4689.09	549.15
4706.85	552.97	4755.91	557.03	4780.43	558.74	4790.68	559.32	4794.45	559.52
4832.11	561.58	4874.16	563.79	4891.17	564.43	4925.4	567.48	4931.97	567.58
4972.27	569.34	4976.19	570.04	4992.76	572.48	5003.8	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1719.8	.04	2702.67	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1719.8	2702.67	406	410 329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 131220.*

INPUT

Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	47.2	561.8	60.69	560.43	90.19	553.86	115.33	549.44
160.15	542.58	221.68	533.94	226.09	533.49	279	529.54	330.01	525.42
340.53	524.63	380.15	521.09	423.64	519.14	439.63	520.04	443.36	520.04
478.45	520.04	501.52	518.72	503.57	518.77	526.81	519.85	578.23	519.5
609.77	518.79	626.27	518.64	692.02	520.4	701.12	520.3	751.86	519.49
795.9	518.46	825.19	517.87	845.42	517.33	880.82	510.32	884.96	510.36
886.72	510.36	887.57	510.33	890.94	510.21	905.27	509.04	921.51	505.27
929.71	504.08	965.96	505.55	969.46	505.74	1019.9	506.47	1048.56	507.52
1073.38	507.87	1115.99	509.71	1149.88	511.48	1163.59	509.85	1184.14	511.76
1188.48	511.8	1194.42	511.8	1204.69	511.8	1244.66	503.34	1275.3	502.75
1304.8	501.42	1338.3	501.28	1350.32	500.06	1380.54	496.66	1400.05	498.19
1443.04	501.4	1470.75	503.27	1512.15	504.25	1547.26	504.84	1564.41	503.7
1619.2	502.14	1641.62	496.07	1650.28	491.57	1663.27	486.89	1664.82	486.26
1665.63	486.19	1720.19	485.15	1805.24	483.96	1863.23	482.89	1926.68	481.94
1940.55	481.69	1979.21	480.58	2041.06	479.28	2056.52	478.36	2075.85	477.4
2142.85	477.4	2168.69	478.53	2194.53	479.66	2236.63	480.59	2280.65	481
2314.78	481.32	2366.77	481.8	2435.66	482.6	2461.5	483.4	2521.78	484.2
2564.84	485	2572.4	485.52	2572.67	485.55	2596.12	489	2598.19	489.8
2598.24	489.81	2600.6	490.83	2625.56	501.8	2629.45	503.22	2683.64	505.27
2686.56	505.39	2692.74	505.82	2698.8	506.08	2710.71	506.59	2754.96	507.41
2774.35	507.99	2775.3	508.02	2793.69	508.94	2822.08	510.12	2826.86	510.18
2834.01	510.18	2877.12	509.88	2894.63	509.95	2935.83	509.81	2948.63	509.69
2982.32	509.21	3008.18	508.74	3009.21	508.72	3026.47	508.34	3039.68	507.94
3053.13	507.54	3089.93	507.54	3157.81	507.42	3224.78	507	3229.09	506.79
3235.47	506.88	3240.26	507.04	3250.46	506.54	3258.23	506.67	3262.14	506.33
3310.09	507.1	3323.6	507.13	3325.71	507.54	3362.67	508.03	3382.55	508.12
3440.34	506.84	3501.8	506.95	3529.32	507.29	3549.5	509.91	3562.34	507.17
3589.8	507.22	3600.87	507.26	3616.46	511.04	3626.56	507.48	3635.73	507.39
3680.68	507.56	3697.77	507.66	3738.47	508.07	3747.73	508.25	3814.6	509.4
3821.84	509.47	3866.89	510.01	3876.25	511.35	3898.26	514.73	3904.3	515.94
3908.98	516.98	3919.94	518.86	3920.09	518.88	3927.41	519.04	3932.47	519.15
3933.85	519.26	3936.6	519.43	3939.05	519.58	3939.35	519.58	3940.73	519.54
3949.45	518.98	3952.39	518.6	3956.26	517.84	3963.53	517.16	3968.71	516.97
3990.37	519.32	4014.57	520.98	4072.36	522.33	4084.03	522.93	4138.41	525.51
4162.67	525.94	4194.37	526.35	4206.61	526.53	4218.17	526.63	4234.73	527.01
4298.02	529.03	4312.99	529.59	4344.8	530.84	4380.58	531.42	4396.25	531.98
4440.2	533.26	4507.27	535.81	4509	535.89	4533.77	540.82	4546.61	541.58
4578.96	542.14	4582.38	542.32	4589.72	542.52	4592.84	542.62	4635.62	541.74
4649.5	541.09	4651.18	541.36	4656.44	542.68	4690.63	545.76	4709.63	550.43
4728.23	555.31	4779.6	559.09	4805.29	560.49	4816.02	560.88	4819.96	561.01
4859.41	562.45	4903.44	563.92	4921.25	564.15	4957.1	565.76	4963.98	565.75
5006.18	567.36	5010.29	568.31	5027.64	571.96	5039.2	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1619.2	.04	2629.45	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1619.2	2629.45	406	410	329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130810.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	575	44.27	564.43	56.92	562.61	84.59	556.84	108.17	552.52
150.2	546.18	207.91	537.86	212.05	537.35	261.66	533.16	309.5	528.96
319.37	528.17	356.53	524.92	397.32	522.32	412.31	523.52	415.82	523.52
448.73	523.52	470.36	521.76	472.29	521.69	494.08	521.5	542.3	519.73
571.88	518.4	587.36	517.99	649.02	517.54	657.56	517.3	705.15	515.69
746.45	514.13	773.92	513.23	792.9	512.53	826.1	508.3	829.98	508.23
831.63	508.18	832.42	508.14	835.59	507.99	849.02	506.99	864.25	504.63
871.95	504.41	905.94	506.77	909.23	507.02	956.54	507.99	983.41	508.86
1006.69	509.33	1046.66	511.82	1078.44	513.94	1091.29	511.68	1110.57	514.08
1114.64	514.1	1120.21	514.1	1129.85	514.1	1167.33	502.82	1196.07	502.03
1223.73	500.9	1255.15	500.29	1266.42	498.51	1294.77	493.88	1313.06	495.86
1353.38	500.13	1379.38	502.78	1418.2	504.33	1451.13	505.52	1467.22	504.2
1518.6	501.02	1538.83	493.69	1546.64	489.78	1558.36	486.68	1559.76	486.28
1560.49	486.19	1609.71	485.47	1686.45	484.54	1738.77	483.79	1796.02	483.07
1808.52	482.85	1843.4	482.04	1899.21	480.97	1913.16	480.41	1930.6	479.8
2001.6	479.8	2031.05	480.64	2060.5	481.48	2108.49	482.4	2158.66	482.6
2197.57	482.76	2256.82	483	2335.34	483.4	2364.79	483.8	2433.5	484.2
2482.58	484.6	2491.2	484.86	2491.51	484.87	2518.23	487.6	2520.59	488.5
2520.65	488.52	2523.34	489.54	2551.79	500.5	2556.22	502.06	2612.85	504.8
2615.91	504.95	2622.37	505.36	2628.7	505.54	2641.15	505.89	2687.39	506.64
2707.66	507.09	2708.65	507.11	2727.87	508.02	2757.54	509.31	2762.54	509.34
2770	509.34	2815.06	508.94	2833.36	509.04	2876.41	509.11	2889.79	509.02
2925	508.71	2952.03	508.42	2953.11	508.41	2971.14	508.22	2984.95	508.02
2999.01	507.82	3037.47	507.82	3108.41	507.66	3178.39	507.1	3182.89	506.82
3189.56	506.6	3194.57	506.49	3205.23	505.82	3213.35	505.99	3217.43	505.87
3267.54	506.9	3281.66	506.94	3283.88	507.15	3322.5	507.47	3343.28	507.56
3403.67	505.77	3467.9	505.82	3496.66	506.25	3517.75	509.7	3531.17	506.04
3559.86	506.06	3571.44	506.08	3587.73	511.07	3598.28	506.29	3607.86	506.15
3654.84	506.23	3672.7	506.31	3715.23	506.58	3724.91	506.77	3794.8	508
3802.36	508.06	3849.44	508.51	3859.23	510.23	3882.23	514.4	3888.54	515.69
3893.43	516.73	3904.89	518.91	3905.05	518.94	3912.7	519.15	3917.98	519.3
3919.43	519.38	3922.3	519.47	3924.85	519.54	3925.18	519.54	3926.62	519.49
3935.72	518.99	3938.8	518.57	3942.85	517.89	3950.44	516.99	3955.85	516.48
3978.49	518.63	4003.79	520.54	4064.18	521.61	4076.38	522.28	4133.2	525.26
4158.55	525.62	4191.68	526.03	4204.48	526.21	4216.56	526.34	4233.86	526.66
4300.01	528.62	4315.66	529.18	4348.9	530.42	4386.29	530.71	4402.67	531.24
4448.6	532.58	4518.69	535.42	4520.5	535.49	4546.38	541.71	4559.8	542.54
4593.62	542.82	4597.19	542.91	4604.86	542.86	4608.12	542.85	4652.83	541.69
4667.33	541.13	4669.09	541.23	4674.59	542.2	4710.31	545.78	4730.18	551.7
4749.62	557.66	4803.3	561.14	4830.14	562.25	4841.36	562.44	4845.48	562.51
4886.7	563.33	4932.72	564.06	4951.33	563.87	4988.8	564.05	4995.99	563.93
5040.09	565.38	5044.39	566.58	5062.51	571.45	5074.6	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1518.6	.04	2556.22	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1518.6	2556.22	406	410	329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130400

INPUT
Description: FEMA CQ
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8

1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1455.35	486.2	1665.35	484.2	1785.35	482.2
1860.35	482.2	1980.35	484.2	2080.35	484.2	2410.35	484.2	2440.35	486.2
2443	487.2	2483	500.9	2552	504.9	2642	506.2	2693	508.5
2706	508.5	2753	508	2817	508.4	2897	508.1	2985	508.1
3059	507.9	3132	507.2	3160	505.1	3225	506.7	3304	507
3367	504.7	3434	504.7	3464	505.2	3486	509.5	3500	504.9
3542	504.9	3559	511.1	3570	505.1	3580	504.9	3629	504.9
3692	505.1	3775	506.6	3832	507	3890	519	3905	519.5
3908	519.5	3911	519.5	3922	519	3943	516	3993	520.1
4056	520.9	4128	525	4189	525.7	4233	526.3	4302	528.2
4353	530	4392	530	4457	531.9	4532	535.1	4559	542.6
4573	543.5	4612	543.5	4620	543.2	4687	541.1	4730	545.8
4771	560	4827	563.2	4855	564	4871	564	4914	564.2
4962	564.2	5028	562.1	5074	563.4	5110	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1418	.04	2483	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1418	2483	2400 1704.99	1200	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 128690

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	933.06	486.2	983.06	484.2	1093.06	482.2
1143.06	480.2	1243.06	478.2	1318.06	476.2	1368.06	476.2	1443.06	478.2
1483.06	480.2	1553.06	482.2	1628.06	484.2	1668.06	486.2	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	852	.04	1713	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
852	1713	970 890	900	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 127800

INPUT
Description: FEMA CP
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1100	486.2	1150	484.2	1275	482.2	1315	480.2	1425	478.2
1500	476.2	1550	476.2	1630	478.2	1670	480.2	1730	482.2
1805	484.2	1835	486.2	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	1074	.04	1957	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1074	1957	1015	945	960	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area (cfs)	Top Width (ft)	Froude # Chl (ft)
(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.63	
	512.22	0.000355	6.20	28687.18	2041.02	0.21
1	139600	50 yr	232000.00	481.50	516.13	
	516.87	0.000386	7.09	38262.09	2255.52	0.22
1	139600	100 yr	260000.00	481.50	517.79	
	518.60	0.000398	7.43	42192.71	2459.46	0.23
1	139600	500 yr	340000.00	481.50	522.06	
	522.99	0.000413	8.16	53331.33	2712.75	0.24
1	137275	10 yr	167000.00	476.20	510.20	
	511.02	0.000514	7.37	25811.93	2417.80	0.25
1	137275	50 yr	232000.00	476.20	514.75	
	515.65	0.000489	8.01	39995.78	3379.88	0.25
1	137275	100 yr	260000.00	476.20	516.49	
	517.38	0.000470	8.14	45914.56	3453.23	0.25
1	137275	500 yr	340000.00	476.20	520.94	
	521.82	0.000425	8.44	61733.54	3634.26	0.24
1	134600	10 yr	167000.00	480.20	508.68	
493.47	509.45	0.000518	7.12	25516.86	1936.11	0.25
1	134600	50 yr	232000.00	480.20	513.23	
496.07	514.17	0.000528	7.99	34337.93	3588.54	0.26

1		134600	100 yr	260000.00		480.20		514.98	
497.11	515.95	0.000524	8.25	38981.17		3830.95			0.26
1		134600	500 yr	340000.00		480.20		519.52	
499.87	520.58	0.000503	8.81	51514.63		4129.96			0.26
1		133431	10 yr	167000.00		472.50		508.11	
488.34	508.91	0.000429	7.25	26294.47		1781.35			0.23
1		133431	50 yr	232000.00		472.50		512.53	
491.41	513.58	0.000491	8.45	34198.19		2232.55			0.25
1		133431	100 yr	260000.00		472.50		514.21	
492.61	515.35	0.000512	8.90	37217.72		2331.86			0.26
1		133431	500 yr	340000.00		472.50		518.55	
495.82	519.94	0.000562	10.01	45198.92		2737.63			0.28
1		133138	10 yr	167000.00		474.40		508.05	
489.76	508.76	0.000435	6.81	26970.08		2392.96			0.23
1		133138	50 yr	232000.00		474.40		512.48	
492.51	513.40	0.000470	7.85	34942.32		2761.19			0.25
1		133138	100 yr	260000.00		474.40		514.16	
493.62	515.16	0.000482	8.24	37986.67		2871.94			0.25
1		133138	500 yr	340000.00		474.40		518.51	
496.58	519.73	0.000512	9.23	46028.69		3276.41			0.27
1		132450	10 yr	167000.00		470.20		507.81	
489.53	508.46	0.000384	6.52	28467.38		2043.27			0.22
1		132450	50 yr	232000.00		470.20		512.22	
492.19	513.07	0.000421	7.54	36723.05		2806.81			0.24
1		132450	100 yr	260000.00		470.20		513.90	
493.25	514.82	0.000434	7.93	40041.43		3026.76			0.24
1		132450	500 yr	340000.00		470.20		518.34	
496.05	519.34	0.000428	8.56	56130.57		3276.41			0.25
1		130400	10 yr	167000.00		482.20		506.78	
	507.51	0.000566	6.93	26871.45		2206.41			0.26
1		130400	50 yr	232000.00		482.20		511.26	
	512.10	0.000536	7.63	39338.38		3060.18			0.26
1		130400	100 yr	260000.00		482.20		512.97	
	513.84	0.000520	7.84	44648.72		3124.96			0.26
1		130400	500 yr	340000.00		482.20		517.46	
	518.40	0.000487	8.37	59174.95		3365.02			0.26
1		128690	10 yr	167000.00		476.20		505.13	
	506.29	0.000851	8.69	20191.82		1314.88			0.32
1		128690	50 yr	232000.00		476.20		509.44	
	510.89	0.000882	9.84	27827.54		2015.02			0.33
1		128690	100 yr	260000.00		476.20		511.14	
	512.66	0.000875	10.17	31290.12		2079.02			0.34
1		128690	500 yr	340000.00		476.20		515.65	
	517.29	0.000831	10.84	40741.19		2112.24			0.33
1		127800	10 yr	167000.00		476.20		504.50	
492.07	505.53	0.000780	8.22	21646.01		1282.26			0.31
1		127800	50 yr	232000.00		476.20		508.80	
494.79	510.10	0.000799	9.35	28737.90		1752.84			0.32
1		127800	100 yr	260000.00		476.20		510.50	
495.92	511.87	0.000790	9.69	31736.34		1774.71			0.32
1		127800	500 yr	340000.00		476.20		515.00	

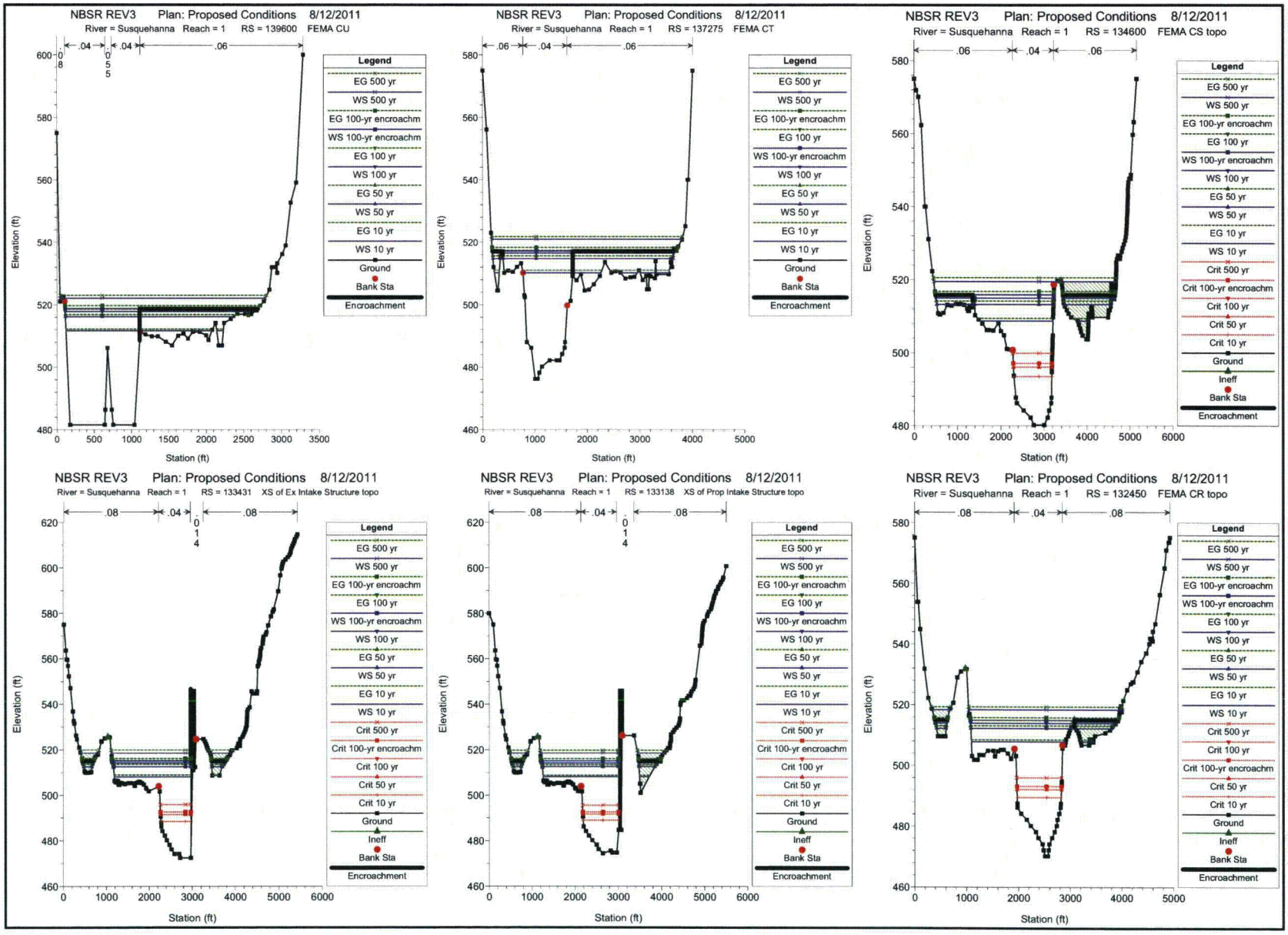
498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32

Appendix I:
Proposed Conditions Model

- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

HEC-RAS Plan: Proposed River: Susquehanna Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.59		512.18	0.000357	6.21	28595.08	2039.81	0.21
1	139600	50 yr	232000.00	481.50	516.09		516.83	0.000388	7.10	38166.47	2253.16	0.22
1	139600	100 yr	260000.00	481.50	517.75		518.56	0.000400	7.44	42088.54	2459.19	0.23
1	139600	500 yr	340000.00	481.50	522.02		522.96	0.000415	8.17	53226.06	2710.93	0.24
1	139600	100-yr encroachm	260000.00	481.50	518.75		519.67	0.000416	7.70	33757.00	1001.01	0.23
1	137275	10 yr	167000.00	476.20	510.16		510.99	0.000516	7.38	25723.65	2411.66	0.25
1	137275	50 yr	232000.00	476.20	514.72		515.62	0.000492	8.02	39884.19	3379.22	0.26
1	137275	100 yr	260000.00	476.20	516.45		517.35	0.000472	8.16	45805.39	3452.90	0.25
1	137275	500 yr	340000.00	476.20	520.92		521.80	0.000427	8.45	61633.96	3633.72	0.25
1	137275	100-yr encroachm	260000.00	476.20	517.11		518.33	0.000559	8.99	31618.68	1338.00	0.28
1	134600	10 yr	167000.00	480.20	508.63	493.47	509.41	0.000522	7.14	25439.10	1930.98	0.25
1	134600	50 yr	232000.00	480.20	513.19	496.07	514.13	0.000531	8.01	34235.08	3555.06	0.26
1	134600	100 yr	260000.00	480.20	514.94	497.11	515.92	0.000526	8.26	38874.81	3825.52	0.26
1	134600	500 yr	340000.00	480.20	519.49	499.87	520.55	0.000505	8.83	51419.86	4125.90	0.26
1	134600	100-yr encroachm	260000.00	480.20	515.82	497.11	516.75	0.000482	8.04	38434.72	1877.57	0.25
1	133431	10 yr	167000.00	472.50	508.06	488.34	508.87	0.000432	7.27	26206.30	1781.16	0.23
1	133431	50 yr	232000.00	472.50	512.48	491.41	513.54	0.000493	8.47	34118.30	2230.68	0.25
1	133431	100 yr	260000.00	472.50	514.16	492.61	515.31	0.000514	8.91	37140.81	2328.77	0.26
1	133431	500 yr	340000.00	472.50	518.51	495.82	519.91	0.000564	10.02	45132.70	2734.98	0.28
1	133431	100-yr encroachm	260000.00	472.50	515.13	492.61	516.20	0.000465	8.62	38901.96	1837.28	0.25
1	133138	10 yr	167000.00	474.40	508.05	488.87	508.71	0.000341	6.58	27883.77	1963.77	0.22
1	133138	50 yr	232000.00	474.40	512.47	491.57	513.36	0.000387	7.70	35623.61	2312.08	0.23
1	133138	100 yr	260000.00	474.40	514.15	492.64	515.12	0.000404	8.12	38577.80	2401.51	0.24
1	133138	500 yr	340000.00	474.40	518.49	495.51	519.71	0.000443	9.19	46387.25	2828.26	0.26
1	133138	100-yr encroachm	260000.00	474.40	515.12	492.65	516.03	0.000365	7.86	40302.54	1797.59	0.23
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	132450	100-yr encroachm	260000.00	470.20	514.90	493.24	515.75	0.000386	7.63	42052.75	2003.73	0.23
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	130400	100-yr encroachm	260000.00	482.20	513.95		514.85	0.000497	7.84	39327.08	1923.92	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	128690	100-yr encroachm	260000.00	476.20	512.10		513.69	0.000847	10.22	27356.50	1228.21	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32
1	127800	100-yr encroachm	260000.00	476.20	511.50	495.74	512.93	0.000760	9.72	29288.21	1323.84	0.32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River = Susquehanna Reach = 1 RS = 139600 FEMA CU
.04 .04 .06
0.08 0.05 0.05
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
WS 100-yr encroachm
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 137275 FEMA CT
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 134600 FEMA CS topo
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100-yr encroachm
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 133431 XS of Ex Intake Structure topo
.08 .04 .08
0.14
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100-yr encroachm
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 133138 XS of Prop Intake Structure topo
.08 .04 .08
0.14
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100-yr encroachm
Crit 100 yr
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 132450 FEMA CR topo
.08 .04 .08
Elevation (ft)
Station (ft)
Legend
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WS 500 yr
EG 100-yr encroachm
WS 100-yr encroachm
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
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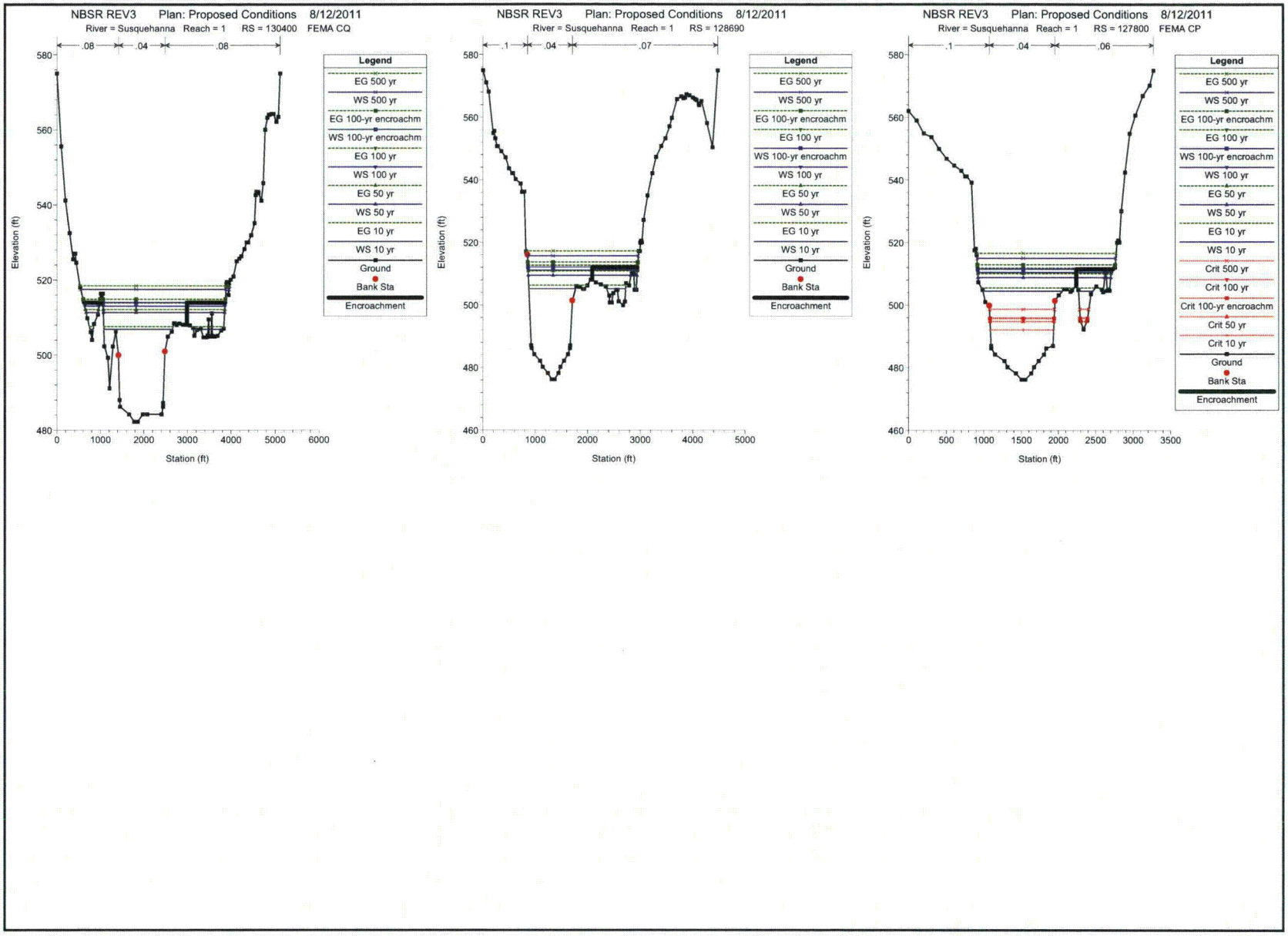
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Encroachment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.08
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
WS 100-yr encroachm
EG 100 yr
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 128690
.1
.04
.07
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Ground
Bank Sta
Encroachment
NBSR REV3 Plan: Proposed Conditions 8/12/2011
River = Susquehanna Reach = 1 RS = 127800 FEMA CP
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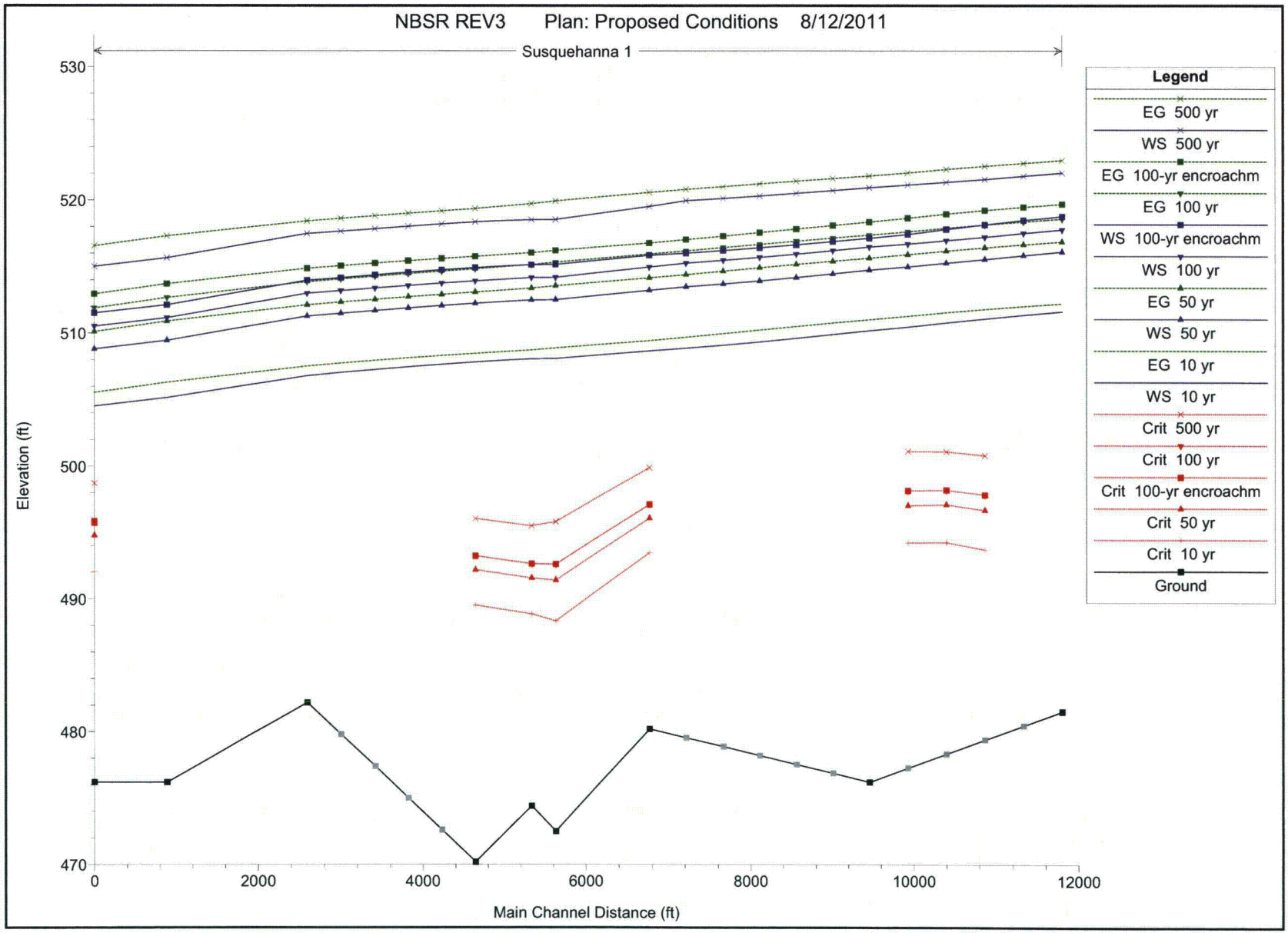
.04
.06
Elevation (ft)
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground
Bank Sta
Encroachment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Susquehanna 1
Elevation (ft)
530
520
510
500
490
480
470
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)
Legend
EG 500 yr
WS 500 yr
EG 100-yr encroachm
EG 100 yr
WS 100-yr encroachm
WS 100 yr
EG 50 yr
WS 50 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 100-yr encroachm
Crit 50 yr
Crit 10 yr
Ground

proposed.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    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        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: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 10:16:15 AM

Project in English units

PLAN DATA

Plan Title: Proposed Conditions
Plan File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.p11

Geometry Title: Proposed Conditions
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g11

Flow Title : FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Plan Summary Information:

Number of:	Cross Sections	= 22	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	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
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = False
Left Offset = 0
Right Offset = 0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	50 yr	0	0	0
139135.*	50 yr	0	0	0
138670.*	50 yr	0	0	0
138205.*	50 yr	0	0	0
137740.*	50 yr	0	0	0
137275	50 yr	0	0	0
136829.*	50 yr	0	0	0
136383.*	50 yr	0	0	0
135937.*	50 yr	0	0	0
135491.*	50 yr	0	0	0
135045.*	50 yr	0	0	0
134600	50 yr	0	0	0
133431	50 yr	0	0	0
133138	50 yr	0	0	0
132450	50 yr	0	0	0
132040.*	50 yr	0	0	0
131630.*	50 yr	0	0	0
131220.*	50 yr	0	0	0
130810.*	50 yr	0	0	0
130400	50 yr	0	0	0
128690	50 yr	0	0	0
127800	50 yr	0	0	0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	100 yr	0	0	0
139135.*	100 yr	0	0	0
138670.*	100 yr	0	0	0
138205.*	100 yr	0	0	0
137740.*	100 yr	0	0	0
137275	100 yr	0	0	0
136829.*	100 yr	0	0	0
136383.*	100 yr	0	0	0
135937.*	100 yr	0	0	0
135491.*	100 yr	0	0	0
135045.*	100 yr	0	0	0
134600	100 yr	0	0	0
133431	100 yr	0	0	0
133138	100 yr	0	0	0
132450	100 yr	0	0	0
132040.*	100 yr	0	0	0
131630.*	100 yr	0	0	0
131220.*	100 yr	0	0	0
130810.*	100 yr	0	0	0
130400	100 yr	0	0	0
128690	100 yr	0	0	0
127800	100 yr	0	0	0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	500 yr	0	0	0
139135.*	500 yr	0	0	0
138670.*	500 yr	0	0	0
138205.*	500 yr	0	0	0
137740.*	500 yr	0	0	0
137275	500 yr	0	0	0
136829.*	500 yr	0	0	0
136383.*	500 yr	0	0	0
135937.*	500 yr	0	0	0
135491.*	500 yr	0	0	0
135045.*	500 yr	0	0	0
134600	500 yr	0	0	0

			proposed.rep	
133431	500 yr	0	0	0
133138	500 yr	0	0	0
132450	500 yr	0	0	0
132040.*	500 yr	0	0	0
131630.*	500 yr	0	0	0
131220.*	500 yr	0	0	0
130810.*	500 yr	0	0	0
130400	500 yr	0	0	0
128690	500 yr	0	0	0
127800	500 yr	0	0	0

River = Susquehanna Reach = 1

RS	Profile	Method	Value1	Value2
139600	100-yr encroachment	1	89	1111
139135.*	100-yr encroachment	1	210	1314.31
138670.*	100-yr encroachment	1	319.47	1416.98
138205.*	100-yr encroachment	1	490	1519.66
137740.*	100-yr encroachment	1	612	1622.33
137275	100-yr encroachment	1	387	1725
136829.*	100-yr encroachment	1	515	1990.46
136383.*	100-yr encroachment	1	635	2255.91
135937.*	100-yr encroachment	1	770	2521.37
135491.*	100-yr encroachment	1	885	2790
135045.*	100-yr encroachment	1	1210	3050
134600	100-yr encroachment	1	1350	3310
133431	100-yr encroachment	1	1075	2965.8
133138	100-yr encroachment	1	1165	3011
132450	100-yr encroachment	1	1065	3078.44
132040.*	100-yr encroachment	1	950.47	3017.17
131630.*	100-yr encroachment	1	925	2955.9
131220.*	100-yr encroachment	1	875	2935.83
130810.*	100-yr encroachment	1	1125	2889.79
130400	100-yr encroachment	1	1060	2985
128690	100-yr encroachment	1	860	2090
127800	100-yr encroachment	1	892	2242

FLOW DATA

Flow Title: FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr
100 yr	500 yr	100-yr encroachment		
Susquehanna	1	139600	167000	232000
260000	340000	260000		

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Susquehanna	1	10 yr	Critical	
Known WS = 504.5				

Susquehanna	1	50 yr	Critical
Known WS = 508.8			
Susquehanna	1	100 yr	Critical
Known WS = 510.5			
Susquehanna	1	500 yr	Critical
Known WS = 515			
Susquehanna	1	100-yr encroachment	Critical
Known WS = 511.5			

GEOMETRY DATA

Geometry Title: Proposed Conditions
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g11

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139600

INPUT
Description: FEMA CU
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	106	.04	647	.055	733	.04	1118	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
106	1118	475	468	413	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
2575	3289	518.6

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 139135.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	23.49	560.56	49.46	542.15	64.3	533.21	85.94	521.89
90.58	519.79	95.17	518.38	105.42	520.12	108.82	520.19	113.14	520.37
119.64	520.51	128.6	519.56	135.96	519.76	153.02	519.86	163.15	519.83

179.3	520.09	188.08	520.37	201.68	520.54	204.96	520.46	228.45	519.87
240.2	518.84	251.25	513.99	255.67	512.5	271.59	504.7	309.32	492.68
342.47	480.44	345.72	480.44	719.04	480.44	724.72	484.33	749.88	500.2
794.52	484.33	811.56	480.44	1043.67	480.44	1052.99	482.1	1068.53	484.61
1113.58	491.12	1157.08	497.03	1172.62	499.13	1189.71	501.85	1203.69	504.15
1205.44	504.75	1218.8	508.9	1275.37	508.77	1292.24	509.33	1314.31	510.12
1377.92	509.49	1381.08	509.48	1459.9	509.88	1462.58	509.84	1523.88	508.06
1571.72	507.5	1602.7	507.16	1654.34	506.77	1687.09	507.87	1737.98	509.64
1790.95	510.34	1809.37	510.66	1871.59	509.98	1883.68	510.4	1938.91	511.44
1995.88	511.08	2030.71	511.13	2067.28	510.81	2117.41	510.26	2148.01	509.03
2158.16	509.53	2201.05	511.47	2243.47	512.87	2247.97	513.04	2287.75	507.32
2333.42	507.36	2334.67	507.36	2362.21	513.13	2405.75	513.59	2456.05	514.36
2486.42	514.96	2543.77	515.24	2550.41	515.18	2611.61	515.46	2627.37	514.58
2647.81	514.58	2653.34	514.55	2665.39	515.41	2691.36	515.18	2695.75	515.15
2704.93	516.66	2714.11	516.65	2734.51	515.34	2758.12	515.61	2772.96	516.88
2787.8	516.24	2807.95	516.5	2904.84	518.82	2979.3	521.78	3008.5	526.93
3011.94	527.62	3025.2	527.91	3042.81	528.3	3050.22	528.5	3053.01	528.3
3062.94	528.07	3065.99	527.77	3082.32	527.13	3084.36	529.68	3100.3	530.81
3104.93	530.95	3145.74	532.26	3149.64	532.44	3174.48	533.86	3197.58	535.09
3239.39	542.27	3263.88	546.66	3300.6	549.7	3338.34	555.06	3341.4	556.33
3353.45	560.49	3433.2	595						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.076	240.2	.04	763.34	.054	846.51	.042	1218.8	.06
3433.2	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
240.2	1218.8	475	468	413	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 138670.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	36.62	559.44	77.1	537.36	100.23	527.91	133.96	517.54
141.18	515.96	148.35	515.76	164.31	518.97	169.61	519.02	176.36	519.25
186.48	519.36	200.45	517.22	211.92	517.42	238.52	517.62	254.31	517.56
279.47	517.69	293.16	518.04	314.35	518.38	319.47	518.37	356.09	518.23
374.4	516.68	388.94	511.24	394.75	509.97	415.69	500.53	465.33	491.06
508.94	479.38	511.44	479.38	798.08	479.38	802.45	482.3	821.76	494.2
856.04	482.3	869.12	479.38	1047.34	479.38	1061.83	481.13	1085.99	483.51
1156.03	488.89	1223.65	493.32	1247.8	494.9	1274.37	497.44	1296.11	499.66
1298.83	500.56	1319.6	506.6	1377.27	506.88	1394.48	508.17	1416.98	509.89
1481.84	509.09	1485.06	509.06	1565.42	509.86	1568.16	509.77	1630.66	507.17
1679.43	506.79	1711.03	506.57	1763.67	506.54	1797.07	507.53	1848.95	509.19
1902.96	510.05	1921.75	510.52	1985.19	510.77	1997.51	511.23	2053.83	511.57
2111.91	510.86	2147.43	510.96	2184.71	510.78	2235.82	510.31	2267.02	509.36
2277.37	509.72	2321.1	510.94	2364.35	511.75	2368.94	511.89	2409.5	507.64
2456.06	507.72	2457.34	507.72	2485.42	512.06	2529.81	512.41	2581.1	513.32
2612.07	513.97	2670.54	513.49	2677.31	513.36	2739.71	513.92	2755.78	512.16
2776.61	512.16	2782.25	512.14	2794.54	513.93	2821.02	513.64	2825.49	513.61
2834.85	514.72	2844.21	514.69	2865.01	513.67	2889.09	513.83	2904.22	516.14
2919.35	514.6	2939.89	514.8	3038.69	516.54	3114.61	518.76	3144.37	522.62
3147.89	523.23	3161.41	523.82	3179.35	524.6	3186.92	525	3189.75	524.6
3199.89	524.14	3202.99	523.83	3219.65	524.06	3221.73	526.07	3237.97	527.6
3242.7	527.69	3284.3	528.5	3288.29	528.68	3313.61	530.07	3337.16	531.18
3379.8	536.9	3404.76	540.63	3442.2	543.55	3480.68	551.01	3483.8	552.25

3496.09	555.37	3577.4	590

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	374.4	.04	1047.34	.045	1319.6	.06	3577.4	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
374.4	1319.6	475	468	413	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	314.35	518.38	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 138205.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49.75	558.33	104.73	532.57	136.15	522.61	181.97	513.2
191.79	512.14	201.52	513.14	223.21	517.81	230.41	517.85	239.57	518.13
253.32	518.2	272.3	514.88	287.89	515.09	324.01	515.38	345.46	515.29
379.65	515.3	398.24	515.71	427.03	516.22	433.98	516.28	483.73	516.59
508.6	514.52	526.63	508.49	533.84	507.45	559.79	496.35	621.34	489.44
675.42	478.32	677.15	478.32	877.13	478.32	880.17	480.26	893.65	488.2
917.56	480.26	926.69	478.32	1051.02	478.32	1070.68	480.15	1103.44	482.41
1198.47	486.66	1290.22	489.61	1322.99	490.67	1359.03	493.03	1388.52	495.17
1392.22	496.37	1420.4	504.3	1479.18	504.98	1496.72	507	1519.66	509.66
1585.76	508.68	1589.04	508.64	1670.95	509.84	1673.73	509.71	1737.44	506.28
1787.15	506.09	1819.35	505.98	1873.01	506.3	1907.04	507.19	1959.93	508.73
2014.97	509.77	2034.12	510.38	2098.78	511.55	2111.34	512.05	2168.74	511.71
2227.94	510.64	2264.14	510.79	2302.14	510.75	2354.24	510.37	2386.03	509.69
2396.58	509.91	2441.15	510.41	2485.23	510.64	2489.91	510.73	2531.25	507.96
2578.71	508.08	2580.01	508.08	2608.63	510.98	2653.87	511.24	2706.15	512.29
2737.71	512.98	2797.3	511.73	2804.2	511.54	2867.8	512.38	2884.19	509.74
2905.42	509.74	2911.17	509.73	2923.7	512.46	2950.68	512.09	2955.24	512.06
2964.78	512.78	2974.32	512.74	2995.52	512.01	3020.06	512.05	3035.48	515.39
3050.9	512.97	3071.84	513.1	3172.53	514.26	3249.91	515.74	3280.25	518.32
3283.83	518.85	3297.61	519.73	3315.9	520.9	3323.61	521.5	3326.5	520.9
3336.83	520.21	3339.99	519.89	3356.97	520.99	3359.09	522.45	3375.65	524.4
3380.47	524.43	3422.87	524.73	3426.93	524.92	3452.74	526.28	3476.75	527.27
3520.2	531.54	3545.64	534.59	3583.8	537.4	3623.02	546.97	3626.2	548.17
3638.73	550.25	3721.6	585						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.068	508.6	.04	1051.02	.052	1103.44	.047	1420.4	.06
3721.6	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
508.6	1420.4	475	468	413	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	253.32	518.2	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137740.*

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	62.87	557.21	132.37	527.79	172.08	517.3	229.99	508.85
242.39	508.32	254.69	510.53	282.1	516.66	291.2	516.67	302.79	517.02
320.16	517.05	344.15	512.54	363.85	512.75	409.51	513.14	436.62	513.02
479.82	512.9	503.32	513.38	539.71	514.06	548.49	514.19	611.36	514.94
642.8	512.36	664.31	505.75	672.92	504.92	703.9	492.18	777.35	487.82
841.89	477.26	842.87	477.26	956.17	477.26	957.89	478.23	965.53	482.2
979.08	478.23	984.25	477.26	1054.69	477.26	1079.52	479.18	1120.9	481.3
1240.92	484.43	1356.79	485.91	1398.17	486.43	1443.7	488.61	1480.94	490.69
1485.61	492.19	1521.2	502	1581.09	503.09	1598.96	505.83	1622.33	509.43
1689.67	508.27	1693.02	508.22	1776.47	509.82	1779.31	509.64	1844.22	505.39
1894.87	505.39	1927.68	505.39	1982.34	506.07	2017.02	506.84	2070.9	508.28
2126.99	509.48	2146.5	510.24	2212.38	512.33	2225.17	512.88	2283.65	511.84
2343.97	510.42	2380.85	510.62	2419.57	510.73	2472.65	510.42	2505.05	510.02
2515.79	510.11	2561.2	509.88	2606.12	509.52	2610.88	509.58	2653	508.28
2701.35	508.44	2702.68	508.44	2731.84	509.91	2777.94	510.07	2831.2	511.25
2863.36	511.99	2924.07	509.98	2931.1	509.72	2995.9	510.84	3012.59	507.32
3034.23	507.32	3040.08	507.31	3052.85	510.98	3080.34	510.55	3084.99	510.51
3094.71	510.84	3104.43	510.78	3126.03	510.34	3151.03	510.28	3166.74	514.65
3182.45	511.33	3203.78	511.4	3306.38	511.98	3385.22	512.72	3416.12	514.01
3419.78	514.47	3433.81	515.64	3452.45	517.2	3460.31	518	3463.25	517.2
3473.77	516.28	3477	515.94	3494.29	517.93	3496.45	518.83	3513.32	521.2
3518.23	521.16	3561.43	520.97	3565.57	521.16	3591.87	522.49	3616.33	523.36
3660.6	526.17	3686.53	528.56	3725.4	531.25	3765.36	542.93	3768.6	544.08
3781.36	545.12	3865.8	580						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.064	642.8	.04	1120.9	.052	1240.92	.05	1521.2	.06
3865.8	.06								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
642.8	1521.2	475	468	413	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	320.16	517.05	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 137275

INPUT
Description: FEMA CT
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3
777	510.2	802	503	812	502.4	848	488	933.36	486.2
1008.36	476.2	1058.36	476.2	1088.36	478.2	1138.36	480.2	1283.36	482.2
1423.36	482.2	1473.36	482.2	1528.36	484.2	1573.36	486.2	1579	488
1622	499.7	1683	501.2	1725	509.2	1797	507.8	1882	509.8
1951	504.5	2036	504.8	2127	506.5	2239	509.2	2339	513.7
2460	510.2	2537	510.7	2635	510.3	2727	508.4	2824	508.8
2902	508.9	2989	511	3058	507.9	3124	509.3	3141	504.9
3169	504.9	3182	509.5	3210	509	3282	508.5	3298	513.9
3314	509.7	3552	509.7	3589	513.5	3597	514.5	3600	513.5

3614	512	3651	518	3656	517.9	3700	517.2	3731	518.7
3801	520.8	3867	525.1	3911	540	3924	540	4010	575

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	777	.04	1622	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
777	1622	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 136829.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	22.09	571.02	45.99	566.97	75.75	561.01	100.47	554.68
113.18	550.26	119.94	548.58	151.05	539.37	189.83	528.27	211.51	522.18
222.3	520.28	249.8	515.44	266.94	512.91	272.8	512.06	274.97	511.75
306.17	509.71	347.2	507.3	367.51	505.92	387.34	505.9	391.39	506.49
436.93	513.13	450.79	515.13	465.33	515.13	476.16	515.33	483.84	515.46
511.6	515.44	521.7	514.18	549.94	510.54	553.71	510.54	562.73	510.47
569.95	510.51	578.06	510.81	603.76	510.87	611.43	511.36	614.14	511.44
617.74	511.4	629.02	511.41	633.98	510.69	654.37	510.69	671.4	510.55
710.63	510.25	757.07	509.81	766.74	509.78	775.56	509.89	823.36	510.45
876.46	511.43	877.47	511.44	904.07	511.34	934.73	511.46	964.94	511.15
976.93	511.25	992	510.46	1027.17	508.62	1040.08	504.84	1056.8	500.82
1066.46	500.04	1068.65	499.91	1079.68	496.6	1111.32	487.58	1169.49	486.5
1212.5	485.71	1259.3	481.15	1301.39	476.87	1383.06	476.87	1410.08	478.59
1455.12	480.34	1550.03	481.74	1585.73	482.33	1639.08	482.53	1711.84	482.78
1739.27	482.87	1755.83	483.12	1756.88	483.18	1774.76	484.88	1779.21	485.2
1783.66	485.52	1788.11	485.83	1792.57	486.15	1797.02	486.47	1801.47	486.78
1805.92	487.1	1806.42	487.14	1810.38	487.45	1814.83	487.8	1819.28	488.15
1841.54	489.89	1846.89	490.28	1846.95	490.29	1852.04	491.94	1852.32	492.02
1858.11	493.65	1863.54	495.18	1869.04	496.73	1874.47	498.26	1879.9	499.8
1885.34	501.33	1890.77	502.87	1949.81	504.21	1990.46	510.95	1991.15	510.94
2060.14	509.78	2078.96	510.16	2107.22	510.57	2120.99	510.68	2128.2	510.66
2135.87	510.65	2142.41	510.66	2144.96	510.45	2159.85	509.3	2191.17	507.06
2209.19	505.81	2247.5	505.82	2291.46	505.79	2293.07	505.81	2365.93	506.81
2379.53	507.02	2487.93	509.17	2552.42	511.62	2584.72	512.7	2585.26	512.69
2615.56	511.77	2639.55	511	2681.86	509.78	2701.83	509.25	2776.35	509.56
2795.71	509.47	2829.15	509.35	2838	509.48	2841.46	509.64	2844.91	509.79
2847.28	509.95	2850.52	510.11	2853.54	510.26	2856.35	510.42	2871.2	510.37
2872.53	510.34	2874.37	510.14	2924.9	509.25	2927.39	509.37	2929.29	509.5
2931.28	509.63	2947.17	509.35	2951.59	509.1	2956.14	508.86	2960.25	508.62
2960.27	508.62	3054.13	508.95	3129.62	509.03	3213.82	510.78	3280.6	508.2
3344.48	509.37	3360.94	505.7	3388.04	505.7	3400.62	509.53	3407.92	509.59
3415.46	509.64	3427.72	509.45	3433.14	509.42	3447.05	509.33	3476.75	509.32
3479.86	509.47	3482.96	509.62	3486.15	509.77	3489.18	509.92	3492.11	510.06
3494.79	510.22	3497.4	510.2	3506.43	512.82	3512.89	514.65	3528.37	511.04
3529.89	511.03	3538.67	510.87	3547.8	510.7	3557.44	510.53	3569.81	510.53
3588.05	510.7	3602.47	510.87	3608.97	511.03	3614.58	511.2	3618.6	511.37
3621.98	511.53	3624.91	511.7	3627.77	511.87	3630.64	512.03	3633.31	512.2
3649.31	512.37	3676.74	512.53	3683.86	512.53	3718.97	512.37	3735.05	512.37
3742.17	512.53	3758.72	512.6	3782.96	514.84	3794.53	515.94	3802.28	516.82
3805.18	516	3810.81	515.51	3818.73	514.82	3847.72	519	3854.54	519.99
3859.38	519.93	3876.56	519.8	3898.83	519.66	3901.97	519.65	3912.78	520.23
3921.27	520.75	3926.45	521.14	3931.4	521.51	3931.97	521.55	3936.24	521.81
3940.41	522.08	3944.69	522.36	3948.18	522.62	3951.1	522.86	3954.03	523.1

3956.92	523.34	3959.81	523.59	3962.8	523.83	3966.03	524.08	3973.42	524.44
3998.82	525.26	3999.72	525.28	4024.08	526.65	4035.89	527.31	4041.05	527.77
4063.6	529.76	4097.77	540.83	4106.18	543.48	4118.76	543.77	4122.86	545.3
4202	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1027.17	.04	1890.77	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1027.17	1890.77	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 136383.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	27.48	571.2	57.19	567.6	94.2	561.27	124.94	553.26
140.74	548.21	149.15	546.86	187.84	537.71	236.07	527.08	263.03	521.36
276.44	519.42	310.64	514.51	331.95	512.43	339.24	511.75	341.94	511.51
380.73	509.95	431.76	508.46	457.01	507.34	481.67	507.31	486.71	507.77
543.34	513.16	560.58	514.77	578.66	514.77	592.13	514.92	601.68	515.02
636.2	514.98	648.76	513.97	683.87	510.87	688.57	510.85	699.79	510.66
708.76	510.69	718.85	511.23	750.81	511.17	760.34	512.11	763.71	512.25
768.19	512.14	782.21	512.09	788.38	510.61	813.75	510.48	834.92	510.26
883.7	509.8	941.46	509.09	953.48	509.07	964.45	509.15	1023.89	509.58
1089.93	510.75	1091.17	510.77	1124.26	510.25	1162.38	510.13	1199.95	509.14
1214.86	509.2	1233.6	508.55	1277.33	507.03	1292.26	502.61	1311.6	498.63
1322.77	497.57	1325.3	497.42	1338.06	494.52	1374.64	487.17	1441.9	486.04
1491.63	485.21	1545.75	481.36	1594.43	477.53	1707.76	477.53	1731.81	478.97
1771.88	480.49	1856.34	481.84	1888.11	482.47	1935.58	482.87	2000.32	483.35
2024.73	483.53	2039.47	484.03	2040.4	484.16	2056.3	486.85	2060.27	487.3
2064.23	487.75	2068.19	488.21	2072.15	488.66	2076.11	489.11	2080.08	489.57
2084.04	490.02	2084.48	490.07	2088	490.5	2091.96	490.98	2095.93	491.46
2115.74	493.86	2120.49	494.36	2120.55	494.37	2125.07	495.88	2125.32	495.96
2130.47	497.46	2135.31	498.88	2140.2	500.32	2145.04	501.75	2149.87	503.18
2154.7	504.61	2159.54	506.03	2216.61	507.23	2255.91	512.7	2256.58	512.69
2323.29	511.77	2341.48	512.07	2368.79	512.2	2382.11	512.09	2389.08	511.87
2396.5	511.66	2402.82	511.53	2405.29	511.3	2419.68	510.18	2449.96	508.19
2467.38	507.13	2504.42	506.99	2546.92	506.78	2548.48	506.79	2618.92	507.39
2632.07	507.54	2736.87	509.15	2799.21	511.03	2830.44	511.71	2830.96	511.69
2860.25	510.75	2883.45	509.94	2924.35	508.76	2943.66	508.31	3015.71	508.42
3034.42	508.31	3066.75	508.22	3075.31	508.53	3078.65	508.85	3081.99	509.17
3084.28	509.5	3087.41	509.82	3090.33	510.15	3093.05	510.48	3107.41	510.43
3108.68	510.41	3110.47	510.05	3159.32	509.34	3161.72	509.63	3163.57	509.94
3165.49	510.25	3180.85	510.02	3185.12	509.62	3189.52	509.23	3193.49	508.84
3193.51	508.83	3284.25	509.1	3357.24	509.17	3438.65	510.57	3503.21	508.5
3564.97	509.43	3580.87	506.5	3607.07	506.5	3619.24	509.57	3626.3	509.81
3633.59	510.05	3645.44	509.9	3650.68	509.87	3664.13	509.81	3692.84	510
3695.85	510.32	3698.85	510.64	3701.93	510.95	3704.85	511.27	3707.69	511.59
3710.28	511.91	3712.81	511.9	3721.54	514	3727.78	515.41	3742.75	512.39
3744.21	512.37	3752.7	512.03	3761.53	511.7	3770.85	511.37	3782.81	511.37
3800.44	511.7	3814.39	512.03	3820.67	512.37	3826.1	512.7	3829.98	513.03
3833.25	513.37	3836.08	513.7	3838.85	514.03	3841.62	514.37	3844.2	514.7
3859.67	515.03	3886.18	515.37	3893.07	515.37	3927.01	515.03	3942.56	515.03
3949.45	515.37	3965.45	515.5	3988.88	517.41	4000.07	518.37	4007.55	519.13
4010.36	518.5	4015.81	518.15	4023.46	517.64	4051.49	521.14	4058.08	521.98
4062.76	521.97	4079.37	521.98	4100.9	522.07	4103.93	522.11	4114.38	522.73

4122.59	523.34	4127.6	523.85	4132.39	524.35	4132.94	524.41	4137.07	524.79
4141.09	525.21	4145.23	525.63	4148.61	526.03	4151.44	526.43	4154.26	526.82
4157.06	527.22	4159.85	527.61	4162.75	528	4165.87	528.4	4173.01	528.89
4197.56	529.75	4198.44	529.77	4221.99	530.86	4233.41	531.39	4238.4	531.95
4260.19	534.42	4293.23	544.6	4301.37	546.96	4313.53	547.54	4317.48	548.88
4394	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1277.33	.04	2159.54	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1277.33	2159.54	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135937.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	32.86	571.37	68.4	568.22	112.65	561.52	149.41	551.84
168.31	546.16	178.36	545.15	224.63	536.06	282.3	525.88	314.54	520.55
330.58	518.57	371.48	513.58	396.96	511.95	405.68	511.44	408.91	511.26
455.3	510.19	516.32	509.62	546.52	508.75	576.01	508.71	582.03	509.05
649.76	513.2	670.37	514.4	691.99	514.4	708.09	514.52	719.52	514.58
760.8	514.52	775.82	513.75	817.81	511.21	823.43	511.16	836.84	510.84
847.57	510.87	859.64	511.64	897.86	511.48	909.26	512.86	913.28	513.07
918.65	512.88	935.41	512.77	942.79	510.53	973.12	510.27	998.44	509.97
1056.78	509.35	1125.84	508.37	1140.22	508.35	1153.34	508.41	1224.41	508.71
1303.39	510.08	1304.88	510.11	1344.44	509.16	1390.04	508.8	1434.96	507.13
1452.8	507.16	1475.2	506.64	1527.5	505.45	1544.45	500.38	1566.4	496.45
1579.07	495.11	1581.95	494.93	1596.43	492.44	1637.96	486.75	1714.32	485.58
1770.77	484.72	1832.2	481.57	1887.46	478.2	2032.46	478.2	2053.53	479.36
2088.64	480.63	2162.64	481.93	2190.48	482.6	2232.07	483.2	2288.8	483.93
2310.19	484.2	2323.1	484.95	2323.92	485.14	2337.85	488.81	2341.32	489.4
2344.8	489.99	2348.27	490.58	2351.74	491.17	2355.21	491.76	2358.68	492.35
2362.15	492.94	2362.54	493.01	2365.63	493.55	2369.1	494.16	2372.57	494.77
2389.93	497.82	2394.09	498.45	2394.15	498.46	2398.11	499.82	2398.33	499.89
2402.84	501.27	2407.08	502.59	2411.36	503.92	2415.6	505.24	2419.83	506.56
2424.07	507.88	2428.31	509.2	2483.42	510.24	2521.37	514.45	2522.02	514.44
2586.43	513.75	2604	513.98	2630.37	513.82	2643.24	513.49	2649.96	513.08
2657.13	512.67	2663.23	512.39	2665.61	512.15	2679.51	511.06	2708.75	509.32
2725.58	508.44	2761.34	508.17	2802.38	507.77	2803.88	507.77	2871.9	507.97
2884.6	508.06	2985.8	509.12	3046.01	510.45	3076.16	510.71	3076.66	510.69
3104.95	509.74	3127.35	508.88	3166.84	507.75	3185.49	507.36	3255.06	507.29
3273.13	507.16	3304.35	507.09	3312.61	507.57	3315.84	508.06	3319.06	508.56
3321.28	509.05	3324.3	509.54	3327.12	510.04	3329.74	510.53	3343.61	510.5
3344.84	510.49	3346.57	509.97	3393.74	509.43	3396.06	509.9	3397.84	510.38
3399.7	510.86	3414.53	510.69	3418.65	510.14	3422.91	509.59	3426.74	509.05
3426.76	509.05	3514.38	509.25	3584.86	509.3	3663.47	510.35	3725.81	508.8
3785.45	509.5	3800.81	507.3	3826.11	507.3	3837.85	509.6	3844.67	510.03
3851.71	510.46	3863.15	510.35	3868.22	510.33	3881.2	510.28	3908.93	510.67
3911.83	511.16	3914.73	511.65	3917.71	512.14	3920.53	512.63	3923.27	513.12
3925.77	513.61	3928.21	513.6	3936.64	515.17	3942.67	516.16	3957.12	513.73
3958.54	513.7	3966.73	513.2	3975.26	512.7	3984.26	512.2	3995.8	512.2
4012.83	512.7	4026.3	513.2	4032.37	513.7	4037.61	514.2	4041.36	514.7
4044.51	515.2	4047.25	515.7	4049.92	516.2	4052.6	516.7	4055.09	517.2
4070.03	517.7	4095.63	518.2	4102.28	518.2	4135.06	517.7	4150.07	517.7
4156.72	518.2	4172.17	518.4	4194.79	519.99	4205.6	520.81	4212.83	521.45

4215.54	521	4220.8	520.79	4228.19	520.46	4255.26	523.28	4261.62	523.97
4266.14	524	4282.18	524.16	4302.97	524.48	4305.9	524.56	4315.99	525.22
4323.92	525.93	4328.75	526.56	4333.38	527.19	4333.91	527.26	4337.9	527.77
4341.78	528.33	4345.78	528.9	4349.04	529.45	4351.77	530	4354.5	530.54
4357.2	531.09	4359.9	531.63	4362.69	532.18	4365.71	532.73	4372.6	533.34
4396.31	534.24	4397.16	534.25	4419.9	535.07	4430.93	535.47	4435.74	536.14
4456.79	539.09	4488.69	548.38	4496.55	550.44	4508.29	551.31	4512.11	552.46
4586	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1527.5	.04	2428.31	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1527.5	2428.31	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135491.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	38.24	571.55	79.6	568.85	131.1	561.78	173.88	550.41
195.87	544.1	207.58	543.43	261.42	534.41	328.53	524.69	366.06	519.73
384.72	517.71	432.32	512.65	461.97	511.46	472.12	511.13	475.87	511.02
529.87	510.42	600.88	510.78	636.02	510.17	670.34	510.11	677.35	510.33
756.17	513.23	780.16	514.03	805.33	514.03	824.06	514.11	837.36	514.14
885.4	514.06	902.88	513.53	951.75	511.55	958.29	511.48	973.89	511.03
986.38	511.04	1000.43	512.06	1044.91	511.79	1058.17	513.6	1062.85	513.88
1069.1	513.62	1088.61	513.44	1097.19	510.45	1132.49	510.06	1161.96	509.68
1229.85	508.9	1310.23	507.64	1326.96	507.63	1342.22	507.68	1424.94	507.84
1516.85	509.41	1518.59	509.44	1564.63	508.08	1617.69	507.47	1669.98	505.12
1690.73	505.11	1716.8	504.72	1777.67	503.87	1796.63	498.15	1821.19	494.26
1835.38	492.64	1838.61	492.43	1854.81	490.36	1901.29	486.33	1986.73	485.12
2049.91	484.23	2118.65	481.78	2180.49	478.87	2357.16	478.87	2375.25	479.75
2405.41	480.78	2468.95	482.02	2492.85	482.73	2528.57	483.53	2577.28	484.5
2595.64	484.87	2606.73	485.87	2607.43	486.12	2619.4	490.77	2622.38	491.5
2625.36	492.23	2628.35	492.95	2631.33	493.68	2634.31	494.41	2637.29	495.13
2640.27	495.86	2640.6	495.94	2643.25	496.6	2646.23	497.34	2649.21	498.08
2664.12	501.78	2667.69	502.53	2667.74	502.54	2671.14	503.77	2671.33	503.83
2675.21	505.08	2678.84	506.29	2682.53	507.51	2686.16	508.73	2689.8	509.94
2693.44	511.15	2697.07	512.37	2750.23	513.26	2786.83	516.2	2787.45	516.2
2849.57	515.73	2866.52	515.89	2891.95	515.45	2904.36	514.89	2910.85	514.28
2917.76	513.68	2923.64	513.25	2925.94	513	2939.34	511.94	2967.54	510.44
2983.77	509.75	3018.26	509.35	3057.84	508.76	3059.29	508.74	3124.89	508.55
3137.14	508.58	3234.73	509.1	3292.8	509.87	3321.87	509.71	3322.36	509.69
3349.64	508.73	3371.25	507.82	3409.34	506.73	3427.31	506.42	3494.41	506.15
3511.84	506.01	3541.95	505.96	3549.92	506.61	3553.03	507.28	3556.14	507.94
3558.28	508.6	3561.19	509.26	3563.91	509.92	3566.44	510.59	3579.81	510.57
3581	510.56	3582.66	509.88	3628.16	509.52	3630.4	510.17	3632.11	510.82
3633.91	511.47	3648.21	511.36	3652.18	510.66	3656.29	509.96	3659.98	509.27
3660	509.27	3744.51	509.4	3812.48	509.43	3888.29	510.13	3948.42	509.1
4005.93	509.57	4020.74	508.1	4045.14	508.1	4056.47	509.63	4063.05	510.26
4069.84	510.88	4080.87	510.8	4085.75	510.79	4098.28	510.75	4125.02	511.35
4127.82	512.01	4130.61	512.67	4133.49	513.33	4136.21	513.99	4138.85	514.65
4141.26	515.31	4143.61	515.3	4151.74	516.35	4157.56	516.92	4171.5	515.08
4172.86	515.03	4180.76	514.37	4188.99	513.7	4197.67	513.03	4208.8	513.03
4225.22	513.7	4238.21	514.37	4244.06	515.03	4249.12	515.7	4252.73	516.37
4255.78	517.03	4258.41	517.7	4260.99	518.37	4263.57	519.03	4265.98	519.7

4280.38	520.37	4305.08	521.03	4311.49	521.03	4343.1	520.37	4357.58	520.37
4363.99	521.03	4378.89	521.3	4400.71	522.56	4411.14	523.24	4418.11	523.76
4420.72	523.5	4425.79	523.43	4432.92	523.28	4459.02	525.42	4465.16	525.96
4469.52	526.04	4484.99	526.34	4505.04	526.88	4507.86	527.02	4517.6	527.71
4525.24	528.52	4529.9	529.27	4534.36	530.02	4534.88	530.11	4538.73	530.74
4542.47	531.45	4546.33	532.16	4549.47	532.87	4552.1	533.56	4554.74	534.26
4557.34	534.96	4559.94	535.65	4562.64	536.35	4565.54	537.05	4572.19	537.79
4595.06	538.72	4595.88	538.73	4617.81	539.28	4628.45	539.55	4633.09	540.33
4653.39	543.75	4684.16	552.15	4691.73	553.92	4703.06	555.09	4706.74	556.04
4778	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1777.67	.04	2697.07	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1777.67	2697.07	464.17	448.38 414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 135045.*

INPUT
Description:
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	43.62	571.72	90.8	569.47	149.55	562.04	198.35	548.99
223.44	542.05	236.79	541.72	298.21	532.75	374.77	523.49	417.57	518.91
438.86	516.86	493.16	511.73	526.99	510.98	538.56	510.81	542.84	510.77
604.43	510.66	685.44	511.94	725.53	511.59	764.68	511.52	772.68	511.62
862.59	513.27	889.95	513.67	918.66	513.67	940.03	513.71	955.2	513.71
1010	513.6	1029.94	513.32	1085.69	511.88	1093.14	511.79	1110.95	511.21
1125.19	511.22	1141.21	512.48	1191.95	512.09	1207.09	514.35	1212.43	514.69
1219.55	514.36	1241.8	514.12	1251.6	510.38	1291.86	509.85	1325.48	509.39
1402.93	508.45	1494.61	506.92	1513.7	506.92	1531.11	506.94	1625.47	506.97
1730.31	508.74	1732.29	508.77	1784.81	506.99	1845.35	506.13	1904.99	503.11
1928.66	503.06	1958.4	502.81	2027.83	502.28	2048.82	495.93	2075.99	492.08
2091.69	490.17	2095.26	489.94	2113.18	488.28	2164.61	485.91	2259.15	484.66
2329.05	483.74	2405.11	481.99	2473.53	479.53	2681.86	479.53	2696.98	480.14
2722.17	480.92	2775.25	482.11	2795.22	482.87	2825.06	483.87	2865.76	485.08
2881.1	485.53	2890.37	486.78	2890.95	487.11	2900.95	492.74	2903.44	493.6
2905.93	494.46	2908.42	495.33	2910.91	496.19	2913.4	497.05	2915.89	497.92
2918.38	498.78	2918.66	498.88	2920.88	499.65	2923.37	500.52	2925.86	501.39
2938.31	505.74	2941.3	506.62	2941.34	506.63	2944.18	507.71	2944.34	507.76
2947.57	508.89	2950.61	510	2953.69	511.11	2956.73	512.21	2959.76	513.32
2962.8	514.43	2965.84	515.53	3017.04	516.27	3052.29	517.94	3052.89	517.95
3112.71	517.72	3129.03	517.79	3153.53	517.07	3165.48	516.3	3171.73	515.49
3178.38	514.69	3184.05	514.12	3186.26	513.85	3199.17	512.82	3226.33	511.57
3241.96	511.07	3275.18	510.52	3313.3	509.75	3314.69	509.72	3377.87	509.12
3389.67	509.11	3483.67	509.07	3539.59	509.28	3567.59	508.71	3568.06	508.7
3594.34	507.71	3615.14	506.76	3651.83	505.72	3669.14	505.47	3733.77	505.01
3750.55	504.85	3779.55	504.83	3787.22	505.66	3790.22	506.49	3793.21	507.32
3795.27	508.15	3798.08	508.98	3800.7	509.81	3803.13	510.64	3816.01	510.63
3817.16	510.63	3818.76	509.79	3862.58	509.61	3864.73	510.43	3866.39	511.26
3868.11	512.09	3881.89	512.03	3885.72	511.18	3889.67	510.33	3893.23	509.49
3893.25	509.48	3974.64	509.55	4040.1	509.57	4113.11	509.92	4171.02	509.4
4226.41	509.63	4240.68	508.9	4264.18	508.9	4275.09	509.67	4281.42	510.48
4287.96	511.29	4298.59	511.25	4303.29	511.24	4315.35	511.23	4341.11	512.02
4343.8	512.85	4346.5	513.68	4349.26	514.51	4351.88	515.34	4354.43	516.17
4356.75	517	4359.02	517	4366.85	517.52	4372.45	517.67	4385.87	516.42
4387.19	516.37	4394.8	515.53	4402.72	514.7	4411.08	513.87	4421.8	513.87

4437.62	514.7	4450.13	515.53	4455.76	516.37	4460.63	517.2	4464.11	518.03
4467.04	518.87	4469.58	519.7	4472.07	520.53	4474.55	521.37	4476.87	522.2
4490.74	523.03	4514.52	523.87	4520.7	523.87	4551.15	523.03	4565.09	523.03
4571.27	523.87	4585.62	524.2	4606.63	525.13	4616.67	525.68	4623.38	526.08
4625.9	526	4630.79	526.06	4637.65	526.1	4662.79	527.56	4668.7	527.95
4672.9	528.07	4687.8	528.52	4707.11	529.29	4709.83	529.47	4719.2	530.21
4726.57	531.11	4731.06	531.99	4735.35	532.86	4735.85	532.96	4739.55	533.72
4743.16	534.58	4746.87	535.43	4749.9	536.28	4752.44	537.13	4754.97	537.98
4757.48	538.83	4759.99	539.68	4762.58	540.53	4765.38	541.38	4771.79	542.25
4793.81	543.21	4794.59	543.22	4815.72	543.49	4825.96	543.62	4830.43	544.51
4849.99	548.41	4879.62	555.93	4886.91	557.39	4897.82	558.86	4901.37	559.62
4970	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2027.83	.04	2965.84	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2027.83	2965.84	464.16	448.3	414.16	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 134600

INPUT
Description: FEMA CS topo
Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2371.56	486.2	2531.56	484.2	2691.56	482.2	2766.56	480.2
3006.56	480.2	3081.56	482.2	3121.56	484.2	3166.56	486.2	3174	487.7
3182.5	494.7	3184.5	495.7	3186.5	496.7	3188.5	497.7	3190.5	498.7
3192.5	499.7	3194.5	500.7	3196.5	501.7	3198.5	502.7	3200.5	503.7
3202.5	504.7	3212.5	509.7	3214.9	510.7	3217.34	511.7	3219.94	512.7
3222.38	513.7	3224.85	514.7	3227.29	515.7	3229.73	516.7	3232.17	517.7
3234.61	518.7	3318.32	519.7	3391.55	519.7	3415.11	518.7	3426.6	517.7
3432.61	516.7	3439.01	515.7	3446.59	514.7	3459	513.7	3485.12	512.7
3532.1	511.7	3570.1	510.7	3630.86	509.7	3786.38	508.7	3813.76	507.7
3839.03	506.7	3859.04	505.7	3894.32	504.7	3989.26	503.7	4017.15	503.7
4024.53	504.7	4027.41	505.7	4030.29	506.7	4032.27	507.7	4034.97	508.7
4037.49	509.7	4039.83	510.7	4053.32	510.7	4054.86	509.7	4097	509.7
4099.07	510.7	4100.66	511.7	4102.32	512.7	4115.57	512.7	4119.25	511.7
4123.05	510.7	4126.49	509.7	4493.71	509.7	4499.8	510.7	4506.09	511.7
4520.83	511.7	4532.43	511.7	4557.2	512.7	4559.79	513.7	4562.38	514.7
4565.04	515.7	4567.56	516.7	4570.01	517.7	4572.24	518.7	4581.95	518.7
4601.51	517.7	4608.83	516.7	4616.45	515.7	4624.49	514.7	4634.8	514.7
4650.01	515.7	4662.04	516.7	4667.46	517.7	4672.14	518.7	4675.49	519.7
4678.31	520.7	4680.75	521.7	4683.14	522.7	4685.53	523.7	4687.76	524.7
4701.1	525.7	4723.97	526.7	4729.91	526.7	4759.19	525.7	4772.6	525.7
4778.54	526.7	4812.55	527.7	4835.78	528.7	4866.56	529.7	4890.61	530.7
4909.18	531.7	4920.81	532.7	4927.89	533.7	4932.21	534.7	4936.34	535.7
4940.38	536.7	4943.85	537.7	4947.42	538.7	4950.33	539.7	4952.77	540.7
4955.21	541.7	4957.62	542.7	4960.03	543.7	4962.53	544.7	4965.22	545.7
4971.38	546.7	4992.56	547.7	5013.63	547.7	5023.48	547.7	5027.78	548.7

5075.08	559.7	5096	563.2	5162	575

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2278	.04	3234.61	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2278	3234.61	1080.55	1139.54 1175.03	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
3391.55	5162	519.7	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 133431

INPUT
Description: XS of Ex Intake Structure topo
Station Elevation Data num= 179

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20	575	63.88	563.59	79.47	559.7	96.46	559.49	111.34	556.9
133.63	552.32	170.45	547.05	221.77	536.83	244.78	532.63	258.21	531.53
299.29	526.16	320	524.5	371.5	520.87	397.01	518.87	449.03	515.07
461.49	513.93	498.94	510.55	516.12	510	550.15	509.9	561.79	509.9
578.58	509.93	628.06	510.03	651.86	510.25	683.72	514.07	709.55	515.34
748.5	516.87	797.31	517.8	809.03	518.05	887.76	523.49	891.86	523.77
965.67	525.01	967.26	525.03	1056.12	525.54	1059.65	525.55	1085.13	525.35
1119.7	517.26	1129.73	514.84	1137.17	515.07	1137.61	515.07	1138.23	515.07
1142.48	515.07	1151.94	514.47	1160.53	514.2	1168.06	512.46	1191.33	506.29
1219.1	505.71	1234.33	506.35	1236.99	506.37	1239.7	506.43	1246.87	506.3
1269.25	506.2	1279.1	504.7	1304.96	504.56	1341.06	505.43	1353.43	505.36
1426.02	504.96	1431.34	504.99	1517.35	505.37	1523.58	505.33	1560.3	505.33
1626.73	505.31	1655.22	504.33	1663.89	504.09	1721.24	505.58	1762.69	506.05
1783.89	505.87	1815.52	505.43	1838.05	505.3	1876.42	504.71	1925.13	503.27
1936.42	502.83	1990.15	501.78	1990.97	501.77	2225.73	503.9	2247.39	501.66
2268.3	490.51	2282.3	488	2285.8	486.2	2310.8	484.2	2370.8	482.2
2415.8	480.2	2475.8	478.2	2525.8	476.2	2590.8	474.2	2700	474.2
2722	472.5	2965.8	472.5	3010.97	510.98	3025.05	511.32	3069.71	512.4
3089.8	524.7	3261.44	524.7	3296.35	523.7	3315.96	522.7	3334.18	521.7
3352.9	520.7	3377.31	519.7	3416.45	518.7	3434.16	517.7	3438.84	516.7
3441.75	515.7	3464.95	508.7	3635.39	508.7	3695.47	512.7	3729.89	513.7
3760.07	514.7	3797.72	515.7	3823.61	516.7	3870.15	517.7	3894.18	518.7
3926.25	519.7	4036.52	520.7	4062.59	521.7	4072.83	522.7	4079.04	522.7
4081.99	521.7	4088.88	521.7	4101.51	521.7	4105.95	521.7	4108.63	522.7
4111.08	523.7	4121.65	524.7	4170.67	525.7	4193.46	526.7	4216	527.7
4237.77	528.7	4254.01	529.7	4266.02	530.7	4270.48	531.7	4272.86	532.7
4274.9	533.7	4276.76	534.7	4278.69	535.7	4280.47	536.7	4297.21	537.7
4337.33	538.7	4381.16	545.7	4439.94	544.7	4471.96	544.7	4480.4	544.7
4503.16	544.7	4504.55	545.7	4525.95	556.7	4546.76	557.7	4550.01	558.7
4566.02	559.7	4573.83	560.7	4581.25	561.7	4584.25	562.7	4587.63	563.7
4605.2	564.7	4636.09	566.7	4643.17	567.7	4652.1	568.7	4659.08	569.7
4709.38	570.7	4728.91	571.7	4767.71	574.7	4826.02	578.7	4866.76	580.7
4889.06	581.7	4990.46	589.7	5039.94	596.7	5065.73	599.7	5079.67	600.7
5091.75	601.7	5109.58	602.7	5159.72	603.7	5208.74	604.7	5248.85	605.7
5272.62	606.7	5283.39	607.7	5295.65	608.7	5321.28	609.7	5344.31	610.7
5365.7	611.7	5380.05	612.7	5410.31	613.7	5434.83	614.7		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
20	.08	2225.73	.04	2965.8	.014	3261.44	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
2225.73 3089.8 305.73 294.78 300.13 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
20	1036.12	525.54	F
3089.8	5434.83	524.7	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
2965.8	3089.8	546.76

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 133138

INPUT
Description: XS of Prop Intake Structure topo
Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	580	98.84	575	142.72	563.59	158.31	559.7	175.3	559.49
190.18	556.9	212.47	552.32	249.29	547.05	300.61	536.83	323.62	532.63
337.05	531.53	378.13	526.16	398.84	524.5	450.34	520.87	475.85	518.87
527.87	515.07	540.33	513.93	577.78	510.55	594.96	510	628.99	509.9
640.63	509.9	657.42	509.93	706.9	510.03	730.7	510.25	762.56	514.07
788.39	515.34	827.34	516.87	876.15	517.8	887.87	518.05	966.6	523.49
970.7	523.77	1044.51	525.01	1046.1	525.03	1134.96	525.54	1138.49	525.55
1163.97	525.35	1198.54	517.26	1208.57	514.84	1216.01	515.07	1216.45	515.07
1217.07	515.07	1221.32	515.07	1230.78	514.47	1239.37	514.2	1246.9	512.46
1270.17	506.29	1297.94	505.71	1313.17	506.35	1315.83	506.37	1318.54	506.43
1325.71	506.3	1348.09	506.2	1357.94	504.7	1383.8	504.56	1419.9	505.43
1432.27	505.36	1504.86	504.96	1510.18	504.99	1596.19	505.37	1602.42	505.33
1639.14	505.33	1705.57	505.31	1734.06	504.33	1742.73	504.09	1800.08	505.58
1841.53	506.05	1862.73	505.87	1894.36	505.43	1916.89	505.3	1955.26	504.71
2003.97	503.27	2015.26	502.83	2068.99	501.78	2069.81	501.77	2138.84	503.9
2160.5	501.66	2181.41	490.51	2198.91	486.2	2248.91	484.2	2318.91	482.2
2398.91	480.2	2498.91	478.2	2543.91	476.2	2643.91	474.4	2823.08	475.64
2865.8	474.76	2965.8	474.76	3010.97	484.7	3025.05	484.7	3069.71	484.7
3089.8	526.18	3368.8	526.18	3465.8	517.18	3502.34	505	3507.34	505
3515.34	501	3875.92	513.7	3895.52	514.7	3919.17	515.7	3947.84	515.7
3955.56	514.7	3971.24	514.7	3977.73	515.7	3988.88	516.7	4017.67	517.7
4064.78	518.7	4119.33	519.7	4149.71	520.7	4186.51	520.7	4194.94	521.7
4197.66	522.7	4213.41	523.7	4215.79	524.7	4218.26	525.7	4220.73	526.7
4267.72	527.7	4295.73	528.7	4343.39	529.7	4388.9	530.7	4408.11	531.7
4421.63	532.7	4423.45	533.7	4434.29	539.7	4443.63	540.7	4464.88	541.7
4485.38	541.7	4514.79	541.7	4587.03	542.7	4622.7	543.7	4663.66	543.7
4676.66	544.7	4699.94	545.7	4738.93	546.7	4770.52	547.7	4776.57	548.7
4783.67	549.7	4790.77	550.7	4894.9	565.7	4931.02	566.7	4934.35	567.7
4937.98	568.7	4941.31	569.7	4944.79	570.7	4949.17	571.7	4953.86	572.7
4959.45	573.7	4963.98	574.7	4972.29	575.7	5002.27	576.7	5059.83	578.7
5073.48	579.7	5101.8	580.7	5145.44	581.7	5161.37	582.7	5176.5	583.7
5191.22	584.7	5206.88	585.7	5220.4	586.7	5232.98	587.7	5256.94	588.7
5271.66	589.7	5310.61	590.7	5322.52	591.7	5359.54	592.7	5387.25	593.7
5422.32	594.7	5435.44	595.7	5508.65	600.7				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	2138.84	.04	2965.8	.014	3368.8	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
2138.84 3089.8 688.72 690.68 684.84 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent

0	1134.96	525.54	F
3089.8	5508.65	526.18	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
3005	3129	546.76

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132450

INPUT
Description: FEMA CR topo
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	56	553.9	72	553.9	107	544.9	190	531.8
263	522.2	331	518.7	404	514	451	509.6	526	509.6
595	509.6	625	514.9	686	518.8	743	520.6	821	529
892	530.9	979	531.8	1003	531.7	1045	516.4	1052	516.9
1053	516.9	1057	516.9	1074	515.2	1103	503.1	1146	501.9
1210	501.9	1244	503.5	1324	503.4	1410	504.9	1513	504.9
1548	503	1602	504.7	1661	505.2	1712	505.2	1794	504
1856	502.2	1921	505.5	1950	503.2	1978	487.5	1980	486.2
2051.61	484.2	2161.61	482.2	2236.61	480.2	2336.61	478.2	2386.61	476.2
2466.61	474.2	2486.61	472.2	2511.61	470.2	2566.61	470.2	2581.61	472.2
2596.61	474.2	2646.61	476.2	2696.61	478.2	2736.61	480.2	2751.61	482.2
2786.61	484.2	2811.61	486.2	2816	487.5	2831	493.7	2832.37	494.7
2846.86	505.7	2849.12	506.7	2895.98	506.7	2898.51	506.7	2909.09	507.7
2919.39	508.7	2957.66	509.7	2974.43	510.7	2991.15	511.7	3019.84	512.7
3078.44	512.7	3125.14	511.7	3154.27	510.7	3176.64	509.7	3192.45	508.7
3203.88	507.7	3215.51	506.7	3367.67	506.7	3373.19	507.7	3377.33	508.7
3392.87	508.7	3396.25	507.7	3449.4	507.7	3451.23	508.7	3483.19	509.7
3679.6	510.7	3772.97	511.7	3816.173	512.7	3880.26	513.7	3927.32	514.7
3946.35	515.7	3951.57	516.7	3955.62	517.7	3965.1	518.7	3971.56	518.7
3975.93	518.7	3981.62	519.7	3983.08	519.7	3993.16	518.7	3996.51	517.7
4002.79	517.7	4026	521.4	4107	524.9	4175	526.9	4213	527.5
4223	527.5	4305	530.8	4377	534.2	4473	537	4535	540.1
4547	541.9	4584	541.9	4596	541	4602	544.1	4648	546.6
4740	556.2	4831	565	4862	570.9	4908	573.5	4923	573.5
4933	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1921	.04	2849.12	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1921	2849.12	406	410	329.99	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	979	531.8	F
3078.44	4933	515	F

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 132040.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	575	53.07	556.53	68.23	556.08	101.4	547.89	129.66	543.27
180.05	535.39	249.23	526.11	254.19	525.78	313.67	522.31	371.01	518.34
382.84	517.54	427.38	513.43	476.28	512.78	494.26	513.08	498.45	513.08
537.9	513.08	563.84	512.64	566.15	512.94	592.27	516.55	650.08	519.03
685.54	519.59	704.09	519.95	778.01	526.13	788.24	526.29	845.29	527.1
894.79	527.11	927.73	527.16	950.47	526.91	990.27	514.37	994.93	514.62
996.91	514.72	997.86	514.71	1001.65	514.67	1017.76	513.15	1036.01	506.53
1045.24	503.43	1085.99	503.12	1089.93	503.18	1146.63	503.42	1178.85	504.84
1206.75	504.93	1254.66	505.5	1292.77	506.56	1308.17	506.21	1331.28	507.13
1336.16	507.2	1342.83	507.2	1354.39	507.2	1399.32	504.38	1433.77	504.18
1466.93	502.47	1504.59	503.26	1518.11	503.15	1552.09	502.22	1574.02	502.86
1622.34	503.93	1653.51	504.23	1700.05	504.08	1739.52	503.47	1758.8	502.7
1820.4	504.38	1847.21	500.82	1857.56	495.14	1873.09	487.3	1874.94	486.22
1875.91	486.18	1941.14	484.52	2042.82	482.79	2112.15	481.1	2188.01	479.69
2204.59	479.36	2250.81	477.66	2324.76	475.89	2343.25	474.25	2366.36	472.6
2425.36	472.6	2443.97	474.31	2462.58	476.02	2492.92	476.98	2524.62	477.8
2549.21	478.43	2586.66	479.4	2636.29	481	2654.91	482.6	2698.33	484.2
2729.35	485.8	2734.8	486.84	2735	486.89	2751.89	491.79	2753.38	492.39
2753.41	492.4	2755.11	493.41	2773.09	504.4	2775.9	505.54	2825.2	506.22
2827.86	506.26	2833.48	506.74	2838.99	507.16	2849.83	508	2890.09	508.94
2907.74	509.8	2908.6	509.84	2925.33	510.78	2951.16	511.74	2955.51	511.86
2962.01	511.86	3001.24	511.76	3017.17	511.78	3054.65	511.23	3066.3	511.03
3096.95	510.2	3120.49	509.38	3121.42	509.34	3137.12	508.58	3149.15	507.78
3161.38	506.98	3194.87	506.98	3256.63	506.94	3317.55	506.8	3321.48	506.73
3327.28	507.43	3331.64	508.15	3340.92	507.98	3347.99	508.02	3351.55	507.24
3395.17	507.5	3407.47	507.51	3409.39	508.31	3443.02	509.14	3461.11	509.23
3513.69	508.97	3569.6	509.19	3594.64	509.39	3613	510.32	3624.69	509.44
3649.67	509.54	3659.74	509.62	3673.93	510.98	3683.11	509.85	3691.46	509.88
3732.35	510.21	3747.9	510.35	3784.93	511.03	3793.36	511.22	3854.2	512.2
3860.79	512.29	3901.78	513.02	3910.3	513.58	3930.32	515.38	3935.81	516.45
3940.07	517.46	3950.05	518.75	3950.18	518.76	3956.84	518.81	3961.44	518.85
3962.7	519.03	3965.21	519.36	3967.43	519.66	3967.71	519.66	3968.96	519.65
3976.89	518.96	3979.57	518.67	3983.09	517.75	3989.7	517.52	3994.42	517.93
4014.12	520.71	4036.15	521.86	4088.73	523.75	4099.34	524.24	4148.82	526.03
4170.89	526.58	4199.73	527.01	4210.87	527.18	4221.39	527.21	4236.45	527.72
4294.04	529.86	4307.67	530.4	4336.6	531.68	4369.15	532.85	4383.42	533.46
4423.4	534.63	4484.42	536.6	4486	536.68	4508.53	539.04	4520.22	539.66
4549.65	540.78	4552.77	541.14	4559.44	541.84	4562.28	542.14	4601.21	541.85
4613.83	541.03	4615.36	541.62	4620.15	543.63	4651.25	545.73	4668.54	547.88
4685.47	550.62	4732.21	554.97	4755.58	556.99	4765.34	557.76	4768.93	558.02
4804.82	560.7	4844.88	563.65	4861.08	564.72	4893.7	569.19	4899.96	569.41
4938.35	571.32	4942.1	571.77	4957.88	572.99	4968.4	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1820.4	.04	2775.9	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1820.4	2775.9	406	410	329.99 .1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 131630.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	50.13	559.16	64.46	558.26	95.79	550.87	122.5	546.36
170.1	538.99	235.45	530.03	240.14	529.64	296.33	525.93	350.51	521.88
361.69	521.09	403.76	517.26	449.96	515.96	466.94	516.56	470.91	516.56

508.18	516.56	532.68	515.68	534.86	515.86	559.54	518.2	614.15	519.26
647.65	519.19	665.18	519.29	735.01	523.27	744.68	523.29	798.57	523.3
845.35	522.78	876.46	522.51	897.95	522.12	935.55	512.35	939.95	512.49
941.82	512.54	942.71	512.52	946.29	512.44	961.51	511.09	978.76	505.9
987.47	503.75	1025.97	504.33	1029.7	504.46	1083.27	504.95	1113.71	506.18
1140.06	506.4	1185.33	507.61	1221.32	509.02	1235.88	508.03	1257.71	509.45
1262.32	509.5	1268.63	509.5	1279.54	509.5	1321.99	503.86	1354.53	503.47
1385.87	501.95	1421.44	502.27	1434.21	501.61	1466.32	499.44	1487.03	500.53
1532.69	502.66	1562.13	503.75	1606.1	504.16	1643.39	504.15	1661.61	503.2
1719.8	503.26	1744.42	498.45	1753.92	493.35	1768.18	487.09	1769.88	486.24
1770.77	486.18	1830.66	484.83	1924.03	483.37	1987.69	481.99	2057.35	480.82
2072.57	480.53	2115.01	479.12	2182.91	477.59	2199.89	476.3	2221.11	475
2284.11	475	2306.33	476.42	2328.55	477.84	2364.77	478.79	2402.63	479.4
2432	479.88	2476.71	480.6	2535.98	481.8	2558.2	483	2610.06	484.2
2647.1	485.4	2653.6	486.18	2653.83	486.22	2674	490.39	2675.78	491.09
2675.83	491.11	2677.86	492.12	2699.32	503.1	2702.67	504.38	2754.42	505.75
2757.21	505.82	2763.11	506.28	2768.89	506.62	2780.27	507.29	2822.53	508.17
2841.05	508.89	2841.95	508.93	2859.51	509.86	2886.62	510.93	2891.19	511.02
2898.01	511.02	2939.18	510.82	2955.9	510.87	2995.24	510.52	3007.47	510.36
3039.63	509.7	3064.34	509.06	3065.32	509.03	3081.79	508.46	3094.42	507.86
3107.26	507.26	3142.4	507.26	3207.22	507.18	3271.17	506.9	3275.28	506.76
3281.38	507.15	3285.95	507.59	3295.69	507.26	3303.11	507.34	3306.84	506.79
3352.63	507.3	3365.53	507.32	3367.55	507.93	3402.84	508.59	3421.83	508.67
3477.01	507.91	3535.7	508.07	3561.98	508.34	3581.25	510.11	3593.52	508.31
3619.73	508.38	3630.31	508.44	3645.2	511.01	3654.83	508.66	3663.59	508.64
3706.51	508.89	3722.83	509	3761.7	509.55	3770.54	509.73	3834.4	510.8
3841.31	510.88	3884.33	511.52	3893.28	512.47	3914.29	515.05	3920.05	516.19
3924.53	517.22	3934.99	518.81	3935.14	518.82	3942.13	518.93	3946.95	519
3948.28	519.15	3950.9	519.4	3953.24	519.62	3953.53	519.62	3954.85	519.59
3963.17	518.97	3965.98	518.64	3969.68	517.8	3976.61	517.34	3981.56	517.45
4002.24	520.01	4025.36	521.42	4080.55	523.04	4091.69	523.59	4143.61	525.77
4166.78	526.26	4197.05	526.68	4208.74	526.85	4219.78	526.92	4235.59	527.37
4296.03	529.45	4310.33	529.99	4340.7	531.26	4374.87	532.14	4389.84	532.72
4431.8	533.95	4495.84	536.21	4497.5	536.28	4521.15	539.93	4533.41	540.62
4564.31	541.46	4567.58	541.73	4574.58	542.18	4577.56	542.38	4618.42	541.79
4631.67	541.06	4633.27	541.49	4638.29	543.15	4670.94	545.74	4689.09	549.15
4706.85	552.97	4755.91	557.03	4780.43	558.74	4790.68	559.32	4794.45	559.52
4832.11	561.58	4874.16	563.79	4891.17	564.43	4925.4	567.48	4931.97	567.58
4972.27	569.34	4976.19	570.04	4992.76	572.48	5003.8	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1719.8	.04	2702.67	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1719.8	2702.67	406	410 329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 131220.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	47.2	561.8	60.69	560.43	90.19	553.86	115.33	549.44
160.15	542.58	221.68	533.94	226.09	533.49	279	529.54	330.01	525.42
340.53	524.63	380.15	521.09	423.64	519.14	439.63	520.04	443.36	520.04
478.45	520.04	501.52	518.72	503.57	518.77	526.81	519.85	578.23	519.5
609.77	518.79	626.27	518.64	692.02	520.4	701.12	520.3	751.86	519.49
795.9	518.46	825.19	517.87	845.42	517.33	880.82	510.32	884.96	510.36

886.72	510.36	887.57	510.33	890.94	510.21	905.27	509.04	921.51	505.27
929.71	504.08	965.96	505.55	969.46	505.74	1019.9	506.47	1048.56	507.52
1073.38	507.87	1115.99	509.71	1149.88	511.48	1163.59	509.85	1184.14	511.76
1188.48	511.8	1194.42	511.8	1204.69	511.8	1244.66	503.34	1275.3	502.75
1304.8	501.42	1338.3	501.28	1350.32	500.06	1380.54	496.66	1400.05	498.19
1443.04	501.4	1470.75	503.27	1512.15	504.25	1547.26	504.84	1564.41	503.7
1619.2	502.14	1641.62	496.07	1650.28	491.57	1663.27	486.89	1664.82	486.26
1665.63	486.19	1720.19	485.15	1805.24	483.96	1863.23	482.89	1926.68	481.94
1940.55	481.69	1979.21	480.58	2041.06	479.28	2056.52	478.36	2075.85	477.4
2142.85	477.4	2168.69	478.53	2194.53	479.66	2236.63	480.59	2280.65	481
2314.78	481.32	2366.77	481.8	2435.66	482.6	2461.5	483.4	2521.78	484.2
2564.84	485	2572.4	485.52	2572.67	485.55	2596.12	489	2598.19	489.8
2598.24	489.81	2600.6	490.83	2625.56	501.8	2629.45	503.22	2683.64	505.27
2686.56	505.39	2692.74	505.82	2698.8	506.08	2710.71	506.59	2754.96	507.41
2774.35	507.99	2775.3	508.02	2793.69	508.94	2822.08	510.12	2826.86	510.18
2834.01	510.18	2877.12	509.88	2894.63	509.95	2935.83	509.81	2948.63	509.69
2982.32	509.21	3008.18	508.74	3009.21	508.72	3026.47	508.34	3039.68	507.94
3053.13	507.54	3089.93	507.54	3157.81	507.42	3224.78	507	3229.09	506.79
3235.47	506.88	3240.26	507.04	3250.46	506.54	3258.23	506.67	3262.14	506.33
3310.09	507.1	3323.6	507.13	3325.71	507.54	3362.67	508.03	3382.55	508.12
3440.34	506.84	3501.8	506.95	3529.32	507.29	3549.5	509.91	3562.34	507.17
3589.8	507.22	3600.87	507.26	3616.46	511.04	3626.56	507.48	3635.73	507.39
3680.68	507.56	3697.77	507.66	3738.47	508.07	3747.73	508.25	3814.6	509.4
3821.84	509.47	3866.89	510.01	3876.25	511.35	3898.26	514.73	3904.3	515.94
3908.98	516.98	3919.94	518.86	3920.09	518.88	3927.41	519.04	3932.47	519.15
3933.85	519.26	3936.6	519.43	3939.05	519.58	3939.35	519.58	3940.73	519.54
3949.45	518.98	3952.39	518.6	3956.26	517.84	3963.53	517.16	3968.71	516.97
3990.37	519.32	4014.57	520.98	4072.36	522.33	4084.03	522.93	4138.41	525.51
4162.67	525.94	4194.37	526.35	4206.61	526.53	4218.17	526.63	4234.73	527.01
4298.02	529.03	4312.99	529.59	4344.8	530.84	4380.58	531.42	4396.25	531.98
4440.2	533.26	4507.27	535.81	4509	535.89	4533.77	540.82	4546.61	541.58
4578.96	542.14	4582.38	542.32	4589.72	542.52	4592.84	542.62	4635.62	541.74
4649.5	541.09	4651.18	541.36	4656.44	542.68	4690.63	545.76	4709.63	550.43
4728.23	555.31	4779.6	559.09	4805.29	560.49	4816.02	560.88	4819.96	561.01
4859.41	562.45	4903.44	563.92	4921.25	564.15	4957.1	565.76	4963.98	565.75
5006.18	567.36	5010.29	568.31	5027.64	571.96	5039.2	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1619.2	.04	2629.45	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1619.2	2629.45	406	410 329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130810.*

INPUT
Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	44.27	564.43	56.92	562.61	84.59	556.84	108.17	552.52
150.2	546.18	207.91	537.86	212.05	537.35	261.66	533.16	309.5	528.96
319.37	528.17	356.53	524.92	397.32	522.32	412.31	523.52	415.82	523.52
448.73	523.52	470.36	521.76	472.29	521.69	494.08	521.5	542.3	519.73
571.88	518.4	587.36	517.99	649.02	517.54	657.56	517.3	705.15	515.69
746.45	514.13	773.92	513.23	792.9	512.53	826.1	508.3	829.98	508.23
831.63	508.18	832.42	508.14	835.59	507.99	849.02	506.99	864.25	504.63
871.95	504.41	905.94	506.77	909.23	507.02	956.54	507.99	983.41	508.86
1006.69	509.33	1046.66	511.82	1078.44	513.94	1091.29	511.68	1110.57	514.08

1114.64	514.1	1120.21	514.1	1129.85	514.1	1167.33	502.82	1196.07	502.03
1223.73	500.9	1255.15	500.29	1266.42	498.51	1294.77	493.88	1313.06	495.86
1353.38	500.13	1379.38	502.78	1418.2	504.33	1451.13	505.52	1467.22	504.2
1518.6	501.02	1538.83	493.69	1546.64	489.78	1558.36	486.68	1559.76	486.28
1560.49	486.19	1609.71	485.47	1686.45	484.54	1738.77	483.79	1796.02	483.07
1808.52	482.85	1843.4	482.04	1899.21	480.97	1913.16	480.41	1930.6	479.8
2001.6	479.8	2031.05	480.64	2060.5	481.48	2108.49	482.4	2158.66	482.6
2197.57	482.76	2256.82	483	2335.34	483.4	2364.79	483.8	2433.5	484.2
2482.58	484.6	2491.2	484.86	2491.51	484.87	2518.23	487.6	2520.59	488.5
2520.65	488.52	2523.34	489.54	2551.79	500.5	2556.22	502.06	2612.85	504.8
2615.91	504.95	2622.37	505.36	2628.7	505.54	2641.15	505.89	2687.39	506.64
2707.66	507.09	2708.65	507.11	2727.87	508.02	2757.54	509.31	2762.54	509.34
2770	509.34	2815.06	508.94	2833.36	509.04	2876.41	509.11	2889.79	509.02
2925	508.71	2952.03	508.42	2953.11	508.41	2971.14	508.22	2984.95	508.02
2999.01	507.82	3037.47	507.82	3108.41	507.66	3178.39	507.1	3182.89	506.82
3189.56	506.6	3194.57	506.49	3205.23	505.82	3213.35	505.99	3217.43	505.87
3267.54	506.9	3281.66	506.94	3283.88	507.15	3322.5	507.47	3343.28	507.56
3403.67	505.77	3467.9	505.82	3496.66	506.25	3517.75	509.7	3531.17	506.04
3559.86	506.06	3571.44	506.08	3587.73	511.07	3598.28	506.29	3607.86	506.15
3654.84	506.23	3672.7	506.31	3715.23	506.58	3724.91	506.77	3794.8	508
3802.36	508.06	3849.44	508.51	3859.23	510.23	3882.23	514.4	3888.54	515.69
3893.43	516.73	3904.89	518.91	3905.05	518.94	3912.7	519.15	3917.98	519.3
3919.43	519.38	3922.3	519.47	3924.85	519.54	3925.18	519.54	3926.62	519.49
3935.72	518.99	3938.8	518.57	3942.85	517.89	3950.44	516.99	3955.85	516.48
3978.49	518.63	4003.79	520.54	4064.18	521.61	4076.38	522.28	4133.2	525.26
4158.55	525.62	4191.68	526.03	4204.48	526.21	4216.56	526.34	4233.86	526.66
4300.01	528.62	4315.66	529.18	4348.9	530.42	4386.29	530.71	4402.67	531.24
4448.6	532.58	4518.69	535.42	4520.5	535.49	4546.38	541.71	4559.8	542.54
4593.62	542.82	4597.19	542.91	4604.86	542.86	4608.12	542.85	4652.83	541.69
4667.33	541.13	4669.09	541.23	4674.59	542.2	4710.31	545.78	4730.18	551.7
4749.62	557.66	4803.3	561.14	4830.14	562.25	4841.36	562.44	4845.48	562.51
4886.7	563.33	4932.72	564.06	4951.33	563.87	4988.8	564.05	4995.99	563.93
5040.09	565.38	5044.39	566.58	5062.51	571.45	5074.6	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1518.6	.04	2556.22	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1518.6	2556.22	406	410	329.99	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130400

INPUT
Description: FEMA CQ
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1455.35	486.2	1665.35	484.2	1785.35	482.2
1860.35	482.2	1980.35	484.2	2080.35	484.2	2410.35	484.2	2440.35	486.2
2443	487.2	2483	500.9	2552	504.9	2642	506.2	2693	508.5
2706	508.5	2753	508	2817	508.4	2897	508.1	2985	508.1
3059	507.9	3132	507.2	3160	505.1	3225	506.7	3304	507
3367	504.7	3434	504.7	3464	505.2	3486	509.5	3500	504.9
3542	504.9	3559	511.1	3570	505.1	3580	504.9	3629	504.9

3692	505.1	3775	506.6	3832	507	3890	519	3905	519.5
3908	519.5	3911	519.5	3922	519	3943	516	3993	520.1
4056	520.9	4128	525	4189	525.7	4233	526.3	4302	528.2
4353	530	4392	530	4457	531.9	4532	535.1	4559	542.6
4573	543.5	4612	543.5	4620	543.2	4687	541.1	4730	545.8
4771	560	4827	563.2	4855	564	4871	564	4914	564.2
4962	564.2	5028	562.1	5074	563.4	5110	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1418	.04	2483	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1418	2483	2400 1704.99	1200	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 128690

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	933.06	486.2	983.06	484.2	1093.06	482.2
1143.06	480.2	1243.06	478.2	1318.06	476.2	1368.06	476.2	1443.06	478.2
1483.06	480.2	1553.06	482.2	1628.06	484.2	1668.06	486.2	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	852	.04	1713	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
852	1713	970 890	900	.1	.3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 127800

INPUT
Description: FEMA CP
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9

505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1100	486.2	1150	484.2	1275	482.2	1315	480.2	1425	478.2
1500	476.2	1550	476.2	1630	478.2	1670	480.2	1730	482.2
1805	484.2	1835	486.2	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	1074	.04	1957	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1074	1957	1015	960	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile		Q Total	Min Ch El	W.S. Elev
Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)
(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr		167000.00	481.50	511.59
	512.18	0.000357	6.21	28595.08	2039.81	0.21
1	139600	50 yr		232000.00	481.50	516.09
	516.83	0.000388	7.10	38166.47	2253.16	0.22
1	139600	100 yr		260000.00	481.50	517.75
	518.56	0.000400	7.44	42088.54	2459.19	0.23
1	139600	500 yr		340000.00	481.50	522.02
	522.96	0.000415	8.17	53226.06	2710.93	0.24
1	139600	100-yr encroachm		260000.00	481.50	518.75
	519.67	0.000416	7.70	33757.00	1001.01	0.23
1	137275	10 yr		167000.00	476.20	510.16
	510.99	0.000516	7.38	25723.65	2411.66	0.25
1	137275	50 yr		232000.00	476.20	514.72
	515.62	0.000492	8.02	39884.19	3379.22	0.26
1	137275	100 yr		260000.00	476.20	516.45
	517.35	0.000472	8.16	45805.39	3452.90	0.25
1	137275	500 yr		340000.00	476.20	520.92
	521.80	0.000427	8.45	61633.96	3633.72	0.25

1	137275	100-yr encroachm		260000.00	476.20	517.11
	518.33	0.000559	8.99	31618.68	1338.00	0.28
1	134600	10 yr		167000.00	480.20	508.63
493.47	509.41	0.000522	7.14	25439.10	1930.98	0.25
1	134600	50 yr		232000.00	480.20	513.19
496.07	514.13	0.000531	8.01	34235.08	3555.06	0.26
1	134600	100 yr		260000.00	480.20	514.94
497.11	515.92	0.000526	8.26	38874.81	3825.52	0.26
1	134600	500 yr		340000.00	480.20	519.49
499.87	520.55	0.000505	8.83	51419.86	4125.90	0.26
1	134600	100-yr encroachm		260000.00	480.20	515.82
497.11	516.75	0.000482	8.04	38434.72	1877.57	0.25
1	133431	10 yr		167000.00	472.50	508.06
488.34	508.87	0.000432	7.27	26206.30	1781.16	0.23
1	133431	50 yr		232000.00	472.50	512.48
491.41	513.54	0.000493	8.47	34118.30	2230.68	0.25
1	133431	100 yr		260000.00	472.50	514.16
492.61	515.31	0.000514	8.91	37140.81	2328.77	0.26
1	133431	500 yr		340000.00	472.50	518.51
495.82	519.91	0.000564	10.02	45132.70	2734.98	0.28
1	133431	100-yr encroachm		260000.00	472.50	515.13
492.61	516.20	0.000465	8.62	38901.96	1837.28	0.25
1	133138	10 yr		167000.00	474.40	508.05
488.87	508.71	0.000341	6.58	27883.77	1963.77	0.22
1	133138	50 yr		232000.00	474.40	512.47
491.57	513.36	0.000387	7.70	35623.61	2312.08	0.23
1	133138	100 yr		260000.00	474.40	514.15
492.64	515.12	0.000404	8.12	38577.80	2401.51	0.24
1	133138	500 yr		340000.00	474.40	518.49
495.51	519.71	0.000443	9.19	46387.25	2828.26	0.26
1	133138	100-yr encroachm		260000.00	474.40	515.12
492.65	516.03	0.000365	7.86	40302.54	1797.59	0.23
1	132450	10 yr		167000.00	470.20	507.81
489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22

1	132450	50 yr		232000.00	470.20	512.22
492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr		260000.00	470.20	513.90
493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr		340000.00	470.20	518.34
496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	132450	100-yr encroachm		260000.00	470.20	514.90
493.24	515.75	0.000386	7.63	42052.75	2003.73	0.23
1	130400	10 yr		167000.00	482.20	506.78
	507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr		232000.00	482.20	511.26
	512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr		260000.00	482.20	512.97
	513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr		340000.00	482.20	517.46
	518.40	0.000487	8.37	59174.95	3365.02	0.26
1	130400	100-yr encroachm		260000.00	482.20	513.95
	514.85	0.000497	7.84	39327.08	1923.92	0.26
1	128690	10 yr		167000.00	476.20	505.13
	506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr		232000.00	476.20	509.44
	510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr		260000.00	476.20	511.14
	512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr		340000.00	476.20	515.65
	517.29	0.000831	10.84	40741.19	2112.24	0.33
1	128690	100-yr encroachm		260000.00	476.20	512.10
	513.69	0.000847	10.22	27356.50	1228.21	0.33
1	127800	10 yr		167000.00	476.20	504.50
492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr		232000.00	476.20	508.80
494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr		260000.00	476.20	510.50
495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr		340000.00	476.20	515.00
498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32

1	127800	100-yr encroachm	260000.00	476.20	511.50	
495.74	512.93	0.000760	9.72	29288.21	1323.84	0.32

Appendix J:
Bathymetry Data

ECOLOGICAL STUDIES OF THE SUSQUEHANNA RIVER IN THE VICINITY OF THE SUSQUEHANNA STEAM ELECTRIC STATION

1983 Annual Report

Theodore V. Jacobsen, Project Director and Editor
Susquehanna SES Biological Laboratory
R.D. 1, Berwick, Pennsylvania 18603

Prepared For

Pennsylvania Power and Light Company
Two North Ninth Street
Allentown, Pennsylvania 18101

Ichthyological Associates, Inc.
301 Forest Drive
Ithaca, New York 14850

August 1984

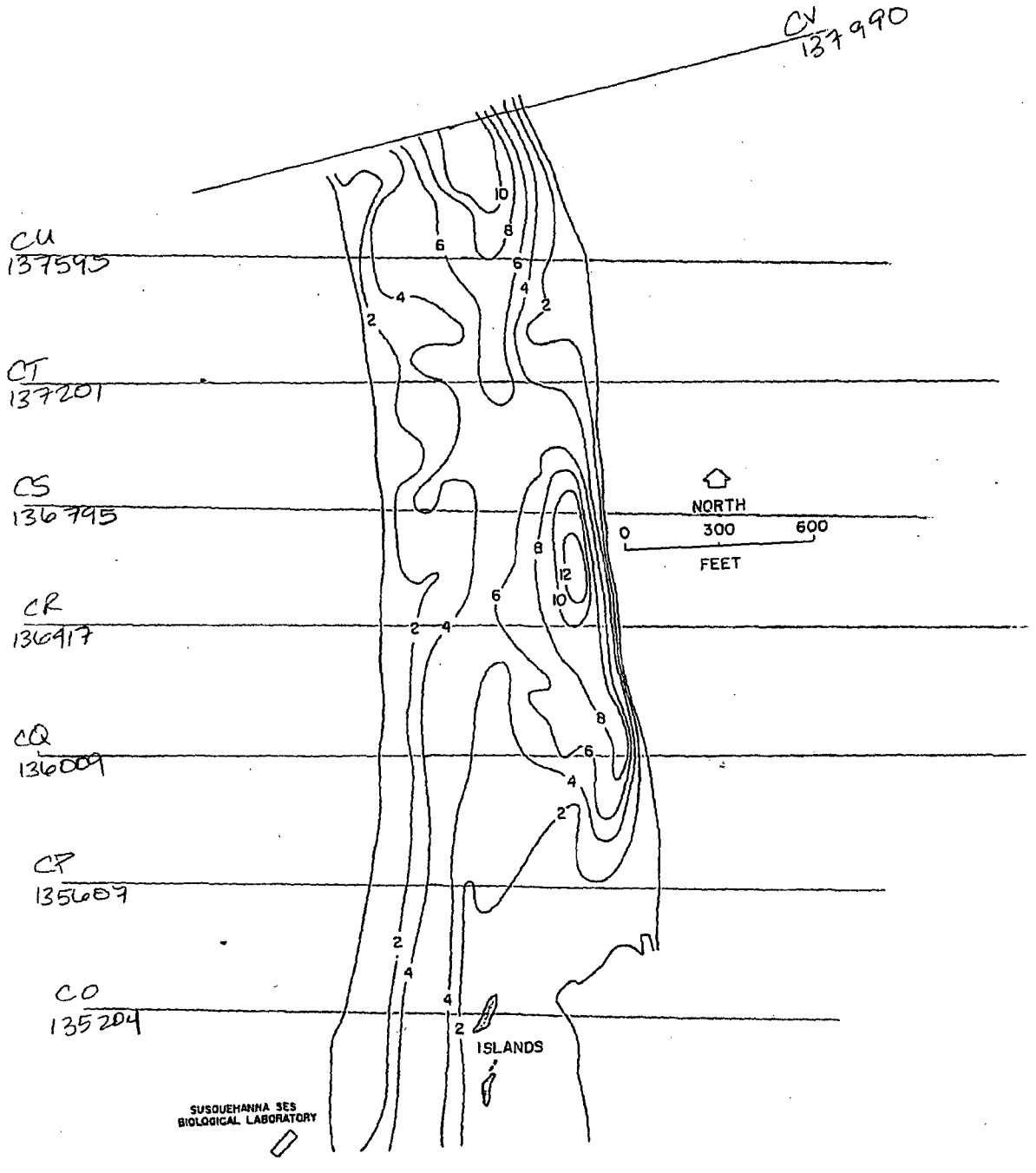


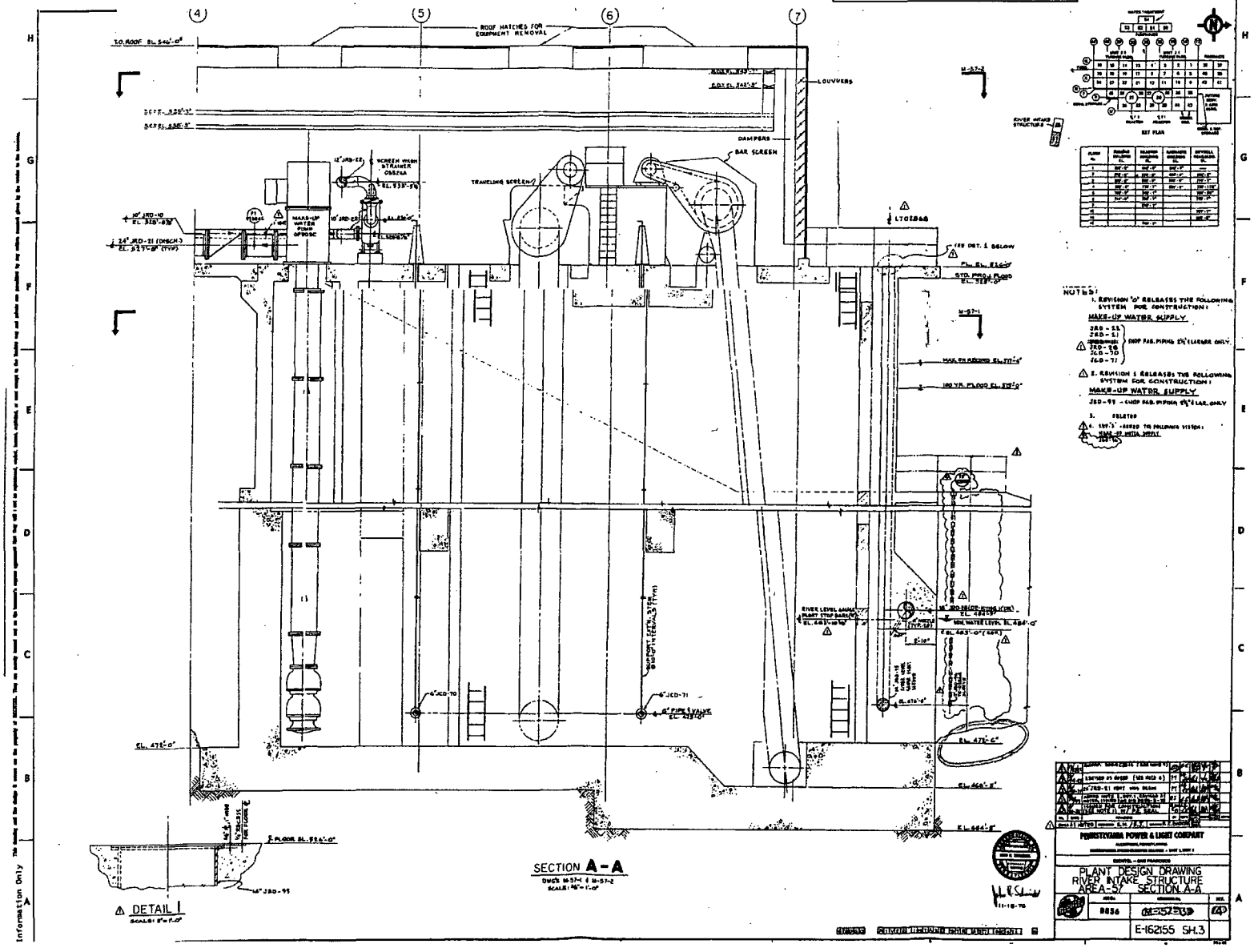
Fig. A-3

Section A (see Fig. A-2) depth contours (2-ft intervals) of the Susquehanna River, 1983.

Appendix K:
Supplemental Intake Structure Information

- Existing Structure Detail
- Photographs of Existing and Proposed Site
- Details of Proposed Structure

Existing Intake Structure Detail



PENNSYLVANIA POWER & LIGHT COMPANY

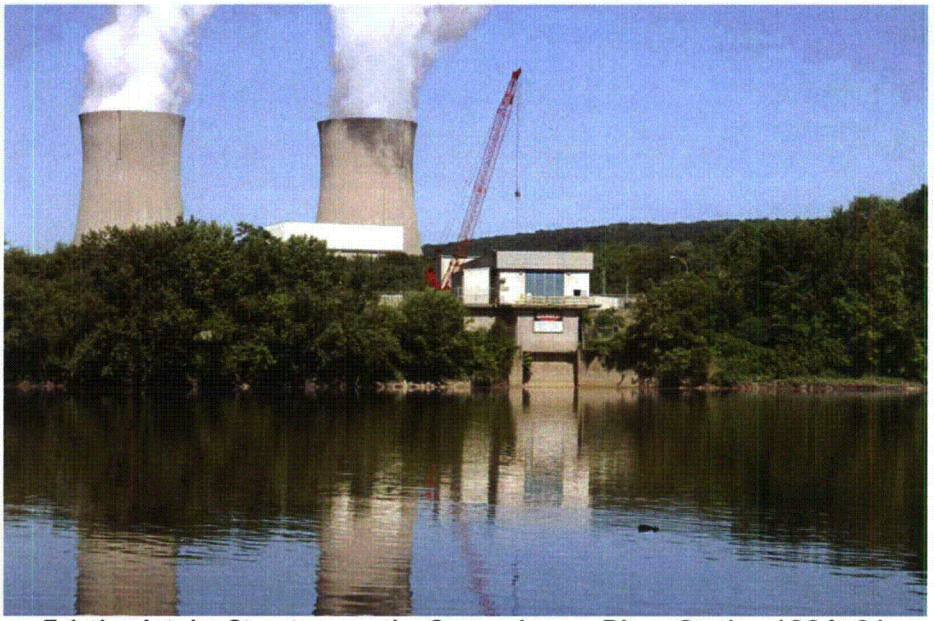
PLANT DESIGN DRAWING
RIVER INTAKE STRUCTURE
AREA-57 SECTION A-A

E-162155 SH.3

Information Only

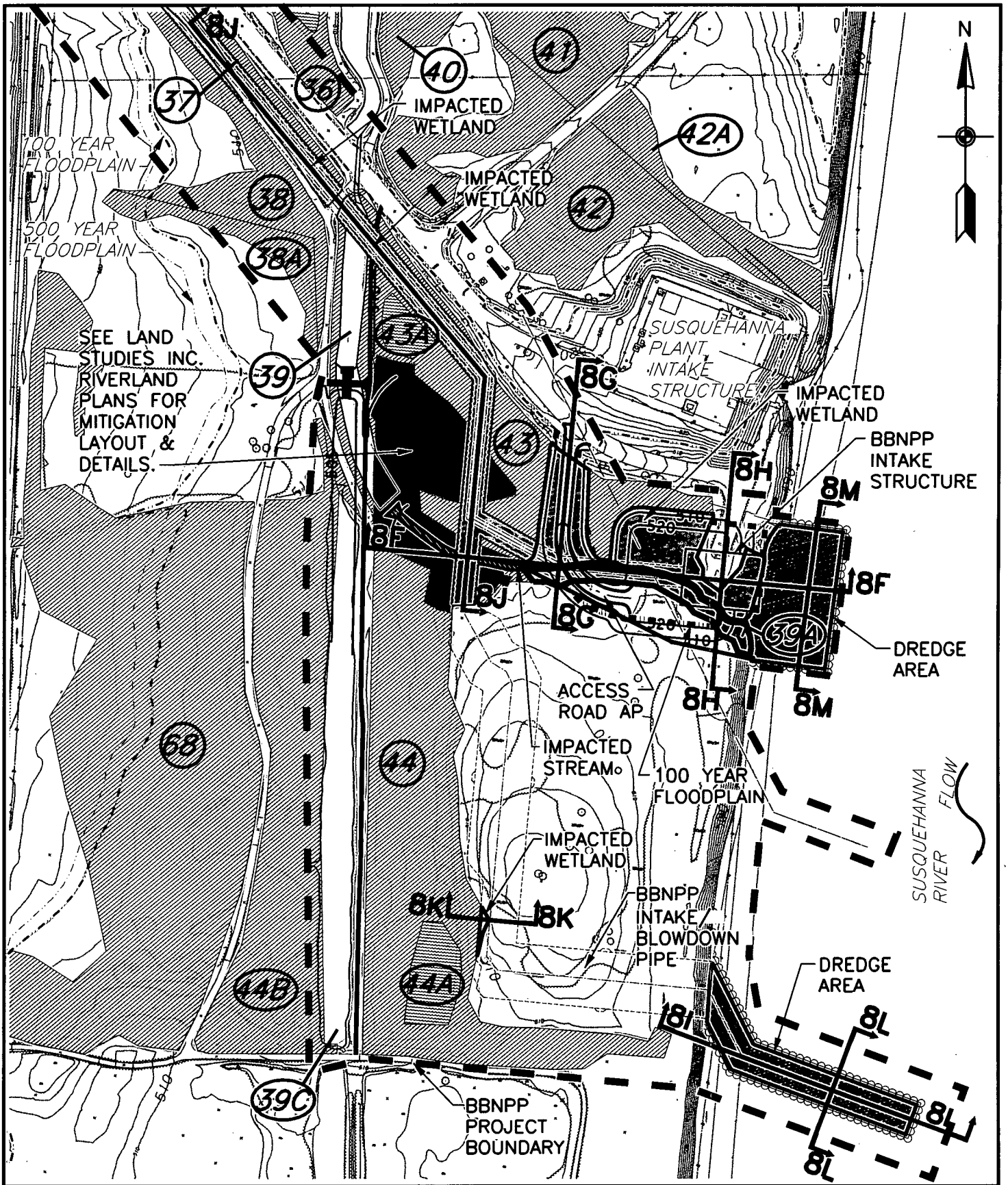
Intake Structure Photograph Log

Susquehanna River Flood Study Report
Bell Bend Nuclear Power Plant
November 2010



Existing Intake Structure on the Susquehanna River, Station 1334+31

Susquehanna River, looking upstream of the Existing Intake Structure



Pennoni

Pennoni Associates Inc.
100 N. Wilkes-Barre Blvd.
Wilkes-Barre, PA 18702

DRAWN BY: WCK
CHECKED BY: LGB
JOB No. PPLS 0902

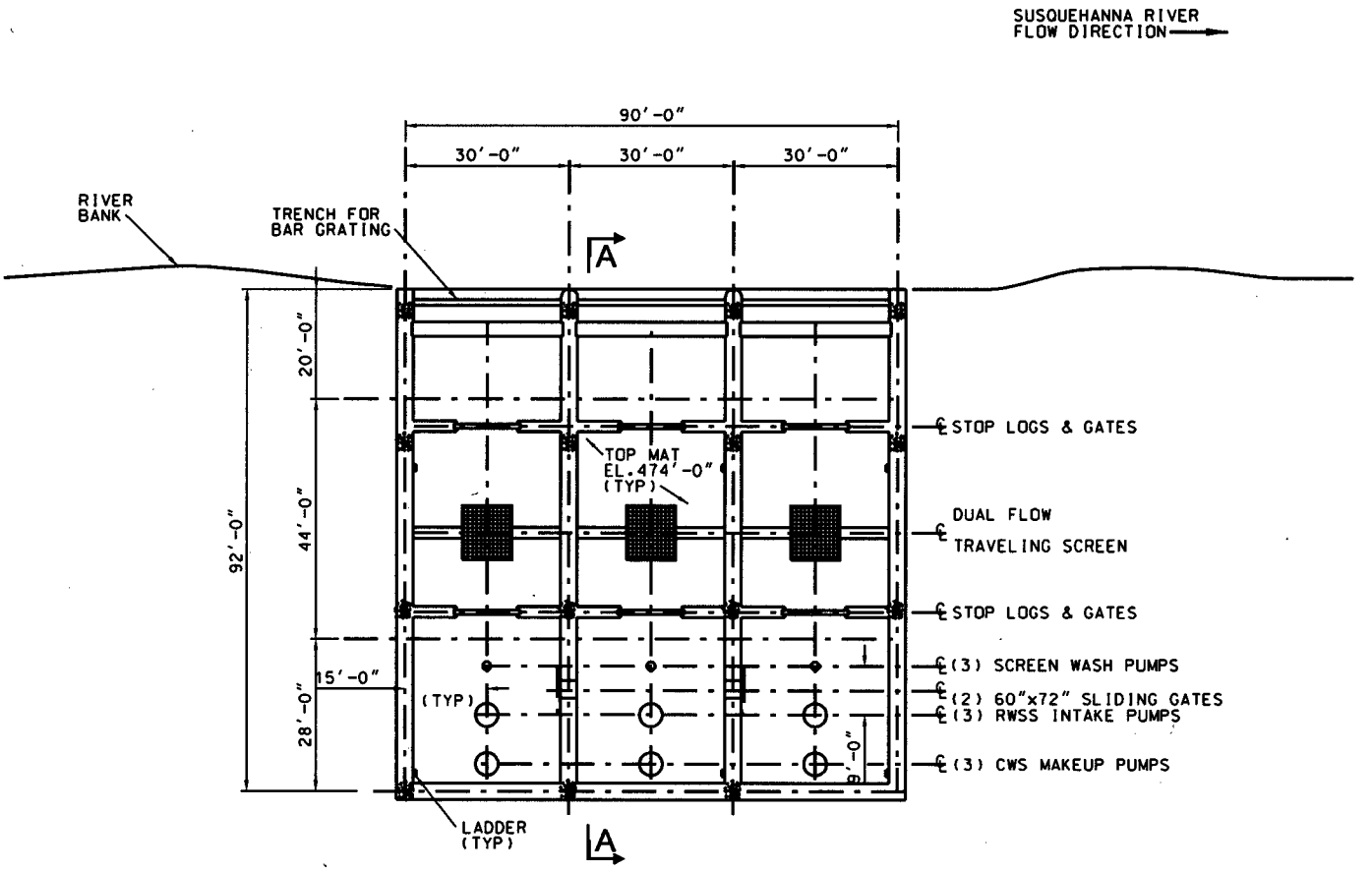
HORZ. SCALE: 1"=200'
VERT. SCALE: N/A
DATE: 04/08/2011

JPA PERMIT SUBMITTAL

BELL BEND NUCLEAR POWER PLANT
LUZERNE COUNTY, PENNSYLVANIA

APPLICATION BY:
PPL NUCLEAR DEVELOPMENT, LLC

FIGURE 8A - SITE LAYOUT



LOWER PLAN

TOP OF MAT EL 474'-0"
N.T.S.

FOR SECTION A-A
SEE FIGURE 8E

DRAWING SOURCE: S&L DRAWING NO.
12198-004-RWSS-004, REV. 2

Pennoni
Pennoni Associates Inc.
100 N. Wilkes-Barre Blvd.
Wilkes-Barre, PA 18702

DRAWN BY: WCK
CHECKED BY: LGB
JOB No. PPLS 0902

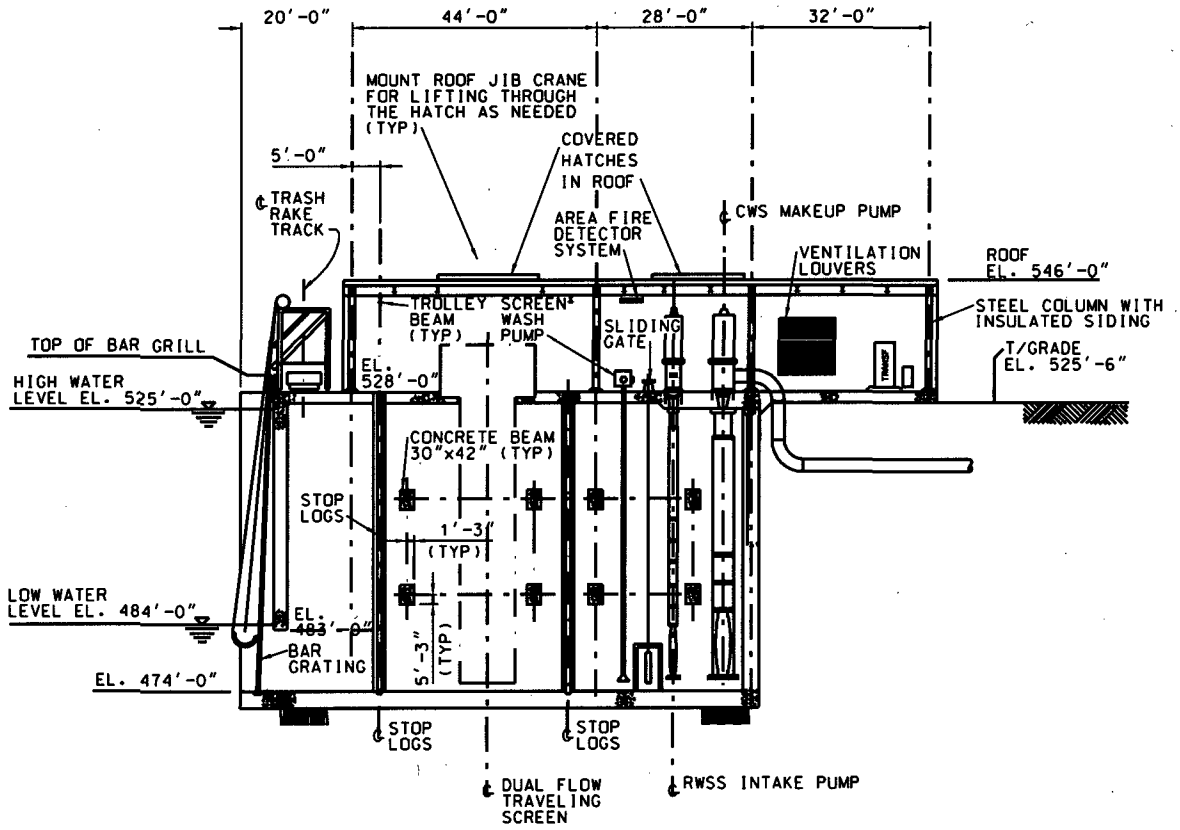
HORZ. SCALE: N.T.S.
VERT. SCALE: N.T.S.
DATE: 04/08/2011

JPA PERMIT SUBMITTAL

BELL BEND NUCLEAR POWER PLANT
LUZERNE COUNTY, PENNSYLVANIA

APPLICATION BY:
PPL NUCLEAR DEVELOPMENT, LLC

FIGURE 8D – INTAKE STRUCTURE PLAN



SECTION A-A

N.T.S.

FOR SECTION LOCATION
SEE FIGURE 8D

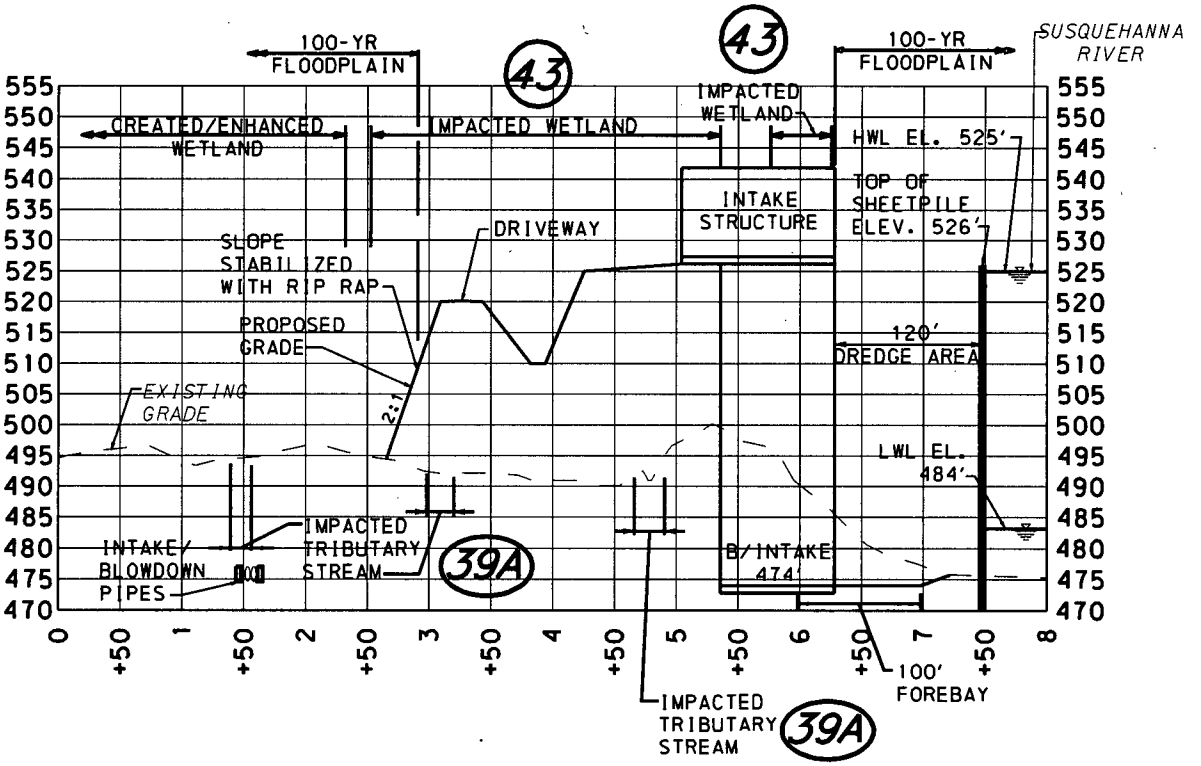
DRAWING SOURCE: S&L DRAWING NO. 12198-004-RWSS-004. REV. 2

NOTE:
HIGH WATER AND LOW WATER ELEVATIONS TAKEN FROM DRAWING "CONCEPTUAL INTAKE STRUCTURE GENERAL ARRANGEMENT. BBNPP". 12198-004-RWSS-004. REV. 2. 05/23/2008 AND "SUSQUEHANNA STEAM ELECTRIC STATION" FSAR. REV. 53. 04/1999 FIGURE 2.4-52.

Pennoni
Pennoni Associates Inc.
100 N. Wilkes-Barre Blvd.
Wilkes-Barre, PA 18702

DRAWN BY: WCK	HORZ. SCALE: N.T.S.	DATE: 04/08/2011
CHECKED BY: LGB	VERT. SCALE: N.T.S.	JPA PERMIT SUBMITTAL
JOB No. PPLS 0902	BELL BEND NUCLEAR POWER PLANT LUZERNE COUNTY, PENNSYLVANIA	
	APPLICATION BY: PPL NUCLEAR DEVELOPMENT, LLC	

FIGURE 8E – INTAKE STRUCTURE PLAN



NOTE: FLOOD ELEVATION FROM FEMA FIRM MAP PANEL NUMBER 420625 0020 B IS 512.5.

Pennoni

Pennoni Associates Inc.
100 N. Wilkes-Barre Blvd.
Wilkes-Barre, PA 18702

DRAWN BY: WCK	HORZ. SCALE: 1"=150' VERT. SCALE: 1"=30'	DATE: 04/08/2011
CHECKED BY: LGB	JPA PERMIT SUBMITTAL	
JOB No. PPLS 0902	BELL BEND NUCLEAR POWER PLANT LUZERNE COUNTY, PENNSYLVANIA	
	APPLICATION BY: PPL NUCLEAR DEVELOPMENT, LLC	

FIGURE 8F – INTAKE STRUCTURE CROSS SECTION