

## **APPENDIX L**

### **HEC-HMS MODEL FOR THE CALCULATION OF THE 100-YEAR PEAK DISCHARGE, ANTECEDENT MOISTURE CONDITION II**

# HMS \* Summary of Results

Project : WCS

Run Name : 100YrAMII3/24/06NOD

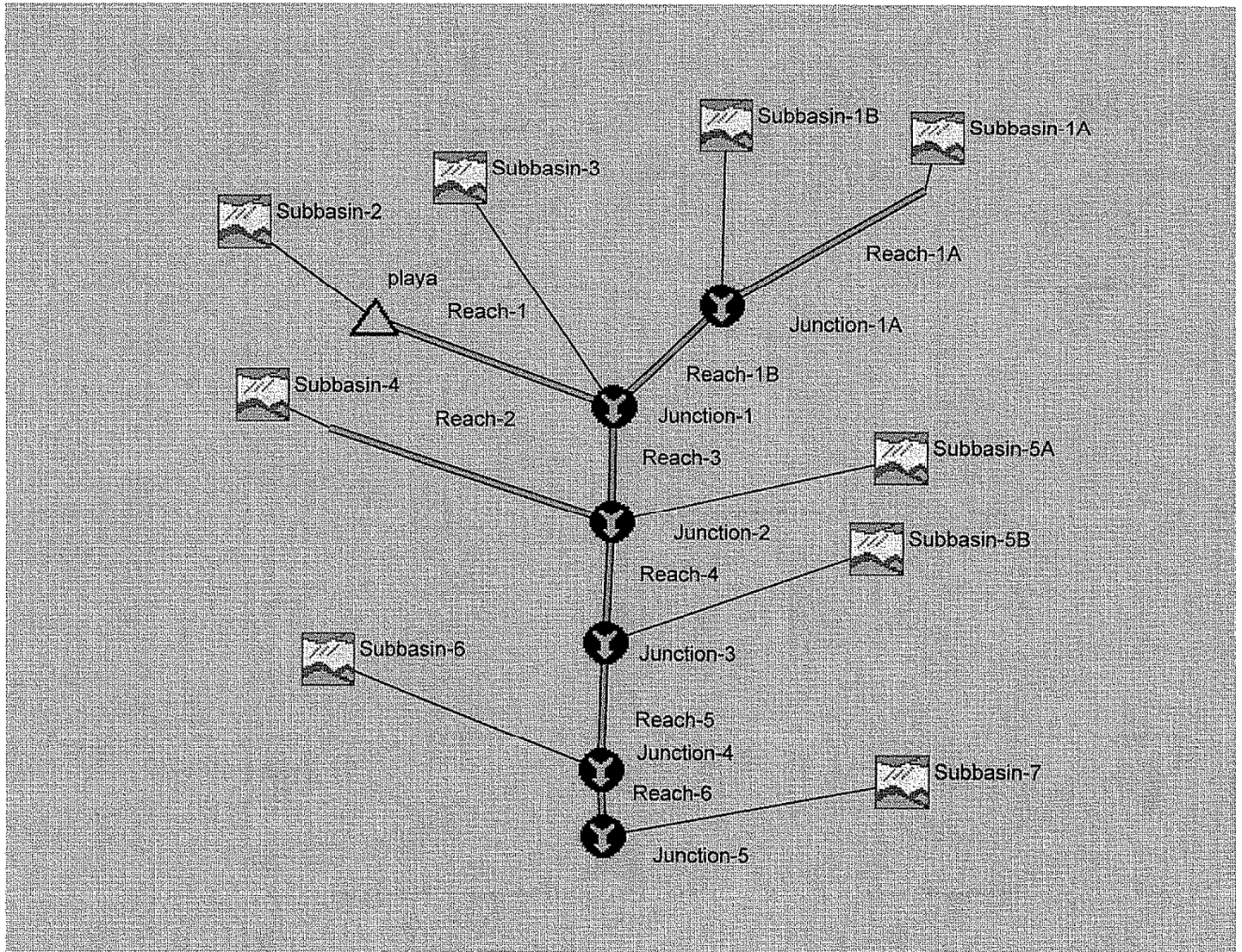
Start of Run : 01Dec00 0000 Basin Model : 100YrAMII3/24/06NOD

End of Run : 02Dec00 0000 Met. Model : Met100 Year

Execution Time : 24Mar06 1343 Control Specs : Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4	572.63	01 Dec 00 1232	87.051	0.490
Reach-2	572.63	01 Dec 00 1247	86.663	0.490
Subbasin-2	744.22	01 Dec 00 1301	165.24	1.063
playa	0.0	30 Nov 00 2400	0.0	1.063
Reach-1	0.0	30 Nov 00 2400	0.0	1.063
Subbasin-1A	487.80	01 Dec 00 1323	131.37	0.691
Reach-1A	487.80	01 Dec 00 1340	130.69	0.691
Subbasin-1B	325.64	01 Dec 00 1238	54.045	0.314
Junction-1A	611.21	01 Dec 00 1325	184.74	1.005
Reach-1B	611.21	01 Dec 00 1328	184.57	1.005
Subbasin-3	166.92	01 Dec 00 1238	27.661	0.156
Junction-1	697.32	01 Dec 00 1259	212.23	2.224
Reach-3	697.32	01 Dec 00 1316	211.13	2.224
Subbasin-5A	200.57	01 Dec 00 1232	30.187	0.192
Junction-2	1328.0	01 Dec 00 1252	327.98	2.906
Reach-4	1328.0	01 Dec 00 1313	325.85	2.906
Subbasin-5B	216.46	01 Dec 00 1248	41.405	0.265
Junction-3	1500.7	01 Dec 00 1311	367.25	3.171
Reach-5	1500.7	01 Dec 00 1325	365.62	3.171
Subbasin-6	91.584	01 Dec 00 1223	11.673	0.074
Junction-4	1520.6	01 Dec 00 1325	377.30	3.245
Reach-6	1520.6	01 Dec 00 1325	377.30	3.245
Subbasin-7	76.276	01 Dec 00 1300	16.696	0.104
Junction-5	1584.9	01 Dec 00 1325	393.99	3.349







## Meteorologic Model Input

The screenshot shows a Windows-style dialog box titled "HMS \* Meteorologic Model". It has a menu bar with "File", "Edit", and "Help". The main area contains several input fields and buttons. At the top, "Meteorologic Model:" is set to "Met100 Year" and "Description:" is "100 Year, 24 Hour Storm". There is a "Subbasin List" button and an ellipsis button. Below these are two tabs: "Precipitation" (selected) and "Evapotranspiration". Under the "Precipitation" tab, there is a "Method:" dropdown menu set to "SCS Hypothetical Storm". Further down is a "Storm Selection:" dropdown menu set to "Type II". At the bottom of the main area is a "Storm Depth (in) :" text box containing "6.0". At the very bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

HMS \* Meteorologic Model

File Edit Help

Meteorologic Model: Met100 Year Subbasin List

Description: 100 Year, 24 Hour Storm ...

Precipitation Evapotranspiration

Method : SCS Hypothetical Storm

Storm Selection: Type II

Storm Depth (in) : 6.0

OK Apply Cancel

**HMS \* Basin Model \* SCS Curve Number**

Sort Help

Basin Model ID: 100YrAMII3/24/06NOD

Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	79		0.0
Subbasin-2	72		0.0
Subbasin-3	76		0.0
Subbasin-4	76		0.0
Subbasin-5B	72		0.0
Subbasin-6	72		0.0
Subbasin-1B	75		0.0
Subbasin-5A	72		0.0
Subbasin-7	73		0.0

OK Apply Cancel

**HMS \* Basin Model \* SCS UH**

Sort Help

Basin Model ID: 100YrAMII3/24/06NOD

Time Units : Minutes

Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3	44
Subbasin-4	39
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64

OK Apply Cancel

**HMS \* Basin Model \* Lag Routing**

Help

Basin Model ID : 100YrAMII3/24/06NOD

Interval :

Reach Name	Lag (min)
Reach-1	35
Reach-2	15
Reach-3	17
Reach-4	21
Reach-5	14
Reach-1A	17
Reach-1B	3
Reach-6	0

OK Apply Cancel

**HMS \* Basin Model \* Reservoir Editor**

Edit File Help

Reservoir Name:

Description:

Storage Outlet Spillway Overflow Dam Break

Method :

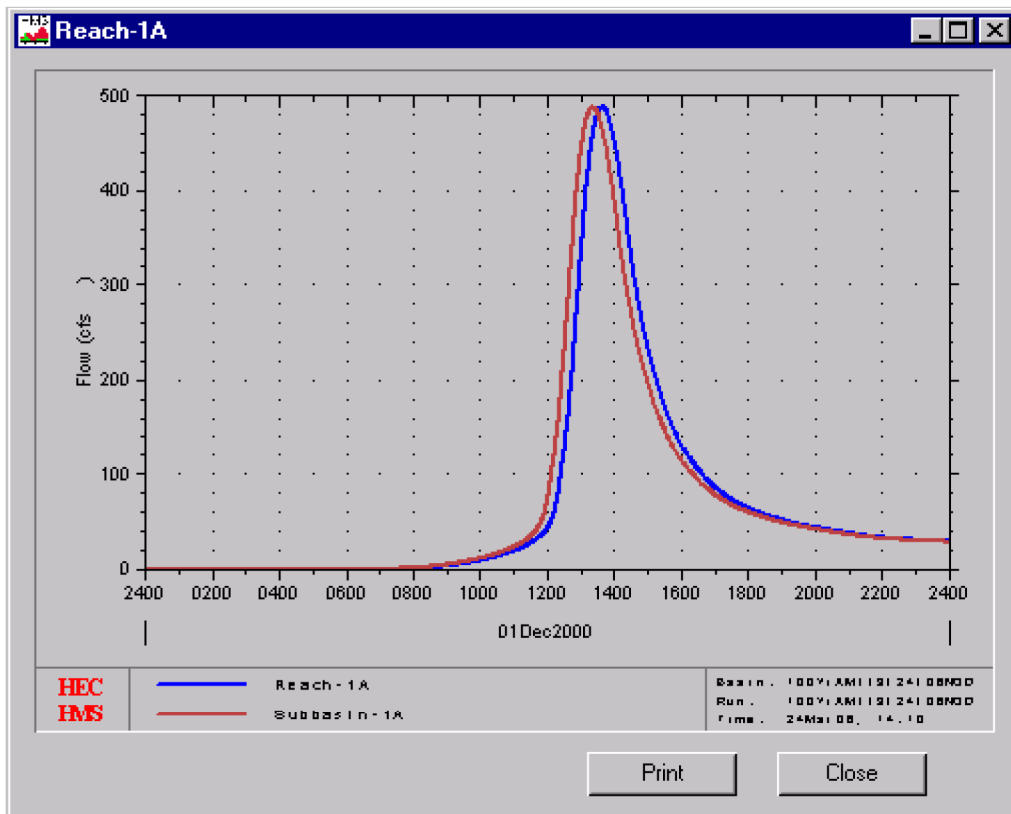
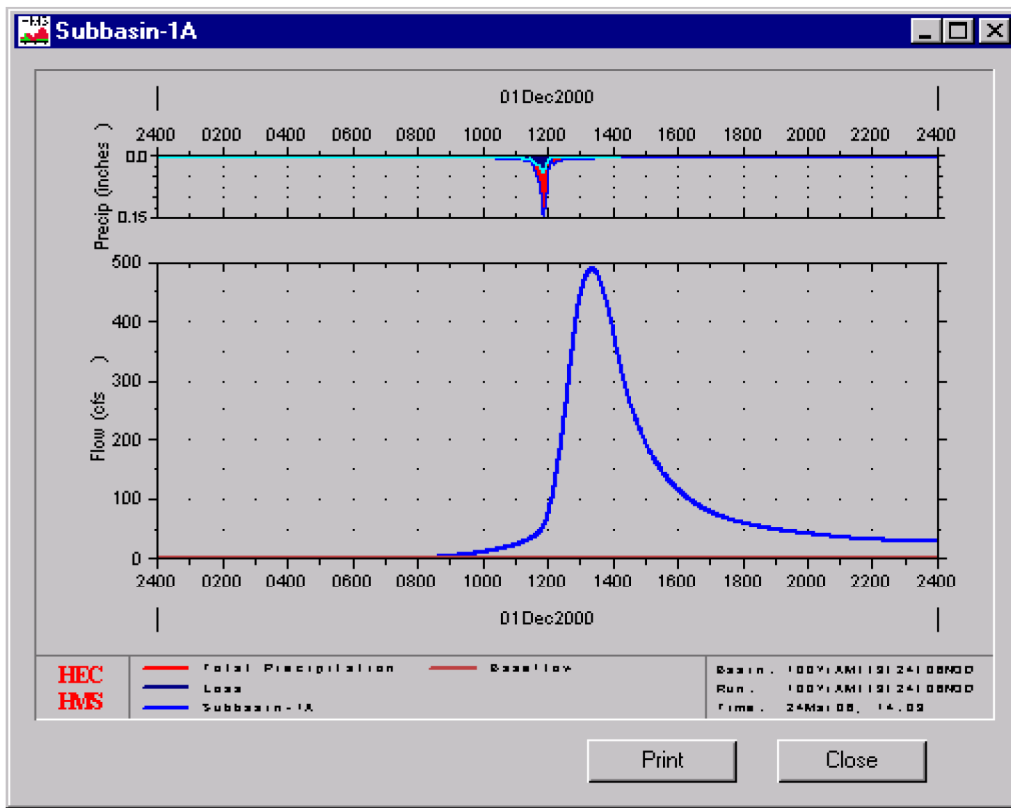
Initial

Elevation (ft)	Storage (acre-feet)	Outflow (cfs)
3478.0	0.0	0.0
3480.0	24.0	0.0
3482.0	61.0	0.0
3484.0	170.0	0.0
3486.0	457.0	0.0
3487.0	693.0	863.0
3488.0	928.0	2427.0

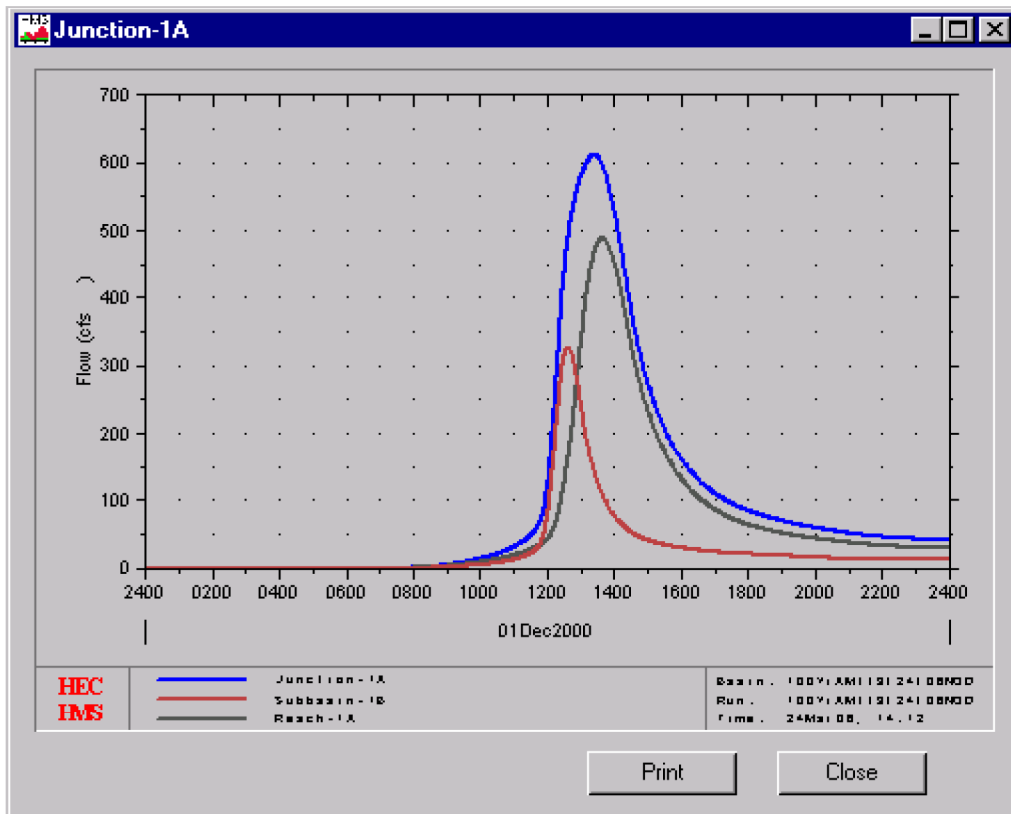
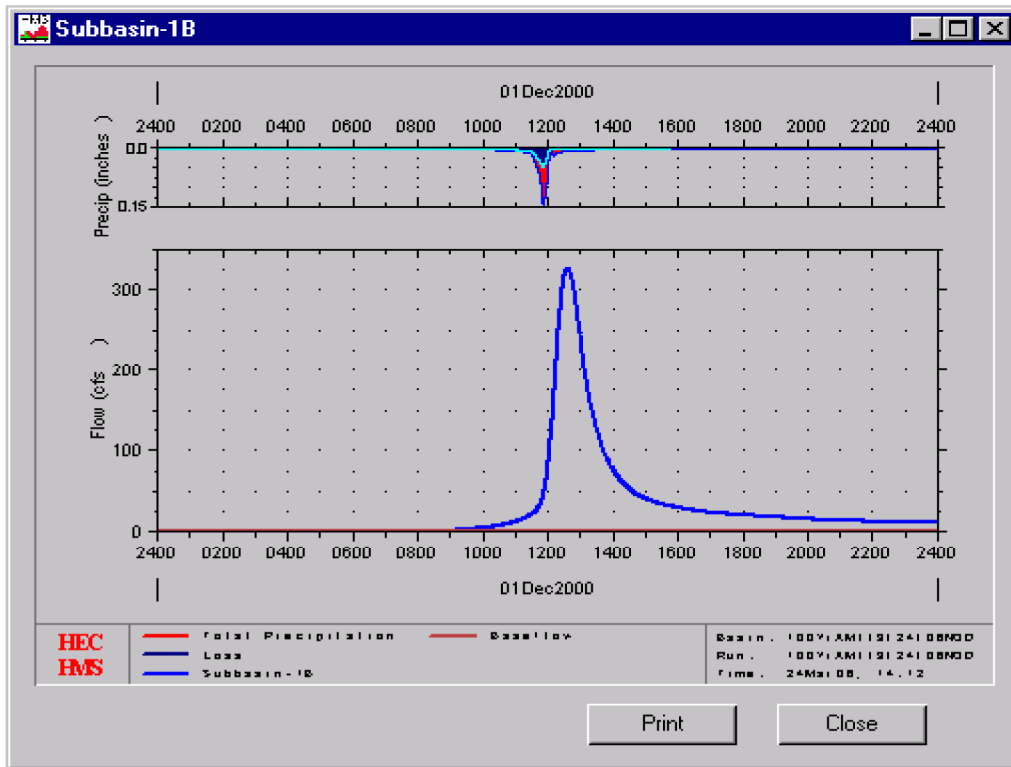
Graph

OK Apply Cancel

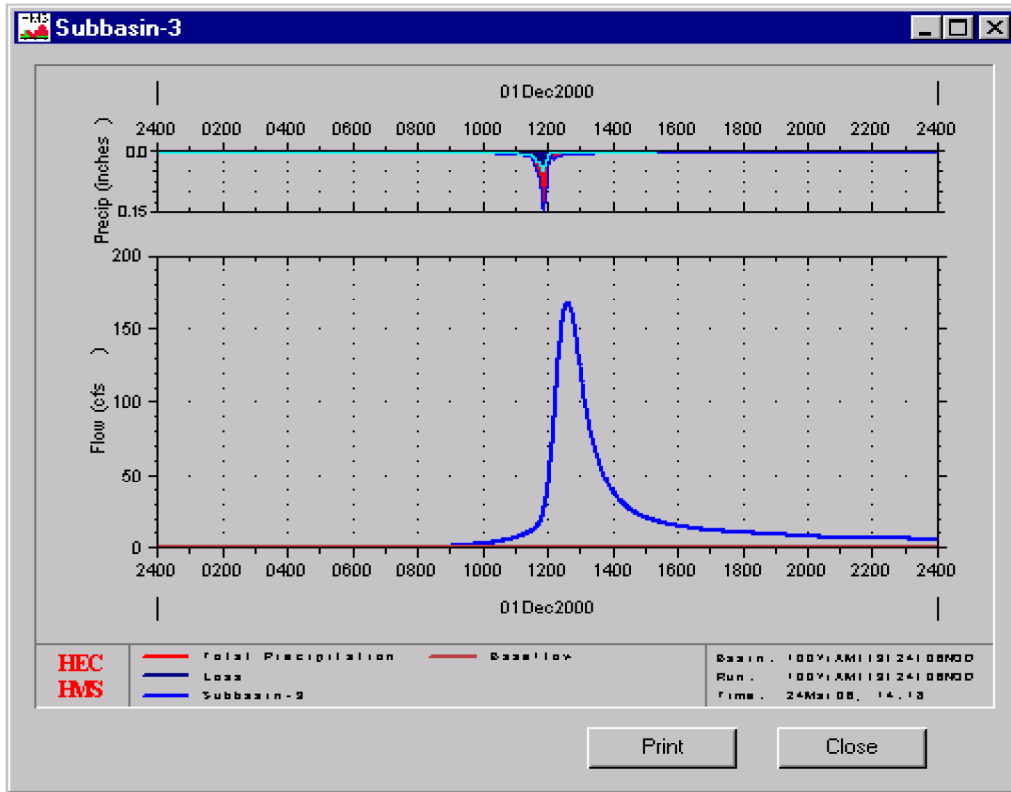
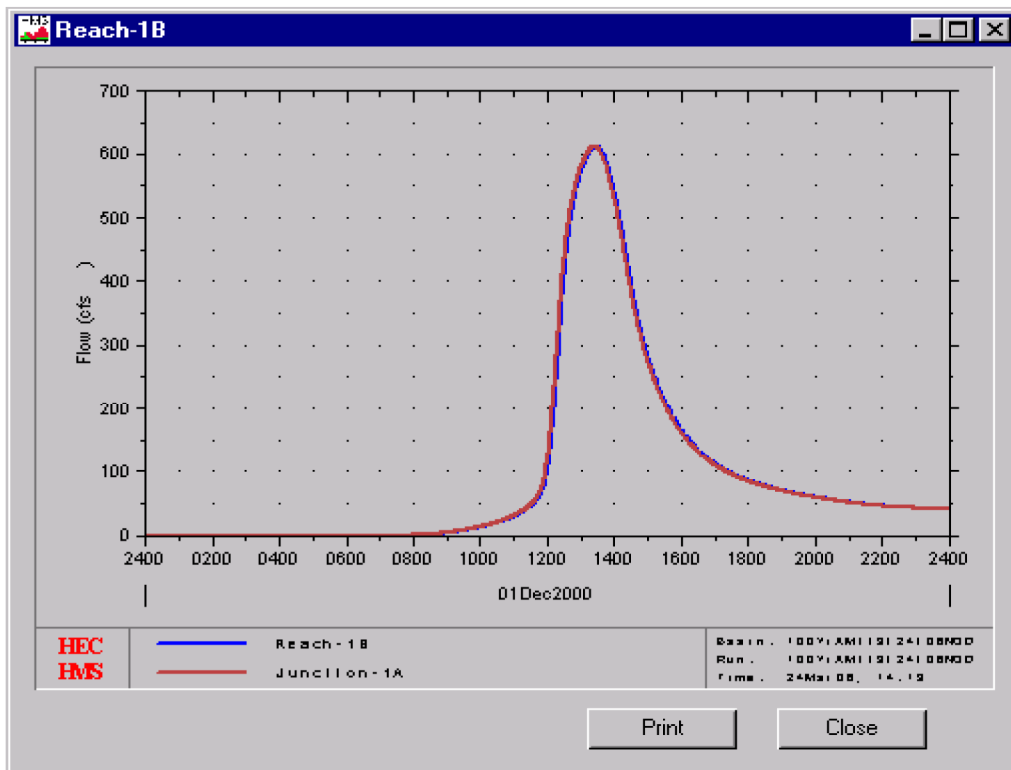
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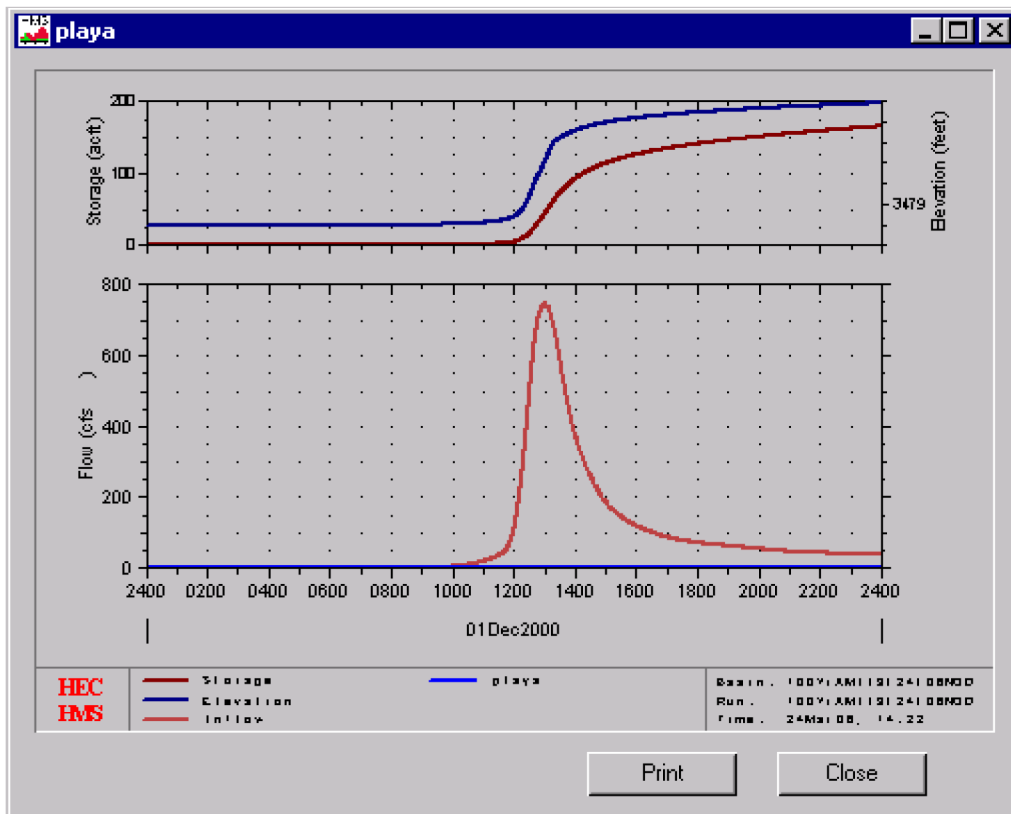
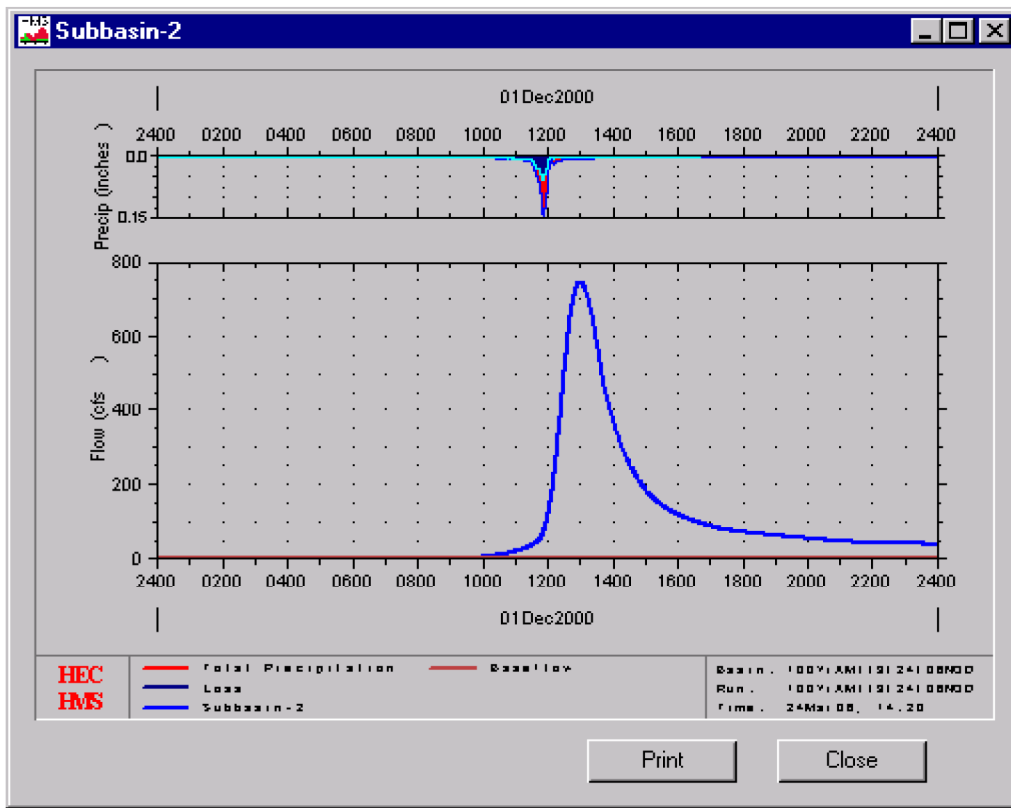
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

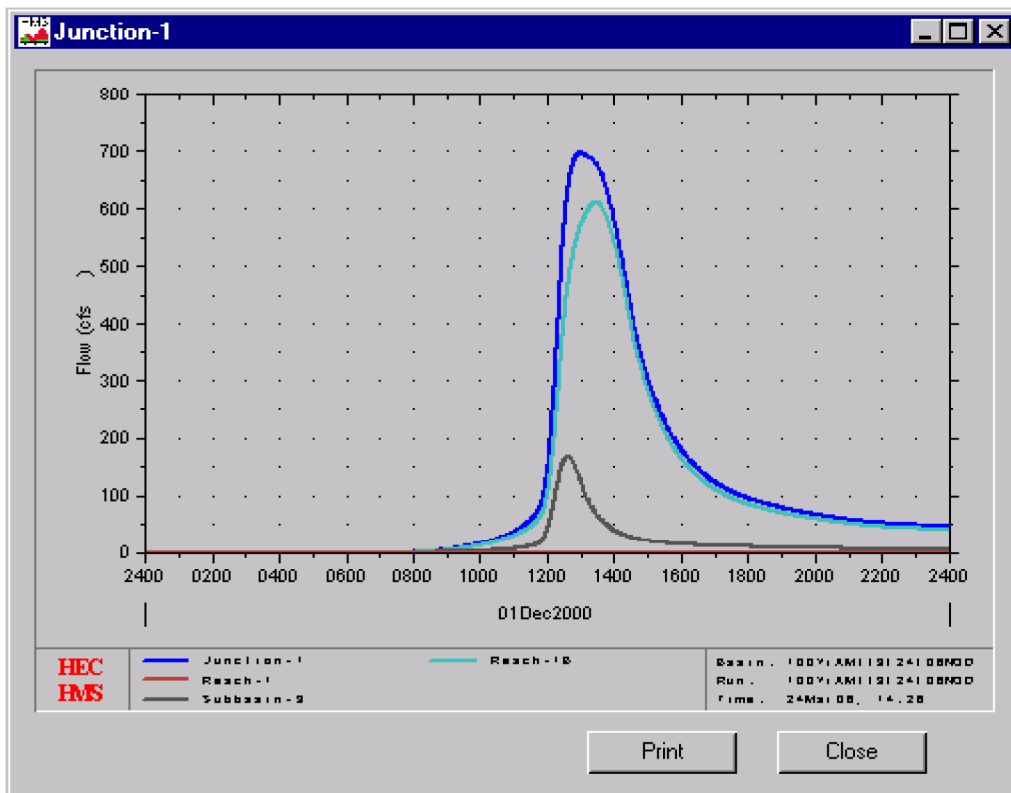
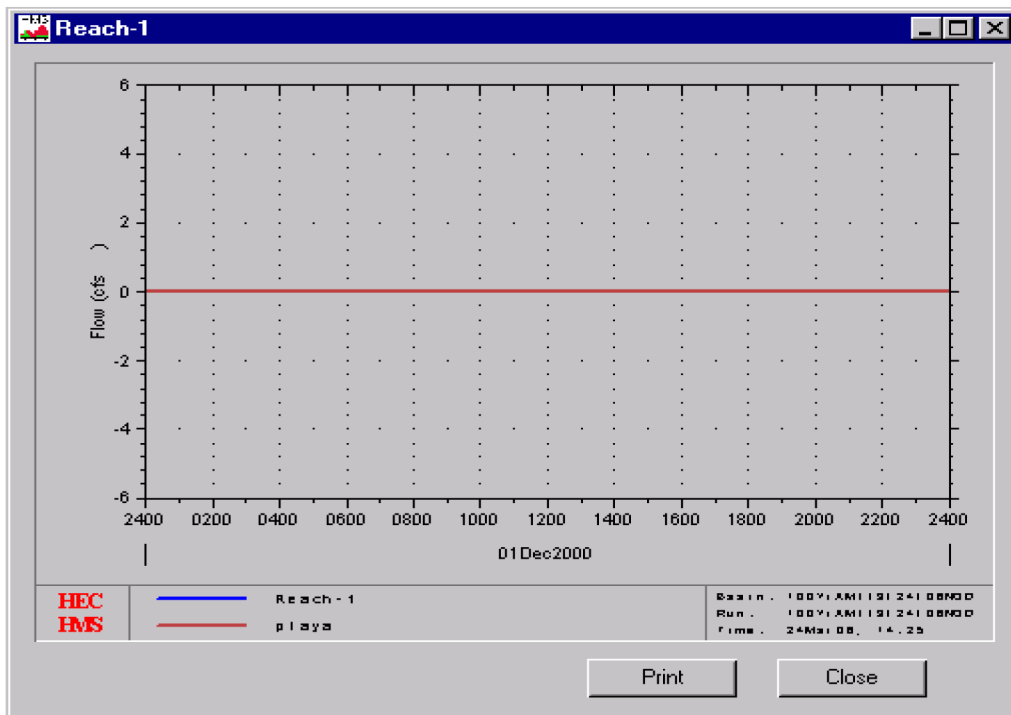


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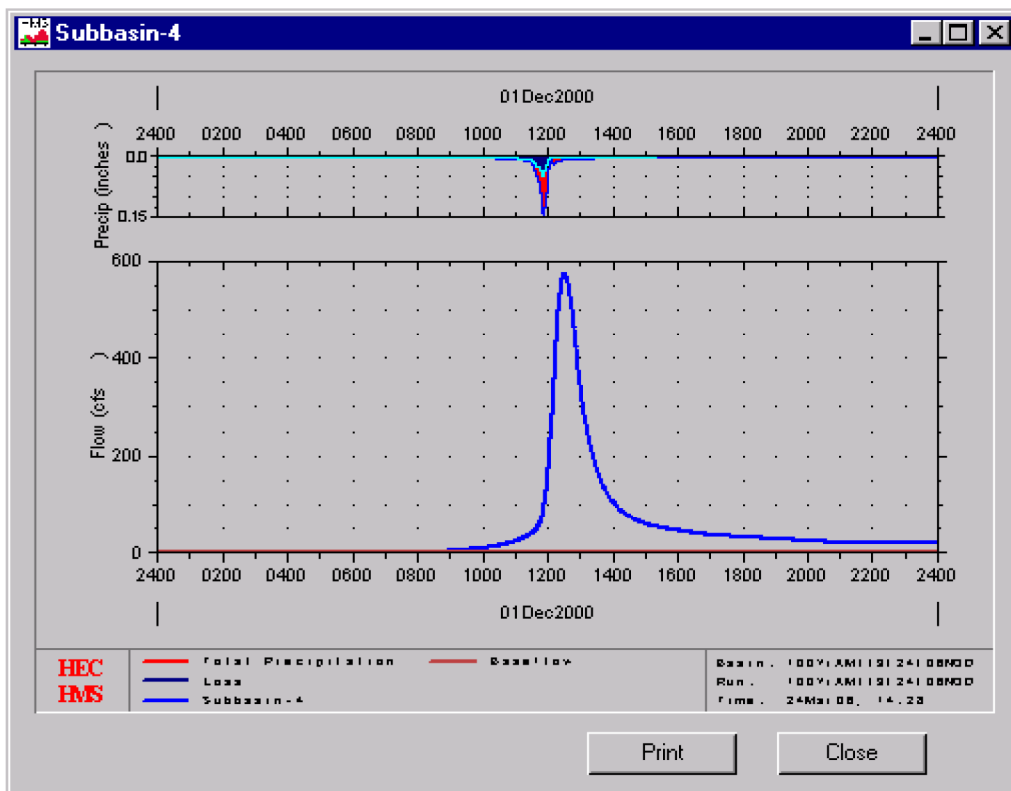
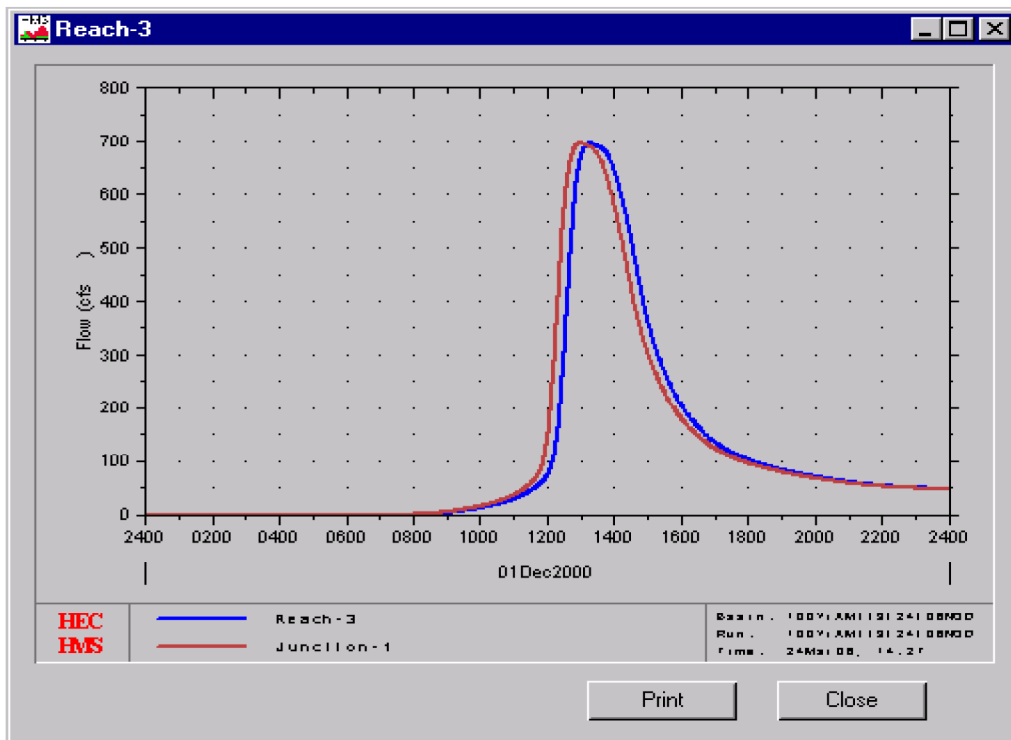




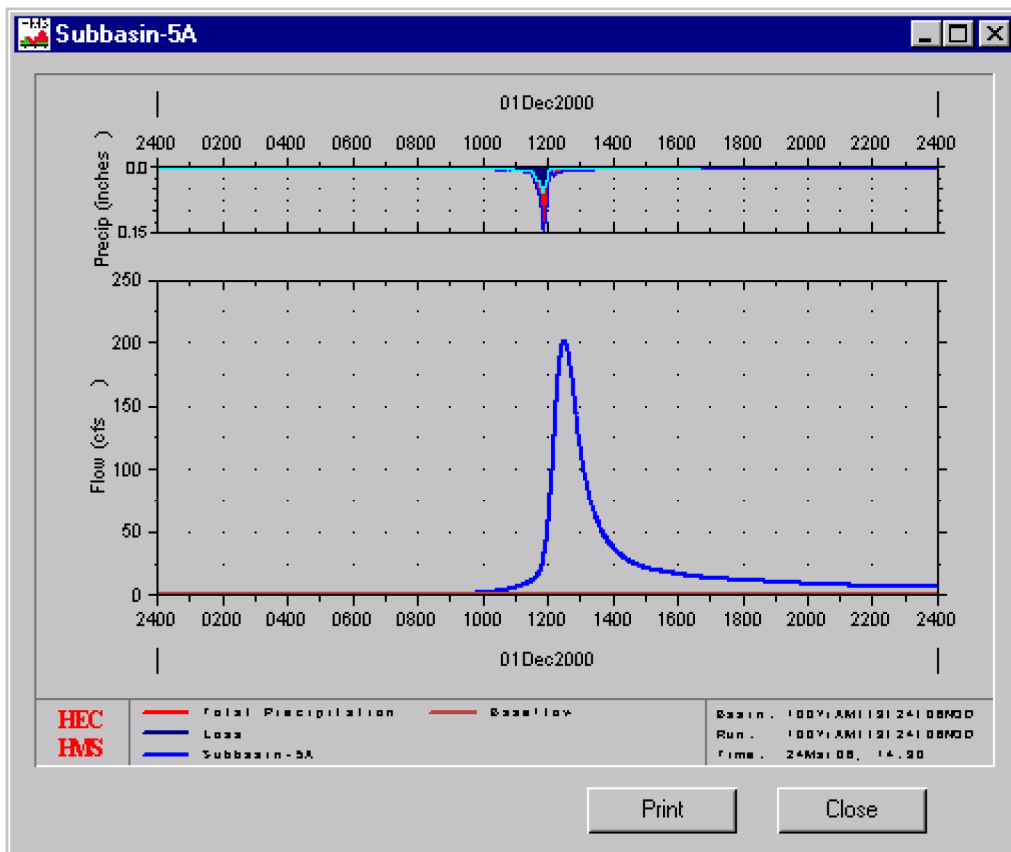
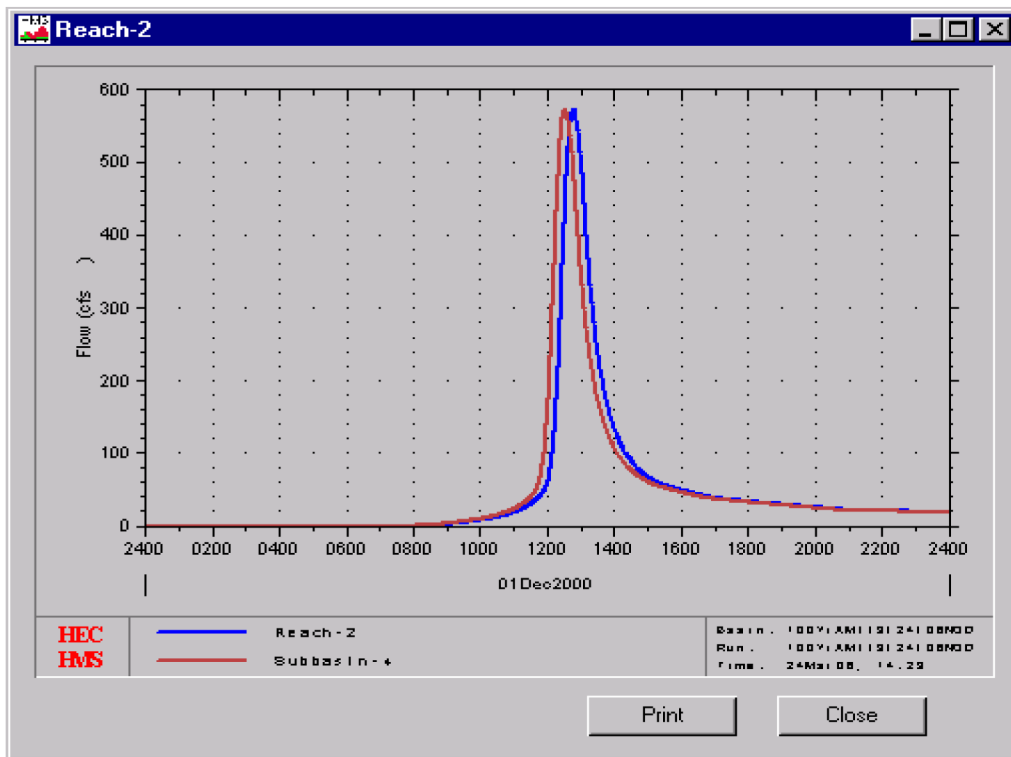
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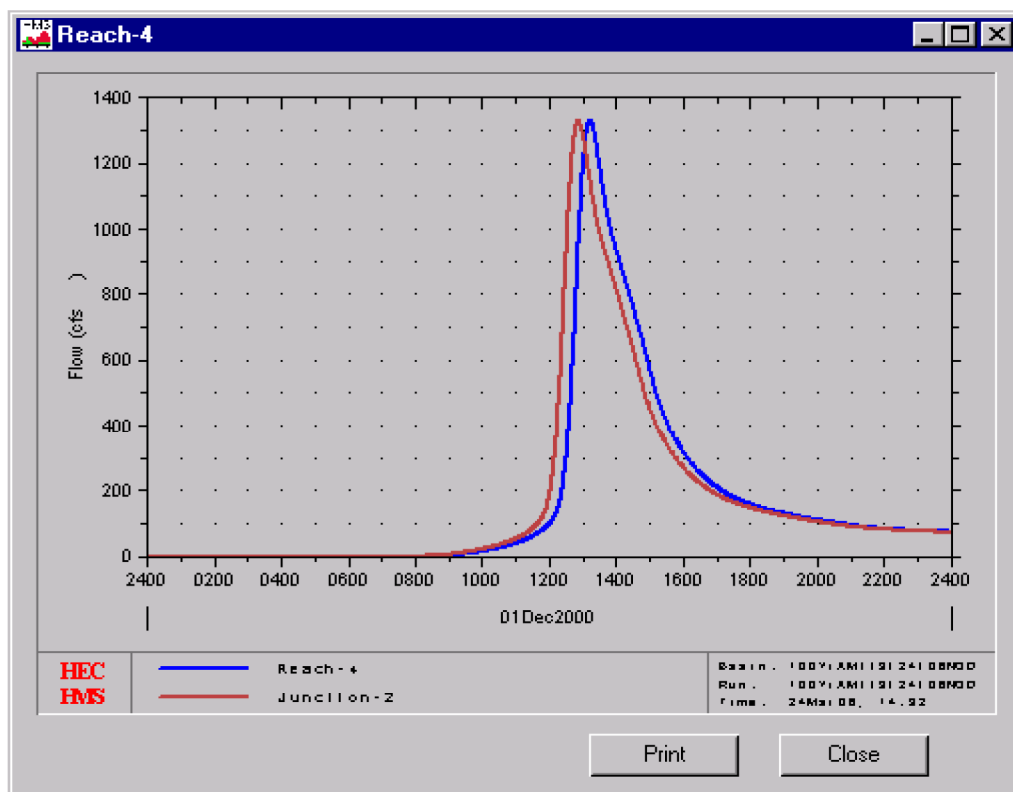
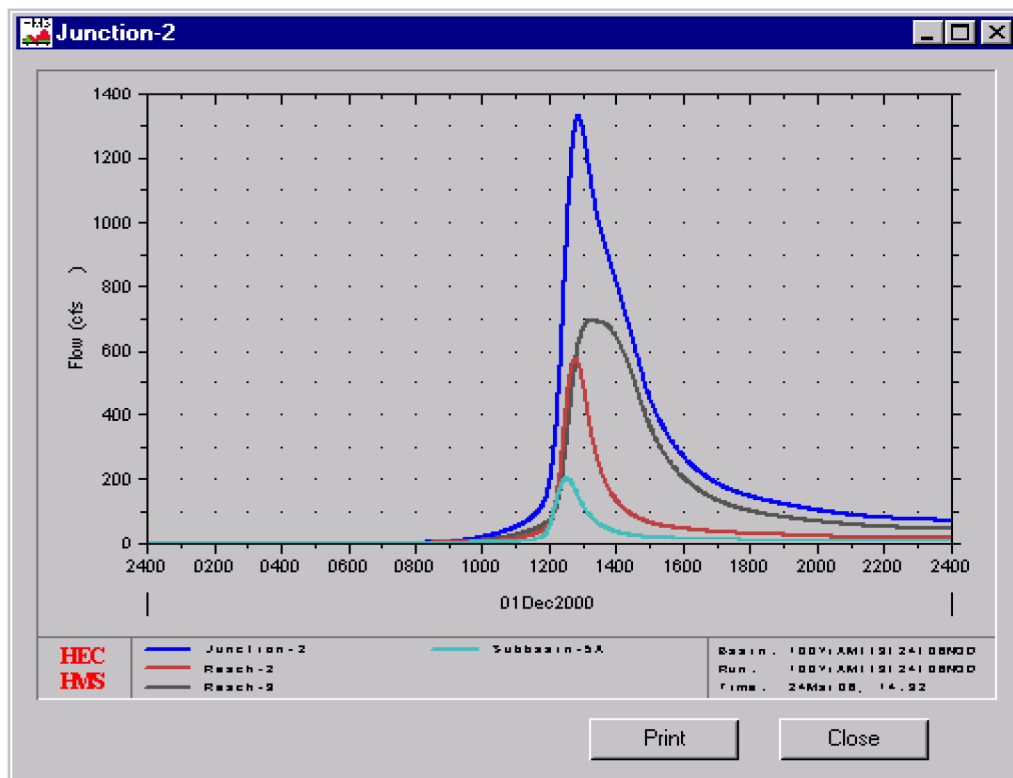
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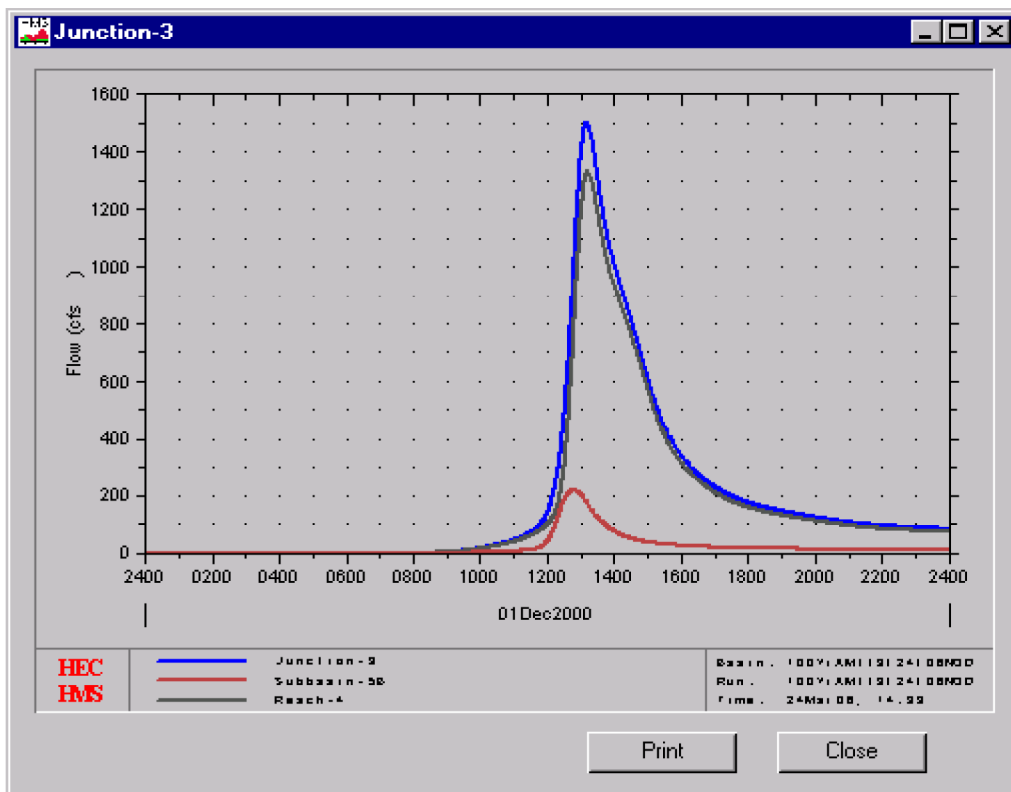
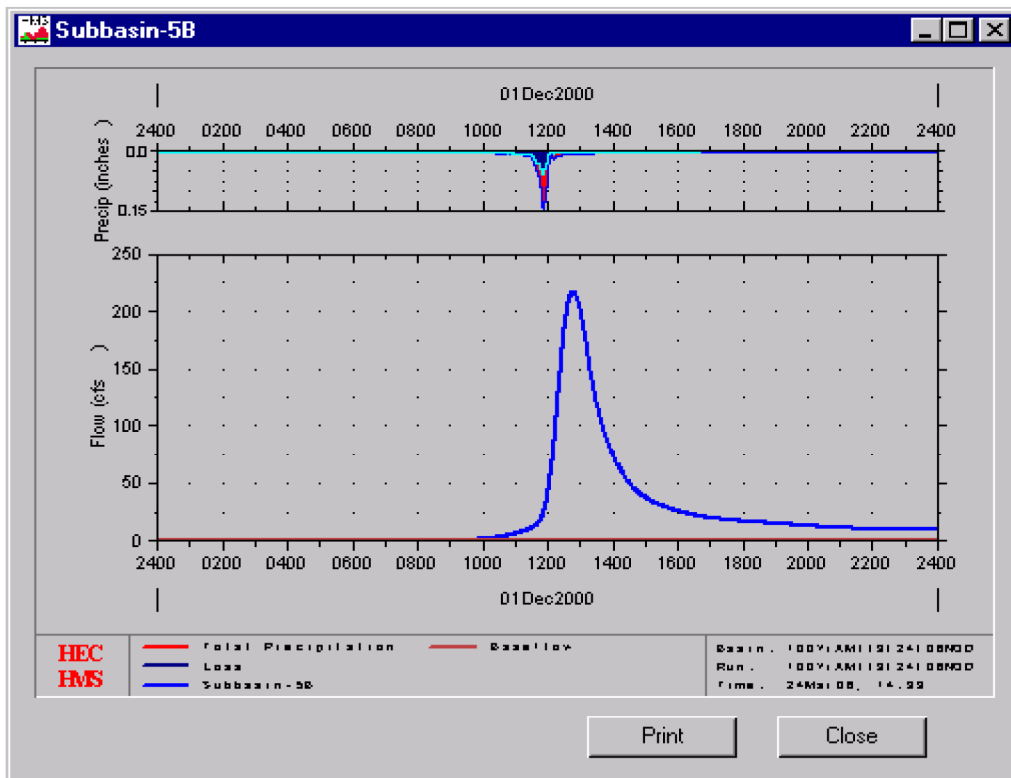
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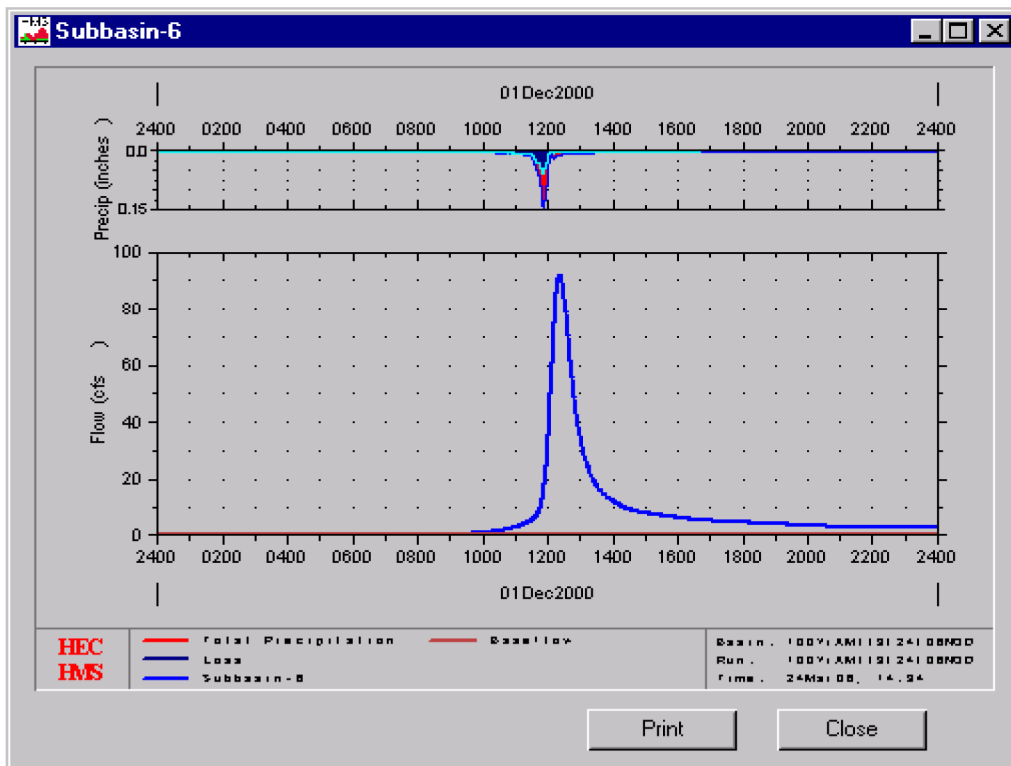
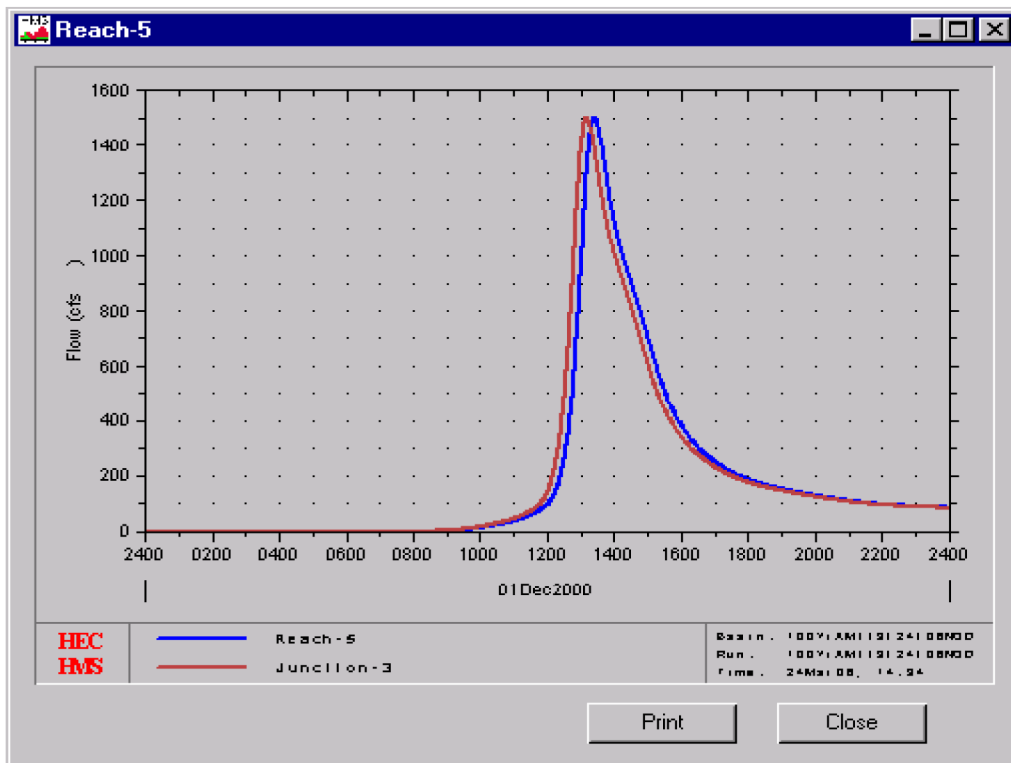
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



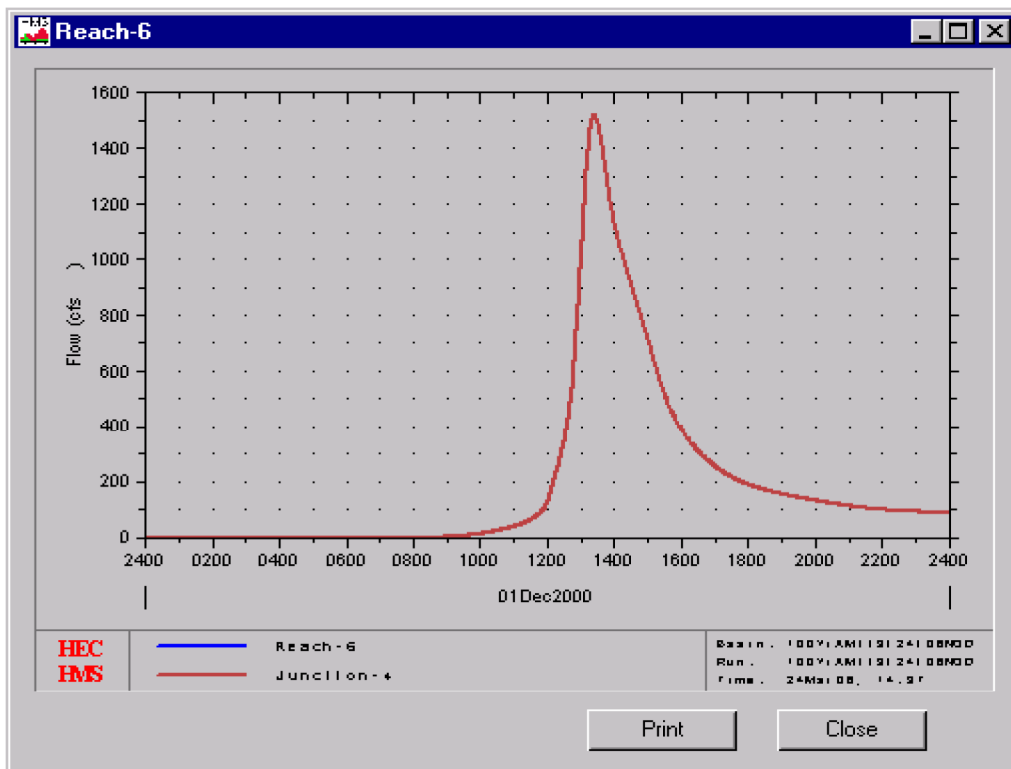
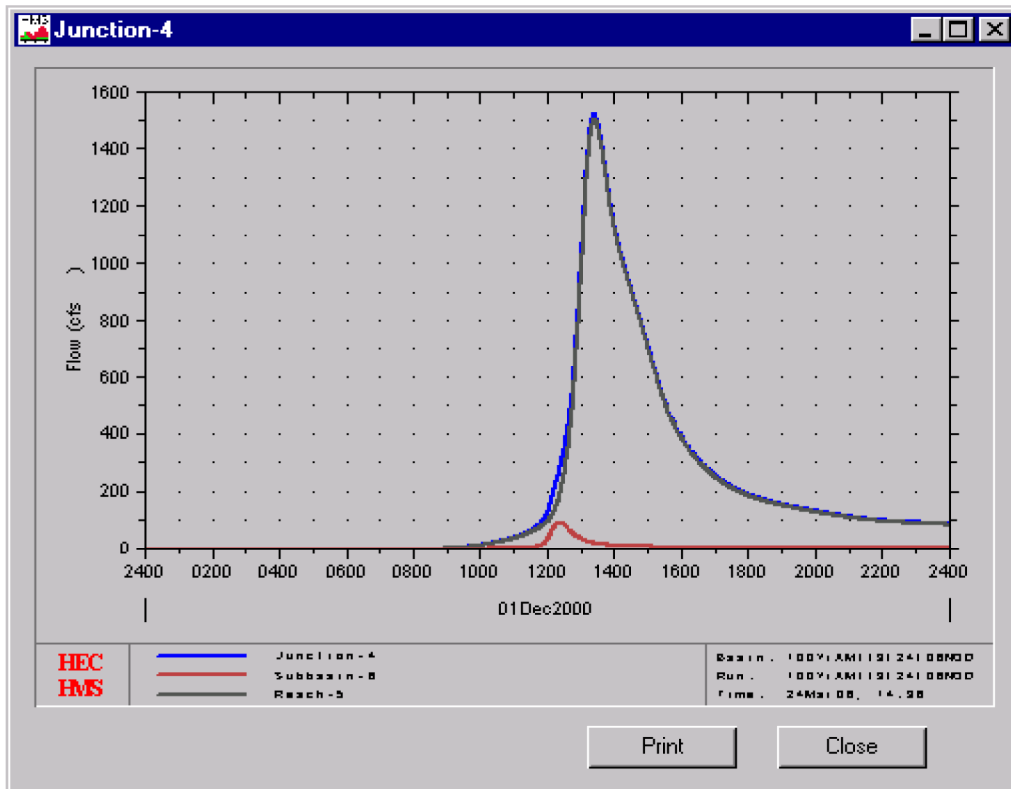
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



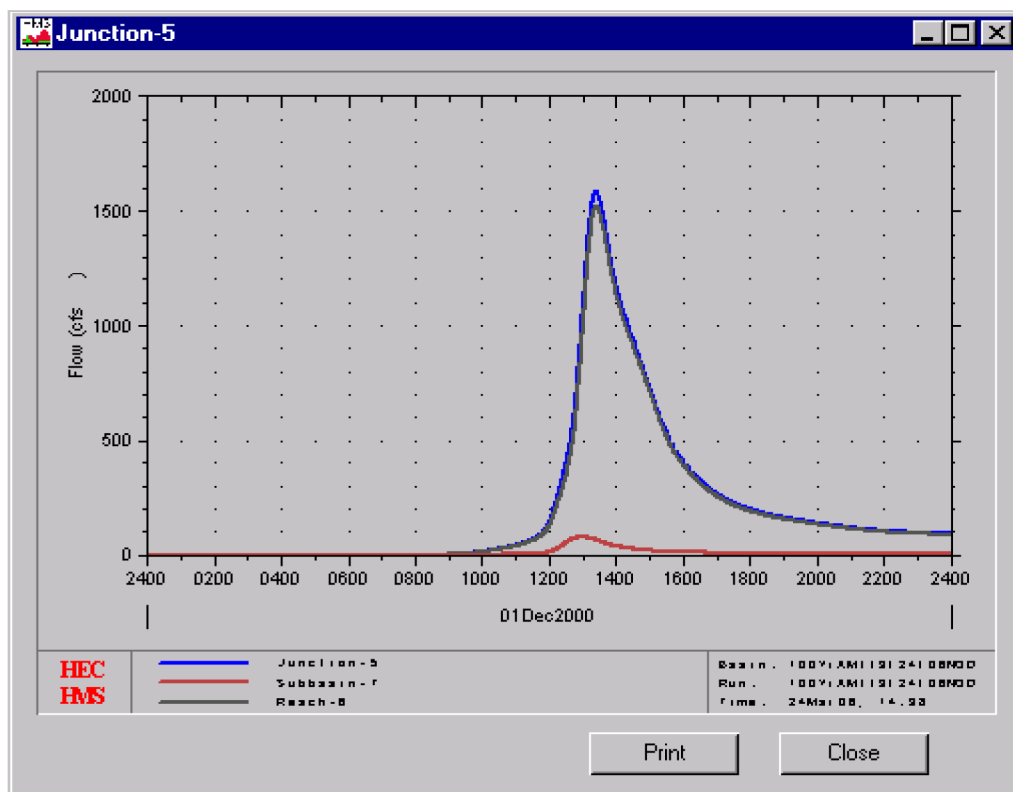
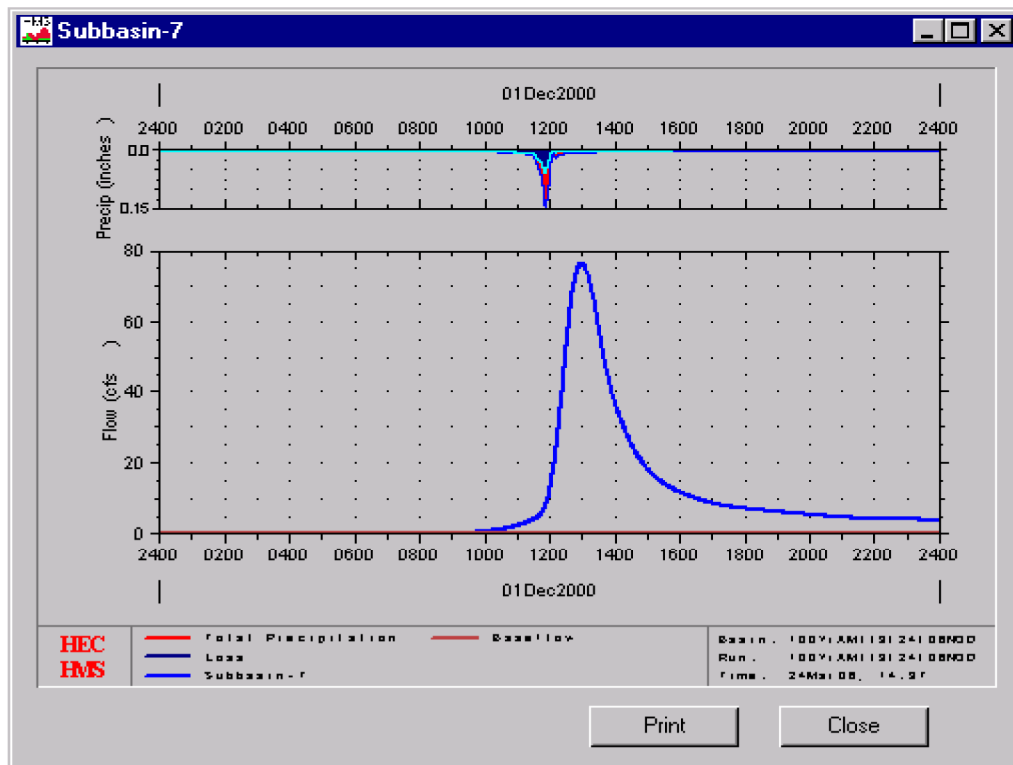
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS





## **APPENDIX M**

### **HEC-RAS MODEL FOR THE CALCULATION OF THE 100-YEAR WATER SURFACE PROFILE, ANTECEDENT MOISTURE CONDITION II**

HEC-RAS Plan: AMH 100 River: Ditch A Reach: 5

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Max Chl Dpth (ft)	E.G. Elev (ft)	E.G. Slope (ft/m)	Vel Chl (ft/s)	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
5	12674	488.00	3477.00	3478.35	3477.98	1.35	3478.42	0.003073	2.23	355.77	656.81	223.75	301.04	0.43
5	12674	488.00	3477.00	3478.35	3477.98	1.35	3478.42	0.003073	2.23	355.77	656.81	223.75	301.04	0.43
5	12674	488.00	3477.00	3478.35	3477.98	1.35	3478.42	0.003073	2.23	355.77	656.81	223.75	301.04	0.43
5	12674	488.00	3477.00	3478.35	3477.98	1.35	3478.42	0.003073	2.23	355.77	656.81	223.75	301.04	0.43
5	11337	488.00	3469.00	3470.36	3470.33	1.36	3470.73	0.014260	4.87	427.21	557.43	101.95	130.23	0.92
5	11337	488.00	3469.00	3470.36	3470.33	1.36	3470.73	0.014260	4.87	427.21	557.43	101.95	130.23	0.92
5	11337	488.00	3469.00	3470.36	3470.33	1.36	3470.73	0.014260	4.87	427.21	557.43	101.95	130.23	0.92
5	11337	488.00	3469.00	3470.36	3470.33	1.36	3470.73	0.014260	4.87	427.21	557.43	101.95	130.23	0.92
5	10937	488.00	3464.00	3465.74	3465.55	1.74	3466.02	0.009772	4.21	474.19	600.46	116.03	126.27	0.77
5	10937	488.00	3464.00	3465.74	3465.55	1.74	3466.02	0.009772	4.21	474.19	600.46	116.03	126.27	0.77
5	10937	488.00	3464.00	3465.74	3465.55	1.74	3466.02	0.009772	4.21	474.19	600.46	116.03	126.27	0.77
5	10937	488.00	3464.00	3465.74	3465.55	1.74	3466.02	0.009772	4.21	474.19	600.46	116.03	126.27	0.77
5	10288	488.00	3456.00	3456.90	3456.90	0.90	3457.15	0.020388	4.04	405.26	647.69	120.78	242.43	1.01
5	10288	488.00	3456.00	3456.90	3456.90	0.90	3457.15	0.020388	4.04	405.26	647.69	120.78	242.43	1.01
5	10288	488.00	3456.00	3456.90	3456.90	0.90	3457.15	0.020388	4.04	405.26	647.69	120.78	242.43	1.01
5	10288	488.00	3456.00	3456.90	3456.90	0.90	3457.15	0.020388	4.04	405.26	647.69	120.78	242.43	1.01
5	9690	611.00	3450.00	3451.49	3451.14	1.49	3451.60	0.004656	2.56	444.61	758.20	238.60	313.59	0.52
5	9690	611.00	3450.00	3451.49	3451.14	1.49	3451.60	0.004656	2.56	444.61	758.20	238.60	313.59	0.52
5	9690	611.00	3450.00	3451.49	3451.14	1.49	3451.60	0.004656	2.56	444.61	758.20	238.60	313.59	0.52
5	9690	611.00	3450.00	3451.49	3451.14	1.49	3451.60	0.004656	2.56	444.61	758.20	238.60	313.59	0.52
5	9009	611.00	3445.00	3446.45	3446.34	1.45	3446.68	0.012581	3.84	454.43	694.37	159.10	239.94	0.83
5	9009	611.00	3445.00	3446.45	3446.34	1.45	3446.68	0.012581	3.84	454.43	694.37	159.10	239.94	0.83
5	9009	611.00	3445.00	3446.45	3446.34	1.45	3446.68	0.012581	3.84	454.43	694.37	159.10	239.94	0.83
5	9009	611.00	3445.00	3446.45	3446.34	1.45	3446.68	0.012581	3.84	454.43	694.37	159.10	239.94	0.83
5	8130	611.00	3440.00	3441.57	3441.11	1.57	3441.65	0.003204	2.21	469.14	811.67	276.52	342.53	0.43
5	8130	611.00	3440.00	3441.57	3441.11	1.57	3441.65	0.003204	2.21	469.14	811.67	276.52	342.53	0.43
5	8130	611.00	3440.00	3441.57	3441.11	1.57	3441.65	0.003204	2.21	469.14	811.67	276.52	342.53	0.43
5	8130	611.00	3440.00	3441.57	3441.11	1.57	3441.65	0.003204	2.21	469.14	811.67	276.52	342.53	0.43
5	7717	611.00	3437.80	3438.66	3438.66	0.86	3438.94	0.020021	4.18	333.18	607.65	146.05	274.48	1.01
5	7717	611.00	3437.80	3438.66	3438.66	0.86	3438.94	0.020021	4.18	333.18	607.65	146.05	274.48	1.01
5	7717	611.00	3437.80	3438.66	3438.66	0.86	3438.94	0.020021	4.18	333.18	607.65	146.05	274.48	1.01
5	7717	611.00	3437.80	3438.66	3438.66	0.86	3438.94	0.020021	4.18	333.18	607.65	146.05	274.48	1.01
5	7253	697.00	3435.00	3436.35	3435.88	1.35	3436.40	0.001738	1.69	405.86	923.44	417.07	517.58	0.32
5	7253	697.00	3435.00	3436.35	3435.88	1.35	3436.40	0.001738	1.69	405.86	923.44	417.07	517.58	0.32
5	7253	697.00	3435.00	3436.35	3435.88	1.35	3436.40	0.001738	1.69	405.86	923.44	417.07	517.58	0.32
5	7253	697.00	3435.00	3436.35	3435.88	1.35	3436.40	0.001738	1.69	405.86	923.44	417.07	517.58	0.32
5	6343	1328.00	3430.00	3430.70	3430.70	0.70	3431.00	0.019035	4.37	780.28	1294.88	303.78	514.60	1.00
5	6343	1328.00	3430.00	3430.70	3430.70	0.70	3431.00	0.019035	4.37	780.28	1294.88	303.78	514.60	1.00
5	6343	1328.00	3430.00	3430.70	3430.70	0.70	3431.00	0.019035	4.37	780.28	1294.88	303.78	514.60	1.00
5	6343	1328.00	3430.00	3430.70	3430.70	0.70	3431.00	0.019035	4.37	780.28	1294.88	303.78	514.60	1.00
5	5363	1328.00	3425.00	3426.33	3425.78	1.33	3426.38	0.001763	1.85	710.73	1541.30	727.78	830.57	0.33
5	5363	1328.00	3425.00	3426.33	3425.78	1.33	3426.38	0.001763	1.85	710.73	1541.30	727.78	830.57	0.33
5	5363	1328.00	3425.00	3426.33	3425.78	1.33	3426.38	0.001763	1.85	710.73	1541.30	727.78	830.57	0.33
5	5363	1328.00	3425.00	3426.33	3425.78	1.33	3426.38	0.001763	1.85	710.73	1541.30	727.78	830.57	0.33
5	4221	1501.00	3420.00	3420.99	3420.99	0.99	3421.33	0.018533	4.67	544.80	1028.40	321.48	483.60	1.01
5	4221	1501.00	3420.00	3420.99	3420.99	0.99	3421.33	0.018533	4.67	544.80	1028.40	321.48	483.60	1.01
5	4221	1501.00	3420.00	3420.99	3420.99	0.99	3421.33	0.018533	4.67	544.80	1028.40	321.48	483.60	1.01
5	4221	1501.00	3420.00	3420.99	3420.99	0.99	3421.33	0.018533	4.67	544.80	1028.40	321.48	483.60	1.01
5	3489	1501.00	3416.00	3417.18	3416.67	2.18	3417.24	0.002251	2.05	-116.98	881.92	804.91	998.90	0.37
5	3489	1501.00	3416.00	3417.18	3416.67	2.18	3417.24	0.002251	2.05	-116.98	881.92	804.91	998.90	0.37
5	3489	1501.00	3416.00	3417.18	3416.67	2.18	3417.24	0.002251	2.05	-116.98	881.92	804.91	998.90	0.37
5	3489	1501.00	3416.00	3417.18	3416.67	2.18	3417.24	0.002251	2.05	-116.98	881.92	804.91	998.90	0.37
5	2989	1501.00	3413.80	3414.52	3414.52	0.72	3414.81	0.019219	4.14	179.04	802.32	351.67	623.28	0.99
5	2989	1501.00	3413.80	3414.52	3414.52	0.72	3414.81	0.019219	4.14	179.04	802.32	351.67	623.28	0.99
5	2989	1501.00	3413.80	3414.52	3414.52	0.72	3414.81	0.019219	4.14	179.04	802.32	351.67	623.28	0.99
5	2989	1501.00	3413.80	3414.52	3414.52	0.72	3414.81	0.019219	4.14	179.04	802.32	351.67	623.28	0.99
5	2774	1501.00	3409.00	3413.99	3412.71	4.99	3414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64	0.17
5	2774	1501.00	3409.00	3413.99	3412.71	4.99	3414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64	0.17
5	2774	1501.00	3409.00	3413.99	3412.71	4.99	3414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64	0.17
5	2774	1501.00	3409.00	3413.99	3412.71	4.99	3414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64	0.17
5	2773	Culvert												
5	2734	1501.00	3408.90	3412.71	3412.71	3.81	3412.82	0.001004	3.22	83.74	515.65	665.51	431.91	0.31
5	2734	1501.00	3408.90	3412.71	3412.71	3.81	3412.82	0.001004	3.22	83.74	515.65	665.51	431.91	0.31
5	2734	1501.00	3408.90	3412.71	3412.71	3.81	3412.82	0.001004	3.22	83.74	515.65	665.51	431.91	0.31
5	2734	1501.00	3408.90	3412.71	3412.71	3.81	3412.82	0.001004	3.22	83.74	515.65	665.51	431.91	0.31
5	1888	1521.00	3408.00	3408.41	3408.72	0.41	3409.58	0.151914	8.68	286.11	789.53	175.18	503.42	2.59
5	1888	1521.00	3408.00	3408.41	3408.72	0.41	3409.58	0.151914	8.68	286.11	789.53	175.18	503.42	2.59

HEC-RAS Plan: AMII 100 River: Ditch A Reach: 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G. Elev	E.G. Slope	Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(ft)	(ft)	(sq ft)	(ft)	
5	1898	1521.00	3408.00	3408.41	3408.72	0.41	3409.58	0.151914	8.68	286.11	789.53	175.18	503.42	2.59
5	1898	1521.00	3408.00	3408.41	3408.72	0.41	3409.58	0.151914	8.68	286.11	789.53	175.18	503.42	2.59
5	1080	1585.00	3402.70	3404.50	3404.11	1.80	3404.66	0.005270	3.16	614.45	1141.44	501.30	526.88	0.57
5	1080	1585.00	3402.70	3405.00	3404.11	2.30	3405.06	0.001518	1.98	540.97	1206.00	799.30	665.03	0.32
5	1080	1585.00	3402.70	3405.00	3404.11	3.30	3406.01	0.000250	0.93	394.00	1523.00	1696.32	1129.00	0.13
5	1080	1585.00	3402.70	3407.00	3404.11	4.30	3407.01	0.000045	0.56	247.00	1523.00	2898.82	1276.00	0.06

FloodPlain.rep

HEC-RAS Version 3.0.1 Mar 2001  
 U.S. Army Corp of Engineers  
 Hydrologic Engineering Center  
 609 Second Street, Suite D  
 Davis, California 95616-4687  
 (916) 756-1104

```

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
XXXXXXXX XXXX      X          XXX XXXX XXXXXXX 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: WCS  
 Project File : FloodPlain.prj  
 Run Date and Time: 3/24/06 3:15:28 PM

Project in English units

PLAN DATA

Plan Title: Plan 35  
 Plan File : D:\program files\WCS\FloodPlain.p35

Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04

Flow Title : 100YrAMII3-24-06ManyNOD  
 Flow File : D:\program files\WCS\FloodPlain.f27

Plan Summary Information:

Number of: Cross Sections =	18	Multitple Openings =	0
Culverts =	1	Inline Weirs =	0
Bridges =	0		

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculaton 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:	Mixed Flow

FLOW DATA

Flow Title: 100YrAMII3-24-06ManyNOD  
 Flow File : D:\program files\WCS\FloodPlain.f27

## FloodPlain.rep

## Flow Data (cfs)

River	Reach	RS	100 Yr.-WS3404.5	100 Yr.-WS3405	100 Yr.-WS3406
100 Yr.-WS3407					
Ditch A	5	12674	488	488	488
488					
Ditch A	5	9690	611	611	611
611					
Ditch A	5	7253	697	697	697
697					
Ditch A	5	6343	1328	1328	1328
1328					
Ditch A	5	4221	1501	1501	1501
1501					
Ditch A	5	1888	1521	1521	1521
1521					
Ditch A	5	1060	1585	1585	1585
1585					

## Boundary Conditions

River stream	Reach	Profile	Upstream	Down
Ditch A	5	100 Yr.-WS3404.5	Critical	Known WS
= 3404.5				
Ditch A	5	100 Yr.-WS3405	Critical	Known
WS = 3405				
Ditch A	5	100 Yr.-WS3406	Critical	Known
WS = 3406				
Ditch A	5	100 Yr.-WS3407	Critical	Known
WS = 3407				

## GEOMETRY DATA

Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 12674

## INPUT

Description: Sta. 12674

Station Elevation Data		num=	6						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3482	380	3478	560	3477	635	3478	761	3480
964	3482								

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	380	.033	635	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	380	635		1206	1337	1433	.1	.3



FloodPlain.rep

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3478.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.35	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3477.98	Flow Area (sq ft)	4.19	215.78	3.78
E.G. Slope (ft/ft)	0.003073	Area (sq ft)	4.19	215.78	3.78
Q Total (cfs)	488.00	Flow (cfs)	3.25	481.82	2.93
Top Width (ft)	301.04	Top Width (ft)	24.23	255.00	21.81
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.78	2.23	0.78
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.17	0.85	0.17
Conv. Total (cfs)	8803.6	Conv. (cfs)	58.7	8692.1	52.8
Length Wtd. (ft)	1336.75	Wetted Per. (ft)	24.24	255.01	21.81
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.03	0.36	0.03
Frctn Loss (ft)	7.66	Cum Volume (acre-ft)	13.94	75.93	2.13
C & E Loss (ft)	0.03	Cum SA (acres)	18.70	98.60	3.43

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3478.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.35	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3477.98	Flow Area (sq ft)	4.19	215.78	3.78
E.G. Slope (ft/ft)	0.003073	Area (sq ft)	4.19	215.78	3.78
Q Total (cfs)	488.00	Flow (cfs)	3.25	481.82	2.93
Top Width (ft)	301.04	Top Width (ft)	24.23	255.00	21.81
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.78	2.23	0.78
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.17	0.85	0.17
Conv. Total (cfs)	8803.6	Conv. (cfs)	58.7	8692.1	52.8

## FloodPlain.rep

Length Wtd. (ft)	1336.75	Wetted Per. (ft)	24.24	255.01	21.81
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.03	0.36	0.03
Frctn Loss (ft)	7.66	Cum Volume (acre-ft)	13.94	78.76	2.13
C & E Loss (ft)	0.03	Cum SA (acres)	18.70	99.92	3.43

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3478.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.35	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3477.98	Flow Area (sq ft)	4.19	215.78	3.78
E.G. Slope (ft/ft)	0.003073	Area (sq ft)	4.19	215.78	3.78
Q Total (cfs)	488.00	Flow (cfs)	3.25	481.82	2.93
Top Width (ft)	301.04	Top Width (ft)	24.23	255.00	21.81
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.78	2.23	0.78
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.17	0.85	0.17
Conv. Total (cfs)	8803.6	Conv. (cfs)	58.7	8692.1	52.8
Length Wtd. (ft)	1336.75	Wetted Per. (ft)	24.24	255.01	21.81
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.03	0.36	0.03
Frctn Loss (ft)	7.66	Cum Volume (acre-ft)	13.94	87.29	2.13
C & E Loss (ft)	0.03	Cum SA (acres)	18.70	104.33	3.43

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

## FloodPlain.rep

E.G. Elev (ft)	3478.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.35	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3477.98	Flow Area (sq ft)	4.19	215.78	3.78
E.G. Slope (ft/ft)	0.003073	Area (sq ft)	4.19	215.78	3.78
Q Total (cfs)	488.00	Flow (cfs)	3.25	481.82	2.93
Top Width (ft)	301.04	Top Width (ft)	24.23	255.00	21.81
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.78	2.23	0.78
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.17	0.85	0.17
Conv. Total (cfs)	8803.6	Conv. (cfs)	58.7	8692.1	52.8
Length Wtd. (ft)	1336.75	Wetted Per. (ft)	24.24	255.01	21.81
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.03	0.36	0.03
Frctn Loss (ft)	7.66	Cum Volume (acre-ft)	14.20	98.02	2.13
C & E Loss (ft)	0.03	Cum SA (acres)	19.22	104.33	3.43

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 11337

## INPUT

Description: Sta. 11337

Station Elevation Data		num= 8	
Sta	Elev	Sta	Elev
100	3477	315	3474
550	3470	591	3472

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	435	.033
		550	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
435	550	545	400	332	.1 .3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3470.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.033	0.033	0.033



## FloodPlain.rep

W.S. Elev (ft)	3470.36	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.33	Flow Area (sq ft)	1.41	99.19	1.35
E.G. Slope (ft/ft)	0.014260	Area (sq ft)	1.41	99.19	1.35
Q Total (cfs)	488.00	Flow (cfs)	2.43	483.25	2.32
Top Width (ft)	130.23	Top Width (ft)	7.79	115.00	7.43
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	1.72	4.87	1.72
Max Chl Dpth (ft)	1.36	Hydr. Depth (ft)	0.18	0.86	0.18
Conv. Total (cfs)	4086.5	Conv. (cfs)	20.4	4046.8	19.4
Length Wtd. (ft)	400.20	Wetted Per. (ft)	7.80	115.02	7.44
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.16	0.77	0.16
Alpha	1.03	Stream Power (lb/ft s)	0.28	3.74	0.28
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)	13.87	71.10	2.04
C & E Loss (ft)	0.03	Cum SA (acres)	18.26	92.93	2.95

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3470.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.36	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.33	Flow Area (sq ft)	1.41	99.19	1.35
E.G. Slope (ft/ft)	0.014260	Area (sq ft)	1.41	99.19	1.35
Q Total (cfs)	488.00	Flow (cfs)	2.43	483.25	2.32
Top Width (ft)	130.23	Top Width (ft)	7.79	115.00	7.43
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	1.72	4.87	1.72
Max Chl Dpth (ft)	1.36	Hydr. Depth (ft)	0.18	0.86	0.18
Conv. Total (cfs)	4086.5	Conv. (cfs)	20.4	4046.8	19.4
Length Wtd. (ft)	400.20	Wetted Per. (ft)	7.80	115.02	7.44
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.16	0.77	0.16
Alpha	1.03	Stream Power (lb/ft s)	0.28	3.74	0.28
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)	13.87	73.93	2.04

		FloodPlain.rep			
C & E Loss (ft)	0.03	Cum SA (acres)	18.26	94.24	2.95

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3470.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.36	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.33	Flow Area (sq ft)	1.41	99.19	1.35
E.G. Slope (ft/ft)	0.014260	Area (sq ft)	1.41	99.19	1.35
Q Total (cfs)	488.00	Flow (cfs)	2.43	483.25	2.32
Top Width (ft)	130.23	Top Width (ft)	7.79	115.00	7.43
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	1.72	4.87	1.72
Max Chl Dpth (ft)	1.36	Hydr. Depth (ft)	0.18	0.86	0.18
Conv. Total (cfs)	4086.5	Conv. (cfs)	20.4	4046.8	19.4
Length Wtd. (ft)	400.20	Wetted Per. (ft)	7.80	115.02	7.44
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.16	0.77	0.16
Alpha	1.03	Stream Power (lb/ft s)	0.28	3.74	0.28
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)	13.87	82.45	2.04
C & E Loss (ft)	0.03	Cum SA (acres)	18.26	98.65	2.95

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3470.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.36	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.33	Flow Area (sq ft)	1.41	99.19	1.35
E.G. Slope (ft/ft)	0.014260	Area (sq ft)	1.41	99.19	1.35
Q Total (cfs)	488.00	Flow (cfs)	2.43	483.25	2.32
Top Width (ft)	130.23	Top Width (ft)	7.79	115.00	7.43

## FloodPlain.rep

Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	1.72	4.87	1.72
Max Chl Dpth (ft)	1.36	Hydr. Depth (ft)	0.18	0.86	0.18
Conv. Total (cfs)	4086.5	Conv. (cfs)	20.4	4046.8	19.4
Length Wtd. (ft)	400.20	Wetted Per. (ft)	7.80	115.02	7.44
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.16	0.77	0.16
Alpha	1.03	Stream Power (lb/ft s)	0.28	3.74	0.28
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)	14.12	93.18	2.04
C & E Loss (ft)	0.03	Cum SA (acres)	18.77	98.65	2.95

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 10937

## INPUT

Description: Sta. 10937

Station Elevation Data		num=	9						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3470	351	3468	428	3467	465	3466	536	3464
543	3464	609	3466	683	3468	811	3472		

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	428	.033	609	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
428	609	729 649	445	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3466.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.74	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.55	Flow Area (sq ft)		116.03	
E.G. Slope (ft/ft)	0.009772	Area (sq ft)		116.03	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	126.27	Top Width (ft)		126.27	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21	
Max Chl Dpth (ft)	1.74	Hydr. Depth (ft)		0.92	
Conv. Total (cfs)	4936.6	Conv. (cfs)		4936.6	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		126.32	

## FloodPlain.rep

Min Ch El (ft)	3464.00	Shear (lb/sq ft)	0.56		
Alpha	1.00	Stream Power (lb/ft s)	2.36		
Frctn Loss (ft)	8.86	Cum Volume (acre-ft)	13.86	70.11	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.21	91.82	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3466.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.74	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.55	Flow Area (sq ft)		116.03	
E.G. Slope (ft/ft)	0.009772	Area (sq ft)		116.03	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	126.27	Top Width (ft)		126.27	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21	
Max Chl Dpth (ft)	1.74	Hydr. Depth (ft)		0.92	
Conv. Total (cfs)	4936.6	Conv. (cfs)		4936.6	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		126.32	
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)		2.36	
Frctn Loss (ft)	8.86	Cum Volume (acre-ft)	13.86	72.94	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.21	93.13	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3466.02	FloodPlain.rep Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.74	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.55	Flow Area (sq ft)		116.03	
E.G. Slope (ft/ft)	0.009772	Area (sq ft)		116.03	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	126.27	Top Width (ft)		126.27	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21	
Max Chl Dpth (ft)	1.74	Hydr. Depth (ft)		0.92	
Conv. Total (cfs)	4936.6	Conv. (cfs)		4936.6	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		126.32	
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)		2.36	
Frctn Loss (ft)	8.86	Cum Volume (acre-ft)	13.86	81.46	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.21	97.54	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3466.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.74	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.55	Flow Area (sq ft)		116.03	
E.G. Slope (ft/ft)	0.009772	Area (sq ft)		116.03	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	126.27	Top Width (ft)		126.27	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21	
Max Chl Dpth (ft)	1.74	Hydr. Depth (ft)		0.92	
Conv. Total (cfs)	4936.6	Conv. (cfs)		4936.6	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		126.32	

Min Ch El (ft)	3464.00	FloodPlain.rep Shear (lb/sq ft)	0.56
Alpha	1.00	Stream Power (lb/ft s)	2.36
Frctn Loss (ft)	8.86	Cum Volume (acre-ft)	14.11 92.19 2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.72 97.54 2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 10288

# INPUT

Description: Sta. 10288

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
100	3464	177	3462	238 3460 298 3458 493 3456
519	3456	662	3457	778 3457.1 857 3458 903 3460
947	3462	989	3464	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
100	.033	298	.033
		857	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	298	857		552 598	633	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3457.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3456.90	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3456.90	Flow Area (sq ft)		120.78	
E.G. Slope (ft/ft)	0.020388	Area (sq ft)		120.78	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	242.43	Top Width (ft)		242.43	
Vel Total (ft/s)	4.04	Avg. Vel. (ft/s)		4.04	
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)		0.50	
Conv. Total (cfs)	3417.7	Conv. (cfs)		3417.7	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		242.43	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		2.56	

		FloodPlain.rep			
Frctn Loss (ft)	4.72	Cum Volume (acre-ft)	13.86	68.34	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.21	89.07	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.--WS3405

E.G. Elev (ft)	3457.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3456.90	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3456.90	Flow Area (sq ft)		120.78	
E.G. Slope (ft/ft)	0.020388	Area (sq ft)		120.78	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	242.43	Top Width (ft)		242.43	
Vel Total (ft/s)	4.04	Avg. Vel. (ft/s)		4.04	
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)		0.50	
Conv. Total (cfs)	3417.7	Conv. (cfs)		3417.7	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		242.43	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		2.56	
Frctn Loss (ft)	4.72	Cum Volume (acre-ft)	13.86	71.18	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.21	90.38	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less

than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

# CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3457.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3456.90	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3456.90	Flow Area (sq ft)		120.78	
E.G. Slope (ft/ft)	0.020388	Area (sq ft)		120.78	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	242.43	Top Width (ft)		242.43	
Vel Total (ft/s)	4.04	Avg. Vel. (ft/s)		4.04	
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)		0.50	
Conv. Total (cfs)	3417.7	Conv. (cfs)		3417.7	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		242.43	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		2.56	
Frctn Loss (ft)	4.72	Cum Volume (acre-ft)	13.86	79.70	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.21	94.79	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.



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CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3457.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3456.90	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3456.90	Flow Area (sq ft)		120.78	
E.G. Slope (ft/ft)	0.020388	Area (sq ft)		120.78	
Q Total (cfs)	488.00	Flow (cfs)		488.00	
Top Width (ft)	242.43	Top Width (ft)		242.43	
Vel Total (ft/s)	4.04	Avg. Vel. (ft/s)		4.04	
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)		0.50	
Conv. Total (cfs)	3417.7	Conv. (cfs)		3417.7	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		242.43	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		2.56	
Frctn Loss (ft)	4.72	Cum Volume (acre-ft)	14.11	90.43	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.72	94.79	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION      RIVER: Ditch A  
REACH: 5      RS: 9690

INPUT

Description: Sta. 9690

Station Elevation Data		num= 8							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3454.5	202	3454	381	3452	632	3450	638	3450
799	3452	897	3454	1010	3458				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val

FloodPlain.rep

100    .033    381    .033    799    .033

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

381    799    639    681    658    .1    .3

CROSS SECTION OUTPUT    Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3451.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.49	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.14	Flow Area (sq ft)		238.60	
E.G. Slope (ft/ft)	0.004656	Area (sq ft)		238.60	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	313.59	Top Width (ft)		313.59	
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)		2.56	
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)		0.76	
Conv. Total (cfs)	8953.9	Conv. (cfs)		8953.9	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		313.61	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frcn Loss (ft)	4.90	Cum Volume (acre-ft)	13.86	65.88	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.21	85.26	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT    Profile #100 Yr.-WS3405

E.G. Elev (ft)	3451.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.49	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.14	Flow Area (sq ft)		238.60	
E.G. Slope (ft/ft)	0.004656	Area (sq ft)		238.60	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	313.59	Top Width (ft)		313.59	

		FloodPlain.rep			
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)		2.56	
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)		0.76	
Conv. Total (cfs)	8953.9	Conv. (cfs)		8953.9	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		313.61	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	13.86	68.71	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.21	86.57	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

#### CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3451.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.49	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.14	Flow Area (sq ft)		238.60	
E.G. Slope (ft/ft)	0.004656	Area (sq ft)		238.60	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	313.59	Top Width (ft)		313.59	
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)		2.56	
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)		0.76	
Conv. Total (cfs)	8953.9	Conv. (cfs)		8953.9	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		313.61	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	13.86	77.23	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.21	90.98	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

## FloodPlain.rep

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3451.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.49	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.14	Flow Area (sq ft)		238.60	
E.G. Slope (ft/ft)	0.004656	Area (sq ft)		238.60	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	313.59	Top Width (ft)		313.59	
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)		2.56	
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)		0.76	
Conv. Total (cfs)	8953.9	Conv. (cfs)		8953.9	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		313.61	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frcn Loss (ft)	4.90	Cum Volume (acre-ft)	14.11	87.96	2.04
C & E Loss (ft)	0.01	Cum SA (acres)	18.72	90.98	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 9009

## INPUT

Description: Sta 9009

Station	Elev	Data	num=	9
100	3452	203	3450	325
637	3446	892	3448	1007
				3450
				1124
				3452

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
100	.033	325	.033
		892	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	325	892		898	879	794	
						.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

## FloodPlain.rep

E.G. Elev (ft)	3446.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.45	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.34	Flow Area (sq ft)		159.10	
E.G. Slope (ft/ft)	0.012581	Area (sq ft)		159.10	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	239.94	Top Width (ft)		239.94	
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)		3.84	
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	5447.3	Conv. (cfs)		5447.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		239.96	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)		2.00	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	13.86	62.77	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.21	80.93	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3446.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.45	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.34	Flow Area (sq ft)		159.10	
E.G. Slope (ft/ft)	0.012581	Area (sq ft)		159.10	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	239.94	Top Width (ft)		239.94	
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)		3.84	
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	5447.3	Conv. (cfs)		5447.3	

Length Wtd. (ft)	879.00	FloodPlain.rep Wetted Per. (ft)	239.96		
Min Ch El (ft)	3445.00	Shear (lb/sq ft)	0.52		
Alpha	1.00	Stream Power (lb/ft s)	2.00		
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	13.86	65.60	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.21	82.24	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3446.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.45	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.34	Flow Area (sq ft)		159.10	
E.G. Slope (ft/ft)	0.012581	Area (sq ft)		159.10	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	239.94	Top Width (ft)		239.94	
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)		3.84	
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	5447.3	Conv. (cfs)		5447.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		239.96	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)		2.00	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	13.86	74.12	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.21	86.65	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

## FloodPlain.rep

E.G. Elev (ft)	3446.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.45	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.34	Flow Area (sq ft)		159.10	
E.G. Slope (ft/ft)	0.012581	Area (sq ft)		159.10	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	239.94	Top Width (ft)		239.94	
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)		3.84	
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	5447.3	Conv. (cfs)		5447.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		239.96	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)		2.00	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	14.11	84.86	2.04
C & E Loss (ft)	0.05	Cum SA (acres)	18.72	86.65	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 8130

## INPUT

Description: Sta. 8130

Station Elevation Data		num= 8	
Sta	Elev	Sta	Elev
100	3448	303	3444
852	3442	995	3444
		1104	3446

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	419	.033
		852	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
419	852	399	413	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3441.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	

W.S. Elev (ft)	3441.57	FloodPlain.rep Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.11	Flow Area (sq ft)		276.52	
E.G. Slope (ft/ft)	0.003204	Area (sq ft)		276.52	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	342.53	Top Width (ft)		342.53	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)		0.81	
Conv. Total (cfs)	10794.8	Conv. (cfs)		10794.8	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		342.54	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.36	
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	13.86	58.37	2.04
C & E Loss (ft)	0.02	Cum SA (acres)	18.21	75.05	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

# CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3441.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.57	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.11	Flow Area (sq ft)		276.52	
E.G. Slope (ft/ft)	0.003204	Area (sq ft)		276.52	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	342.53	Top Width (ft)		342.53	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)		0.81	
Conv. Total (cfs)	10794.8	Conv. (cfs)		10794.8	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		342.54	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.36	



Frctn Loss (ft)	2.70	FloodPlain.rep Cum Volume (acre-ft)	13.86	61.20	2.04
C & E Loss (ft)	0.02	Cum SA (acres)	18.21	76.36	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3441.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.57	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.11	Flow Area (sq ft)		276.52	
E.G. Slope (ft/ft)	0.003204	Area (sq ft)		276.52	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	342.53	Top Width (ft)		342.53	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)		0.81	
Conv. Total (cfs)	10794.8	Conv. (cfs)		10794.8	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		342.54	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.36	
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	13.86	69.73	2.04
C & E Loss (ft)	0.02	Cum SA (acres)	18.21	80.77	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3441.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.57	Reach Len. (ft)	399.00	413.00	456.00

## FloodPlain.rep

Crit W.S. (ft)	3441.11	Flow Area (sq ft)	276.52		
E.G. Slope (ft/ft)	0.003204	Area (sq ft)	276.52		
Q Total (cfs)	611.00	Flow (cfs)	611.00		
Top Width (ft)	342.53	Top Width (ft)	342.53		
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)	2.21		
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)	0.81		
Conv. Total (cfs)	10794.8	Conv. (cfs)	10794.8		
Length Wtd. (ft)	413.00	Wetted Per. (ft)	342.54		
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.16		
Alpha	1.00	Stream Power (lb/ft s)	0.36		
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	14.11	80.46	2.04
C & E Loss (ft)	0.02	Cum SA (acres)	18.72	80.77	2.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 7717

## INPUT

Description: Sta 7717

Station Elevation Data		num=	8						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	233	.033	747	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	233	747		444	464	510	.1
							.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3438.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.033		
W.S. Elev (ft)	3438.66	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.66	Flow Area (sq ft)	146.05		
E.G. Slope (ft/ft)	0.020021	Area (sq ft)	146.05		

		FloodPlain.rep			
Q Total (cfs)	611.00	Flow (cfs)	611.00		
Top Width (ft)	274.48	Top Width (ft)	274.48		
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	4.18		
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)	0.53		
Conv. Total (cfs)	4318.2	Conv. (cfs)	4318.2		
Length Wtd. (ft)	464.03	Wetted Per. (ft)	274.48		
Min Ch El (ft)	3437.80	Shear (lb/sq ft)	0.67		
Alpha	1.00	Stream Power (lb/ft s)	2.78		
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	13.86	56.37	2.04
C & E Loss (ft)	0.07	Cum SA (acres)	18.21	72.13	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3438.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.033		
W.S. Elev (ft)	3438.66	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.66	Flow Area (sq ft)	146.05		
E.G. Slope (ft/ft)	0.020021	Area (sq ft)	146.05		
Q Total (cfs)	611.00	Flow (cfs)	611.00		
Top Width (ft)	274.48	Top Width (ft)	274.48		
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	4.18		
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)	0.53		
Conv. Total (cfs)	4318.2	Conv. (cfs)	4318.2		
Length Wtd. (ft)	464.03	Wetted Per. (ft)	274.48		

Min Ch El (ft)	3437.80	FloodPlain.rep Shear (lb/sq ft)	0.67		
Alpha	1.00	Stream Power (lb/ft s)	2.78		
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	13.86	59.20	2.04
C & E Loss (ft)	0.07	Cum SA (acres)	18.21	73.44	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

#### CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3438.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.66	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.66	Flow Area (sq ft)		146.05	
E.G. Slope (ft/ft)	0.020021	Area (sq ft)		146.05	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	274.48	Top Width (ft)		274.48	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)		0.53	
Conv. Total (cfs)	4318.2	Conv. (cfs)		4318.2	
Length Wtd. (ft)	464.03	Wetted Per. (ft)		274.48	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		2.78	
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	13.86	67.73	2.04
C & E Loss (ft)	0.07	Cum SA (acres)	18.21	77.85	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.

# FloodPlain.rep

The program used critical depth for the water surface and continued on with the calculations.  
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3438.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.66	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.66	Flow Area (sq ft)		146.05	
E.G. Slope (ft/ft)	0.020021	Area (sq ft)		146.05	
Q Total (cfs)	611.00	Flow (cfs)		611.00	
Top Width (ft)	274.48	Top Width (ft)		274.48	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)		0.53	
Conv. Total (cfs)	4318.2	Conv. (cfs)		4318.2	
Length Wtd. (ft)	464.03	Wetted Per. (ft)		274.48	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		2.78	
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	14.11	78.46	2.04
C & E Loss (ft)	0.07	Cum SA (acres)	18.72	77.85	2.92

Warning: The energy equation could not be balanced within the specified number of iterations.

The program used critical depth for the water surface and continued on with the calculations.  
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## FloodPlain.rep

ndicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 7253

## INPUT

Description: Sta. 7253

Station Elevation Data		num= 9	
Sta	Elev	Sta	Elev
100	3438	109	3438.7
906	3436	1005	3438

## Manning's n Values

num= 3	
Sta	n Val
100	.033
424	.033
906	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	424	906		756	910	980	
						.1	.3

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3436.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.35	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.88	Flow Area (sq ft)	3.20	410.81	3.07
E.G. Slope (ft/ft)	0.001738	Area (sq ft)	3.20	410.81	3.07
Q Total (cfs)	697.00	Flow (cfs)	1.89	693.30	1.81
Top Width (ft)	517.58	Top Width (ft)	18.14	482.00	17.44
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)	0.59	1.69	0.59
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.18	0.85	0.18
Conv. Total (cfs)	16716.8	Conv. (cfs)	45.2	16628.1	43.5
Length Wtd. (ft)	909.92	Wetted Per. (ft)	18.15	482.00	17.44
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.02	0.09	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.16	0.01
Frctn Loss (ft)	5.38	Cum Volume (acre-ft)	13.84	53.40	2.02
C & E Loss (ft)	0.03	Cum SA (acres)	18.12	68.10	2.82

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

## FloodPlain.rep

E.G. Elev (ft)	3436.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.35	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.88	Flow Area (sq ft)	3.20	410.81	3.07
E.G. Slope (ft/ft)	0.001738	Area (sq ft)	3.20	410.81	3.07
Q Total (cfs)	697.00	Flow (cfs)	1.89	693.30	1.81
Top Width (ft)	517.58	Top Width (ft)	18.14	482.00	17.44
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)	0.59	1.69	0.59
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.18	0.85	0.18
Conv. Total (cfs)	16716.8	Conv. (cfs)	45.2	16628.1	43.5
Length Wtd. (ft)	909.92	Wetted Per. (ft)	18.15	482.00	17.44
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.02	0.09	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.16	0.01
Frctn Loss (ft)	5.38	Cum Volume (acre-ft)	13.84	56.24	2.02
C & E Loss (ft)	0.03	Cum SA (acres)	18.12	69.41	2.82

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3436.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.35	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.88	Flow Area (sq ft)	3.20	410.81	3.07
E.G. Slope (ft/ft)	0.001738	Area (sq ft)	3.20	410.81	3.07
Q Total (cfs)	697.00	Flow (cfs)	1.89	693.30	1.81
Top Width (ft)	517.58	Top Width (ft)	18.14	482.00	17.44
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)	0.59	1.69	0.59
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.18	0.85	0.18
Conv. Total (cfs)	16716.8	Conv. (cfs)	45.2	16628.1	43.5

Length Wtd. (ft)	909.92	FloodPlain.rep Wetted Per. (ft)	18.15	482.00	17.44
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.02	0.09	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.16	0.01
Frctn Loss (ft)	5.38	Cum Volume (acre-ft)	13.84	64.76	2.02
C & E Loss (ft)	0.03	Cum SA (acres)	18.12	73.82	2.82

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3436.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.35	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.88	Flow Area (sq ft)	3.20	410.81	3.07
E.G. Slope (ft/ft)	0.001738	Area (sq ft)	3.20	410.81	3.07
Q Total (cfs)	697.00	Flow (cfs)	1.89	693.30	1.81
Top Width (ft)	517.58	Top Width (ft)	18.14	482.00	17.44
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)	0.59	1.69	0.59
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.18	0.85	0.18
Conv. Total (cfs)	16716.8	Conv. (cfs)	45.2	16628.1	43.5
Length Wtd. (ft)	909.92	Wetted Per. (ft)	18.15	482.00	17.44
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.02	0.09	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.16	0.01
Frctn Loss (ft)	5.38	Cum Volume (acre-ft)	14.10	75.49	2.02
C & E Loss (ft)	0.03	Cum SA (acres)	18.63	73.82	2.82

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION      RIVER: Ditch A  
REACH: 5              RS: 6343



# FloodPlain.rep

## INPUT

Description: Sta. 6343

Station Elevation Data		num= 9	
Sta	Elev	Sta	Elev
100	3434	346	3433
981	3430	1273	3430

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	663	.033
		1320	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	663	1320		767	980	1051	.1

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3431.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.70	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.70	Flow Area (sq ft)		303.78	
E.G. Slope (ft/ft)	0.019035	Area (sq ft)		303.78	
Q Total (cfs)	1328.00	Flow (cfs)		1328.00	
Top Width (ft)	514.60	Top Width (ft)		514.60	
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)		4.37	
Max Chl Dpth (ft)	0.70	Hydr. Depth (ft)		0.59	
Conv. Total (cfs)	9625.4	Conv. (cfs)		9625.4	
Length Wtd. (ft)	979.93	Wetted Per. (ft)		514.61	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		3.07	
Frctn Loss (ft)	4.06	Cum Volume (acre-ft)	13.81	45.94	1.99
C & E Loss (ft)	0.07	Cum SA (acres)	17.96	57.69	2.63

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3431.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.70	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.70	Flow Area (sq ft)		303.78	
E.G. Slope (ft/ft)	0.019035	Area (sq ft)		303.78	
Q Total (cfs)	1328.00	Flow (cfs)		1328.00	
Top Width (ft)	514.60	Top Width (ft)		514.60	
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)		4.37	
Max Chl Dpth (ft)	0.70	Hydr. Depth (ft)		0.59	
Conv. Total (cfs)	9625.4	Conv. (cfs)		9625.4	
Length Wtd. (ft)	979.93	Wetted Per. (ft)		514.61	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		3.07	
Frctn Loss (ft)	4.06	Cum Volume (acre-ft)	13.81	48.77	1.99
C & E Loss (ft)	0.07	Cum SA (acres)	17.96	59.00	2.63

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3431.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.70	Reach Len. (ft)	767.00	980.00	1051.00

Crit W.S. (ft)	3430.70	FloodPlain.rep Flow Area (sq ft)	303.78		
E.G. Slope (ft/ft)	0.019035	Area (sq ft)	303.78		
Q Total (cfs)	1328.00	Flow (cfs)	1328.00		
Top Width (ft)	514.60	Top Width (ft)	514.60		
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)	4.37		
Max Chl Dpth (ft)	0.70	Hydr. Depth (ft)	0.59		
Conv. Total (cfs)	9625.4	Conv. (cfs)	9625.4		
Length Wtd. (ft)	979.93	Wetted Per. (ft)	514.61		
Min Ch El (ft)	3430.00	Shear (lb/sq ft)	0.70		
Alpha	1.00	Stream Power (lb/ft s)	3.07		
Frctn Loss (ft)	4.06	Cum Volume (acre-ft)	13.81	57.30	1.99
C & E Loss (ft)	0.07	Cum SA (acres)	17.96	63.41	2.63

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

# CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3431.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.70	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.70	Flow Area (sq ft)		303.78	
E.G. Slope (ft/ft)	0.019035	Area (sq ft)		303.78	
Q Total (cfs)	1328.00	Flow (cfs)		1328.00	
Top Width (ft)	514.60	Top Width (ft)		514.60	
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)		4.37	
Max Chl Dpth (ft)	0.70	Hydr. Depth (ft)		0.59	

Conv. Total (cfs)	9625.4	FloodPlain.rep Conv. (cfs)	9625.4
Length Wtd. (ft)	979.93	Wetted Per. (ft)	514.61
Min Ch El (ft)	3430.00	Shear (lb/sq ft)	0.70
Alpha	1.00	Stream Power (lb/ft s)	3.07
Frctn Loss (ft)	4.06	Cum Volume (acre-ft)	14.07 68.03 1.99
C & E Loss (ft)	0.07	Cum SA (acres)	18.47 63.41 2.63

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 5363

#### INPUT

Description: Sta. 5363

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3432	282	3430	550	3428	742	3426	885	3425
1097	3425	1476	3426	1877	3428	1966	3428	2160	3430

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	742	.033	1476	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	742	1476		1199 1142	713	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3426.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.33	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.78	Flow Area (sq ft)	5.09	712.05	10.63
E.G. Slope (ft/ft)	0.001763	Area (sq ft)	5.09	712.05	10.63
Q Total (cfs)	1328.00	Flow (cfs)	2.87	1319.14	5.99
Top Width (ft)	830.57	Top Width (ft)	31.27	734.00	65.30

## FloodPlain.rep

Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	0.56	1.85	0.56
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.16	0.97	0.16
Conv. Total (cfs)	31630.8	Conv. (cfs)	68.4	31419.6	142.8
Length Wtd. (ft)	1141.15	Wetted Per. (ft)	31.27	734.00	65.30
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.20	0.01
Frctn Loss (ft)	5.02	Cum Volume (acre-ft)	13.77	34.51	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	17.68	43.64	1.84

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3426.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.33	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.78	Flow Area (sq ft)	5.09	712.05	10.63
E.G. Slope (ft/ft)	0.001763	Area (sq ft)	5.09	712.05	10.63
Q Total (cfs)	1328.00	Flow (cfs)	2.87	1319.14	5.99
Top Width (ft)	830.57	Top Width (ft)	31.27	734.00	65.30
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	0.56	1.85	0.56
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.16	0.97	0.16
Conv. Total (cfs)	31630.8	Conv. (cfs)	68.4	31419.6	142.8
Length Wtd. (ft)	1141.15	Wetted Per. (ft)	31.27	734.00	65.30
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.20	0.01
Frctn Loss (ft)	5.02	Cum Volume (acre-ft)	13.77	37.34	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	17.68	44.95	1.84

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

## FloodPlain.rep

ons.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3426.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.33	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.78	Flow Area (sq ft)	5.09	712.05	10.63
E.G. Slope (ft/ft)	0.001763	Area (sq ft)	5.09	712.05	10.63
Q Total (cfs)	1328.00	Flow (cfs)	2.87	1319.14	5.99
Top Width (ft)	830.57	Top Width (ft)	31.27	734.00	65.30
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	0.56	1.85	0.56
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.16	0.97	0.16
Conv. Total (cfs)	31630.8	Conv. (cfs)	68.4	31419.6	142.8
Length Wtd. (ft)	1141.15	Wetted Per. (ft)	31.27	734.00	65.30
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.20	0.01
Frctn Loss (ft)	5.02	Cum Volume (acre-ft)	13.77	45.87	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	17.68	49.36	1.84

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3426.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.33	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.78	Flow Area (sq ft)	5.09	712.05	10.63
E.G. Slope (ft/ft)	0.001763	Area (sq ft)	5.09	712.05	10.63
Q Total (cfs)	1328.00	Flow (cfs)	2.87	1319.14	5.99
Top Width (ft)	830.57	Top Width (ft)	31.27	734.00	65.30

Vel Total (ft/s)	1.82	FloodPlain.rep Avg. Vel. (ft/s)	0.56	1.85	0.56
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.16	0.97	0.16
Conv. Total (cfs)	31630.8	Conv. (cfs)	68.4	31419.6	142.8
Length Wtd. (ft)	1141.15	Wetted Per. (ft)	31.27	734.00	65.30
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.20	0.01
Frctn Loss (ft)	5.02	Cum Volume (acre-ft)	14.03	56.60	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	18.20	49.36	1.84

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 4221

#### INPUT

Description: Sta. 4221

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
100	3423	341	3422	544 3421 640 3420 669 3420
753	3420.2	829	3420	837 3420 1030 3421 1320 3422
1407	3423	1497	3424	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
100	.033	544	.033
		1407	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	544	1407		749 732	843	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3421.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3420.99	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3420.99	Flow Area (sq ft)		321.48	
E.G. Slope (ft/ft)	0.018533	Area (sq ft)		321.48	
Q Total (cfs)	1501.00	Flow (cfs)		1501.00	
Top Width (ft)	483.60	Top Width (ft)		483.60	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.66	

Conv. Total (cfs)	11025.7	FloodPlain.rep Conv. (cfs)	11025.7
Length Wtd. (ft)	736.75	Wetted Per. (ft)	483.61
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.77
Alpha	1.00	Stream Power (lb/ft s)	3.59
Frctn Loss (ft)	3.65	Cum Volume (acre-ft)	13.70 20.96 1.77
C & E Loss (ft)	0.09	Cum SA (acres)	17.25 27.68 1.30

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3421.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3420.99	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3420.99	Flow Area (sq ft)		321.48	
E.G. Slope (ft/ft)	0.018533	Area (sq ft)		321.48	
Q Total (cfs)	1501.00	Flow (cfs)		1501.00	
Top Width (ft)	483.60	Top Width (ft)		483.60	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	11025.7	Conv. (cfs)		11025.7	
Length Wtd. (ft)	736.75	Wetted Per. (ft)		483.61	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		3.59	
Frctn Loss (ft)	3.65	Cum Volume (acre-ft)	13.70	23.80	1.77
C & E Loss (ft)	0.09	Cum SA (acres)	17.25	28.99	1.30



FloodPlain.rep

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3421.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3420.99	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3420.99	Flow Area (sq ft)		321.48	
E.G. Slope (ft/ft)	0.018533	Area (sq ft)		321.48	
Q Total (cfs)	1501.00	Flow (cfs)		1501.00	
Top Width (ft)	483.60	Top Width (ft)		483.60	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	11025.7	Conv. (cfs)		11025.7	
Length Wtd. (ft)	736.75	Wetted Per. (ft)		483.61	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		3.59	
Frctn Loss (ft)	3.65	Cum Volume (acre-ft)	13.70	32.32	1.77
C & E Loss (ft)	0.09	Cum SA (acres)	17.25	33.40	1.30

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

FloodPlain.rep

section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3421.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3420.99	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3420.99	Flow Area (sq ft)		321.48	
E.G. Slope (ft/ft)	0.018533	Area (sq ft)		321.48	
Q Total (cfs)	1501.00	Flow (cfs)		1501.00	
Top Width (ft)	483.60	Top Width (ft)		483.60	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	11025.7	Conv. (cfs)		11025.7	
Length Wtd. (ft)	736.75	Wetted Per. (ft)		483.61	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		3.59	
Frctn Loss (ft)	3.65	Cum Volume (acre-ft)	13.96	43.05	1.77
C & E Loss (ft)	0.09	Cum SA (acres)	17.77	33.40	1.30

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 3489

INPUT

## FloodPlain.rep

Description: Sta. 3489

Station Elevation Data		num= 22							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-286	3420	-138	3418.5	-126	3418	-104	3416	-91	3415.5
-76	3416	-21	3417	100	3417	258	3416.5	299	3416
309	3415	318	3416	405	3416	422	3416	539	3416.4
581	3416.2	642	3416.4	744	3416	830	3416	918	3418
1068	3420	1159	3421						

Manning's n Values

		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-286	.033	539	.033	918	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	539	918		464 500	457	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3417.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.18	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.67	Flow Area (sq ft)	482.21	322.70	
E.G. Slope (ft/ft)	0.002251	Area (sq ft)	482.21	322.70	
Q Total (cfs)	1501.00	Flow (cfs)	838.96	662.05	
Top Width (ft)	998.90	Top Width (ft)	655.98	342.92	
Vel Total (ft/s)	1.86	Avg. Vel. (ft/s)	1.74	2.05	
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)	0.74	0.94	
Conv. Total (cfs)	31635.3	Conv. (cfs)	17681.9	13953.4	
Length Wtd. (ft)	481.78	Wetted Per. (ft)	656.17	342.93	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.10	0.13	
Alpha	1.02	Stream Power (lb/ft s)	0.18	0.27	
Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	9.55	15.55	1.77
C & E Loss (ft)	0.02	Cum SA (acres)	11.61	20.74	1.30

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3417.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	

## FloodPlain.rep

W.S. Elev (ft)	3417.18	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.67	Flow Area (sq ft)	482.21	322.70	
E.G. Slope (ft/ft)	0.002251	Area (sq ft)	482.21	322.70	
Q Total (cfs)	1501.00	Flow (cfs)	838.96	662.05	
Top Width (ft)	998.90	Top Width (ft)	655.98	342.92	
Vel Total (ft/s)	1.86	Avg. Vel. (ft/s)	1.74	2.05	
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)	0.74	0.94	
Conv. Total (cfs)	31635.3	Conv. (cfs)	17681.9	13953.4	
Length Wtd. (ft)	481.78	Wetted Per. (ft)	656.17	342.93	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.10	0.13	
Alpha	1.02	Stream Power (lb/ft s)	0.18	0.27	
Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	9.55	18.38	1.77
C & E Loss (ft)	0.02	Cum SA (acres)	11.61	22.05	1.30

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3417.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.18	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.67	Flow Area (sq ft)	482.21	322.70	
E.G. Slope (ft/ft)	0.002251	Area (sq ft)	482.21	322.70	
Q Total (cfs)	1501.00	Flow (cfs)	838.96	662.05	
Top Width (ft)	998.90	Top Width (ft)	655.98	342.92	
Vel Total (ft/s)	1.86	Avg. Vel. (ft/s)	1.74	2.05	
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)	0.74	0.94	
Conv. Total (cfs)	31635.3	Conv. (cfs)	17681.9	13953.4	
Length Wtd. (ft)	481.78	Wetted Per. (ft)	656.17	342.93	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.10	0.13	
Alpha	1.02	Stream Power (lb/ft s)	0.18	0.27	

## FloodPlain.rep

Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	9.55	26.91	1.77
C & E Loss (ft)	0.02	Cum SA (acres)	11.61	26.46	1.30

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3417.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.18	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.67	Flow Area (sq ft)	482.21	322.70	
E.G. Slope (ft/ft)	0.002251	Area (sq ft)	482.21	322.70	
Q Total (cfs)	1501.00	Flow (cfs)	838.96	662.05	
Top Width (ft)	998.90	Top Width (ft)	655.98	342.92	
Vel Total (ft/s)	1.86	Avg. Vel. (ft/s)	1.74	2.05	
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)	0.74	0.94	
Conv. Total (cfs)	31635.3	Conv. (cfs)	17681.9	13953.4	
Length Wtd. (ft)	481.78	Wetted Per. (ft)	656.17	342.93	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.10	0.13	
Alpha	1.02	Stream Power (lb/ft s)	0.18	0.27	
Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	9.81	37.64	1.77
C & E Loss (ft)	0.02	Cum SA (acres)	12.13	26.46	1.30

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 2989

## INPUT

Description: Sta. 2989

Station Elevation Data

num=

14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-----	------	-----	------	-----	------	-----	------	-----	------

				FloodPlain.rep					
-31	3416	59	3414.8	170	3414.8	196	3414	436	3413.8
613	3414	651	3414	700	3414	747	3414	761	3414
841	3415.01	920	3416	976	3418	1067	3420		

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
-31 .033	436 .033	841 .033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
436	841	317	215	172	.3	.5

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3414.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.52	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.52	Flow Area (sq ft)	153.63	198.04	
E.G. Slope (ft/ft)	0.019219	Area (sq ft)	153.63	198.04	
Q Total (cfs)	1501.00	Flow (cfs)	680.62	820.38	
Top Width (ft)	623.28	Top Width (ft)	256.96	366.32	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)	4.43	4.14	
Max Chl Dpth (ft)	0.72	Hydr. Depth (ft)	0.60	0.54	
Conv. Total (cfs)	10827.1	Conv. (cfs)	4909.5	5917.6	
Length Wtd. (ft)	252.84	Wetted Per. (ft)	256.96	366.33	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.72	0.65	
Alpha	1.00	Stream Power (lb/ft s)	3.18	2.69	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	6.17	12.56	1.77
C & E Loss (ft)	0.12	Cum SA (acres)	6.75	16.67	1.30

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3414.81	Element	Left OB	Channel	Right OB
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## FloodPlain.rep

Vel Head (ft)	0.28	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.52	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.52	Flow Area (sq ft)	153.63	198.04	
E.G. Slope (ft/ft)	0.019219	Area (sq ft)	153.63	198.04	
Q Total (cfs)	1501.00	Flow (cfs)	680.62	820.38	
Top Width (ft)	623.28	Top Width (ft)	256.96	366.32	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)	4.43	4.14	
Max Chl Dpth (ft)	0.72	Hydr. Depth (ft)	0.60	0.54	
Conv. Total (cfs)	10827.1	Conv. (cfs)	4909.5	5917.6	
Length Wtd. (ft)	252.84	Wetted Per. (ft)	256.96	366.33	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.72	0.65	
Alpha	1.00	Stream Power (lb/ft s)	3.18	2.69	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	6.17	15.40	1.77
C & E Loss (ft)	0.12	Cum SA (acres)	6.75	17.98	1.30

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3414.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.52	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.52	Flow Area (sq ft)	153.63	198.04	
E.G. Slope (ft/ft)	0.019219	Area (sq ft)	153.63	198.04	
Q Total (cfs)	1501.00	Flow (cfs)	680.62	820.38	
Top Width (ft)	623.28	Top Width (ft)	256.96	366.32	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)	4.43	4.14	



		FloodPlain.rep			
Max Chl Dpth (ft)	0.72	Hydr. Depth (ft)	0.60	0.54	
Conv. Total (cfs)	10827.1	Conv. (cfs)	4909.5	5917.6	
Length Wtd. (ft)	252.84	Wetted Per. (ft)	256.96	366.33	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.72	0.65	
Alpha	1.00	Stream Power (lb/ft s)	3.18	2.69	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	6.17	23.92	1.77
C & E Loss (ft)	0.12	Cum SA (acres)	6.75	22.39	1.30

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3414.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.52	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.52	Flow Area (sq ft)	153.63	198.04	
E.G. Slope (ft/ft)	0.019219	Area (sq ft)	153.63	198.04	
Q Total (cfs)	1501.00	Flow (cfs)	680.62	820.38	
Top Width (ft)	623.28	Top Width (ft)	256.96	366.32	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)	4.43	4.14	
Max Chl Dpth (ft)	0.72	Hydr. Depth (ft)	0.60	0.54	
Conv. Total (cfs)	10827.1	Conv. (cfs)	4909.5	5917.6	
Length Wtd. (ft)	252.84	Wetted Per. (ft)	256.96	366.33	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.72	0.65	
Alpha	1.00	Stream Power (lb/ft s)	3.18	2.69	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	6.42	34.65	1.77
C & E Loss (ft)	0.12	Cum SA (acres)	7.27	22.39	1.30



FloodPlain.rep

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 2774

INPUT

Description: Sta. 2774 Upstream of culverts

Station	Elevation	Data	num=	18	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8			
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2			
402	3410.9	437	3410	469	3409	491	3409	511	3410			
560	3412	641	3414	725	3416							

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	437	511		40	40		.3	.5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-888 F  
888 F

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3414.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.99	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	761.53	343.24	226.67
E.G. Slope (ft/ft)	0.000278	Area (sq ft)	761.53	343.24	226.67
Q Total (cfs)	1501.00	Flow (cfs)	537.33	716.64	247.03
Top Width (ft)	1039.64	Top Width (ft)	836.05	74.00	129.58
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.71	2.09	1.09
Max Chl Dpth (ft)	4.99	Hydr. Depth (ft)	0.91	4.64	1.75
Conv. Total (cfs)	90001.4	Conv. (cfs)	32219.0	42970.2	14812.2
Length Wtd. (ft)	40.00	Wetted Per. (ft)	836.13	74.04	129.65
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.02	0.08	0.03

## FloodPlain.rep

Alpha	1.93	Stream Power (lb/ft s)	0.01	0.17	0.03
Frctn Loss (ft)		Cum Volume (acre-ft)	2.84	11.23	1.32
C & E Loss (ft)		Cum SA (acres)	2.77	15.58	1.05

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3414.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.99	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	761.53	343.24	226.67
E.G. Slope (ft/ft)	0.000278	Area (sq ft)	761.53	343.24	226.67
Q Total (cfs)	1501.00	Flow (cfs)	537.33	716.64	247.03
Top Width (ft)	1039.64	Top Width (ft)	836.05	74.00	129.58
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.71	2.09	1.09
Max Chl Dpth (ft)	4.99	Hydr. Depth (ft)	0.91	4.64	1.75
Conv. Total (cfs)	90001.4	Conv. (cfs)	32219.0	42970.2	14812.2
Length Wtd. (ft)	40.00	Wetted Per. (ft)	836.13	74.04	129.65
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.02	0.08	0.03
Alpha	1.93	Stream Power (lb/ft s)	0.01	0.17	0.03
Frctn Loss (ft)		Cum Volume (acre-ft)	2.84	14.06	1.32
C & E Loss (ft)		Cum SA (acres)	2.77	16.89	1.05

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3414.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.99	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	761.53	343.24	226.67

E.G. Slope (ft/ft)	0.000278	FloodPlain.rep Area (sq ft)	761.53	343.24	226.67
Q Total (cfs)	1501.00	Flow (cfs)	537.33	716.64	247.03
Top Width (ft)	1039.64	Top Width (ft)	836.05	74.00	129.58
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.71	2.09	1.09
Max Chl Dpth (ft)	4.99	Hydr. Depth (ft)	0.91	4.64	1.75
Conv. Total (cfs)	90001.4	Conv. (cfs)	32219.0	42970.2	14812.2
Length Wtd. (ft)	40.00	Wetted Per. (ft)	836.13	74.04	129.65
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.02	0.08	0.03
Alpha	1.93	Stream Power (lb/ft s)	0.01	0.17	0.03
Frctn Loss (ft)		Cum Volume (acre-ft)	2.84	22.58	1.32
C & E Loss (ft)		Cum SA (acres)	2.77	21.30	1.05

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3414.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.99	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	761.53	343.24	226.67
E.G. Slope (ft/ft)	0.000278	Area (sq ft)	761.53	343.24	226.67
Q Total (cfs)	1501.00	Flow (cfs)	537.33	716.64	247.03
Top Width (ft)	1039.64	Top Width (ft)	836.05	74.00	129.58
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.71	2.09	1.09
Max Chl Dpth (ft)	4.99	Hydr. Depth (ft)	0.91	4.64	1.75
Conv. Total (cfs)	90001.4	Conv (cfs)	32219.0	42970.2	14812.2
Length Wtd. (ft)	40.00	Wetted Per. (ft)	836.13	74.04	129.65
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.02	0.08	0.03
Alpha	1.93	Stream Power (lb/ft s)	0.01	0.17	0.03
Frctn Loss (ft)		Cum Volume (acre-ft)	3.09	33.31	1.32
C & E Loss (ft)		Cum SA (acres)	3.29	21.30	1.05

## FloodPlain.rep

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CULVERT RIVER: Ditch A  
REACH: 5 RS: 2773

## INPUT

## Description:

Distance from Upstream XS = 8  
Deck/Roadway Width = 24  
Weir Coefficient = 3

## Upstream Deck/Roadway Coordinates

num= 6														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
26	3413.8				100	3413.8				402	3412.7			
500	3412.8				600	3413.9				700	3415.7			

## Upstream Bridge Cross Section Data

Station Elevation Data num= 18									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

## Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	437	511		.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

## Downstream Deck/Roadway Coordinates

num= 6														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
26	3413.8				100	3413.8				402	3412.7			
500	3412.8				600	3413.9				700	3415.7			

## Downstream Bridge Cross Section Data

Station Elevation Data num= 17									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

## Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	349	434		.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

Upstream Embankment side slope = 3 horiz. to 1.0 vertical  
Downstream Embankment side slope = 3 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .95

FloodPlain.rep  
 Elevation at which weir flow begins = 3412.7  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Pipe Arch 1.833 2.43  
 FHWA Chart # 34- 18 inch corner radius; Corrugated metal  
 FHWA Scale # 1 - 90 Degree headwall  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length n Value Entrance Loss Coef Exit Loss Coef  
 1 39 .024 .5 1

Number of Barrels = 6  
 Upstream Elevation = 3409  
 Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
469	473.4	477.8	482.2	486.6	491

Downstream Elevation = 3408.9

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
387	391.4	395.8	400.2	404.6	409

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 2734

#### INPUT

Description: Sta. 2734 Downstream of culverts

Station	Elevation	Data	num=	17	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412			
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9			
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412			
568	3414	658	3416									

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	349	434		745	846	1015	.3
Ineffective Flow	num=		2				
Sta L	Sta R	Elev	Permanent				
-888	F						
888	F						

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3412.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.001004	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	1501.00	Flow (cfs)	404.03	931.98	164.98
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	1.46	3.22	1.64

FloodPlain.rep

Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.07	0.21	0.08
Alpha	1.44	Stream Power (lb/ft s)	0.10	0.69	0.13
Frctn Loss (ft)	1.67	Cum Volume (acre-ft)	2.36	10.94	1.17
C & E Loss (ft)	0.00	Cum SA (acres)	2.27	15.51	0.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3412.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.001004	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	1501.00	Flow (cfs)	404.03	931.98	164.98
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	1.46	3.22	1.64
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.07	0.21	0.08

Alpha	1.44	FloodPlain.rep Stream Power (lb/ft s)	0.10	0.69	0.13
Frctn Loss (ft)	2.25	Cum Volume (acre-ft)	2.36	13.77	1.17
C & E Loss (ft)	0.05	Cum SA (acres)	2.27	16.82	0.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

#### CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3412.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.001004	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	1501.00	Flow (cfs)	404.03	931.98	164.98
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	1.46	3.22	1.64
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.07	0.21	0.08
Alpha	1.44	Stream Power (lb/ft s)	0.10	0.69	0.13
Frctn Loss (ft)	2.25	Cum Volume (acre-ft)	2.36	22.29	1.17
C & E Loss (ft)	0.05	Cum SA (acres)	2.27	21.23	0.95



## FloodPlain.rep

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3412.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.001004	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	1501.00	Flow (cfs)	404.03	931.98	164.98
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	1.46	3.22	1.64
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.07	0.21	0.08
Alpha	1.44	Stream Power (lb/ft s)	0.10	0.69	0.13
Frctn Loss (ft)	2.25	Cum Volume (acre-ft)	2.62	33.02	1.17
C & E Loss (ft)	0.05	Cum SA (acres)	2.78	21.23	0.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross



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section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.  
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1888

INPUT

Description: Sta. 1888

Station Elevation Data		num= 10		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-775	3412	-41	3410	81	3410	100	3410.2	110	3410
331	3408	532	3408	690	3408	1180	3410	1268	3412

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
-775	.033	100	.033	1180	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	1180		305 828	980	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3409.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.		0.033	
W.S. Elev (ft)	3408.41	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.72	Flow Area (sq ft)		175.18	
E.G. Slope (ft/ft)	0.151914	Area (sq ft)		175.18	
Q Total (cfs)	1521.00	Flow (cfs)		1521.00	
Top Width (ft)	503.42	Top Width (ft)		503.42	
Vel Total (ft/s)	8.68	Avg. Vel. (ft/s)		8.68	
Max Chl Dpth (ft)	0.41	Hydr. Depth (ft)		0.35	
Conv. Total (cfs)	3902.4	Conv. (cfs)		3902.4	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		503.42	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		3.30	
Alpha	1.00	Stream Power (lb/ft s)		28.65	
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)		6.43	
C & E Loss (ft)	0.32	Cum SA (acres)		9.79	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the n

## FloodPlain.rep

eed for

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3409.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.		0.033	
W.S. Elev (ft)	3408.41	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.72	Flow Area (sq ft)		175.18	
E.G. Slope (ft/ft)	0.151914	Area (sq ft)		175.18	
Q Total (cfs)	1521.00	Flow (cfs)		1521.00	
Top Width (ft)	503.42	Top Width (ft)		503.42	
Vel Total (ft/s)	8.68	Avg. Vel. (ft/s)		8.68	
Max Chl Dpth (ft)	0.41	Hydr. Depth (ft)		0.35	
Conv. Total (cfs)	3902.4	Conv. (cfs)		3902.4	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		503.42	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		3.30	
Alpha	1.00	Stream Power (lb/ft s)		28.65	
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)		9.26	
C & E Loss (ft)	0.32	Cum SA (acres)		11.11	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3409.58	Element	Left OB	Channel	Right OB
----------------	---------	---------	---------	---------	----------

## FloodPlain.rep

Vel Head (ft)	1.17	Wt. n-Val.	0.033		
W.S. Elev (ft)	3408.41	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.72	Flow Area (sq ft)		175.18	
E.G. Slope (ft/ft)	0.151914	Area (sq ft)		175.18	
Q Total (cfs)	1521.00	Flow (cfs)		1521.00	
Top Width (ft)	503.42	Top Width (ft)		503.42	
Vel Total (ft/s)	8.68	Avg. Vel. (ft/s)		8.68	
Max Chl Dpth (ft)	0.41	Hydr. Depth (ft)		0.35	
Conv. Total (cfs)	3902.4	Conv. (cfs)		3902.4	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		503.42	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		3.30	
Alpha	1.00	Stream Power (lb/ft s)		28.65	
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)		17.79	
C & E Loss (ft)	0.32	Cum SA (acres)		15.51	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3409.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.		0.033	
W.S. Elev (ft)	3408.41	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.72	Flow Area (sq ft)		175.18	
E.G. Slope (ft/ft)	0.151914	Area (sq ft)		175.18	
Q Total (cfs)	1521.00	Flow (cfs)		1521.00	
Top Width (ft)	503.42	Top Width (ft)		503.42	
Vel Total (ft/s)	8.68	Avg. Vel. (ft/s)		8.68	
Max Chl Dpth (ft)	0.41	Hydr. Depth (ft)		0.35	

## FloodPlain.rep

Conv. Total (cfs)	3902.4	Conv. (cfs)	3902.4
Length Wtd. (ft)	825.65	Wetted Per. (ft)	503.42
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	3.30
Alpha	1.00	Stream Power (lb/ft s)	28.65
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)	0.26 28.52
C & E Loss (ft)	0.32	Cum SA (acres)	0.51 15.51

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1060

## INPUT

Description: Sta. 1060

Station Elevation Data		num= 6							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3408	394	3406	879	3402.7	909	3402.7	1206	3405
1523	3406								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	394	.033	1523	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	394	1523		60 60	60	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3404.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.033	
W.S. Elev (ft)	3404.50	Reach Len. (ft)			
Crit W.S. (ft)	3404.11	Flow Area (sq ft)		501.30	
E.G. Slope (ft/ft)	0.005270	Area (sq ft)		501.30	
Q Total (cfs)	1585.00	Flow (cfs)		1585.00	
Top Width (ft)	526.98	Top Width (ft)		526.98	
Vel Total (ft/s)	3.16	Avg. Vel. (ft/s)		3.16	

Max Chl Dpth (ft)	1.80	FloodPlain.rep Hydr. Depth (ft)	0.95
Conv. Total (cfs)	21832.6	Conv. (cfs)	21832.6
Length Wtd. (ft)		Wetted Per. (ft)	527.00
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	0.31
Alpha	1.00	Stream Power (lb/ft s)	0.99
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3405.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.033	
W.S. Elev (ft)	3405.00	Reach Len. (ft)			
Crit W.S. (ft)	3404.11	Flow Area (sq ft)		799.30	
E.G. Slope (ft/ft)	0.001518	Area (sq ft)		799.30	
Q Total (cfs)	1585.00	Flow (cfs)		1585.00	
Top Width (ft)	665.03	Top Width (ft)		665.03	
Vel Total (ft/s)	1.98	Avg. Vel. (ft/s)		1.98	
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)		1.20	
Conv. Total (cfs)	40684.8	Conv. (cfs)		40684.8	
Length Wtd. (ft)		Wetted Per. (ft)		665.05	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3406.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.033	

## FloodPlain.rep

W.S. Elev (ft)	3406.00	Reach Len. (ft)	
Crit W.S. (ft)	3404.11	Flow Area (sq ft)	1696.32
E.G. Slope (ft/ft)	0.000250	Area (sq ft)	1696.32
Q Total (cfs)	1585.00	Flow (cfs)	1585.00
Top Width (ft)	1129.00	Top Width (ft)	1129.00
Vel Total (ft/s)	0.93	Avg. Vel. (ft/s)	0.93
Max Chl Dpth (ft)	3.30	Hydr. Depth (ft)	1.50
Conv. Total (cfs)	100198.1	Conv. (cfs)	100198.1
Length Wtd. (ft)		Wetted Per. (ft)	1129.02
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	0.02
Alpha	1.00	Stream Power (lb/ft s)	0.02
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3407.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3407.00	Reach Len. (ft)			
Crit W.S. (ft)	3404.11	Flow Area (sq ft)	73.50	2825.32	
E.G. Slope (ft/ft)	0.000045	Area (sq ft)	73.50	2825.32	
Q Total (cfs)	1585.00	Flow (cfs)	13.98	1571.02	
Top Width (ft)	1276.00	Top Width (ft)	147.00	1129.00	
Vel Total (ft/s)	0.55	Avg. Vel. (ft/s)	0.19	0.56	
Max Chl Dpth (ft)	4.30	Hydr. Depth (ft)	0.50	2.50	
Conv. Total (cfs)	236437.3	Conv. (cfs)	2084.9	234352.5	
Length Wtd. (ft)		Wetted Per. (ft)	147.00	1130.02	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	0.00	0.01	
Alpha	1.03	Stream Power (lb/ft s)	0.00	0.00	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

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Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta.	Left	Channel	Right
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

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SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS  
River: Ditch A

Reach	River Sta.	Contr.	Expan.
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	
5	2734		.5
5	1888	.1	.3
5	1060	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. S	
lope	Vel Chnl	Flow Area	Top Width	Froude #	Chl			
/ft)	(ft/s)	(sq ft)	(ft)	(cfs)	(ft)	(ft)	(ft)	
5		12674	488.00	3477.00	3478.35	3477.98	3478.42	0.00
3073	2.23	223.75	301.04	0.43				
5		12674	488.00	3477.00	3478.35	3477.98	3478.42	0.00
3073	2.23	223.75	301.04	0.43				
5		12674	488.00	3477.00	3478.35	3477.98	3478.42	0.00
3073	2.23	223.75	301.04	0.43				
5		12674	488.00	3477.00	3478.35	3477.98	3478.42	0.00
3073	2.23	223.75	301.04	0.43				
5		11337	488.00	3469.00	3470.36	3470.33	3470.73	0.01
4260	4.87	101.95	130.23	0.92				
5		11337	488.00	3469.00	3470.36	3470.33	3470.73	0.01
4260	4.87	101.95	130.23	0.92				
5		11337	488.00	3469.00	3470.36	3470.33	3470.73	0.01
4260	4.87	101.95	130.23	0.92				
5		11337	488.00	3469.00	3470.36	3470.33	3470.73	0.01
4260	4.87	101.95	130.23	0.92				
5		10937	488.00	3464.00	3465.74	3465.55	3466.02	0.00
9772	4.21	116.03	126.27	0.77				
5		10937	488.00	3464.00	3465.74	3465.55	3466.02	0.00
9772	4.21	116.03	126.27	0.77				
5		10937	488.00	3464.00	3465.74	3465.55	3466.02	0.00
9772	4.21	116.03	126.27	0.77				
5		10937	488.00	3464.00	3465.74	3465.55	3466.02	0.00



				FloodPlain.rep				
9772	4.21	116.03	126.27	0.77				
5		10288	488.00	3456.00	3456.90	3456.90	3457.15	0.02
0388	4.04	120.78	242.43	1.01				
5		10288	488.00	3456.00	3456.90	3456.90	3457.15	0.02
0388	4.04	120.78	242.43	1.01				
5		10288	488.00	3456.00	3456.90	3456.90	3457.15	0.02
0388	4.04	120.78	242.43	1.01				
5		10288	488.00	3456.00	3456.90	3456.90	3457.15	0.02
0388	4.04	120.78	242.43	1.01				
5		9690	611.00	3450.00	3451.49	3451.14	3451.60	0.00
4656	2.56	238.60	313.59	0.52				
5		9690	611.00	3450.00	3451.49	3451.14	3451.60	0.00
4656	2.56	238.60	313.59	0.52				
5		9690	611.00	3450.00	3451.49	3451.14	3451.60	0.00
4656	2.56	238.60	313.59	0.52				
5		9690	611.00	3450.00	3451.49	3451.14	3451.60	0.00
4656	2.56	238.60	313.59	0.52				
5		9009	611.00	3445.00	3446.45	3446.34	3446.68	0.01
2581	3.84	159.10	239.94	0.83				
5		9009	611.00	3445.00	3446.45	3446.34	3446.68	0.01
2581	3.84	159.10	239.94	0.83				
5		9009	611.00	3445.00	3446.45	3446.34	3446.68	0.01
2581	3.84	159.10	239.94	0.83				
5		9009	611.00	3445.00	3446.45	3446.34	3446.68	0.01
2581	3.84	159.10	239.94	0.83				
5		8130	611.00	3440.00	3441.57	3441.11	3441.65	0.00
3204	2.21	276.52	342.53	0.43				
5		8130	611.00	3440.00	3441.57	3441.11	3441.65	0.00
3204	2.21	276.52	342.53	0.43				
5		8130	611.00	3440.00	3441.57	3441.11	3441.65	0.00
3204	2.21	276.52	342.53	0.43				
5		8130	611.00	3440.00	3441.57	3441.11	3441.65	0.00
3204	2.21	276.52	342.53	0.43				
5		7717	611.00	3437.80	3438.66	3438.66	3438.94	0.02
0021	4.18	146.05	274.48	1.01				
5		7717	611.00	3437.80	3438.66	3438.66	3438.94	0.02
0021	4.18	146.05	274.48	1.01				
5		7717	611.00	3437.80	3438.66	3438.66	3438.94	0.02
0021	4.18	146.05	274.48	1.01				
5		7717	611.00	3437.80	3438.66	3438.66	3438.94	0.02
0021	4.18	146.05	274.48	1.01				
5		7253	697.00	3435.00	3436.35	3435.88	3436.40	0.00
1738	1.69	417.07	517.58	0.32				
5		7253	697.00	3435.00	3436.35	3435.88	3436.40	0.00
1738	1.69	417.07	517.58	0.32				
5		7253	697.00	3435.00	3436.35	3435.88	3436.40	0.00
1738	1.69	417.07	517.58	0.32				
5		7253	697.00	3435.00	3436.35	3435.88	3436.40	0.00
1738	1.69	417.07	517.58	0.32				
5		6343	1328.00	3430.00	3430.70	3430.70	3431.00	0.01
9035	4.37	303.78	514.60	1.00				

FloodPlain.rep								
5		6343	1328.00	3430.00	3430.70	3430.70	3431.00	0.01
9035	4.37	303.78	514.60	1.00				
5		6343	1328.00	3430.00	3430.70	3430.70	3431.00	0.01
9035	4.37	303.78	514.60	1.00				
5		6343	1328.00	3430.00	3430.70	3430.70	3431.00	0.01
9035	4.37	303.78	514.60	1.00				
5		5363	1328.00	3425.00	3426.33	3425.78	3426.38	0.00
1763	1.85	727.78	830.57	0.33				
5		5363	1328.00	3425.00	3426.33	3425.78	3426.38	0.00
1763	1.85	727.78	830.57	0.33				
5		5363	1328.00	3425.00	3426.33	3425.78	3426.38	0.00
1763	1.85	727.78	830.57	0.33				
5		5363	1328.00	3425.00	3426.33	3425.78	3426.38	0.00
1763	1.85	727.78	830.57	0.33				
5		4221	1501.00	3420.00	3420.99	3420.99	3421.33	0.01
8533	4.67	321.48	483.60	1.01				
5		4221	1501.00	3420.00	3420.99	3420.99	3421.33	0.01
8533	4.67	321.48	483.60	1.01				
5		4221	1501.00	3420.00	3420.99	3420.99	3421.33	0.01
8533	4.67	321.48	483.60	1.01				
5		4221	1501.00	3420.00	3420.99	3420.99	3421.33	0.01
8533	4.67	321.48	483.60	1.01				
5		3489	1501.00	3416.00	3417.18	3416.67	3417.24	0.00
2251	2.05	804.91	998.90	0.37				
5		3489	1501.00	3416.00	3417.18	3416.67	3417.24	0.00
2251	2.05	804.91	998.90	0.37				
5		3489	1501.00	3416.00	3417.18	3416.67	3417.24	0.00
2251	2.05	804.91	998.90	0.37				
5		3489	1501.00	3416.00	3417.18	3416.67	3417.24	0.00
2251	2.05	804.91	998.90	0.37				
5		2989	1501.00	3413.80	3414.52	3414.52	3414.81	0.01
9219	4.14	351.67	623.28	0.99				
5		2989	1501.00	3413.80	3414.52	3414.52	3414.81	0.01
9219	4.14	351.67	623.28	0.99				
5		2989	1501.00	3413.80	3414.52	3414.52	3414.81	0.01
9219	4.14	351.67	623.28	0.99				
5		2989	1501.00	3413.80	3414.52	3414.52	3414.81	0.01
9219	4.14	351.67	623.28	0.99				
5		2774	1501.00	3409.00	3413.99	3412.71	3414.03	0.00
0278	2.09	1331.44	1039.64	0.17				
5		2774	1501.00	3409.00	3413.99	3412.71	3414.03	0.00
0278	2.09	1331.44	1039.64	0.17				
5		2774	1501.00	3409.00	3413.99	3412.71	3414.03	0.00
0278	2.09	1331.44	1039.64	0.17				
5		2774	1501.00	3409.00	3413.99	3412.71	3414.03	0.00
0278	2.09	1331.44	1039.64	0.17				
5		2773	Culvert					
5		2734	1501.00	3408.90	3412.71	3412.71	3412.82	0.00
1004	3.22	665.51	431.91	0.31				
5		2734	1501.00	3408.90	3412.71	3412.71	3412.82	0.00

FloodPlain.rep								
1004	3.22	665.51	431.91	0.31				
5		2734	1501.00	3408.90	3412.71	3412.71	3412.82	0.00
1004	3.22	665.51	431.91	0.31				
5		2734	1501.00	3408.90	3412.71	3412.71	3412.82	0.00
1004	3.22	665.51	431.91	0.31				
5		1888	1521.00	3408.00	3408.41	3408.72	3409.58	0.15
1914	8.68	175.18	503.42	2.59				
5		1888	1521.00	3408.00	3408.41	3408.72	3409.58	0.15
1914	8.68	175.18	503.42	2.59				
5		1888	1521.00	3408.00	3408.41	3408.72	3409.58	0.15
1914	8.68	175.18	503.42	2.59				
5		1888	1521.00	3408.00	3408.41	3408.72	3409.58	0.15
1914	8.68	175.18	503.42	2.59				
5		1060	1585.00	3402.70	3404.50	3404.11	3404.66	0.00
5270	3.16	501.30	526.98	0.57				
5		1060	1585.00	3402.70	3405.00	3404.11	3405.06	0.00
1518	1.98	799.30	665.03	0.32				
5		1060	1585.00	3402.70	3406.00	3404.11	3406.01	0.00
0250	0.93	1696.32	1129.00	0.13				
5		1060	1585.00	3402.70	3407.00	3404.11	3407.01	0.00
0045	0.56	2898.82	1276.00	0.06				

Profile Output Table - Report Standard Table 1

Reach	River Sta		Q Total	Min Ch El	W.S.	Elev	Crit W.S.	Max Chl	Dpth	E.G
Elev	E.G.	Slope	Vel Chnl	Sta W.S.	Lft	Sta W.S.	Rgt	Flow Area	Top Width	Froude #
(ft)	(ft/ft)	(ft/s)	(cfs)	(ft)	(ft)	(ft)	(sq ft)	(ft)	(ft)	(ft)
5		12674	488.00	3477.00	3478.35	3477.98			1.35	3
478.42	0.003073	2.23	355.77		656.81	223.75	301.04			0.43
5		12674	488.00	3477.00	3478.35	3477.98			1.35	3
478.42	0.003073	2.23	355.77		656.81	223.75	301.04			0.43
5		12674	488.00	3477.00	3478.35	3477.98			1.35	3
478.42	0.003073	2.23	355.77		656.81	223.75	301.04			0.43
5		12674	488.00	3477.00	3478.35	3477.98			1.35	3
478.42	0.003073	2.23	355.77		656.81	223.75	301.04			0.43
5		11337	488.00	3469.00	3470.36	3470.33			1.36	3
470.73	0.014260	4.87	427.21		557.43	101.95	130.23			0.92
5		11337	488.00	3469.00	3470.36	3470.33			1.36	3
470.73	0.014260	4.87	427.21		557.43	101.95	130.23			0.92
5		11337	488.00	3469.00	3470.36	3470.33			1.36	3
470.73	0.014260	4.87	427.21		557.43	101.95	130.23			0.92

FloodPlain.rep									
5	11337		488.00	3469.00	3470.36	3470.33	1.36	3	
470.73	0.014260	4.87	427.21	557.43	101.95	130.23		0.92	
5	10937		488.00	3464.00	3465.74	3465.55	1.74	3	
466.02	0.009772	4.21	474.19	600.46	116.03	126.27		0.77	
5	10937		488.00	3464.00	3465.74	3465.55	1.74	3	
466.02	0.009772	4.21	474.19	600.46	116.03	126.27		0.77	
5	10937		488.00	3464.00	3465.74	3465.55	1.74	3	
466.02	0.009772	4.21	474.19	600.46	116.03	126.27		0.77	
5	10937		488.00	3464.00	3465.74	3465.55	1.74	3	
466.02	0.009772	4.21	474.19	600.46	116.03	126.27		0.77	
5	10288		488.00	3456.00	3456.90	3456.90	0.90	3	
457.15	0.020388	4.04	405.26	647.69	120.78	242.43		1.01	
5	10288		488.00	3456.00	3456.90	3456.90	0.90	3	
457.15	0.020388	4.04	405.26	647.69	120.78	242.43		1.01	
5	10288		488.00	3456.00	3456.90	3456.90	0.90	3	
457.15	0.020388	4.04	405.26	647.69	120.78	242.43		1.01	
5	10288		488.00	3456.00	3456.90	3456.90	0.90	3	
457.15	0.020388	4.04	405.26	647.69	120.78	242.43		1.01	
5	9690		611.00	3450.00	3451.49	3451.14	1.49	3	
451.60	0.004656	2.56	444.61	758.20	238.60	313.59		0.52	
5	9690		611.00	3450.00	3451.49	3451.14	1.49	3	
451.60	0.004656	2.56	444.61	758.20	238.60	313.59		0.52	
5	9690		611.00	3450.00	3451.49	3451.14	1.49	3	
451.60	0.004656	2.56	444.61	758.20	238.60	313.59		0.52	
5	9690		611.00	3450.00	3451.49	3451.14	1.49	3	
451.60	0.004656	2.56	444.61	758.20	238.60	313.59		0.52	
5	9009		611.00	3445.00	3446.45	3446.34	1.45	3	
446.68	0.012581	3.84	454.43	694.37	159.10	239.94		0.83	
5	9009		611.00	3445.00	3446.45	3446.34	1.45	3	
446.68	0.012581	3.84	454.43	694.37	159.10	239.94		0.83	
5	9009		611.00	3445.00	3446.45	3446.34	1.45	3	
446.68	0.012581	3.84	454.43	694.37	159.10	239.94		0.83	
5	9009		611.00	3445.00	3446.45	3446.34	1.45	3	
446.68	0.012581	3.84	454.43	694.37	159.10	239.94		0.83	

FloodPlain.rep

5	8130		611.00	3440.00	3441.57	3441.11	1.57	3
441.65	0.003204	2.21	469.14	811.67	276.52	342.53		0.43
5	8130		611.00	3440.00	3441.57	3441.11	1.57	3
441.65	0.003204	2.21	469.14	811.67	276.52	342.53		0.43
5	8130		611.00	3440.00	3441.57	3441.11	1.57	3
441.65	0.003204	2.21	469.14	811.67	276.52	342.53		0.43
5	8130		611.00	3440.00	3441.57	3441.11	1.57	3
441.65	0.003204	2.21	469.14	811.67	276.52	342.53		0.43
5	7717		611.00	3437.80	3438.66	3438.66	0.86	3
438.94	0.020021	4.18	333.18	607.65	146.05	274.48		1.01
5	7717		611.00	3437.80	3438.66	3438.66	0.86	3
438.94	0.020021	4.18	333.18	607.65	146.05	274.48		1.01
5	7717		611.00	3437.80	3438.66	3438.66	0.86	3
438.94	0.020021	4.18	333.18	607.65	146.05	274.48		1.01
5	7717		611.00	3437.80	3438.66	3438.66	0.86	3
438.94	0.020021	4.18	333.18	607.65	146.05	274.48		1.01
5	7253		697.00	3435.00	3436.35	3435.88	1.35	3
436.40	0.001738	1.69	405.86	923.44	417.07	517.58		0.32
5	7253		697.00	3435.00	3436.35	3435.88	1.35	3
436.40	0.001738	1.69	405.86	923.44	417.07	517.58		0.32
5	7253		697.00	3435.00	3436.35	3435.88	1.35	3
436.40	0.001738	1.69	405.86	923.44	417.07	517.58		0.32
5	7253		697.00	3435.00	3436.35	3435.88	1.35	3
436.40	0.001738	1.69	405.86	923.44	417.07	517.58		0.32
5	6343		1328.00	3430.00	3430.70	3430.70	0.70	3
431.00	0.019035	4.37	780.28	1294.88	303.78	514.60		1.00
5	6343		1328.00	3430.00	3430.70	3430.70	0.70	3
431.00	0.019035	4.37	780.28	1294.88	303.78	514.60		1.00
5	6343		1328.00	3430.00	3430.70	3430.70	0.70	3
431.00	0.019035	4.37	780.28	1294.88	303.78	514.60		1.00
5	6343		1328.00	3430.00	3430.70	3430.70	0.70	3
431.00	0.019035	4.37	780.28	1294.88	303.78	514.60		1.00
5	5363		1328.00	3425.00	3426.33	3425.78	1.33	3
426.38	0.001763	1.85	710.73	1541.30	727.78	830.57		0.33
5	5363		1328.00	3425.00	3426.33	3425.78	1.33	3

FloodPlain.rep									
426.38	0.001763	1.85	710.73	1541.30	727.78	830.57		0.33	
5	5363		1328.00	3425.00	3426.33	3425.78		1.33	3
426.38	0.001763	1.85	710.73	1541.30	727.78	830.57		0.33	
5	5363		1328.00	3425.00	3426.33	3425.78		1.33	3
426.38	0.001763	1.85	710.73	1541.30	727.78	830.57		0.33	
5	4221		1501.00	3420.00	3420.99	3420.99		0.99	3
421.33	0.018533	4.67	544.80	1028.40	321.48	483.60		1.01	
5	4221		1501.00	3420.00	3420.99	3420.99		0.99	3
421.33	0.018533	4.67	544.80	1028.40	321.48	483.60		1.01	
5	4221		1501.00	3420.00	3420.99	3420.99		0.99	3
421.33	0.018533	4.67	544.80	1028.40	321.48	483.60		1.01	
5	4221		1501.00	3420.00	3420.99	3420.99		0.99	3
421.33	0.018533	4.67	544.80	1028.40	321.48	483.60		1.01	
5	3489		1501.00	3416.00	3417.18	3416.67		2.18	3
417.24	0.002251	2.05	-116.98	881.92	804.91	998.90		0.37	
5	3489		1501.00	3416.00	3417.18	3416.67		2.18	3
417.24	0.002251	2.05	-116.98	881.92	804.91	998.90		0.37	
5	3489		1501.00	3416.00	3417.18	3416.67		2.18	3
417.24	0.002251	2.05	-116.98	881.92	804.91	998.90		0.37	
5	3489		1501.00	3416.00	3417.18	3416.67		2.18	3
417.24	0.002251	2.05	-116.98	881.92	804.91	998.90		0.37	
5	2989		1501.00	3413.80	3414.52	3414.52		0.72	3
414.81	0.019219	4.14	179.04	802.32	351.67	623.28		0.99	
5	2989		1501.00	3413.80	3414.52	3414.52		0.72	3
414.81	0.019219	4.14	179.04	802.32	351.67	623.28		0.99	
5	2989		1501.00	3413.80	3414.52	3414.52		0.72	3
414.81	0.019219	4.14	179.04	802.32	351.67	623.28		0.99	
5	2989		1501.00	3413.80	3414.52	3414.52		0.72	3
414.81	0.019219	4.14	179.04	802.32	351.67	623.28		0.99	
5	2774		1501.00	3409.00	3413.99	3412.71		4.99	3
414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64		0.17	
5	2774		1501.00	3409.00	3413.99	3412.71		4.99	3
414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64		0.17	
5	2774		1501.00	3409.00	3413.99	3412.71		4.99	3
414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64		0.17	

			FloodPlain.rep						
5	2774		1501.00	3409.00	3413.99	3412.71		4.99	3
414.03	0.000278	2.09	-399.05	640.58	1331.44	1039.64			0.17

5	2773		Culvert						
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5	2734		1501.00	3408.90	3412.71	3412.71		3.81	3
412.82	0.001004	3.22	83.74	515.65	665.51	431.91			0.31

5	2734		1501.00	3408.90	3412.71	3412.71		3.81	3
412.82	0.001004	3.22	83.74	515.65	665.51	431.91			0.31

5	2734		1501.00	3408.90	3412.71	3412.71		3.81	3
412.82	0.001004	3.22	83.74	515.65	665.51	431.91			0.31

5	2734		1501.00	3408.90	3412.71	3412.71		3.81	3
412.82	0.001004	3.22	83.74	515.65	665.51	431.91			0.31

5	1888		1521.00	3408.00	3408.41	3408.72		0.41	3
409.58	0.151914	8.68	286.11	789.53	175.18	503.42			2.59

5	1888		1521.00	3408.00	3408.41	3408.72		0.41	3
409.58	0.151914	8.68	286.11	789.53	175.18	503.42			2.59

5	1888		1521.00	3408.00	3408.41	3408.72		0.41	3
409.58	0.151914	8.68	286.11	789.53	175.18	503.42			2.59

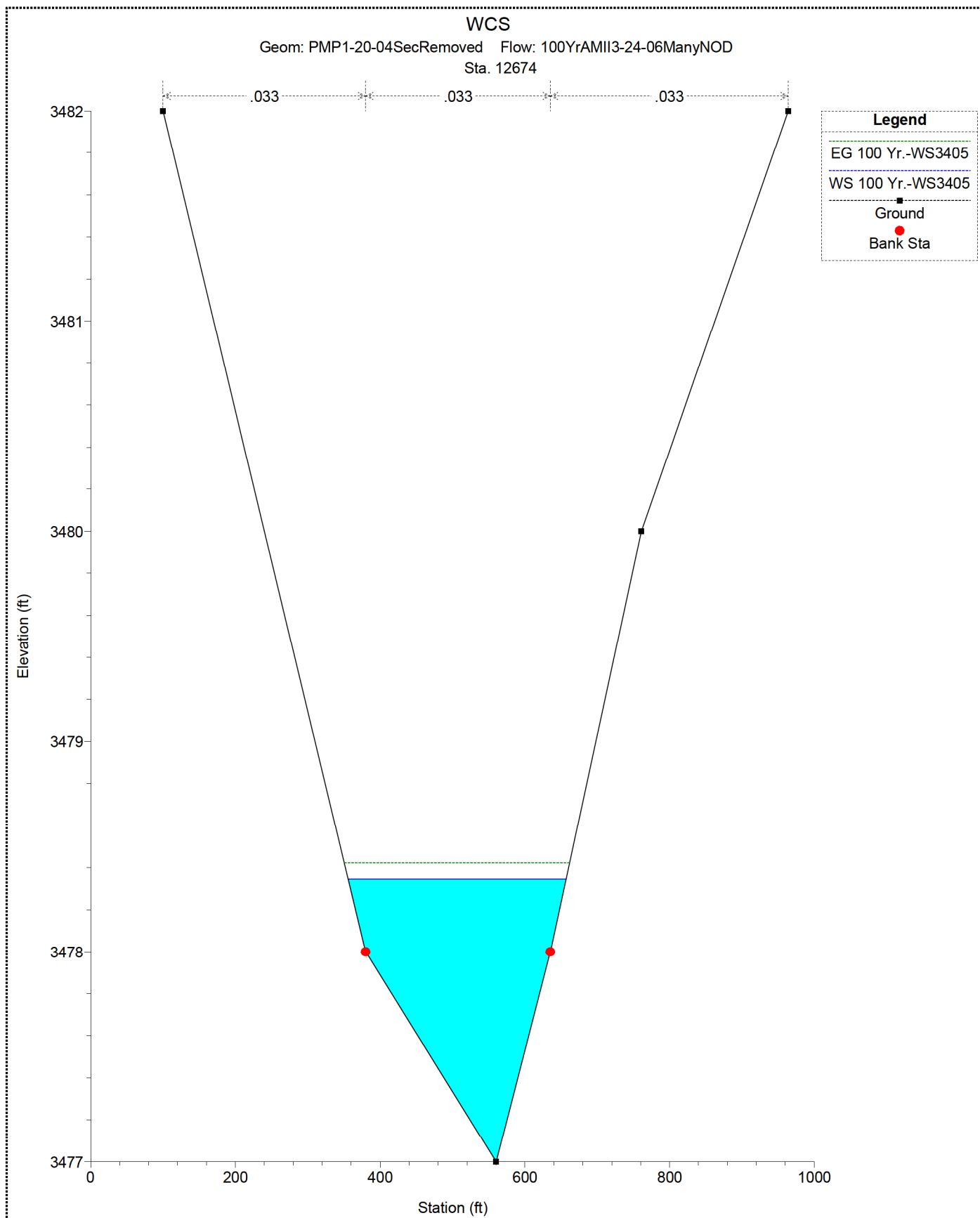
5	1888		1521.00	3408.00	3408.41	3408.72		0.41	3
409.58	0.151914	8.68	286.11	789.53	175.18	503.42			2.59

5	1060		1585.00	3402.70	3404.50	3404.11		1.80	3
404.66	0.005270	3.16	614.45	1141.44	501.30	526.98			0.57

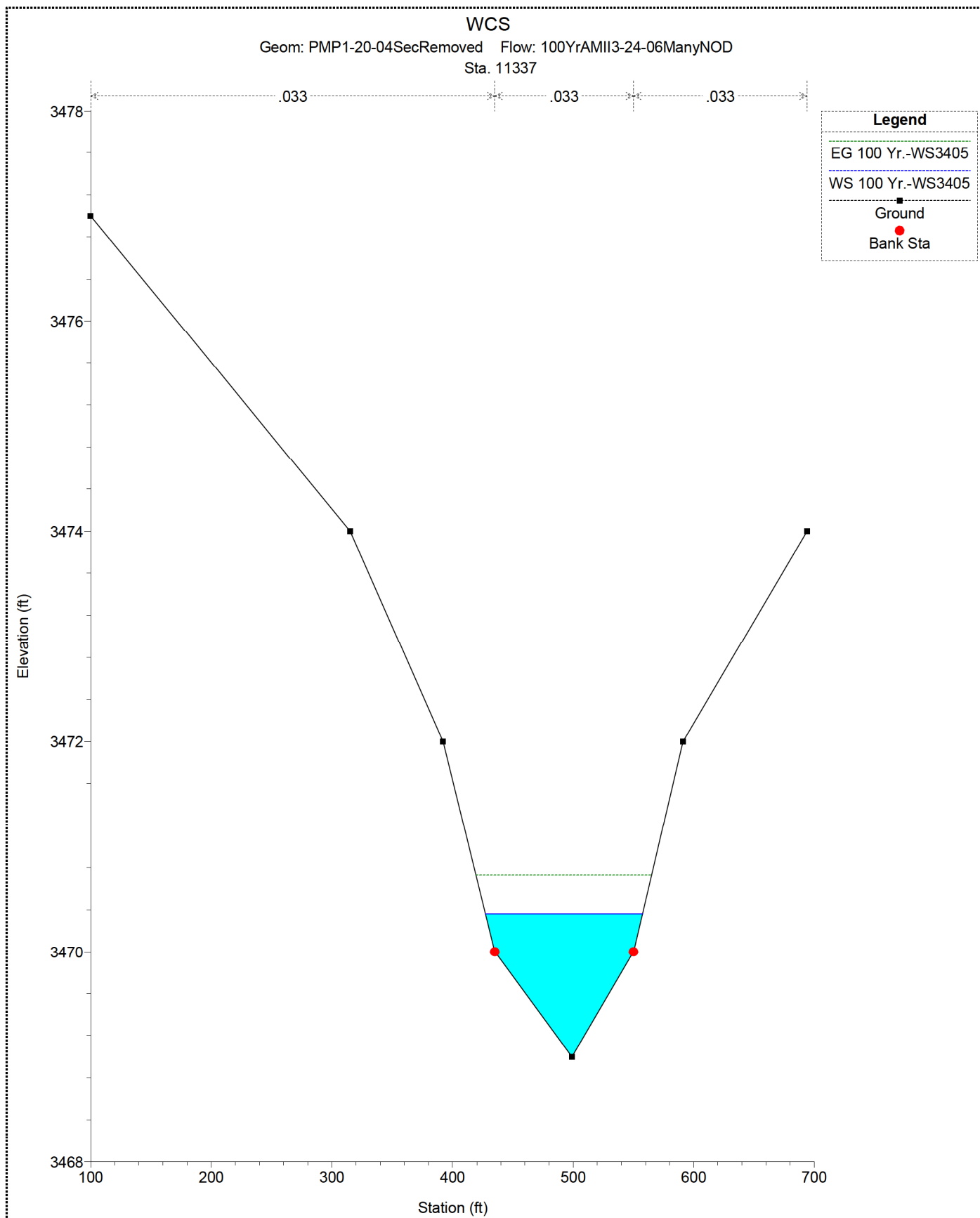
5	1060		1585.00	3402.70	3405.00	3404.11		2.30	3
405.06	0.001518	1.98	540.97	1206.00	799.30	665.03			0.32

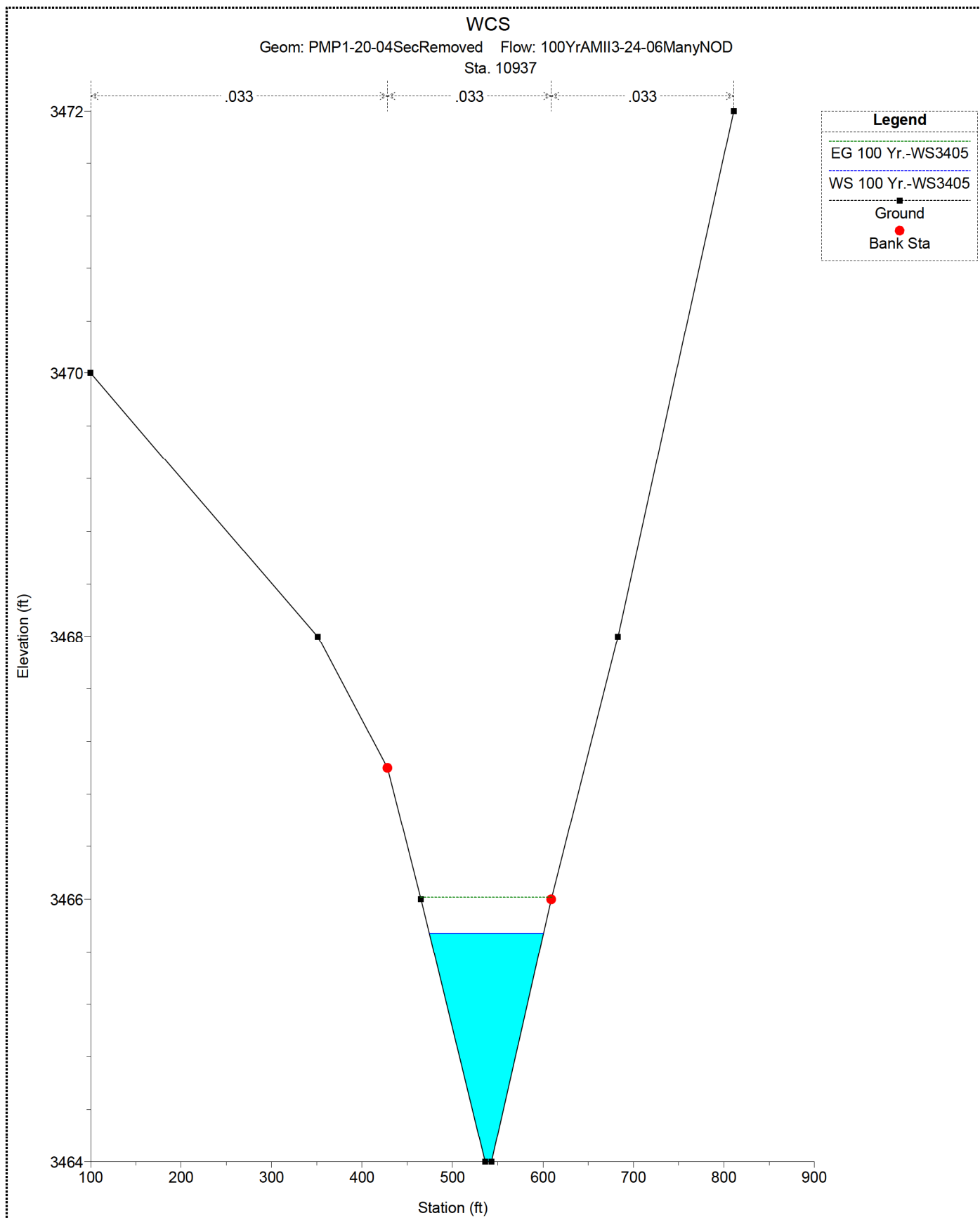
5	1060		1585.00	3402.70	3406.00	3404.11		3.30	3
406.01	0.000250	0.93	394.00	1523.00	1696.32	1129.00			0.13

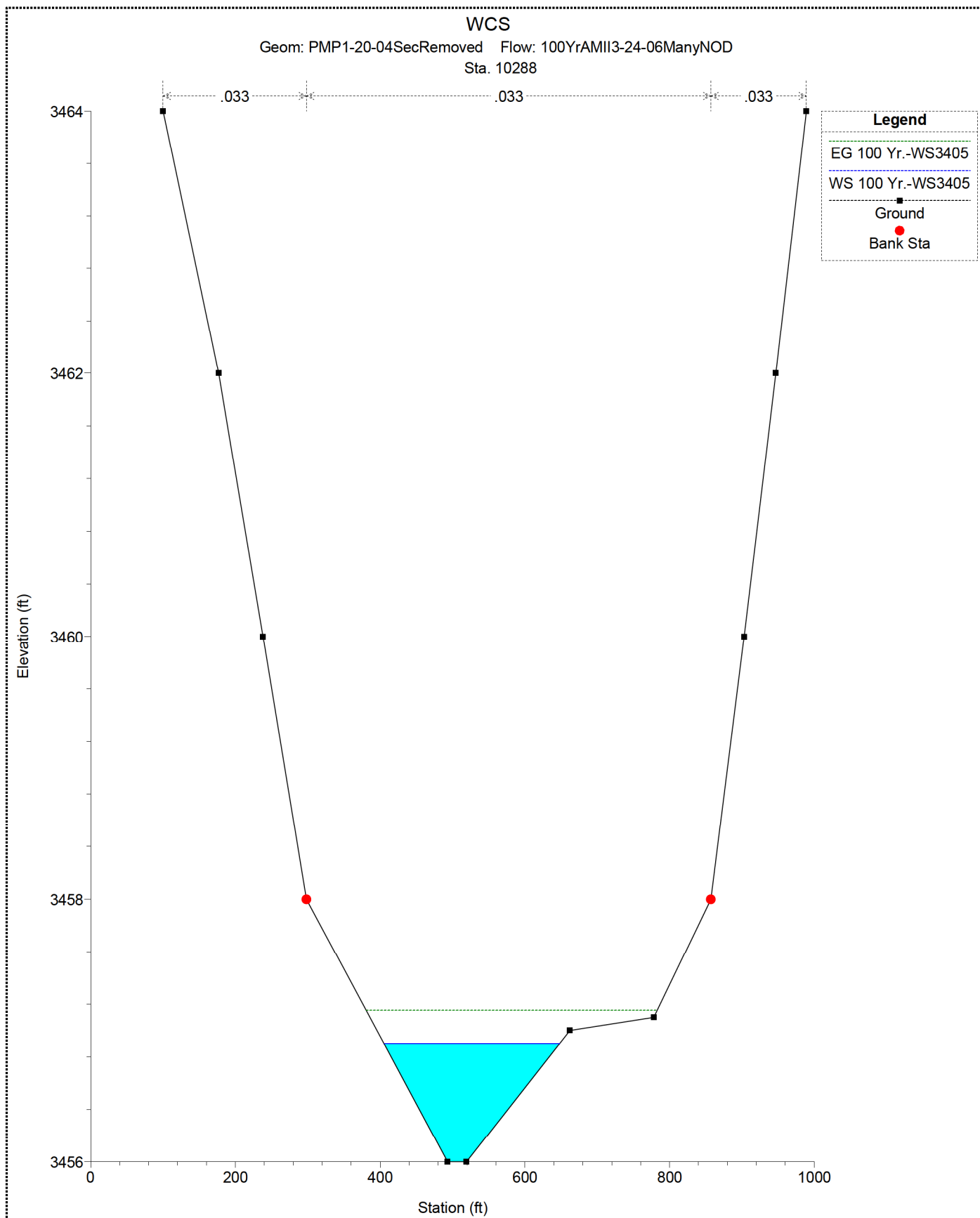
5	1060		1585.00	3402.70	3407.00	3404.11		4.30	3
407.01	0.000045	0.56	247.00	1523.00	2898.82	1276.00			0.06

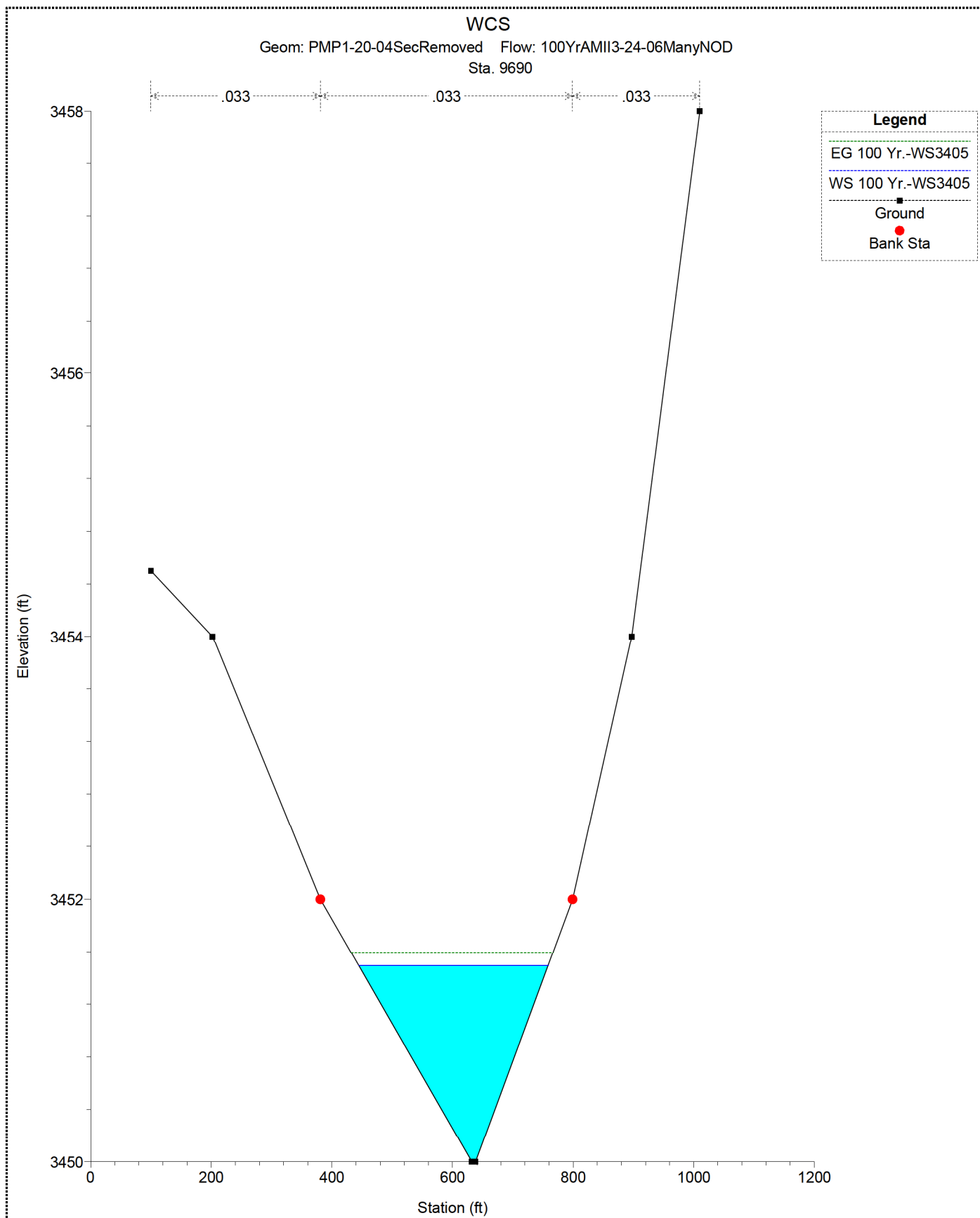


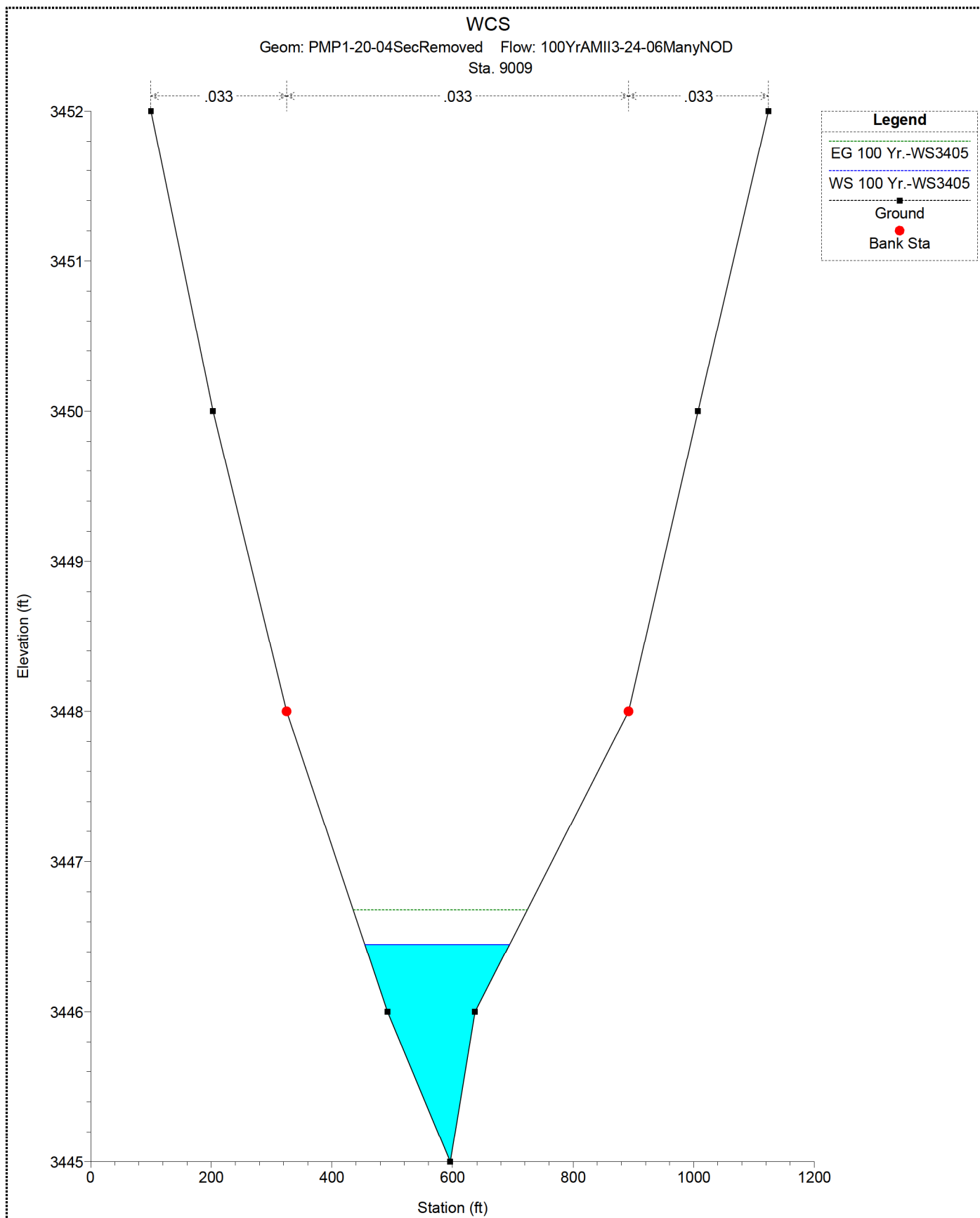


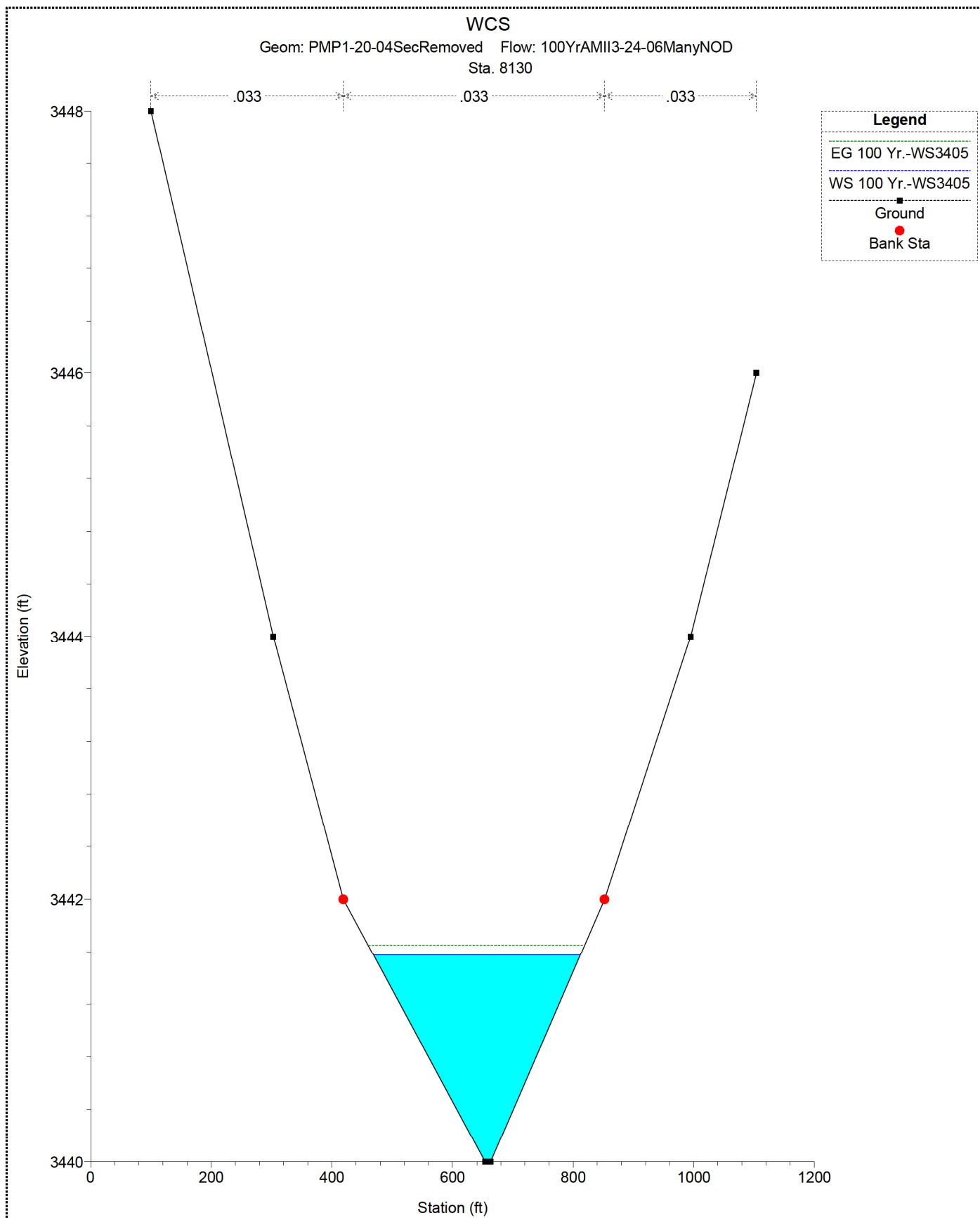


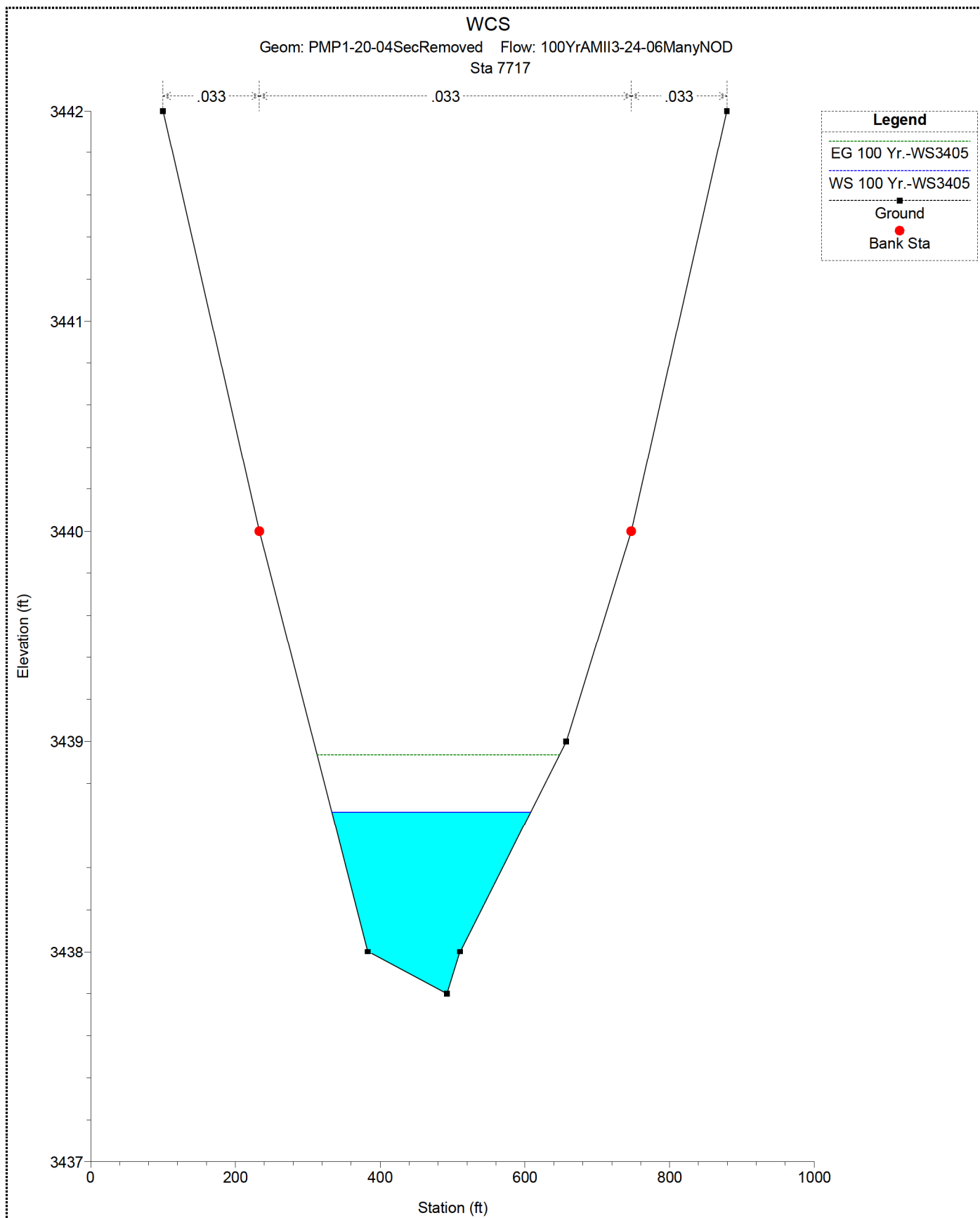


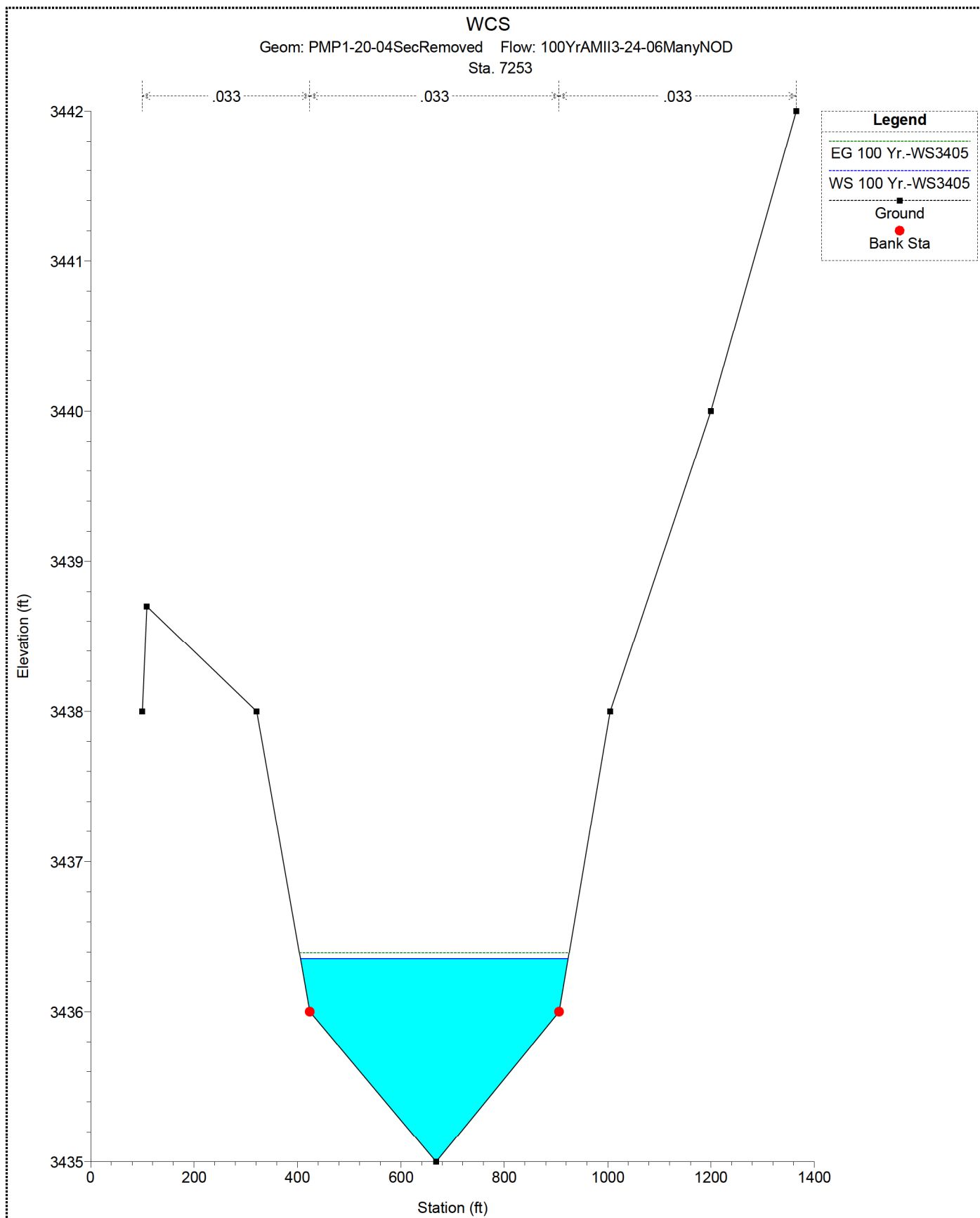




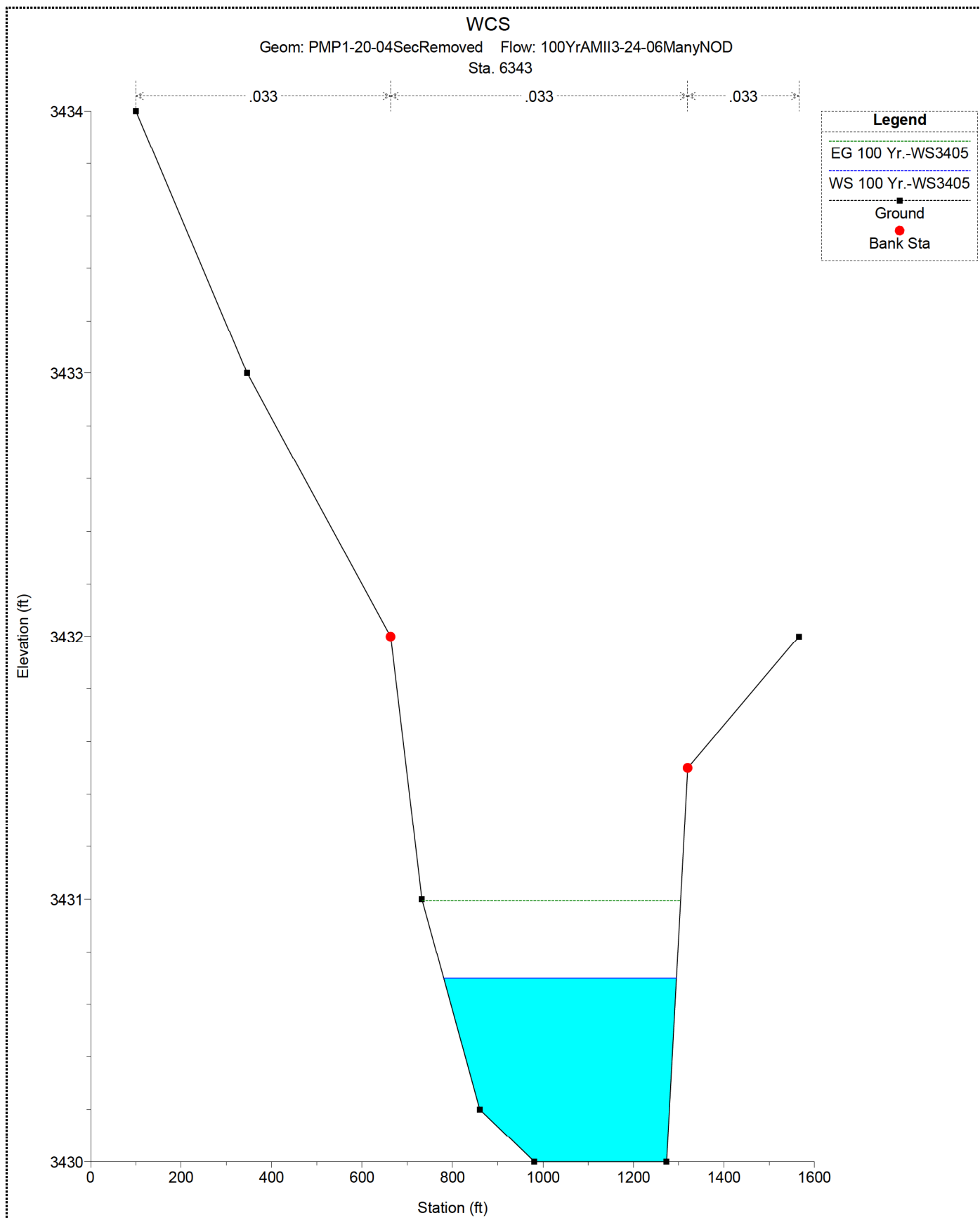


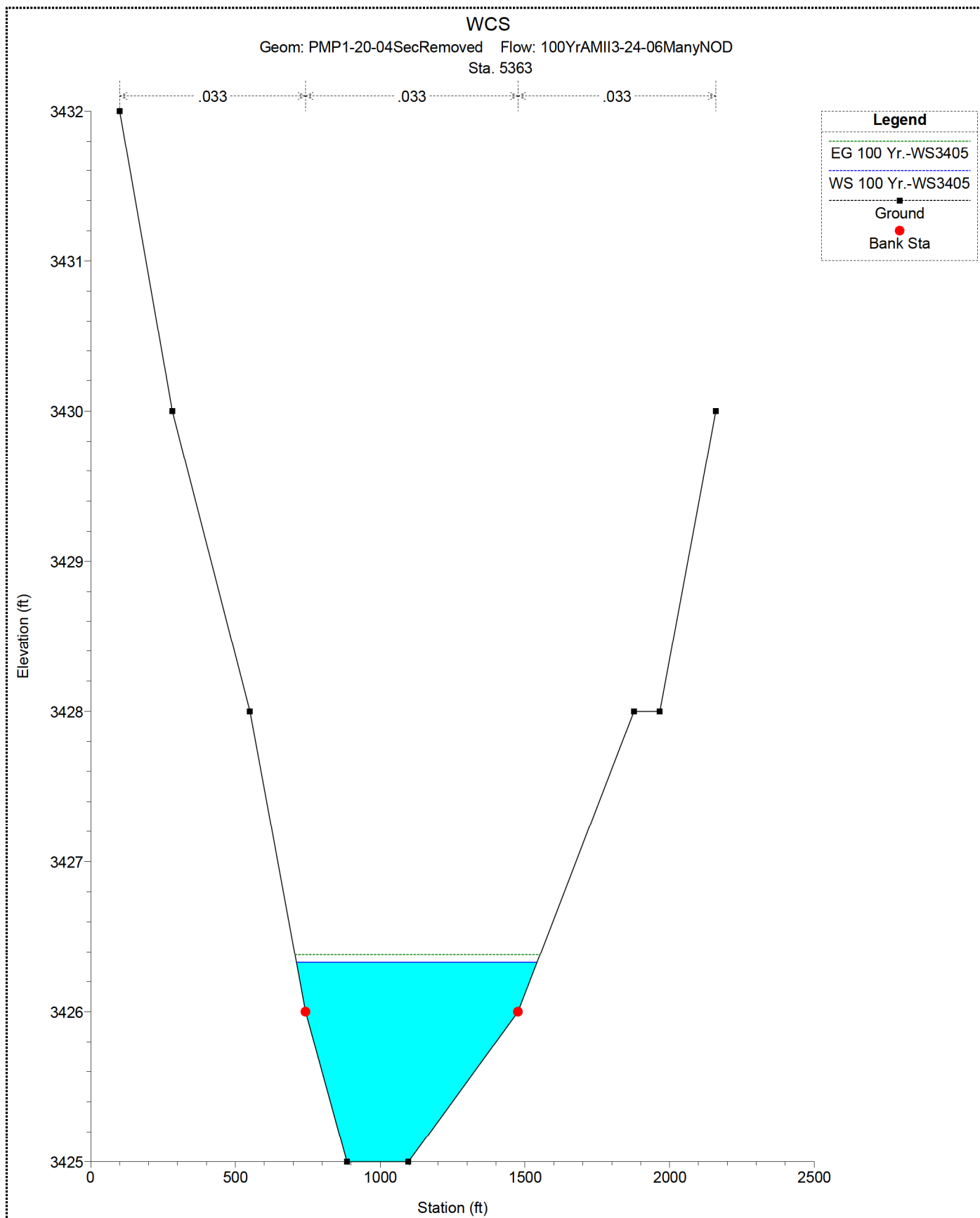


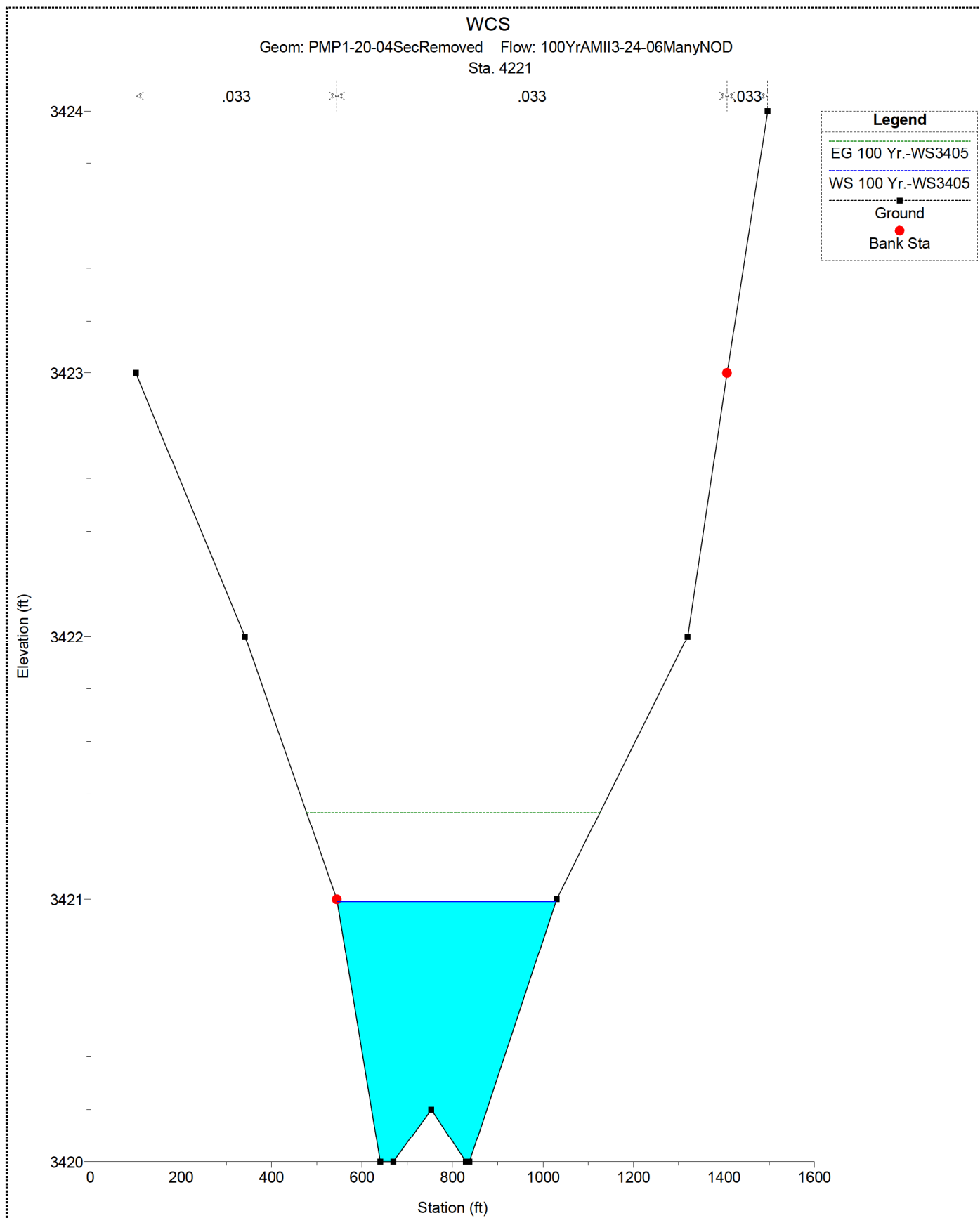


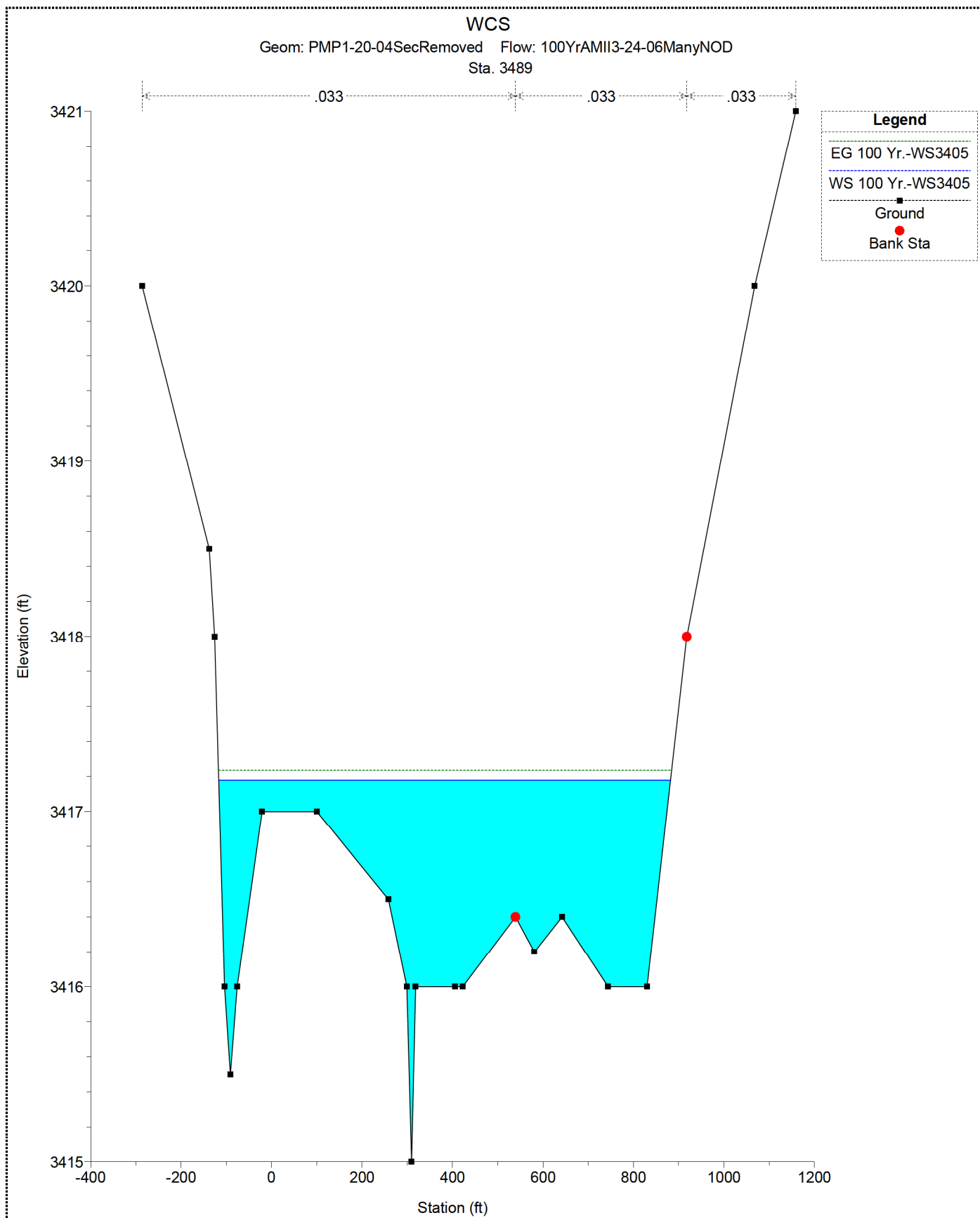


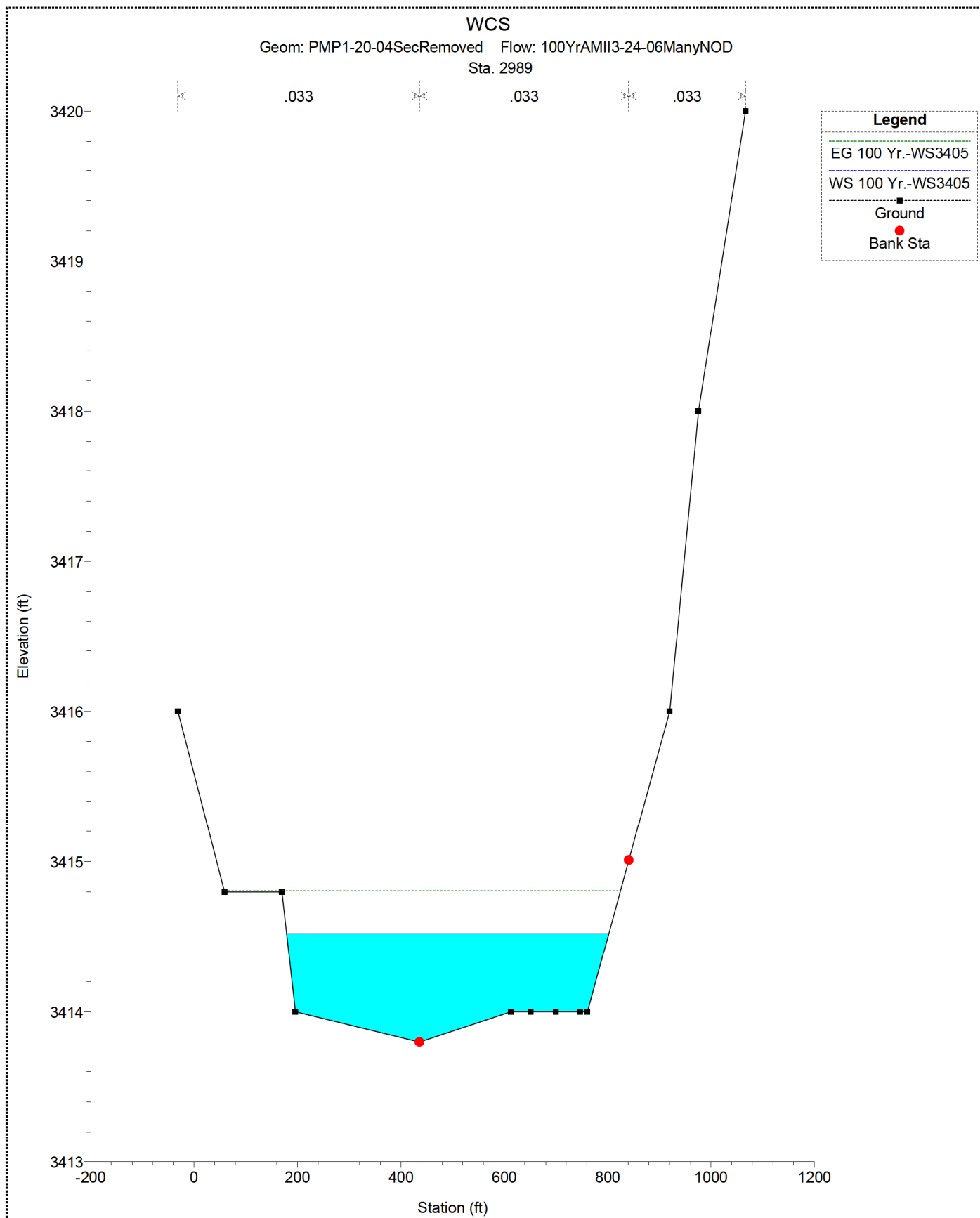


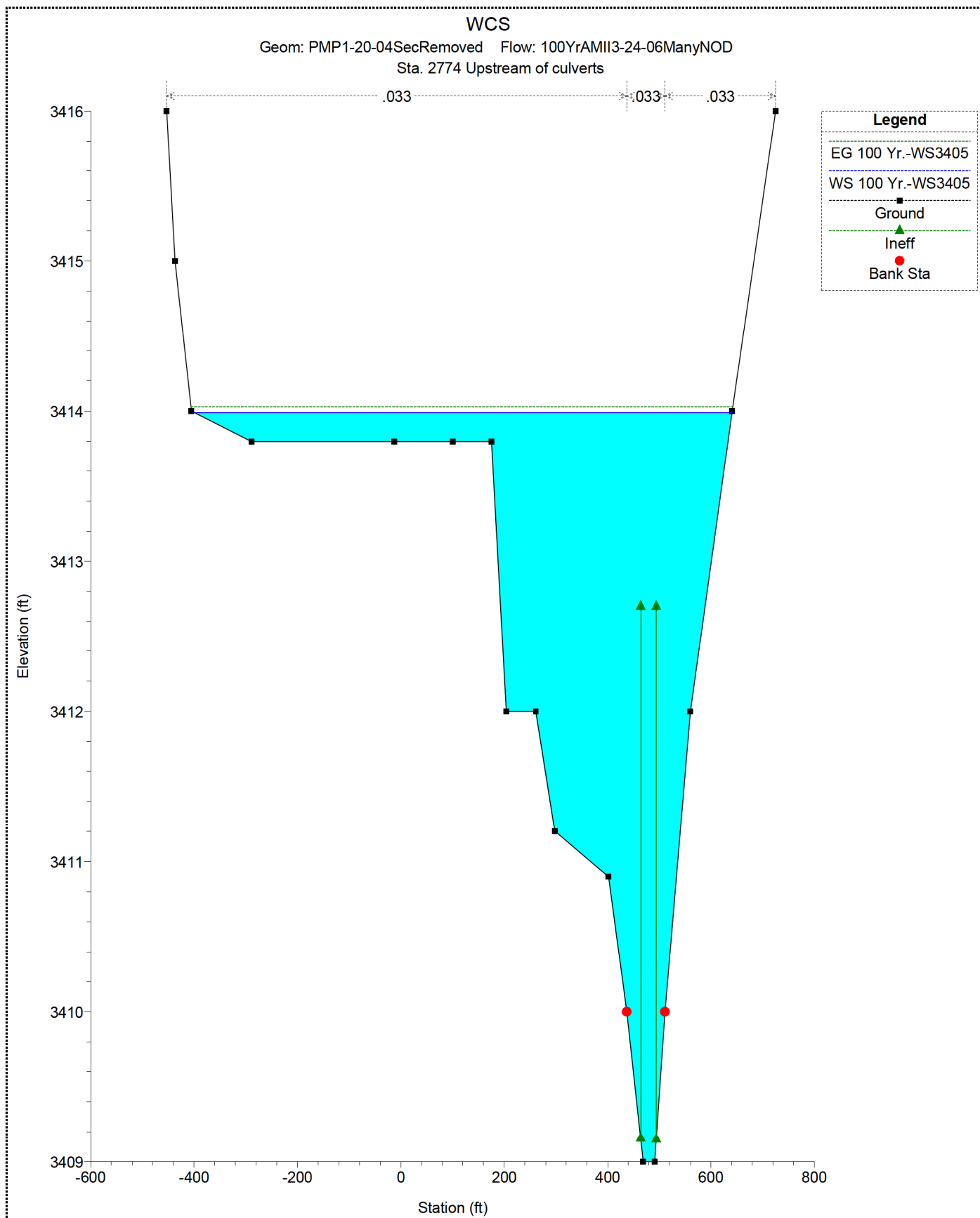








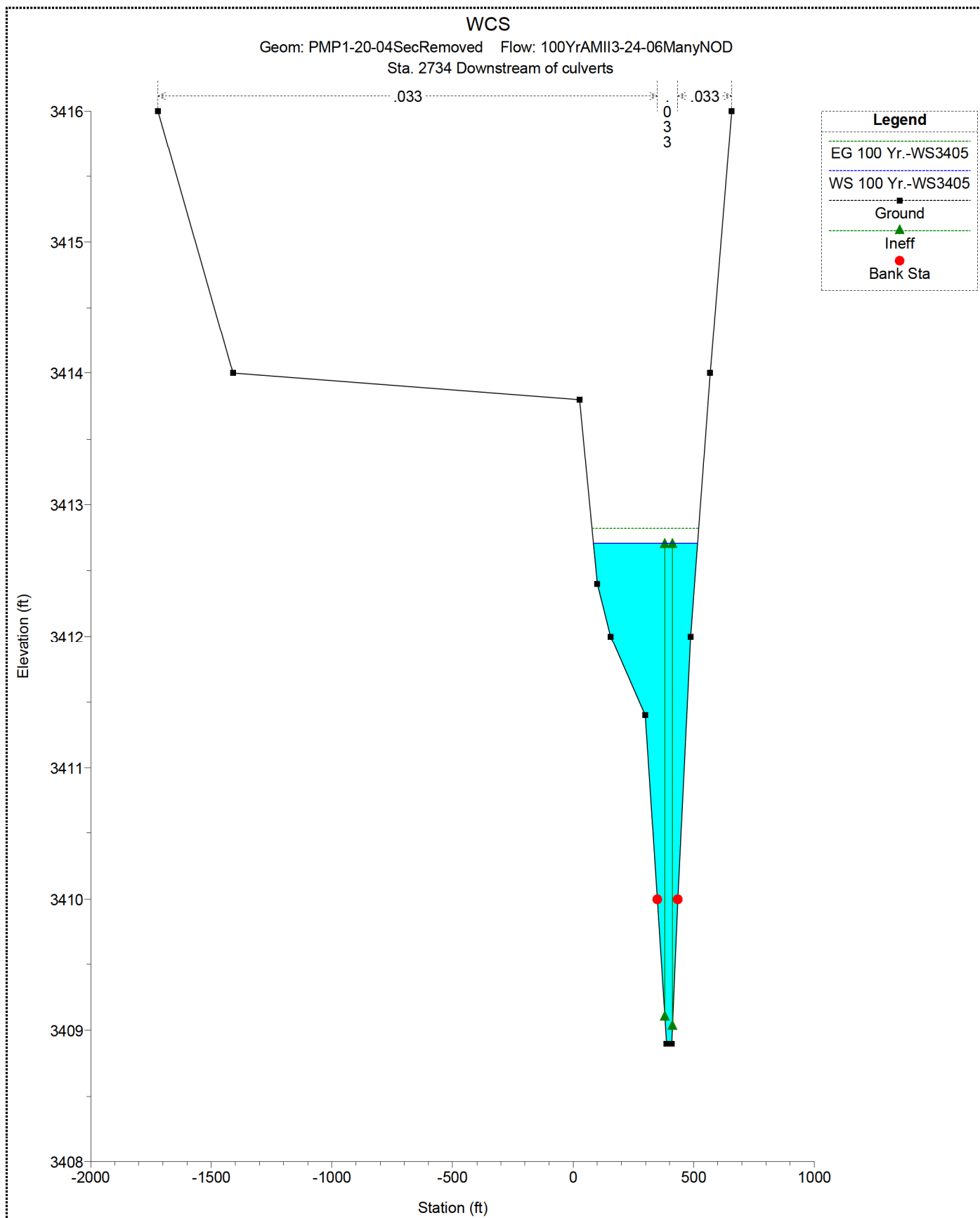


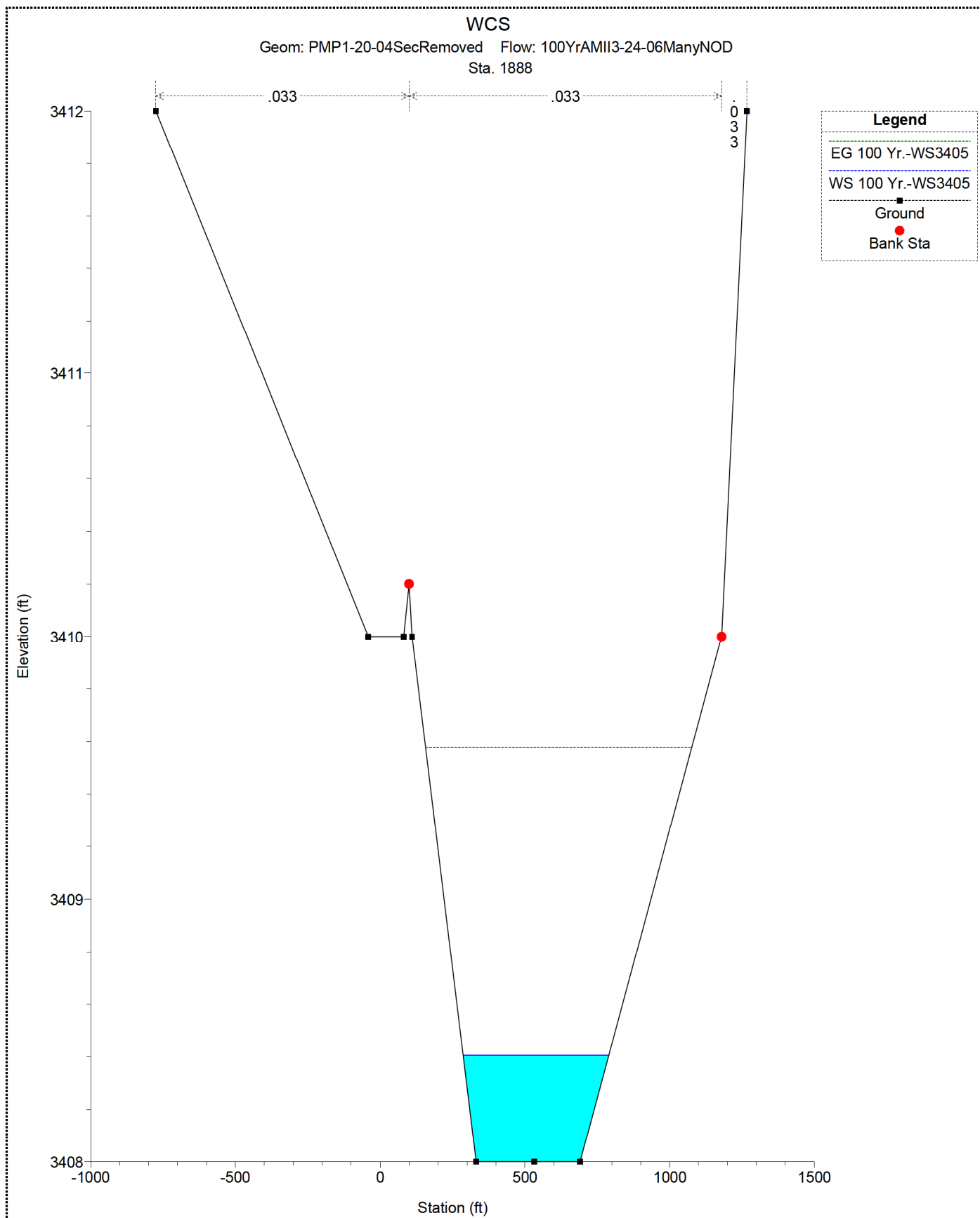


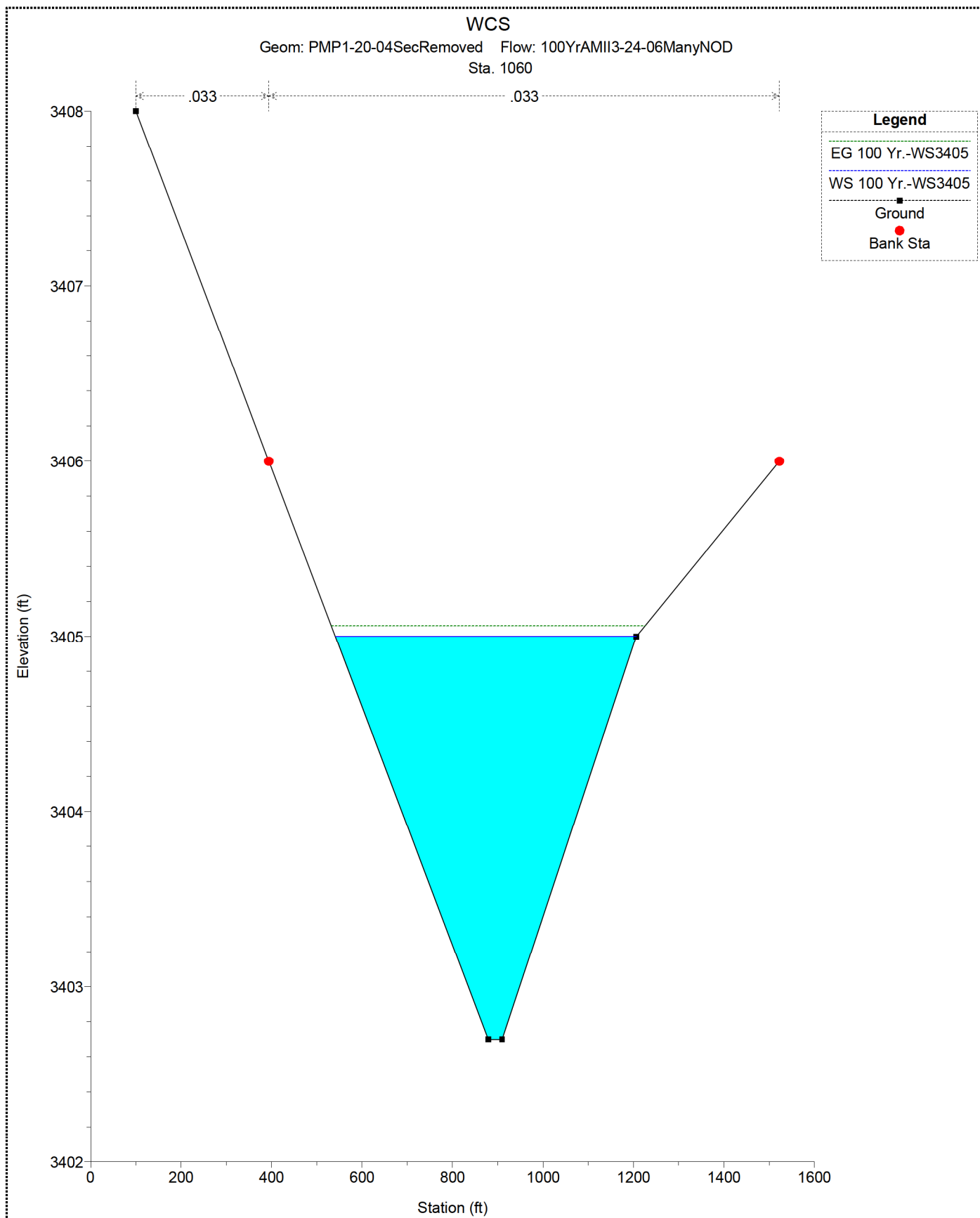












## **APPENDIX N**

### **HEC-HMS MODEL FOR THE CALCULATION OF THE 500-YEAR PEAK DISCHARGE, ANTECEDENT MOISTURE CONDITION II**

# HMS \* Summary of Results

Project : WCS

Run Name : 500 Yr AMII

Start of Run : 01Dec00 0000 Basin Model : 100YrAMII3/24/06NOD

End of Run : 02Dec00 0000 Met. Model : Met 500 Year

Execution Time : 29Mar06 1101 Control Specs : Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4	986.26	01 Dec 00 1232	149.79	0.490
Reach-2	986.26	01 Dec 00 1247	149.19	0.490
Subbasin-2	1343.1	01 Dec 00 1300	294.70	1.063
playa	0.0	30 Nov 00 2400	0.0	1.063
Reach-1	0.0	30 Nov 00 2400	0.0	1.063
Subbasin-1A	817.92	01 Dec 00 1321	220.98	0.691
Reach-1A	817.92	01 Dec 00 1338	219.95	0.691
Subbasin-1B	567.21	01 Dec 00 1237	93.801	0.314
Junction-1A	1031.9	01 Dec 00 1322	313.75	1.005
Reach-1B	1031.9	01 Dec 00 1325	313.49	1.005
Subbasin-3	287.68	01 Dec 00 1237	47.606	0.156
Junction-1	1200.7	01 Dec 00 1256	361.10	2.224
Reach-3	1200.7	01 Dec 00 1313	359.40	2.224
Subbasin-5A	361.11	01 Dec 00 1231	53.770	0.192
Junction-2	2314.6	01 Dec 00 1251	562.36	2.906
Reach-4	2314.6	01 Dec 00 1312	559.06	2.906
Subbasin-5B	390.30	01 Dec 00 1247	73.802	0.265
Junction-3	2624.5	01 Dec 00 1310	632.86	3.171
Reach-5	2624.5	01 Dec 00 1324	630.34	3.171
Subbasin-6	164.62	01 Dec 00 1222	20.784	0.074
Junction-4	2658.6	01 Dec 00 1324	651.12	3.245
Reach-6	2658.6	01 Dec 00 1324	651.12	3.245
Subbasin-7	136.06	01 Dec 00 1259	29.510	0.104
Junction-5	2772.5	01 Dec 00 1323	680.63	3.349

## Meteorologic Model Input

The screenshot shows a software window titled "HMS \* Meteorologic Model". It has a menu bar with "File", "Edit", and "Help". The "Meteorologic Model" is set to "Met 500 Year". The "Description" field contains "500 Year, 24 Hour Storm". There is a "Subbasin List" button. Two tabs are visible: "Precipitation" (selected) and "Evapotranspiration". Under the "Precipitation" tab, the "Method" is set to "SCS Hypothetical Storm". The "Storm Selection" is set to "Type II". The "Storm Depth (in)" is set to "8.71". At the bottom are "OK", "Apply", and "Cancel" buttons. A status bar is at the very bottom.

HMS \* Meteorologic Model

File Edit Help

Meteorologic Model: Met 500 Year Subbasin List

Description: 500 Year, 24 Hour Storm

Precipitation Evapotranspiration

Method : SCS Hypothetical Storm

Storm Selection: Type II

Storm Depth (in) : 8.71

OK Apply Cancel

**HMS \* Basin Model \* SCS Curve Number**

Sort Help

Basin Model ID: 100YrAMII3/24/06NOD

Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	79		0.0
Subbasin-2	72		0.0
Subbasin-3	76		0.0
Subbasin-4	76		0.0
Subbasin-5B	72		0.0
Subbasin-6	72		0.0
Subbasin-1B	75		0.0
Subbasin-5A	72		0.0
Subbasin-7	73		0.0

OK Apply Cancel

**HMS \* Basin Model \* SCS UH**

Sort Help

Basin Model ID: 100YrAMII3/24/06NOD

Time Units : Minutes

Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3	44
Subbasin-4	39
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64

OK Apply Cancel

**HMS \* Basin Model \* Lag Routing**

Help

Basin Model ID : 100YrAMII3/24/06NOD

Interval :

Reach Name	Lag (min)
Reach-1	35
Reach-2	15
Reach-3	17
Reach-4	21
Reach-5	14
Reach-1A	17
Reach-1B	3
Reach-6	0

OK Apply Cancel



**HMS \* Basin Model \* Reservoir Editor**

Edit File Help

Reservoir Name:

Description:

Storage Outlet Spillway Overflow Dam Break

Method:

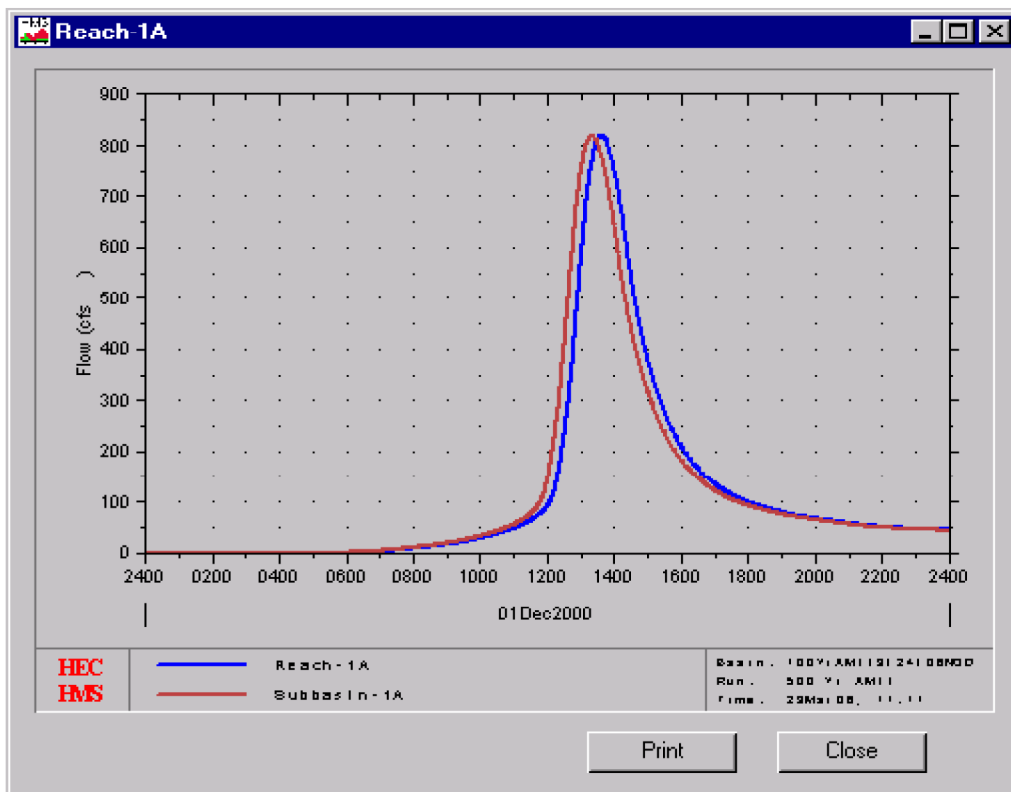
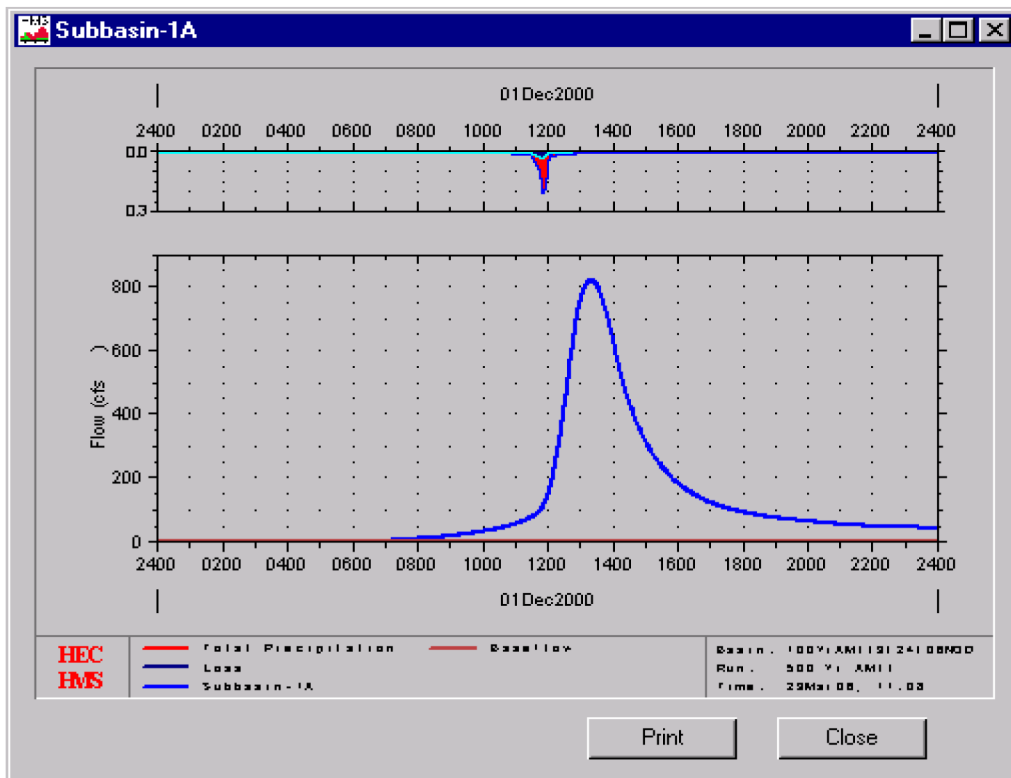
Initial

Elevation (ft)	Storage (acre-feet)	Outflow (cfs)
3478.0	0.0	0.0
3480.0	24.0	0.0
3482.0	61.0	0.0
3484.0	170.0	0.0
3486.0	457.0	0.0
3487.0	693.0	863.0
3488.0	928.0	2427.0

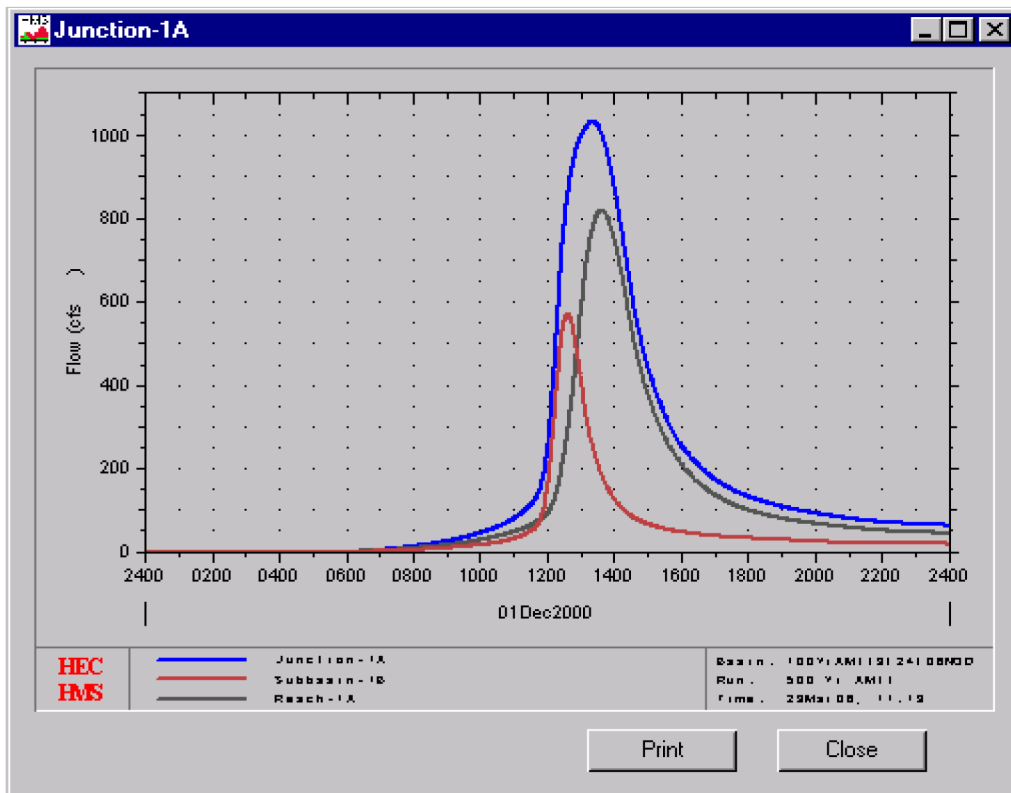
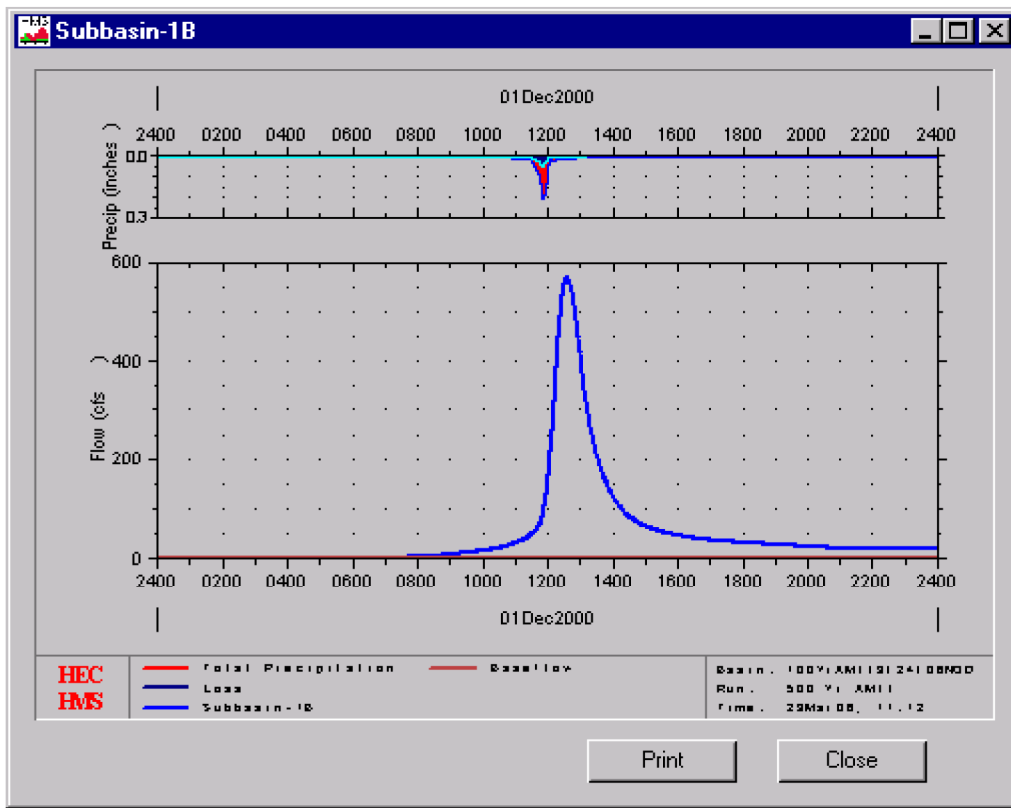
Graph

OK Apply Cancel

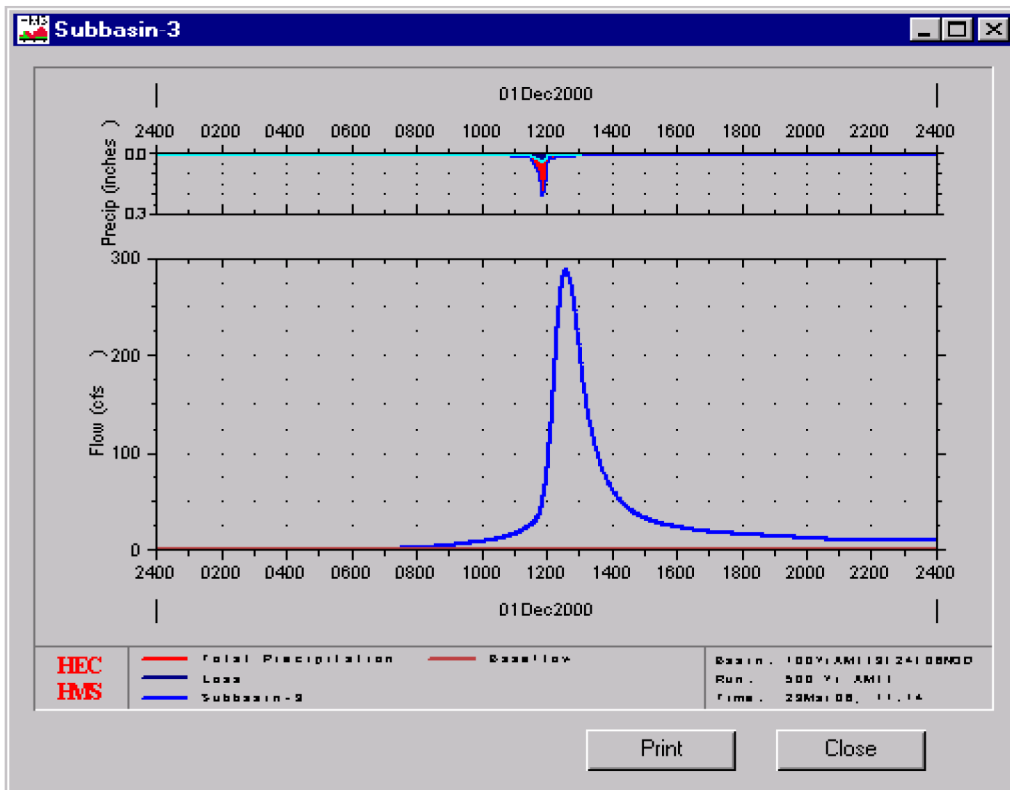
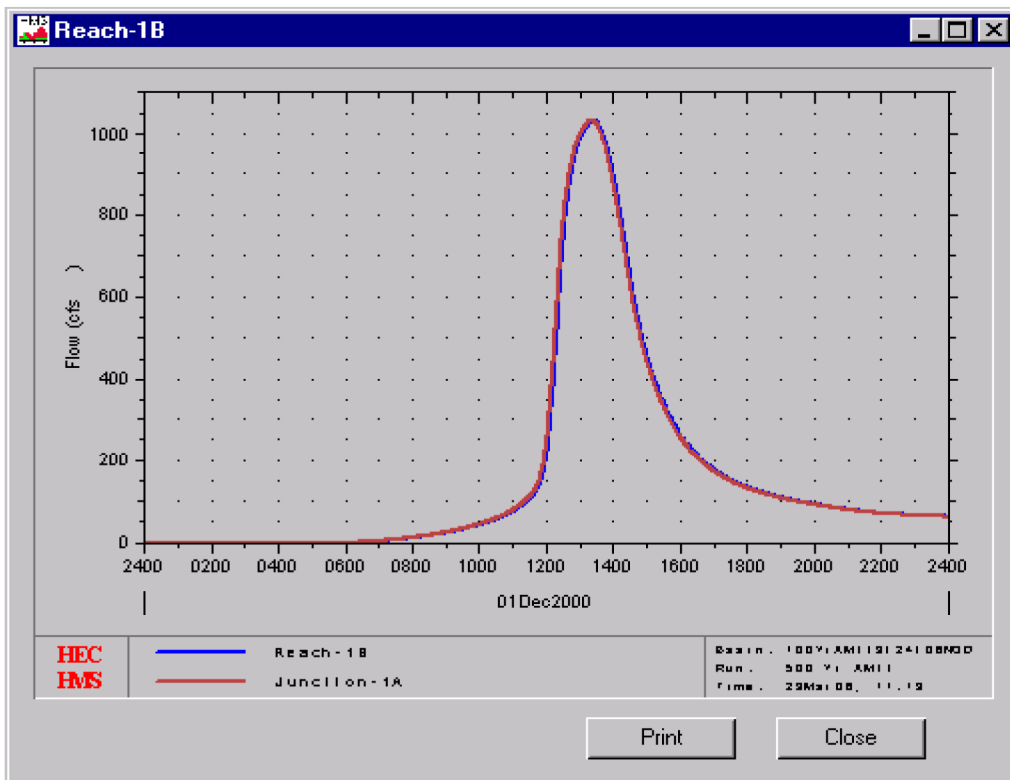
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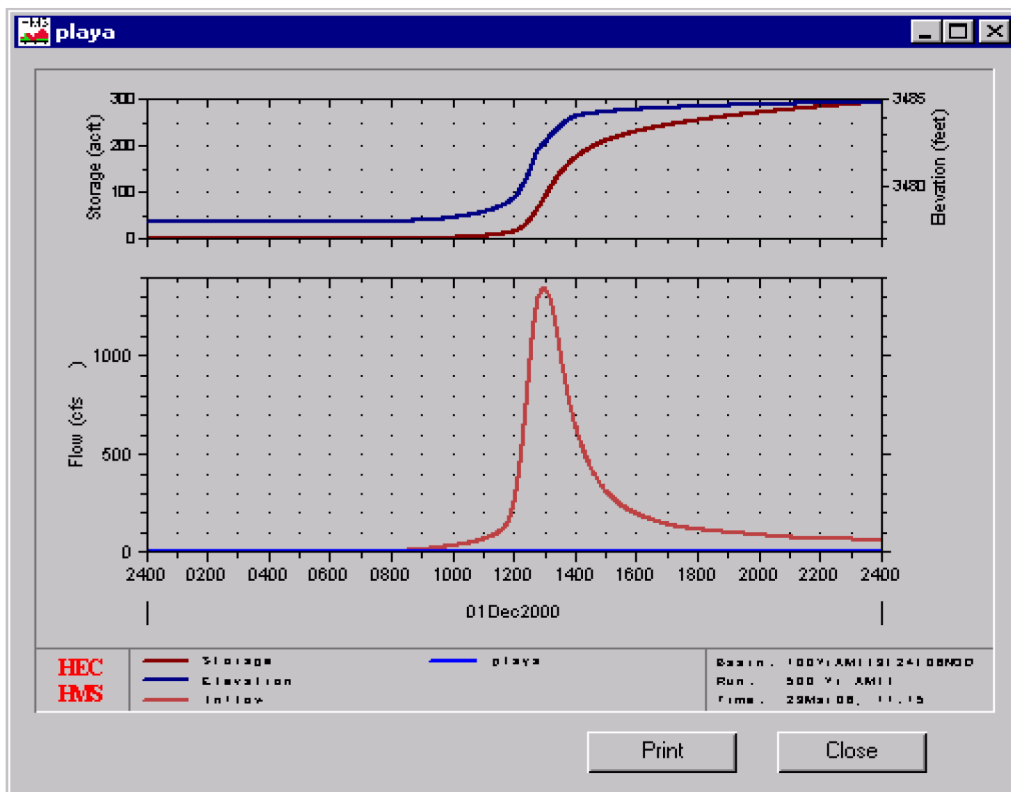
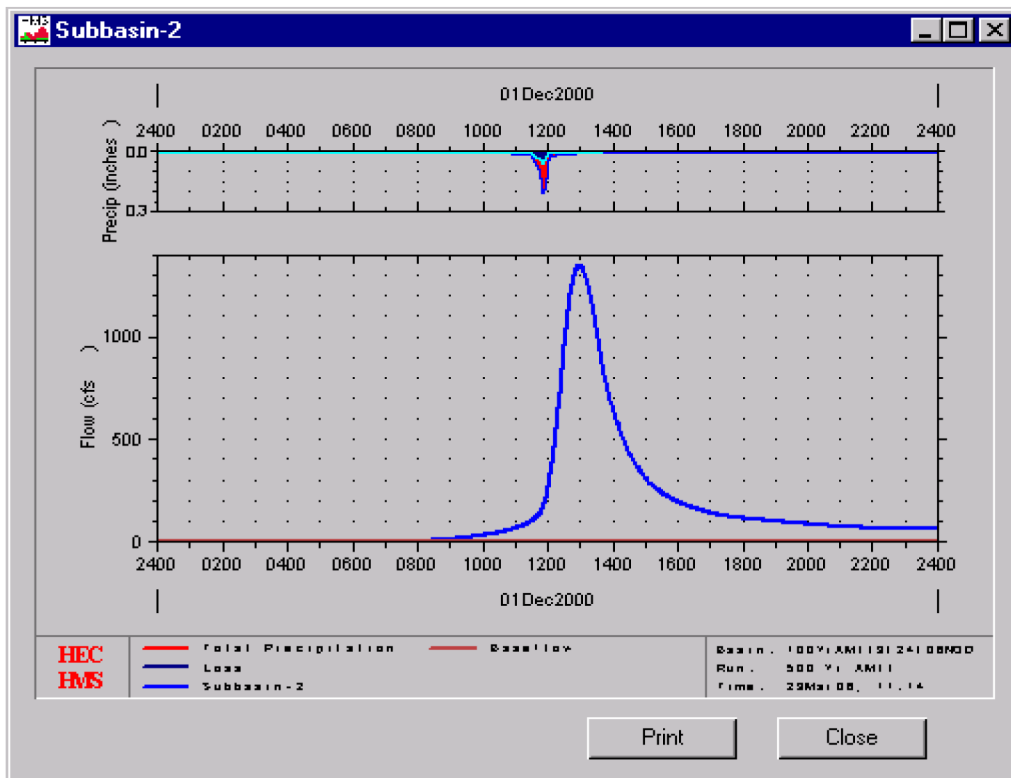
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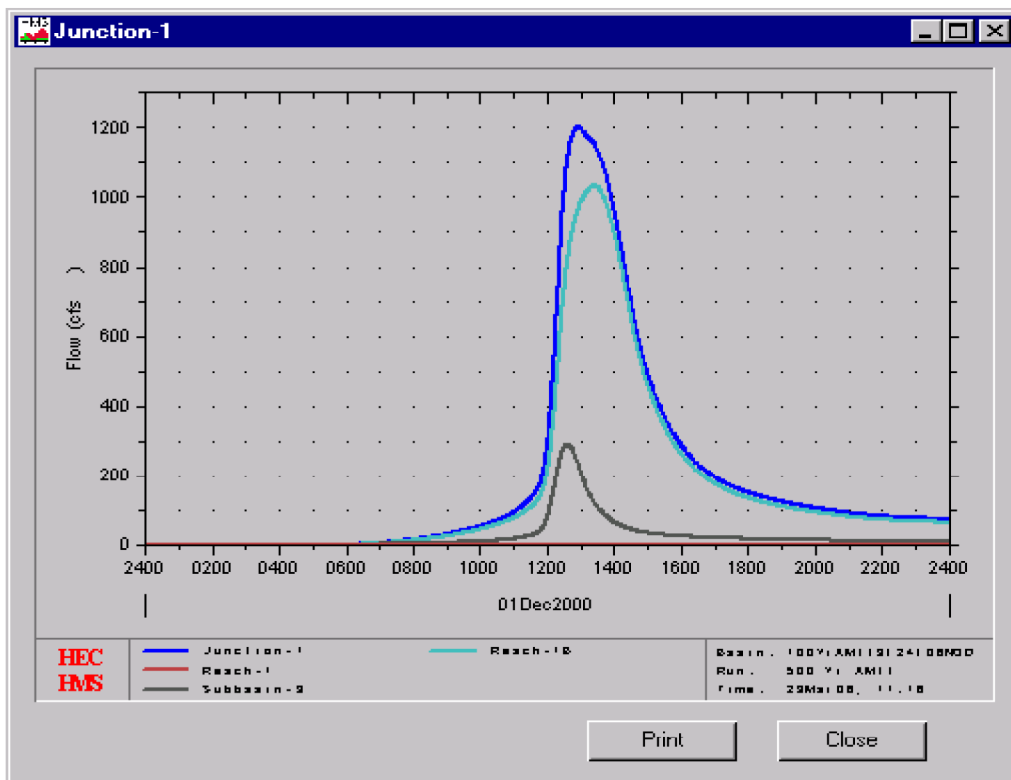
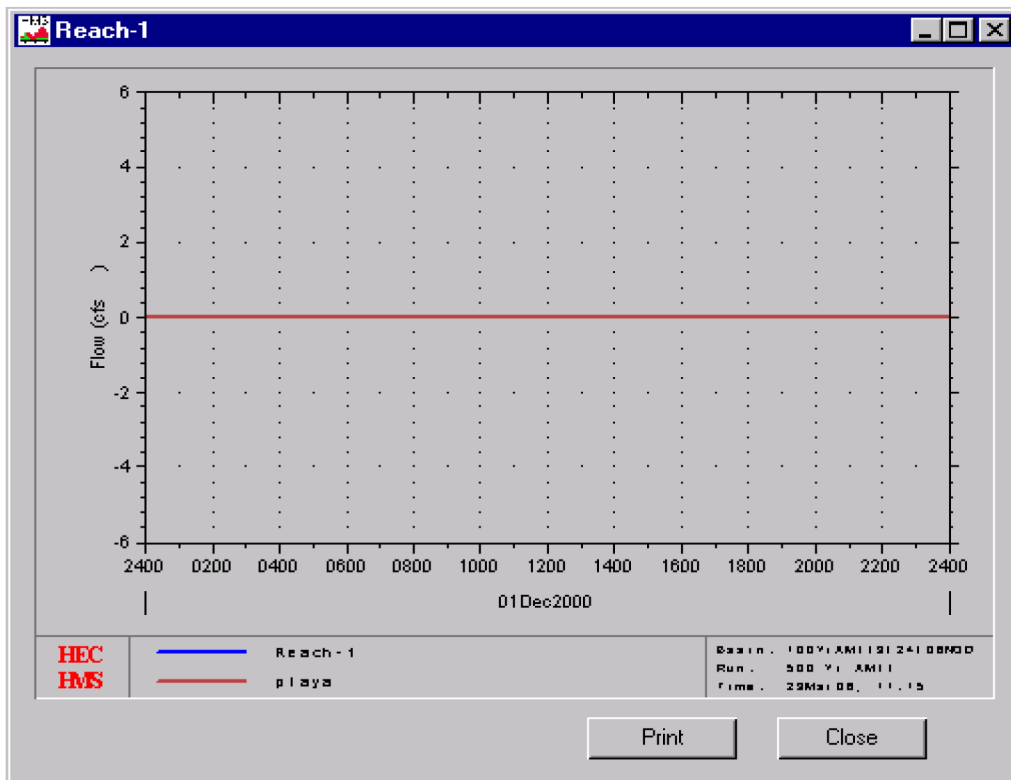
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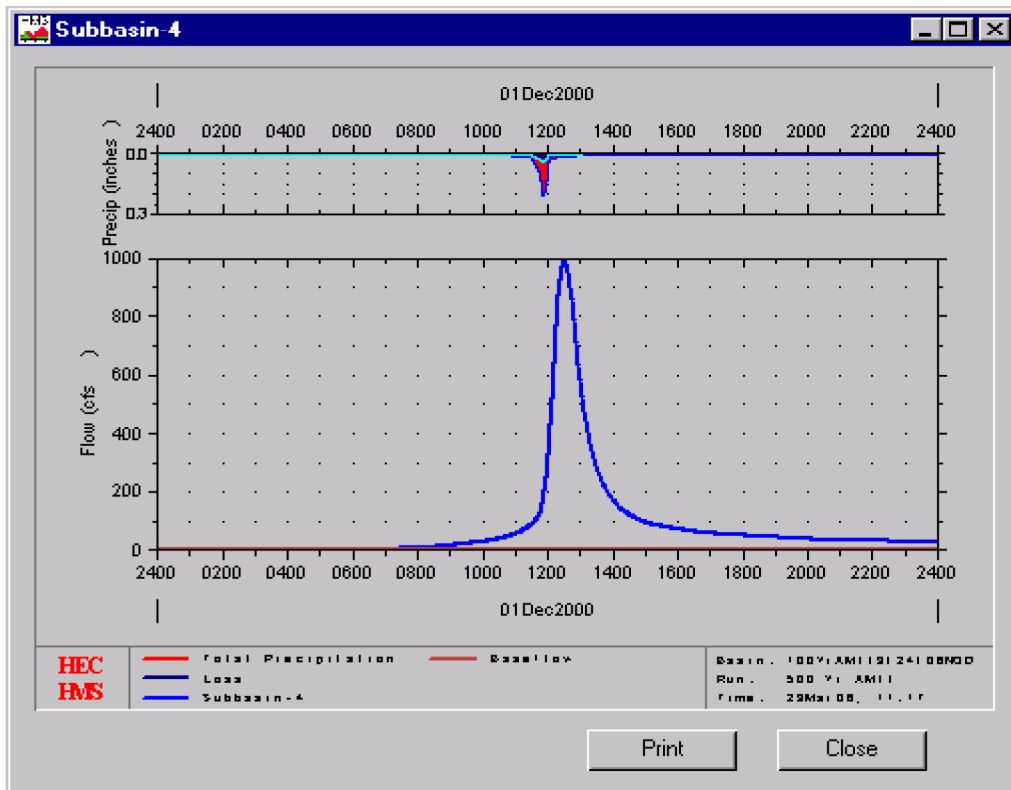
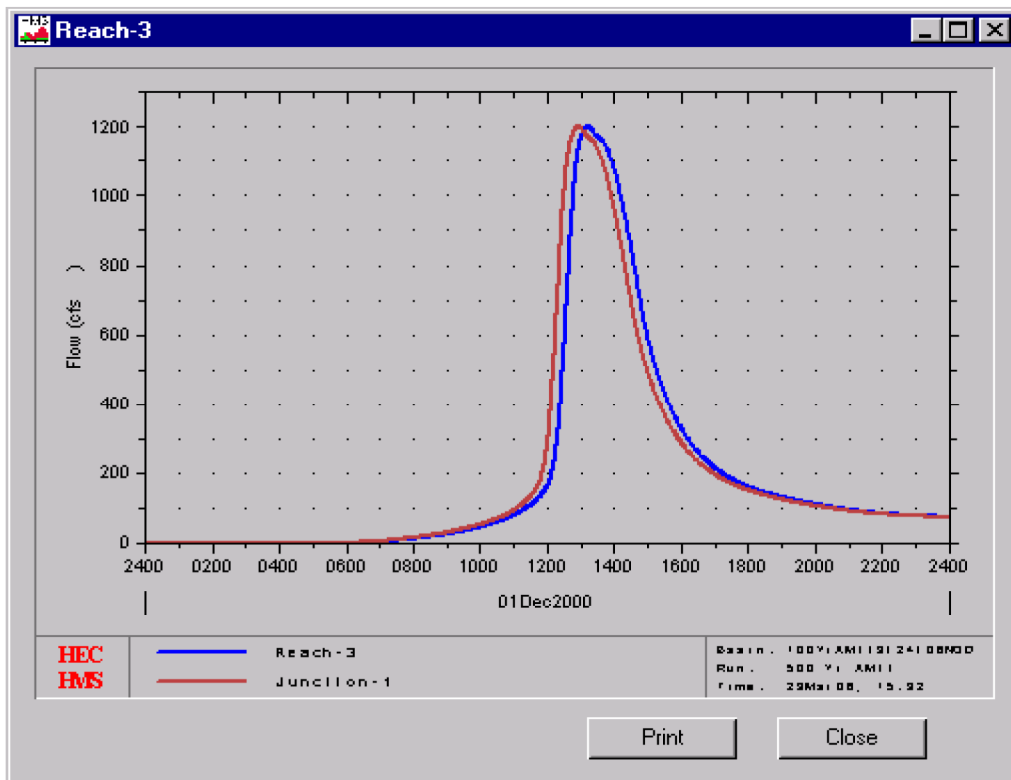
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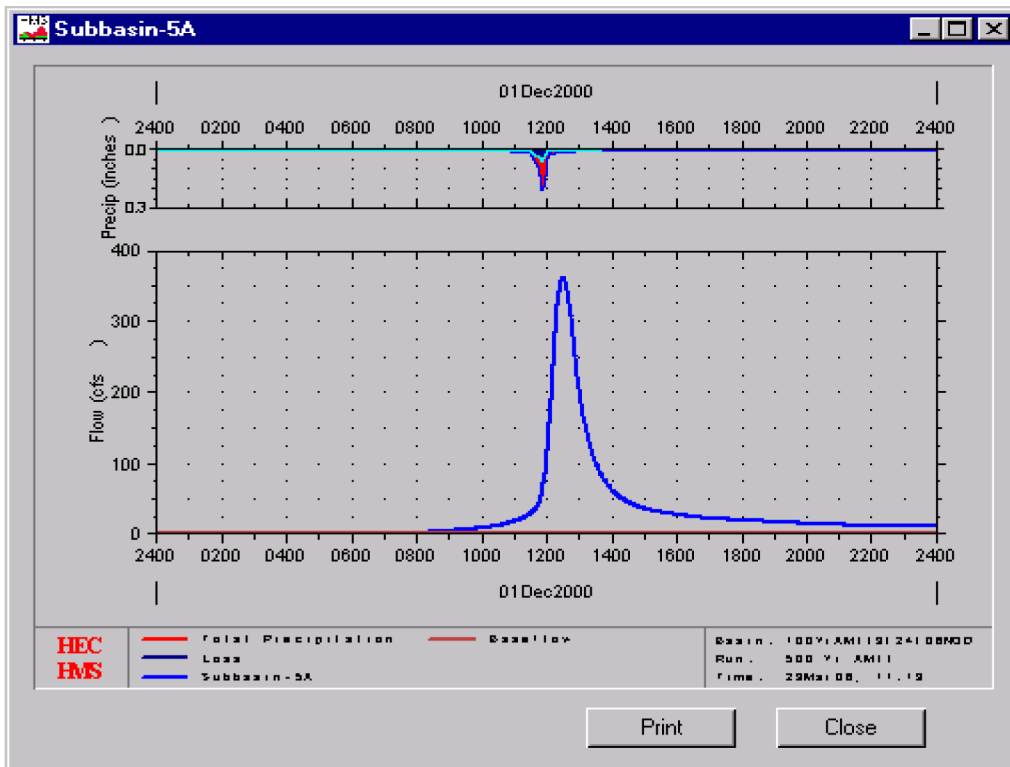
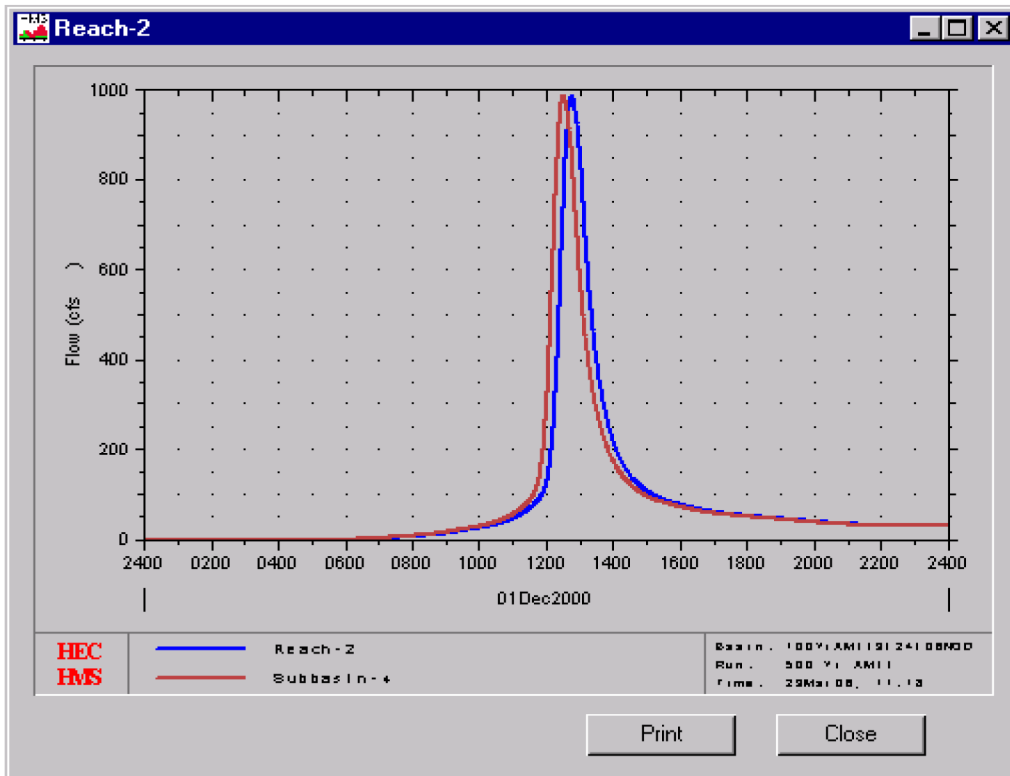
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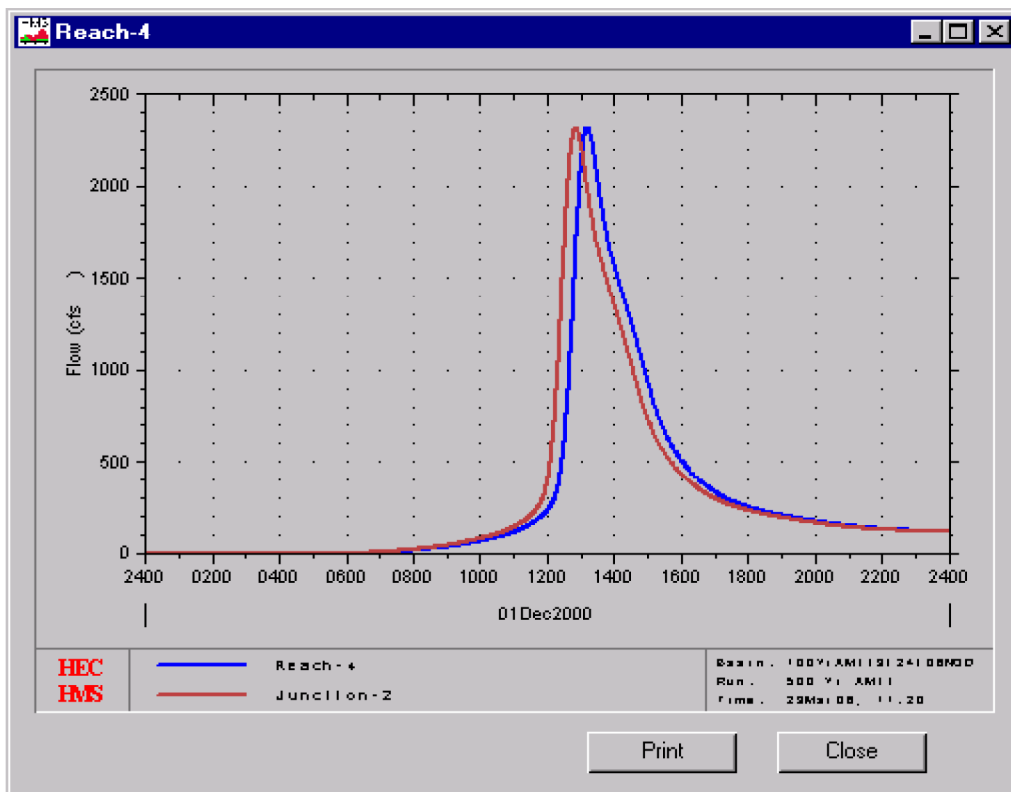
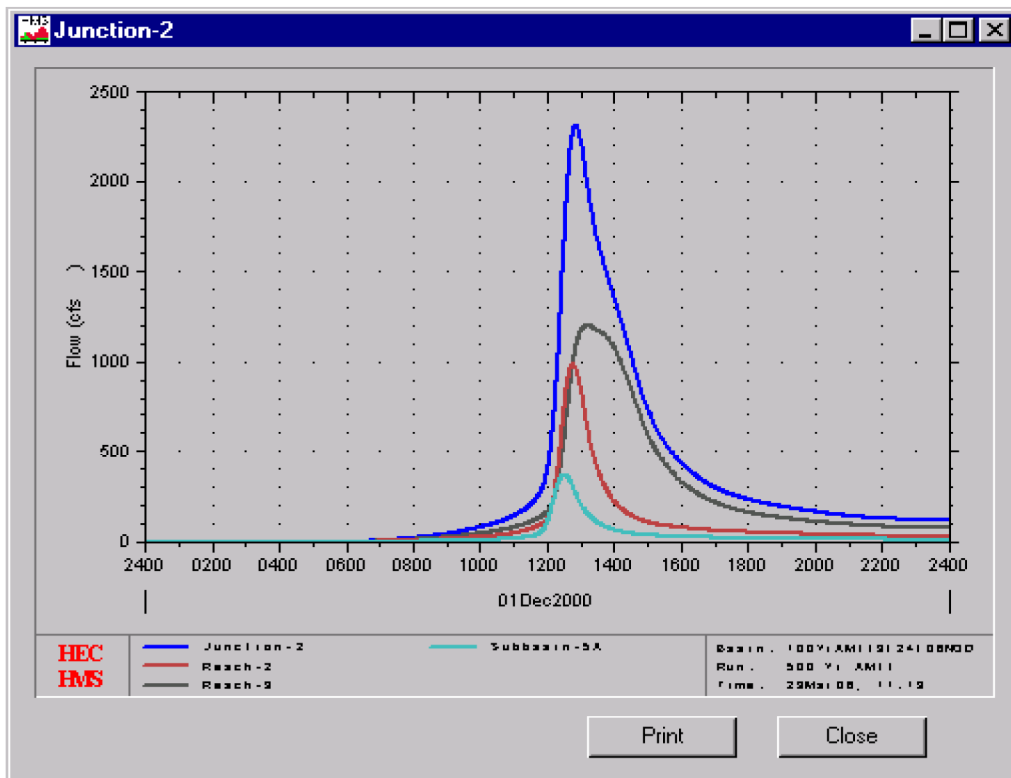


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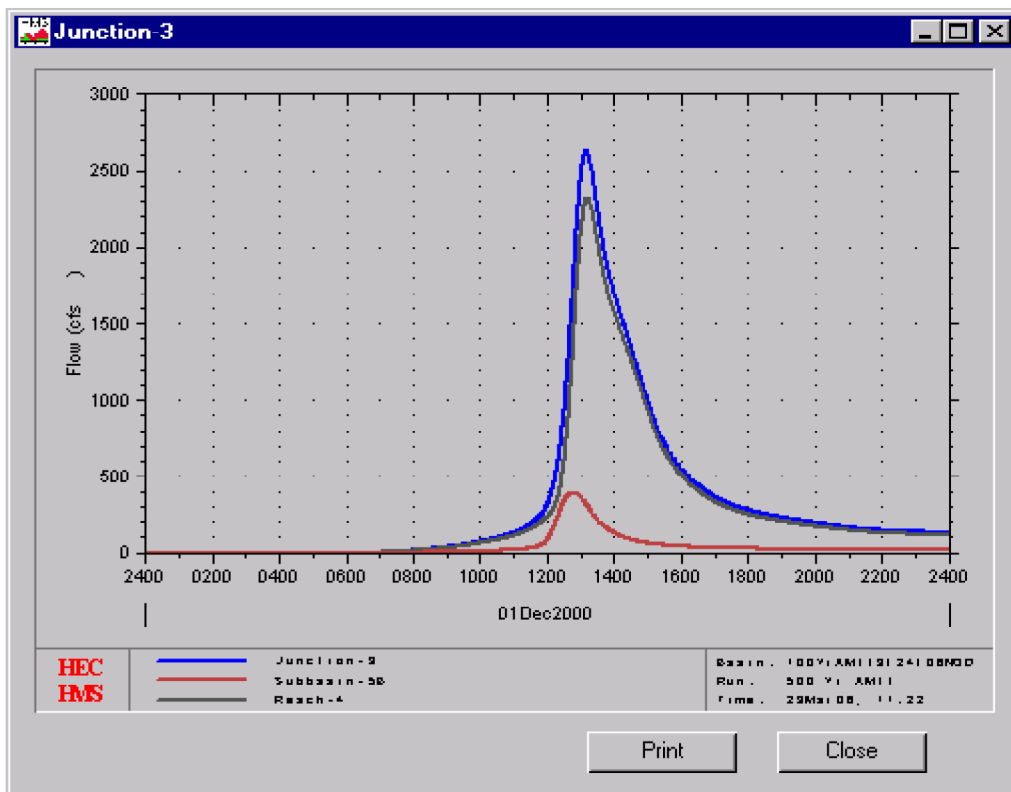
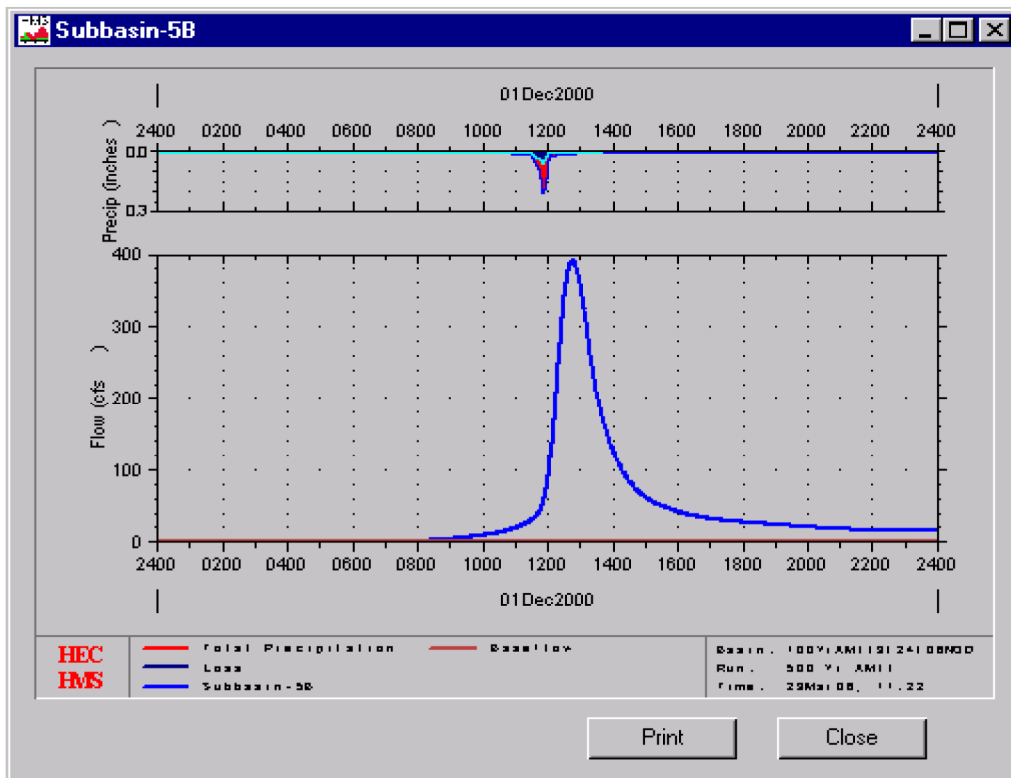




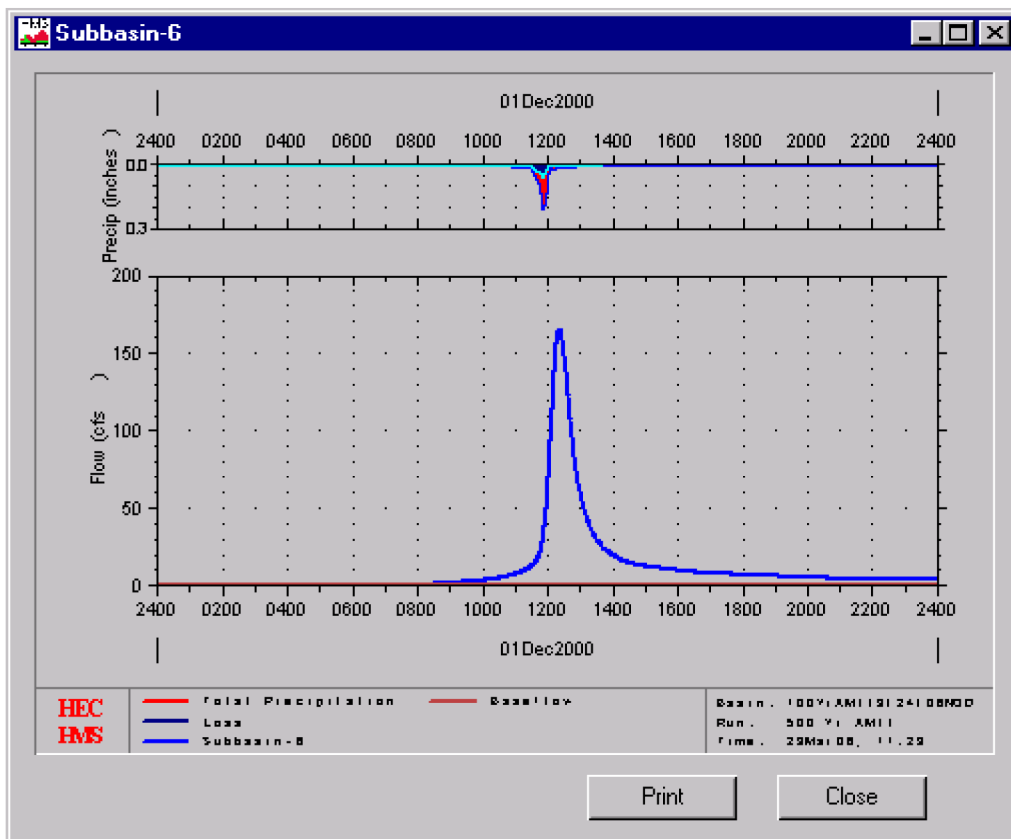
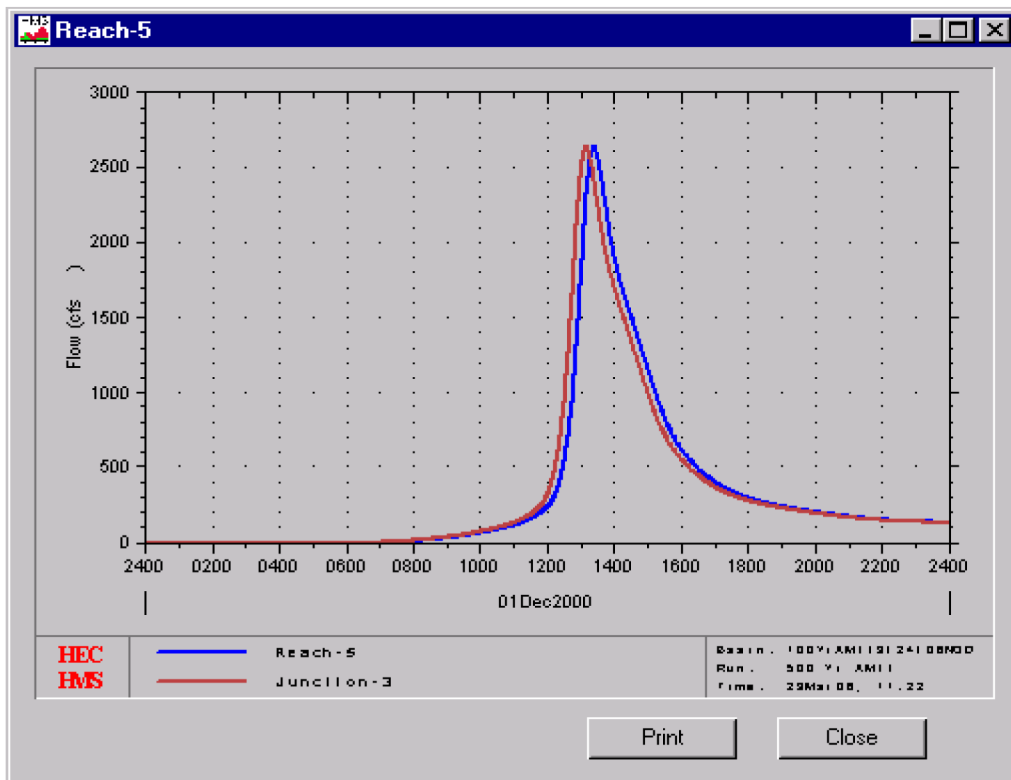
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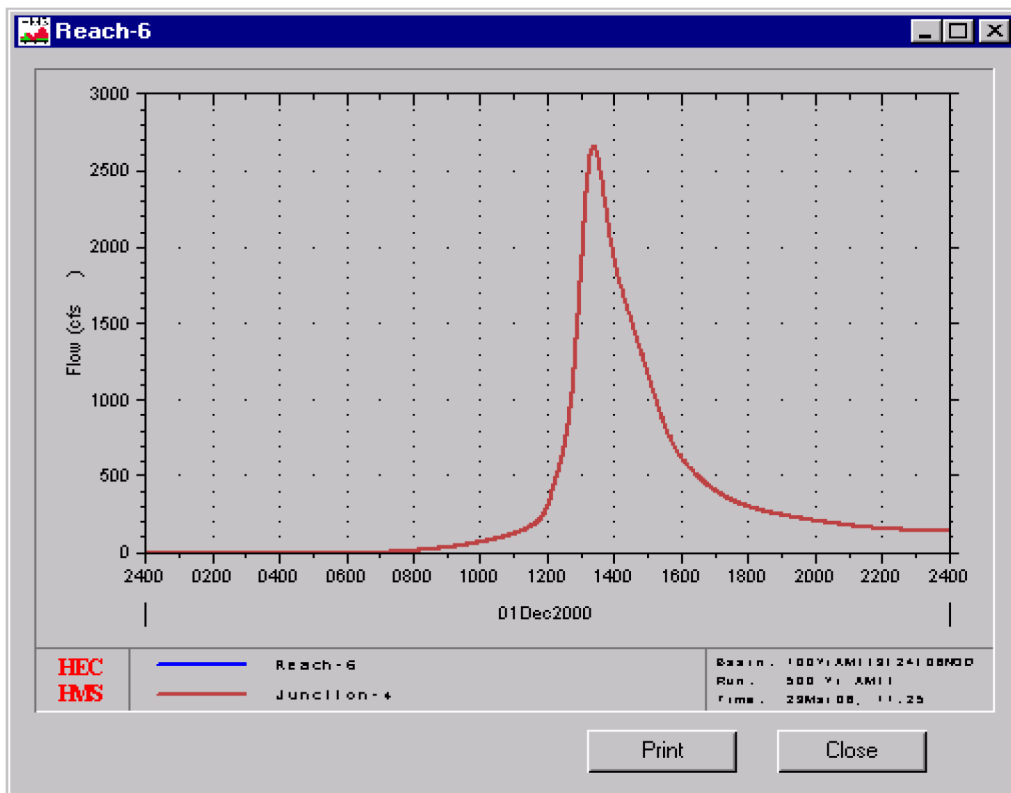
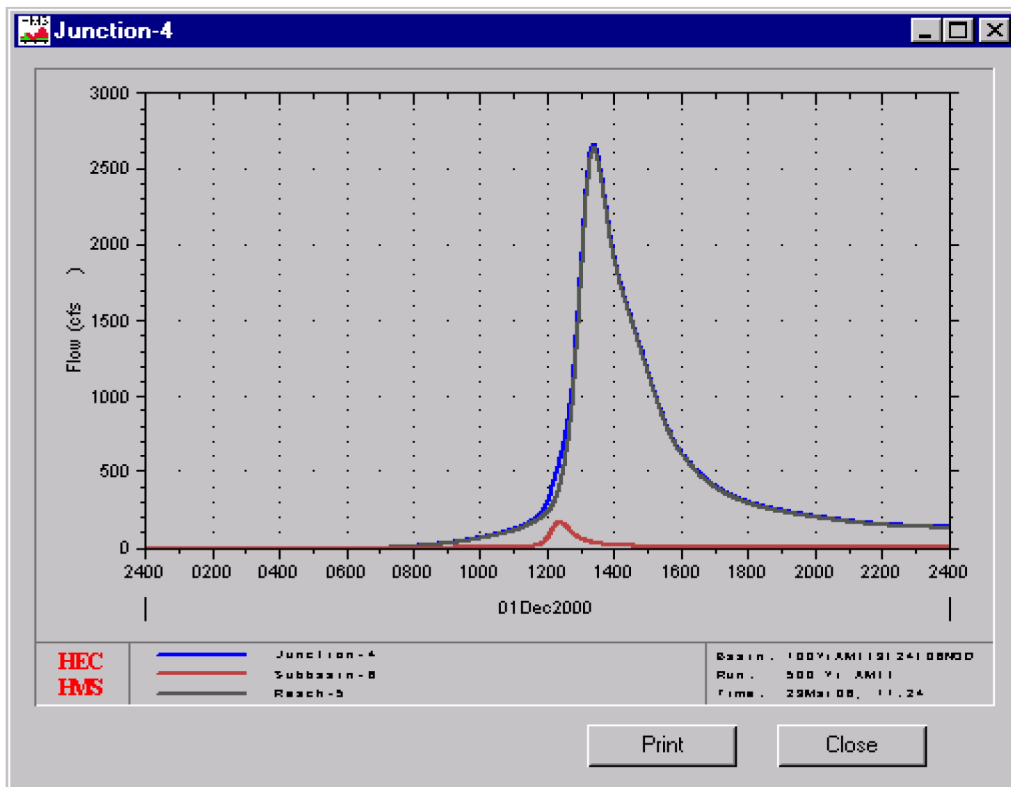
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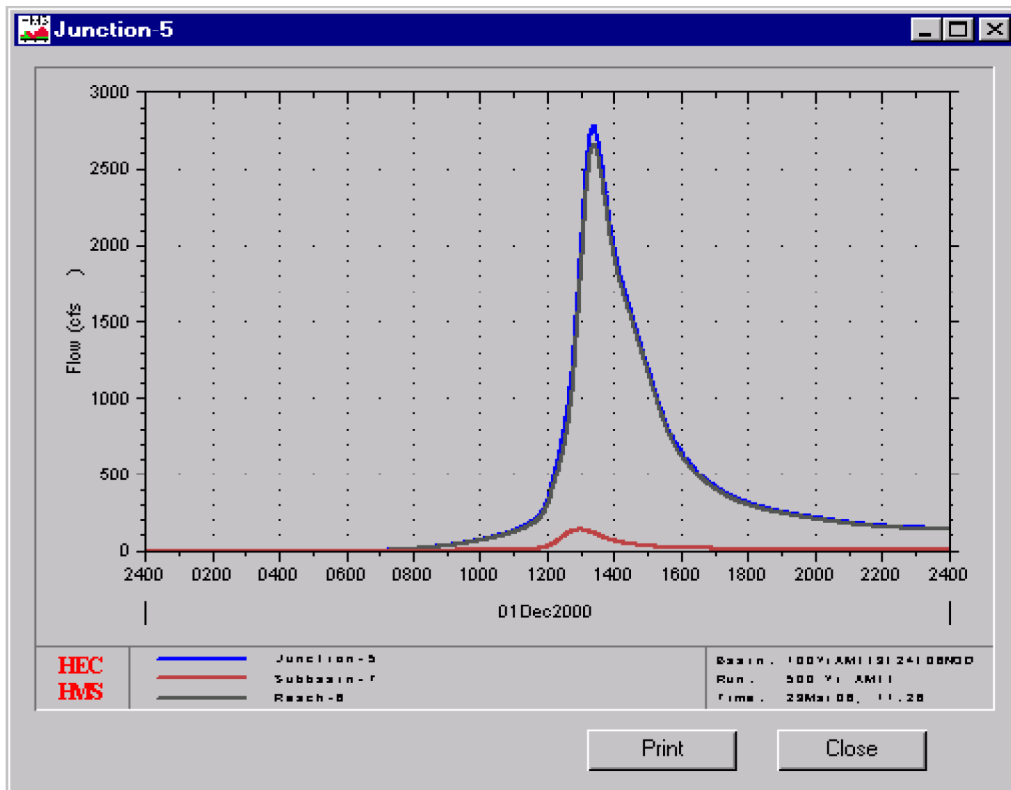
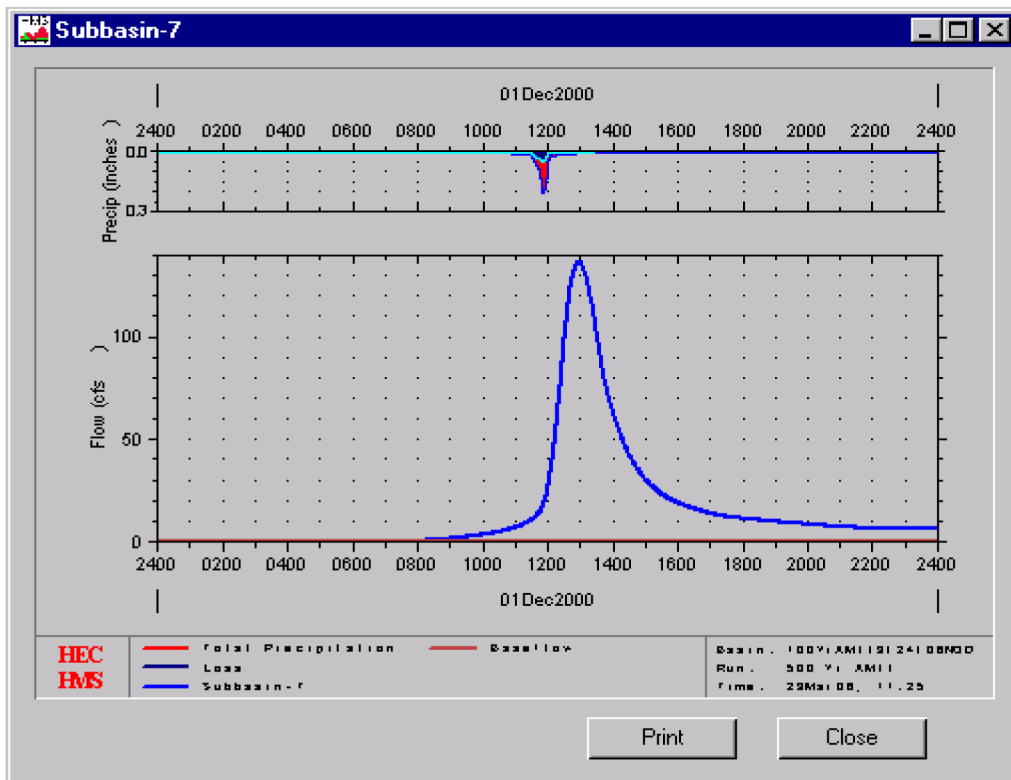
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



## **APPENDIX O**

### **HEC-HMS MODEL FOR THE CALCULATION OF THE PMP PEAK DISCHARGE, ANTECEDENT MOISTURE CONDITION II**

# HMS \* Summary of Results

Project : WCS

Run Name : PMP Dist A AMII

Start of Run : 01Dec00 0000 Basin Model : 100YrAMII3/24/06NOD

End of Run : 05Dec00 0000 Met. Model : PMP Dist. A NOD

Execution Time : 29Mar06 1606 Control Specs : Control PMP

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4	1303.2	03 Dec 00 0600	965.43	0.490
Reach-2	1303.2	03 Dec 00 0615	965.43	0.490
Subbasin-2	2804.8	03 Dec 00 0602	2051.2	1.063
playa	2380.3	03 Dec 00 0649	1594.1	1.063
Reach-1	2380.3	03 Dec 00 0724	1594.1	1.063
Subbasin-1A	1832.7	03 Dec 00 0605	1381.1	0.691
Reach-1A	1832.7	03 Dec 00 0622	1381.1	0.691
Subbasin-1B	833.89	03 Dec 00 0600	615.56	0.314
Junction-1A	2662.1	03 Dec 00 0604	1996.7	1.005
Reach-1B	2662.1	03 Dec 00 0607	1996.7	1.005
Subbasin-3	414.76	03 Dec 00 0600	307.36	0.156
Junction-1	5169.8	03 Dec 00 0621	3898.2	2.224
Reach-3	5169.8	03 Dec 00 0638	3898.1	2.224
Subbasin-5A	508.22	03 Dec 00 0600	370.48	0.192
Junction-2	6871.1	03 Dec 00 0622	5234.1	2.906
Reach-4	6871.1	03 Dec 00 0643	5234.1	2.906
Subbasin-5B	700.32	03 Dec 00 0601	511.35	0.265
Junction-3	7467.3	03 Dec 00 0635	5745.4	3.171
Reach-5	7467.3	03 Dec 00 0649	5745.4	3.171
Subbasin-6	196.02	03 Dec 00 0600	142.79	0.074
Junction-4	7552.2	03 Dec 00 0644	5888.2	3.245
Reach-6	7552.2	03 Dec 00 0644	5888.2	3.245
Subbasin-7	274.88	03 Dec 00 0601	201.77	0.104
Junction-5	7798.5	03 Dec 00 0640	6090.0	3.349

## Meteorologic Model Input

**HMS - Meteorologic Model**

File Edit Help

Meteorologic Model: PMP Distribution A Subbasin List

Description: PMP with Distribution per figure in HMR 51 ...

Precipitation Evapotranspiration

Method : User Hyetograph

Subbasin	"Gage" ID
Subbasin-1A	PMP Distribution A
Subbasin-2	PMP Distribution A
Subbasin-3	PMP Distribution A
Subbasin-4	PMP Distribution A
Subbasin-6	PMP Distribution A
Subbasin-1B	PMP Distribution A
Subbasin-7	PMP Distribution A
Subbasin-5B	PMP Distribution A
Subbasin-5A	PMP Distribution A

OK Apply Cancel



**HMS \* Basin Model \* SCS Curve Number**

Sort Help

Basin Model ID: 100YrAMII3/24/06NOD

Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	79		0.0
Subbasin-2	72		0.0
Subbasin-3	76		0.0
Subbasin-4	76		0.0
Subbasin-5B	72		0.0
Subbasin-6	72		0.0
Subbasin-1B	75		0.0
Subbasin-5A	72		0.0
Subbasin-7	73		0.0

OK Apply Cancel

**HMS \* Basin Model \* SCS UH**

Sort Help

Basin Model ID: 100YrAMII3/24/06NOD

Time Units : Minutes

Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3	44
Subbasin-4	39
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64

OK Apply Cancel

**HMS \* Basin Model \* Lag Routing**

Help

Basin Model ID : 100YrAMII3/24/06NOD

Interval : Minutes

Reach Name	Lag (min)
Reach-1	35
Reach-2	15
Reach-3	17
Reach-4	21
Reach-5	14
Reach-1A	17
Reach-1B	3
Reach-6	0

OK Apply Cancel

**HMS \* Basin Model \* Reservoir Editor**

Edit File Help

Reservoir Name:

Description:

Storage Outlet Spillway Overflow Dam Break

Method:

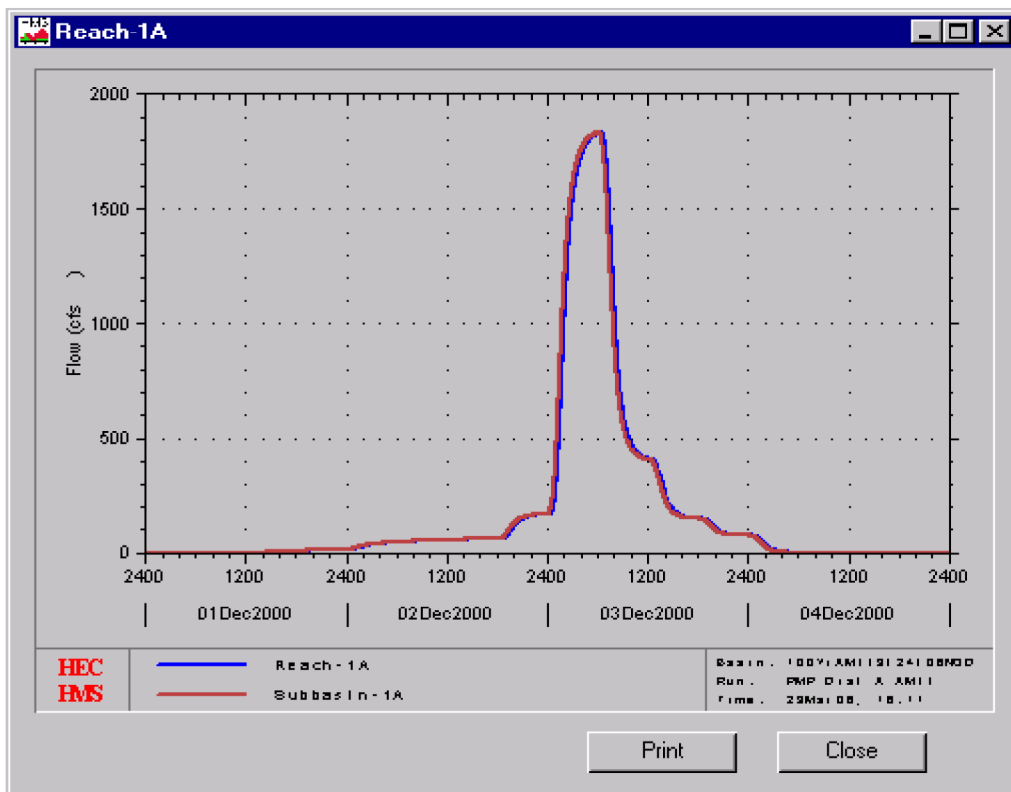
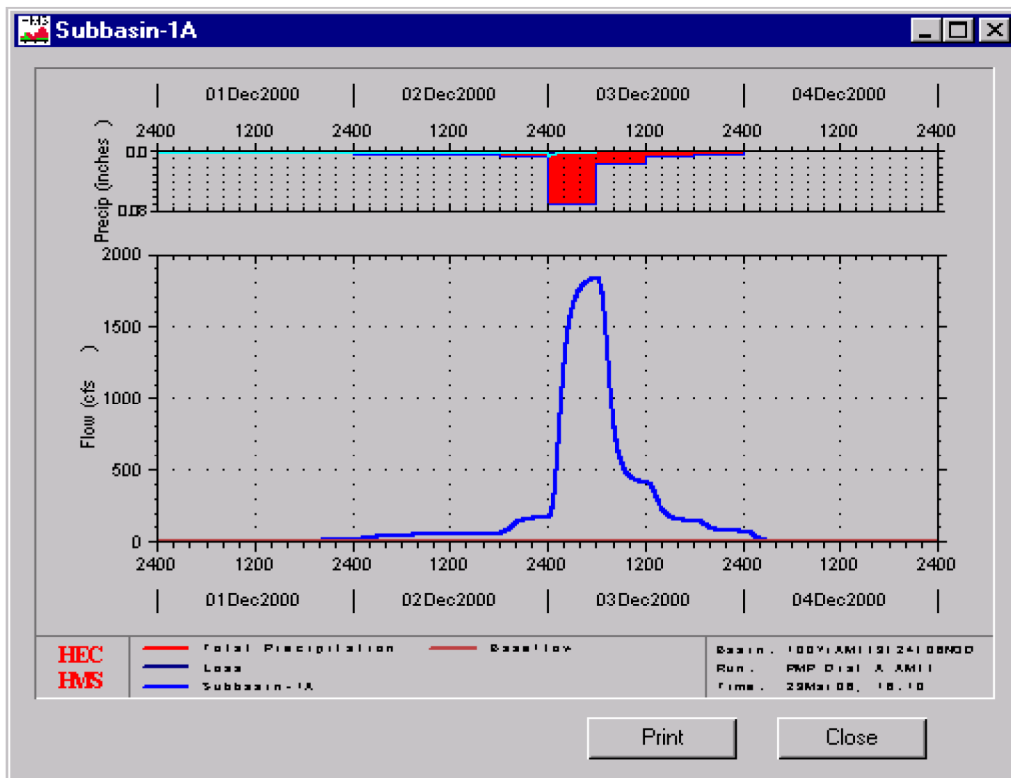
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Elevation (ft)	Storage (acre-feet)	Outflow (cfs)
3478.0	0.0	0.0
3480.0	24.0	0.0
3482.0	61.0	0.0
3484.0	170.0	0.0
3486.0	457.0	0.0
3487.0	693.0	863.0
3488.0	928.0	2427.0

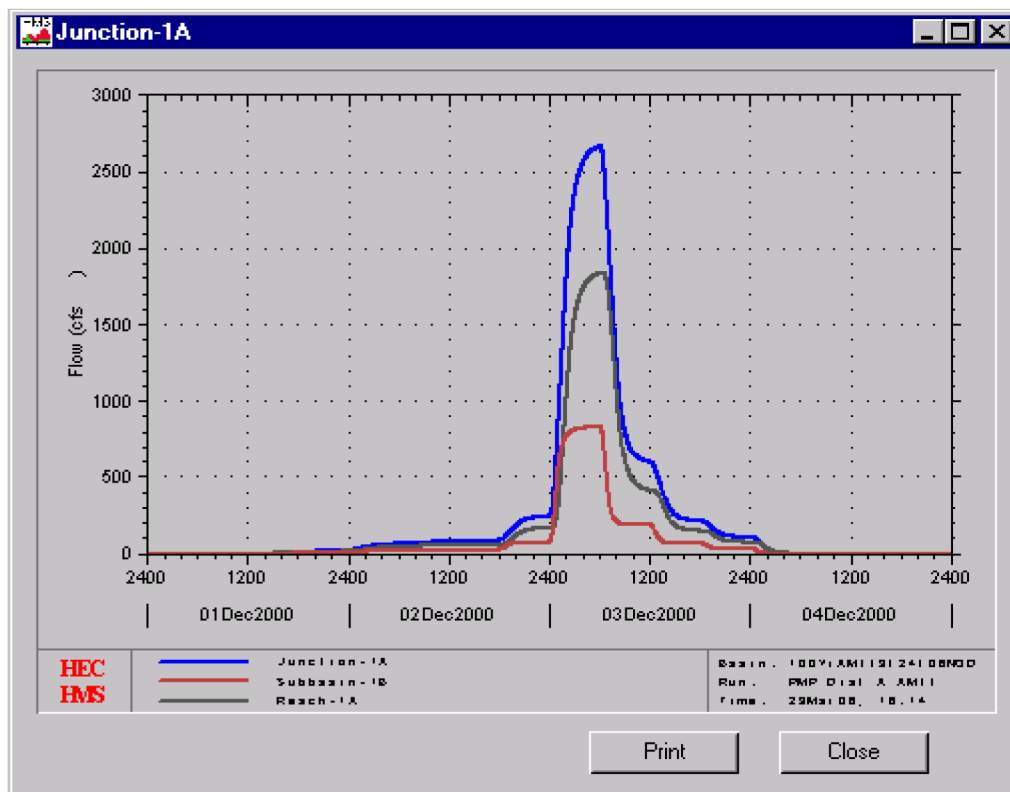
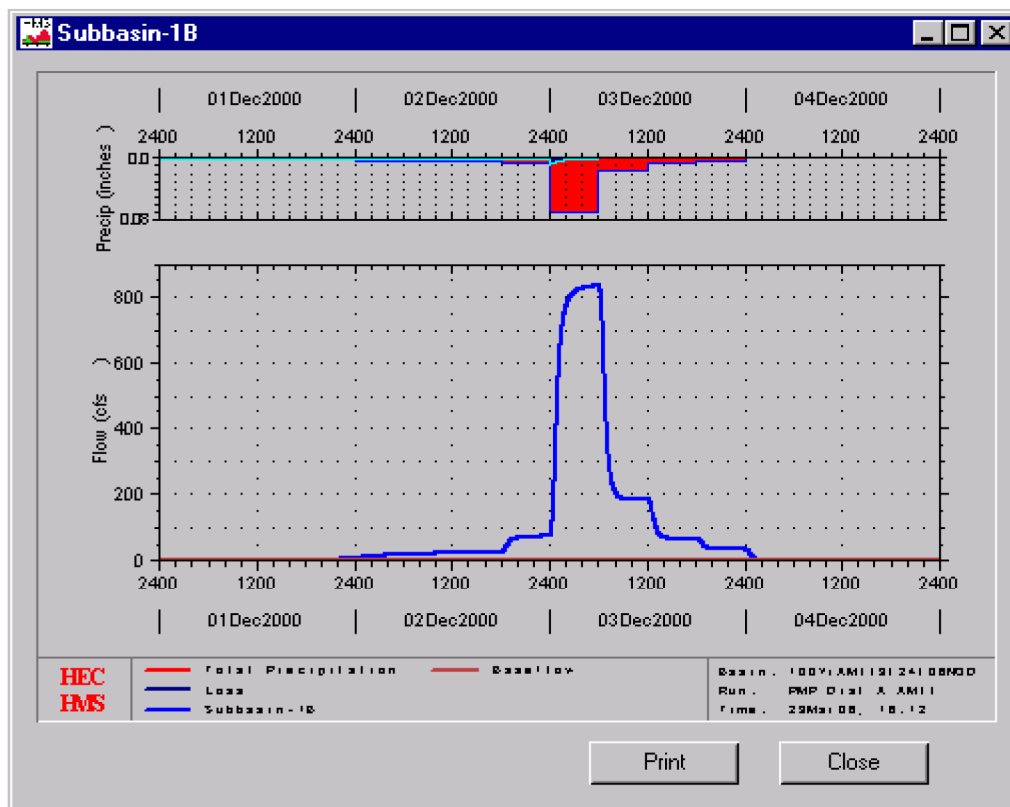
Graph

OK Apply Cancel

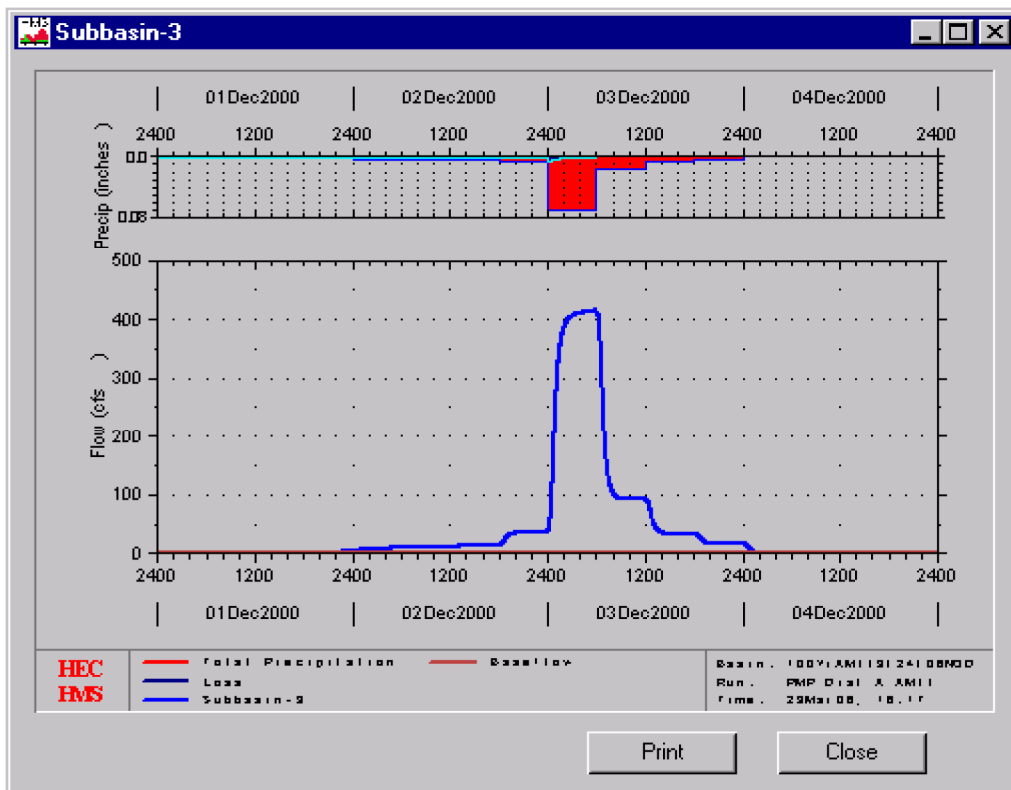
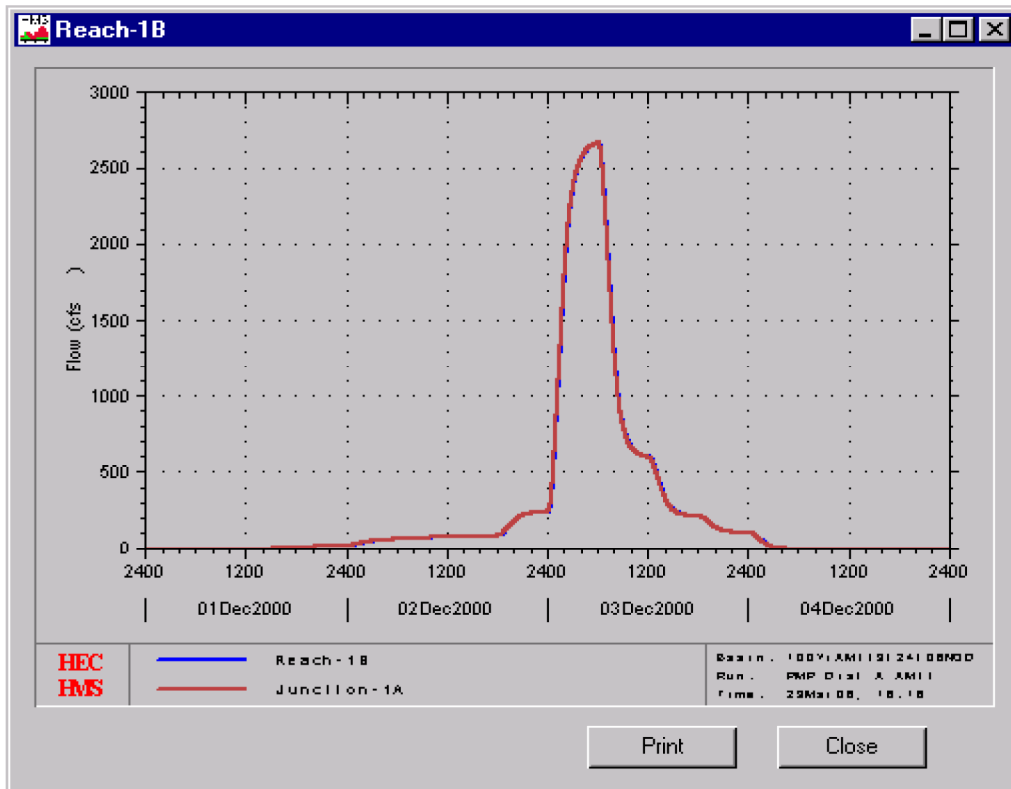
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



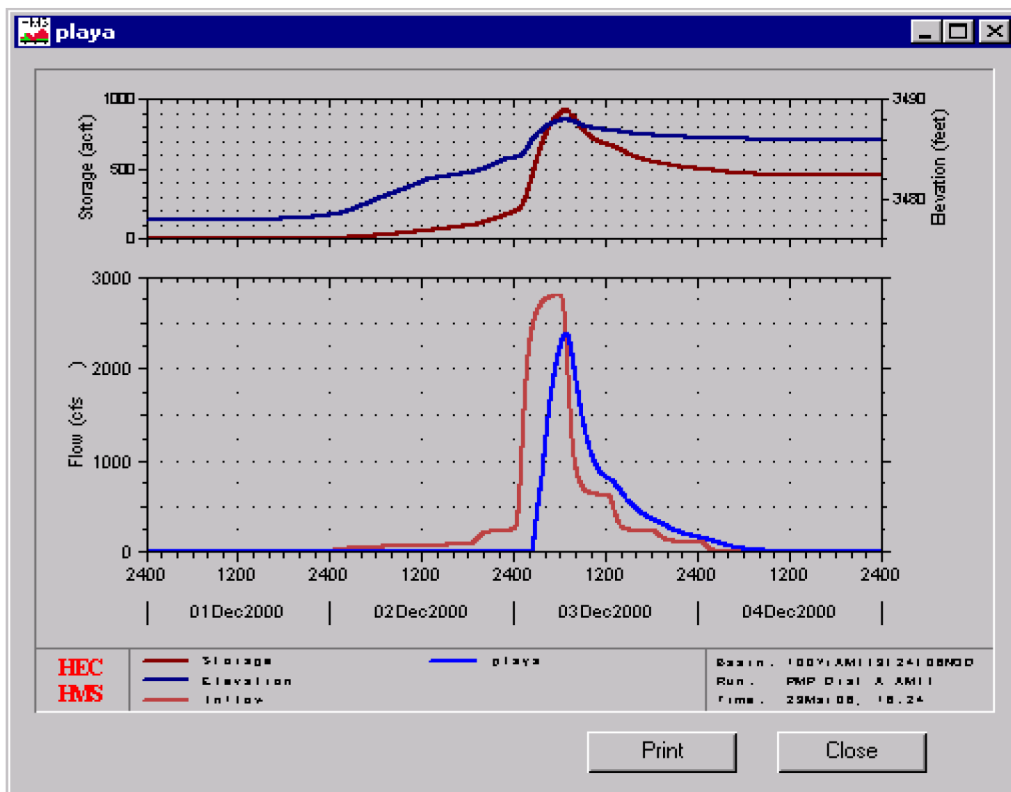
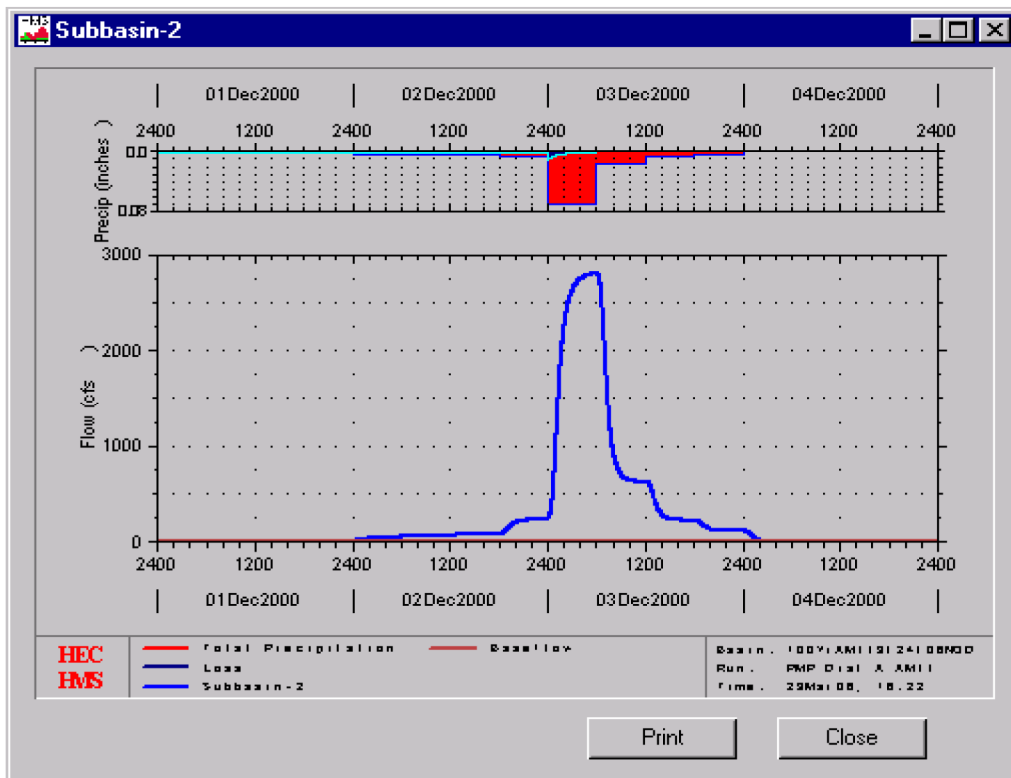
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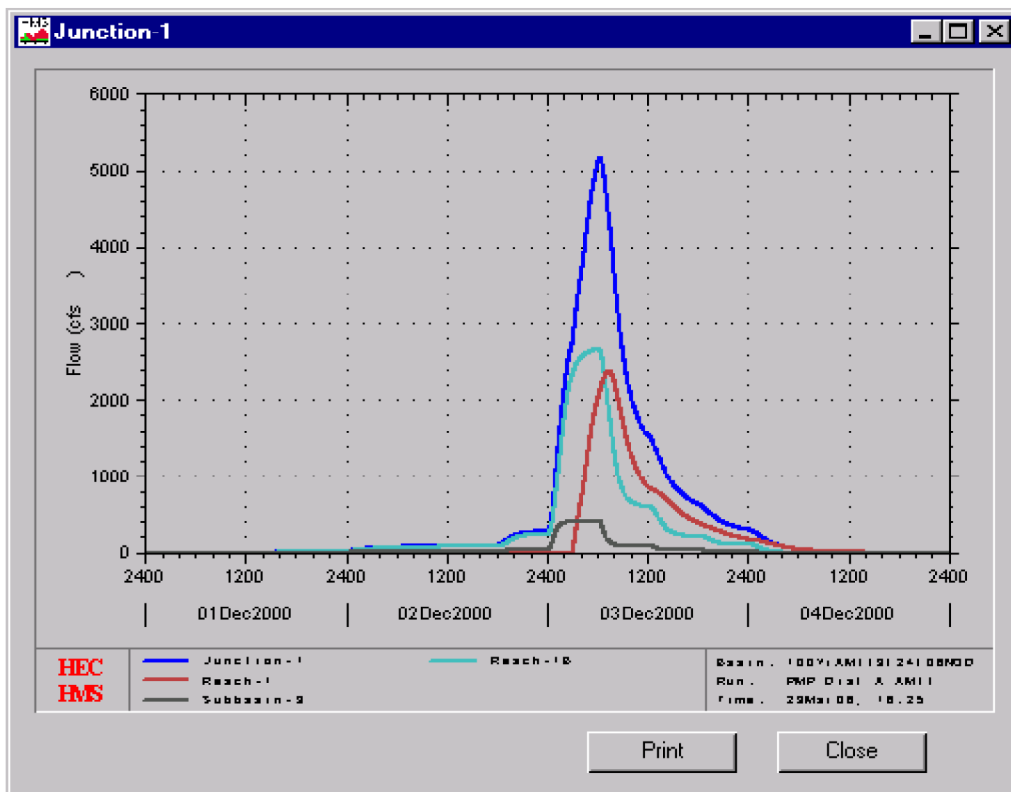
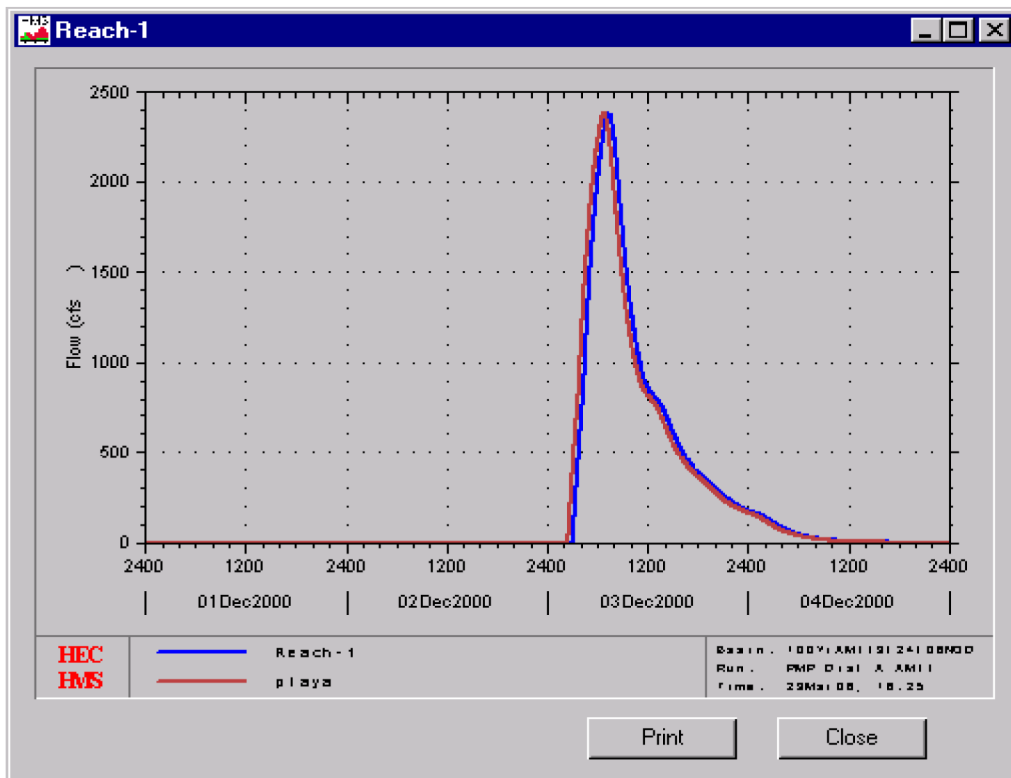
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# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

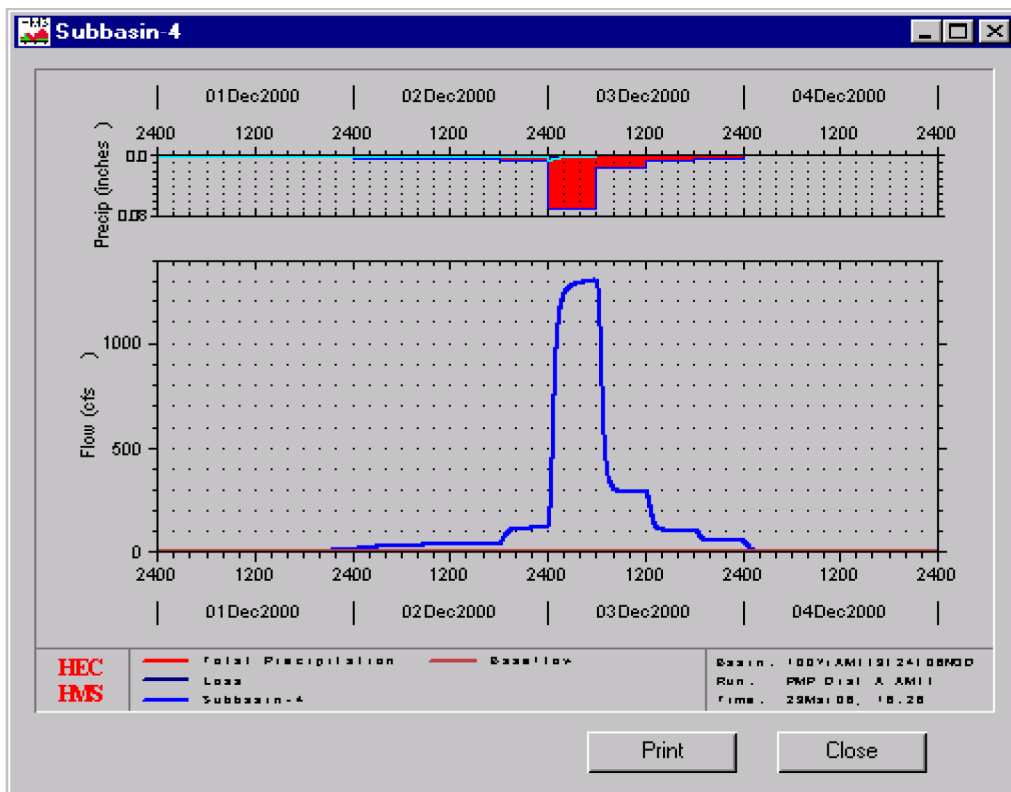
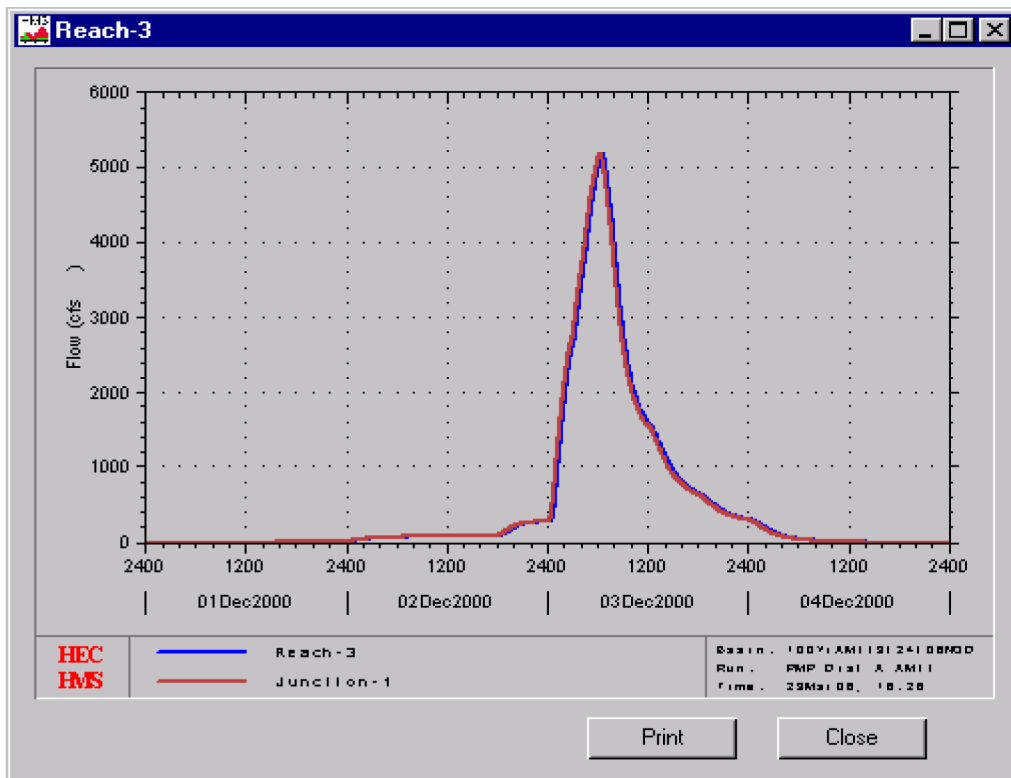


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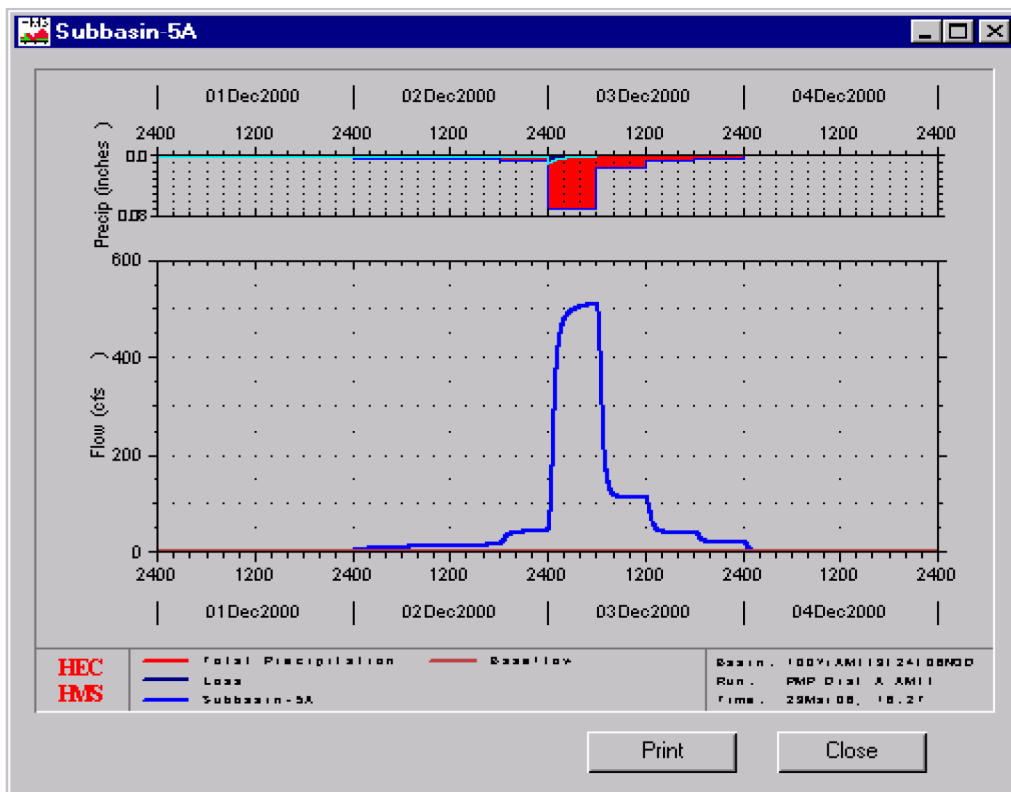
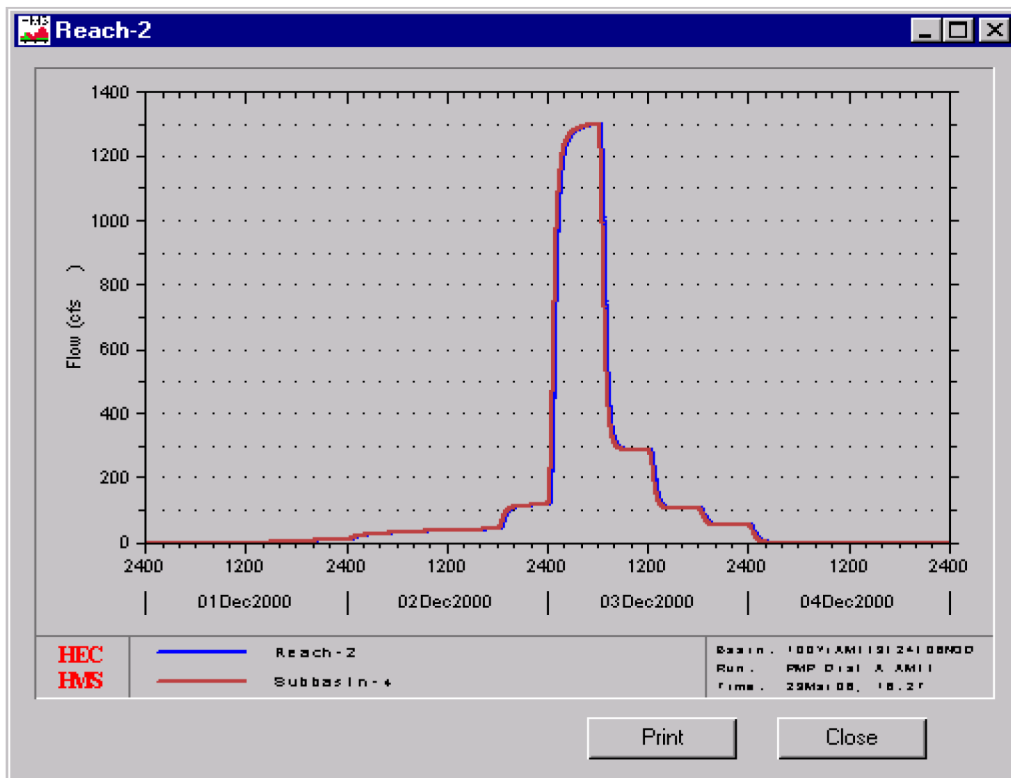




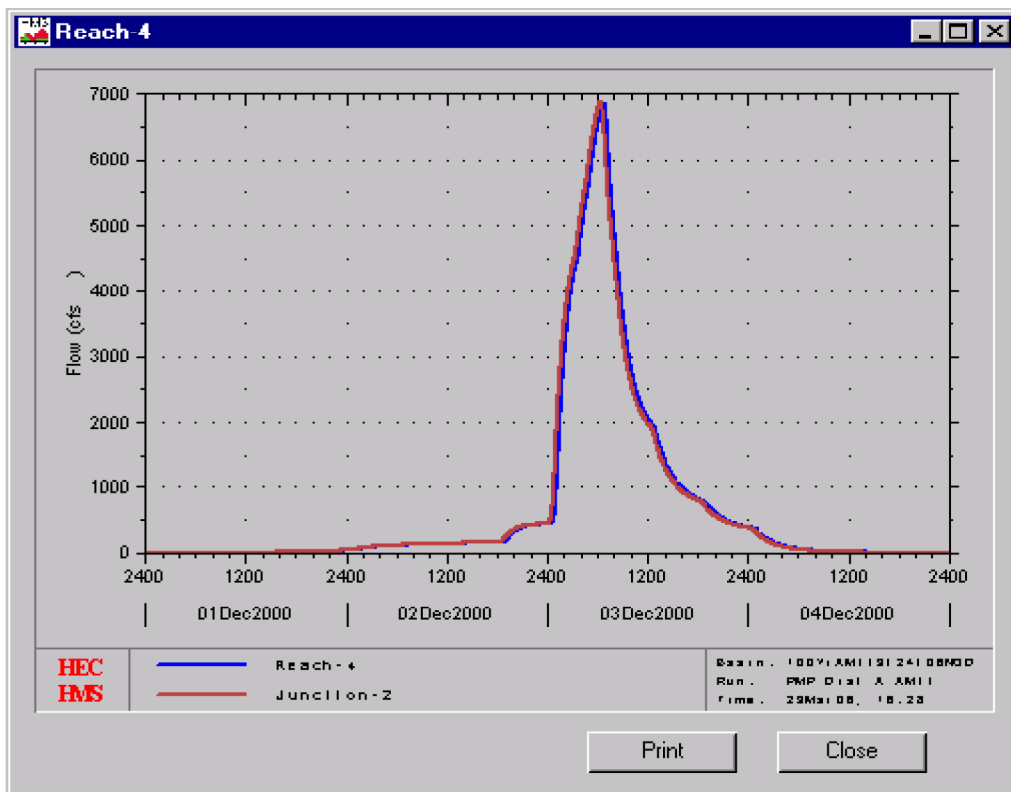
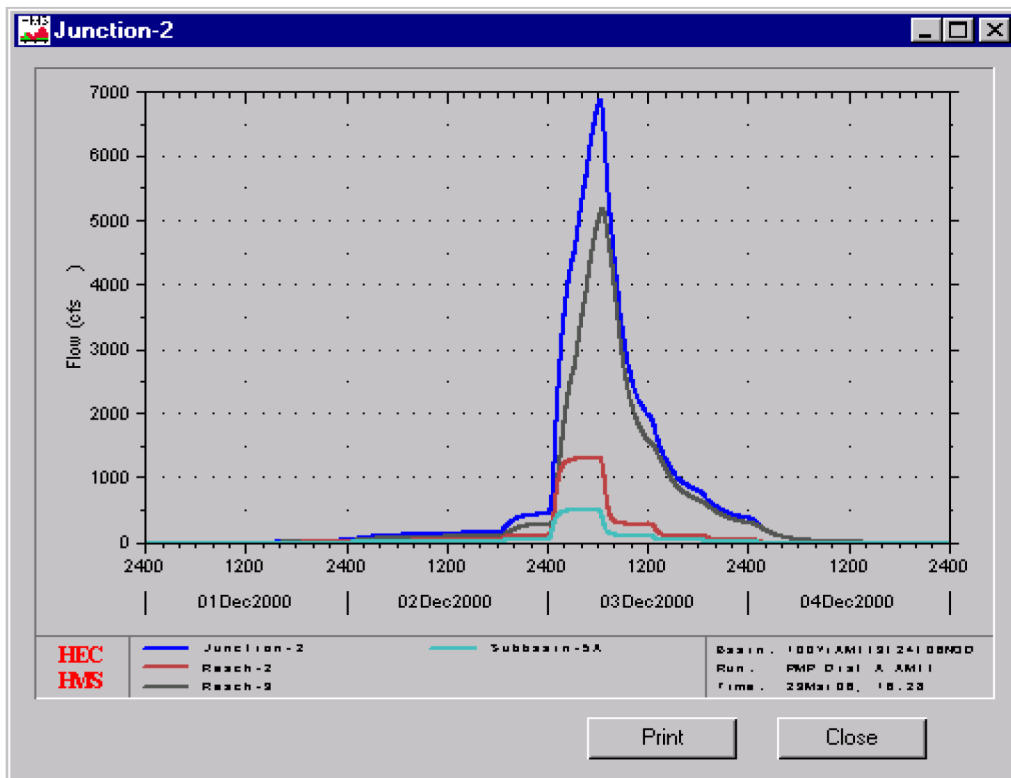
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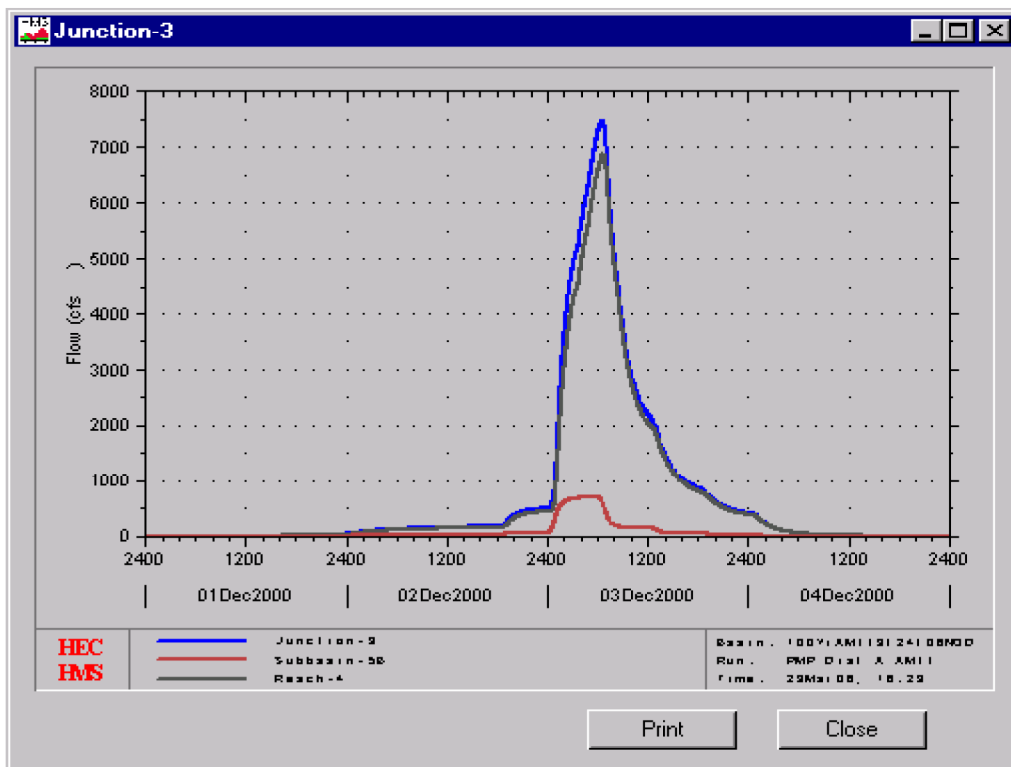
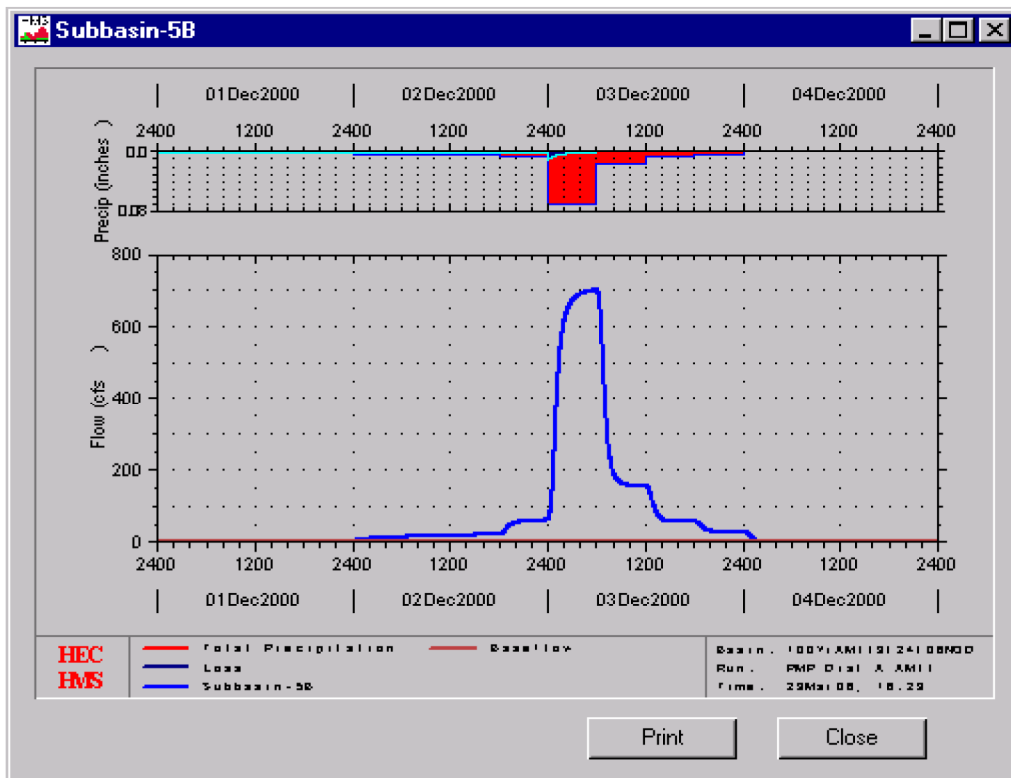
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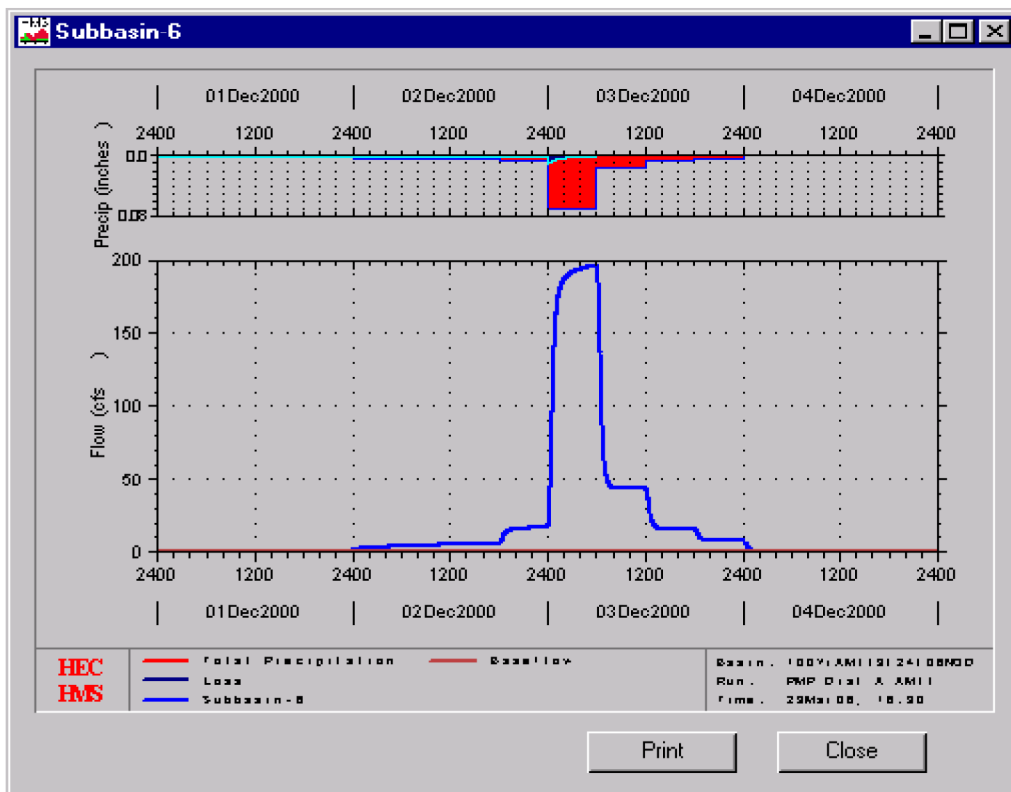
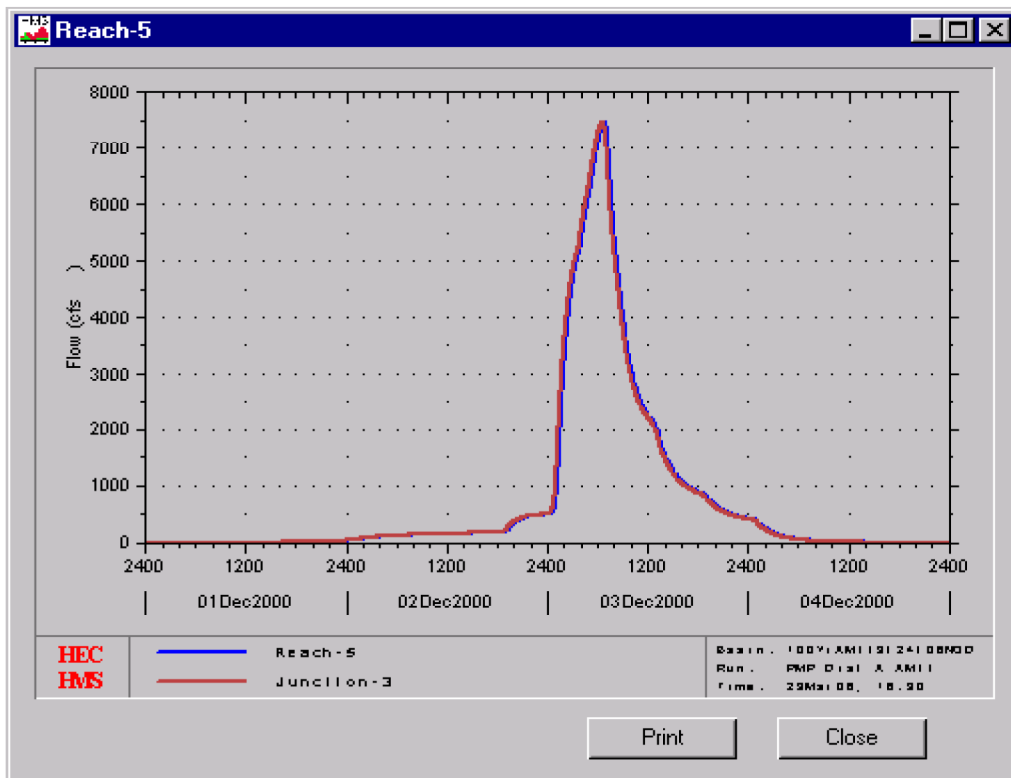
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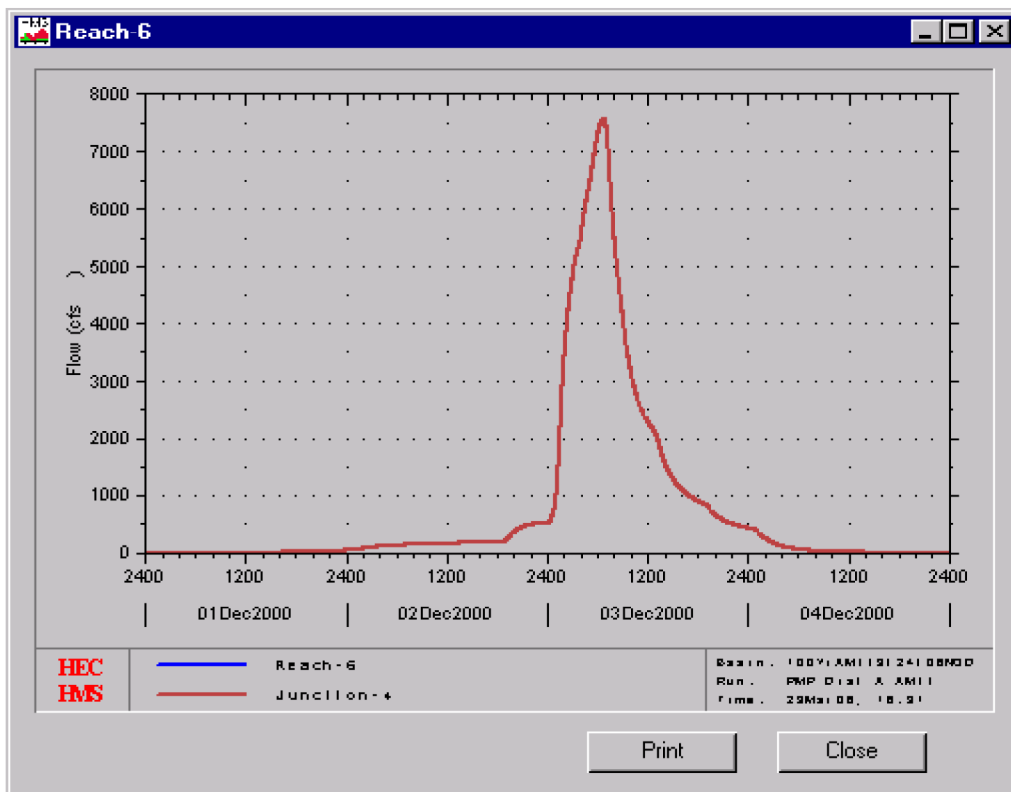
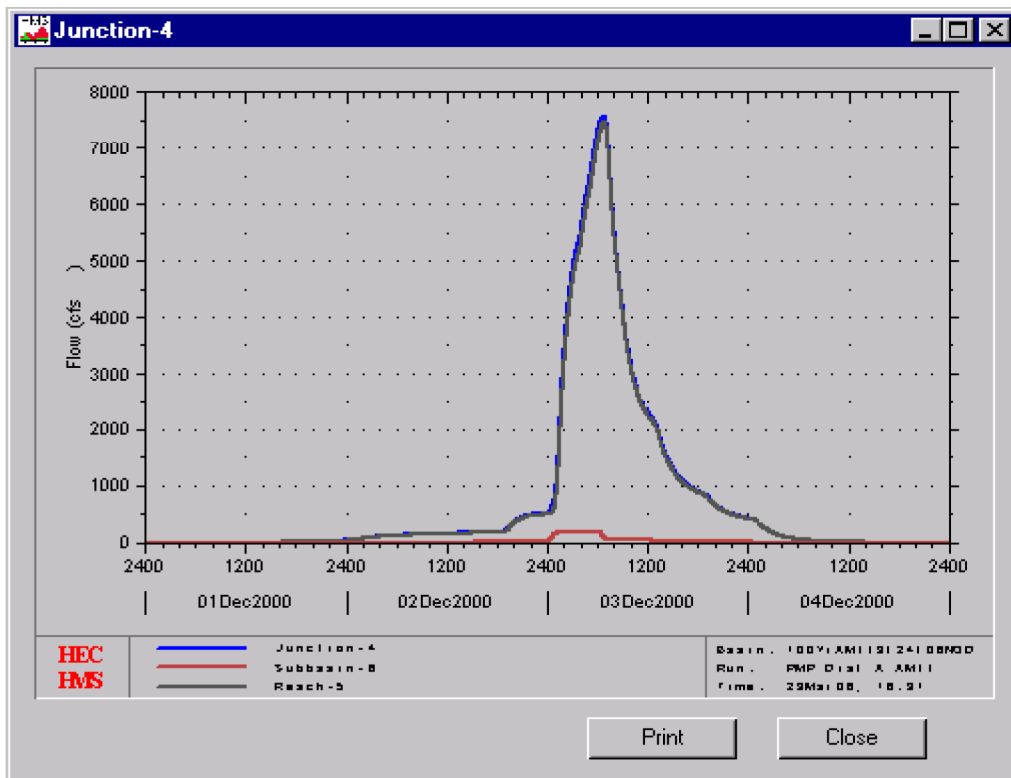
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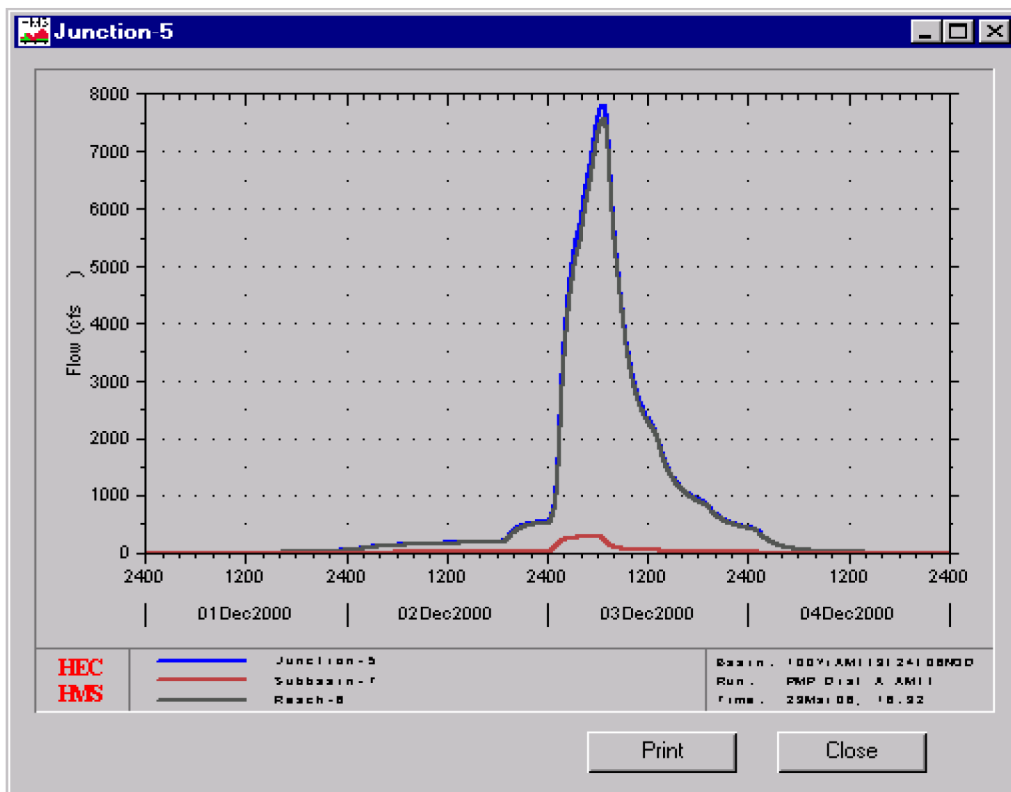
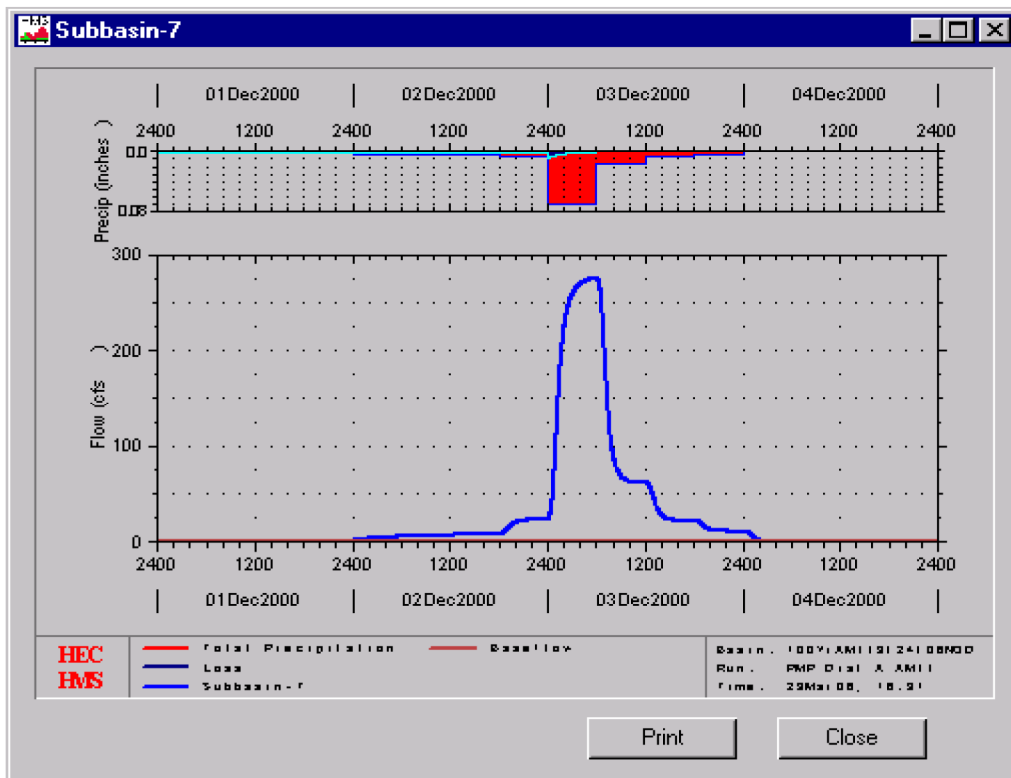
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# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



## **APPENDIX P**

### **HEC-RAS MODEL FOR THE CALCULATION OF THE 500-YEAR AND PMP WATER SURFACE PROFILES, ANTECEDENT MOISTURE CONDITION II**



HEC-RAS Plan: PMP AMII River: Ditch A Reach: 5

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crt W.S. (ft)	Max Chl Dpth (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
5	12574	818.00	3477.00	3478.64	3478.18	1.64	3478.75	0.003030	2.70	335.19	675.33	317.98	340.14	0.45
5	12674	1833.00	3477.00	3479.26	3478.58	2.26	3479.45	0.003127	3.66	292.14	714.07	552.32	421.93	0.49
5	11337	818.00	3489.00	3470.67	3470.66	1.67	3471.20	0.013821	5.89	420.54	583.79	144.35	143.25	0.96
5	11337	1833.00	3489.00	3471.45	3471.45	2.45	3472.25	0.011178	7.43	403.86	579.69	268.14	175.84	0.94
5	10937	818.00	3464.00	3466.11	3465.94	2.11	3466.48	0.009957	4.88	460.77	613.23	167.94	152.46	0.81
5	10937	1833.00	3464.00	3466.73	3466.71	2.73	3467.44	0.012731	6.81	438.12	635.88	275.16	197.77	0.96
5	10288	818.00	3456.00	3457.15	3457.15	1.15	3457.41	0.020844	4.08	380.58	782.65	200.26	402.08	1.02
5	10288	1833.00	3456.00	3457.54	3457.52	1.54	3457.92	0.016736	4.94	342.63	816.81	370.76	474.18	0.99
5	9690	1032.00	3450.00	3451.81	3451.40	1.81	3451.94	0.004888	2.97	405.24	783.45	347.12	378.22	0.55
5	9690	2662.00	3450.00	3452.41	3452.06	2.41	3452.72	0.006092	4.45	344.33	819.07	606.88	474.74	0.66
5	9009	1032.00	3445.00	3446.77	3446.64	1.77	3447.04	0.011804	4.19	427.76	735.08	248.48	307.32	0.82
5	9009	2662.00	3445.00	3447.61		2.61	3447.94	0.008169	4.59	357.39	842.54	580.42	485.14	0.74
5	8130	1032.00	3440.00	3441.91	3441.38	1.91	3442.01	0.003348	2.58	429.84	843.28	402.94	413.44	0.48
5	8130	2662.00	3440.00	3442.51	3442.02	2.51	3442.76	0.004426	3.98	389.33	888.57	680.41	499.24	0.57
5	7717	1032.00	3437.80	3438.91	3438.91	1.11	3439.25	0.018684	4.70	314.92	643.43	219.43	328.51	1.01
5	7717	2662.00	3437.80	3439.69	3439.52	1.89	3440.08	0.010227	5.00	265.92	719.49	532.79	463.57	0.82
5	7253	1201.00	3435.00	3436.66	3436.07	1.66	3436.73	0.001800	2.11	389.96	938.71	581.61	548.75	0.35
5	7253	5170.00	3435.00	3437.80	3437.02	2.80	3438.08	0.003027	4.32	331.21	995.19	1273.39	663.98	0.50
5	6343	2315.00	3430.00	3430.98	3430.98	0.98	3431.38	0.017106	5.08	735.44	1303.66	455.52	568.22	1.00
5	6343	6871.00	3430.00	3431.88	3431.88	1.88	3432.58	0.012467	6.75	671.15	1507.86	1045.07	836.71	0.95
5	5363	2315.00	3425.00	3426.68	3426.03	1.68	3426.76	0.001629	2.32	670.94	1611.69	1638.55	934.95	0.36
5	5363	6871.00	3425.00	3427.67	3426.76	2.67	3427.86	0.002084	3.60	581.55	1811.11	2113.94	1229.57	0.42
5	4221	2625.00	3420.00	3421.33	3421.33	1.33	3421.75	0.016273	5.20	477.24	1125.37	511.99	648.13	0.99
5	4221	7467.00	3420.00	3422.16	3422.16	2.16	3422.78	0.013513	6.45	302.64	1333.85	1218.00	1031.21	0.97
5	3489	2625.00	3416.00	3417.51	3416.93	2.51	3417.59	0.002263	2.45	-120.59	896.35	1135.64	1016.94	0.39
5	3489	7467.00	3416.00	3418.39	3417.57	3.39	3418.60	0.002662	3.72	-135.46	947.57	2061.90	1083.03	0.48
5	2989	2625.00	3413.80	3414.77	3414.77	0.97	3415.18	0.018036	5.02	170.96	822.03	510.19	651.07	1.02
5	2989	7467.00	3413.80	3415.64	3415.55	1.84	3416.23	0.011451	6.54	-3.75	891.01	1223.92	894.76	0.92
5	2774	2625.00	3409.00	3414.27	3412.71	5.27	3414.34	0.000514	2.95	-413.72	652.44	1629.88	1066.16	0.23
5	2774	7467.00	3409.00	3415.13	3413.50	6.13	3415.31	0.001181	4.98	-439.10	688.51	2572.47	1127.60	0.37
5	2773	Culvert												
5	2734	2625.00	3408.90	3412.71	3412.71	3.81	3413.06	0.003071	5.64	83.74	515.65	665.51	431.91	0.54
5	2734	7467.00	3408.90	3413.64	3413.58	4.74	3414.57	0.006651	9.75	34.58	553.33	1107.66	518.75	0.83
5	1888	2659.00	3408.00	3409.62	3409.00	1.61	3409.72	0.002763	2.55	162.60	1085.55	1042.93	932.96	0.42
5	1888	7552.00	3408.00	3410.56		2.56	3410.76	0.002811	3.63	-245.29	1204.49	2169.43	1449.78	0.47
5	1060	2773.00	3402.70	3404.49	3404.49	1.79	3404.98	0.016639	5.80	616.07	1140.02	495.53	523.95	1.01
5	1060	7799.00	3402.70	3405.49	3405.49	2.79	3406.17	0.014796	6.60	468.88	1361.48	1181.30	892.60	1.01

FloodPlain.rep

HEC-RAS Version 3.0.1 Mar 2001  
U.S. Army Corp of Engineers  
Hydrologic Engineering Center  
609 Second Street, Suite D  
Davis, California 95616-4687  
(916) 756-1104

```

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PROJECT DATA

Project Title: WCS  
Project File : FloodPlain.prj  
Run Date and Time: 3/30/06 9:08:03 AM

Project in English units

PLAN DATA

Plan Title: Plan 37  
Plan File : D:\program files\WCS\FloodPlain.p37

Geometry Title: PMP1-20-04SecRemoved  
Geometry File : D:\program files\WCS\FloodPlain.g04

Flow Title : pmp NOD AMII  
Flow File : D:\program files\WCS\FloodPlain.f29

Plan Summary Information:

Number of:	Cross Sections =	18	Mulitple Openings =	0
	Culverts =	1	Inline Weirs =	0
	Bridges =	0		

Computational Information

Water surface calculation tolerance = 0.01  
Critical depth calculaton tolerance = 0.01  
Maximum number of interations = 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: Mixed Flow

FLOW DATA

Flow Title: pmp NOD AMII  
Flow File : D:\program files\WCS\FloodPlain.f29

FloodPlain.rep

Flow Data (cfs)

River	Reach	RS	PF 2	PF 3
Ditch A	5	12674	818	1833
Ditch A	5	9690	1032	2662
Ditch A	5	7253	1201	5170
Ditch A	5	6343	2315	6871
Ditch A	5	4221	2625	7467
Ditch A	5	1888	2659	7552
Ditch A	5	1060	2773	7799

Boundary Conditions

River stream	Reach	Profile	Upstream	Down
Ditch A ritical	5	PF 2	Critical	Cr

GEOMETRY DATA

Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 12674

INPUT

Description: Sta. 12674

Station Elevation Data		num=	6						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3482	380	3478	560	3477	635	3478	761	3480
964	3482								

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	380	.033	635	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	380	635		1206 1337	1433	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3478.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.64	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.18	Flow Area (sq ft)	14.34	290.73	12.91
E.G. Slope (ft/ft)	0.003030	Area (sq ft)	14.34	290.73	12.91
Q Total (cfs)	818.00	Flow (cfs)	16.63	786.40	14.97
Top Width (ft)	340.14	Top Width (ft)	44.81	255.00	40.33

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Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)	1.16	2.70	1.16
Max Chl Dpth (ft)	1.64	Hydr. Depth (ft)	0.32	1.14	0.32
Conv. Total (cfs)	14861.0	Conv. (cfs)	302.2	14286.9	271.9
Length Wtd. (ft)	1336.25	Wetted Per. (ft)	44.81	255.01	40.33
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.06	0.22	0.06
Alpha	1.07	Stream Power (lb/ft s)	0.07	0.58	0.07
Frctn Loss (ft)	7.51	Cum Volume (acre-ft)	19.46	120.19	3.29
C & E Loss (ft)	0.04	Cum SA (acres)	21.78	116.76	5.62

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3479.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3479.26	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.68	Flow Area (sq ft)	55.14	447.56	49.62
E.G. Slope (ft/ft)	0.003127	Area (sq ft)	55.14	447.56	49.62
Q Total (cfs)	1833.00	Flow (cfs)	101.76	1639.66	91.58
Top Width (ft)	421.93	Top Width (ft)	87.86	255.00	79.07
Vel Total (ft/s)	3.32	Avg. Vel. (ft/s)	1.85	3.66	1.85
Max Chl Dpth (ft)	2.26	Hydr. Depth (ft)	0.63	1.76	0.63
Conv. Total (cfs)	32779.3	Conv. (cfs)	1819.7	29321.9	1637.7
Length Wtd. (ft)	1334.83	Wetted Per. (ft)	87.87	255.01	79.08
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.12	0.34	0.12
Alpha	1.12	Stream Power (lb/ft s)	0.23	1.26	0.23
Frctn Loss (ft)	7.14	Cum Volume (acre-ft)	45.36	229.55	13.10
C & E Loss (ft)	0.06	Cum SA (acres)	37.00	136.51	18.89

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

## FloodPlain.rep

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 11337

## INPUT

Description: Sta. 11337

Station Elevation Data		num= 8	
Sta	Elev	Sta	Elev
100	3477	315	3474
550	3470	591	3472

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	435	.033
550	.033	591	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	435	550		545 400	332	.1	.3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3471.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.67	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.66	Flow Area (sq ft)	4.86	134.85	4.64
E.G. Slope (ft/ft)	0.013821	Area (sq ft)	4.86	134.85	4.64
Q Total (cfs)	818.00	Flow (cfs)	12.44	793.70	11.86
Top Width (ft)	143.25	Top Width (ft)	14.46	115.00	13.79
Vel Total (ft/s)	5.67	Avg. Vel. (ft/s)	2.56	5.89	2.56
Max Chl Dpth (ft)	1.67	Hydr. Depth (ft)	0.34	1.17	0.34
Conv. Total (cfs)	6958.0	Conv. (cfs)	105.8	6751.3	100.9
Length Wtd. (ft)	400.60	Wetted Per. (ft)	14.48	115.02	13.80
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.29	1.01	0.29
Alpha	1.05	Stream Power (lb/ft s)	0.74	5.95	0.74
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	19.19	113.66	3.00
C & E Loss (ft)	0.05	Cum SA (acres)	20.96	111.08	4.73

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT      Profile #PF 3

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3472.25				
Vel Head (ft)	0.80	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3471.45	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3471.45	Flow Area (sq ft)	22.55	224.08	21.51
E.G. Slope (ft/ft)	0.011178	Area (sq ft)	22.55	224.08	21.51
Q Total (cfs)	1833.00	Flow (cfs)	86.53	1663.97	82.50
Top Width (ft)	175.84	Top Width (ft)	31.14	115.00	29.69
Vel Total (ft/s)	6.84	Avg. Vel. (ft/s)	3.84	7.43	3.84
Max Chl Dpth (ft)	2.45	Hydr. Depth (ft)	0.72	1.95	0.72
Conv. Total (cfs)	17337.3	Conv. (cfs)	818.5	15738.5	780.3
Length Wtd. (ft)	401.42	Wetted Per. (ft)	31.18	115.02	29.73
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.50	1.36	0.50
Alpha	1.10	Stream Power (lb/ft s)	1.94	10.10	1.94
Frctn Loss (ft)	4.78	Cum Volume (acre-ft)	44.28	219.24	11.93
C & E Loss (ft)	0.03	Cum SA (acres)	35.35	130.83	17.11

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION      RIVER: Ditch A  
 REACH: 5      RS: 10937

## INPUT

Description: Sta. 10937

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3470	351	3468	428	3467	465	3466	536	3464
543	3464	609	3466	683	3468	811	3472		

Manning's n Values		num= 3				
Sta	n Val	Sta	n Val	Sta	n Val	
100	.033	428	.033	609	.033	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	428	609		729	649	445	
						.1	.3

## CROSS SECTION OUTPUT      Profile #PF 2

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3466.48				
Vel Head (ft)	0.37	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3466.11	Reach Len. (ft)	729.00	649.00	445.00

## FloodPlain.rep

Crit W.S. (ft)	3465.94	Flow Area (sq ft)	167.69	0.24
E.G. Slope (ft/ft)	0.009957	Area (sq ft)	167.69	0.24
Q Total (cfs)	818.00	Flow (cfs)	817.84	0.16
Top Width (ft)	152.46	Top Width (ft)	148.23	4.23
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)	4.88	0.67
Max Chl Dpth (ft)	2.11	Hydr. Depth (ft)	1.13	0.06
Conv. Total (cfs)	8197.8	Conv. (cfs)	8196.2	1.6
Length Wtd. (ft)	648.98	Wetted Per. (ft)	148.29	4.23
Min Ch El (ft)	3464.00	Shear (lb/sq ft)	0.70	0.04
Alpha	1.00	Stream Power (lb/ft s)	3.43	0.02
Frctn Loss (ft)	9.04	Cum Volume (acre-ft)	19.16	112.27
C & E Loss (ft)	0.03	Cum SA (acres)	20.87	109.87

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3467.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3466.73	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3466.71	Flow Area (sq ft)		265.39	9.77
E.G. Slope (ft/ft)	0.012731	Area (sq ft)		265.39	9.77
Q Total (cfs)	1833.00	Flow (cfs)		1807.75	25.26
Top Width (ft)	197.77	Top Width (ft)		170.88	26.88
Vel Total (ft/s)	6.66	Avg. Vel. (ft/s)		6.81	2.59
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)		1.55	0.36
Conv. Total (cfs)	16245.6	Conv. (cfs)		16021.8	223.8
Length Wtd. (ft)	647.59	Wetted Per. (ft)		170.95	26.89
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		1.23	0.29
Alpha	1.03	Stream Power (lb/ft s)		8.40	0.75
Frctn Loss (ft)	9.41	Cum Volume (acre-ft)	44.14	217.00	11.81



## FloodPlain.rep

C & E Loss (ft)	0.10	Cum SA (acres)	35.16	129.52	16.89
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Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 10288

## INPUT

Description: Sta. 10288

Station Elevation Data		num=	12						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3464	177	3462	238	3460	298	3458	493	3456
519	3456	662	3457	778	3457.1	857	3458	903	3460
947	3462	989	3464						

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	298	.033	857	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
298	857	552 598	633	.1	.3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3457.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.15	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.15	Flow Area (sq ft)		200.26	
E.G. Slope (ft/ft)	0.020844	Area (sq ft)		200.26	
Q Total (cfs)	818.00	Flow (cfs)		818.00	
Top Width (ft)	402.08	Top Width (ft)		402.08	
Vel Total (ft/s)	4.08	Avg. Vel. (ft/s)		4.08	
Max Chl Dpth (ft)	1.15	Hydr. Depth (ft)		0.50	
Conv. Total (cfs)	5665.8	Conv. (cfs)		5665.8	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		402.09	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		2.65	
Frctn Loss (ft)	4.91	Cum Volume (acre-ft)	19.16	109.53	2.98
C & E Loss (ft)	0.04	Cum SA (acres)	20.87	105.78	4.64

Warning: The energy equation could not be balanced within the specified number of iterations.



FloodPlain.rep

The program used critical depth for the water surface and continued on with the calculations.  
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3457.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.54	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.52	Flow Area (sq ft)		370.76	
E.G. Slope (ft/ft)	0.016736	Area (sq ft)		370.76	
Q Total (cfs)	1833.00	Flow (cfs)		1833.00	
Top Width (ft)	474.18	Top Width (ft)		474.18	
Vel Total (ft/s)	4.94	Avg. Vel. (ft/s)		4.94	
Max Chl Dpth (ft)	1.54	Hydr. Depth (ft)		0.78	
Conv. Total (cfs)	14169.0	Conv. (cfs)		14169.0	
Length Wtd. (ft)	597.95	Wetted Per. (ft)		474.20	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)		4.04	
Frctn Loss (ft)	5.18	Cum Volume (acre-ft)	44.14	212.26	11.76
C & E Loss (ft)	0.02	Cum SA (acres)	35.16	124.71	16.75

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION      RIVER: Ditch A  
 REACH: 5      RS: 9690

INPUT  
 Description: Sta. 9690  
 Station Elevation Data      num=      8

FloodPlain.rep									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3454.5	202	3454	381	3452	632	3450	638	3450
799	3452	897	3454	1010	3458				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	381	.033	799	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	381	799		639	681	658	.1 .3

CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3451.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.81	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.40	Flow Area (sq ft)		347.12	
E.G. Slope (ft/ft)	0.004888	Area (sq ft)		347.12	
Q Total (cfs)	1032.00	Flow (cfs)		1032.00	
Top Width (ft)	378.22	Top Width (ft)		378.22	
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)		2.97	
Max Chl Dpth (ft)	1.81	Hydr. Depth (ft)		0.92	
Conv. Total (cfs)	14760.6	Conv. (cfs)		14760.6	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		378.24	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)		0.83	
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	19.16	105.77	2.98
C & E Loss (ft)	0.01	Cum SA (acres)	20.87	100.42	4.64

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3452.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3452.41	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3452.06	Flow Area (sq ft)	7.51	595.24	4.11

E.G. Slope (ft/ft)	0.006092	FloodPlain.rep Area (sq ft)	7.51	595.24	4.11
Q Total (cfs)	2662.00	Flow (cfs)	9.17	2647.81	5.02
Top Width (ft)	474.74	Top Width (ft)	36.67	418.00	20.07
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	1.22	4.45	1.22
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)	0.20	1.42	0.20
Conv. Total (cfs)	34105.6	Conv. (cfs)	117.5	33923.8	64.3
Length Wtd. (ft)	680.91	Wetted Per. (ft)	36.67	418.02	20.08
Min Ch El (ft)	3450.00	Shear (lb/sq ft)	0.08	0.54	0.08
Alpha	1.02	Stream Power (lb/ft s)	0.10	2.41	0.10
Frctn Loss (ft)	4.78	Cum Volume (acre-ft)	44.10	205.63	11.73
C & E Loss (ft)	0.00	Cum SA (acres)	34.92	118.59	16.61

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 9009

#### INPUT

Description: Sta. 9009

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3452	203	3450	325	3448	492	3446	596	3445
637	3446	892	3448	1007	3450	1124	3452		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	325	.033	892	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
325	892	898	879	794	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3447.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.77	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.64	Flow Area (sq ft)		246.48	
E.G. Slope (ft/ft)	0.011604	Area (sq ft)		246.48	
Q Total (cfs)	1032.00	Flow (cfs)		1032.00	
Top Width (ft)	307.32	Top Width (ft)		307.32	
Vel Total (ft/s)	4.19	Avg. Vel. (ft/s)		4.19	

Max Chl Dpth (ft)	1.77	FloodPlain.rep Hydr. Depth (ft)	0.80		
Conv. Total (cfs)	9580.2	Conv. (cfs)	9580.2		
Length Wtd. (ft)	879.00	Wetted Per. (ft)	307.34		
Min Ch El (ft)	3445.00	Shear (lb/sq ft)	0.58		
Alpha	1.00	Stream Power (lb/ft s)	2.43		
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	19.16	101.13	2.98
C & E Loss (ft)	0.05	Cum SA (acres)	20.87	95.06	4.64

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

#### CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3447.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.033	
W.S. Elev (ft)	3447.61	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)		Flow Area (sq ft)		580.42	
E.G. Slope (ft/ft)	0.008169	Area (sq ft)		580.42	
Q Total (cfs)	2662.00	Flow (cfs)		2662.00	
Top Width (ft)	485.14	Top Width (ft)		485.14	
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)		4.59	
Max Chl Dpth (ft)	2.61	Hydr. Depth (ft)		1.20	
Conv. Total (cfs)	29451.9	Conv. (cfs)		29451.9	
Length Wtd. (ft)	878.85	Wetted Per. (ft)		485.18	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.61	
Alpha	1.00	Stream Power (lb/ft s)		2.80	
Frctn Loss (ft)	5.16	Cum Volume (acre-ft)	44.04	196.44	11.70
C & E Loss (ft)	0.02	Cum SA (acres)	34.66	111.53	16.46

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

#### CROSS SECTION RIVER: Ditch A

REACH: 5

RS: 8130

## INPUT

Description: Sta. 8130

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3448	303	3444	419	3442	654	3440	663	3440
852	3442	995	3444	1104	3446				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	419	.033	852	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	419	852		399	413	456	.1	.3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3442.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.91	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.38	Flow Area (sq ft)		402.94	
E.G. Slope (ft/ft)	0.003348	Area (sq ft)		402.94	
Q Total (cfs)	1032.00	Flow (cfs)		1032.00	
Top Width (ft)	413.44	Top Width (ft)		413.44	
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)		2.56	
Max Chl Dpth (ft)	1.91	Hydr. Depth (ft)		0.97	
Conv. Total (cfs)	17834.9	Conv. (cfs)		17834.9	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		413.45	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	2.73	Cum Volume (acre-ft)	19.16	94.58	2.98
C & E Loss (ft)	0.02	Cum SA (acres)	20.87	87.79	4.64

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3442.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.033	0.033	0.033

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W.S. Elev (ft)	3442.51	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3442.02	Flow Area (sq ft)	7.59	663.47	9.35
E.G. Slope (ft/ft)	0.004426	Area (sq ft)	7.59	663.47	9.35
Q Total (cfs)	2662.00	Flow (cfs)	9.16	2641.56	11.29
Top Width (ft)	499.24	Top Width (ft)	29.67	433.00	36.57
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	1.21	3.98	1.21
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)	0.26	1.53	0.26
Conv. Total (cfs)	40012.1	Conv. (cfs)	137.6	39704.9	169.7
Length Wtd. (ft)	413.07	Wetted Per. (ft)	29.67	433.02	36.57
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.07	0.42	0.07
Alpha	1.03	Stream Power (lb/ft s)	0.09	1.69	0.09
Frctn Loss (ft)	2.66	Cum Volume (acre-ft)	43.96	183.89	11.61
C & E Loss (ft)	0.01	Cum SA (acres)	34.35	102.27	16.12

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 7717

## INPUT

Description: Sta 7717

Station Elevation Data				num=	8				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values				num=	3				
Sta	n Val	Sta	n Val	Sta	n Val				
100	.033	233	.033	747	.033				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	233	747		444 464	510	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3439.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.91	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.91	Flow Area (sq ft)		219.43	

E.G. Slope (ft/ft)	0.018684	FloodPlain.rep Area (sq ft)	219.43
Q Total (cfs)	1032.00	Flow (cfs)	1032.00
Top Width (ft)	328.51	Top Width (ft)	328.51
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)	4.70
Max Chl Dpth (ft)	1.11	Hydr. Depth (ft)	0.67
Conv. Total (cfs)	7550.0	Conv. (cfs)	7550.0
Length Wtd. (ft)	464.11	Wetted Per. (ft)	328.52
Min Ch El (ft)	3437.80	Shear (lb/sq ft)	0.78
Alpha	1.00	Stream Power (lb/ft s)	3.66
Frctn Loss (ft)	1.80	Cum Volume (acre-ft)	19.16 91.63 2.98
C & E Loss (ft)	0.08	Cum SA (acres)	20.87 84.27 4.64

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

#### CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3440.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.033	
W.S. Elev (ft)	3439.69	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3439.52	Flow Area (sq ft)		532.79	
E.G. Slope (ft/ft)	0.010227	Area (sq ft)		532.79	
Q Total (cfs)	2662.00	Flow (cfs)		2662.00	
Top Width (ft)	463.57	Top Width (ft)		463.57	
Vel Total (ft/s)	5.00	Avg. Vel. (ft/s)		5.00	
Max Chl Dpth (ft)	1.89	Hydr. Depth (ft)		1.15	
Conv. Total (cfs)	26322.5	Conv. (cfs)		26322.5	

Length Wtd. (ft)	464.60	FloodPlain.rep Wetted Per. (ft)	463.59
Min Ch El (ft)	3437.80	Shear (lb/sq ft)	0.73
Alpha	1.00	Stream Power (lb/ft s)	3.67
Frctn Loss (ft)	1.97	Cum Volume (acre-ft)	43.93    178.22    11.57
C & E Loss (ft)	0.03	Cum SA (acres)	34.21    98.02    15.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION                      RIVER: Ditch A  
REACH: 5                              RS: 7253

INPUT

Description: Sta. 7253

Station Elevation Data		num=	9
Sta	Elev	Sta	Elev
100	3438	109	3438.7
906	3436	1005	3438
		1200	3440
		1365	3442
		668	3435

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
100	.033	424	.033
		906	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
424	906	756	910	980	.1	.3

CROSS SECTION OUTPUT              Profile #PF 2

E.G. Elev (ft)	3436.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.66	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3436.07	Flow Area (sq ft)	11.25	559.55	10.81
E.G. Slope (ft/ft)	0.001800	Area (sq ft)	11.25	559.55	10.81
Q Total (cfs)	1201.00	Flow (cfs)	10.27	1180.86	9.87
Top Width (ft)	548.75	Top Width (ft)	34.04	482.00	32.71
Vel Total (ft/s)	2.06	Avg. Vel. (ft/s)	0.91	2.11	0.91
Max Chl Dpth (ft)	1.66	Hydr. Depth (ft)	0.33	1.16	0.33
Conv. Total (cfs)	28304.5	Conv. (cfs)	242.0	27829.8	232.6
Length Wtd. (ft)	909.75	Wetted Per. (ft)	34.04	482.00	32.72
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.04	0.13	0.04
Alpha	1.03	Stream Power (lb/ft s)	0.03	0.28	0.03



## FloodPlain.rep

Frctn Loss (ft)	5.31	Cum Volume (acre-ft)	19.11	87.48	2.92
C & E Loss (ft)	0.03	Cum SA (acres)	20.69	79.95	4.45

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3438.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3437.80	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3437.02	Flow Area (sq ft)	83.59	1109.45	80.35
E.G. Slope (ft/ft)	0.003027	Area (sq ft)	83.59	1109.45	80.35
Q Total (cfs)	5170.00	Flow (cfs)	193.14	4791.23	185.63
Top Width (ft)	663.98	Top Width (ft)	92.79	482.00	89.19
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)	2.31	4.32	2.31
Max Chl Dpth (ft)	2.80	Hydr. Depth (ft)	0.90	2.30	0.90
Conv. Total (cfs)	93972.8	Conv. (cfs)	3510.5	87088.0	3374.2
Length Wtd. (ft)	908.96	Wetted Per. (ft)	92.81	482.00	89.21
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.17	0.43	0.17
Alpha	1.07	Stream Power (lb/ft s)	0.39	1.88	0.39
Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	43.50	169.47	11.10
C & E Loss (ft)	0.04	Cum SA (acres)	33.74	92.98	15.41

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 6343

## INPUT

Description: Sta. 6343

Station	Elevation	Data	num=	9	Sta	Elev	Sta	Elev	Sta	Elev
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FloodPlain.rep

100	3434	346	3433	663	3432	732	3431	860	3430.2
981	3430	1273	3430	1320	3431.5	1566	3432		

Manning's n Values      num=      3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	663	.033	1320	.033

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

663	1320	767	980	1051	.1	.3
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CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3431.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.98	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.98	Flow Area (sq ft)		455.52	
E.G. Slope (ft/ft)	0.017106	Area (sq ft)		455.52	
Q Total (cfs)	2315.00	Flow (cfs)		2315.00	
Top Width (ft)	568.22	Top Width (ft)		568.22	
Vel Total (ft/s)	5.08	Avg. Vel. (ft/s)		5.08	
Max Chl Dpth (ft)	0.98	Hydr. Depth (ft)		0.80	
Conv. Total (cfs)	17700.0	Conv. (cfs)		17700.0	
Length Wtd. (ft)	979.71	Wetted Per. (ft)		568.24	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)		4.35	
Frctn Loss (ft)	4.07	Cum Volume (acre-ft)	19.01	76.87	2.80
C & E Loss (ft)	0.10	Cum SA (acres)	20.40	68.98	4.08

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #PF 3

## FloodPlain.rep

E.G. Elev (ft)	3432.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3431.88	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3431.88	Flow Area (sq ft)		1009.20	35.87
E.G. Slope (ft/ft)	0.012467	Area (sq ft)		1009.20	35.87
Q Total (cfs)	6871.00	Flow (cfs)		6811.21	59.79
Top Width (ft)	836.71	Top Width (ft)		648.85	187.86
Vel Total (ft/s)	6.57	Avg. Vel. (ft/s)		6.75	1.67
Max Chl Dpth (ft)	1.88	Hydr. Depth (ft)		1.56	0.19
Conv. Total (cfs)	61536.4	Conv. (cfs)		61001.0	535.5
Length Wtd. (ft)	979.16	Wetted Per. (ft)		648.88	187.86
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		1.21	0.15
Alpha	1.05	Stream Power (lb/ft s)		8.17	0.25
Frctn Loss (ft)	4.11	Cum Volume (acre-ft)	42.78	147.34	9.79
C & E Loss (ft)	0.16	Cum SA (acres)	32.94	81.17	12.29

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 5363

## INPUT

Description: Sta. 5363

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3432	282	3430	550	3428	742	3426	885	3425
1097	3425	1476	3426	1877	3428	1966	3428	2160	3430

Manning's n Values num= 3

## FloodPlain.rep

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	742	.033	1476	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	742	1476		1199	1142	713	.1 .3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3426.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.68	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3426.03	Flow Area (sq ft)	22.05	970.46	46.05
E.G. Slope (ft/ft)	0.001829	Area (sq ft)	22.05	970.46	46.05
Q Total (cfs)	2315.00	Flow (cfs)	20.64	2251.26	43.10
Top Width (ft)	934.95	Top Width (ft)	65.06	734.00	135.89
Vel Total (ft/s)	2.23	Avg. Vel. (ft/s)	0.94	2.32	0.94
Max Chl Dpth (ft)	1.68	Hydr. Depth (ft)	0.34	1.32	0.34
Conv. Total (cfs)	54129.5	Conv. (cfs)	482.5	52639.2	1007.8
Length Wtd. (ft)	1138.71	Wetted Per. (ft)	65.07	734.00	135.89
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.04	0.15	0.04
Alpha	1.06	Stream Power (lb/ft s)	0.04	0.35	0.04
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	18.81	60.83	2.24
C & E Loss (ft)	0.03	Cum SA (acres)	19.82	54.34	2.45

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3427.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3427.67	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3426.76	Flow Area (sq ft)	134.09	1699.80	280.05
E.G. Slope (ft/ft)	0.002084	Area (sq ft)	134.09	1699.80	280.05
Q Total (cfs)	6871.00	Flow (cfs)	244.53	6115.75	510.72
Top Width (ft)	1229.57	Top Width (ft)	160.45	734.00	335.11

## FloodPlain.rep

Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)	1.82	3.60	1.82
Max Chl Dpth (ft)	2.67	Hydr. Depth (ft)	0.84	2.32	0.84
Conv. Total (cfs)	150515.5	Conv. (cfs)	5356.6	133971.0	11187.9
Length Wtd. (ft)	1129.64	Wetted Per. (ft)	160.46	734.00	335.12
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.11	0.30	0.11
Alpha	1.13	Stream Power (lb/ft s)	0.20	1.08	0.20
Frctn Loss (ft)	5.04	Cum Volume (acre-ft)	41.60	116.87	5.98
C & E Loss (ft)	0.04	Cum SA (acres)	31.52	65.61	5.98

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 4221

## INPUT

Description: Sta. 4221

Station Elevation Data		num= 12							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3423	341	3422	544	3421	640	3420	669	3420
753	3420.2	829	3420	837	3420	1030	3421	1320	3422
1407	3423	1497	3424						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	544	.033	1407	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
544	1407	749	732	843	.1

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3421.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.33	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.33	Flow Area (sq ft)	10.98	501.01	
E.G. Slope (ft/ft)	0.016273	Area (sq ft)	10.98	501.01	
Q Total (cfs)	2625.00	Flow (cfs)	18.92	2606.08	
Top Width (ft)	648.13	Top Width (ft)	66.76	581.37	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)	1.72	5.20	
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.16	0.86	

## FloodPlain.rep

Conv. Total (cfs)	20577.6	Conv. (cfs)	148.3	20429.3	
Length Wtd. (ft)	737.09	Wetted Per. (ft)	66.76	581.38	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.17	0.88	
Alpha	1.02	Stream Power (lb/ft s)	0.29	4.55	
Frctn Loss (ft)	3.54	Cum Volume (acre-ft)	18.36	41.55	1.86
C & E Loss (ft)	0.10	Cum SA (acres)	18.01	37.09	1.33

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3422.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3422.16	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3422.16	Flow Area (sq ft)	136.87	1081.13	
E.G. Slope (ft/ft)	0.013513	Area (sq ft)	136.87	1081.13	
Q Total (cfs)	7467.00	Flow (cfs)	490.80	6976.20	
Top Width (ft)	1031.21	Top Width (ft)	241.36	789.85	
Vel Total (ft/s)	6.13	Avg. Vel. (ft/s)	3.59	6.45	
Max Chl Dpth (ft)	2.16	Hydr. Depth (ft)	0.57	1.37	
Conv. Total (cfs)	64234.9	Conv. (cfs)	4222.1	60012.8	
Length Wtd. (ft)	737.83	Wetted Per. (ft)	241.37	789.86	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.48	1.15	
Alpha	1.06	Stream Power (lb/ft s)	1.72	7.45	
Frctn Loss (ft)	3.77	Cum Volume (acre-ft)	37.87	80.41	3.68
C & E Loss (ft)	0.12	Cum SA (acres)	25.99	45.64	3.24

Warning: The energy equation could not be balanced within the specified number of iterations.

The program selected the water surface that had the least amount of error between computed and assumed values.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 3489

## INPUT

Description: Sta. 3489

Station Elevation Data		num= 22									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-286	3420	-138	3418.5	-126	3418	-104	3416	-91	3415.5		
-76	3416	-21	3417	100	3417	258	3416.5	299	3416		
309	3415	318	3416	405	3416	422	3416	539	3416.4		
581	3416.2	642	3416.4	744	3416	830	3416	918	3418		
1068	3420	1159	3421								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-286	.033	539	.033	918	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	539	918		464 500	457	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3417.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.51	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.93	Flow Area (sq ft)	698.04	437.59	
E.G. Slope (ft/ft)	0.002263	Area (sq ft)	698.04	437.59	
Q Total (cfs)	2625.00	Flow (cfs)	1552.31	1072.69	
Top Width (ft)	1016.94	Top Width (ft)	659.59	357.35	
Vel Total (ft/s)	2.31	Avg. Vel. (ft/s)	2.22	2.45	
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)	1.06	1.22	
Conv. Total (cfs)	55186.5	Conv. (cfs)	32634.8	22551.7	



Length Wtd. (ft)	481.39	FloodPlain.rep Wetted Per. (ft)	659.79	357.37	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.15	0.17	
Alpha	1.01	Stream Power (lb/ft s)	0.33	0.42	
Frctn Loss (ft)	2.38	Cum Volume (acre-ft)	12.26	33.66	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	11.77	29.21	1.33

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3418.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3418.39	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3417.57	Flow Area (sq ft)	1287.92	768.15	5.83
E.G. Slope (ft/ft)	0.002662	Area (sq ft)	1287.92	768.15	5.83
Q Total (cfs)	7467.00	Flow (cfs)	4604.42	2858.00	4.59
Top Width (ft)	1083.03	Top Width (ft)	674.46	379.00	29.57
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)	3.58	3.72	0.79
Max Chl Dpth (ft)	3.39	Hydr. Depth (ft)	1.91	2.03	0.20
Conv. Total (cfs)	144720.1	Conv. (cfs)	89239.5	55391.6	88.9
Length Wtd. (ft)	480.96	Wetted Per. (ft)	674.70	379.02	29.57
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.32	0.34	0.03
Alpha	1.00	Stream Power (lb/ft s)	1.13	1.25	0.03
Frctn Loss (ft)	2.33	Cum Volume (acre-ft)	25.62	64.87	3.63
C & E Loss (ft)	0.04	Cum SA (acres)	18.12	35.82	2.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION      RIVER: Ditch A  
REACH: 5      RS: 2989



## FloodPlain.rep

## INPUT

Description: Sta. 2989

Station Elevation Data				num=	14				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-31	3416	59	3414.8	170	3414.8	196	3414	436	3413.8
613	3414	651	3414	700	3414	747	3414	761	3414
841	3415.01	920	3416	976	3418	1067	3420		

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
-31	.033	436	.033	841	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	436	841		317 215	172	.3	.5

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3415.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.77	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.77	Flow Area (sq ft)	218.56	291.62	
E.G. Slope (ft/ft)	0.018036	Area (sq ft)	218.56	291.62	
Q Total (cfs)	2625.00	Flow (cfs)	1162.24	1462.76	
Top Width (ft)	651.07	Top Width (ft)	265.04	386.03	
Vel Total (ft/s)	5.15	Avg. Vel. (ft/s)	5.32	5.02	
Max Chl Dpth (ft)	0.97	Hydr. Depth (ft)	0.82	0.76	
Conv. Total (cfs)	19545.9	Conv. (cfs)	8654.1	10891.8	
Length Wtd. (ft)	256.34	Wetted Per. (ft)	265.05	386.03	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.93	0.85	
Alpha	1.00	Stream Power (lb/ft s)	4.94	4.27	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	7.38	29.47	1.86
C & E Loss (ft)	0.17	Cum SA (acres)	6.84	24.94	1.33

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program selected the water surface that had the least amount of error between computed

and assumed values.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

th.

## CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3416.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3415.64	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3415.55	Flow Area (sq ft)	568.08	640.17	15.67
E.G. Slope (ft/ft)	0.011451	Area (sq ft)	568.08	640.17	15.67
Q Total (cfs)	7467.00	Flow (cfs)	3246.66	4185.51	34.83
Top Width (ft)	894.76	Top Width (ft)	439.75	405.00	50.01
Vel Total (ft/s)	6.10	Avg. Vel. (ft/s)	5.72	6.54	2.22
Max Chl Dpth (ft)	1.84	Hydr. Depth (ft)	1.29	1.58	0.31
Conv. Total (cfs)	69779.2	Conv. (cfs)	30340.1	39113.6	325.5
Length Wtd. (ft)	263.12	Wetted Per. (ft)	439.77	405.01	50.01
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.92	1.13	0.22
Alpha	1.03	Stream Power (lb/ft s)	5.28	7.39	0.50
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	15.73	56.79	3.52
C & E Loss (ft)	0.21	Cum SA (acres)	12.18	31.32	2.54

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION      RIVER: Ditch A  
REACH: 5      RS: 2774

## INPUT

Description: Sta. 2774 Upstream of culverts

Station Elevation Data		num= 18									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8		
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2		
402	3410.9	437	3410	469	3409	491	3409	511	3410		
560	3412	641	3414	725	3416						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	437	511		40	40		
Ineffective Flow			num= 2				
Sta L	Sta R	Elev	Permanent				
-888	F						
888	F						

## CROSS SECTION OUTPUT

Profile #PF 2

E.G. Elev (ft)	3414.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.27	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	1000.73	364.16	264.98
E.G. Slope (ft/ft)	0.000514	Area (sq ft)	1000.73	364.16	264.98
Q Total (cfs)	2625.00	Flow (cfs)	1138.58	1075.38	411.03
Top Width (ft)	1066.16	Top Width (ft)	850.72	74.00	141.44
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)	1.14	2.95	1.55
Max Chl Dpth (ft)	5.27	Hydr. Depth (ft)	1.18	4.92	1.87
Conv. Total (cfs)	115759.9	Conv. (cfs)	50210.4	47423.4	18126.1
Length Wtd. (ft)	40.00	Wetted Per. (ft)	850.80	74.04	141.51
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.04	0.16	0.06
Alpha	1.74	Stream Power (lb/ft s)	0.04	0.47	0.09
Frctn Loss (ft)		Cum Volume (acre-ft)	2.95	27.86	1.34
C & E Loss (ft)		Cum SA (acres)	2.78	23.80	1.05

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT

Profile #PF 3

E.G. Elev (ft)	3415.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3415.13	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3413.50	Flow Area (sq ft)	1742.86	427.70	401.91
E.G. Slope (ft/ft)	0.001181	Area (sq ft)	1742.86	427.70	401.91
Q Total (cfs)	7467.00	Flow (cfs)	4264.79	2130.35	1071.87
Top Width (ft)	1127.60	Top Width (ft)	876.10	74.00	177.51
Vel Total (ft/s)	2.90	Avg. Vel. (ft/s)	2.45	4.98	2.67
Max Chl Dpth (ft)	6.13	Hydr. Depth (ft)	1.99	5.78	2.26
Conv. Total (cfs)	217319.5	Conv. (cfs)	124122.4	62001.6	31195.6
Length Wtd. (ft)	40.00	Wetted Per. (ft)	876.19	74.04	177.59

Min Ch El (ft)	3409.00	FloodPlain.rep Shear (lb/sq ft)	0.15	0.43	0.17
Alpha	1.37	Stream Power (lb/ft s)	0.36	2.12	0.44
Frctn Loss (ft)		Cum Volume (acre-ft)	7.32	54.16	2.69
C & E Loss (ft)		Cum SA (acres)	7.40	30.13	2.09

Warning: The cross section had to be extended vertically during the critical depth calculations.  
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CULVERT RIVER: Ditch A  
REACH: 5 RS: 2773

#### INPUT

##### Description:

Distance from Upstream XS = 8

Deck/Roadway Width = 24

Weir Coefficient = 3

##### Upstream Deck/Roadway Coordinates

num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

##### Upstream Bridge Cross Section Data

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

##### Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta: Left Right Coeff Contr. Expan.  
437 511 .3 .5

##### Ineffective Flow num= 2

Sta L Sta R Elev Permanent

-888 F

888 F

##### Downstream Deck/Roadway Coordinates

num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

##### Downstream Bridge Cross Section Data

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

##### Manning's n Values

num= 3

## FloodPlain.rep

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	349	434		.3	.5

Ineffective Flow	num=	2
Sta L	Sta R	Elev Permanent
-888	F	
888	F	

Upstream Embankment side slope	=	3 horiz. to 1.0 vertical
Downstream Embankment side slope	=	3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow	=	.95
Elevation at which weir flow begins	=	3412.7
Energy head used in spillway design	=	
Spillway height used in design	=	
Weir crest shape	=	Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Pipe Arch	1.833	2.43

FHWA Chart # 34- 18 inch corner radius; Corrugated metal  
 FHWA Scale # 1 - 90 Degree headwall  
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
1	39	.024	.5	1

Number of Barrels = 6

Upstream Elevation = 3409

Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
469	473.4	477.8	482.2	486.6	491

Downstream Elevation = 3408.9

Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
387	391.4	395.8	400.2	404.6	409

CROSS SECTION	RIVER: Ditch A
REACH: 5	RS: 2734

## INPUT

Description: Sta. 2734 Downstream of culverts

Station Elevation Data	num=	17							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	349	434		745	846	1015	.3	.5

Ineffective Flow	num=	2
Sta L	Sta R	Elev Permanent
-888	F	
888	F	

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3413.06	Element	Left OB	Channel	Right OB
----------------	---------	---------	---------	---------	----------

Vel Head (ft)	0.35	FloodPlain.rep Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.003071	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	2625.00	Flow (cfs)	706.59	1629.89	288.53
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)	2.56	5.64	2.87
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.20	0.65	0.24
Alpha	1.44	Stream Power (lb/ft s)	0.51	3.67	0.68
Frctn Loss (ft)	2.45	Cum Volume (acre-ft)	2.36	27.56	1.17
C & E Loss (ft)	0.12	Cum SA (acres)	2.27	23.73	0.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.  
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

# CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3414.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.64	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3413.58	Flow Area (sq ft)	545.49	368.06	194.11
E.G. Slope (ft/ft)	0.006651	Area (sq ft)	545.49	368.06	194.11
Q Total (cfs)	7467.00	Flow (cfs)	2891.92	3589.49	985.59
Top Width (ft)	518.75	Top Width (ft)	314.42	85.00	119.33

Vel Total (ft/s)	6.74	FloodPlain.rep Avg. Vel. (ft/s)	5.30	9.75	5.08
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)	1.73	4.33	1.63
Conv. Total (cfs)	91560.7	Conv. (cfs)	35460.9	44014.4	12085.4
Length Wtd. (ft)	836.58	Wetted Per. (ft)	314.45	85.04	119.38
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.72	1.80	0.68
Alpha	1.32	Stream Power (lb/ft s)	3.82	17.53	3.43
Frctn Loss (ft)	3.45	Cum Volume (acre-ft)	6.27	53.79	2.42
C & E Loss (ft)	0.37	Cum SA (acres)	6.85	30.06	1.95

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1888

#### INPUT

Description: Sta. 1888

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-775	3412	-41	3410	81	3410	100	3410.2	110	3410
331	3408	532	3408	690	3408	1180	3410	1268	3412

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-775	.033	100	.033	1180	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	1180	305 828	980	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3409.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3409.62	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3409.00	Flow Area (sq ft)		1042.93	
E.G. Slope (ft/ft)	0.002763	Area (sq ft)		1042.93	
Q Total (cfs)	2659.00	Flow (cfs)		2659.00	
Top Width (ft)	932.96	Top Width (ft)		932.96	
Vel Total (ft/s)	2.55	Avg. Vel. (ft/s)		2.55	

Max Chl Dpth (ft)	1.61	FloodPlain.rep Hydr. Depth (ft)	1.12
Conv. Total (cfs)	50582.2	Conv. (cfs)	50582.2
Length Wtd. (ft)	828.00	Wetted Per. (ft)	932.97
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.19
Alpha	1.00	Stream Power (lb/ft s)	0.49
Frctn Loss (ft)	4.70	Cum Volume (acre-ft)	14.62
C & E Loss (ft)	0.04	Cum SA (acres)	13.85

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

#### CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3410.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3410.56	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)		Flow Area (sq ft)	133.44	2029.17	6.82
E.G. Slope (ft/ft)	0.002811	Area (sq ft)	133.44	2029.17	6.82
Q Total (cfs)	7552.00	Flow (cfs)	169.03	7376.04	6.94
Top Width (ft)	1449.78	Top Width (ft)	345.29	1080.00	24.49
Vel Total (ft/s)	3.48	Avg. Vel. (ft/s)	1.27	3.63	1.02
Max Chl Dpth (ft)	2.56	Hydr. Depth (ft)	0.39	1.88	0.28
Conv. Total (cfs)	142439.9	Conv. (cfs)	3188.0	139121.0	130.8
Length Wtd. (ft)	822.31	Wetted Per. (ft)	345.29	1080.02	24.50
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.07	0.33	0.05
Alpha	1.07	Stream Power (lb/ft s)	0.09	1.20	0.05
Frctn Loss (ft)	4.54	Cum Volume (acre-ft)	0.47	30.51	0.08
C & E Loss (ft)	0.05	Cum SA (acres)	1.21	18.75	0.28

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.



## FloodPlain.rep

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1060

## INPUT

Description: Sta. 1060

Station Elevation Data		num=	6								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3408	394	3406	879	3402.7	909	3402.7	1206	3405		
1523	3406										

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.033	394	.033	1523	.033		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	394	1523		60	60	.1	.3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3404.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.033	
W.S. Elev (ft)	3404.49	Reach Len. (ft)			
Crit W.S. (ft)	3404.49	Flow Area (sq ft)		495.53	
E.G. Slope (ft/ft)	0.016639	Area (sq ft)		495.53	
Q Total (cfs)	2773.00	Flow (cfs)		2773.00	
Top Width (ft)	523.95	Top Width (ft)		523.95	
Vel Total (ft/s)	5.60	Avg. Vel. (ft/s)		5.60	
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)		0.95	
Conv. Total (cfs)	21497.7	Conv. (cfs)		21497.7	
Length Wtd. (ft)		Wetted Per. (ft)		523.96	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		5.50	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3406.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.		0.033	
W.S. Elev (ft)	3405.49	Reach Len. (ft)			

## FloodPlain.rep

Crit W.S. (ft)	3405.49	Flow Area (sq ft)	1181.30
E.G. Slope (ft/ft)	0.014796	Area (sq ft)	1181.30
Q Total (cfs)	7799.00	Flow (cfs)	7799.00
Top Width (ft)	892.60	Top Width (ft)	892.60
Vel Total (ft/s)	6.60	Avg. Vel. (ft/s)	6.60
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)	1.32
Conv. Total (cfs)	64116.4	Conv. (cfs)	64116.4
Length Wtd. (ft)		Wetted Per. (ft)	892.62
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	1.22
Alpha	1.00	Stream Power (lb/ft s)	8.07
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

## SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

## SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta.	Left	Channel	Right
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FloodPlain.rep				
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS  
River: Ditch A

Reach	River Sta.	Contr.	Expan.
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	
5	2734	.3	.5
5	1888	.1	.3
5	1060	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. S
lope	Vel Chnl	Flow Area	Top Width	Froude #	Chl		
/ft)	(ft/s)	(sq ft)	(ft)	(cfs)	(ft)	(ft)	(ft
5	12674	818.00	3477.00	3478.64	3478.18	3478.75	0.00
3030	2.70	317.98	340.14	0.45			
5	12674	1833.00	3477.00	3479.26	3478.68	3479.45	0.00
3127	3.66	552.32	421.93	0.49			

FloodPlain.rep								
5		11337	818.00	3469.00	3470.67	3470.66	3471.20	0.01
3821	5.89	144.35	143.25	0.96				
5		11337	1833.00	3469.00	3471.45	3471.45	3472.25	0.01
1178	7.43	268.14	175.84	0.94				
5		10937	818.00	3464.00	3466.11	3465.94	3466.48	0.00
9957	4.88	167.94	152.46	0.81				
5		10937	1833.00	3464.00	3466.73	3466.71	3467.44	0.01
2731	6.81	275.16	197.77	0.96				
5		10288	818.00	3456.00	3457.15	3457.15	3457.41	0.02
0844	4.08	200.26	402.08	1.02				
5		10288	1833.00	3456.00	3457.54	3457.52	3457.92	0.01
6736	4.94	370.76	474.18	0.99				
5		9690	1032.00	3450.00	3451.81	3451.40	3451.94	0.00
4888	2.97	347.12	378.22	0.55				
5		9690	2662.00	3450.00	3452.41	3452.06	3452.72	0.00
6092	4.45	606.86	474.74	0.66				
5		9009	1032.00	3445.00	3446.77	3446.64	3447.04	0.01
1604	4.19	246.48	307.32	0.82				
5		9009	2662.00	3445.00	3447.61		3447.94	0.00
8169	4.59	580.42	485.14	0.74				
5		8130	1032.00	3440.00	3441.91	3441.38	3442.01	0.00
3348	2.56	402.94	413.44	0.46				
5		8130	2662.00	3440.00	3442.51	3442.02	3442.76	0.00
4426	3.98	680.41	499.24	0.57				
5		7717	1032.00	3437.80	3438.91	3438.91	3439.25	0.01
8684	4.70	219.43	328.51	1.01				
5		7717	2662.00	3437.80	3439.69	3439.52	3440.08	0.01
0227	5.00	532.79	463.57	0.82				
5		7253	1201.00	3435.00	3436.66	3436.07	3436.73	0.00
1800	2.11	581.61	548.75	0.35				
5		7253	5170.00	3435.00	3437.80	3437.02	3438.08	0.00
3027	4.32	1273.39	663.98	0.50				
5		6343	2315.00	3430.00	3430.98	3430.98	3431.38	0.01
7106	5.08	455.52	568.22	1.00				
5		6343	6871.00	3430.00	3431.88	3431.88	3432.58	0.01
2467	6.75	1045.07	836.71	0.95				
5		5363	2315.00	3425.00	3426.68	3426.03	3426.76	0.00
1829	2.32	1038.55	934.95	0.36				
5		5363	6871.00	3425.00	3427.67	3426.76	3427.86	0.00
2084	3.60	2113.94	1229.57	0.42				
5		4221	2625.00	3420.00	3421.33	3421.33	3421.75	0.01
6273	5.20	511.99	648.13	0.99				
5		4221	7467.00	3420.00	3422.16	3422.16	3422.78	0.01
3513	6.45	1218.00	1031.21	0.97				

## FloodPlain.rep

5		3489	2625.00	3416.00	3417.51	3416.93	3417.59	0.00
2263	2.45	1135.64	1016.94	0.39				
5		3489	7467.00	3416.00	3418.39	3417.57	3418.60	0.00
2662	3.72	2061.90	1083.03	0.46				
5		2989	2625.00	3413.80	3414.77	3414.77	3415.18	0.01
8036	5.02	510.19	651.07	1.02				
5		2989	7467.00	3413.80	3415.64	3415.55	3416.23	0.01
1451	6.54	1223.92	894.76	0.92				
5		2774	2625.00	3409.00	3414.27	3412.71	3414.34	0.00
0514	2.95	1629.88	1066.16	0.23				
5		2774	7467.00	3409.00	3415.13	3413.50	3415.31	0.00
1181	4.98	2572.47	1127.60	0.37				
5		2773	Culvert					
5		2734	2625.00	3408.90	3412.71	3412.71	3413.06	0.00
3071	5.64	665.51	431.91	0.54				
5		2734	7467.00	3408.90	3413.64	3413.58	3414.57	0.00
6651	9.75	1107.66	518.75	0.83				
5		1888	2659.00	3408.00	3409.62	3409.00	3409.72	0.00
2763	2.55	1042.93	932.96	0.42				
5		1888	7552.00	3408.00	3410.56		3410.76	0.00
2811	3.63	2169.43	1449.78	0.47				
5		1060	2773.00	3402.70	3404.49	3404.49	3404.98	0.01
6639	5.60	495.53	523.95	1.01				
5		1060	7799.00	3402.70	3405.49	3405.49	3406.17	0.01
4796	6.60	1181.30	892.60	1.01				

## Profile Output Table - Report Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G
Elev	E.G. Slope	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude #	Chl
(ft)	(ft/ft)	(cfs)	(ft)	(ft)	(sq ft)	(ft)	(ft)
		(ft)	(ft)				
5	12674	818.00	3477.00	3478.64	3478.18	1.64	3
478.75	0.003030	335.19	675.33	317.98	340.14		0.45
5	12674	1833.00	3477.00	3479.26	3478.68	2.26	3
479.45	0.003127	292.14	714.07	552.32	421.93		0.49
5	11337	818.00	3469.00	3470.67	3470.66	1.67	3

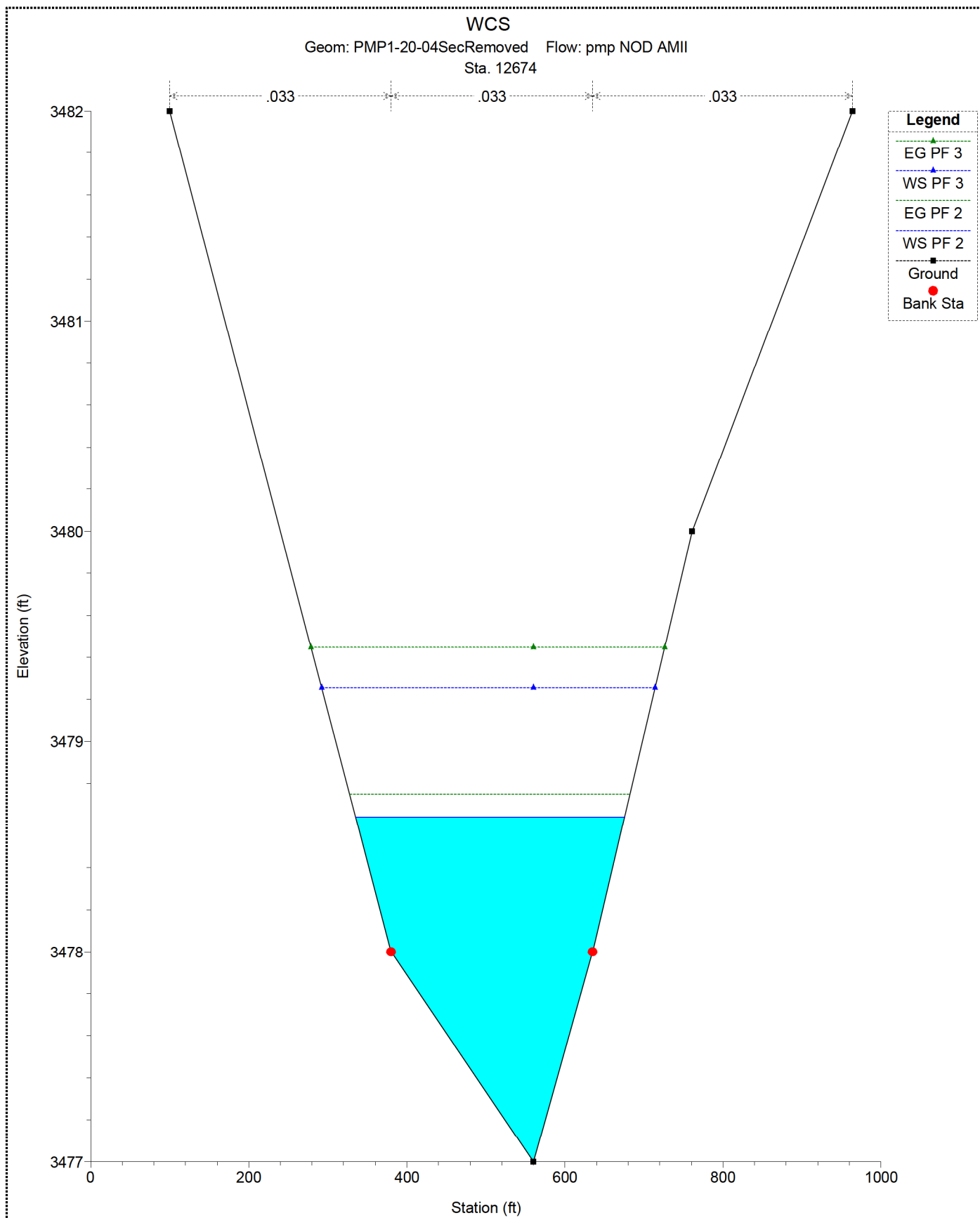
FloodPlain.rep									
471.20	0.013821	5.89	420.54	563.79	144.35	143.25		0.96	
5	11337		1833.00	3469.00	3471.45	3471.45		2.45	3
472.25	0.011178	7.43	403.86	579.69	268.14	175.84		0.94	
5	10937		818.00	3464.00	3466.11	3465.94		2.11	3
466.48	0.009957	4.88	460.77	613.23	167.94	152.46		0.81	
5	10937		1833.00	3464.00	3466.73	3466.71		2.73	3
467.44	0.012731	6.81	438.12	635.88	275.16	197.77		0.96	
5	10288		818.00	3456.00	3457.15	3457.15		1.15	3
457.41	0.020844	4.08	380.58	782.65	200.26	402.08		1.02	
5	10288		1833.00	3456.00	3457.54	3457.52		1.54	3
457.92	0.016736	4.94	342.63	816.81	370.76	474.18		0.99	
5	9690		1032.00	3450.00	3451.81	3451.40		1.81	3
451.94	0.004888	2.97	405.24	783.45	347.12	378.22		0.55	
5	9690		2662.00	3450.00	3452.41	3452.06		2.41	3
452.72	0.006092	4.45	344.33	819.07	606.86	474.74		0.66	
5	9009		1032.00	3445.00	3446.77	3446.64		1.77	3
447.04	0.011604	4.19	427.76	735.08	246.48	307.32		0.82	
5	9009		2662.00	3445.00	3447.61			2.61	3
447.94	0.008169	4.59	357.39	842.54	580.42	485.14		0.74	
5	8130		1032.00	3440.00	3441.91	3441.38		1.91	3
442.01	0.003348	2.56	429.84	843.28	402.94	413.44		0.46	
5	8130		2662.00	3440.00	3442.51	3442.02		2.51	3
442.76	0.004426	3.98	389.33	888.57	680.41	499.24		0.57	
5	7717		1032.00	3437.80	3438.91	3438.91		1.11	3
439.25	0.018684	4.70	314.92	643.43	219.43	328.51		1.01	
5	7717		2662.00	3437.80	3439.69	3439.52		1.89	3
440.08	0.010227	5.00	255.92	719.49	532.79	463.57		0.82	
5	7253		1201.00	3435.00	3436.66	3436.07		1.66	3
436.73	0.001800	2.11	389.96	938.71	581.61	548.75		0.35	

FloodPlain.rep									
5	7253		5170.00	3435.00	3437.80	3437.02	2.80	3	
438.08	0.003027	4.32	331.21	995.19	1273.39	663.98		0.50	
5	6343		2315.00	3430.00	3430.98	3430.98	0.98	3	
431.38	0.017106	5.08	735.44	1303.66	455.52	568.22		1.00	
5	6343		6871.00	3430.00	3431.88	3431.88	1.88	3	
432.58	0.012467	6.75	671.15	1507.86	1045.07	836.71		0.95	
5	5363		2315.00	3425.00	3426.68	3426.03	1.68	3	
426.76	0.001829	2.32	676.94	1611.89	1038.55	934.95		0.36	
5	5363		6871.00	3425.00	3427.67	3426.76	2.67	3	
427.86	0.002084	3.60	581.55	1811.11	2113.94	1229.57		0.42	
5	4221		2625.00	3420.00	3421.33	3421.33	1.33	3	
421.75	0.016273	5.20	477.24	1125.37	511.99	648.13		0.99	
5	4221		7467.00	3420.00	3422.16	3422.16	2.16	3	
422.78	0.013513	6.45	302.64	1333.85	1218.00	1031.21		0.97	
5	3489		2625.00	3416.00	3417.51	3416.93	2.51	3	
417.59	0.002263	2.45	-120.59	896.35	1135.64	1016.94		0.39	
5	3489		7467.00	3416.00	3418.39	3417.57	3.39	3	
418.60	0.002662	3.72	-135.46	947.57	2061.90	1083.03		0.46	
5	2989		2625.00	3413.80	3414.77	3414.77	0.97	3	
415.18	0.018036	5.02	170.96	822.03	510.19	651.07		1.02	
5	2989		7467.00	3413.80	3415.64	3415.55	1.84	3	
416.23	0.011451	6.54	-3.75	891.01	1223.92	894.76		0.92	
5	2774		2625.00	3409.00	3414.27	3412.71	5.27	3	
414.34	0.000514	2.95	-413.72	652.44	1629.88	1066.16		0.23	
5	2774		7467.00	3409.00	3415.13	3413.50	6.13	3	
415.31	0.001181	4.98	-439.10	688.51	2572.47	1127.60		0.37	
5	2773		Culvert						

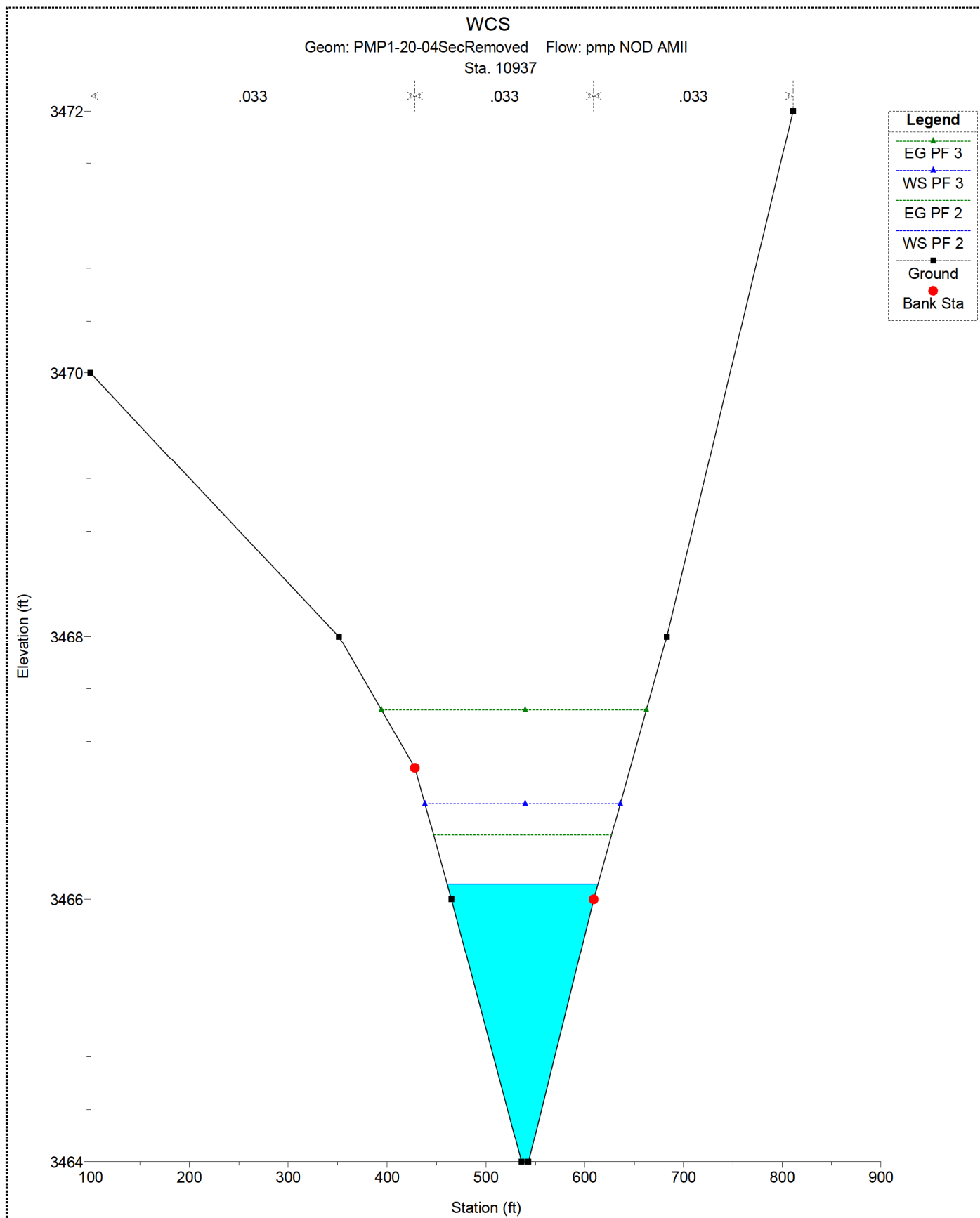
FloodPlain.rep

5	2734		2625.00	3408.90	3412.71	3412.71	3.81	3
413.06	0.003071	5.64	83.74	515.65	665.51	431.91		0.54
5	2734		7467.00	3408.90	3413.64	3413.58	4.74	3
414.57	0.006651	9.75	34.58	553.33	1107.66	518.75		0.83
5	1888		2659.00	3408.00	3409.62	3409.00	1.61	3
409.72	0.002763	2.55	152.60	1085.55	1042.93	932.96		0.42
5	1888		7552.00	3408.00	3410.56		2.56	3
410.76	0.002811	3.63	-245.29	1204.49	2169.43	1449.78		0.47
5	1060		2773.00	3402.70	3404.49	3404.49	1.79	3
404.98	0.016639	5.60	616.07	1140.02	495.53	523.95		1.01
5	1060		7799.00	3402.70	3405.49	3405.49	2.79	3
406.17	0.014796	6.60	468.88	1361.48	1181.30	892.60		1.01

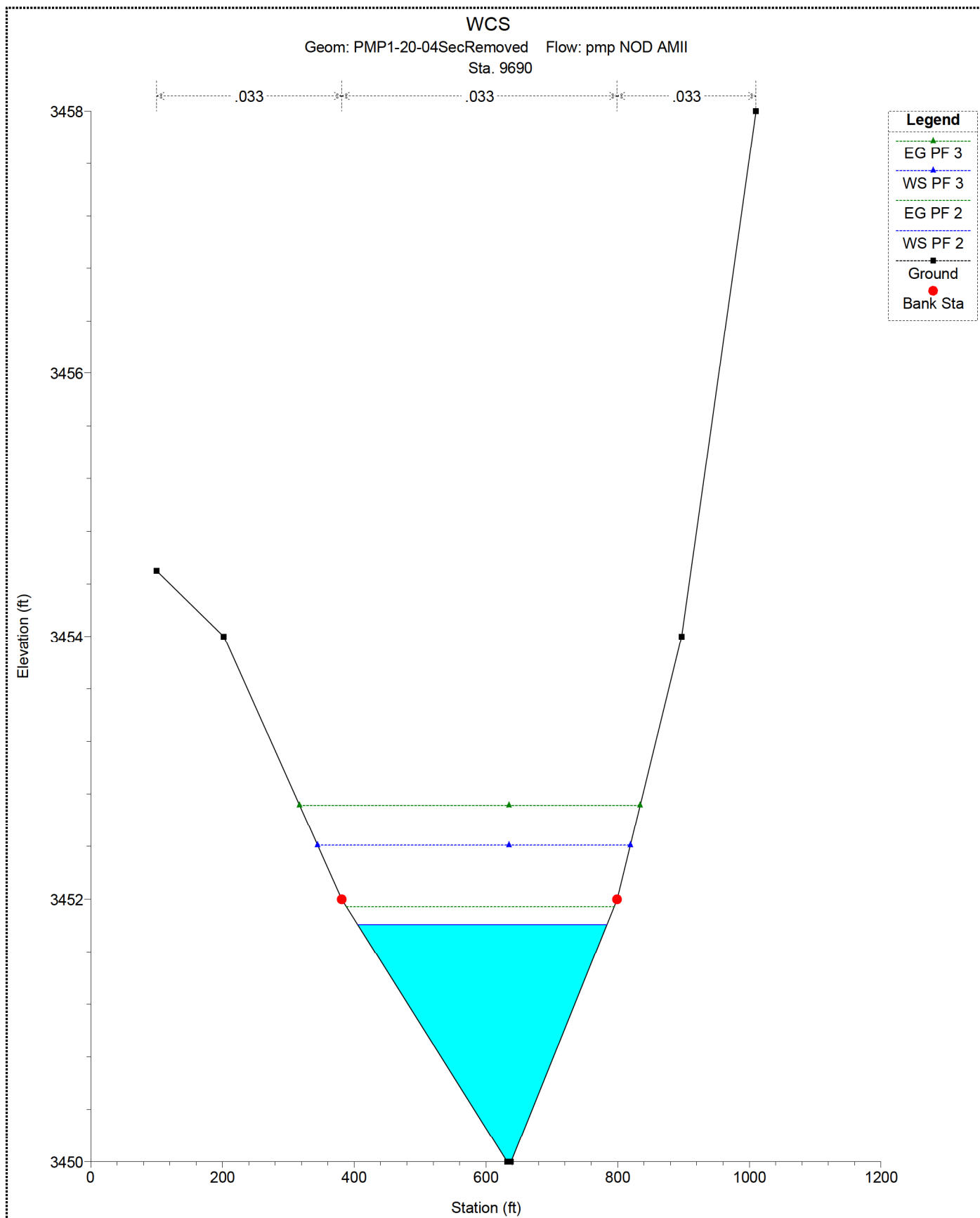


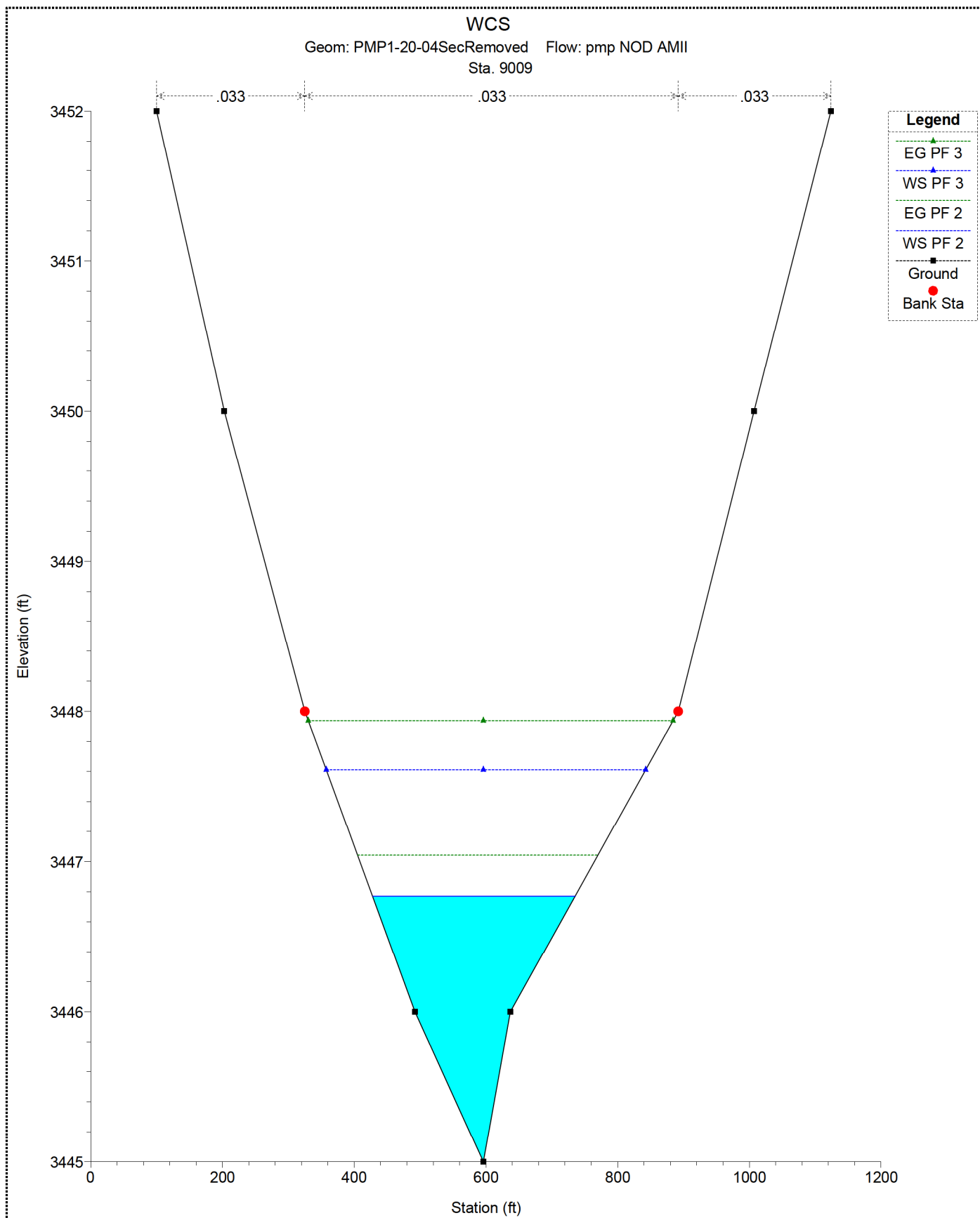


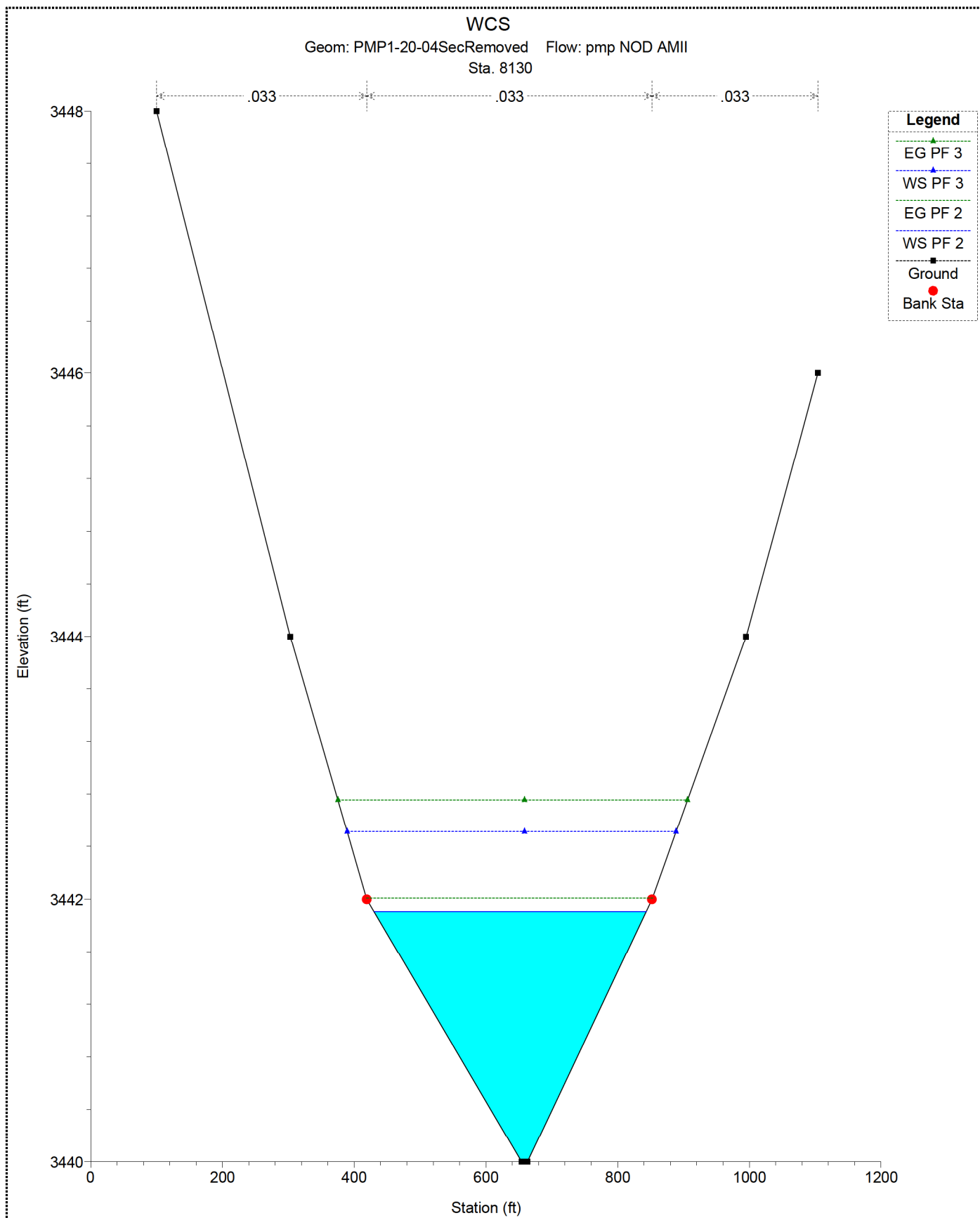


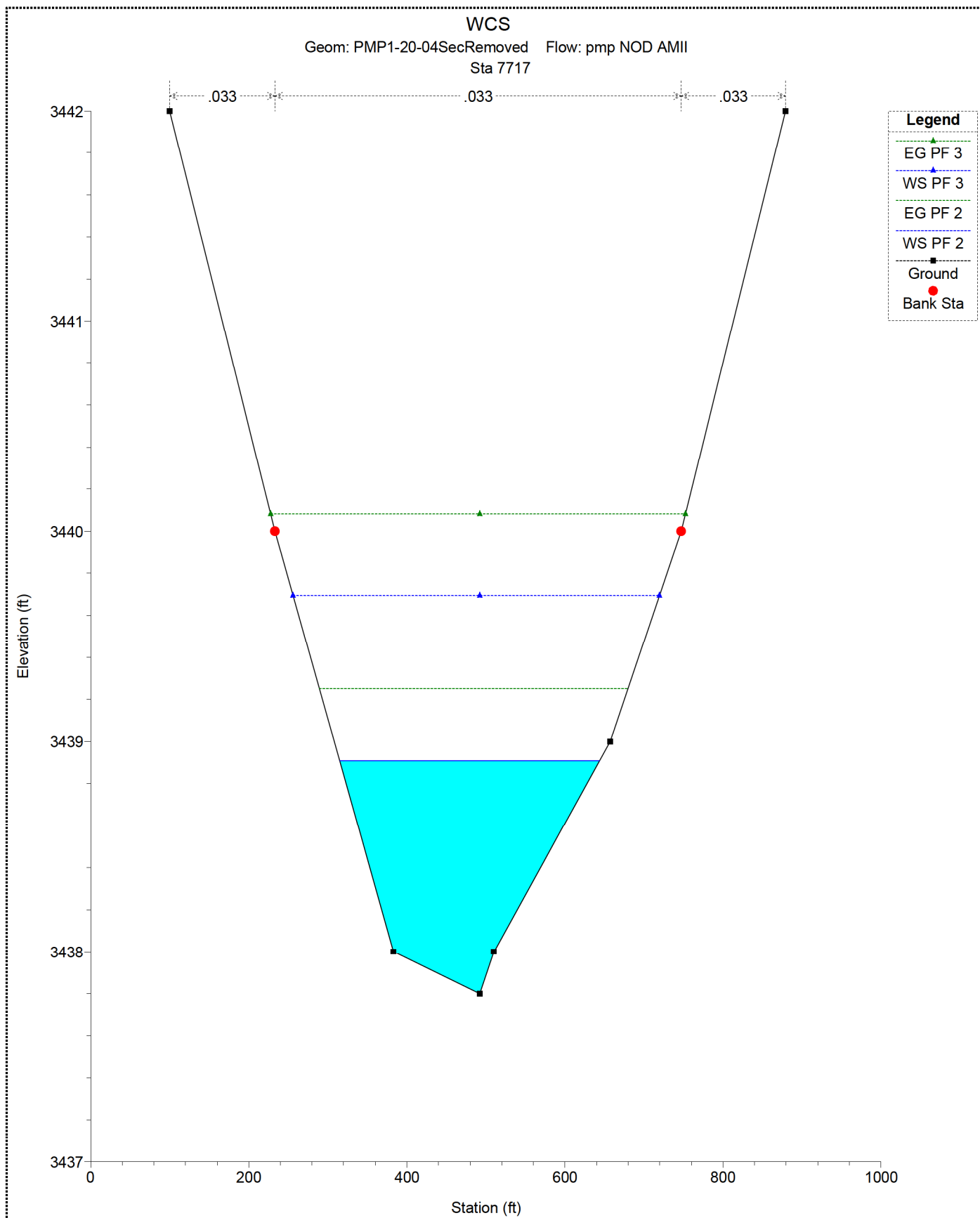




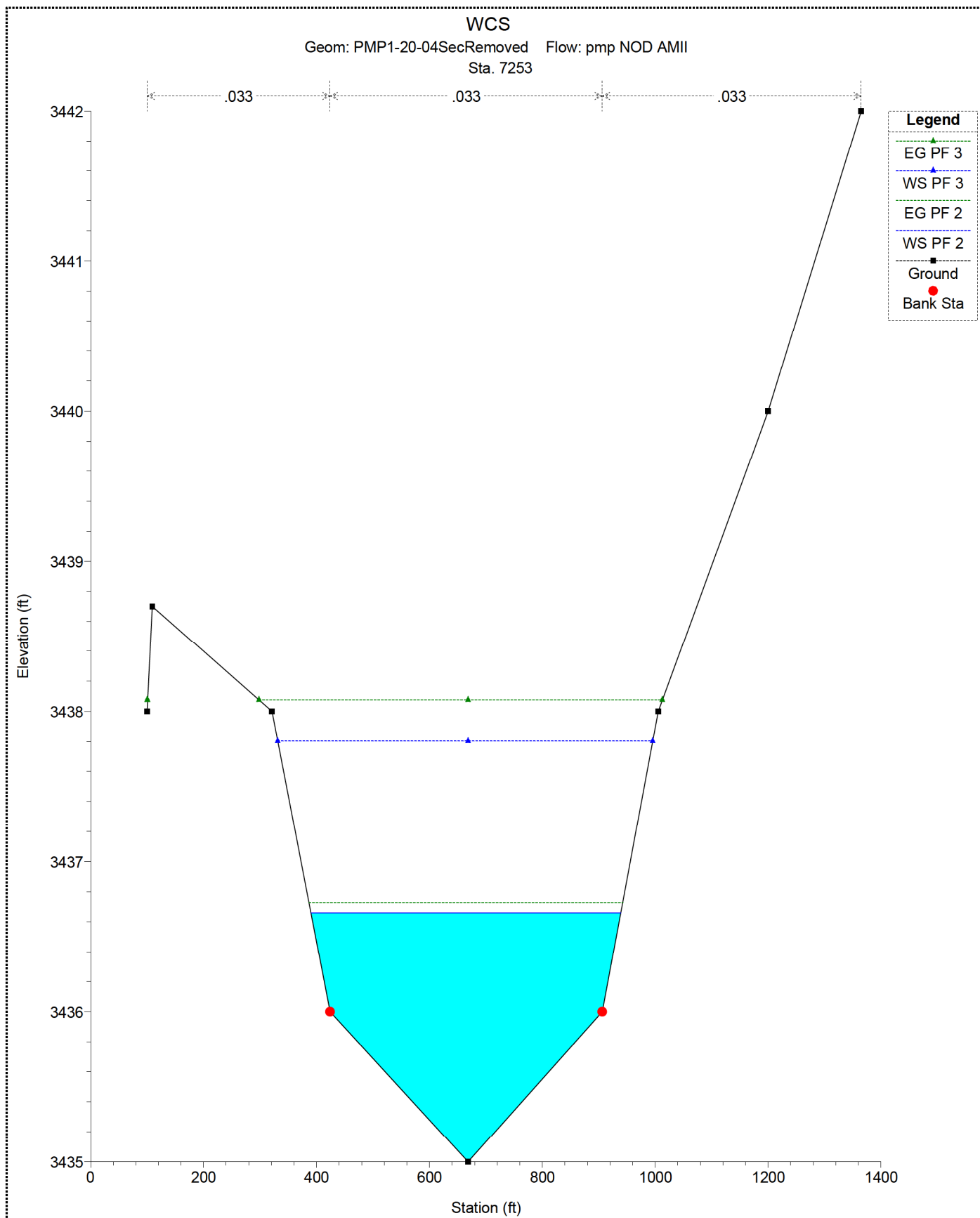


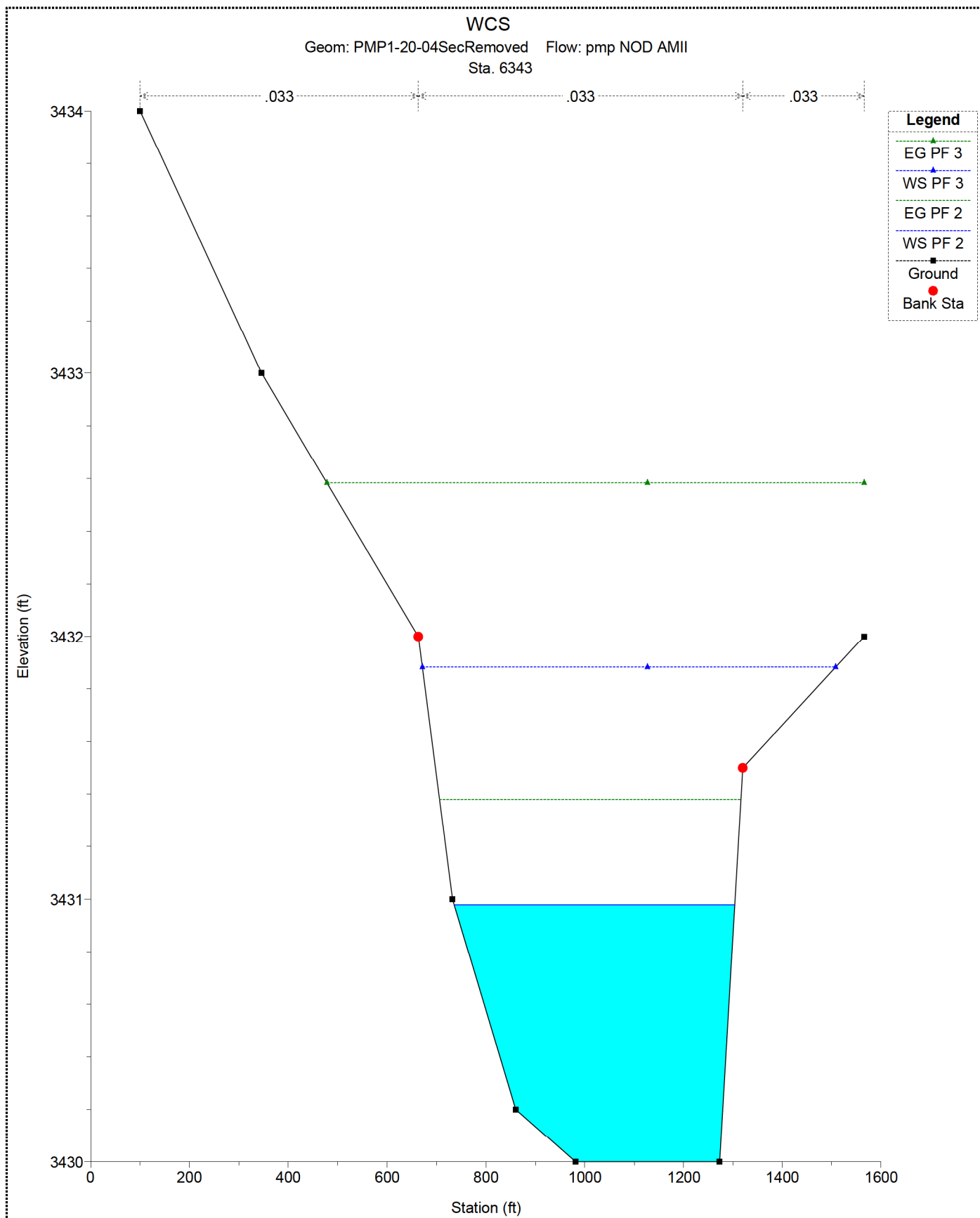


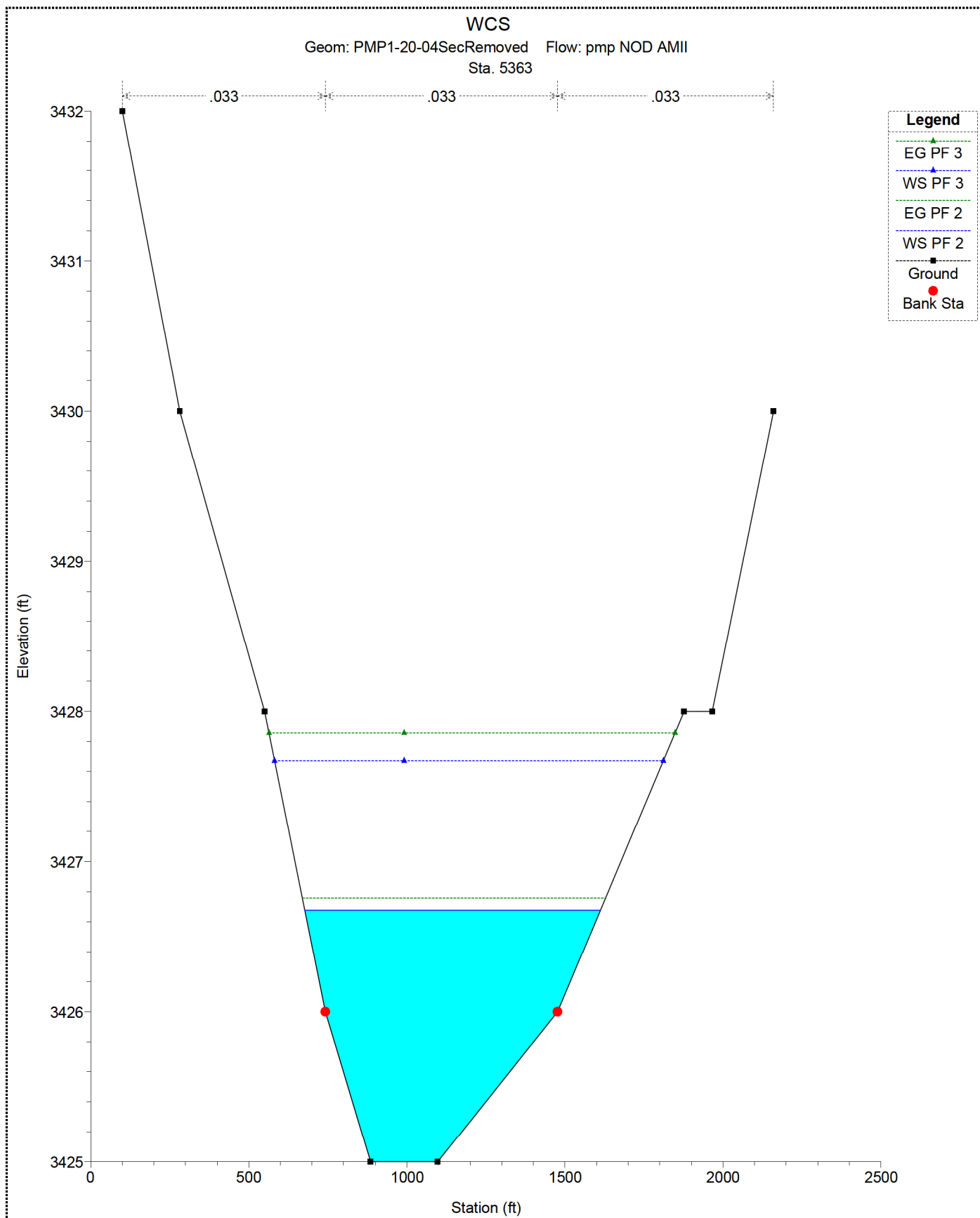


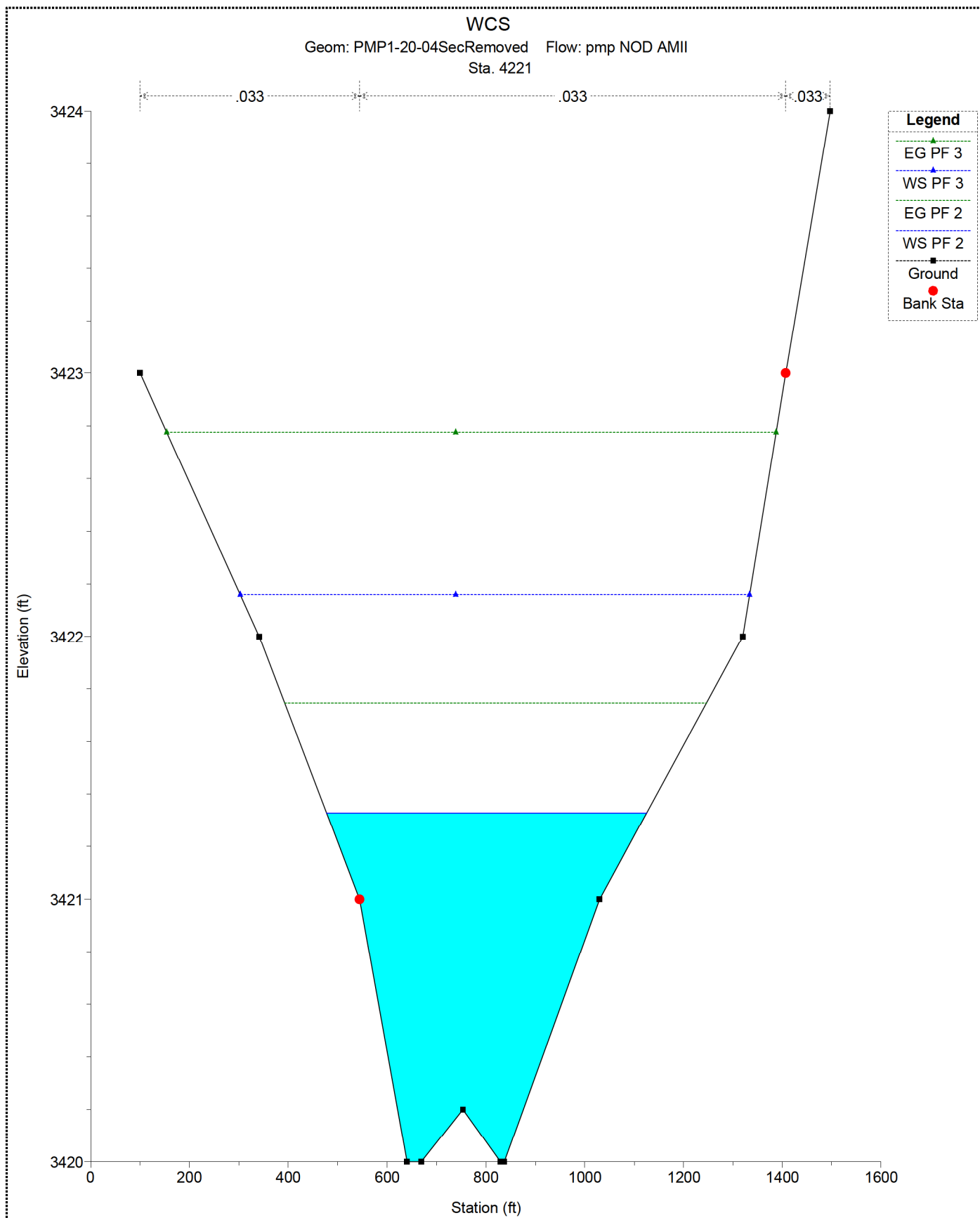


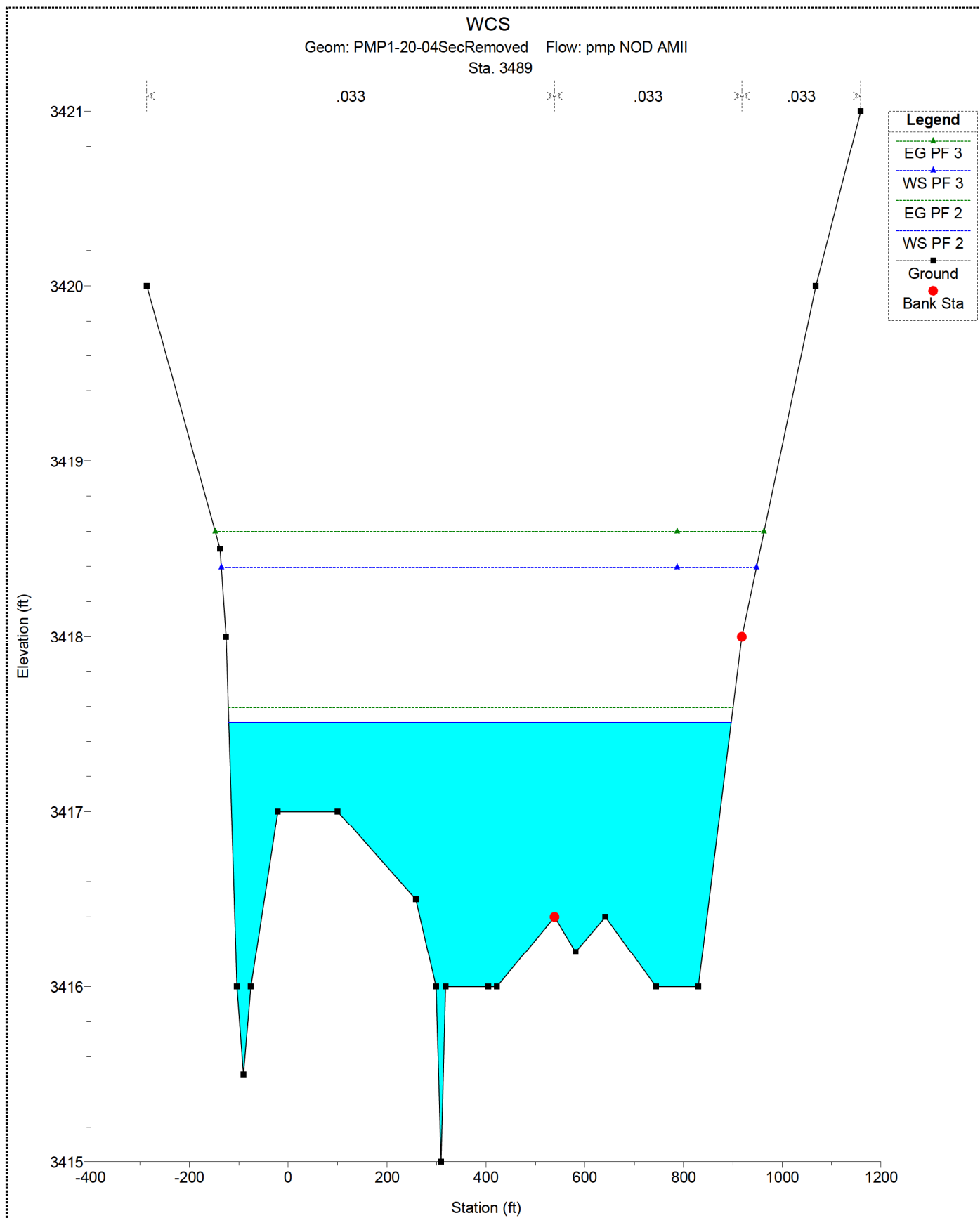


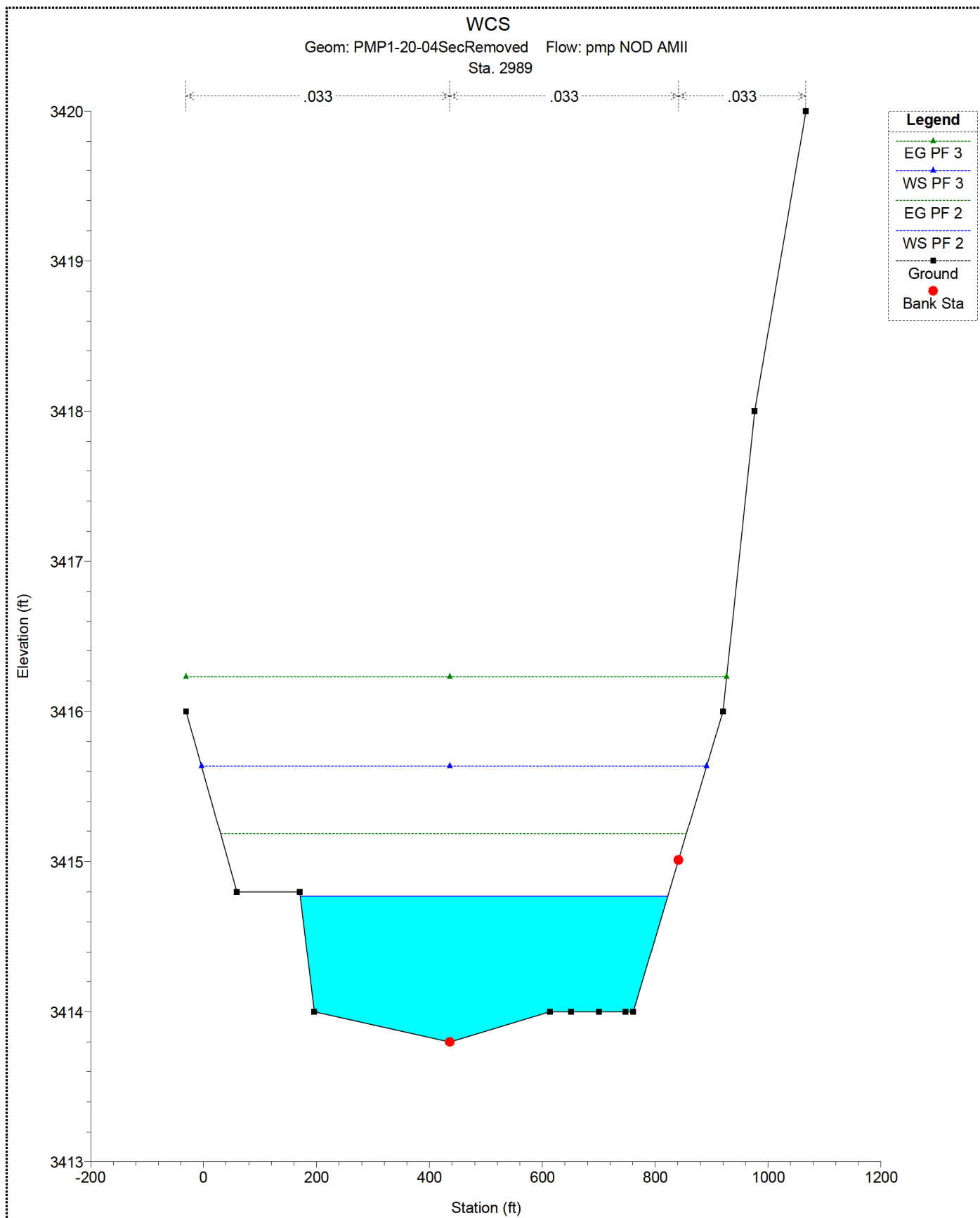


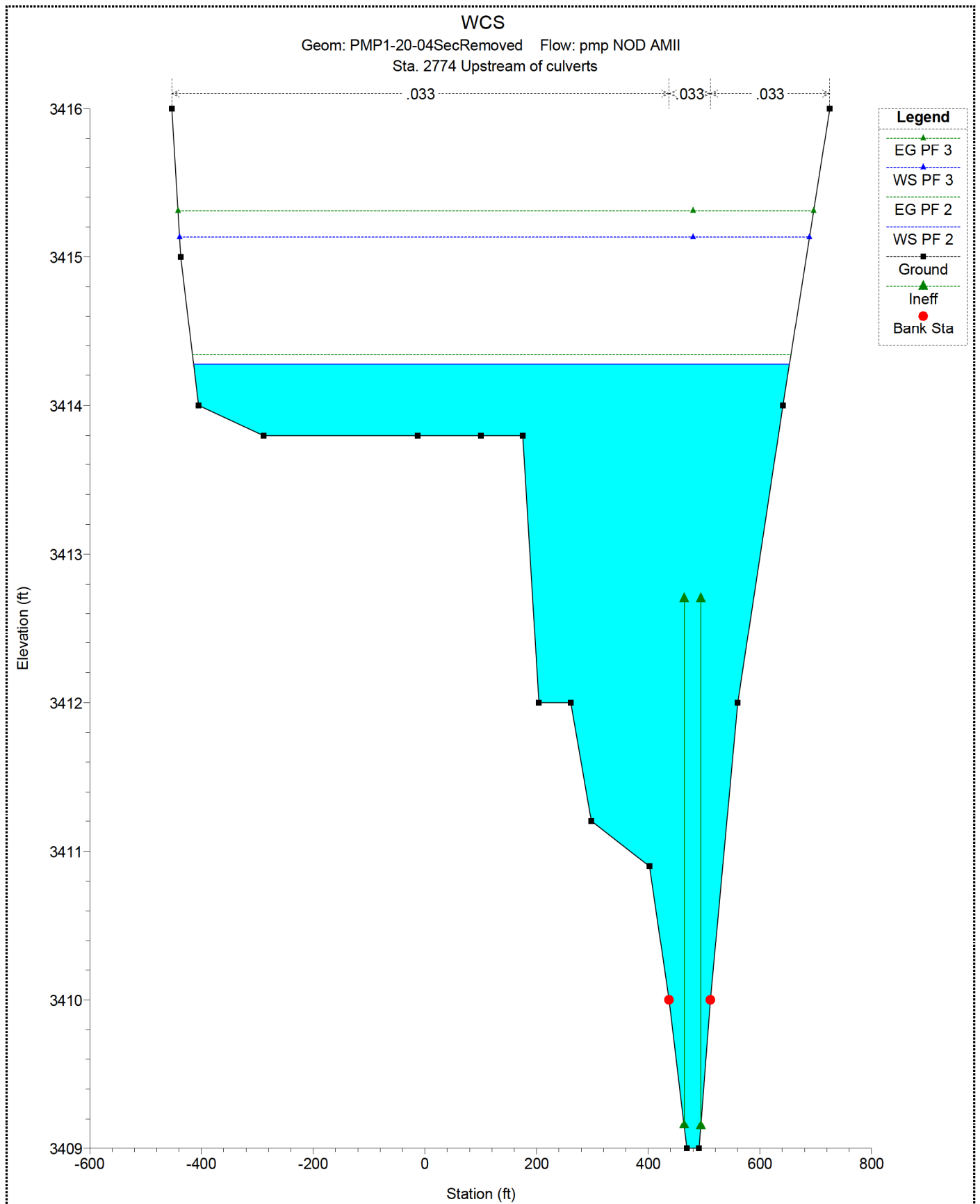


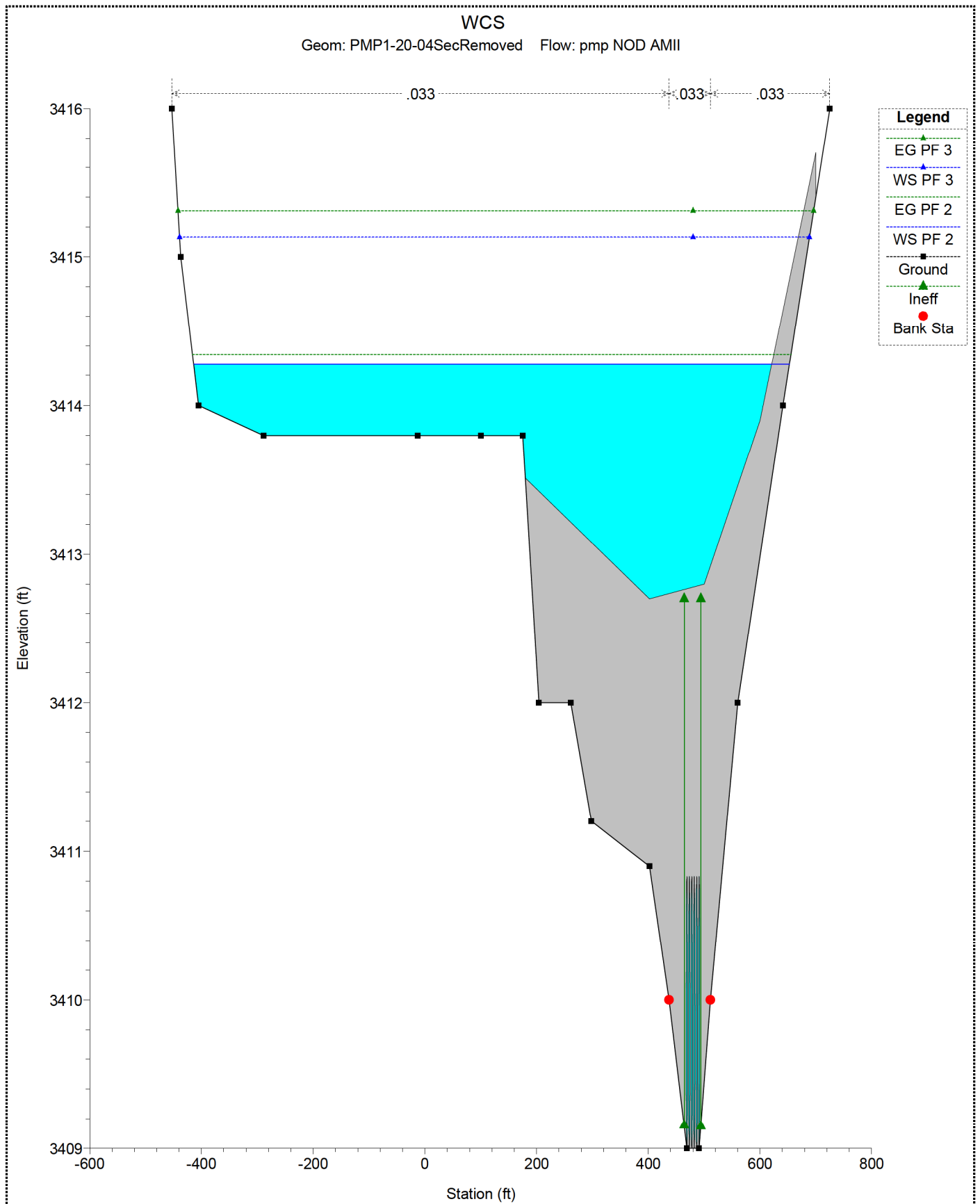




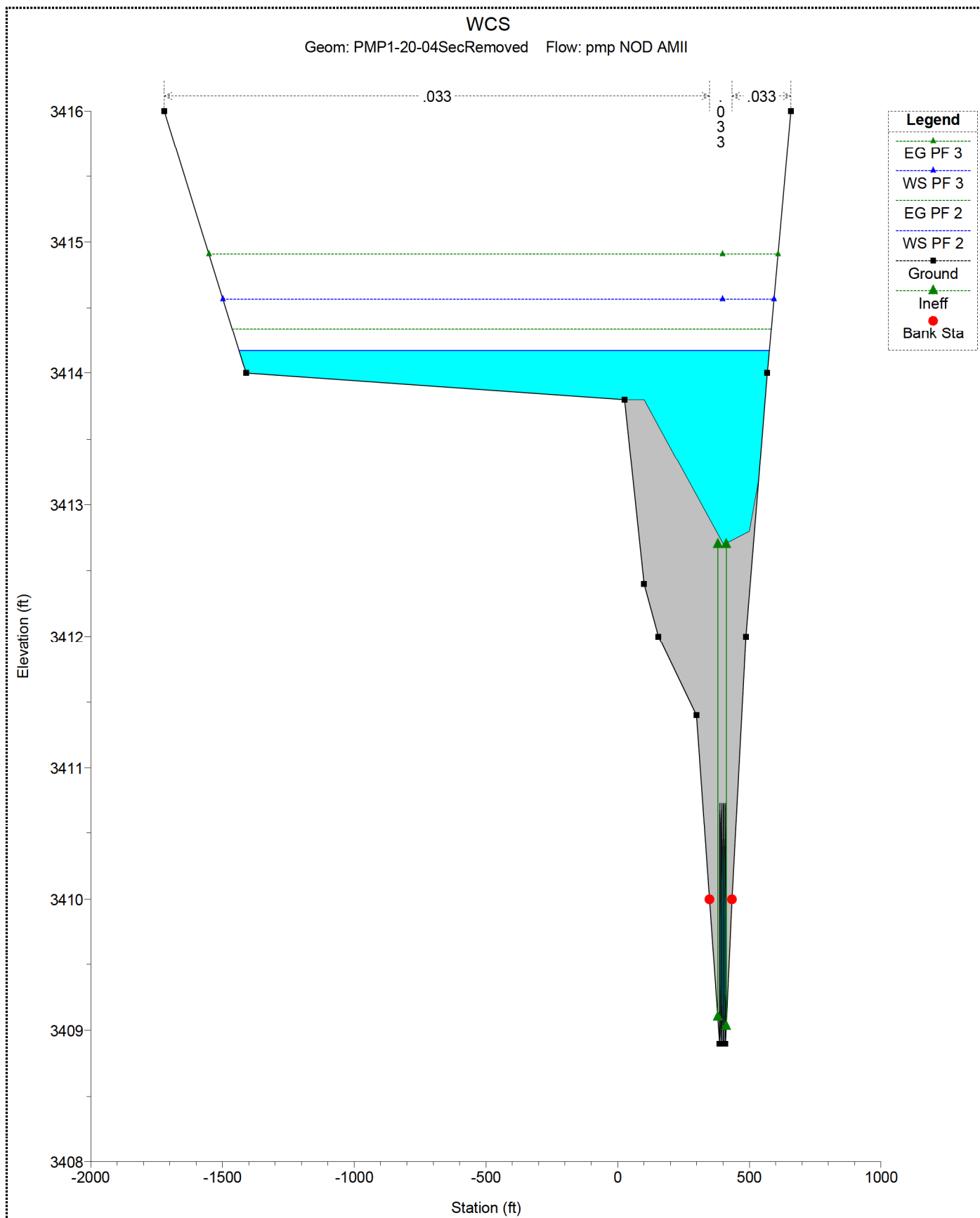


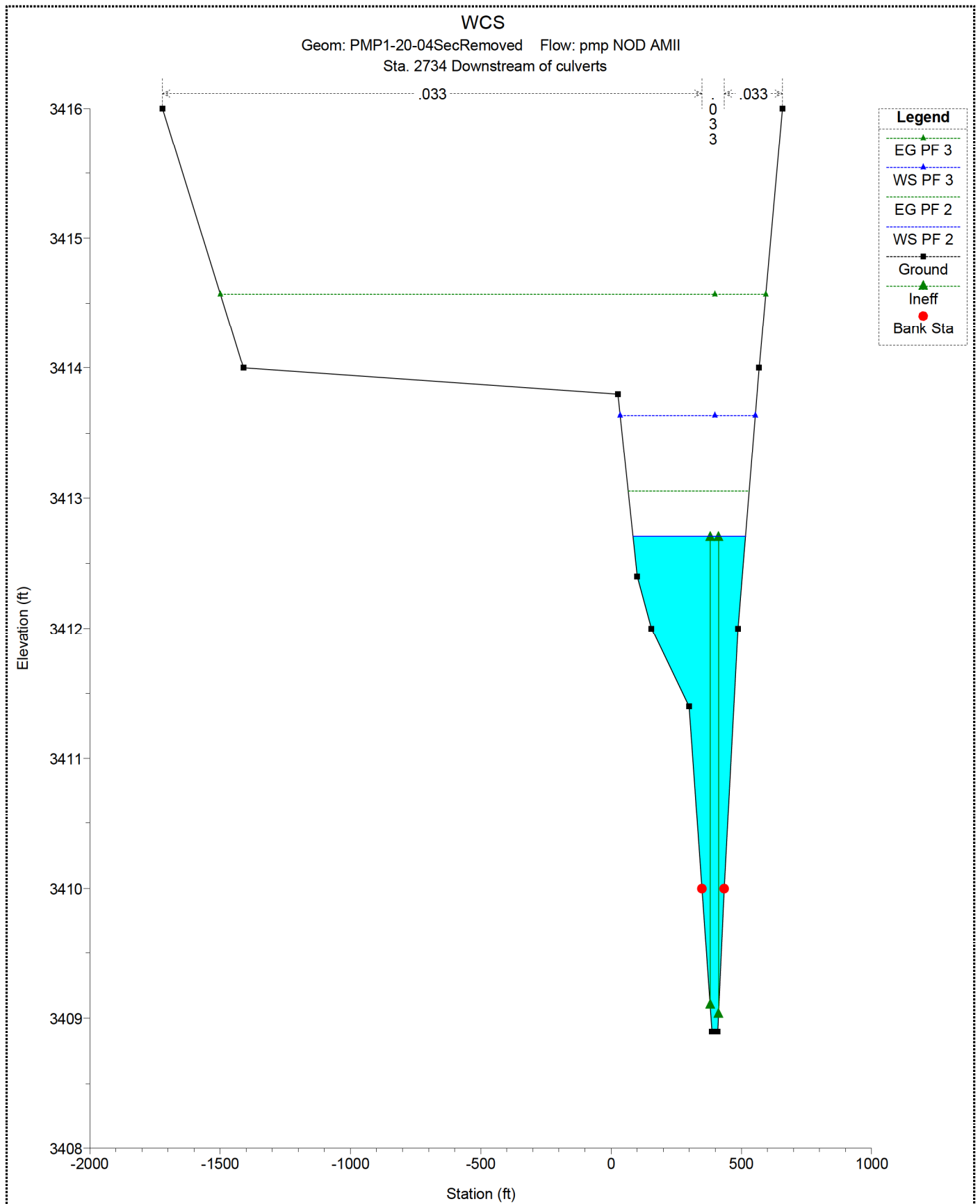


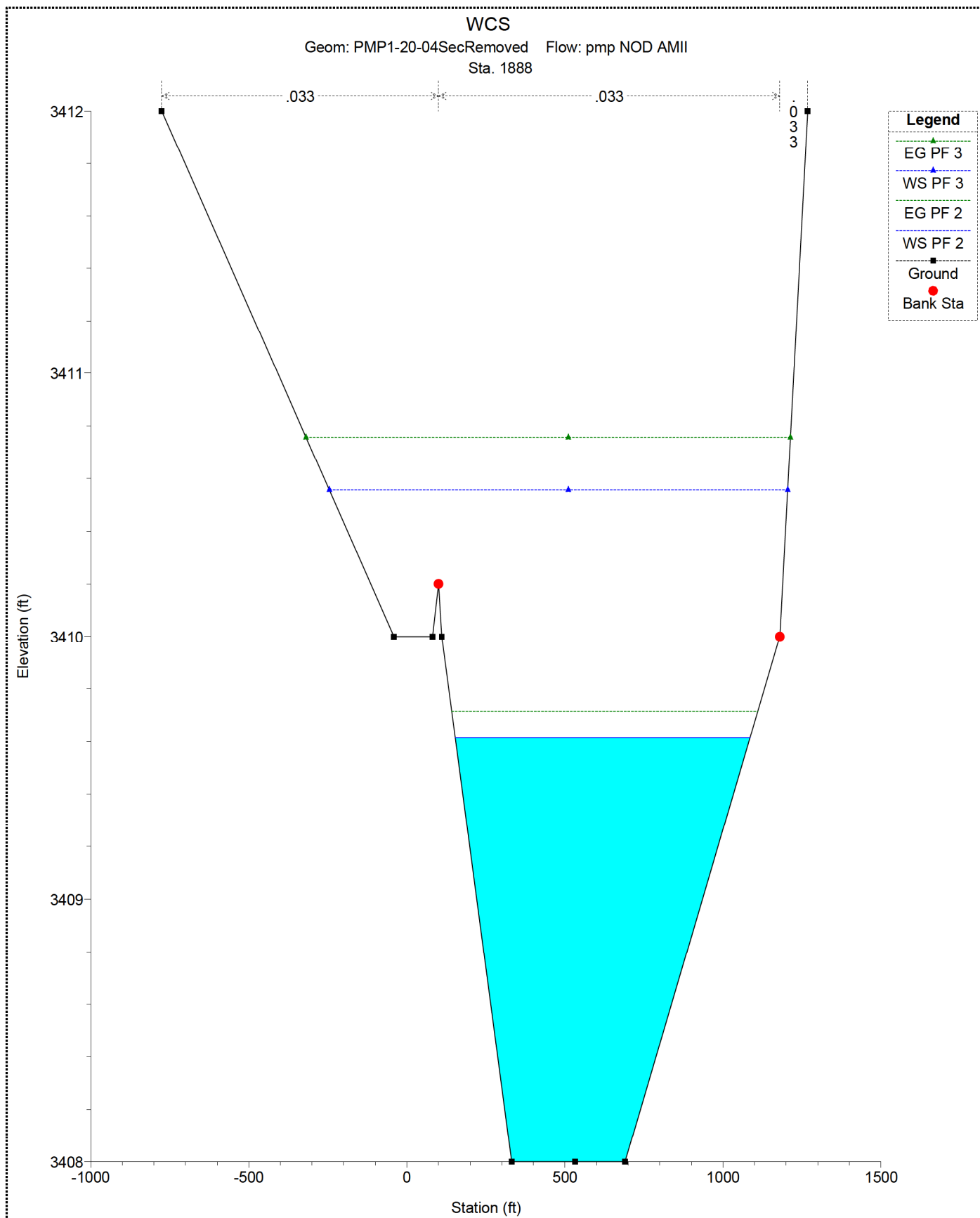


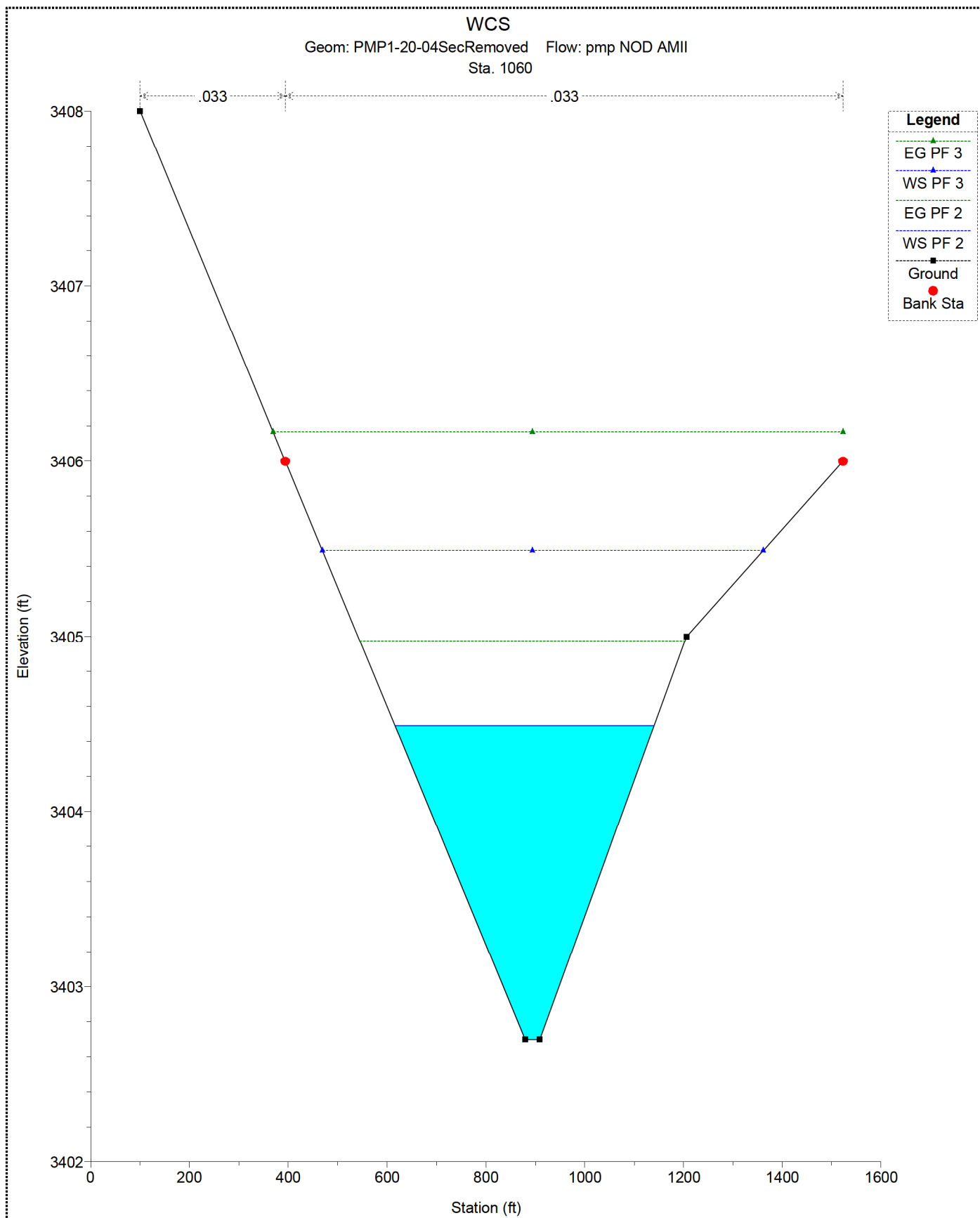












## **APPENDIX Q**

### **HEC-HMS MODEL FOR THE CALCULATION OF THE 100-YEAR PEAK DISCHARGE, ANTECEDENT MOISTURE CONDITION III**

# HMS \* Summary of Results

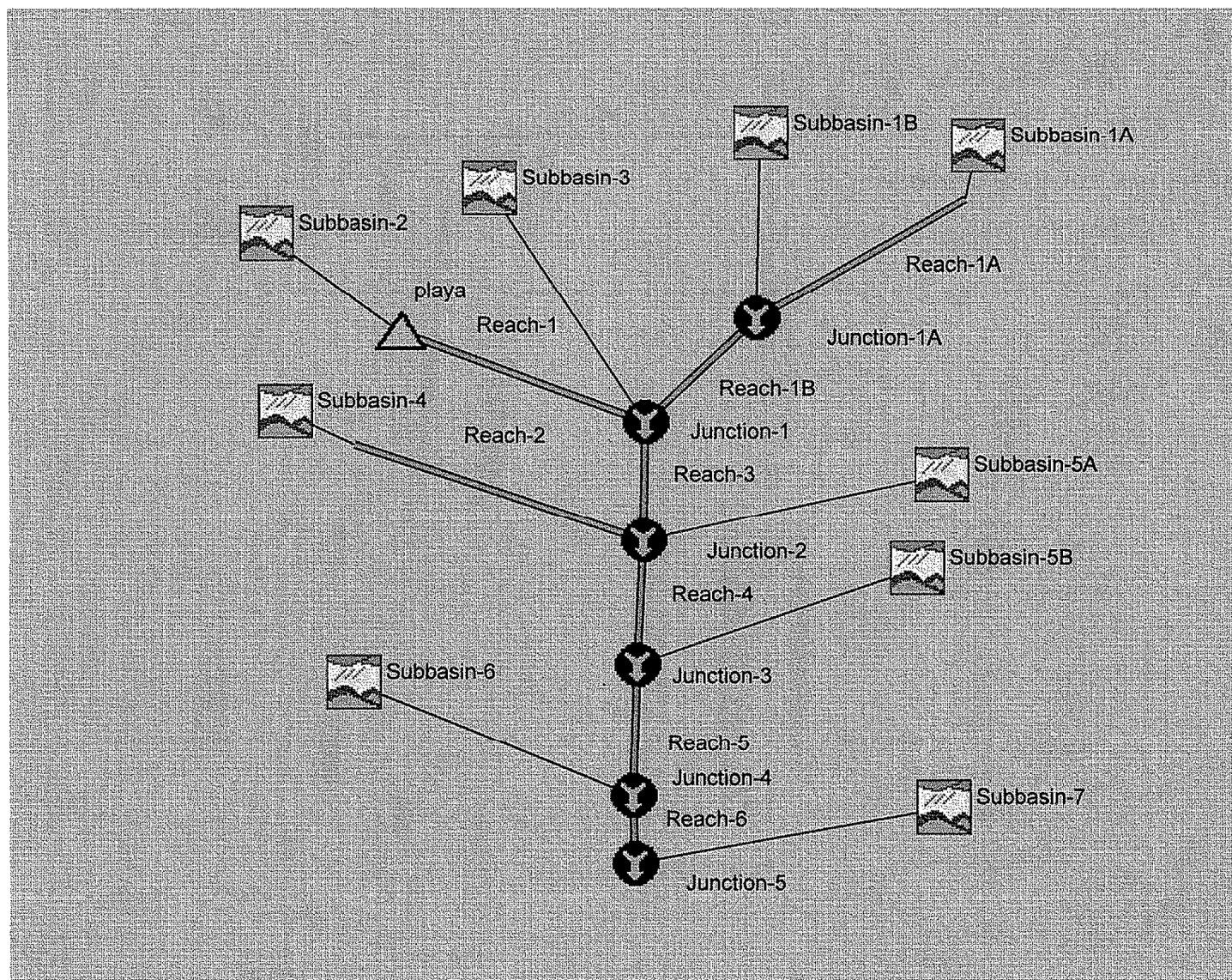
Project : WCS

Run Name : 100YrAMIII3/24/06NOD

Start of Run : 01Dec00 0000 Basin Model : 100YrAMIII3/24/06NOD  
 End of Run : 02Dec00 0000 Met. Model : Met100 Year  
 Execution Time : 24Mar06 1557 Control Specs : Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4	790.29	01 Dec 00 1231	122.31	0.490
Reach-2	790.29	01 Dec 00 1246	121.87	0.490
Subbasin-2	1107.9	01 Dec 00 1259	244.80	1.063
playa	0.0	30 Nov 00 2400	0.0	1.063
Reach-1	0.0	30 Nov 00 2400	0.0	1.063
Subbasin-1A	644.57	01 Dec 00 1319	178.03	0.691
Reach-1A	644.57	01 Dec 00 1336	177.29	0.691
Subbasin-1B	455.38	01 Dec 00 1236	76.429	0.314
Junction-1A	816.66	01 Dec 00 1319	253.72	1.005
Reach-1B	816.66	01 Dec 00 1322	253.54	1.005
Subbasin-3	230.66	01 Dec 00 1236	38.879	0.156
Junction-1	965.95	01 Dec 00 1253	292.42	2.224
Reach-3	965.95	01 Dec 00 1310	291.19	2.224
Subbasin-5A	296.92	01 Dec 00 1230	44.613	0.192
Junction-2	1873.4	01 Dec 00 1250	457.68	2.906
Reach-4	1873.4	01 Dec 00 1311	455.29	2.906
Subbasin-5B	321.56	01 Dec 00 1246	61.273	0.265
Junction-3	2127.6	01 Dec 00 1309	516.56	3.171
Reach-5	2127.6	01 Dec 00 1323	514.73	3.171
Subbasin-6	135.18	01 Dec 00 1222	17.239	0.074
Junction-4	2154.5	01 Dec 00 1323	531.96	3.245
Reach-6	2154.5	01 Dec 00 1323	531.96	3.245
Subbasin-7	112.07	01 Dec 00 1257	24.553	0.104
Junction-5	2247.7	01 Dec 00 1323	556.52	3.349







## Meteorologic Model Input

The screenshot shows a software window titled "HMS \* Meteorologic Model". It has a menu bar with "File", "Edit", and "Help". The "Meteorologic Model" is set to "Met100 Year". The "Description" field contains "100 Year, 24 Hour Storm". There are two tabs: "Precipitation" (selected) and "Evapotranspiration". Under the "Precipitation" tab, the "Method" is set to "SCS Hypothetical Storm". The "Storm Selection" is set to "Type II". The "Storm Depth (in)" is set to "6.0". There are buttons for "Subbasin List", "OK", "Apply", and "Cancel".

**HMS \* Meteorologic Model**

File Edit Help

Meteorologic Model: Met100 Year Subbasin List

Description: 100 Year, 24 Hour Storm ...

Precipitation Evapotranspiration

Method : SCS Hypothetical Storm

Storm Selection: Type II

Storm Depth (in) : 6.0

OK Apply Cancel



**HMS \* Basin Model \* SCS Curve Number**

Sort Help

Basin Model ID: 100YrAMIII3/24/06NOD

Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	91		0.0
Subbasin-2	86		0.0
Subbasin-3	89		0.0
Subbasin-4	89		0.0
Subbasin-5B	86		0.0
Subbasin-6	86		0.0
Subbasin-1B	88		0.0
Subbasin-5A	86		0.0
Subbasin-7	87		0.0

OK Apply Cancel

**HMS \* Basin Model \* SCS UH**

Sort Help

Basin Model ID: 100YrAMIII3/24/06NOD

Time Units : Minutes

Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3	44
Subbasin-4	39
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64

OK Apply Cancel

**HMS \* Basin Model \* Lag Routing**

Help

Basin Model ID : 100YrAMIII3/24/06NOD

Interval :

Reach Name	Lag (min)
Reach-1	35
Reach-2	15
Reach-3	17
Reach-4	21
Reach-5	14
Reach-1A	17
Reach-1B	3
Reach-6	0

OK Apply Cancel

**HMS \* Basin Model \* Reservoir Editor**

Edit File Help

Reservoir Name:

Description:

Storage Outlet Spillway Overflow Dam Break

Method :

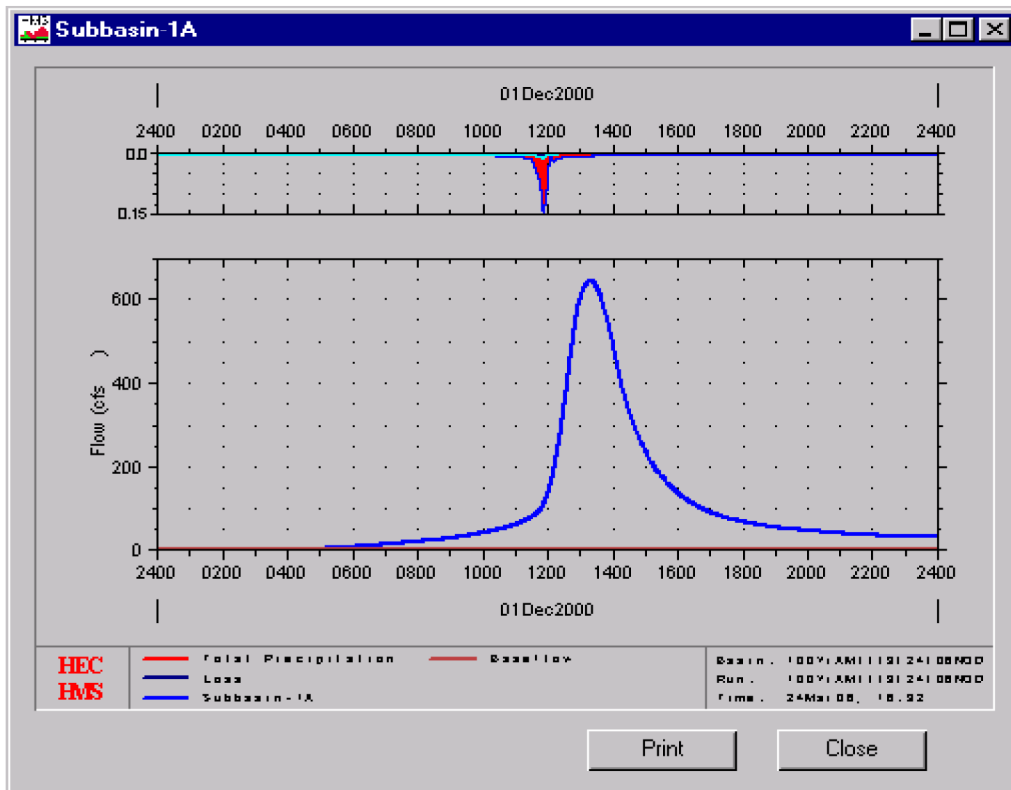
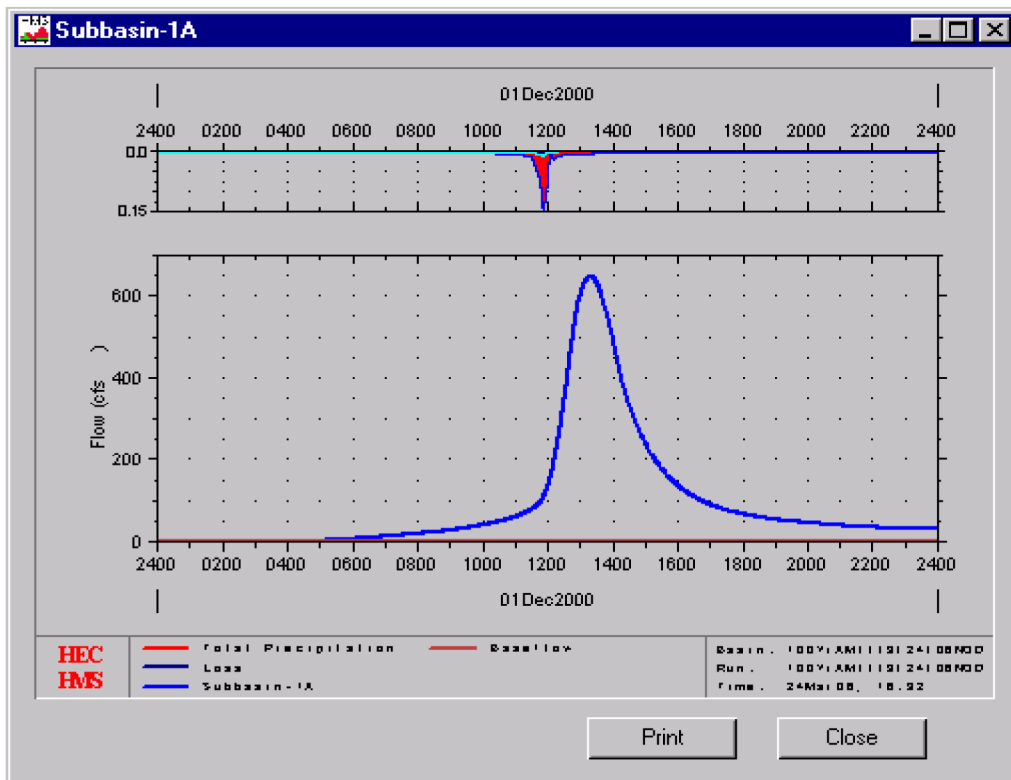
Initial

Elevation (ft)	Storage (acre-feet)	Outflow (cfs)
3478.0	0.0	0.0
3480.0	24.0	0.0
3482.0	61.0	0.0
3484.0	170.0	0.0
3486.0	457.0	0.0
3487.0	693.0	863.0
3488.0	928.0	2427.0

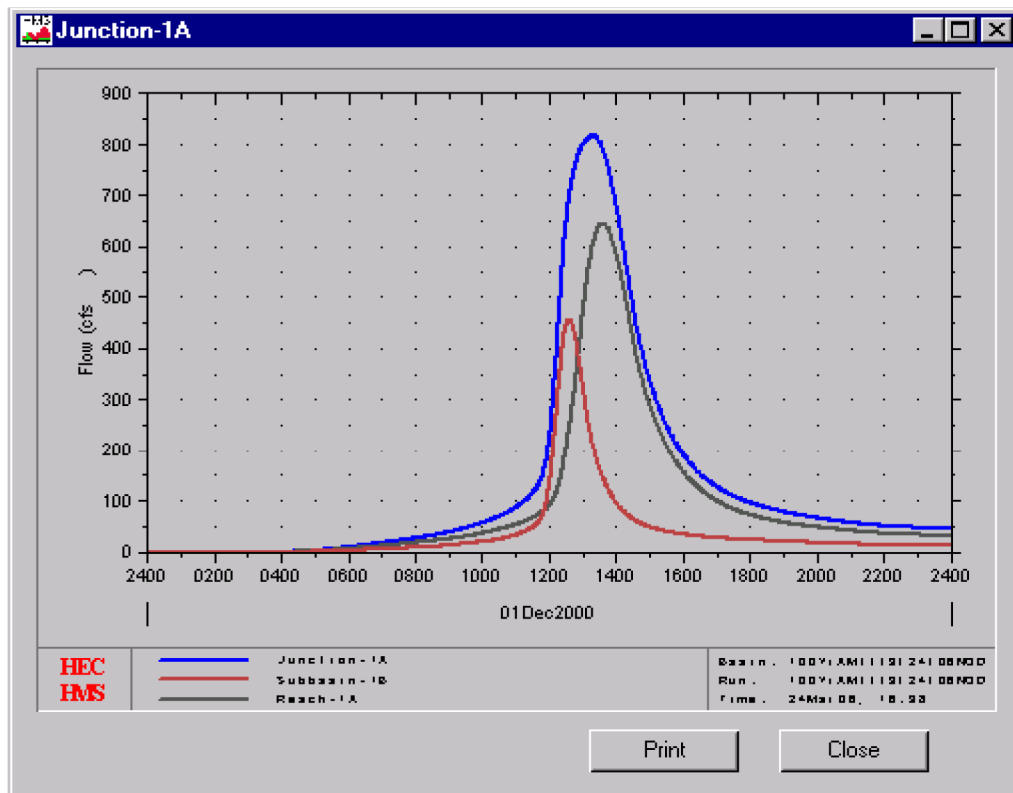
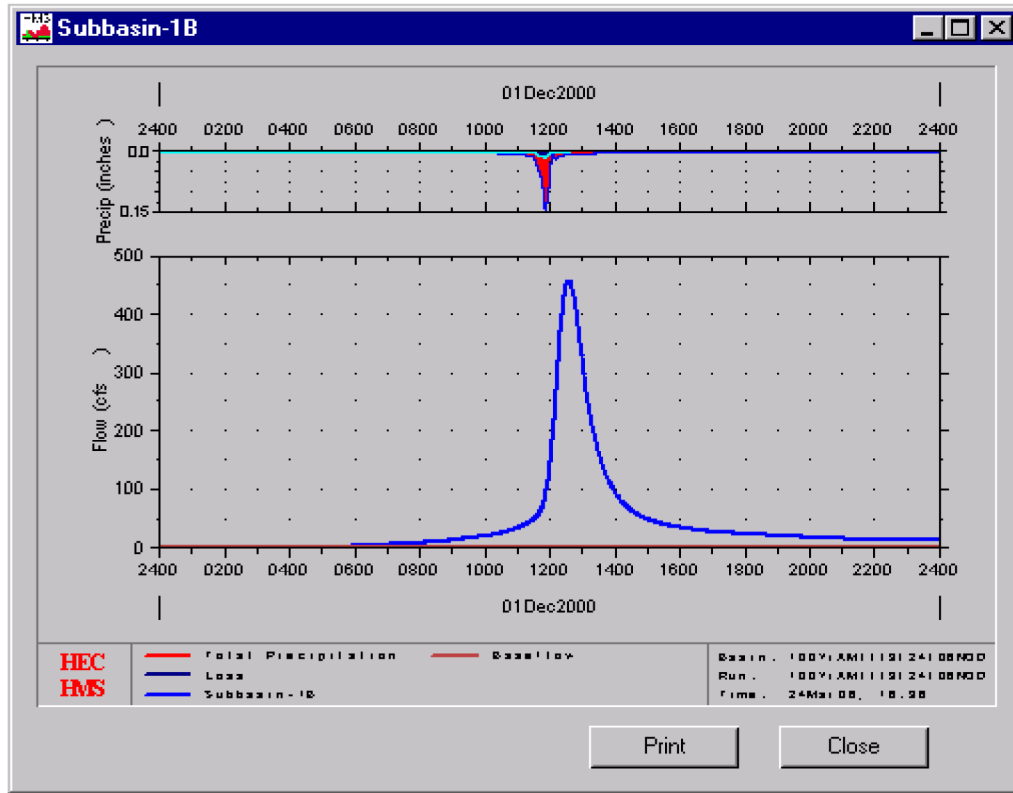
Graph

OK Apply Cancel

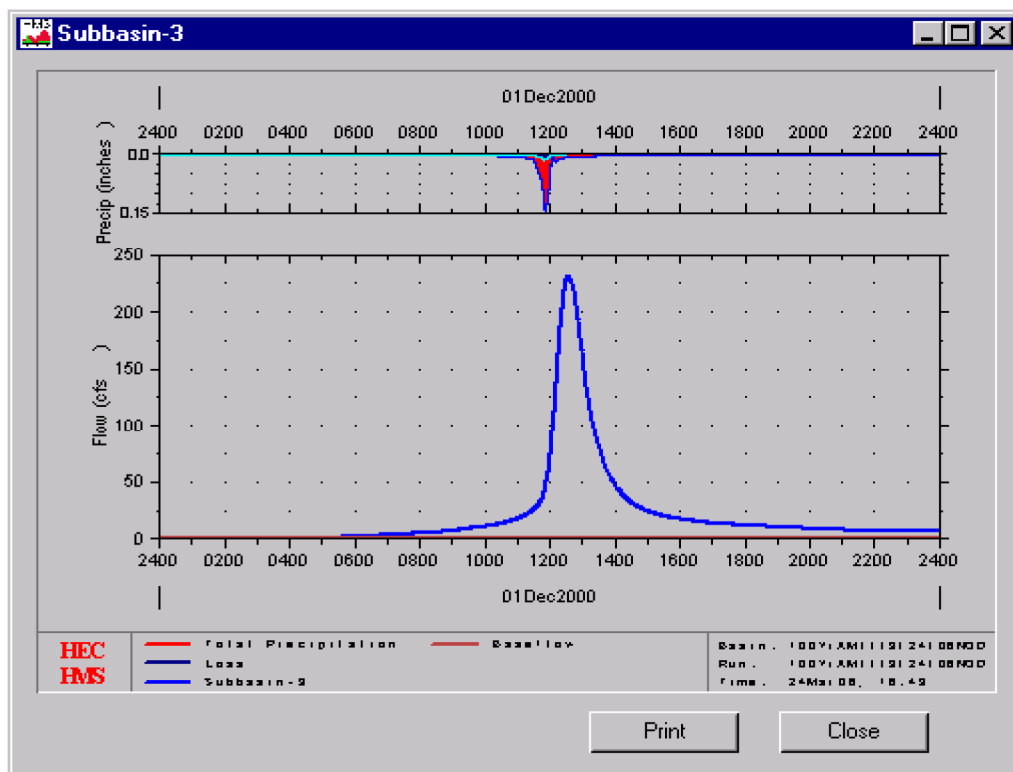
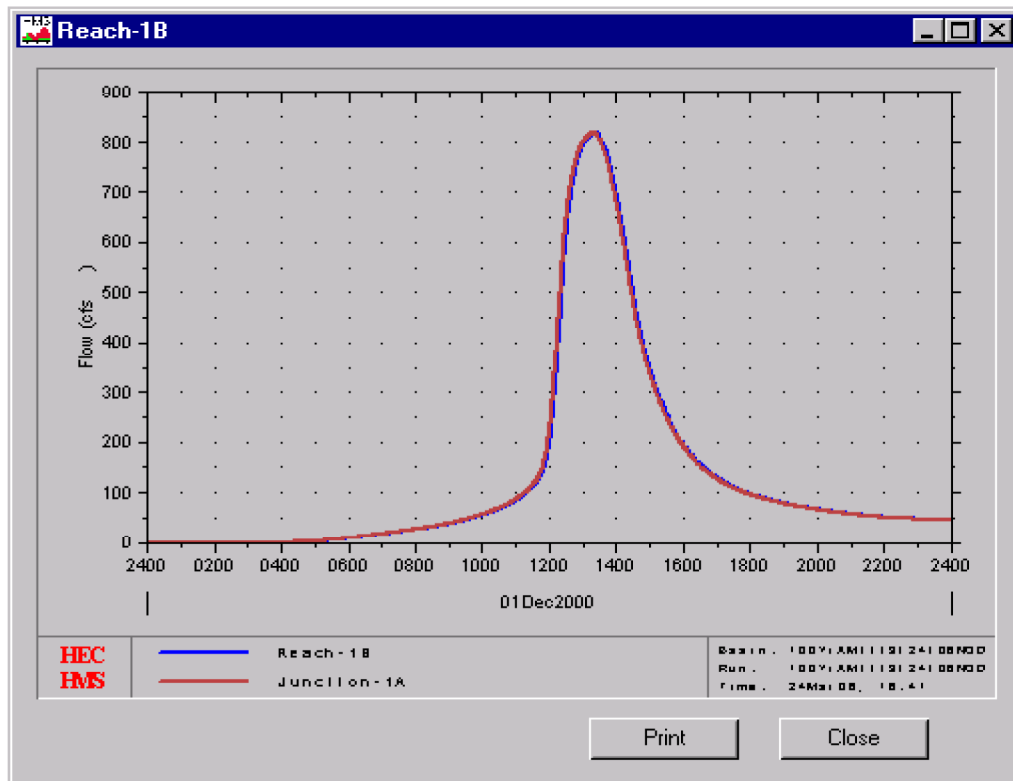
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



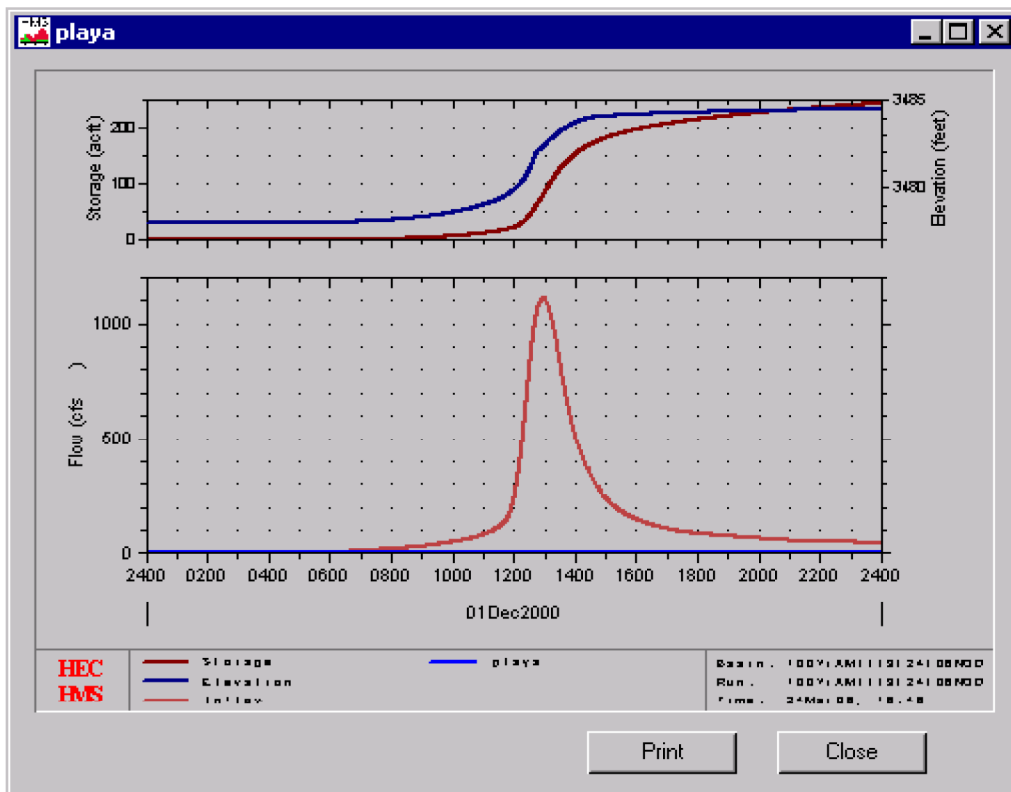
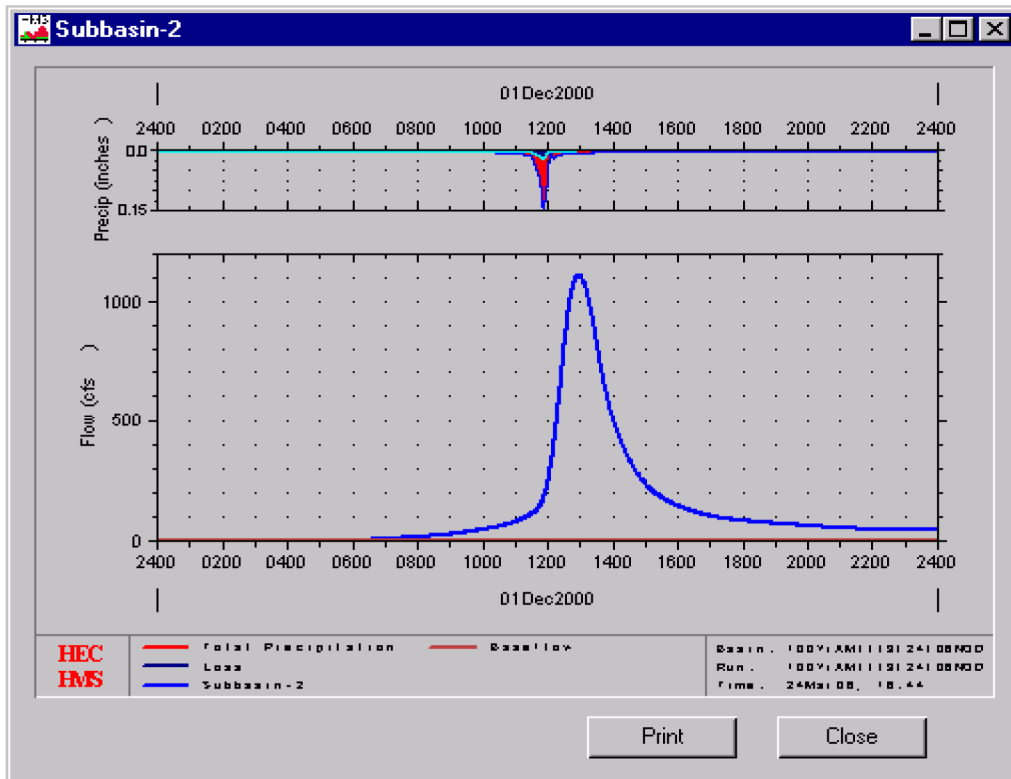
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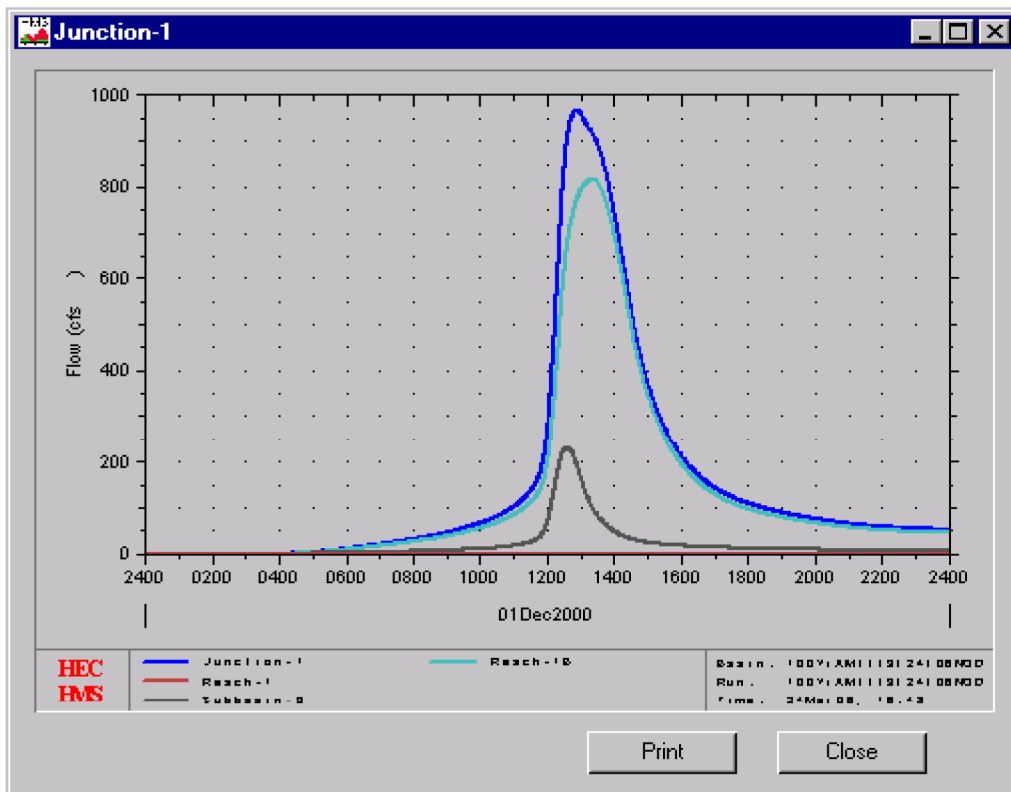
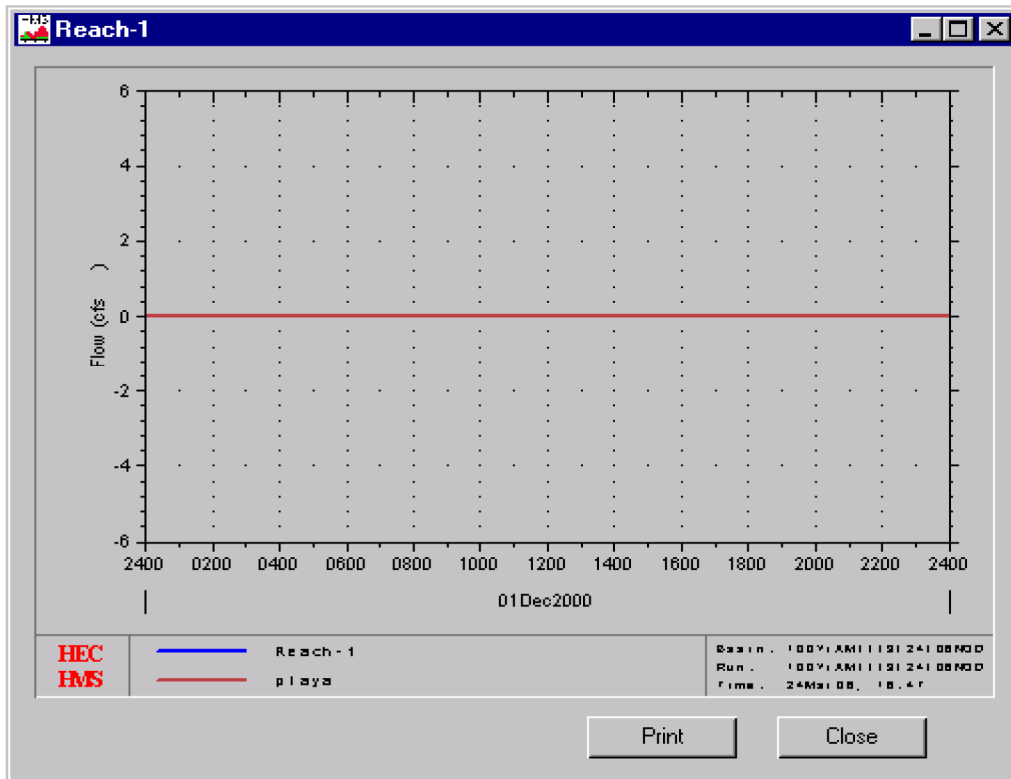
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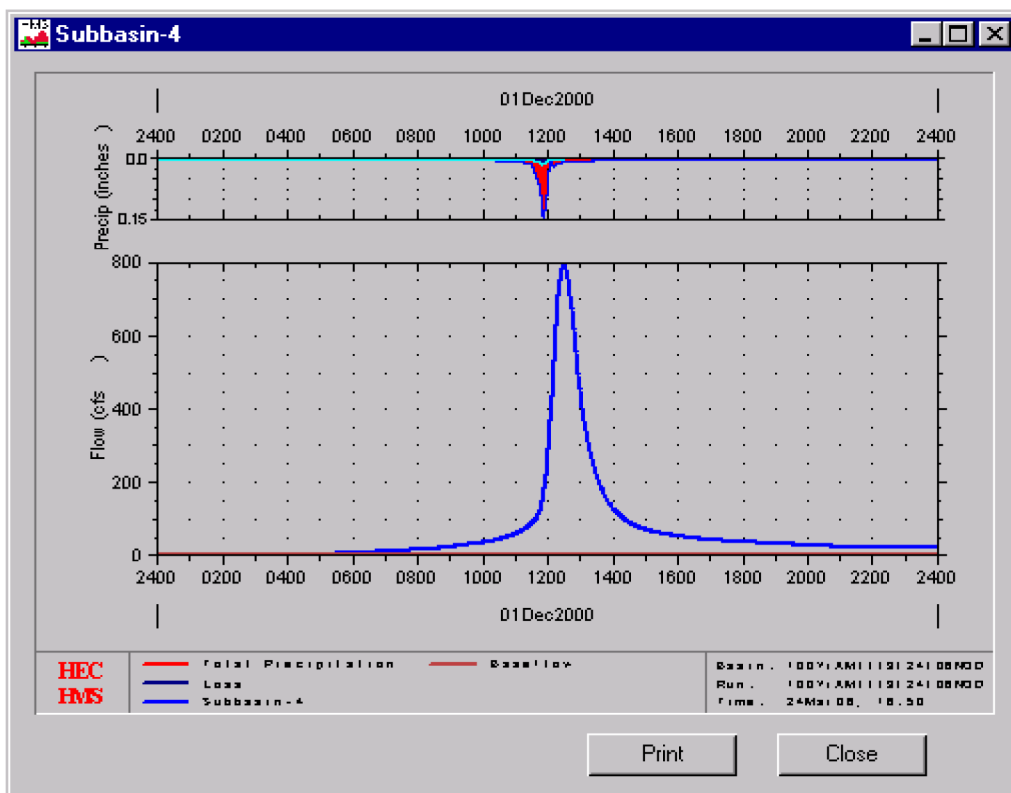
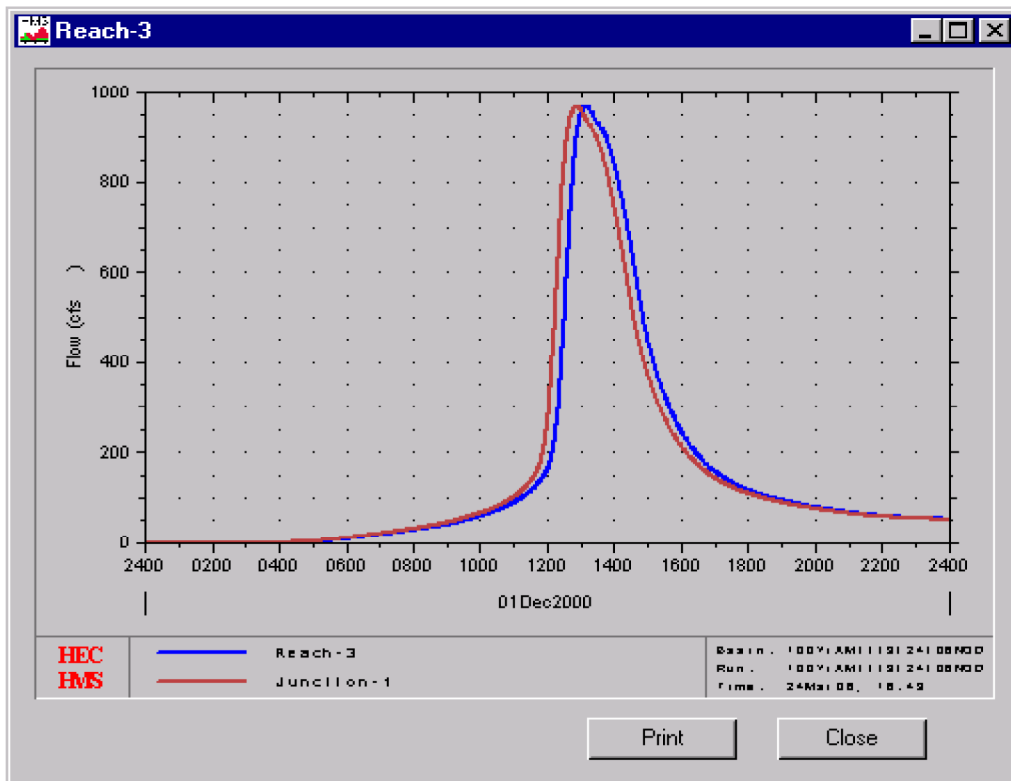
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

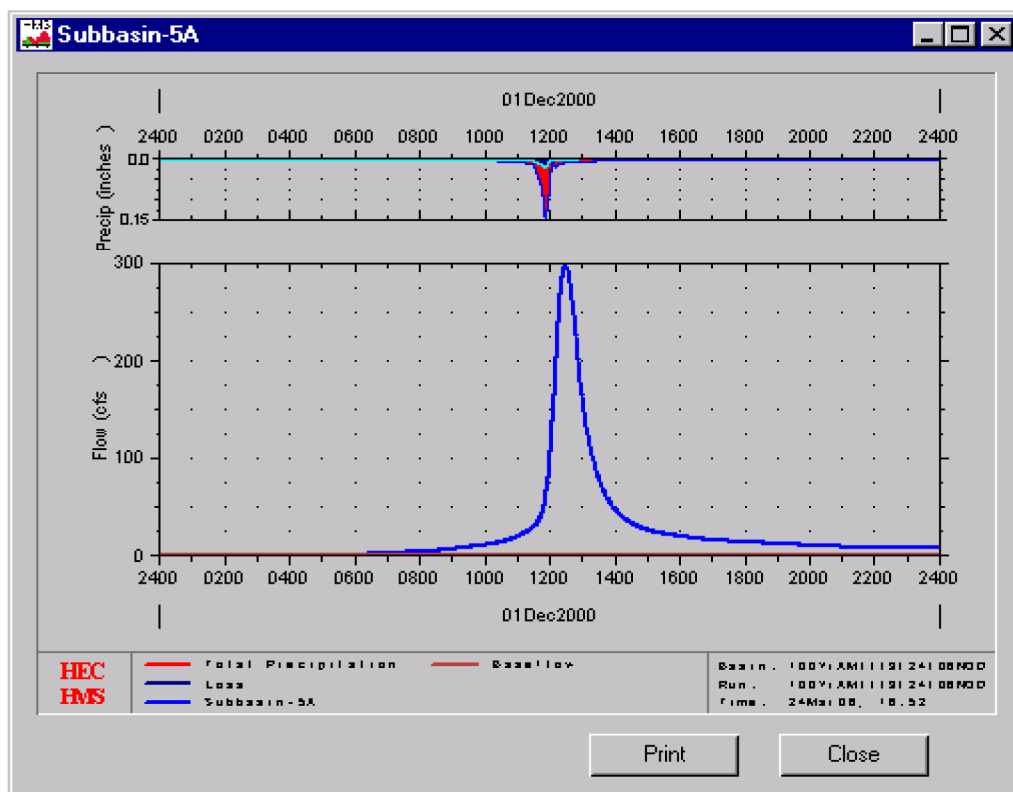
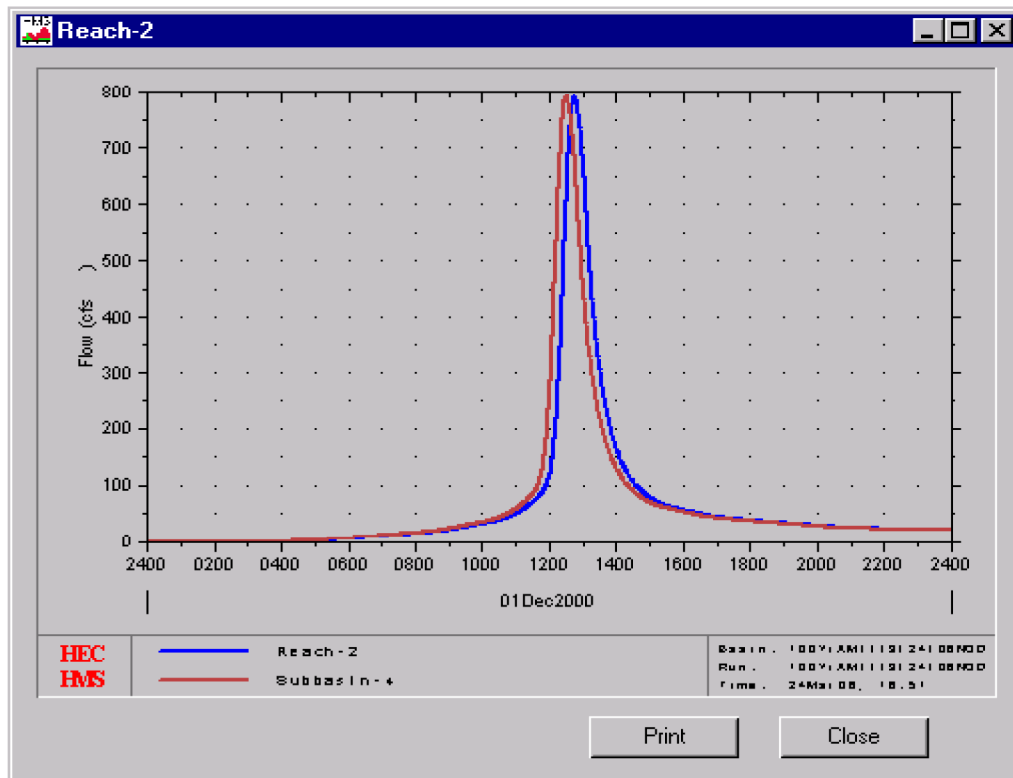


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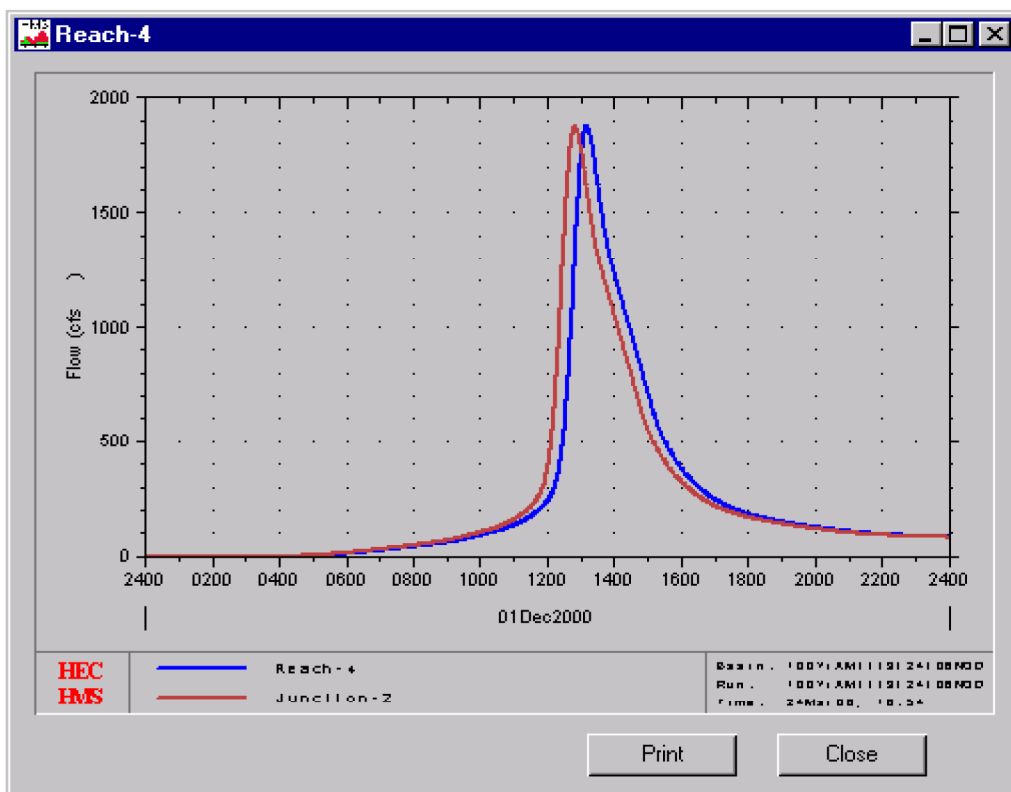
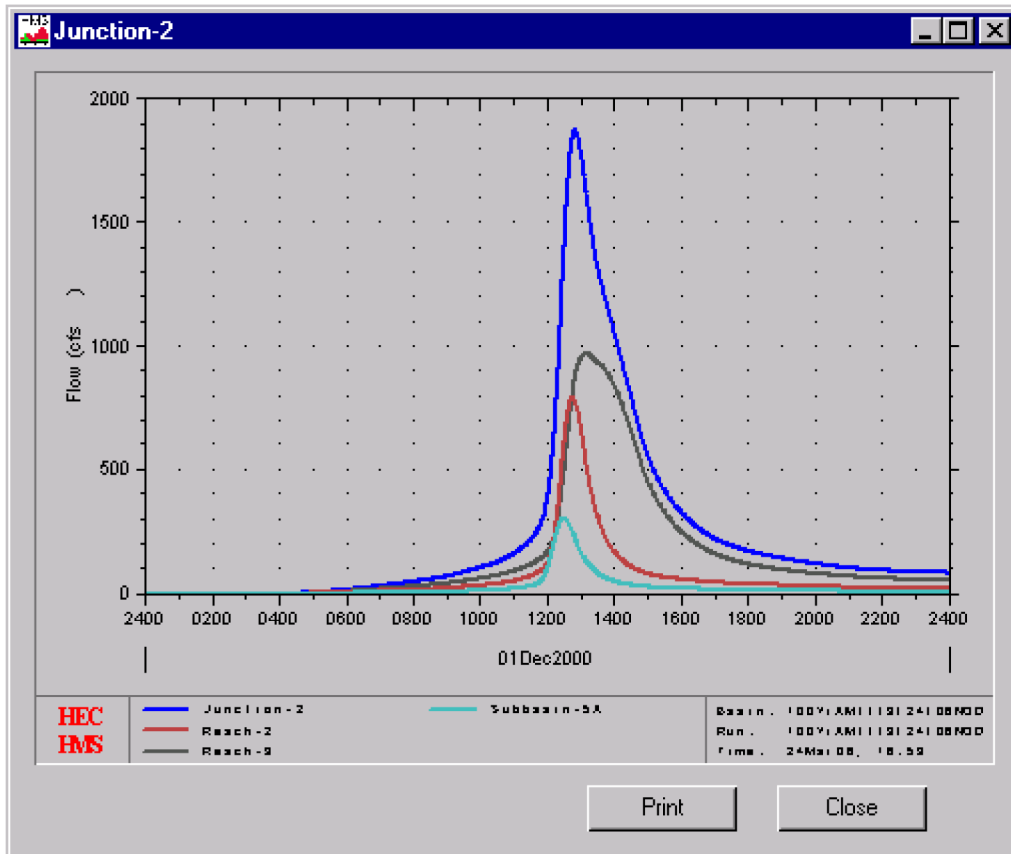




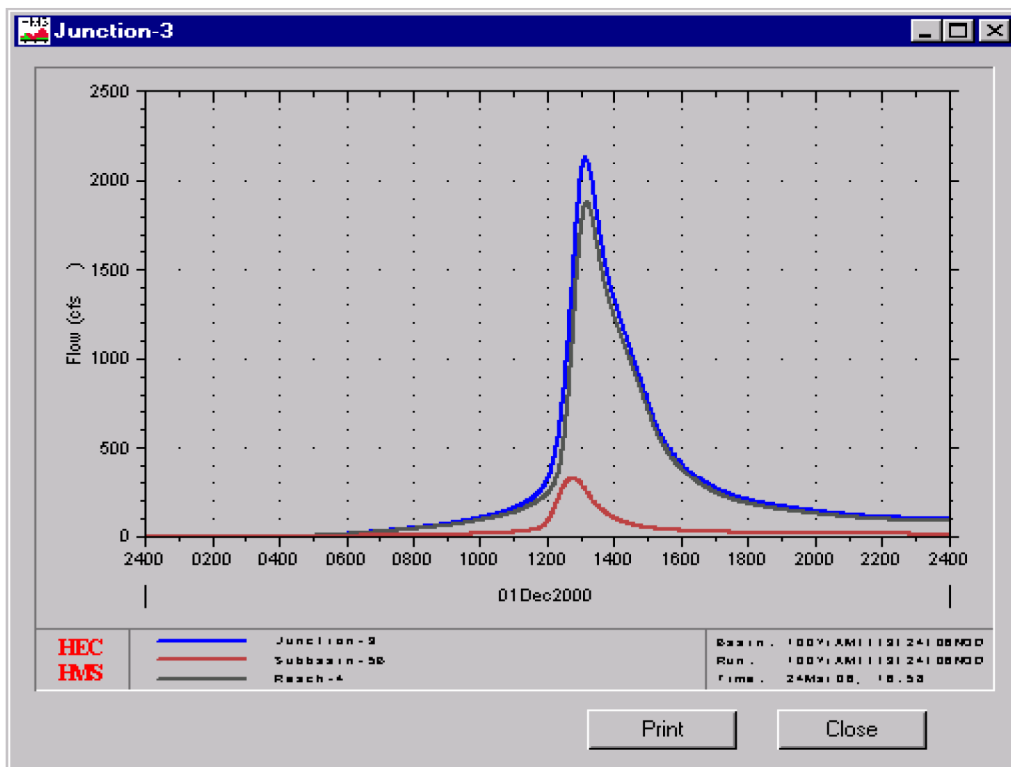
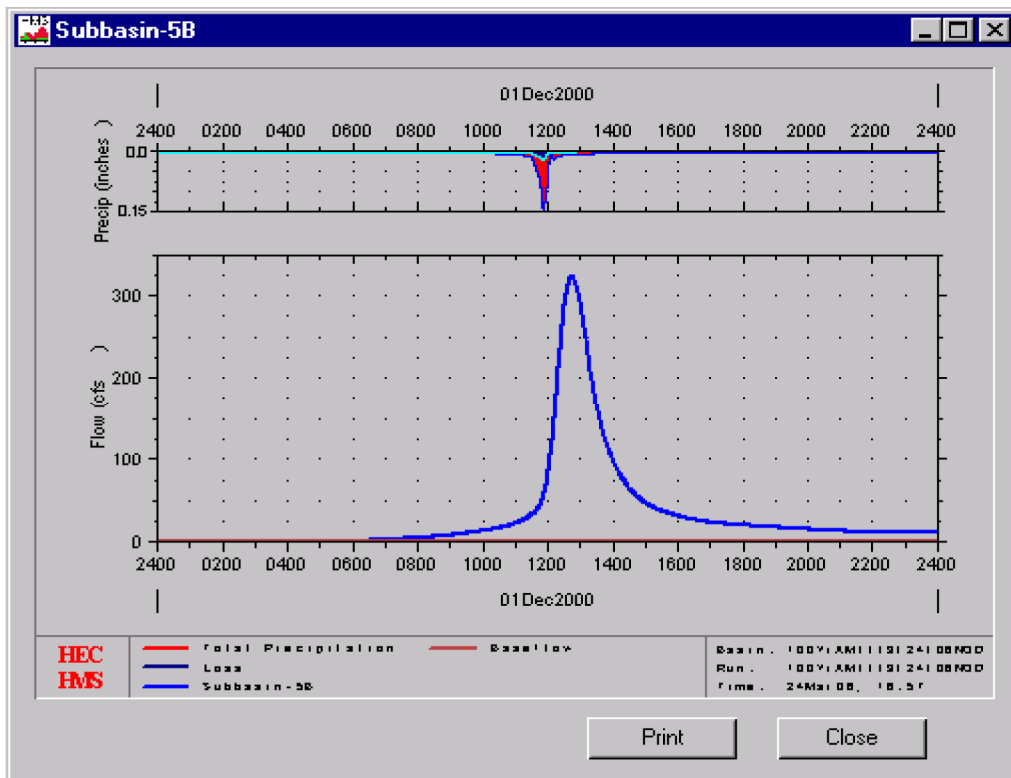
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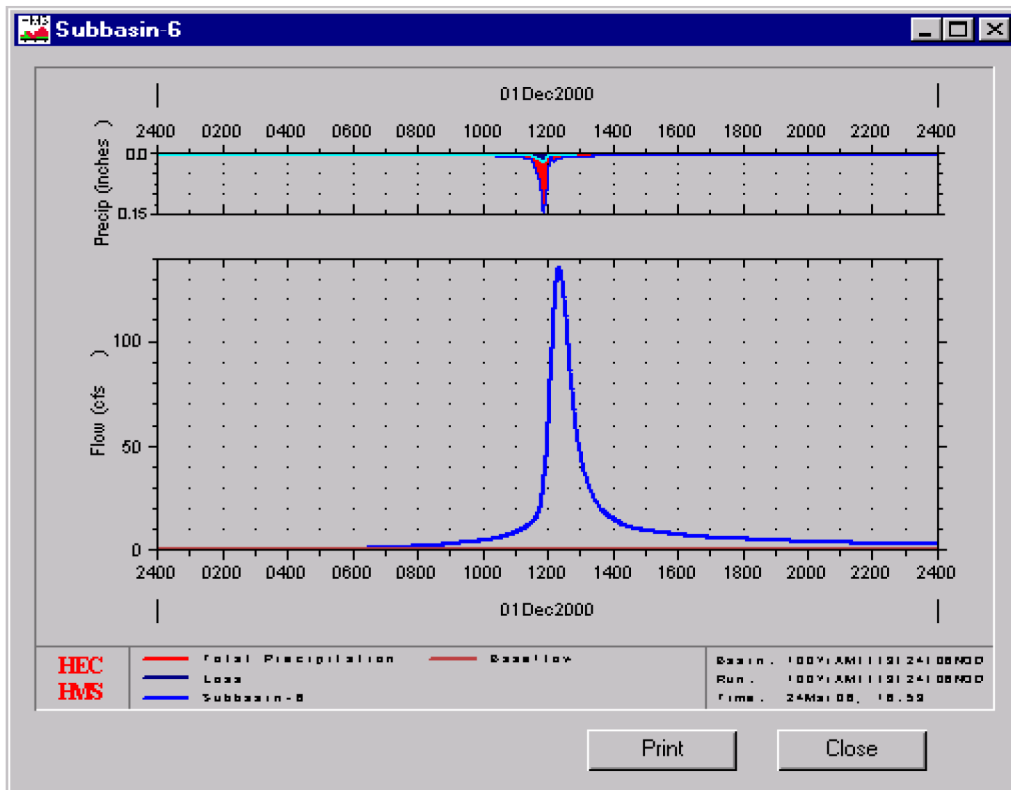
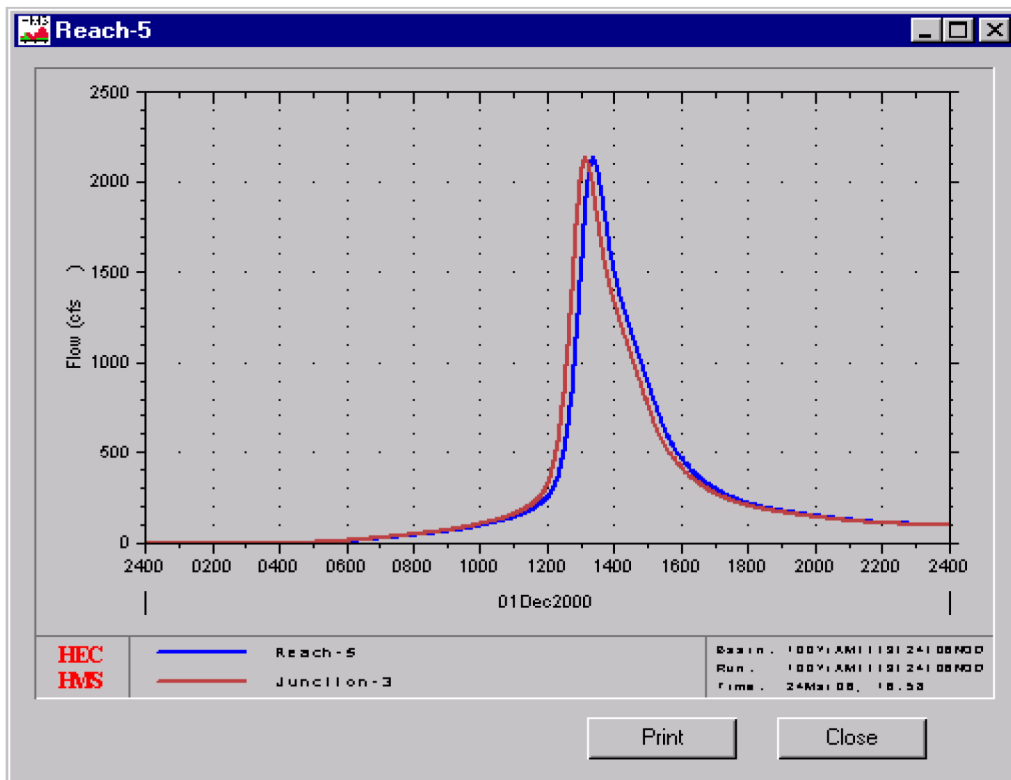
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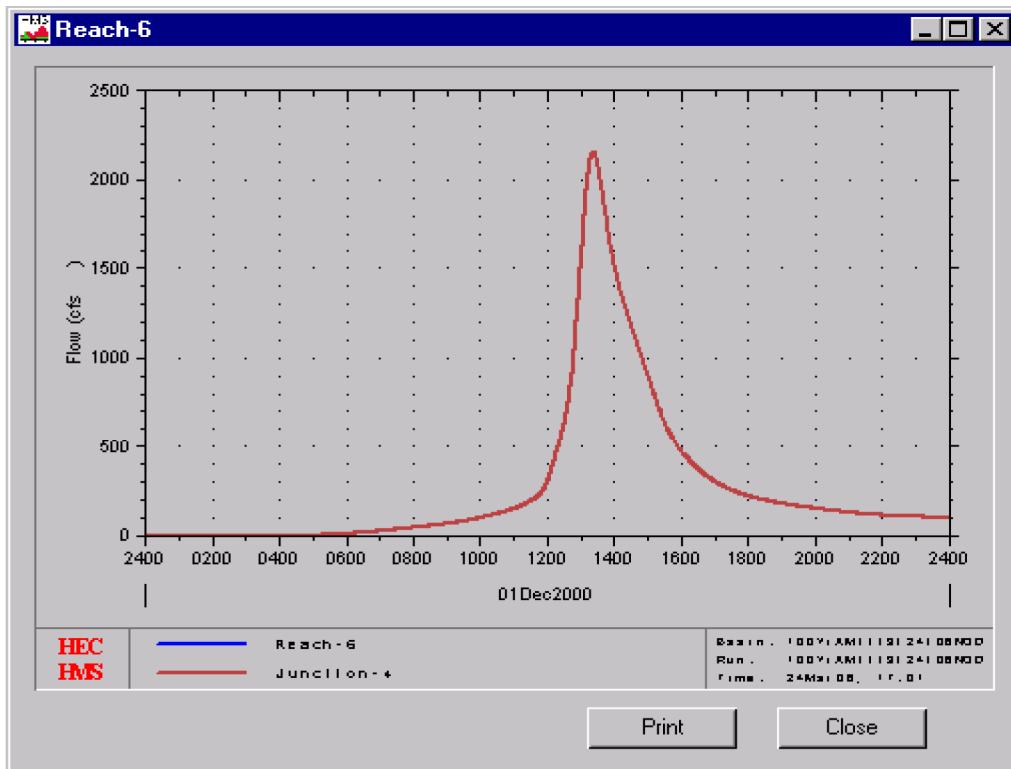
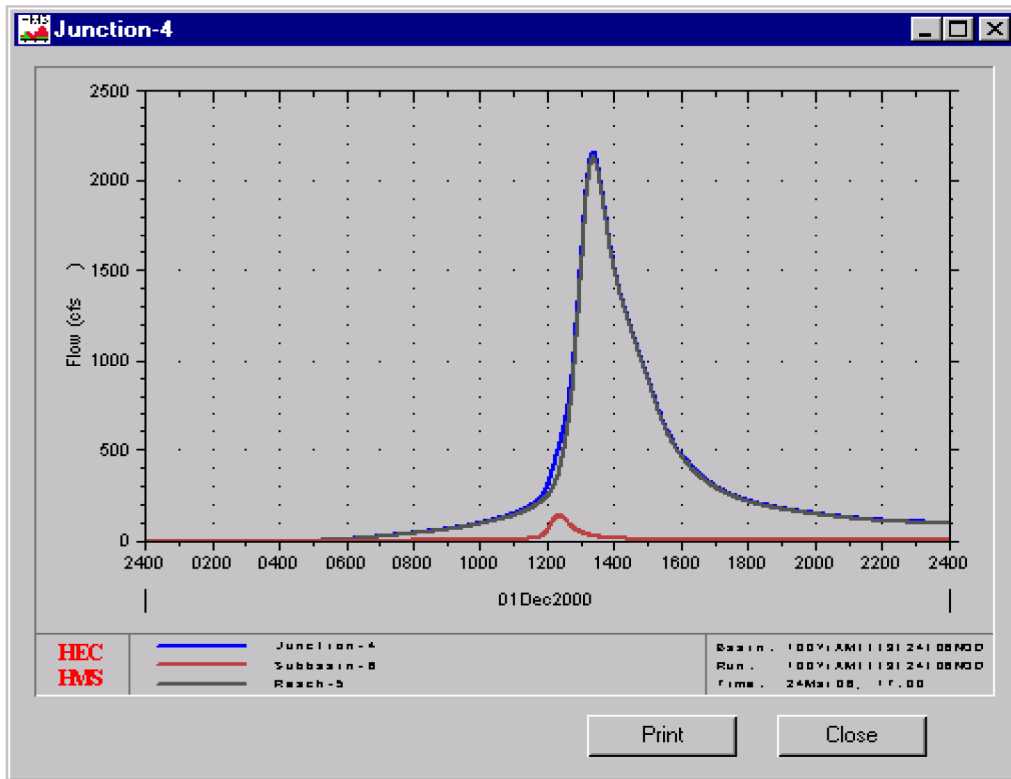
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



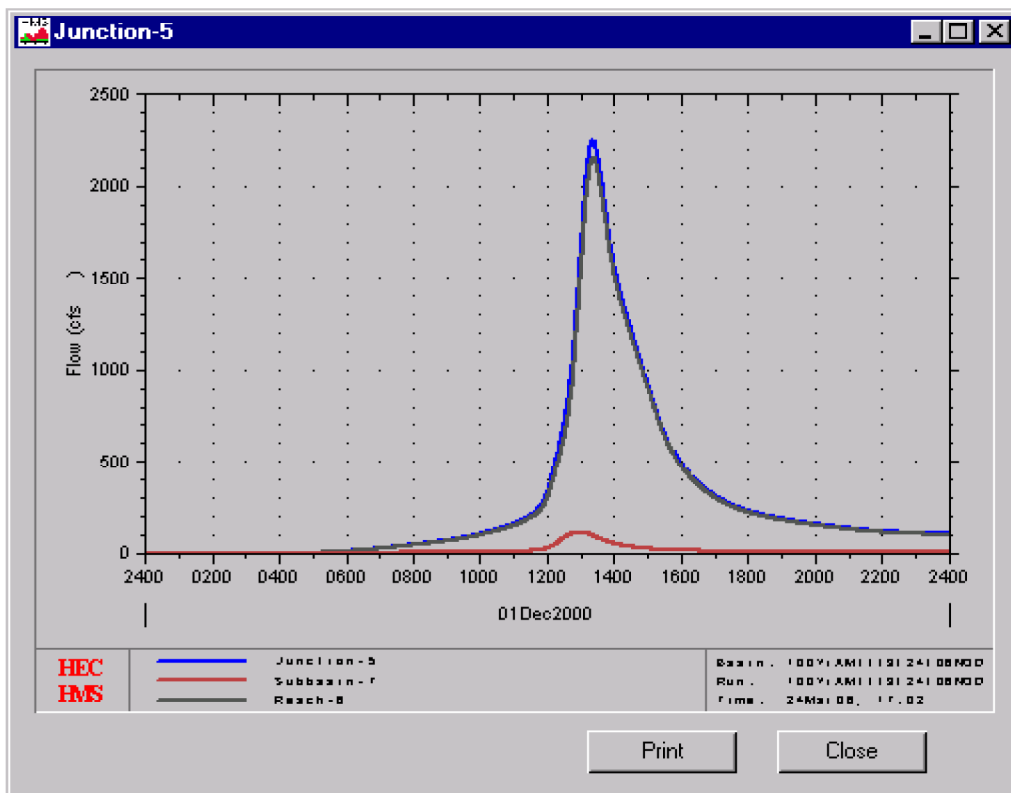
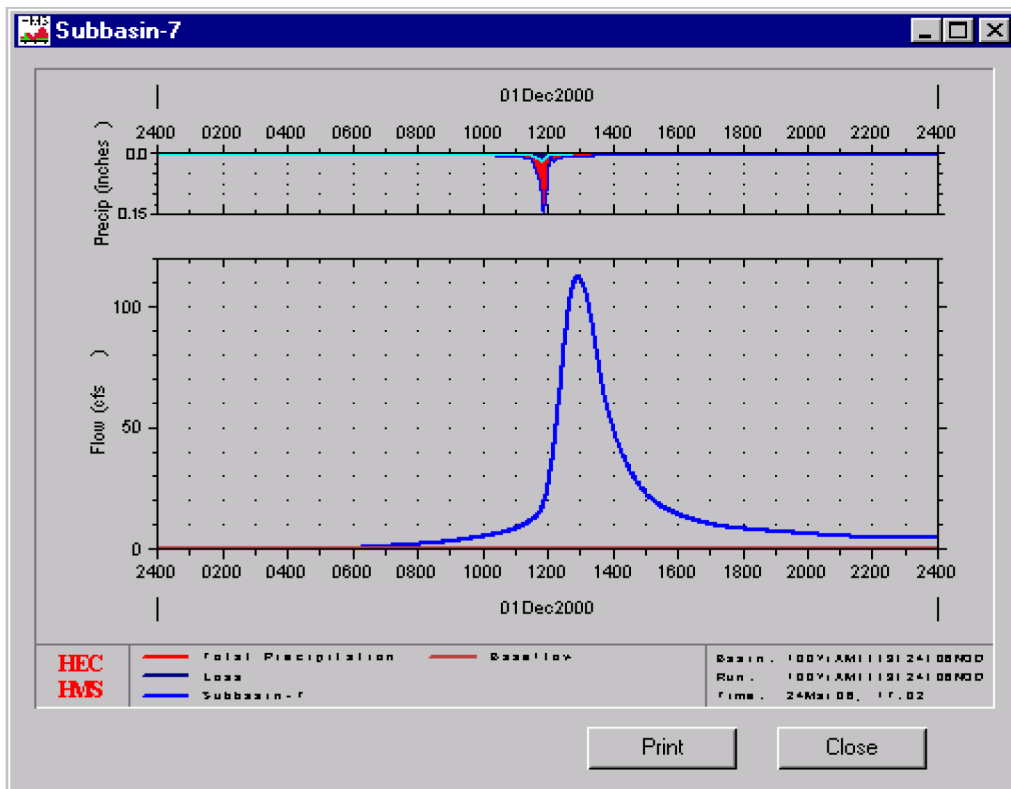
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



## **APPENDIX R**

### **HEC-RAS MODEL FOR THE CALCULATION OF THE 100-YEAR WATER SURFACE PROFILE, ANTECEDENT MOISTURE CONDITION III**



HEC-RAS Plan: AM111 100 River: Ditch A Reach: 5

Reach	River Sta	Q Total (cfs)	Min Chl El (ft)	W.S. Elev (ft)	Cut W.S. (ft)	Max Chl Dpth (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3478.59	0.003093	2.49	345.62	665.95	268.80	320.33	0.44
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3478.59	0.003093	2.49	345.62	665.95	268.80	320.33	0.44
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3478.59	0.003093	2.49	345.62	665.95	268.80	320.33	0.44
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3478.59	0.003093	2.49	345.62	665.95	268.80	320.33	0.44
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3470.97	0.013657	5.36	423.67	560.80	123.92	137.13	0.93
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3470.97	0.013657	5.36	423.67	560.80	123.92	137.13	0.93
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3470.97	0.013657	5.36	423.67	560.80	123.92	137.13	0.93
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3470.97	0.013657	5.36	423.67	560.80	123.92	137.13	0.93
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3466.26	0.010093	4.57	467.44	606.74	141.28	139.30	0.80
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3466.26	0.010093	4.57	467.44	606.74	141.28	139.30	0.80
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3466.26	0.010093	4.57	467.44	606.74	141.28	139.30	0.80
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3466.26	0.010093	4.57	467.44	606.74	141.28	139.30	0.80
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3457.30	0.019840	3.87	389.03	738.96	166.72	349.93	0.99
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3457.30	0.019840	3.87	389.03	738.96	166.72	349.93	0.99
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3457.30	0.019840	3.87	389.03	738.96	166.72	349.93	0.99
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3457.30	0.019840	3.87	389.03	738.96	166.72	349.93	0.99
5	9690	817.00	3450.00	3451.66	3451.28	1.66	3451.78	0.004774	2.78	423.62	771.66	293.93	348.04	0.53
5	9690	817.00	3450.00	3451.66	3451.28	1.66	3451.78	0.004774	2.78	423.62	771.66	293.93	348.04	0.53
5	9690	817.00	3450.00	3451.66	3451.28	1.66	3451.78	0.004774	2.78	423.62	771.66	293.93	348.04	0.53
5	9690	817.00	3450.00	3451.66	3451.28	1.66	3451.78	0.004774	2.78	423.62	771.66	293.93	348.04	0.53
5	9009	817.00	3445.00	3446.62	3446.50	1.62	3446.87	0.012038	4.03	440.24	716.03	202.92	275.79	0.83
5	9009	817.00	3445.00	3446.62	3446.50	1.62	3446.87	0.012038	4.03	440.24	716.03	202.92	275.79	0.83
5	9009	817.00	3445.00	3446.62	3446.50	1.62	3446.87	0.012038	4.03	440.24	716.03	202.92	275.79	0.83
5	9009	817.00	3445.00	3446.62	3446.50	1.62	3446.87	0.012038	4.03	440.24	716.03	202.92	275.79	0.83
5	8130	817.00	3440.00	3441.75	3441.25	1.75	3441.84	0.003282	2.40	448.26	828.47	340.75	380.21	0.45
5	8130	817.00	3440.00	3441.75	3441.25	1.75	3441.84	0.003282	2.40	448.26	828.47	340.75	380.21	0.45
5	8130	817.00	3440.00	3441.75	3441.25	1.75	3441.84	0.003282	2.40	448.26	828.47	340.75	380.21	0.45
5	8130	817.00	3440.00	3441.75	3441.25	1.75	3441.84	0.003282	2.40	448.26	828.47	340.75	380.21	0.45
5	7717	817.00	3437.80	3438.79	3438.79	0.99	3439.10	0.019275	4.47	323.60	626.42	182.90	302.82	1.01
5	7717	817.00	3437.80	3438.79	3438.79	0.99	3439.10	0.019275	4.47	323.60	626.42	182.90	302.82	1.01
5	7717	817.00	3437.80	3438.79	3438.79	0.99	3439.10	0.019275	4.47	323.60	626.42	182.90	302.82	1.01
5	7717	817.00	3437.80	3438.79	3438.79	0.99	3439.10	0.019275	4.47	323.60	626.42	182.90	302.82	1.01
5	7253	966.00	3435.00	3436.53	3435.99	1.53	3436.59	0.001746	1.92	396.63	932.31	511.45	535.68	0.33
5	7253	966.00	3435.00	3436.53	3435.99	1.53	3436.59	0.001746	1.92	396.63	932.31	511.45	535.68	0.33
5	7253	966.00	3435.00	3436.53	3435.99	1.53	3436.59	0.001746	1.92	396.63	932.31	511.45	535.68	0.33
5	7253	966.00	3435.00	3436.53	3435.99	1.53	3436.59	0.001746	1.92	396.63	932.31	511.45	535.68	0.33
5	6343	1873.00	3430.00	3430.86	3430.86	0.86	3431.22	0.018047	4.82	754.77	1299.87	388.25	545.10	1.01
5	6343	1873.00	3430.00	3430.86	3430.86	0.86	3431.22	0.018047	4.82	754.77	1299.87	388.25	545.10	1.01
5	6343	1873.00	3430.00	3430.86	3430.86	0.86	3431.22	0.018047	4.82	754.77	1299.87	388.25	545.10	1.01
5	6343	1873.00	3430.00	3430.86	3430.86	0.86	3431.22	0.018047	4.82	754.77	1299.87	388.25	545.10	1.01
5	5363	1873.00	3425.00	3426.53	3425.93	1.53	3426.60	0.001798	2.13	690.84	1562.86	906.30	892.02	0.35
5	5363	1873.00	3425.00	3426.53	3425.93	1.53	3426.60	0.001798	2.13	690.84	1562.86	906.30	892.02	0.35
5	5363	1873.00	3425.00	3426.53	3425.93	1.53	3426.60	0.001798	2.13	690.84	1562.86	906.30	892.02	0.35
5	5363	1873.00	3425.00	3426.53	3425.93	1.53	3426.60	0.001798	2.13	690.84	1562.86	906.30	892.02	0.35
5	4221	2128.00	3420.00	3421.19	3421.19	1.19	3421.58	0.017043	5.00	504.75	1086.07	428.69	581.33	0.99
5	4221	2128.00	3420.00	3421.19	3421.19	1.19	3421.58	0.017043	5.00	504.75	1086.07	428.69	581.33	0.99
5	4221	2128.00	3420.00	3421.19	3421.19	1.19	3421.58	0.017043	5.00	504.75	1086.07	428.69	581.33	0.99
5	4221	2128.00	3420.00	3421.19	3421.19	1.19	3421.58	0.017043	5.00	504.75	1086.07	428.69	581.33	0.99
5	3469	2128.00	3416.00	3417.37	3416.82	2.37	3417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36	0.38
5	3469	2128.00	3416.00	3417.37	3416.82	2.37	3417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36	0.38
5	3469	2128.00	3416.00	3417.37	3416.82	2.37	3417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36	0.38
5	3469	2128.00	3416.00	3417.37	3416.82	2.37	3417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36	0.38
5	2889	2128.00	3413.80	3414.67	3414.67	0.87	3415.03	0.018086	4.64	174.17	814.20	446.36	640.02	1.00
5	2889	2128.00	3413.80	3414.67	3414.67	0.87	3415.03	0.018086	4.64	174.17	814.20	446.36	640.02	1.00
5	2889	2128.00	3413.80	3414.67	3414.67	0.87	3415.03	0.018086	4.64	174.17	814.20	446.36	640.02	1.00
5	2889	2128.00	3413.80	3414.67	3414.67	0.87	3415.03	0.018086	4.64	174.17	814.20	446.36	640.02	1.00
5	2774	2128.00	3409.00	3414.16	3412.71	5.16	3414.21	0.000414	2.61	-409.98	647.53	1505.18	1057.47	0.21
5	2774	2128.00	3409.00	3414.16	3412.71	5.16	3414.21	0.000414	2.61	-409.98	647.53	1505.18	1057.47	0.21
5	2774	2128.00	3409.00	3414.16	3412.71	5.16	3414.21	0.000414	2.61	-409.98	647.53	1505.18	1057.47	0.21
5	2774	2128.00	3409.00	3414.16	3412.71	5.16	3414.21	0.000414	2.61	-409.98	647.53	1505.18	1057.47	0.21
5	2773		Culvert											
5	2734	2128.00	3408.90	3412.71	3412.71	3.81	3412.94	0.002018	4.57	83.74	515.65	665.51	431.91	0.44
5	2734	2128.00	3408.90	3412.71	3412.71	3.81	3412.94	0.002018	4.57	83.74	515.65	665.51	431.91	0.44
5	2734	2128.00	3408.90	3412.74	3412.71	3.84	3412.96	0.001906	4.47	81.87	517.09	680.86	435.22	0.43
5	2734	2128.00	3408.90	3412.74	3412.71	3.84	3412.96	0.001906	4.47	81.87	517.09	680.86	435.22	0.43
5	1888	2155.00	3408.00	3409.38	3408.89	1.38	3409.48	0.003403	2.59	178.82	1027.41	831.55	848.59	0.46
5	1888	2155.00	3408.00	3409.05	3408.89	1.05	3409.27	0.008907	3.78	215.37	946.36	570.28	730.99	0.75



HEC-RAS Plan: AMIII 100 River: Ditch A Reach: 5 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Chl W.S. (ft)	Max Chl Dpth (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Sta W.S. Lr (ft)	Sta W.S. Rgt (ft)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
5	1888	2155.00	3408.00	3408.89	3408.89	0.89	3409.23	0.018312	4.71	233.07	907.13	457.76	674.05	1.01
5	1888	2155.00	3408.00	3408.89	3408.89	0.89	3409.23	0.018312	4.71	233.07	907.13	457.76	674.05	1.01
5	1060	2248.00	3402.70	3404.50	3404.34	1.80	3404.81	0.010602	4.48	614.45	1141.44	501.30	526.98	0.81
5	1060	2248.00	3402.70	3405.00	3404.34	2.30	3405.12	0.003053	2.81	540.97	1206.00	799.30	665.03	0.45
5	1060	2248.00	3402.70	3406.00	3404.34	3.30	3406.63	0.000503	1.33	394.00	1523.00	1696.32	1128.00	0.19
5	1060	2248.00	3402.70	3407.00	3404.34	4.30	3407.61	0.000090	0.79	247.00	1523.00	2898.82	1276.00	0.09

HECRASAMIII100

HEC-RAS Version 3.0.1 Mar 2001  
 U.S. Army Corp of Engineers  
 Hydrologic Engineering Center  
 609 Second Street, Suite D  
 Davis, California 95616-4687  
 (916) 756-1104

```

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

PROJECT DATA

Project Title: WCS  
 Project File : FloodPlain.prj  
 Run Date and Time: 3/24/06 4:04:35 PM

Project in English units

PLAN DATA

Plan Title: Plan 36  
 Plan File : D:\program files\WCS\FloodPlain.p36  
  
 Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04  
  
 Flow Title : 100YrAMIII3-24-06ManyNOD  
 Flow File : D:\program files\WCS\FloodPlain.f28

Plan Summary Information:

Number of: Cross Sections =	18	Multitple Openings =	0
Culverts =	1	Inline Weirs =	0
Bridges =	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: Mixed Flow

FLOW DATA

Flow Title: 100YrAMIII3-24-06ManyNOD  
 Flow File : D:\program files\WCS\FloodPlain.f28

HECRASAMIIII100

Flow Data (cfs)

River	Reach	RS	100 Yr.-WS3404.5	100 Yr.-WS3405	100 Yr.-WS3406
100 Yr.-WS3407					
Ditch A	5	12674	645	645	645
645					
Ditch A	5	9690	817	817	817
817					
Ditch A	5	7253	966	966	966
966					
Ditch A	5	6343	1873	1873	1873
1873					
Ditch A	5	4221	2128	2128	2128
2128					
Ditch A	5	1888	2155	2155	2155
2155					
Ditch A	5	1060	2248	2248	2248
2248					

Boundary Conditions

River stream	Reach	Profile	Upstream	Down
Ditch A	5	100 Yr.-WS3404.5	Critical	Known WS
= 3404.5				
Ditch A	5	100 Yr.-WS3405	Critical	Known
WS = 3405				
Ditch A	5	100 Yr.-WS3406	Critical	Known
WS = 3406				
Ditch A	5	100 Yr.-WS3407	Critical	Known
WS = 3407				

GEOMETRY DATA

Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 12674

INPUT

Description: Sta. 12674

Station Elevation Data		num=		6					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3482	380	3478	560	3477	635	3478	761	3480
964	3482								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	380	.033	635	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	380	635		1206	1337	1433	.1
							.3

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3478.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.49	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.08	Flow Area (sq ft)	8.45	252.76	7.60
E.G. Slope (ft/ft)	0.003093	Area (sq ft)	8.45	252.76	7.60
Q Total (cfs)	645.00	Flow (cfs)	8.29	629.24	7.46
Top Width (ft)	320.33	Top Width (ft)	34.38	255.00	30.95
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	0.98	2.49	0.98
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)	0.25	0.99	0.25
Conv. Total (cfs)	11597.5	Conv. (cfs)	149.1	11314.1	134.2
Length Wtd. (ft)	1336.52	Wetted Per. (ft)	34.39	255.01	30.95
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.05	0.19	0.05
Alpha	1.05	Stream Power (lb/ft s)	0.05	0.48	0.05
Frctn Loss (ft)	7.59	Cum Volume (acre-ft)	17.03	103.92	2.70
C & E Loss (ft)	0.03	Cum SA (acres)	20.48	111.06	4.66

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3478.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.49	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.08	Flow Area (sq ft)	8.45	252.76	7.60
E.G. Slope (ft/ft)	0.003093	Area (sq ft)	8.45	252.76	7.60
Q Total (cfs)	645.00	Flow (cfs)	8.29	629.24	7.46
Top Width (ft)	320.33	Top Width (ft)	34.38	255.00	30.95
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	0.98	2.49	0.98
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)	0.25	0.99	0.25
Conv. Total (cfs)	11597.5	Conv. (cfs)	149.1	11314.1	134.2

## HECRASAMIIII100

Length Wtd. (ft)	1336.52	Wetted Per. (ft)	34.39	255.01	30.95
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.05	0.19	0.05
Alpha	1.05	Stream Power (lb/ft s)	0.05	0.48	0.05
Frctn Loss (ft)	7.59	Cum Volume (acre-ft)	17.03	101.73	2.70
C & E Loss (ft)	0.03	Cum SA (acres)	20.48	110.11	4.66

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3478.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.49	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.08	Flow Area (sq ft)	8.45	252.76	7.60
E.G. Slope (ft/ft)	0.003093	Area (sq ft)	8.45	252.76	7.60
Q Total (cfs)	645.00	Flow (cfs)	8.29	629.24	7.46
Top Width (ft)	320.33	Top Width (ft)	34.38	255.00	30.95
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	0.98	2.49	0.98
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)	0.25	0.99	0.25
Conv. Total (cfs)	11597.5	Conv. (cfs)	149.1	11314.1	134.2
Length Wtd. (ft)	1336.52	Wetted Per. (ft)	34.39	255.01	30.95
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.05	0.19	0.05
Alpha	1.05	Stream Power (lb/ft s)	0.05	0.48	0.05
Frctn Loss (ft)	7.59	Cum Volume (acre-ft)	17.11	108.13	2.74
C & E Loss (ft)	0.03	Cum SA (acres)	20.50	113.43	4.68

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

HECRASAMIIII100

E.G. Elev (ft)	3478.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.49	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.08	Flow Area (sq ft)	8.45	252.76	7.60
E.G. Slope (ft/ft)	0.003093	Area (sq ft)	8.45	252.76	7.60
Q Total (cfs)	645.00	Flow (cfs)	8.29	629.24	7.46
Top Width (ft)	320.33	Top Width (ft)	34.38	255.00	30.95
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	0.98	2.49	0.98
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)	0.25	0.99	0.25
Conv. Total (cfs)	11597.5	Conv. (cfs)	149.1	11314.1	134.2
Length Wtd. (ft)	1336.52	Wetted Per. (ft)	34.39	255.01	30.95
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.05	0.19	0.05
Alpha	1.05	Stream Power (lb/ft s)	0.05	0.48	0.05
Frctn Loss (ft)	7.59	Cum Volume (acre-ft)	17.37	118.86	2.74
C & E Loss (ft)	0.03	Cum SA (acres)	21.02	113.43	4.68

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 11337

INPUT

Description: Sta. 11337

Station Elevation Data		num=		8					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3477	315	3474	392	3472	435	3470	499	3469
550	3470	591	3472	694	3474				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	435	.033	550	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	435	550		545 400	332	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3470.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.033	0.033	0.033

## HECRASAMIIII100

W.S. Elev (ft)	3470.53	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.50	Flow Area (sq ft)	2.98	118.09	2.85
E.G. Slope (ft/ft)	0.013657	Area (sq ft)	2.98	118.09	2.85
Q Total (cfs)	645.00	Flow (cfs)	6.45	632.40	6.15
Top Width (ft)	137.13	Top Width (ft)	11.33	115.00	10.80
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	2.16	5.36	2.16
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.26	1.03	0.26
Conv. Total (cfs)	5519.3	Conv. (cfs)	55.2	5411.5	52.6
Length Wtd. (ft)	400.40	Wetted Per. (ft)	11.34	115.02	10.81
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.22	0.88	0.22
Alpha	1.04	Stream Power (lb/ft s)	0.48	4.69	0.48
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	16.87	98.23	2.53
C & E Loss (ft)	0.03	Cum SA (acres)	19.85	105.38	3.98

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3470.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.53	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.50	Flow Area (sq ft)	2.98	118.09	2.85
E.G. Slope (ft/ft)	0.013657	Area (sq ft)	2.98	118.09	2.85
Q Total (cfs)	645.00	Flow (cfs)	6.45	632.40	6.15
Top Width (ft)	137.13	Top Width (ft)	11.33	115.00	10.80
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	2.16	5.36	2.16
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.26	1.03	0.26
Conv. Total (cfs)	5519.3	Conv. (cfs)	55.2	5411.5	52.6
Length Wtd. (ft)	400.40	Wetted Per. (ft)	11.34	115.02	10.81
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.22	0.88	0.22
Alpha	1.04	Stream Power (lb/ft s)	0.48	4.69	0.48
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	16.87	96.04	2.53

		HECRASAMIII100			
C & E Loss (ft)	0.03	Cum SA (acres)	19.85	104.43	3.98

Warning: The energy loss was greater than 1.0 ft (0.3 m) . between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3470.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.53	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.50	Flow Area (sq ft)	2.98	118.09	2.85
E.G. Slope (ft/ft)	0.013657	Area (sq ft)	2.98	118.09	2.85
Q Total (cfs)	645.00	Flow (cfs)	6.45	632.40	6.15
Top Width (ft)	137.13	Top Width (ft)	11.33	115.00	10.80
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	2.16	5.36	2.16
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.26	1.03	0.26
Conv. Total (cfs)	5519.3	Conv. (cfs)	55.2	5411.5	52.6
Length Wtd. (ft)	400.40	Wetted Per. (ft)	11.34	115.02	10.81
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.22	0.88	0.22
Alpha	1.04	Stream Power (lb/ft s)	0.48	4.69	0.48
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	16.96	102.43	2.57
C & E Loss (ft)	0.03	Cum SA (acres)	19.87	107.75	3.99

Warning: The energy loss was greater than 1.0 ft (0.3 m) . between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3470.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.53	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.50	Flow Area (sq ft)	2.98	118.09	2.85
E.G. Slope (ft/ft)	0.013657	Area (sq ft)	2.98	118.09	2.85
Q Total (cfs)	645.00	Flow (cfs)	6.45	632.40	6.15
Top Width (ft)	137.13	Top Width (ft)	11.33	115.00	10.80



## HECRASAMIII100

Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	2.16	5.36	2.16
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.26	1.03	0.26
Conv. Total (cfs)	5519.3	Conv. (cfs)	55.2	5411.5	52.6
Length Wtd. (ft)	400.40	Wetted Per. (ft)	11.34	115.02	10.81
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.22	0.88	0.22
Alpha	1.04	Stream Power (lb/ft s)	0.48	4.69	0.48
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	17.21	113.16	2.57
C & E Loss (ft)	0.03	Cum SA (acres)	20.38	107.75	3.99

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 10937

## INPUT

Description: Sta. 10937

Station Elevation Data		num=	9						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3470	351	3468	428	3467	465	3466	536	3464
543	3464	609	3466	683	3468	811	3472		

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	428	.033	609	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
428	609	729 649	445	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3466.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.93	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.75	Flow Area (sq ft)		141.28	
E.G. Slope (ft/ft)	0.010093	Area (sq ft)		141.28	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	139.30	Top Width (ft)		139.30	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		1.01	
Conv. Total (cfs)	6420.1	Conv. (cfs)		6420.1	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		139.36	

## HECRASAMIII100

Min Ch El (ft)	3464.00	Shear (lb/sq ft)	0.64
Alpha	1.00	Stream Power (lb/ft s)	2.92
Frctn Loss (ft)	8.93	Cum Volume (acre-ft)	16.85 97.04 2.52
C & E Loss (ft)	0.03	Cum SA (acres)	19.78 104.21 3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3466.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.93	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.75	Flow Area (sq ft)		141.28	
E.G. Slope (ft/ft)	0.010093	Area (sq ft)		141.28	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	139.30	Top Width (ft)		139.30	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		1.01	
Conv. Total (cfs)	6420.1	Conv. (cfs)		6420.1	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		139.36	
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)		2.92	
Frctn Loss (ft)	8.93	Cum Volume (acre-ft)	16.85	94.85	2.52
C & E Loss (ft)	0.03	Cum SA (acres)	19.78	103.27	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

		HECRASAMIIII100			
E.G. Elev (ft)	3466.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.93	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.75	Flow Area (sq ft)		141.28	
E.G. Slope (ft/ft)	0.010093	Area (sq ft)		141.28	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	139.30	Top Width (ft)		139.30	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		1.01	
Conv. Total (cfs)	6420.1	Conv. (cfs)		6420.1	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		139.36	
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)		2.92	
Frctn Loss (ft)	8.93	Cum Volume (acre-ft)	16.94	101.24	2.56
C & E Loss (ft)	0.03	Cum SA (acres)	19.80	106.58	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3466.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.93	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.75	Flow Area (sq ft)		141.28	
E.G. Slope (ft/ft)	0.010093	Area (sq ft)		141.28	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	139.30	Top Width (ft)		139.30	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		1.01	
Conv. Total (cfs)	6420.1	Conv. (cfs)		6420.1	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		139.36	

Min Ch El (ft)	3464.00	HECRASAMIIII100 Shear (lb/sq ft)	0.64
Alpha	1.00	Stream Power (lb/ft s)	2.92
Frctn Loss (ft)	8.93	Cum Volume (acre-ft)	17.19 111.97 2.56
C & E Loss (ft)	0.03	Cum SA (acres)	20.31 106.58 3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 10288

INPUT  
 Description: Sta. 10288  
 Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3464	177	3462	238	3460	298	3458	493	3456
519	3456	662	3457	778	3457.1	857	3458	903	3460
947	3462	989	3464						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	298	.033	857	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	298	857		552 598	633	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3457.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.07	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.07	Flow Area (sq ft)		166.72	
E.G. Slope (ft/ft)	0.019840	Area (sq ft)		166.72	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	349.93	Top Width (ft)		349.93	
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87	
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)		0.48	
Conv. Total (cfs)	4579.2	Conv. (cfs)		4579.2	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		349.94	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		2.28	

		HECRASAMIII100			
Frctn Loss (ft)	4.75	Cum Volume (acre-ft)	16.85	94.74	2.52
C & E Loss (ft)	0.03	Cum SA (acres)	19.78	100.57	3.93

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3457.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.07	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.07	Flow Area (sq ft)		166.72	
E.G. Slope (ft/ft)	0.019840	Area (sq ft)		166.72	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	349.93	Top Width (ft)		349.93	
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87	
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)		0.48	
Conv. Total (cfs)	4579.2	Conv. (cfs)		4579.2	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		349.94	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		2.28	
Frctn Loss (ft)	4.75	Cum Volume (acre-ft)	16.85	92.55	2.52
C & E Loss (ft)	0.03	Cum SA (acres)	19.78	99.62	3.93

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less

## HECRASAMIII100

than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3457.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.07	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.07	Flow Area (sq ft)		166.72	
E.G. Slope (ft/ft)	0.019840	Area (sq ft)		166.72	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	349.93	Top Width (ft)		349.93	
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87	
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)		0.48	
Conv. Total (cfs)	4579.2	Conv. (cfs)		4579.2	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		349.94	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		2.28	
Frctn Loss (ft)	4.75	Cum Volume (acre-ft)	16.94	98.95	2.56
C & E Loss (ft)	0.03	Cum SA (acres)	19.80	102.94	3.95

Warning: The energy equation could not be balanced within the specified number of iterations. The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3457.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.07	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.07	Flow Area (sq ft)		166.72	
E.G. Slope (ft/ft)	0.019840	Area (sq ft)		166.72	
Q Total (cfs)	645.00	Flow (cfs)		645.00	
Top Width (ft)	349.93	Top Width (ft)		349.93	
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87	
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)		0.48	
Conv. Total (cfs)	4579.2	Conv. (cfs)		4579.2	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		349.94	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		2.28	
Frctn Loss (ft)	4.75	Cum Volume (acre-ft)	17.19	109.68	2.56
C & E Loss (ft)	0.03	Cum SA (acres)	20.31	102.94	3.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION      RIVER: Ditch A  
REACH: 5      RS: 9690

## INPUT

Description: Sta. 9690

Station Elevation Data		num=	8						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3454.5	202	3454	381	3452	632	3450	638	3450
799	3452	897	3454	1010	3458				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val

## HECRASAMIII100

100 .033 381 .033 799 .033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	381	799		639 681	658	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3451.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.66	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.28	Flow Area (sq ft)		293.93	
E.G. Slope (ft/ft)	0.004774	Area (sq ft)		293.93	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	348.04	Top Width (ft)		348.04	
Vel Total (ft/s)	2.78	Avg. Vel. (ft/s)		2.78	
Max Chl Dpth (ft)	1.66	Hydr. Depth (ft)		0.84	
Conv. Total (cfs)	11824.3	Conv. (cfs)		11824.3	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		348.06	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	16.85	91.58	2.52
C & E Loss (ft)	0.01	Cum SA (acres)	19.78	95.78	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3451.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.66	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.28	Flow Area (sq ft)		293.93	
E.G. Slope (ft/ft)	0.004774	Area (sq ft)		293.93	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	348.04	Top Width (ft)		348.04	



		HECRASAMIII100			
Vel Total (ft/s)	2.78	Avg. Vel. (ft/s)	2.78		
Max Chl Dpth (ft)	1.66	Hydr. Depth (ft)	0.84		
Conv. Total (cfs)	11824.3	Conv. (cfs)	11824.3		
Length Wtd. (ft)	681.00	Wetted Per. (ft)	348.06		
Min Ch El (ft)	3450.00	Shear (lb/sq ft)	0.25		
Alpha	1.00	Stream Power (lb/ft s)	0.70		
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	16.85	89.39	2.52
C & E Loss (ft)	0.01	Cum SA (acres)	19.78	94.83	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

# CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3451.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.033		
W.S. Elev (ft)	3451.66	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.28	Flow Area (sq ft)	293.93		
E.G. Slope (ft/ft)	0.004774	Area (sq ft)	293.93		
Q Total (cfs)	817.00	Flow (cfs)	817.00		
Top Width (ft)	348.04	Top Width (ft)	348.04		
Vel Total (ft/s)	2.78	Avg. Vel. (ft/s)	2.78		
Max Chl Dpth (ft)	1.66	Hydr. Depth (ft)	0.84		
Conv. Total (cfs)	11824.3	Conv. (cfs)	11824.3		
Length Wtd. (ft)	681.00	Wetted Per. (ft)	348.06		
Min Ch El (ft)	3450.00	Shear (lb/sq ft)	0.25		
Alpha	1.00	Stream Power (lb/ft s)	0.70		
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	16.94	95.79	2.56
C & E Loss (ft)	0.01	Cum SA (acres)	19.80	98.15	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

## HECRASAMIII100

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3451.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.66	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.28	Flow Area (sq ft)		293.93	
E.G. Slope (ft/ft)	0.004774	Area (sq ft)		293.93	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	348.04	Top Width (ft)		348.04	
Vel Total (ft/s)	2.78	Avg. Vel. (ft/s)		2.78	
Max Chl Dpth (ft)	1.66	Hydr. Depth (ft)		0.84	
Conv. Total (cfs)	11824.3	Conv. (cfs)		11824.3	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		348.06	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	17.19	106.52	2.56
C & E Loss (ft)	0.01	Cum SA (acres)	20.31	98.15	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 9009

## INPUT

Description: Sta. 9009

Station Elevation Data				num=	9				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3452	203	3450	325	3448	492	3446	596	3445
637	3446	892	3448	1007	3450	1124	3452		

Manning's n Values				num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.033	325	.033	892	.033				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	325	892		898	879	794	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

## HECRASAMIII100

E.G. Elev (ft)	3446.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.62	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.50	Flow Area (sq ft)		202.92	
E.G. Slope (ft/ft)	0.012038	Area (sq ft)		202.92	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	275.79	Top Width (ft)		275.79	
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)		4.03	
Max Chl Dpth (ft)	1.62	Hydr. Depth (ft)		0.74	
Conv. Total (cfs)	7446.3	Conv. (cfs)		7446.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		275.82	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		2.23	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	16.85	87.70	2.52
C & E Loss (ft)	0.05	Cum SA (acres)	19.78	90.90	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3446.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.62	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.50	Flow Area (sq ft)		202.92	
E.G. Slope (ft/ft)	0.012038	Area (sq ft)		202.92	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	275.79	Top Width (ft)		275.79	
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)		4.03	
Max Chl Dpth (ft)	1.62	Hydr. Depth (ft)		0.74	
Conv. Total (cfs)	7446.3	Conv. (cfs)		7446.3	

		HECRASAMIIII100			
Length Wtd. (ft)	879.00	Wetted Per. (ft)		275.82	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		2.23	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	16.85	85.51	2.52
C & E Loss (ft)	0.05	Cum SA (acres)	19.78	89.95	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3446.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.62	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.50	Flow Area (sq ft)		202.92	
E.G. Slope (ft/ft)	0.012038	Area (sq ft)		202.92	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	275.79	Top Width (ft)		275.79	
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)		4.03	
Max Chl Dpth (ft)	1.62	Hydr. Depth (ft)		0.74	
Conv. Total (cfs)	7446.3	Conv. (cfs)		7446.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		275.82	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		2.23	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	16.94	91.90	2.56
C & E Loss (ft)	0.05	Cum SA (acres)	19.80	93.27	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

## HECRASAMIIII100

E.G. Elev (ft)	3446.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.62	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.50	Flow Area (sq ft)		202.92	
E.G. Slope (ft/ft)	0.012038	Area (sq ft)		202.92	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	275.79	Top Width (ft)		275.79	
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)		4.03	
Max Chl Dpth (ft)	1.62	Hydr. Depth (ft)		0.74	
Conv. Total (cfs)	7446.3	Conv. (cfs)		7446.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		275.82	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		2.23	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	17.19	102.63	2.56
C & E Loss (ft)	0.05	Cum SA (acres)	20.31	93.27	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 8130

## INPUT

Description: Sta. 8130

Station Elevation Data		num=	8						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3448	303	3444	419	3442	654	3440	663	3440
852	3442	995	3444	1104	3446				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	419	.033	852	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
419	852	399	413	456	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3441.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.033	

		HECRASAMIII100			
W.S. Elev (ft)	3441.75	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.25	Flow Area (sq ft)		340.75	
E.G. Slope (ft/ft)	0.003282	Area (sq ft)		340.75	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	380.21	Top Width (ft)		380.21	
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)		2.40	
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)		0.90	
Conv. Total (cfs)	14261.8	Conv. (cfs)		14261.8	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		380.22	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	16.85	82.21	2.52
C & E Loss (ft)	0.02	Cum SA (acres)	19.78	84.28	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3441.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.75	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.25	Flow Area (sq ft)		340.75	
E.G. Slope (ft/ft)	0.003282	Area (sq ft)		340.75	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	380.21	Top Width (ft)		380.21	
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)		2.40	
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)		0.90	
Conv. Total (cfs)	14261.8	Conv. (cfs)		14261.8	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		380.22	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.44	

		HECRASAMIII100			
Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	16.85	80.02	2.52
C & E Loss (ft)	0.02	Cum SA (acres)	19.78	83.34	3.93

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3441.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.75	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.25	Flow Area (sq ft)		340.75	
E.G. Slope (ft/ft)	0.003282	Area (sq ft)		340.75	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	380.21	Top Width (ft)		380.21	
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)		2.40	
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)		0.90	
Conv. Total (cfs)	14261.8	Conv. (cfs)		14261.8	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		380.22	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	16.94	86.42	2.56
C & E Loss (ft)	0.02	Cum SA (acres)	19.80	86.65	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3441.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.75	Reach Len. (ft)	399.00	413.00	456.00

## HECRASAMIIII100

Crit W.S. (ft)	3441.25	Flow Area (sq ft)	340.75		
E.G. Slope (ft/ft)	0.003282	Area (sq ft)	340.75		
Q Total (cfs)	817.00	Flow (cfs)	817.00		
Top Width (ft)	380.21	Top Width (ft)	380.21		
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	2.40		
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)	0.90		
Conv. Total (cfs)	14261.8	Conv. (cfs)	14261.8		
Length Wtd. (ft)	413.00	Wetted Per. (ft)	380.22		
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.18		
Alpha	1.00	Stream Power (lb/ft s)	0.44		
Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	17.19	97.15	2.56
C & E Loss (ft)	0.02	Cum SA (acres)	20.31	86.65	3.95

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 7717

## INPUT

Description: Sta 7717

Station Elevation Data		num= 8							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	233	.033	747	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	233	747		444 464	510	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3439.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.79	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.79	Flow Area (sq ft)		182.90	
E.G. Slope (ft/ft)	0.019275	Area (sq ft)		182.90	



		HECRASAMIII100			
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	302.82	Top Width (ft)		302.82	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.60	
Conv. Total (cfs)	5884.7	Conv. (cfs)		5884.7	
Length Wtd. (ft)	464.08	Wetted Per. (ft)		302.83	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.25	
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	16.85	79.73	2.52
C & E Loss (ft)	0.08	Cum SA (acres)	19.78	81.05	3.93

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3439.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.79	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.79	Flow Area (sq ft)		182.90	
E.G. Slope (ft/ft)	0.019275	Area (sq ft)		182.90	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	302.82	Top Width (ft)		302.82	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.60	
Conv. Total (cfs)	5884.7	Conv. (cfs)		5884.7	
Length Wtd. (ft)	464.08	Wetted Per. (ft)		302.83	

Min Ch El (ft)	3437.80	HECRASAMIII100 Shear (lb/sq ft)	0.73
Alpha	1.00	Stream Power (lb/ft s)	3.25
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	16.85 77.54 2.52
C & E Loss (ft)	0.08	Cum SA (acres)	19.78 80.10 3.93

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3439.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.79	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.79	Flow Area (sq ft)		182.90	
E.G. Slope (ft/ft)	0.019275	Area (sq ft)		182.90	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	302.82	Top Width (ft)		302.82	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.60	
Conv. Total (cfs)	5884.7	Conv. (cfs)		5884.7	
Length Wtd. (ft)	464.08	Wetted Per. (ft)		302.83	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.25	
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	16.94	83.94	2.56
C & E Loss (ft)	0.08	Cum SA (acres)	19.80	83.41	3.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
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## HECRASAMIII100

The program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3439.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.79	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.79	Flow Area (sq ft)		182.90	
E.G. Slope (ft/ft)	0.019275	Area (sq ft)		182.90	
Q Total (cfs)	817.00	Flow (cfs)		817.00	
Top Width (ft)	302.82	Top Width (ft)		302.82	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)		0.60	
Conv. Total (cfs)	5884.7	Conv. (cfs)		5884.7	
Length Wtd. (ft)	464.08	Wetted Per. (ft)		302.83	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.25	
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	17.19	94.67	2.56
C & E Loss (ft)	0.08	Cum SA (acres)	20.31	83.41	3.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This i

## HECRASAMIIII100

ndicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 7253

## INPUT

Description: Sta. 7253

Station Elevation Data		num= 9		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3438	109	3438.7	321	3438	424	3436	668	3435
906	3436	1005	3438	1200	3440	1365	3442		

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	424	.033	906	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	424	906		756 910	980	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3436.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.53	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.99	Flow Area (sq ft)	7.27	497.18	6.99
E.G. Slope (ft/ft)	0.001746	Area (sq ft)	7.27	497.18	6.99
Q Total (cfs)	966.00	Flow (cfs)	5.66	954.91	5.44
Top Width (ft)	535.68	Top Width (ft)	27.37	482.00	26.31
Vel Total (ft/s)	1.89	Avg. Vel. (ft/s)	0.78	1.92	0.78
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.03	0.27
Conv. Total (cfs)	23119.9	Conv. (cfs)	135.4	22854.4	130.1
Length Wtd. (ft)	909.83	Wetted Per. (ft)	27.38	482.00	26.31
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.03	0.11	0.03
Alpha	1.02	Stream Power (lb/ft s)	0.02	0.22	0.02
Frctn Loss (ft)	5.34	Cum Volume (acre-ft)	16.81	76.11	2.48
C & E Loss (ft)	0.03	Cum SA (acres)	19.64	76.87	3.78

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

## HECRASAMIII100

E.G. Elev (ft)	3436.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.53	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.99	Flow Area (sq ft)	7.27	497.18	6.99
E.G. Slope (ft/ft)	0.001746	Area (sq ft)	7.27	497.18	6.99
Q Total (cfs)	966.00	Flow (cfs)	5.66	954.91	5.44
Top Width (ft)	535.68	Top Width (ft)	27.37	482.00	26.31
Vel Total (ft/s)	1.89	Avg. Vel. (ft/s)	0.78	1.92	0.78
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.03	0.27
Conv. Total (cfs)	23119.9	Conv. (cfs)	135.4	22854.4	130.1
Length Wtd. (ft)	909.83	Wetted Per. (ft)	27.38	482.00	26.31
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.03	0.11	0.03
Alpha	1.02	Stream Power (lb/ft s)	0.02	0.22	0.02
Frctn Loss (ft)	5.34	Cum Volume (acre-ft)	16.81	73.92	2.48
C & E Loss (ft)	0.03	Cum SA (acres)	19.64	75.92	3.78

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3436.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.53	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.99	Flow Area (sq ft)	7.27	497.18	6.99
E.G. Slope (ft/ft)	0.001746	Area (sq ft)	7.27	497.18	6.99
Q Total (cfs)	966.00	Flow (cfs)	5.66	954.91	5.44
Top Width (ft)	535.68	Top Width (ft)	27.37	482.00	26.31
Vel Total (ft/s)	1.89	Avg. Vel. (ft/s)	0.78	1.92	0.78
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.03	0.27
Conv. Total (cfs)	23119.9	Conv. (cfs)	135.4	22854.4	130.1

		HECRASAMIIII100			
Length Wtd. (ft)	909.83	Wetted Per. (ft)	27.38	482.00	26.31
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.03	0.11	0.03
Alpha	1.02	Stream Power (lb/ft s)	0.02	0.22	0.02
Frctn Loss (ft)	5.34	Cum Volume (acre-ft)	16.90	80.31	2.51
C & E Loss (ft)	0.03	Cum SA (acres)	19.66	79.23	3.80

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3436.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.53	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.99	Flow Area (sq ft)	7.27	497.18	6.99
E.G. Slope (ft/ft)	0.001746	Area (sq ft)	7.27	497.18	6.99
Q Total (cfs)	966.00	Flow (cfs)	5.66	954.91	5.44
Top Width (ft)	535.68	Top Width (ft)	27.37	482.00	26.31
Vel Total (ft/s)	1.89	Avg. Vel. (ft/s)	0.78	1.92	0.78
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.03	0.27
Conv. Total (cfs)	23119.9	Conv. (cfs)	135.4	22854.4	130.1
Length Wtd. (ft)	909.83	Wetted Per. (ft)	27.38	482.00	26.31
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.03	0.11	0.03
Alpha	1.02	Stream Power (lb/ft s)	0.02	0.22	0.02
Frctn Loss (ft)	5.34	Cum Volume (acre-ft)	17.16	91.04	2.51
C & E Loss (ft)	0.03	Cum SA (acres)	20.17	79.23	3.80

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION                      RIVER: Ditch A  
 REACH: 5                              RS: 6343

## HECRASAMIII100

## INPUT

Description: Sta. 6343

Station Elevation Data		num=		9					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3434	346	3433	663	3432	732	3431	860	3430.2
981	3430	1273	3430	1320	3431.5	1566	3432		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	663	.033	1320	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	663	1320		767 980	1051	.1	.3

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3431.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.86	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.86	Flow Area (sq ft)		388.25	
E.G. Slope (ft/ft)	0.018047	Area (sq ft)		388.25	
Q Total (cfs)	1873.00	Flow (cfs)		1873.00	
Top Width (ft)	545.10	Top Width (ft)		545.10	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82	
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)		0.71	
Conv. Total (cfs)	13942.4	Conv. (cfs)		13942.4	
Length Wtd. (ft)	979.81	Wetted Per. (ft)		545.12	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.80	
Alpha	1.00	Stream Power (lb/ft s)		3.87	
Frctn Loss (ft)	4.07	Cum Volume (acre-ft)	16.75	66.86	2.40
C & E Loss (ft)	0.09	Cum SA (acres)	19.40	66.14	3.48

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates



that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3431.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.86	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.86	Flow Area (sq ft)		388.25	
E.G. Slope (ft/ft)	0.018047	Area (sq ft)		388.25	
Q Total (cfs)	1873.00	Flow (cfs)		1873.00	
Top Width (ft)	545.10	Top Width (ft)		545.10	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82	
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)		0.71	
Conv. Total (cfs)	13942.4	Conv. (cfs)		13942.4	
Length Wtd. (ft)	979.81	Wetted Per. (ft)		545.12	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.80	
Alpha	1.00	Stream Power (lb/ft s)		3.87	
Frctn Loss (ft)	4.07	Cum Volume (acre-ft)	16.75	64.67	2.40
C & E Loss (ft)	0.09	Cum SA (acres)	19.40	65.19	3.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations. Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections. Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections. Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3431.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.86	Reach Len. (ft)	767.00	980.00	1051.00



		HECRASAMIIII100		
Crit W.S. (ft)	3430.86	Flow Area (sq ft)	388.25	
E.G. Slope (ft/ft)	0.018047	Area (sq ft)	388.25	
Q Total (cfs)	1873.00	Flow (cfs)	1873.00	
Top Width (ft)	545.10	Top Width (ft)	545.10	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)	4.82	
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)	0.71	
Conv. Total (cfs)	13942.4	Conv. (cfs)	13942.4	
Length Wtd. (ft)	979.81	Wetted Per. (ft)	545.12	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)	0.80	
Alpha	1.00	Stream Power (lb/ft s)	3.87	
Frctn Loss (ft)	4.07	Cum Volume (acre-ft)	16.84	71.06 2.44
C & E Loss (ft)	0.09	Cum SA (acres)	19.42	68.50 3.50

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

#### CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3431.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.86	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.86	Flow Area (sq ft)		388.25	
E.G. Slope (ft/ft)	0.018047	Area (sq ft)		388.25	
Q Total (cfs)	1873.00	Flow (cfs)		1873.00	
Top Width (ft)	545.10	Top Width (ft)		545.10	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82	
Max Chl Dpth (ft)	0.86	Hydr. Depth (ft)		0.71	

		HECRASAMIIII100			
Conv. Total (cfs)	13942.4	Conv. (cfs)		13942.4	
Length Wtd. (ft)	979.81	Wetted Per. (ft)		545.12	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.80	
Alpha	1.00	Stream Power (lb/ft s)		3.87	
Frctn Loss (ft)	4.07	Cum Volume (acre-ft)	17.09	81.79	2.44
C & E Loss (ft)	0.09	Cum SA (acres)	19.93	68.50	3.50

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 5363

#### INPUT

Description: Sta. 5363

Station Elevation Data		num=	10						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3432	282	3430	550	3428	742	3426	885	3425
1097	3425	1476	3426	1877	3428	1966	3428	2160	3430

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	742	.033	1476	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
742	1476	1199 1142	713	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3426.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.53	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.93	Flow Area (sq ft)	13.63	864.19	28.48
E.G. Slope (ft/ft)	0.001798	Area (sq ft)	13.63	864.19	28.48
Q Total (cfs)	1873.00	Flow (cfs)	10.78	1839.71	22.51
Top Width (ft)	892.02	Top Width (ft)	51.16	734.00	106.86

## HECRASAMIII100

Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	0.79	2.13	0.79
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.18	0.27
Conv. Total (cfs)	44172.8	Conv. (cfs)	254.2	43387.6	531.0
Length Wtd. (ft)	1139.81	Wetted Per. (ft)	51.17	734.00	106.86
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.03	0.13	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.02	0.28	0.02
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	16.63	52.77	2.06
C & E Loss (ft)	0.03	Cum SA (acres)	18.95	51.75	2.20

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3426.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.53	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.93	Flow Area (sq ft)	13.63	864.19	28.48
E.G. Slope (ft/ft)	0.001798	Area (sq ft)	13.63	864.19	28.48
Q Total (cfs)	1873.00	Flow (cfs)	10.78	1839.71	22.51
Top Width (ft)	892.02	Top Width (ft)	51.16	734.00	106.86
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	0.79	2.13	0.79
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.18	0.27
Conv. Total (cfs)	44172.8	Conv. (cfs)	254.2	43387.6	531.0
Length Wtd. (ft)	1139.81	Wetted Per. (ft)	51.17	734.00	106.86
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.03	0.13	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.02	0.28	0.02
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	16.63	50.58	2.06
C & E Loss (ft)	0.03	Cum SA (acres)	18.95	50.80	2.20

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

## HECRASAMIIII100

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Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3426.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.53	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.93	Flow Area (sq ft)	13.63	864.19	28.48
E.G. Slope (ft/ft)	0.001798	Area (sq ft)	13.63	864.19	28.48
Q Total (cfs)	1873.00	Flow (cfs)	10.78	1839.71	22.51
Top Width (ft)	892.02	Top Width (ft)	51.16	734.00	106.86
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	0.79	2.13	0.79
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.18	0.27
Conv. Total (cfs)	44172.8	Conv. (cfs)	254.2	43387.6	531.0
Length Wtd. (ft)	1139.81	Wetted Per. (ft)	51.17	734.00	106.86
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.03	0.13	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.02	0.28	0.02
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	16.72	56.98	2.09
C & E Loss (ft)	0.03	Cum SA (acres)	18.97	54.12	2.21

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3426.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.53	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.93	Flow Area (sq ft)	13.63	864.19	28.48
E.G. Slope (ft/ft)	0.001798	Area (sq ft)	13.63	864.19	28.48
Q Total (cfs)	1873.00	Flow (cfs)	10.78	1839.71	22.51
Top Width (ft)	892.02	Top Width (ft)	51.16	734.00	106.86

HECRASAMIII100					
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	0.79	2.13	0.79
Max Chl Dpth (ft)	1.53	Hydr. Depth (ft)	0.27	1.18	0.27
Conv. Total (cfs)	44172.8	Conv. (cfs)	254.2	43387.6	531.0
Length Wtd. (ft)	1139.81	Wetted Per. (ft)	51.17	734.00	106.86
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.03	0.13	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.02	0.28	0.02
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	16.97	67.71	2.09
C & E Loss (ft)	0.03	Cum SA (acres)	19.48	54.12	2.21

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 4221

#### INPUT

Description: Sta. 4221

Station Elevation Data				num=	12
Sta	Elev	Sta	Elev	Sta	Elev
100	3423	341	3422	544	3421
753	3420.2	829	3420	837	3420
1407	3423	1497	3424	1030	3421
				1320	3422

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	544	.033	1407	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	544	1407		749 732	843	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3421.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.19	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.19	Flow Area (sq ft)	3.79	424.90	
E.G. Slope (ft/ft)	0.017043	Area (sq ft)	3.79	424.90	
Q Total (cfs)	2128.00	Flow (cfs)	4.70	2123.30	
Top Width (ft)	581.33	Top Width (ft)	39.25	542.07	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	1.24	5.00	
Max Chl Dpth (ft)	1.19	Hydr. Depth (ft)	0.10	0.78	

		HECRASAMIIII100			
Conv. Total (cfs)	16300.7	Conv. (cfs)	36.0	16264.7	
Length Wtd. (ft)	736.95	Wetted Per. (ft)	39.25	542.08	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.10	0.83	
Alpha	1.01	Stream Power (lb/ft s)	0.13	4.17	
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	16.39	35.87	1.82
C & E Loss (ft)	0.09	Cum SA (acres)	17.71	35.02	1.32

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3421.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.19	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.19	Flow Area (sq ft)	3.79	424.90	
E.G. Slope (ft/ft)	0.017043	Area (sq ft)	3.79	424.90	
Q Total (cfs)	2128.00	Flow (cfs)	4.70	2123.30	
Top Width (ft)	581.33	Top Width (ft)	39.25	542.07	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	1.24	5.00	
Max Chl Dpth (ft)	1.19	Hydr. Depth (ft)	0.10	0.78	
Conv. Total (cfs)	16300.7	Conv. (cfs)	36.0	16264.7	
Length Wtd. (ft)	736.95	Wetted Per. (ft)	39.25	542.08	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.10	0.83	
Alpha	1.01	Stream Power (lb/ft s)	0.13	4.17	
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	16.39	33.68	1.82
C & E Loss (ft)	0.09	Cum SA (acres)	17.71	34.07	1.32

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

# CROSS SECTION OUTPUT      Profile #100 Yr.-WS3406

E.G. Elev (ft)	3421.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.19	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.19	Flow Area (sq ft)	3.79	424.90	
E.G. Slope (ft/ft)	0.017043	Area (sq ft)	3.79	424.90	
Q Total (cfs)	2128.00	Flow (cfs)	4.70	2123.30	
Top Width (ft)	581.33	Top Width (ft)	39.25	542.07	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	1.24	5.00	
Max Chl Dpth (ft)	1.19	Hydr. Depth (ft)	0.10	0.78	
Conv. Total (cfs)	16300.7	Conv. (cfs)	36.0	16264.7	
Length Wtd. (ft)	736.95	Wetted Per. (ft)	39.25	542.08	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.10	0.83	
Alpha	1.01	Stream Power (lb/ft s)	0.13	4.17	
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	16.48	40.08	1.86
C & E Loss (ft)	0.09	Cum SA (acres)	17.72	37.39	1.34

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross



## HECRASAMIIII100

section. This may indicate the need for additional cross sections.  
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3421.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.19	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.19	Flow Area (sq ft)	3.79	424.90	
E.G. Slope (ft/ft)	0.017043	Area (sq ft)	3.79	424.90	
Q Total (cfs)	2128.00	Flow (cfs)	4.70	2123.30	
Top Width (ft)	581.33	Top Width (ft)	39.25	542.07	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	1.24	5.00	
Max Chl Dpth (ft)	1.19	Hydr. Depth (ft)	0.10	0.78	
Conv. Total (cfs)	16300.7	Conv. (cfs)	36.0	16264.7	
Length Wtd. (ft)	736.95	Wetted Per. (ft)	39.25	542.08	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.10	0.83	
Alpha	1.01	Stream Power (lb/ft s)	0.13	4.17	
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	16.73	50.81	1.86
C & E Loss (ft)	0.09	Cum SA (acres)	18.24	37.39	1.34

Warning: The energy equation could not be balanced within the specified number of iterations.  
 The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION      RIVER: Ditch A  
 REACH: 5      RS: 3489

INPUT



## HECRASAMIII100

Description: Sta. 3489

Station Elevation Data		num= 22							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-286	3420	-138	3418.5	-126	3418	-104	3416	-91	3415.5
-76	3416	-21	3417	100	3417	258	3416.5	299	3416
309	3415	318	3416	405	3416	422	3416	539	3416.4
581	3416.2	642	3416.4	744	3416	830	3416	918	3418
1068	3420	1159	3421						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-286	.033	539	.033	918	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	539	918		464	500	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3417.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.37	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.82	Flow Area (sq ft)	607.17	388.72	
E.G. Slope (ft/ft)	0.002273	Area (sq ft)	607.17	388.72	
Q Total (cfs)	2128.00	Flow (cfs)	1235.19	892.81	
Top Width (ft)	1009.36	Top Width (ft)	658.07	351.29	
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)	2.03	2.30	
Max Chl Dpth (ft)	2.37	Hydr. Depth (ft)	0.92	1.11	
Conv. Total (cfs)	44630.1	Conv. (cfs)	25905.4	18724.6	
Length Wtd. (ft)	481.52	Wetted Per. (ft)	658.27	351.30	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.13	0.16	
Alpha	1.01	Stream Power (lb/ft s)	0.27	0.36	
Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	11.14	29.04	1.82
C & E Loss (ft)	0.03	Cum SA (acres)	11.71	27.52	1.32

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3417.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	

HECRASAMIIII100

W.S. Elev (ft)	3417.37	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.82	Flow Area (sq ft)	607.17	388.72	
E.G. Slope (ft/ft)	0.002273	Area (sq ft)	607.17	388.72	
Q Total (cfs)	2128.00	Flow (cfs)	1235.19	892.81	
Top Width (ft)	1009.36	Top Width (ft)	658.07	351.29	
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)	2.03	2.30	
Max Chl Dpth (ft)	2.37	Hydr. Depth (ft)	0.92	1.11	
Conv. Total (cfs)	44630.1	Conv. (cfs)	25905.4	18724.6	
Length Wtd. (ft)	481.52	Wetted Per. (ft)	658.27	351.30	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.13	0.16	
Alpha	1.01	Stream Power (lb/ft s)	0.27	0.36	
Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	11.14	26.85	1.82
C & E Loss (ft)	0.03	Cum SA (acres)	11.71	26.57	1.32

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3417.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.37	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.82	Flow Area (sq ft)	607.17	388.72	
E.G. Slope (ft/ft)	0.002273	Area (sq ft)	607.17	388.72	
Q Total (cfs)	2128.00	Flow (cfs)	1235.19	892.81	
Top Width (ft)	1009.36	Top Width (ft)	658.07	351.29	
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)	2.03	2.30	
Max Chl Dpth (ft)	2.37	Hydr. Depth (ft)	0.92	1.11	
Conv. Total (cfs)	44630.1	Conv. (cfs)	25905.4	18724.6	
Length Wtd. (ft)	481.52	Wetted Per. (ft)	658.27	351.30	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.13	0.16	
Alpha	1.01	Stream Power (lb/ft s)	0.27	0.36	

## HECRASAMIII100

Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	11.22	33.24	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	11.73	29.88	1.34

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3417.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.37	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.82	Flow Area (sq ft)	607.17	388.72	
E.G. Slope (ft/ft)	0.002273	Area (sq ft)	607.17	388.72	
Q Total (cfs)	2128.00	Flow (cfs)	1235.19	892.81	
Top Width (ft)	1009.36	Top Width (ft)	658.07	351.29	
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)	2.03	2.30	
Max Chl Dpth (ft)	2.37	Hydr. Depth (ft)	0.92	1.11	
Conv. Total (cfs)	44630.1	Conv. (cfs)	25905.4	18724.6	
Length Wtd. (ft)	481.52	Wetted Per. (ft)	658.27	351.30	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.13	0.16	
Alpha	1.01	Stream Power (lb/ft s)	0.27	0.36	
Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	11.48	43.97	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	12.24	29.88	1.34

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 2989

## INPUT

Description: Sta. 2989

Station Elevation Data	num=	14							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

HECRASAMIIII100									
-31	3416	59	3414.8	170	3414.8	196	3414	436	3413.8
613	3414	651	3414	700	3414	747	3414	761	3414
841	3415.01	920	3416	976	3418	1067	3420		

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
-31 .033	436 .033	841 .033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
436	841	317	215	172	.3	.5

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3415.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.67	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.67	Flow Area (sq ft)	192.52	253.84	
E.G. Slope (ft/ft)	0.018086	Area (sq ft)	192.52	253.84	
Q Total (cfs)	2128.00	Flow (cfs)	949.67	1178.33	
Top Width (ft)	640.02	Top Width (ft)	261.83	378.20	
Vel Total (ft/s)	4.77	Avg. Vel. (ft/s)	4.93	4.64	
Max Chl Dpth (ft)	0.87	Hydr. Depth (ft)	0.74	0.67	
Conv. Total (cfs)	15823.5	Conv. (cfs)	7061.6	8761.9	
Length Wtd. (ft)	254.95	Wetted Per. (ft)	261.84	378.20	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.83	0.76	
Alpha	1.00	Stream Power (lb/ft s)	4.10	3.52	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	6.88	25.35	1.82
C & E Loss (ft)	0.15	Cum SA (acres)	6.81	23.33	1.32

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3405

E.G. Elev (ft)	3415.03	Element	Left OB	Channel	Right OB
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## HECRASAMIIII100

Vel Head (ft)	0.35	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.67	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.67	Flow Area (sq ft)	192.52	253.84	
E.G. Slope (ft/ft)	0.018086	Area (sq ft)	192.52	253.84	
Q Total (cfs)	2128.00	Flow (cfs)	949.67	1178.33	
Top Width (ft)	640.02	Top Width (ft)	261.83	378.20	
Vel Total (ft/s)	4.77	Avg. Vel. (ft/s)	4.93	4.64	
Max Chl Dpth (ft)	0.87	Hydr. Depth (ft)	0.74	0.67	
Conv. Total (cfs)	15823.5	Conv. (cfs)	7061.6	8761.9	
Length Wtd. (ft)	254.95	Wetted Per. (ft)	261.84	378.20	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.83	0.76	
Alpha	1.00	Stream Power (lb/ft s)	4.10	3.52	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	6.88	23.16	1.82
C & E Loss (ft)	0.15	Cum SA (acres)	6.81	22.38	1.32

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3415.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.67	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.67	Flow Area (sq ft)	192.52	253.84	
E.G. Slope (ft/ft)	0.018086	Area (sq ft)	192.52	253.84	
Q Total (cfs)	2128.00	Flow (cfs)	949.67	1178.33	
Top Width (ft)	640.02	Top Width (ft)	261.83	378.20	
Vel Total (ft/s)	4.77	Avg. Vel. (ft/s)	4.93	4.64	

		HECRASAMIII100			
Max Chl Dpth (ft)	0.87	Hydr. Depth (ft)	0.74	0.67	
Conv. Total (cfs)	15823.5	Conv. (cfs)	7061.6	8761.9	
Length Wtd. (ft)	254.96	Wetted Per. (ft)	261.84	378.20	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.83	0.76	
Alpha	1.00	Stream Power (lb/ft s)	4.10	3.52	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	6.97	29.55	1.86
C & E Loss (ft)	0.15	Cum SA (acres)	6.83	25.70	1.34

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3415.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.67	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.67	Flow Area (sq ft)	192.52	253.84	
E.G. Slope (ft/ft)	0.018086	Area (sq ft)	192.52	253.84	
Q Total (cfs)	2128.00	Flow (cfs)	949.67	1178.33	
Top Width (ft)	640.02	Top Width (ft)	261.83	378.20	
Vel Total (ft/s)	4.77	Avg. Vel. (ft/s)	4.93	4.64	
Max Chl Dpth (ft)	0.87	Hydr. Depth (ft)	0.74	0.67	
Conv. Total (cfs)	15823.5	Conv. (cfs)	7061.6	8761.9	
Length Wtd. (ft)	254.96	Wetted Per. (ft)	261.84	378.20	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.83	0.76	
Alpha	1.00	Stream Power (lb/ft s)	4.10	3.52	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	7.22	40.28	1.86
C & E Loss (ft)	0.15	Cum SA (acres)	7.35	25.70	1.34

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 2774

## INPUT

Description: Sta. 2774 Upstream of culverts

Station Elevation Data		num= 18	
Sta	Elev	Sta	Elev
-453	3416	-437	3415
100	3413.8	175	3413.8
402	3410.9	437	3410
560	3412	641	3414

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
-453	.033	437	.033
		511	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	437	511		40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3414.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.16	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	901.05	355.47	248.66
E.G. Slope (ft/ft)	0.000414	Area (sq ft)	901.05	355.47	248.66
Q Total (cfs)	2128.00	Flow (cfs)	860.75	927.38	339.87
Top Width (ft)	1057.47	Top Width (ft)	846.96	74.00	136.51
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)	0.96	2.61	1.37
Max Chl Dpth (ft)	5.16	Hydr. Depth (ft)	1.06	4.80	1.82
Conv. Total (cfs)	104526.0	Conv. (cfs)	42279.5	45552.3	16694.2
Length Wtd. (ft)	40.00	Wetted Per. (ft)	847.04	74.04	136.58
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.03	0.12	0.05

## HECRASAMIIII100

Alpha	1.82	Stream Power (lb/ft s)	0.03	0.32	0.06
Frctn Loss (ft)		Cum Volume (acre-ft)	2.90	23.84	1.33
C & E Loss (ft)		Cum SA (acres)	2.78	22.21	1.05

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3414.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.16	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	901.05	355.47	248.66
E.G. Slope (ft/ft)	0.000414	Area (sq ft)	901.05	355.47	248.66
Q Total (cfs)	2128.00	Flow (cfs)	860.75	927.38	339.87
Top Width (ft)	1057.47	Top Width (ft)	846.96	74.00	136.51
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)	0.96	2.61	1.37
Max Chl Dpth (ft)	5.16	Hydr. Depth (ft)	1.06	4.80	1.82
Conv. Total (cfs)	104526.0	Conv. (cfs)	42279.5	45552.3	16694.2
Length Wtd. (ft)	40.00	Wetted Per. (ft)	847.04	74.04	136.58
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.03	0.12	0.05
Alpha	1.82	Stream Power (lb/ft s)	0.03	0.32	0.06
Frctn Loss (ft)		Cum Volume (acre-ft)	2.90	21.66	1.33
C & E Loss (ft)		Cum SA (acres)	2.78	21.26	1.05

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3414.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.16	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	901.47	355.51	248.73



		HECRASAMIII100			
E.G. Slope (ft/ft)	0.000414	Area (sq ft)	901.47	355.51	248.73
Q Total (cfs)	2128.00	Flow (cfs)	861.02	927.14	339.84
Top Width (ft)	1057.51	Top Width (ft)	846.98	74.00	136.53
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)	0.96	2.61	1.37
Max Chl Dpth (ft)	5.16	Hydr. Depth (ft)	1.06	4.80	1.82
Conv. Total (cfs)	104571.3	Conv. (cfs)	42311.3	45560.1	16700.0
Length Wtd. (ft)	40.00	Wetted Per. (ft)	847.06	74.04	136.60
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.03	0.12	0.05
Alpha	1.82	Stream Power (lb/ft s)	0.03	0.32	0.06
Frctn Loss (ft)		Cum Volume (acre-ft)	2.98	28.05	1.37
C & E Loss (ft)		Cum SA (acres)	2.80	24.58	1.07

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT      Profile #100 Yr.-WS3407

E.G. Elev (ft)	3414.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.16	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	901.47	355.51	248.73
E.G. Slope (ft/ft)	0.000414	Area (sq ft)	901.47	355.51	248.73
Q Total (cfs)	2128.00	Flow (cfs)	861.02	927.14	339.84
Top Width (ft)	1057.51	Top Width (ft)	846.98	74.00	136.53
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)	0.96	2.61	1.37
Max Chl Dpth (ft)	5.16	Hydr. Depth (ft)	1.06	4.80	1.82
Conv. Total (cfs)	104571.3	Conv. (cfs)	42311.3	45560.1	16700.0
Length Wtd. (ft)	40.00	Wetted Per. (ft)	847.06	74.04	136.60
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.03	0.12	0.05
Alpha	1.82	Stream Power (lb/ft s)	0.03	0.32	0.06
Frctn Loss (ft)		Cum Volume (acre-ft)	3.24	38.78	1.37
C & E Loss (ft)		Cum SA (acres)	3.31	24.58	1.07

## HECRASAMIII100

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CULVERT RIVER: Ditch A  
REACH: 5 RS: 2773

## INPUT

## Description:

Distance from Upstream XS = 8

Deck/Roadway Width = 24

Weir Coefficient = 3

## Upstream Deck/Roadway Coordinates

num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
26	3413.8				100	3413.8				402	3412.7			
500	3412.8				600	3413.9				700	3415.7			

## Upstream Bridge Cross Section Data

## Station Elevation Data

num=

18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

## Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	437	511		.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

## Downstream Deck/Roadway Coordinates

num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
26	3413.8				100	3413.8				402	3412.7			
500	3412.8				600	3413.9				700	3415.7			

## Downstream Bridge Cross Section Data

## Station Elevation Data

num=

17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

## Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	349	434		.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

Upstream Embankment side slope = 3 horiz. to 1.0 vertical  
Downstream Embankment side slope = 3 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .95

HECRASAMIIII100

Elevation at which weir flow begins = 3412.7  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Pipe Arch 1.833 2.43  
 FHWA Chart # 34- 18 inch corner radius; Corrugated metal  
 FHWA Scale # 1 - 90 Degree headwall  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length n Value Entrance Loss Coef Exit Loss Coef  
 1 39 .024 .5 1

Number of Barrels = 6  
 Upstream Elevation = 3409  
 Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.
469	473.4	477.8	482.2	486.6

Downstream Elevation = 3408.9

Sta.	Sta.	Sta.	Sta.	Sta.
387	391.4	395.8	400.2	404.6

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 2734

# INPUT

Description: Sta. 2734 Downstream of culverts

Station	Elevation	Data	num=	17
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
-1721	3416	-1410	3414	26 3413.8 100 3412.4 155 3412
299	3411.4	349	3410	387 3408.9 391.4 3408.9 395.8 3408.9
400.2	3408.9	404.6	3408.9	409 3408.9 434 3410 487 3412
568	3414	658	3416	

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
-1721 .033	349 .033	434 .033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
349	434	745 846	1015	.3	.5

Ineffective Flow	num=	2
Sta L Sta R Elev Permanent		
-888 F		
888 F		

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3412.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.002018	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	2128.00	Flow (cfs)	572.81	1321.29	233.90
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	3.20	Avg. Vel. (ft/s)	2.08	4.57	2.32

HECRASAMIIII100

Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.13	0.43	0.16
Alpha	1.44	Stream Power (lb/ft s)	0.27	1.96	0.36
Frctn Loss (ft)	2.17	Cum Volume (acre-ft)	2.36	23.55	1.17
C & E Loss (ft)	0.06	Cum SA (acres)	2.27	22.14	0.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3412.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.002018	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	2128.00	Flow (cfs)	572.81	1321.29	233.90
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	3.20	Avg. Vel. (ft/s)	2.08	4.57	2.32
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.13	0.43	0.16
Alpha	1.44	Stream Power (lb/ft s)	0.27	1.96	0.36
Frctn Loss (ft)	3.23	Cum Volume (acre-ft)	2.36	21.36	1.17

## HECRASAMIII100

C & E Loss (ft)	0.00	Cum SA (acres)	2.27	21.19	0.95
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Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3412.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.74	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	285.31	292.00	103.55
E.G. Slope (ft/ft)	0.001906	Area (sq ft)	285.31	292.00	103.55
Q Total (cfs)	2128.00	Flow (cfs)	585.95	1306.41	235.64
Top Width (ft)	435.22	Top Width (ft)	267.13	85.00	83.09
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)	2.05	4.47	2.28
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	1.07	3.44	1.25
Conv. Total (cfs)	48746.0	Conv. (cfs)	13422.4	29925.8	5397.8
Length Wtd. (ft)	841.48	Wetted Per. (ft)	267.15	85.04	83.14
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.13	0.41	0.15
Alpha	1.44	Stream Power (lb/ft s)	0.26	1.83	0.34
Frctn Loss (ft)	3.69	Cum Volume (acre-ft)	2.44	27.75	1.21
C & E Loss (ft)	0.04	Cum SA (acres)	2.28	24.51	0.97

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

## HECRASAMIII100

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3412.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.74	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	285.31	292.00	103.55
E.G. Slope (ft/ft)	0.001906	Area (sq ft)	285.31	292.00	103.55
Q Total (cfs)	2128.00	Flow (cfs)	585.95	1306.41	235.64
Top Width (ft)	435.22	Top Width (ft)	267.13	85.00	83.09
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)	2.05	4.47	2.28
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	1.07	3.44	1.25
Conv. Total (cfs)	48746.0	Conv. (cfs)	13422.4	29925.8	5397.8
Length Wtd. (ft)	841.48	Wetted Per. (ft)	267.15	85.04	83.14
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.13	0.41	0.15
Alpha	1.44	Stream Power (lb/ft s)	0.26	1.83	0.34
Frctn Loss (ft)	3.69	Cum Volume (acre-ft)	2.70	38.48	1.21
C & E Loss (ft)	0.04	Cum SA (acres)	2.80	24.51	0.97

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1888

## INPUT

Description: Sta. 1888

Station	Elevation	Data	num=	10	Sta	Elev	Sta	Elev	Sta	Elev
-775	3412	-41	3410	81	3410	100	3410.2	110	3410	
331	3408	532	3408	690	3408	1180	3410	1268	3412	

Manning's n	Values	num=	3	Sta	n Val
Sta	n Val	Sta	n Val	Sta	n Val

-775 .033 100 .033 1180 .033

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
100 1180 305 828 980 .1 .3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3409.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.033	
W.S. Elev (ft)	3409.38	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.89	Flow Area (sq ft)		831.55	
E.G. Slope (ft/ft)	0.003403	Area (sq ft)		831.55	
Q Total (cfs)	2155.00	Flow (cfs)		2155.00	
Top Width (ft)	848.59	Top Width (ft)		848.59	
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)		2.59	
Max Chl Dpth (ft)	1.38	Hydr. Depth (ft)		0.98	
Conv. Total (cfs)	36939.4	Conv. (cfs)		36939.4	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		848.60	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	4.65	Cum Volume (acre-ft)		12.67	
C & E Loss (ft)	0.02	Cum SA (acres)		13.07	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3409.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.033	
W.S. Elev (ft)	3409.05	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.89	Flow Area (sq ft)		570.28	
E.G. Slope (ft/ft)	0.009807	Area (sq ft)		570.28	
Q Total (cfs)	2155.00	Flow (cfs)		2155.00	



HECRASAMIII100			
Top Width (ft)	730.99	Top Width (ft)	730.99
Vel Total (ft/s)	3.78	Avg. Vel. (ft/s)	3.78
Max Chl Dpth (ft)	1.05	Hydr. Depth (ft)	0.78
Conv. Total (cfs)	21761.0	Conv. (cfs)	21761.0
Length Wtd. (ft)	828.00	Wetted Per. (ft)	731.00
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.48
Alpha	1.00	Stream Power (lb/ft s)	1.80
Frctn Loss (ft)	4.12	Cum Volume (acre-ft)	13.02
C & E Loss (ft)	0.03	Cum SA (acres)	13.27

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

#### CROSS SECTION OUTPUT Profile #100 Yr.-WS3406

E.G. Elev (ft)	3409.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3408.89	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.89	Flow Area (sq ft)		457.76	
E.G. Slope (ft/ft)	0.018312	Area (sq ft)		457.76	
Q Total (cfs)	2155.00	Flow (cfs)		2155.00	
Top Width (ft)	674.05	Top Width (ft)		674.05	
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)		4.71	
Max Chl Dpth (ft)	0.89	Hydr. Depth (ft)		0.68	
Conv. Total (cfs)	15925.1	Conv. (cfs)		15925.1	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		674.06	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)		3.65	
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)		20.47	
C & E Loss (ft)	0.10	Cum SA (acres)		17.14	



## HECRASAMIIII100

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3409.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3408.89	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.89	Flow Area (sq ft)		457.76	
E.G. Slope (ft/ft)	0.018312	Area (sq ft)		457.76	
Q Total (cfs)	2155.00	Flow (cfs)		2155.00	
Top Width (ft)	674.05	Top Width (ft)		674.05	
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)		4.71	
Max Chl Dpth (ft)	0.89	Hydr. Depth (ft)		0.68	
Conv. Total (cfs)	15925.1	Conv. (cfs)		15925.1	
Length Wtd. (ft)	825.65	Wetted Per. (ft)		674.06	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)		3.65	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.26	31.20	
C & E Loss (ft)	0.10	Cum SA (acres)	0.51	17.14	

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

## HECRASAMIII100

critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1060

## INPUT

Description: Sta. 1060

Station Elevation Data		num= 6	
Sta	Elev	Sta	Elev
100	3408	394	3406
1523	3406		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	394	.033
		1523	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	394	1523		60	60	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3404.5

E.G. Elev (ft)	3404.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.033	
W.S. Elev (ft)	3404.50	Reach Len. (ft)			
Crit W.S. (ft)	3404.34	Flow Area (sq ft)		501.30	
E.G. Slope (ft/ft)	0.010602	Area (sq ft)		501.30	
Q Total (cfs)	2248.00	Flow (cfs)		2248.00	
Top Width (ft)	526.98	Top Width (ft)		526.98	
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)		4.48	
Max Chl Dpth (ft)	1.80	Hydr. Depth (ft)		0.95	
Conv. Total (cfs)	21832.6	Conv. (cfs)		21832.6	
Length Wtd. (ft)		Wetted Per. (ft)		527.00	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		2.82	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3405.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.033	

## HECRASAMIIII100

W.S. Elev (ft)	3405.00	Reach Len. (ft)	
Crit W.S. (ft)	3404.34	Flow Area (sq ft)	799.30
E.G. Slope (ft/ft)	0.003053	Area (sq ft)	799.30
Q Total (cfs)	2248.00	Flow (cfs)	2248.00
Top Width (ft)	665.03	Top Width (ft)	665.03
Vel Total (ft/s)	2.81	Avg. Vel. (ft/s)	2.81
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)	1.20
Conv. Total (cfs)	40684.8	Conv. (cfs)	40684.8
Length Wtd. (ft)		Wetted Per. (ft)	665.05
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	0.23
Alpha	1.00	Stream Power (lb/ft s)	0.64
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

## CROSS SECTION OUTPUT

## Profile #100 Yr.-WS3406

E.G. Elev (ft)	3406.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.033	
W.S. Elev (ft)	3406.00	Reach Len. (ft)			
Crit W.S. (ft)	3404.34	Flow Area (sq ft)		1696.32	
E.G. Slope (ft/ft)	0.000503	Area (sq ft)		1696.32	
Q Total (cfs)	2248.00	Flow (cfs)		2248.00	
Top Width (ft)	1129.00	Top Width (ft)		1129.00	
Vel Total (ft/s)	1.33	Avg. Vel. (ft/s)		1.33	
Max Chl Dpth (ft)	3.30	Hydr. Depth (ft)		1.50	
Conv. Total (cfs)	100198.1	Conv. (cfs)		100198.1	
Length Wtd. (ft)		Wetted Per. (ft)		1129.02	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

## HECRASAMIII100

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION OUTPUT Profile #100 Yr.-WS3407

E.G. Elev (ft)	3407.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3407.00	Reach Len. (ft)			
Crit W.S. (ft)	3404.34	Flow Area (sq ft)	73.50	2825.32	
E.G. Slope (ft/ft)	0.000090	Area (sq ft)	73.50	2825.32	
Q Total (cfs)	2248.00	Flow (cfs)	19.82	2228.18	
Top Width (ft)	1276.00	Top Width (ft)	147.00	1129.00	
Vel Total (ft/s)	0.78	Avg. Vel. (ft/s)	0.27	0.79	
Max Chl Dpth (ft)	4.30	Hydr. Depth (ft)	0.50	2.50	
Conv. Total (cfs)	236437.3	Conv. (cfs)	2084.9	234352.5	
Length Wtd. (ft)		Wetted Per. (ft)	147.00	1130.02	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	0.00	0.01	
Alpha	1.03	Stream Power (lb/ft s)	0.00	0.01	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

## SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033

		HECRASAMIII100		
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

# SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta.	Left	Channel	Right
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

# SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Ditch A

Reach	River Sta.	Contr.	Expan.
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	
5	2734	.3	.5
5	1888	.1	.3
5	1060	.1	.3

Profile Output Table - Standard Table 1

Reach lope	Vel Chnl	River Sta Flow Area	Q Total Top Width	Min Ch El Froude # Chl	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. S (ft)
/ft)	(ft/s)	(sq ft)	(ft)	(cfs) (ft)				
5		12674	645.00	3477.00	3478.49	3478.08	3478.59	0.00
3093	2.49	268.80	320.33	0.44				
5		12674	645.00	3477.00	3478.49	3478.08	3478.59	0.00
3093	2.49	268.80	320.33	0.44				
5		12674	645.00	3477.00	3478.49	3478.08	3478.59	0.00
3093	2.49	268.80	320.33	0.44				
5		12674	645.00	3477.00	3478.49	3478.08	3478.59	0.00
3093	2.49	268.80	320.33	0.44				
5		11337	645.00	3469.00	3470.53	3470.50	3470.97	0.01
3657	5.36	123.92	137.13	0.93				
5		11337	645.00	3469.00	3470.53	3470.50	3470.97	0.01
3657	5.36	123.92	137.13	0.93				
5		11337	645.00	3469.00	3470.53	3470.50	3470.97	0.01
3657	5.36	123.92	137.13	0.93				
5		11337	645.00	3469.00	3470.53	3470.50	3470.97	0.01
3657	5.36	123.92	137.13	0.93				
5		10937	645.00	3464.00	3465.93	3465.75	3466.26	0.01
0093	4.57	141.28	139.30	0.80				
5		10937	645.00	3464.00	3465.93	3465.75	3466.26	0.01
0093	4.57	141.28	139.30	0.80				
5		10937	645.00	3464.00	3465.93	3465.75	3466.26	0.01
0093	4.57	141.28	139.30	0.80				
5		10937	645.00	3464.00	3465.93	3465.75	3466.26	0.01
0093	4.57	141.28	139.30	0.80				
5		10288	645.00	3456.00	3457.07	3457.07	3457.30	0.01
9840	3.87	166.72	349.93	0.99				
5		10288	645.00	3456.00	3457.07	3457.07	3457.30	0.01
9840	3.87	166.72	349.93	0.99				
5		10288	645.00	3456.00	3457.07	3457.07	3457.30	0.01
9840	3.87	166.72	349.93	0.99				
5		10288	645.00	3456.00	3457.07	3457.07	3457.30	0.01
9840	3.87	166.72	349.93	0.99				
5		9690	817.00	3450.00	3451.66	3451.28	3451.78	0.00
4774	2.78	293.93	348.04	0.53				
5		9690	817.00	3450.00	3451.66	3451.28	3451.78	0.00
4774	2.78	293.93	348.04	0.53				
5		9690	817.00	3450.00	3451.66	3451.28	3451.78	0.00
4774	2.78	293.93	348.04	0.53				
5		9690	817.00	3450.00	3451.66	3451.28	3451.78	0.00
4774	2.78	293.93	348.04	0.53				
5		9009	817.00	3445.00	3446.62	3446.50	3446.87	0.01
2038	4.03	202.92	275.79	0.83				
5		9009	817.00	3445.00	3446.62	3446.50	3446.87	0.01
2038	4.03	202.92	275.79	0.83				
5		9009	817.00	3445.00	3446.62	3446.50	3446.87	0.01
2038	4.03	202.92	275.79	0.83				

HECRASAMIII100							
5	9009	817.00	3445.00	3446.62	3446.50	3446.87	0.01
2038	4.03 202.92	275.79	0.83				
5	8130	817.00	3440.00	3441.75	3441.25	3441.84	0.00
3282	2.40 340.75	380.21	0.45				
5	8130	817.00	3440.00	3441.75	3441.25	3441.84	0.00
3282	2.40 340.75	380.21	0.45				
5	8130	817.00	3440.00	3441.75	3441.25	3441.84	0.00
3282	2.40 340.75	380.21	0.45				
5	8130	817.00	3440.00	3441.75	3441.25	3441.84	0.00
3282	2.40 340.75	380.21	0.45				
5	7717	817.00	3437.80	3438.79	3438.79	3439.10	0.01
9275	4.47 182.90	302.82	1.01				
5	7717	817.00	3437.80	3438.79	3438.79	3439.10	0.01
9275	4.47 182.90	302.82	1.01				
5	7717	817.00	3437.80	3438.79	3438.79	3439.10	0.01
9275	4.47 182.90	302.82	1.01				
5	7717	817.00	3437.80	3438.79	3438.79	3439.10	0.01
9275	4.47 182.90	302.82	1.01				
5	7253	966.00	3435.00	3436.53	3435.99	3436.59	0.00
1746	1.92 511.45	535.68	0.33				
5	7253	966.00	3435.00	3436.53	3435.99	3436.59	0.00
1746	1.92 511.45	535.68	0.33				
5	7253	966.00	3435.00	3436.53	3435.99	3436.59	0.00
1746	1.92 511.45	535.68	0.33				
5	7253	966.00	3435.00	3436.53	3435.99	3436.59	0.00
1746	1.92 511.45	535.68	0.33				
5	6343	1873.00	3430.00	3430.86	3430.86	3431.22	0.01
8047	4.82 388.25	545.10	1.01				
5	6343	1873.00	3430.00	3430.86	3430.86	3431.22	0.01
8047	4.82 388.25	545.10	1.01				
5	6343	1873.00	3430.00	3430.86	3430.86	3431.22	0.01
8047	4.82 388.25	545.10	1.01				
5	6343	1873.00	3430.00	3430.86	3430.86	3431.22	0.01
8047	4.82 388.25	545.10	1.01				
5	5363	1873.00	3425.00	3426.53	3425.93	3426.60	0.00
1798	2.13 906.30	892.02	0.35				
5	5363	1873.00	3425.00	3426.53	3425.93	3426.60	0.00
1798	2.13 906.30	892.02	0.35				
5	5363	1873.00	3425.00	3426.53	3425.93	3426.60	0.00
1798	2.13 906.30	892.02	0.35				
5	5363	1873.00	3425.00	3426.53	3425.93	3426.60	0.00
1798	2.13 906.30	892.02	0.35				
5	4221	2128.00	3420.00	3421.19	3421.19	3421.58	0.01
7043	5.00 428.69	581.33	0.99				
5	4221	2128.00	3420.00	3421.19	3421.19	3421.58	0.01
7043	5.00 428.69	581.33	0.99				
5	4221	2128.00	3420.00	3421.19	3421.19	3421.58	0.01
7043	5.00 428.69	581.33	0.99				
5	4221	2128.00	3420.00	3421.19	3421.19	3421.58	0.01
7043	5.00 428.69	581.33	0.99				
5	3489	2128.00	3416.00	3417.37	3416.82	3417.44	0.00

HECRASAMIIII100								
2273	2.30	995.88	1009.36	0.38				
5		3489	2128.00	3416.00	3417.37	3416.82	3417.44	0.00
2273	2.30	995.88	1009.36	0.38				
5		3489	2128.00	3416.00	3417.37	3416.82	3417.44	0.00
2273	2.30	995.88	1009.36	0.38				
5		3489	2128.00	3416.00	3417.37	3416.82	3417.44	0.00
2273	2.30	995.88	1009.36	0.38				
5		2989	2128.00	3413.80	3414.67	3414.67	3415.03	0.01
8086	4.64	446.36	640.02	1.00				
5		2989	2128.00	3413.80	3414.67	3414.67	3415.03	0.01
8086	4.64	446.36	640.02	1.00				
5		2989	2128.00	3413.80	3414.67	3414.67	3415.03	0.01
8086	4.64	446.36	640.02	1.00				
5		2989	2128.00	3413.80	3414.67	3414.67	3415.03	0.01
8086	4.64	446.36	640.02	1.00				
5		2774	2128.00	3409.00	3414.16	3412.71	3414.21	0.00
0414	2.61	1505.18	1057.47	0.21				
5		2774	2128.00	3409.00	3414.16	3412.71	3414.21	0.00
0414	2.61	1505.18	1057.47	0.21				
5		2774	2128.00	3409.00	3414.16	3412.71	3414.21	0.00
0414	2.61	1505.70	1057.51	0.21				
5		2774	2128.00	3409.00	3414.16	3412.71	3414.21	0.00
0414	2.61	1505.70	1057.51	0.21				
5		2773	Culvert					
5		2734	2128.00	3408.90	3412.71	3412.71	3412.94	0.00
2018	4.57	665.51	431.91	0.44				
5		2734	2128.00	3408.90	3412.71	3412.71	3412.94	0.00
2018	4.57	665.51	431.91	0.44				
5		2734	2128.00	3408.90	3412.74	3412.71	3412.96	0.00
1906	4.47	680.86	435.22	0.43				
5		2734	2128.00	3408.90	3412.74	3412.71	3412.96	0.00
1906	4.47	680.86	435.22	0.43				
5		1888	2155.00	3408.00	3409.38	3408.89	3409.48	0.00
3403	2.59	831.55	848.59	0.46				
5		1888	2155.00	3408.00	3409.05	3408.89	3409.27	0.00
9807	3.78	570.28	730.99	0.75				
5		1888	2155.00	3408.00	3408.89	3408.89	3409.23	0.01
8312	4.71	457.76	674.05	1.01				
5		1888	2155.00	3408.00	3408.89	3408.89	3409.23	0.01
8312	4.71	457.76	674.05	1.01				
5		1060	2248.00	3402.70	3404.50	3404.34	3404.81	0.01
0602	4.48	501.30	526.98	0.81				
5		1060	2248.00	3402.70	3405.00	3404.34	3405.12	0.00
3053	2.81	799.30	665.03	0.45				
5		1060	2248.00	3402.70	3406.00	3404.34	3406.03	0.00
0503	1.33	1696.32	1129.00	0.19				
5		1060	2248.00	3402.70	3407.00	3404.34	3407.01	0.00
0090	0.79	2898.82	1276.00	0.09				

Profile Output Table - Report Standard Table 1

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## HECRASAMIII100

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G
Elev	E.G. Slope	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude #	Chl
(ft)	(ft/ft)	(cfs)	(ft)	(ft)	(sq ft)	(ft)	(ft)
		(ft)					
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3
478.59	0.003093	345.62	665.95	268.80	320.33	0.44	
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3
478.59	0.003093	345.62	665.95	268.80	320.33	0.44	
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3
478.59	0.003093	345.62	665.95	268.80	320.33	0.44	
5	12674	645.00	3477.00	3478.49	3478.08	1.49	3
478.59	0.003093	345.62	665.95	268.80	320.33	0.44	
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3
470.97	0.013657	423.67	560.80	123.92	137.13	0.93	
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3
470.97	0.013657	423.67	560.80	123.92	137.13	0.93	
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3
470.97	0.013657	423.67	560.80	123.92	137.13	0.93	
5	11337	645.00	3469.00	3470.53	3470.50	1.53	3
470.97	0.013657	423.67	560.80	123.92	137.13	0.93	
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3
466.26	0.010093	467.44	606.74	141.28	139.30	0.80	
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3
466.26	0.010093	467.44	606.74	141.28	139.30	0.80	
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3
466.26	0.010093	467.44	606.74	141.28	139.30	0.80	
5	10937	645.00	3464.00	3465.93	3465.75	1.93	3
466.26	0.010093	467.44	606.74	141.28	139.30	0.80	
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3
457.30	0.019840	389.03	738.96	166.72	349.93	0.99	
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3
457.30	0.019840	389.03	738.96	166.72	349.93	0.99	
5	10288	645.00	3456.00	3457.07	3457.07	1.07	3
457.30	0.019840	389.03	738.96	166.72	349.93	0.99	

## HECRASAMIIII100

5	10288		645.00	3456.00	3457.07	3457.07	1.07	3
457.30	0.019840	3.87	389.03	738.96	166.72	349.93		0.99
5	9690		817.00	3450.00	3451.66	3451.28	1.66	3
451.78	0.004774	2.78	423.62	771.66	293.93	348.04		0.53
5	9690		817.00	3450.00	3451.66	3451.28	1.66	3
451.78	0.004774	2.78	423.62	771.66	293.93	348.04		0.53
5	9690		817.00	3450.00	3451.66	3451.28	1.66	3
451.78	0.004774	2.78	423.62	771.66	293.93	348.04		0.53
5	9690		817.00	3450.00	3451.66	3451.28	1.66	3
451.78	0.004774	2.78	423.62	771.66	293.93	348.04		0.53
5	9009		817.00	3445.00	3446.62	3446.50	1.62	3
446.87	0.012038	4.03	440.24	716.03	202.92	275.79		0.83
5	9009		817.00	3445.00	3446.62	3446.50	1.62	3
446.87	0.012038	4.03	440.24	716.03	202.92	275.79		0.83
5	9009		817.00	3445.00	3446.62	3446.50	1.62	3
446.87	0.012038	4.03	440.24	716.03	202.92	275.79		0.83
5	9009		817.00	3445.00	3446.62	3446.50	1.62	3
446.87	0.012038	4.03	440.24	716.03	202.92	275.79		0.83
5	8130		817.00	3440.00	3441.75	3441.25	1.75	3
441.84	0.003282	2.40	448.26	828.47	340.75	380.21		0.45
5	8130		817.00	3440.00	3441.75	3441.25	1.75	3
441.84	0.003282	2.40	448.26	828.47	340.75	380.21		0.45
5	8130		817.00	3440.00	3441.75	3441.25	1.75	3
441.84	0.003282	2.40	448.26	828.47	340.75	380.21		0.45
5	8130		817.00	3440.00	3441.75	3441.25	1.75	3
441.84	0.003282	2.40	448.26	828.47	340.75	380.21		0.45
5	7717		817.00	3437.80	3438.79	3438.79	0.99	3
439.10	0.019275	4.47	323.60	626.42	182.90	302.82		1.01
5	7717		817.00	3437.80	3438.79	3438.79	0.99	3
439.10	0.019275	4.47	323.60	626.42	182.90	302.82		1.01
5	7717		817.00	3437.80	3438.79	3438.79	0.99	3
439.10	0.019275	4.47	323.60	626.42	182.90	302.82		1.01
5	7717		817.00	3437.80	3438.79	3438.79	0.99	3
439.10	0.019275	4.47	323.60	626.42	182.90	302.82		1.01

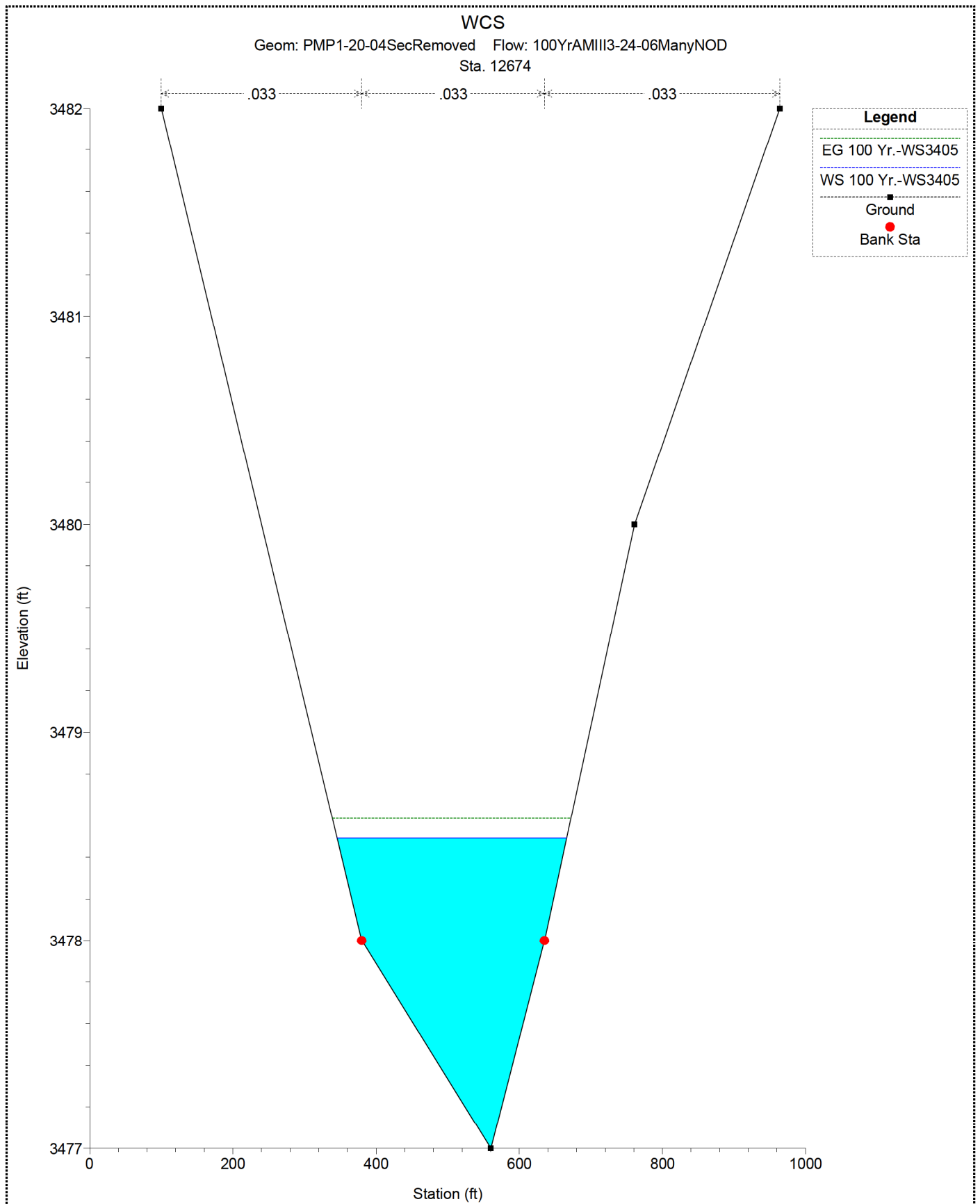
HECRASAMIII100

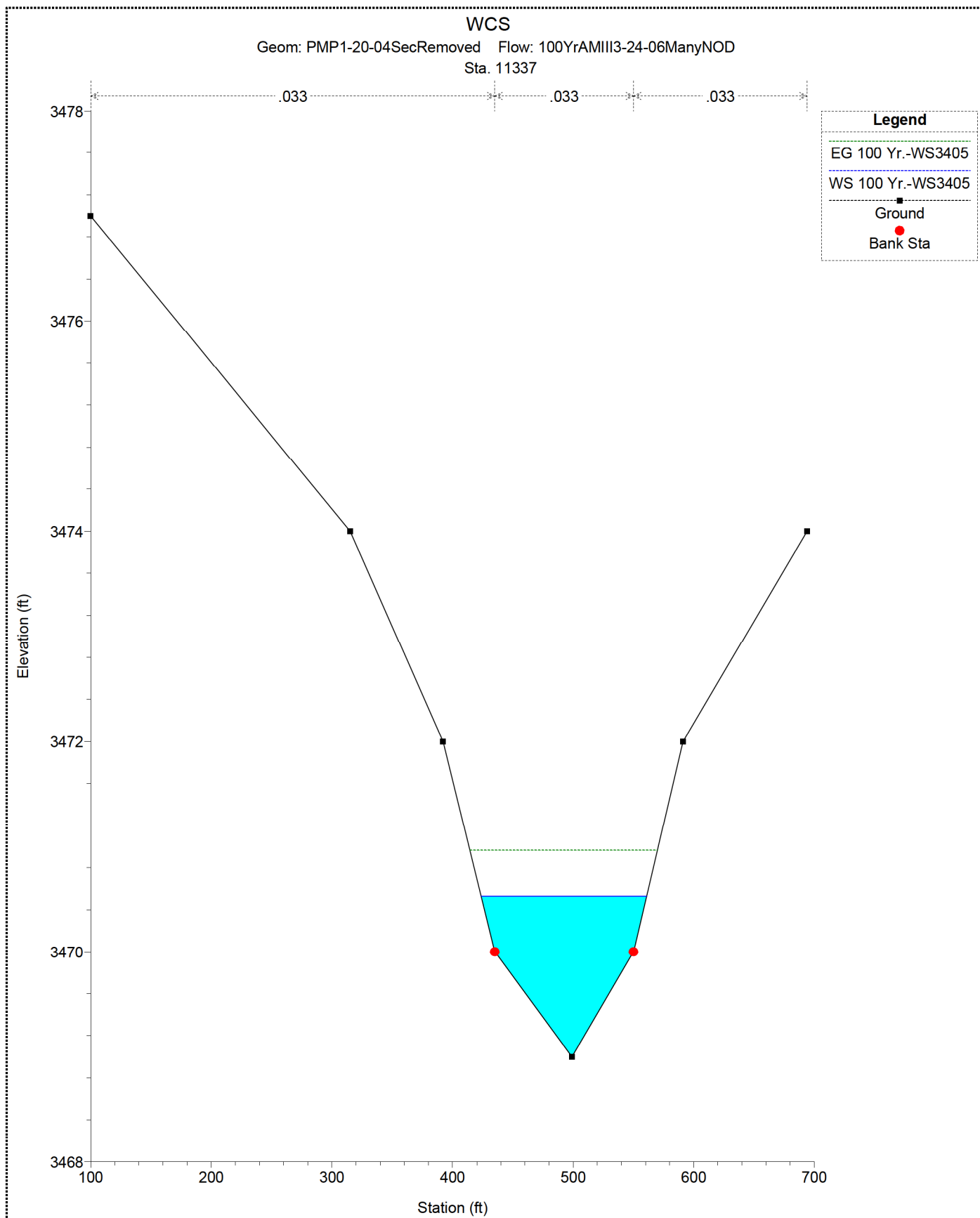
5	7253		966.00	3435.00	3436.53	3435.99	1.53	3
436.59	0.001746	1.92	396.63	932.31	511.45	535.68		0.33
5	7253		966.00	3435.00	3436.53	3435.99	1.53	3
436.59	0.001746	1.92	396.63	932.31	511.45	535.68		0.33
5	7253		966.00	3435.00	3436.53	3435.99	1.53	3
436.59	0.001746	1.92	396.63	932.31	511.45	535.68		0.33
5	7253		966.00	3435.00	3436.53	3435.99	1.53	3
436.59	0.001746	1.92	396.63	932.31	511.45	535.68		0.33
5	6343		1873.00	3430.00	3430.86	3430.86	0.86	3
431.22	0.018047	4.82	754.77	1299.87	388.25	545.10		1.01
5	6343		1873.00	3430.00	3430.86	3430.86	0.86	3
431.22	0.018047	4.82	754.77	1299.87	388.25	545.10		1.01
5	6343		1873.00	3430.00	3430.86	3430.86	0.86	3
431.22	0.018047	4.82	754.77	1299.87	388.25	545.10		1.01
5	6343		1873.00	3430.00	3430.86	3430.86	0.86	3
431.22	0.018047	4.82	754.77	1299.87	388.25	545.10		1.01
5	5363		1873.00	3425.00	3426.53	3425.93	1.53	3
426.60	0.001798	2.13	690.84	1582.86	906.30	892.02		0.35
5	5363		1873.00	3425.00	3426.53	3425.93	1.53	3
426.60	0.001798	2.13	690.84	1582.86	906.30	892.02		0.35
5	5363		1873.00	3425.00	3426.53	3425.93	1.53	3
426.60	0.001798	2.13	690.84	1582.86	906.30	892.02		0.35
5	5363		1873.00	3425.00	3426.53	3425.93	1.53	3
426.60	0.001798	2.13	690.84	1582.86	906.30	892.02		0.35
5	4221		2128.00	3420.00	3421.19	3421.19	1.19	3
421.58	0.017043	5.00	504.75	1086.07	428.69	581.33		0.99
5	4221		2128.00	3420.00	3421.19	3421.19	1.19	3
421.58	0.017043	5.00	504.75	1086.07	428.69	581.33		0.99
5	4221		2128.00	3420.00	3421.19	3421.19	1.19	3
421.58	0.017043	5.00	504.75	1086.07	428.69	581.33		0.99
5	4221		2128.00	3420.00	3421.19	3421.19	1.19	3
421.58	0.017043	5.00	504.75	1086.07	428.69	581.33		0.99
5	3489		2128.00	3416.00	3417.37	3416.82	2.37	3
417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36		0.38

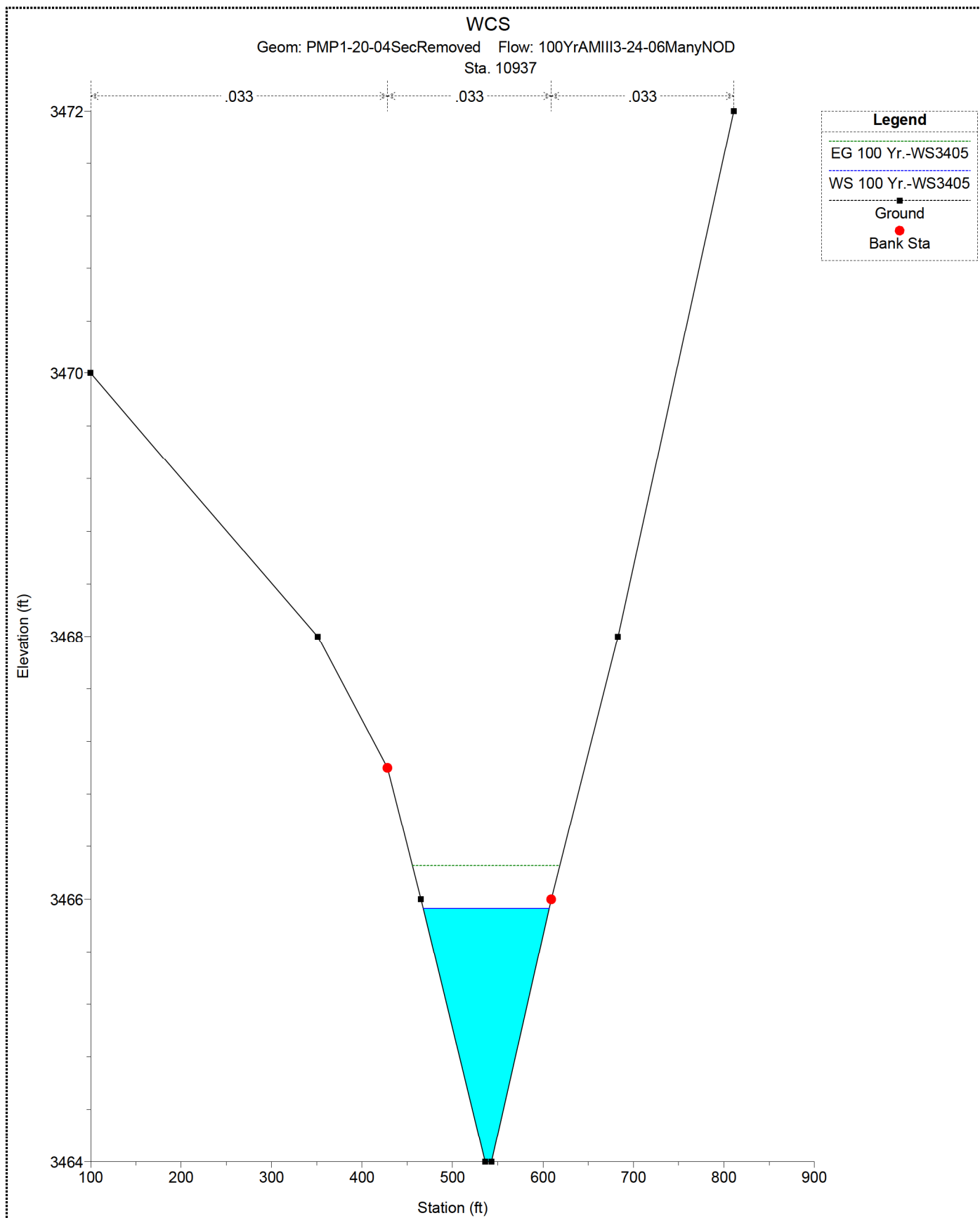
HECRASAMIII100									
5	3489		2128.00	3416.00	3417.37	3416.82	2.37	3	
417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36		0.38	
5	3489		2128.00	3416.00	3417.37	3416.82	2.37	3	
417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36		0.38	
5	3489		2128.00	3416.00	3417.37	3416.82	2.37	3	
417.44	0.002273	2.30	-119.07	890.29	995.88	1009.36		0.38	
5	2989		2128.00	3413.80	3414.67	3414.67	0.87	3	
415.03	0.018086	4.64	174.17	814.20	446.36	640.02		1.00	
5	2989		2128.00	3413.80	3414.67	3414.67	0.87	3	
415.03	0.018086	4.64	174.17	814.20	446.36	640.02		1.00	
5	2989		2128.00	3413.80	3414.67	3414.67	0.87	3	
415.03	0.018086	4.64	174.17	814.20	446.36	640.02		1.00	
5	2989		2128.00	3413.80	3414.67	3414.67	0.87	3	
415.03	0.018086	4.64	174.17	814.20	446.36	640.02		1.00	
5	2774		2128.00	3409.00	3414.16	3412.71	5.16	3	
414.21	0.000414	2.61	-409.96	647.51	1505.18	1057.47		0.21	
5	2774		2128.00	3409.00	3414.16	3412.71	5.16	3	
414.21	0.000414	2.61	-409.96	647.51	1505.18	1057.47		0.21	
5	2774		2128.00	3409.00	3414.16	3412.71	5.16	3	
414.21	0.000414	2.61	-409.98	647.53	1505.70	1057.51		0.21	
5	2774		2128.00	3409.00	3414.16	3412.71	5.16	3	
414.21	0.000414	2.61	-409.98	647.53	1505.70	1057.51		0.21	
5	2773		Culvert						
5	2734		2128.00	3408.90	3412.71	3412.71	3.81	3	
412.94	0.002018	4.57	83.74	515.65	665.51	431.91		0.44	
5	2734		2128.00	3408.90	3412.71	3412.71	3.81	3	
412.94	0.002018	4.57	83.74	515.65	665.51	431.91		0.44	
5	2734		2128.00	3408.90	3412.74	3412.71	3.84	3	
412.96	0.001906	4.47	81.87	517.09	680.86	435.22		0.43	
5	2734		2128.00	3408.90	3412.74	3412.71	3.84	3	
412.96	0.001906	4.47	81.87	517.09	680.86	435.22		0.43	
5	1888		2155.00	3408.00	3409.38	3408.89	1.38	3	
409.48	0.003403	2.59	178.82	1027.41	831.55	848.59		0.46	

HECRASAMIIII100

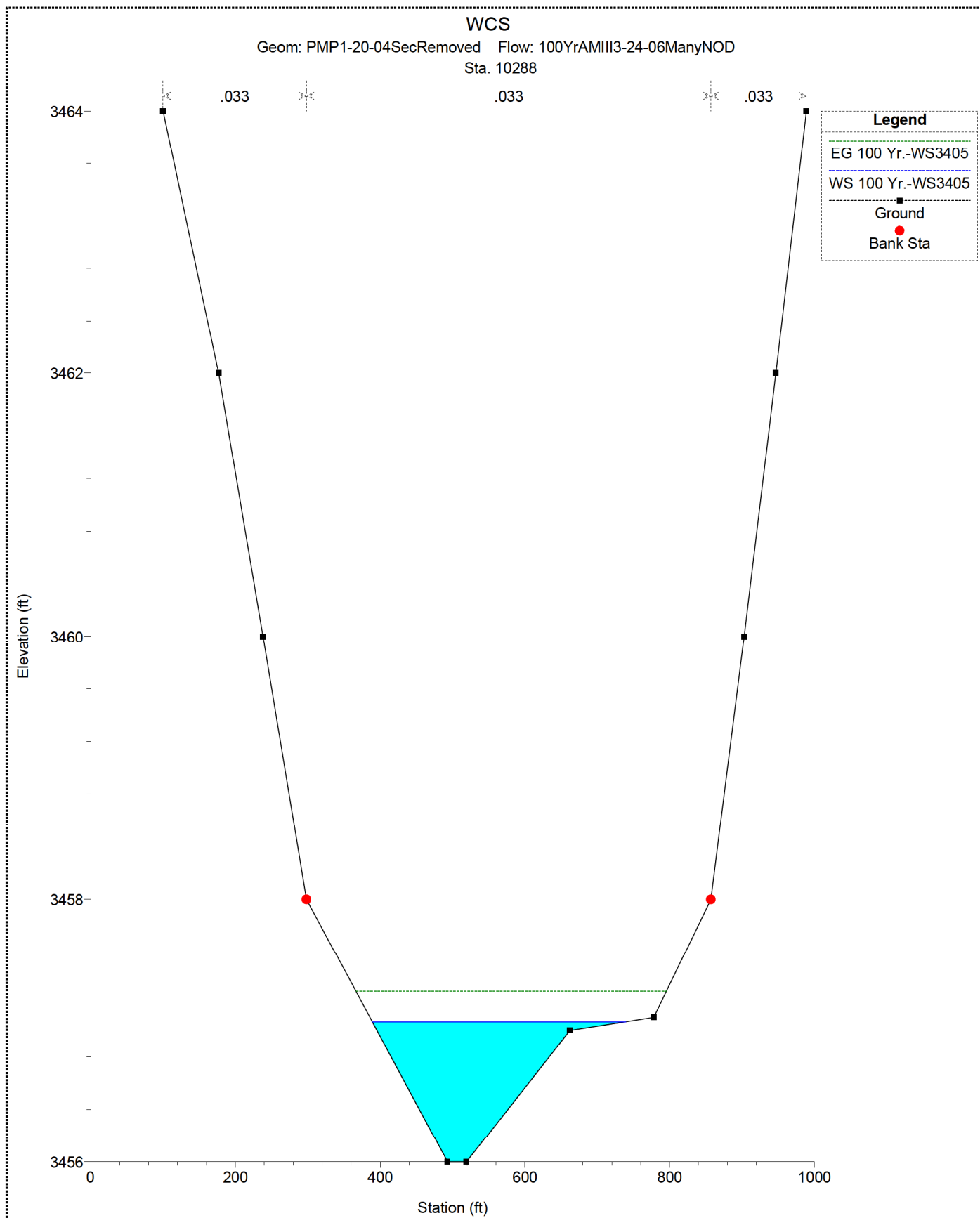
5	1888		2155.00	3408.00	3409.05	3408.89	1.05	3
409.27	0.009807	3.78	215.37	946.36	570.28	730.99		0.75
5	1888		2155.00	3408.00	3408.89	3408.89	0.89	3
409.23	0.018312	4.71	233.07	907.13	457.76	674.05		1.01
5	1888		2155.00	3408.00	3408.89	3408.89	0.89	3
409.23	0.018312	4.71	233.07	907.13	457.76	674.05		1.01
5	1060		2248.00	3402.70	3404.50	3404.34	1.80	3
404.81	0.010602	4.48	614.45	1141.44	501.30	526.98		0.81
5	1060		2248.00	3402.70	3405.00	3404.34	2.30	3
405.12	0.003053	2.81	540.97	1206.00	799.30	665.03		0.45
5	1060		2248.00	3402.70	3406.00	3404.34	3.30	3
406.03	0.000503	1.33	394.00	1523.00	1696.32	1129.00		0.19
5	1060		2248.00	3402.70	3407.00	3404.34	4.30	3
407.01	0.000090	0.79	247.00	1523.00	2898.82	1276.00		0.09

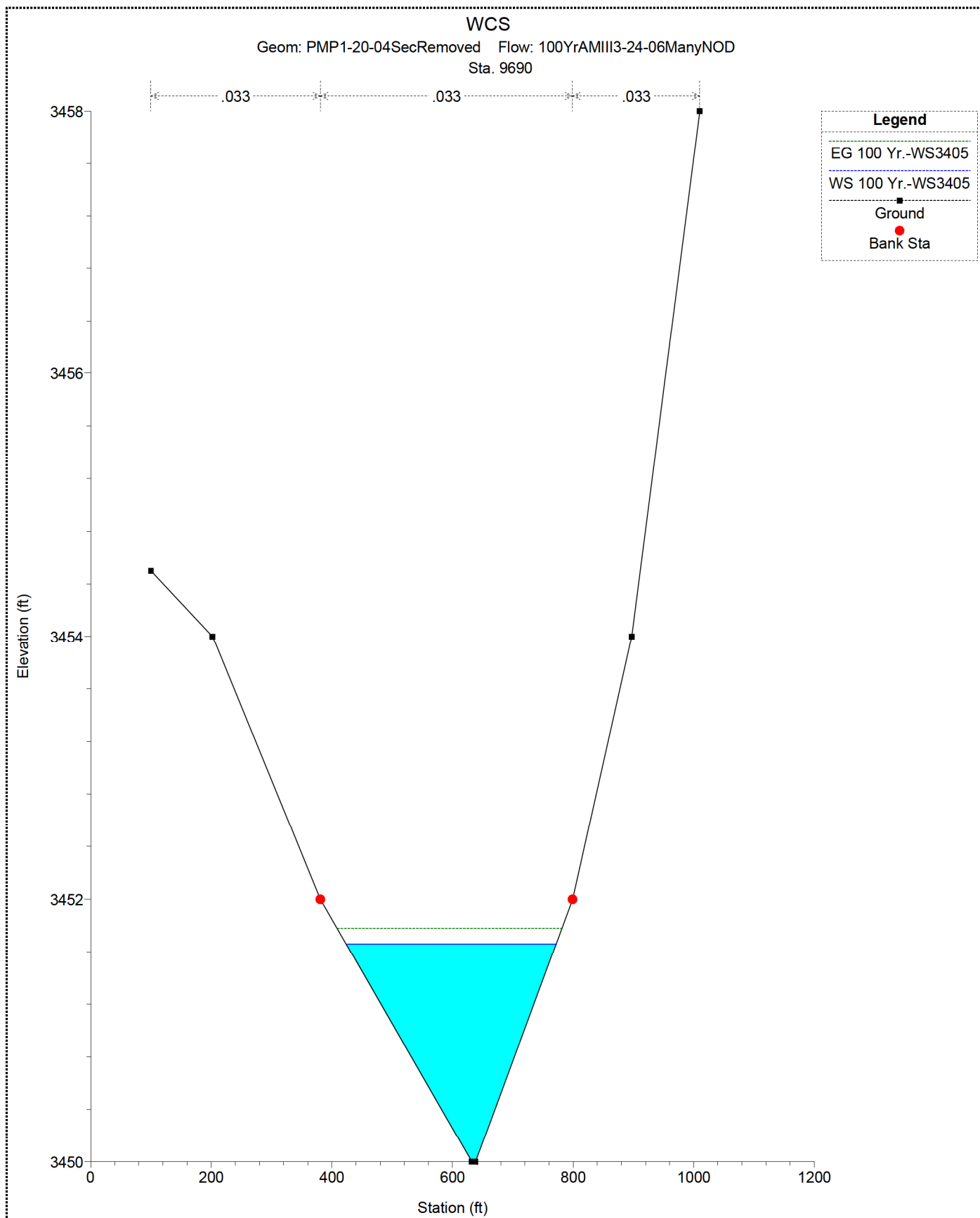


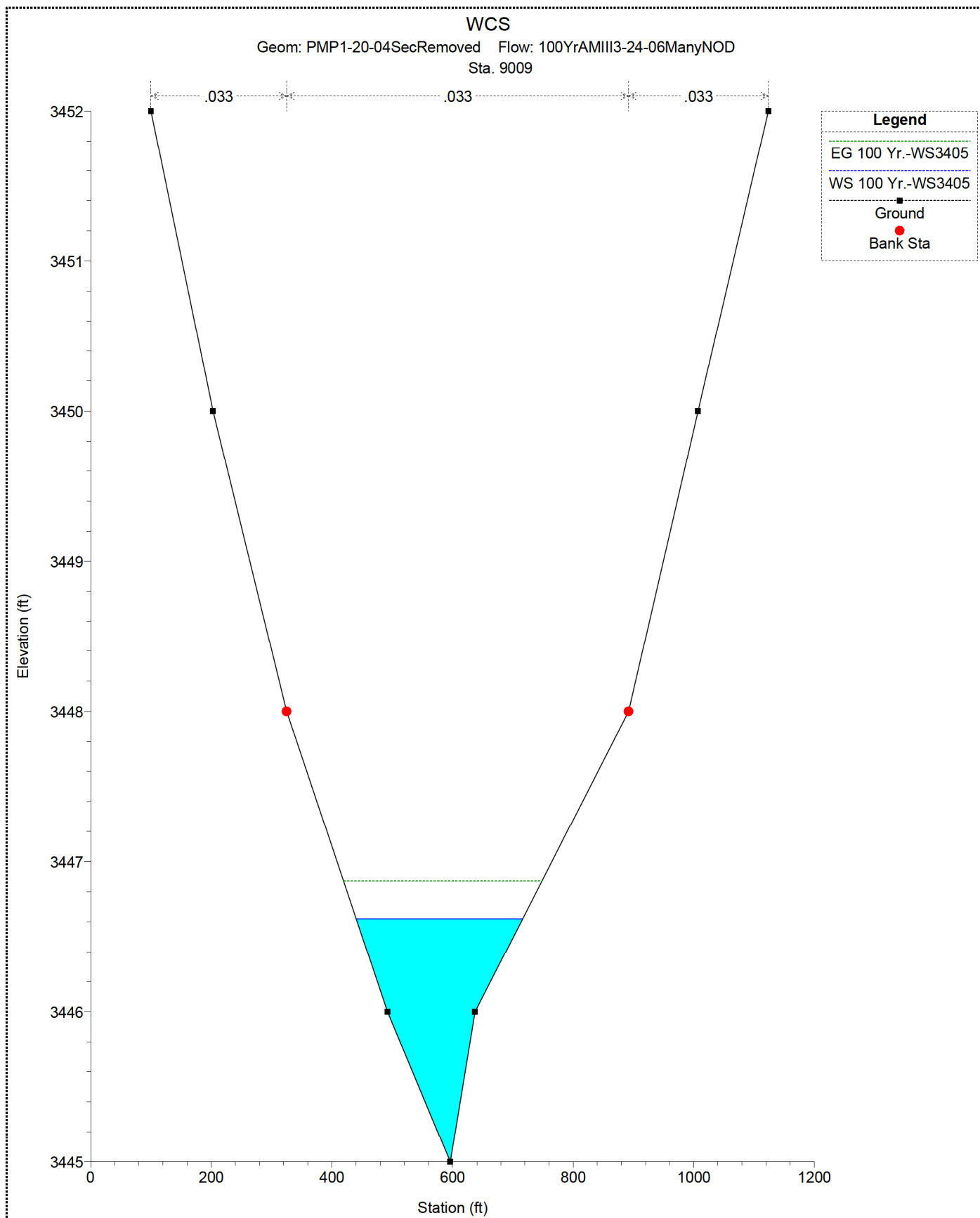


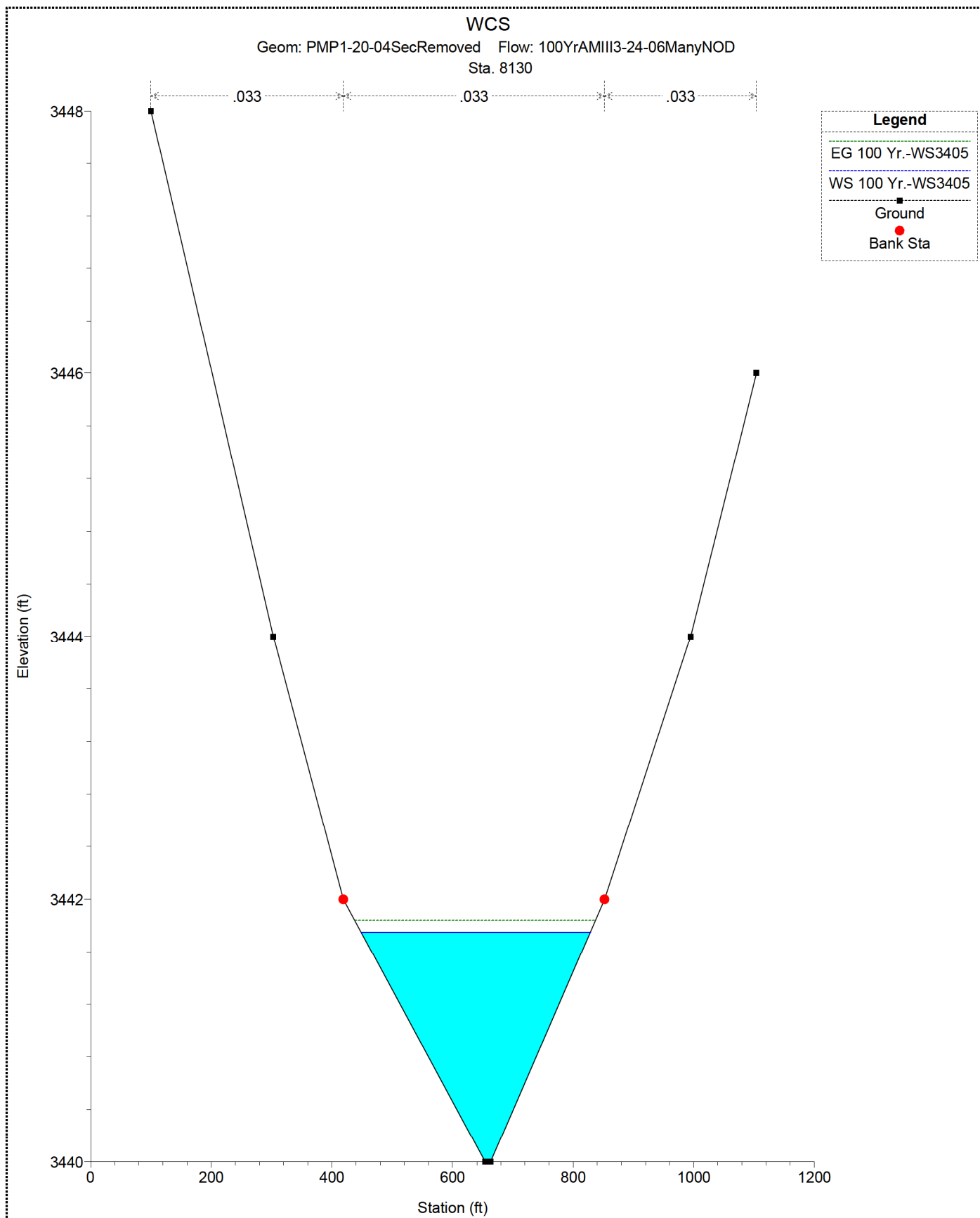


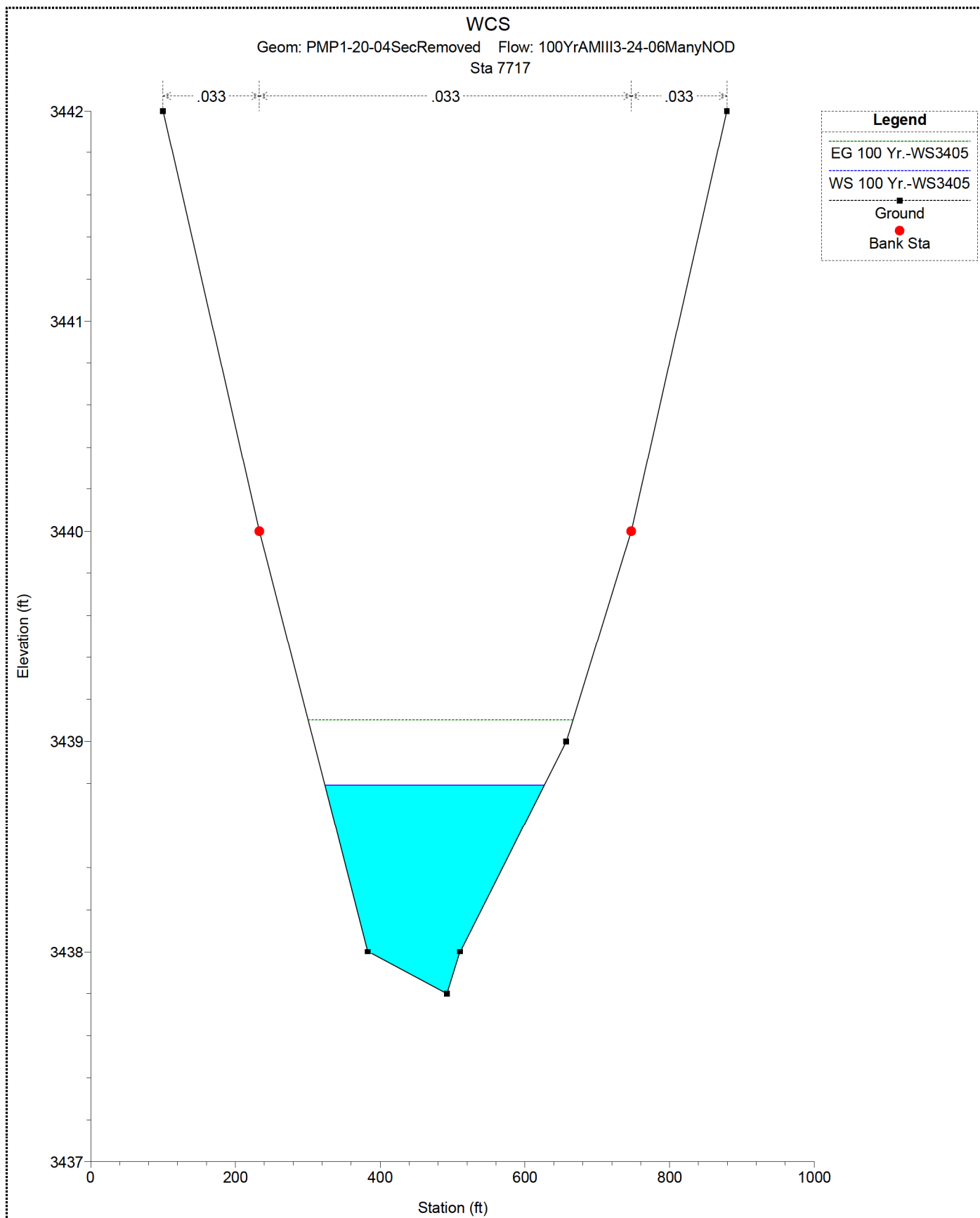


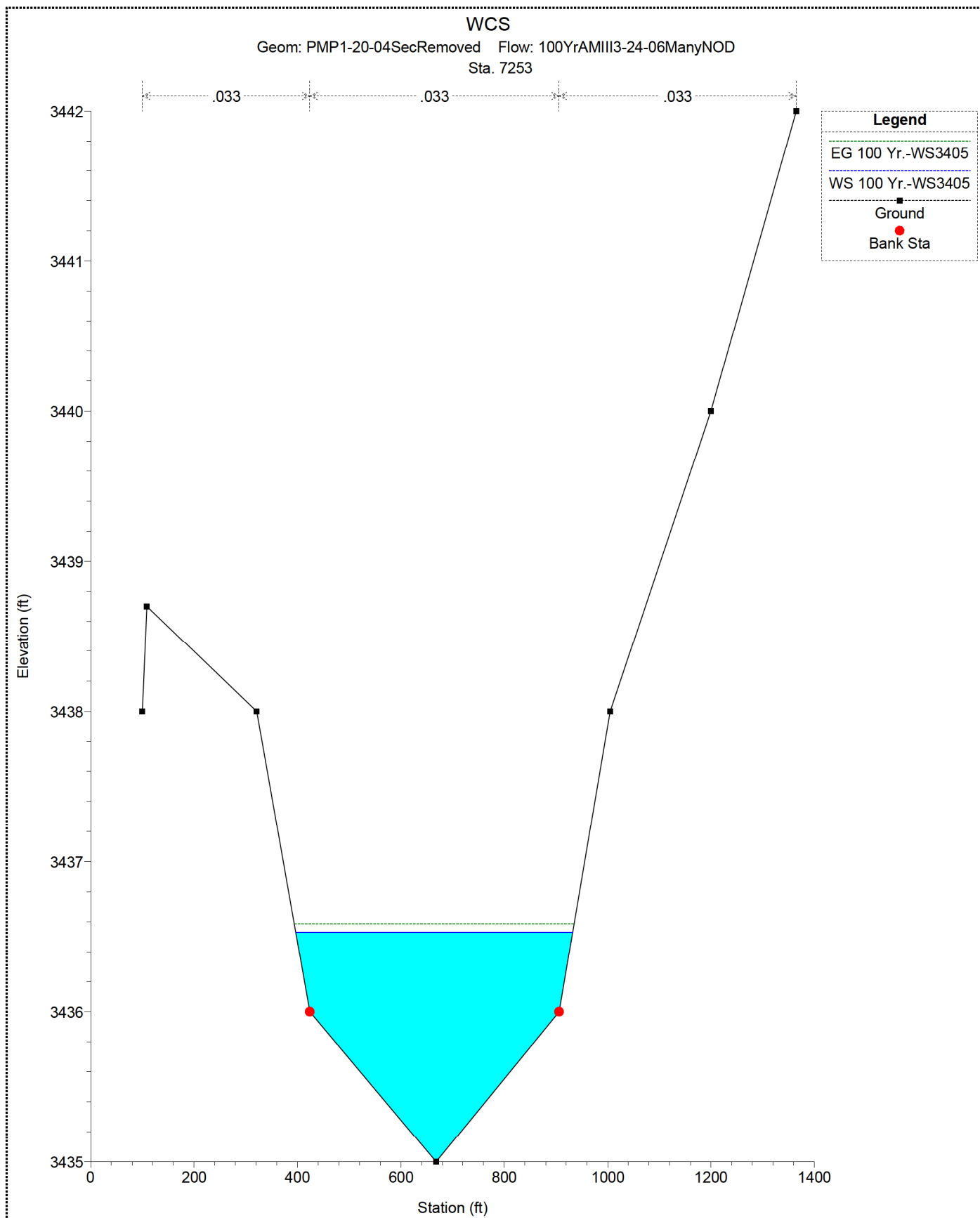


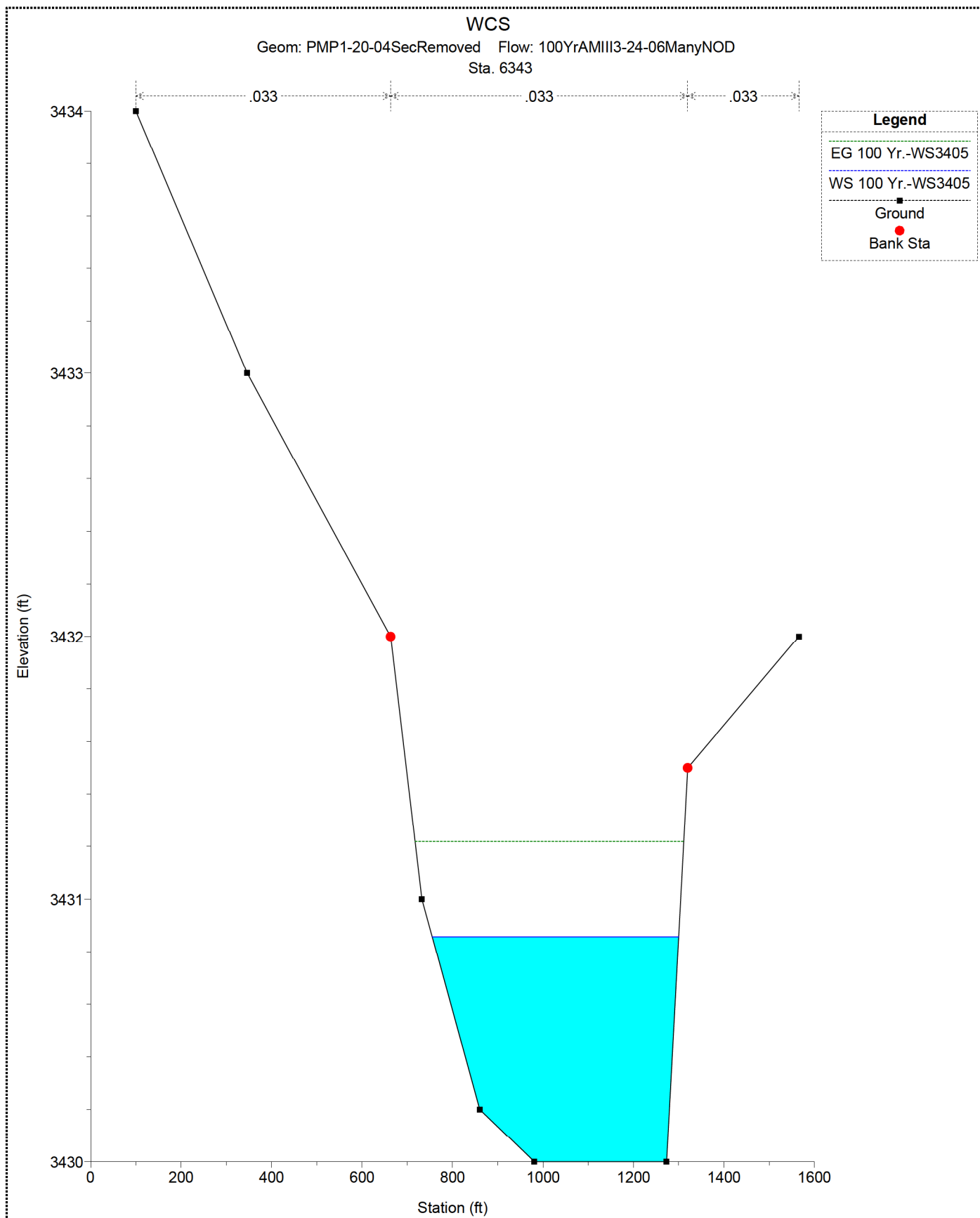


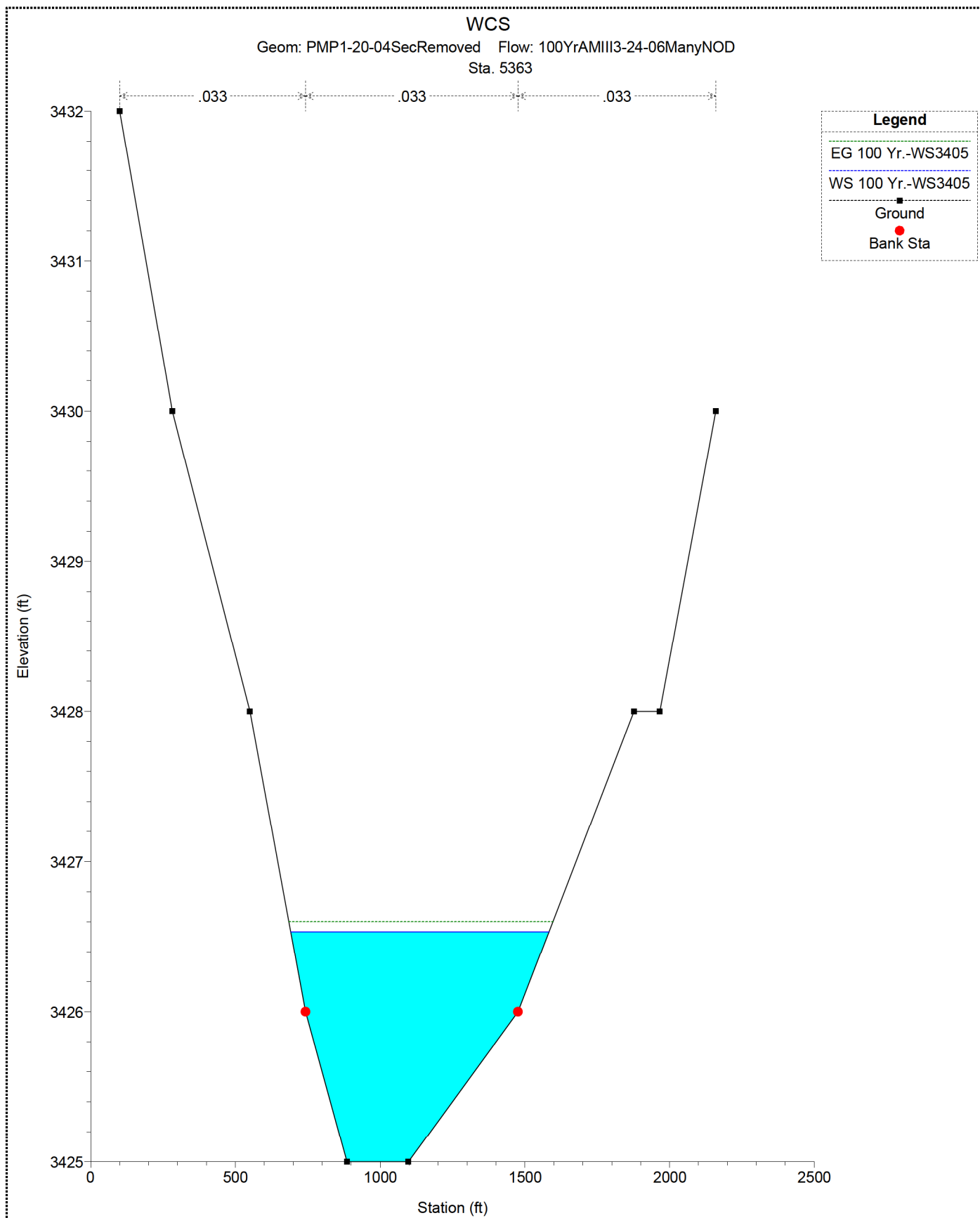




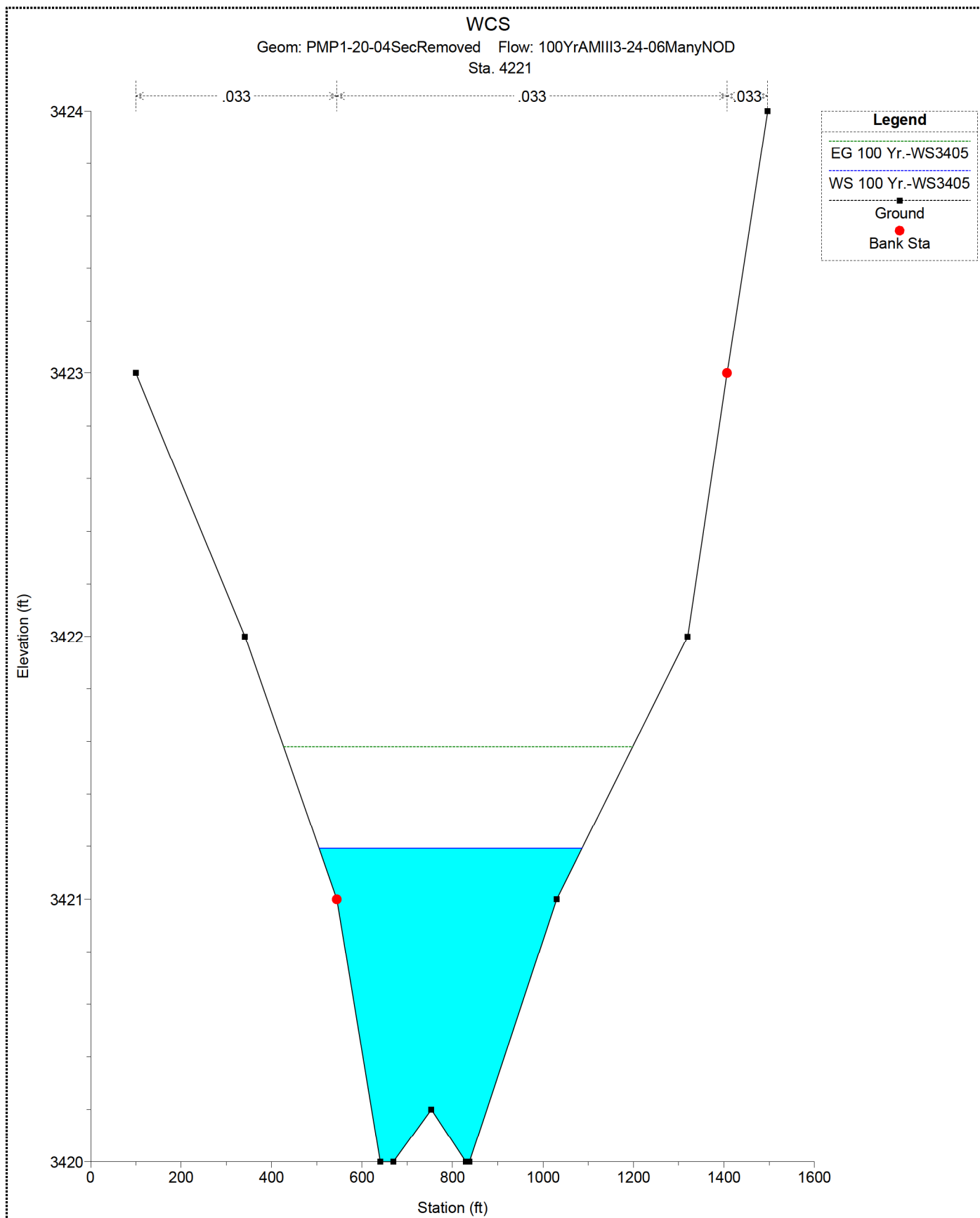


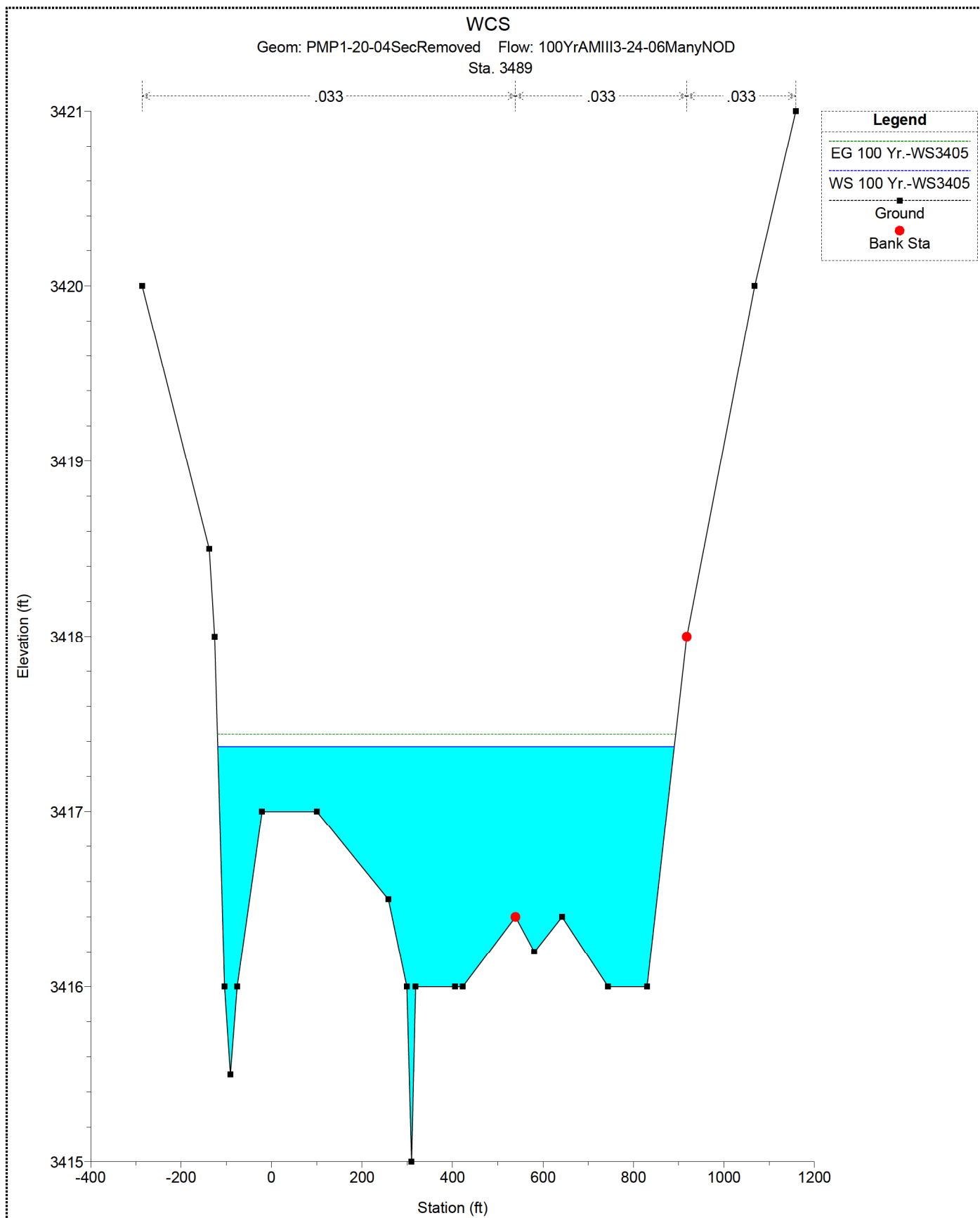


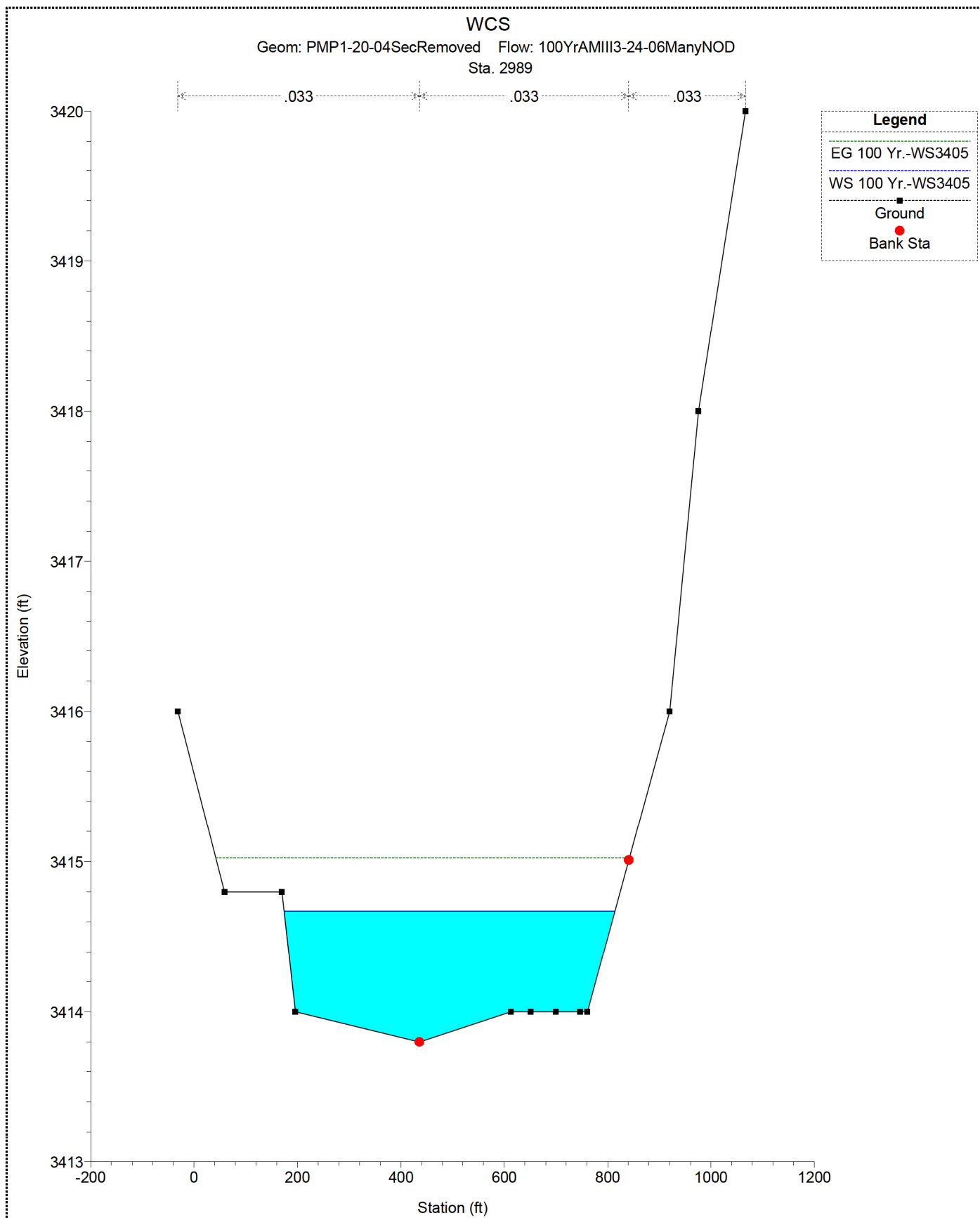


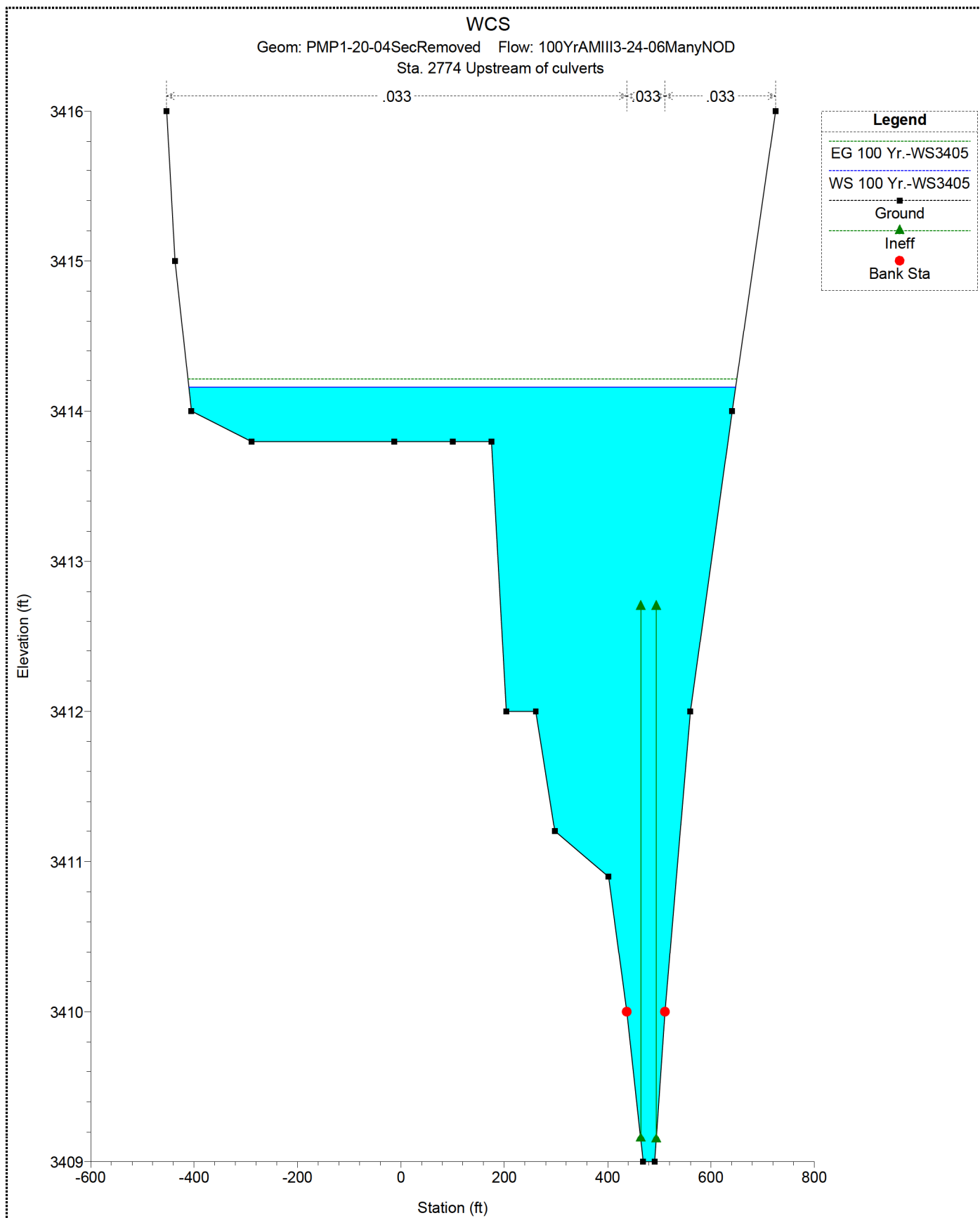


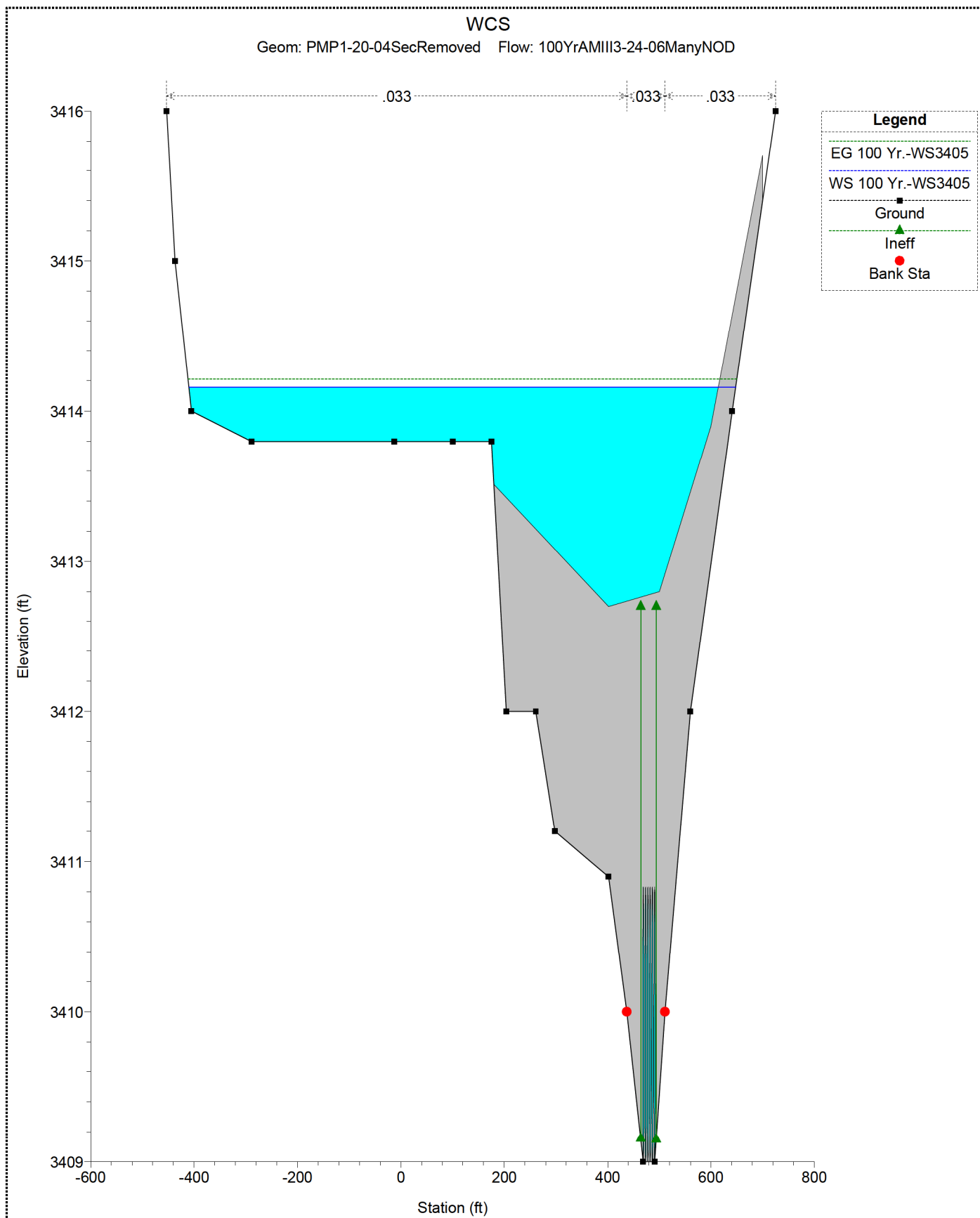






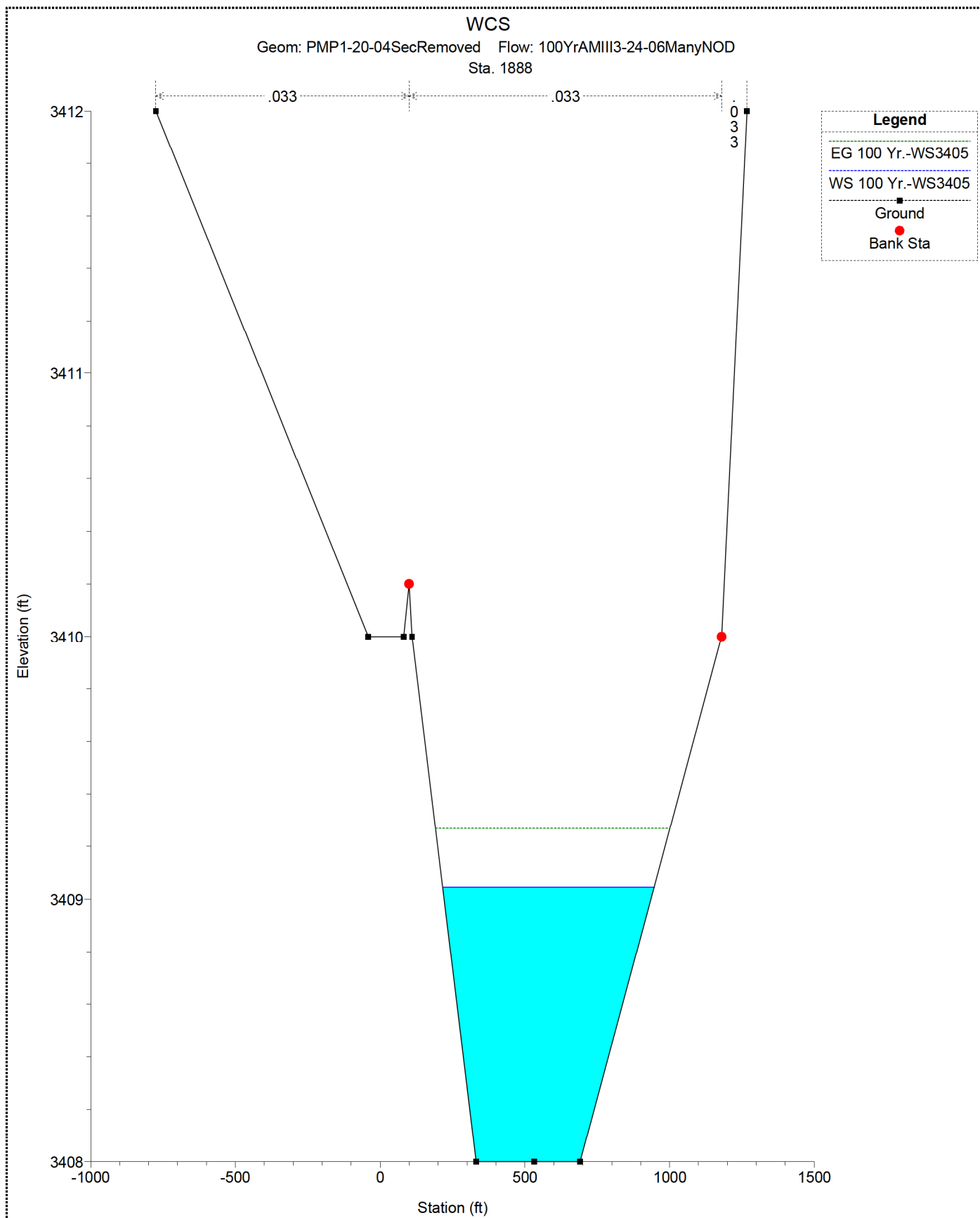




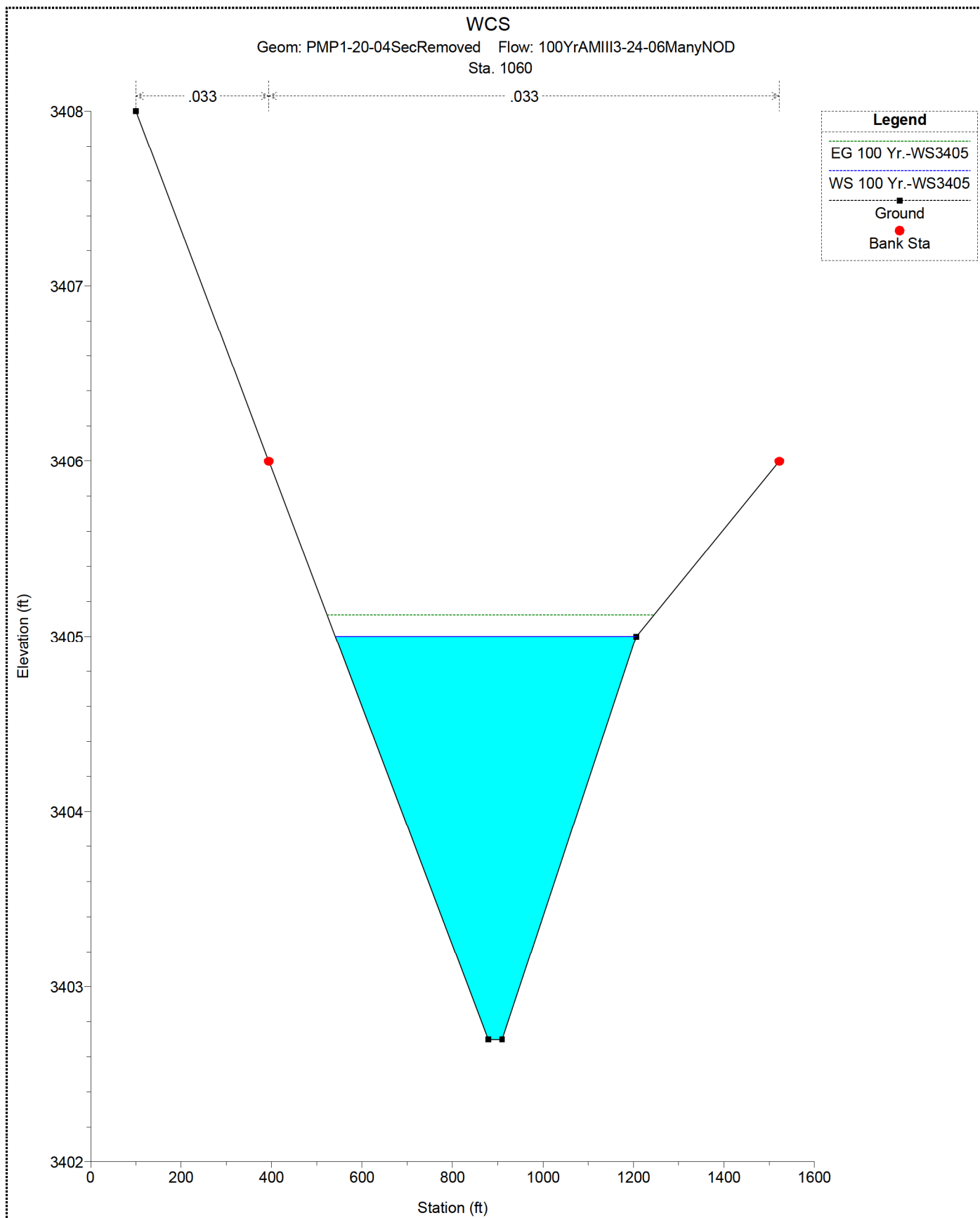












## **APPENDIX S**

### **HEC-HMS MODEL FOR THE CALCULATION OF THE 500-YEAR PEAK DISCHARGES, ANTECEDENT MOISTURE CONDITION III**

# HMS \* Summary of Results

Project : WCS

Run Name : 500 Yr AMIII

Start of Run : 01Dec00 0000 Basin Model : 100YrAMIII3/24/06NOD  
 End of Run : 02Dec00 0000 Met. Model : Met 500 Year  
 Execution Time : 29Mar06 1420 Control Specs : Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4	1210.1	01 Dec 00 1231	190.85	0.490
Reach-2	1210.1	01 Dec 00 1246	190.21	0.490
Subbasin-2	1741.4	01 Dec 00 1258	390.34	1.063
playa	0.0	30 Nov 00 2400	0.0	1.063
Reach-1	0.0	30 Nov 00 2400	0.0	1.063
Subbasin-1A	975.62	01 Dec 00 1319	274.21	0.691
Reach-1A	975.62	01 Dec 00 1336	273.13	0.691
Subbasin-1B	703.08	01 Dec 00 1236	120.10	0.314
Junction-1A	1241.7	01 Dec 00 1318	393.23	1.005
Reach-1B	1241.7	01 Dec 00 1321	392.96	1.005
Subbasin-3	353.38	01 Dec 00 1236	60.672	0.156
Junction-1	1483.0	01 Dec 00 1252	453.63	2.224
Reach-3	1483.0	01 Dec 00 1309	451.82	2.224
Subbasin-5A	465.61	01 Dec 00 1230	71.094	0.192
Junction-2	2887.8	01 Dec 00 1250	713.12	2.906
Reach-4	2887.8	01 Dec 00 1311	709.60	2.906
Subbasin-5B	504.92	01 Dec 00 1245	97.675	0.265
Junction-3	3286.1	01 Dec 00 1309	807.28	3.171
Reach-5	3286.1	01 Dec 00 1323	804.57	3.171
Subbasin-6	211.72	01 Dec 00 1222	27.467	0.074
Junction-4	3326.9	01 Dec 00 1323	832.04	3.245
Reach-6	3326.9	01 Dec 00 1323	832.04	3.245
Subbasin-7	174.68	01 Dec 00 1257	38.870	0.104
Junction-5	3472.7	01 Dec 00 1322	870.91	3.349

## Meteorologic Model Input

The screenshot shows a software window titled "HMS \* Meteorologic Model". It has a menu bar with "File", "Edit", and "Help". The "Meteorologic Model" is set to "Met 500 Year". The "Description" field contains "500 Year, 24 Hour Storm". There is a "Subbasin List" button. Two tabs are visible: "Precipitation" (selected) and "Evapotranspiration". Under the "Precipitation" tab, the "Method" is set to "SCS Hypothetical Storm". The "Storm Selection" is set to "Type II". The "Storm Depth (in)" is set to "8.71". At the bottom are "OK", "Apply", and "Cancel" buttons. A status bar is at the very bottom.

**HMS \* Meteorologic Model**

File Edit Help

Meteorologic Model: Met 500 Year Subbasin List

Description: 500 Year, 24 Hour Storm

Precipitation Evapotranspiration

Method : SCS Hypothetical Storm

Storm Selection: Type II

Storm Depth (in) : 8.71

OK Apply Cancel

**HMS \* Basin Model \* SCS Curve Number**

Sort Help

Basin Model ID: 100YrAMIII3/24/06NOD

Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	91		0.0
Subbasin-2	86		0.0
Subbasin-3	89		0.0
Subbasin-4	89		0.0
Subbasin-5B	86		0.0
Subbasin-6	86		0.0
Subbasin-1B	88		0.0
Subbasin-5A	86		0.0
Subbasin-7	87		0.0

OK Apply Cancel

**HMS \* Basin Model \* SCS UH**

Sort Help

Basin Model ID: 100YrAMIII3/24/06NOD

Time Units : Minutes

Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3	44
Subbasin-4	39
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64

OK Apply Cancel

**HMS \* Basin Model \* Lag Routing**

Help

Basin Model ID : 100YrAMIII3/24/06NOD

Interval : Minutes

Reach Name	Lag (min)
Reach-1	35
Reach-2	15
Reach-3	17
Reach-4	21
Reach-5	14
Reach-1A	17
Reach-1B	3
Reach-6	0

OK Apply Cancel

**HMS \* Basin Model \* Reservoir Editor**

Edit File Help

Reservoir Name:

Description:  ...

Storage Outlet Spillway Overflow Dam Break

Method:

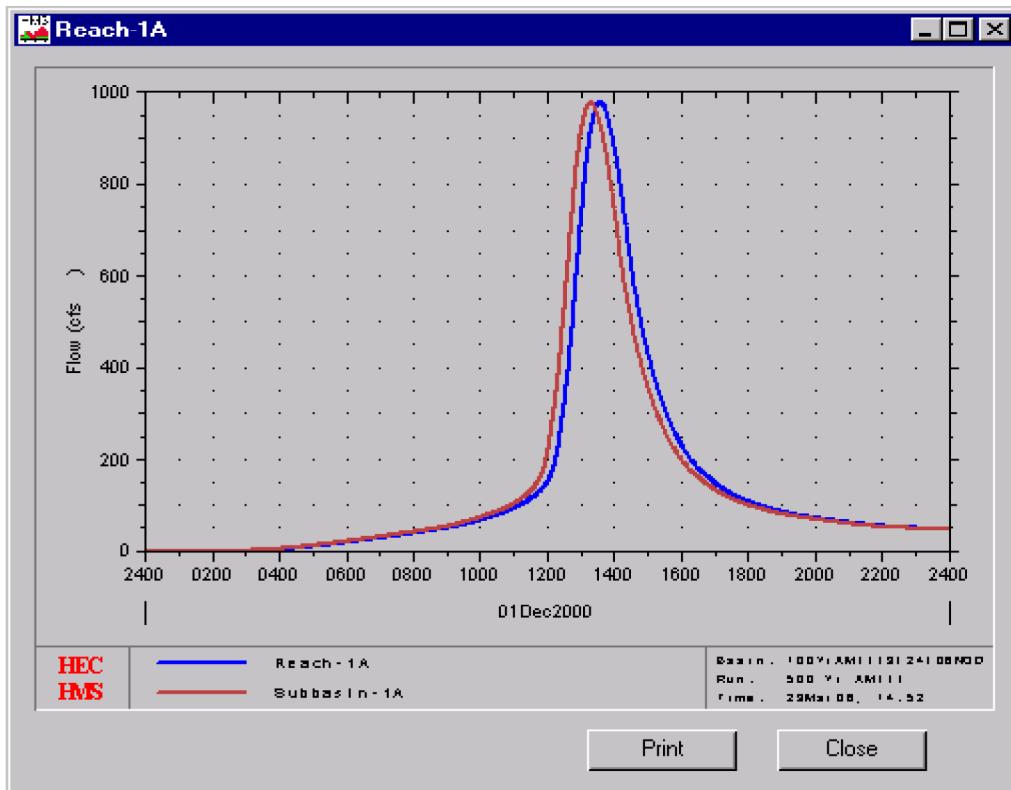
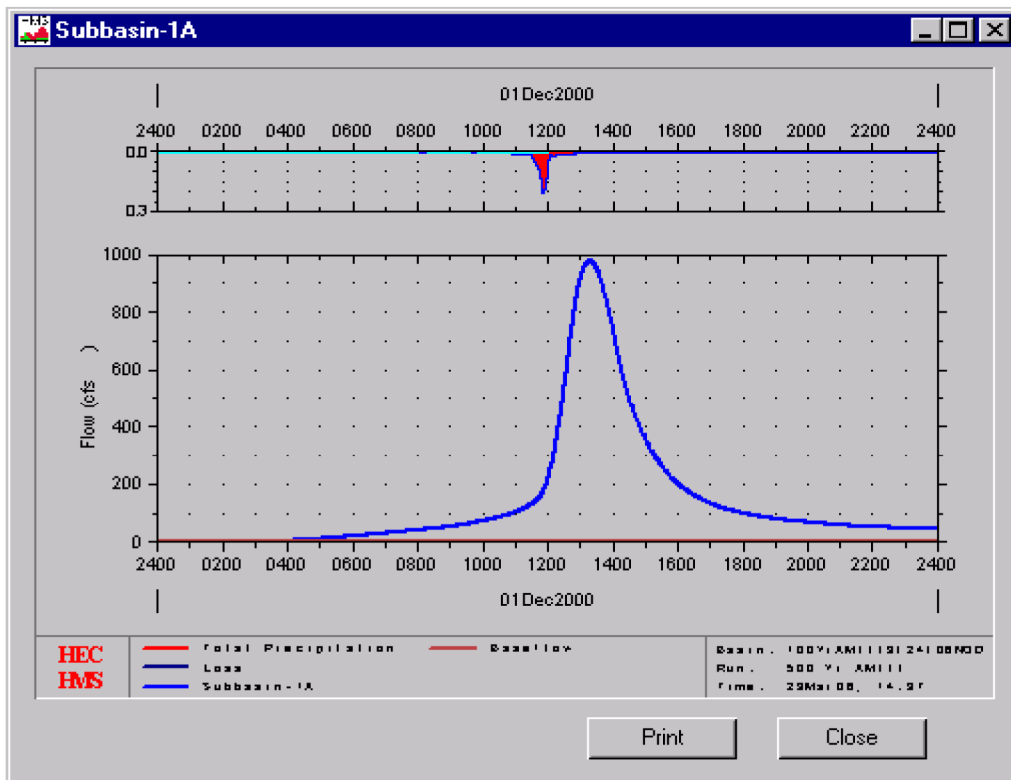
Initial

Elevation (ft)	Storage (acre-feet)	Outflow (cfs)
3478.0	0.0	0.0
3480.0	24.0	0.0
3482.0	61.0	0.0
3484.0	170.0	0.0
3486.0	457.0	0.0
3487.0	693.0	863.0
3488.0	928.0	2427.0

Graph

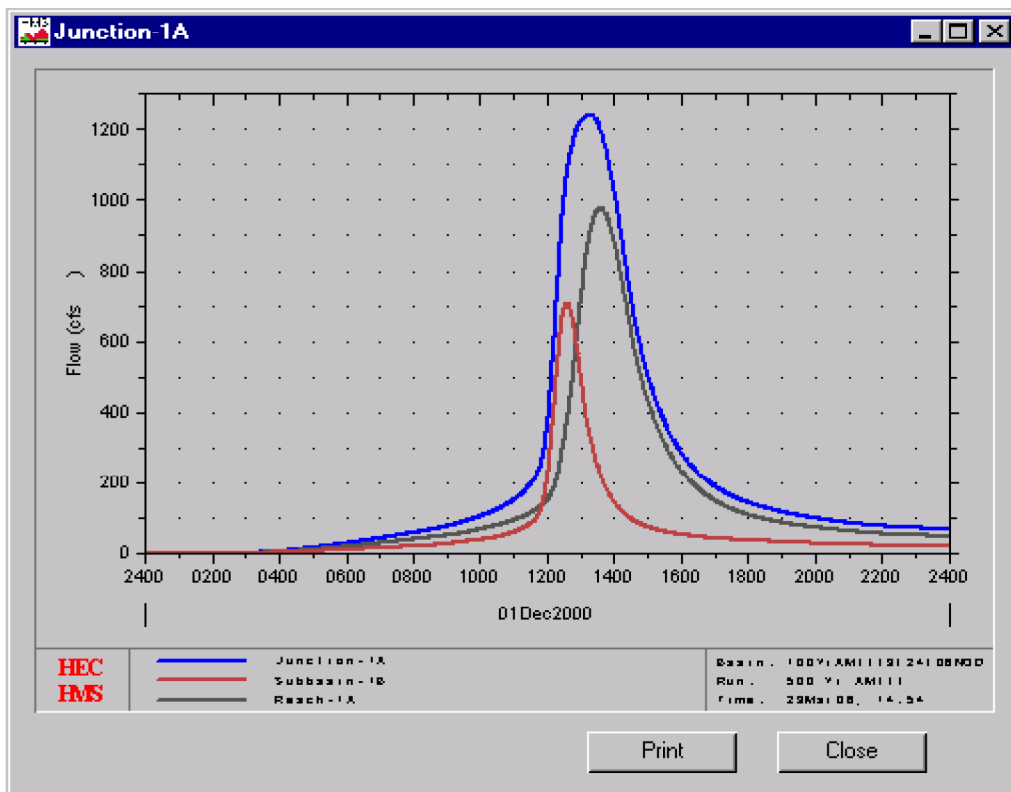
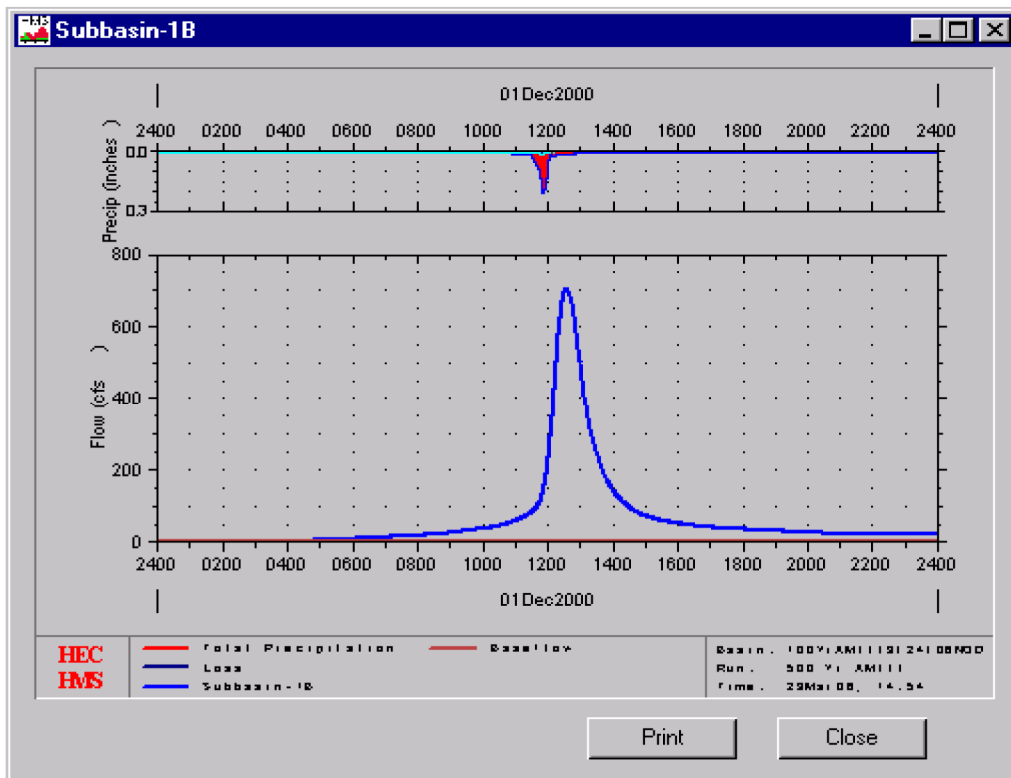
OK Apply Cancel

# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

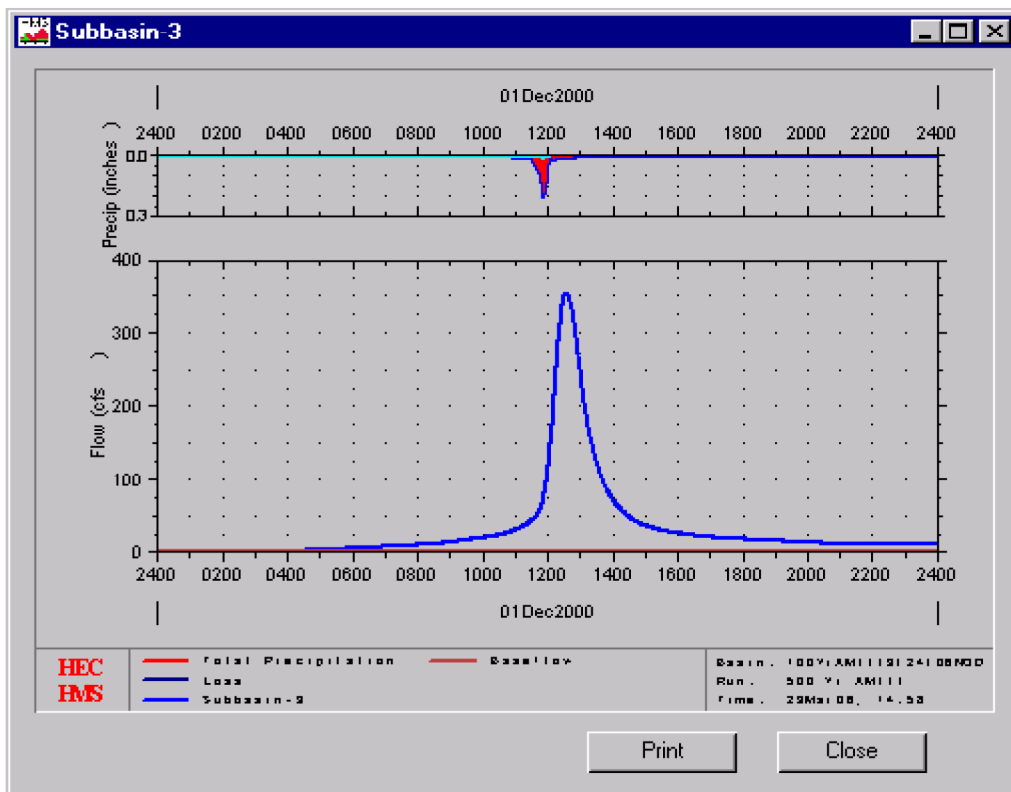
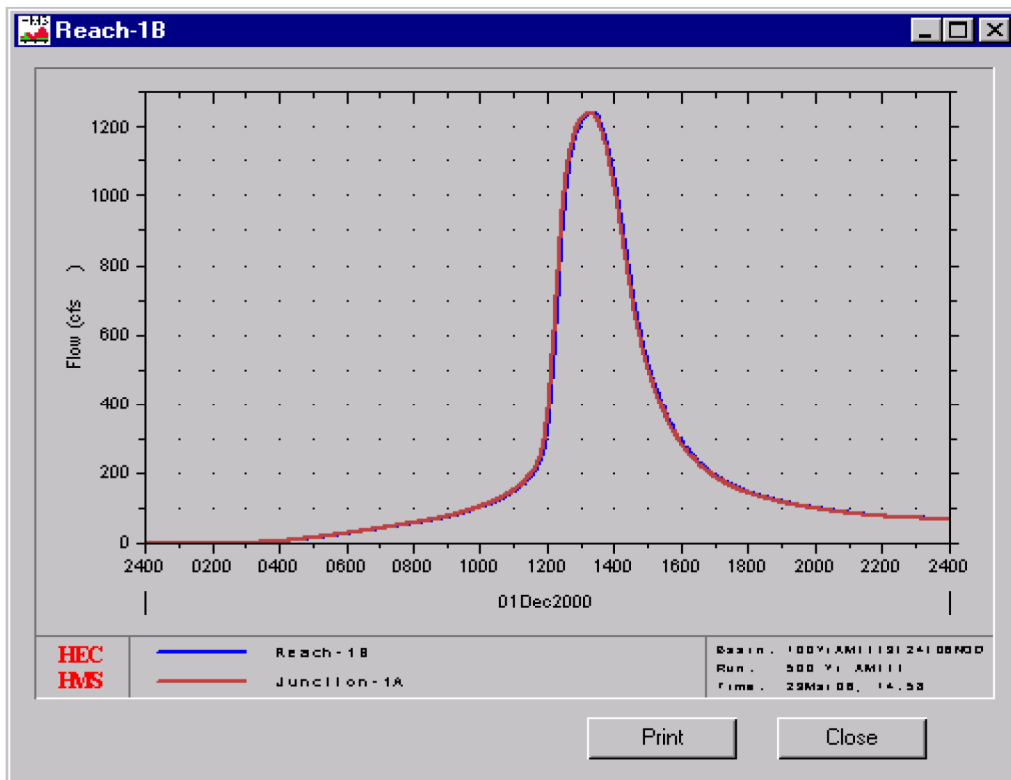




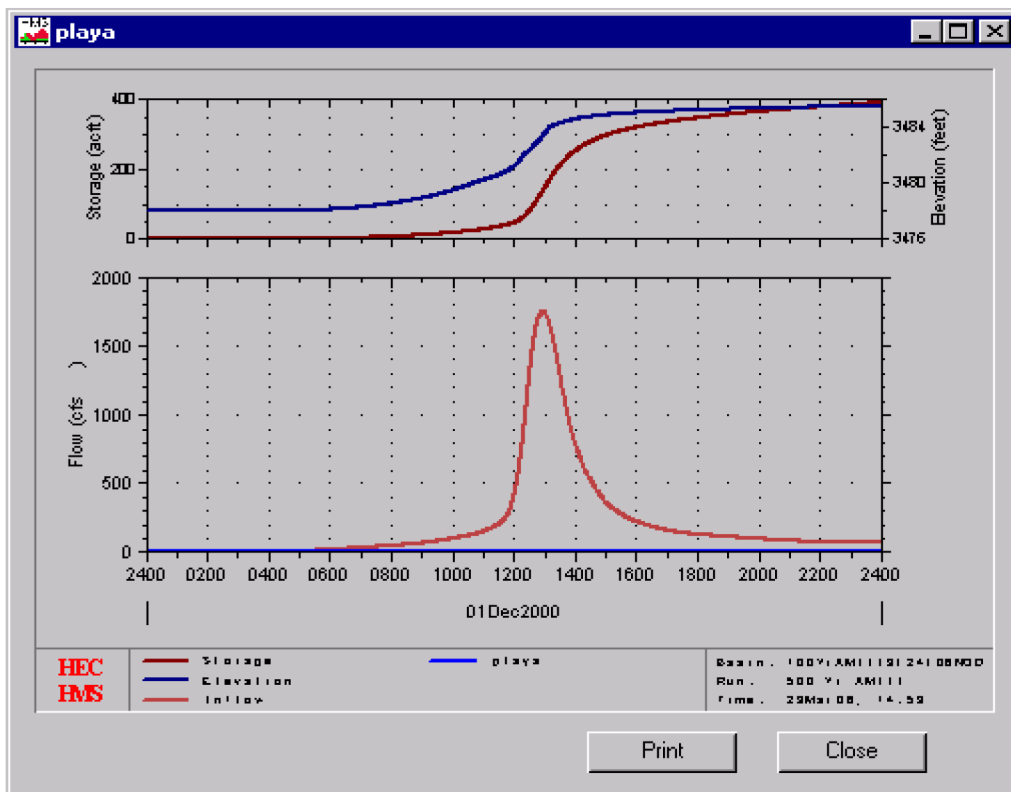
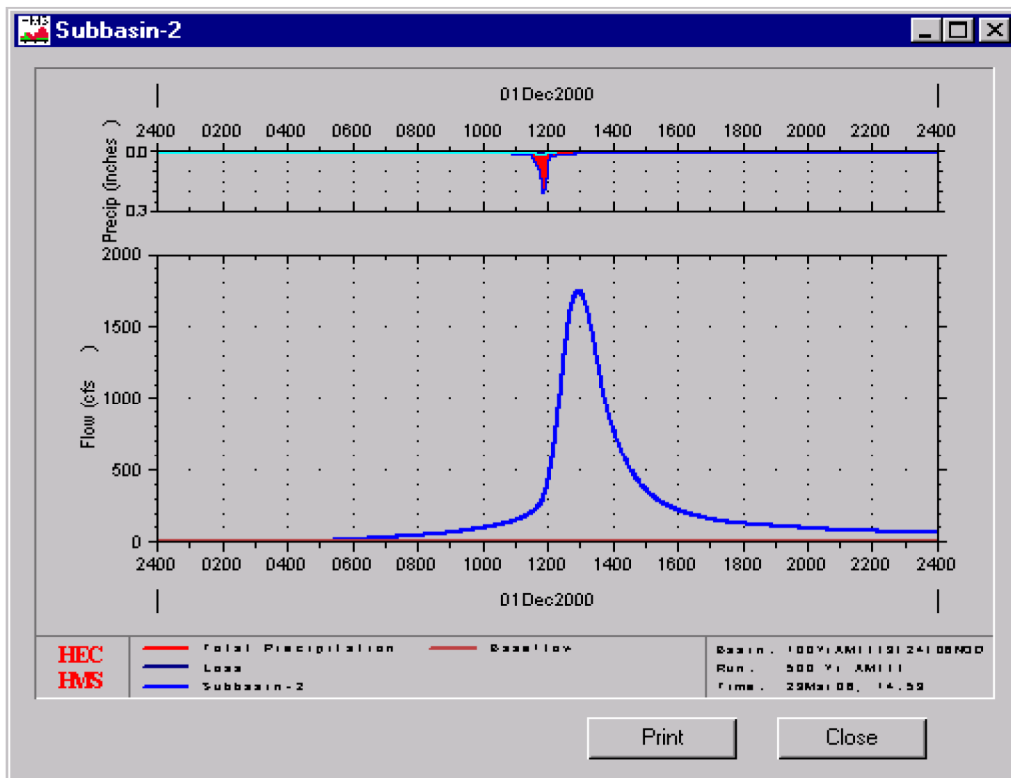
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



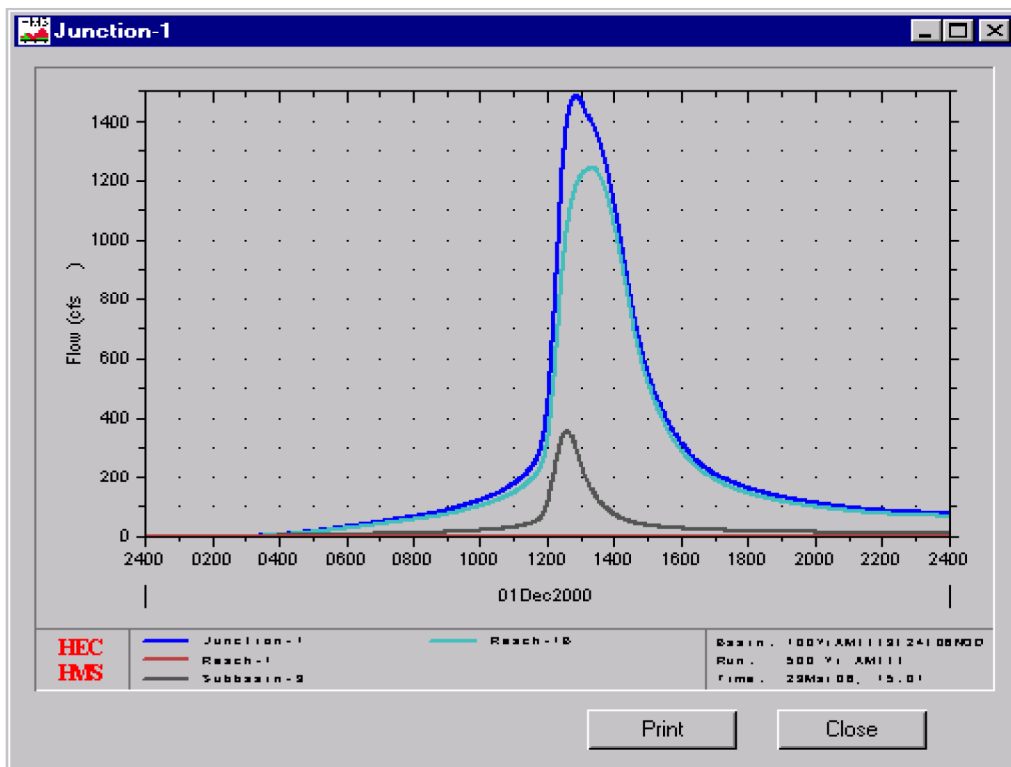
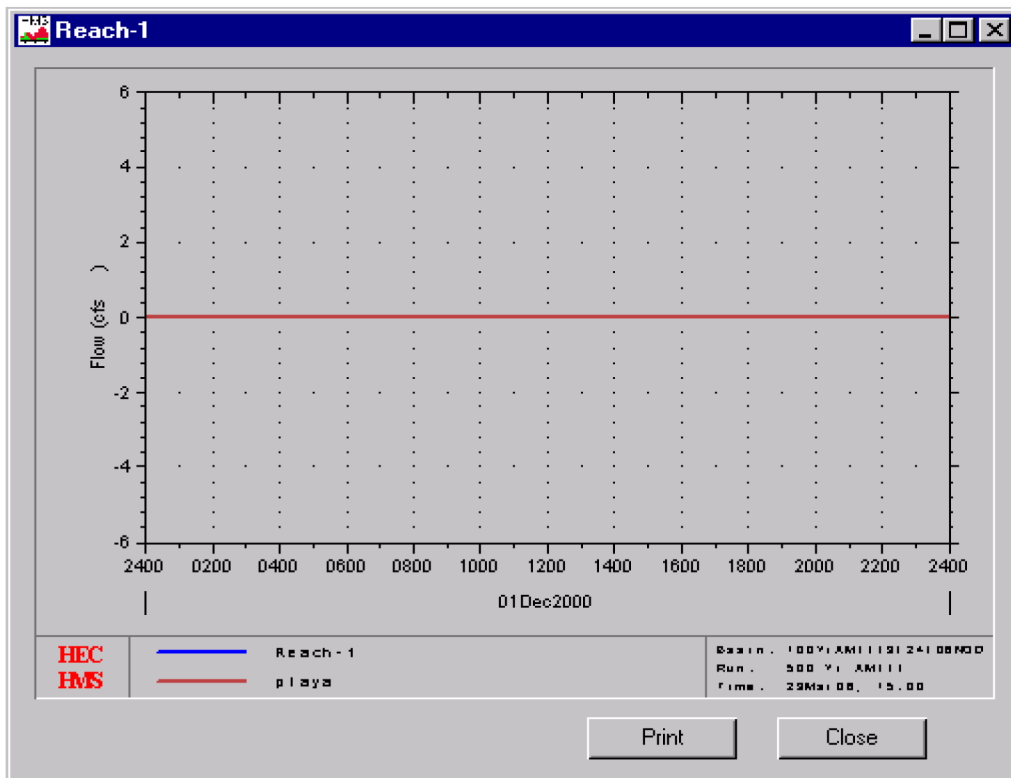
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



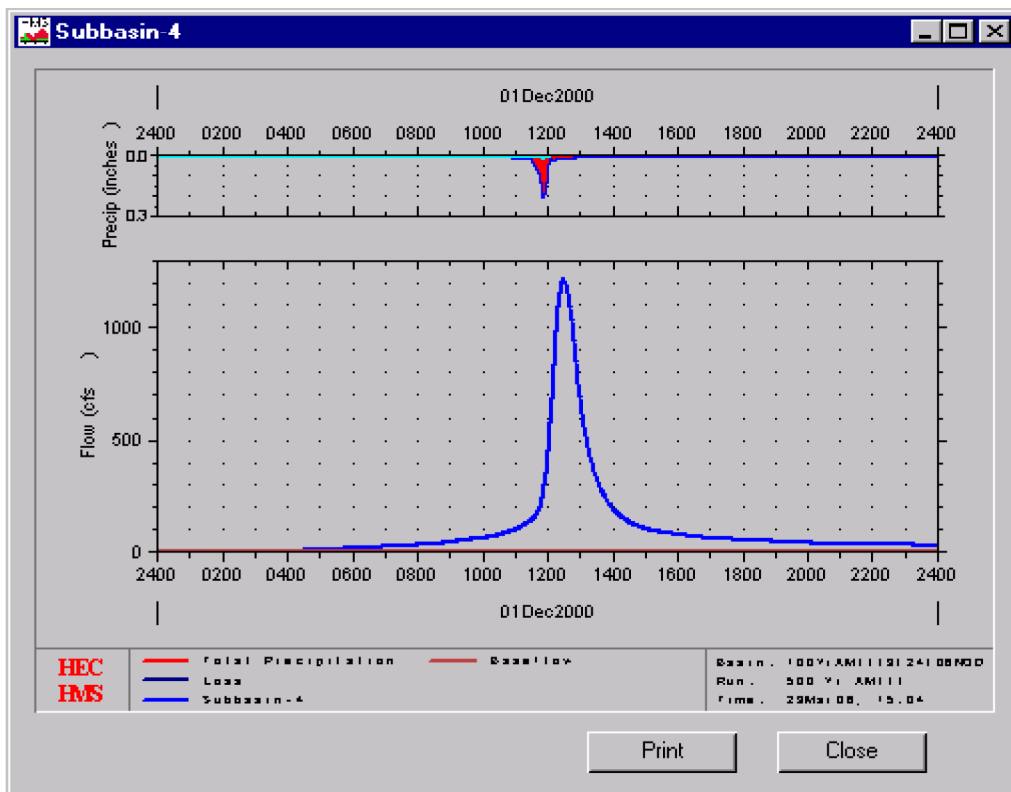
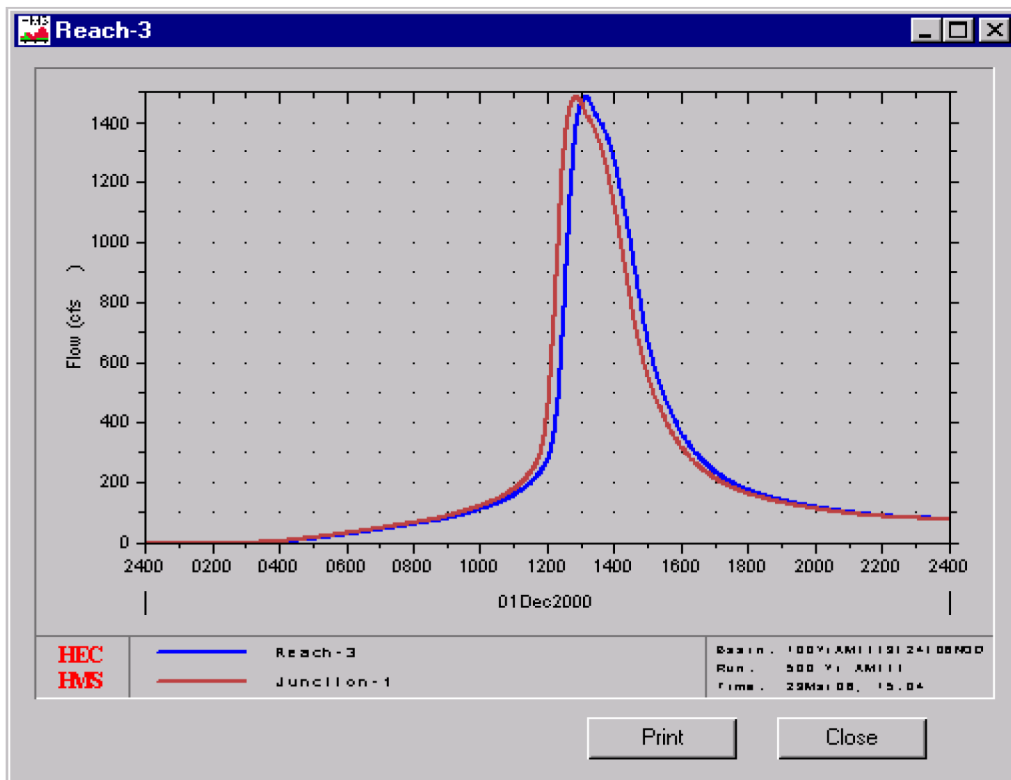
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



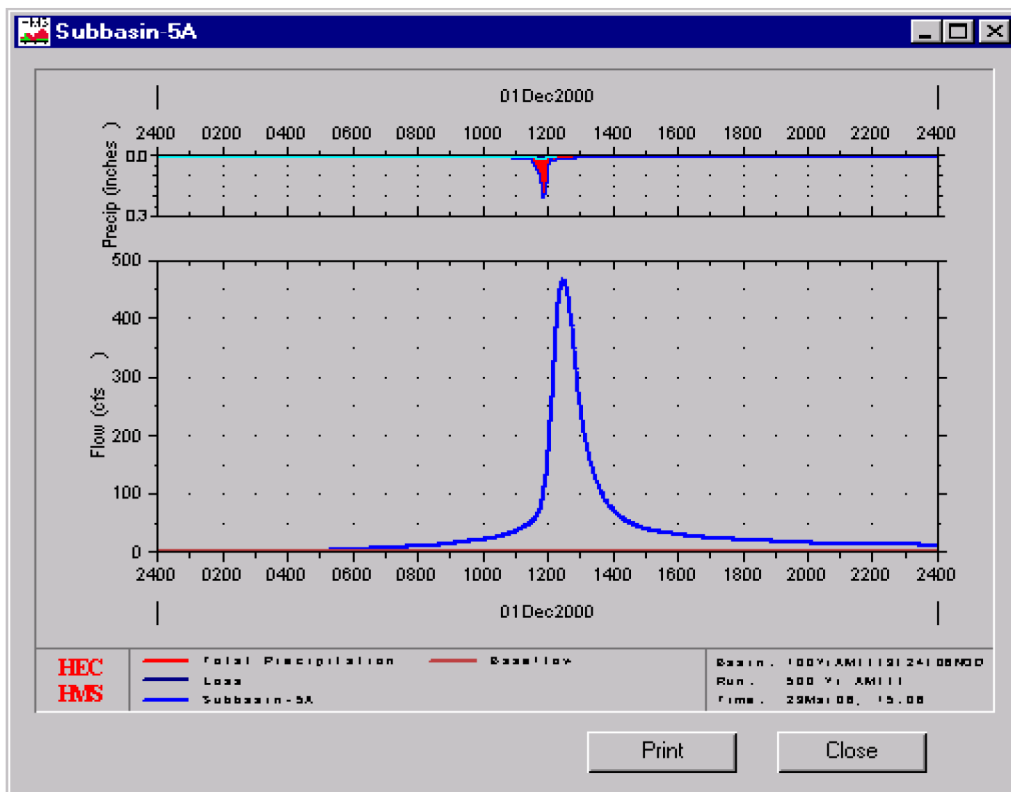
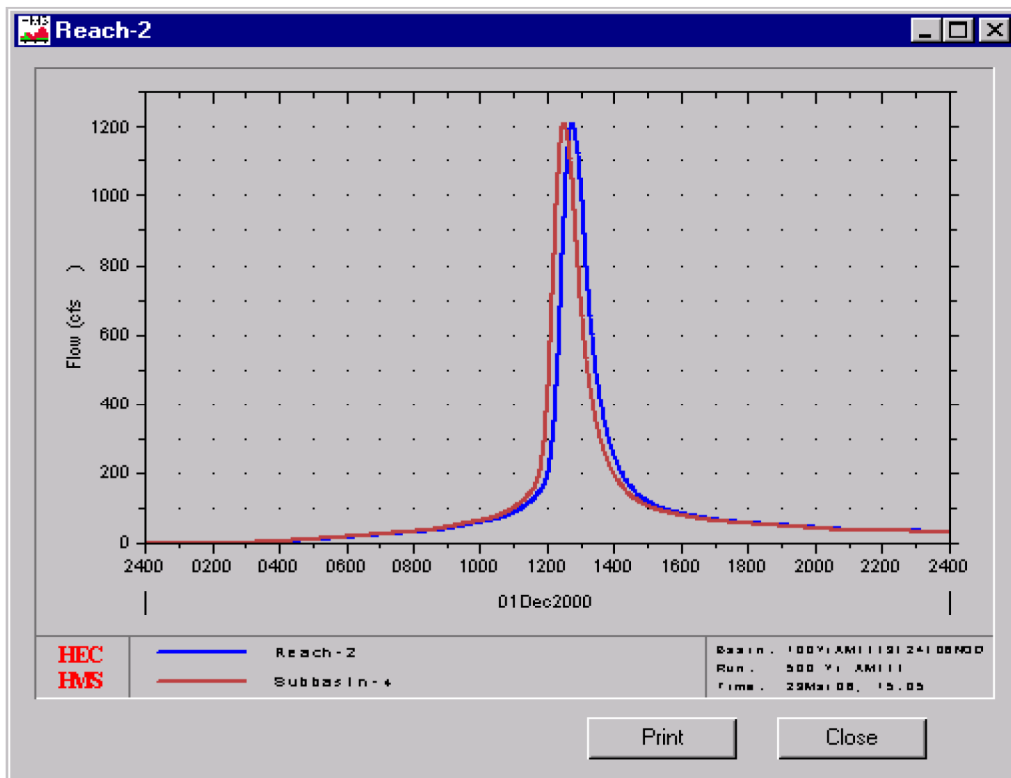
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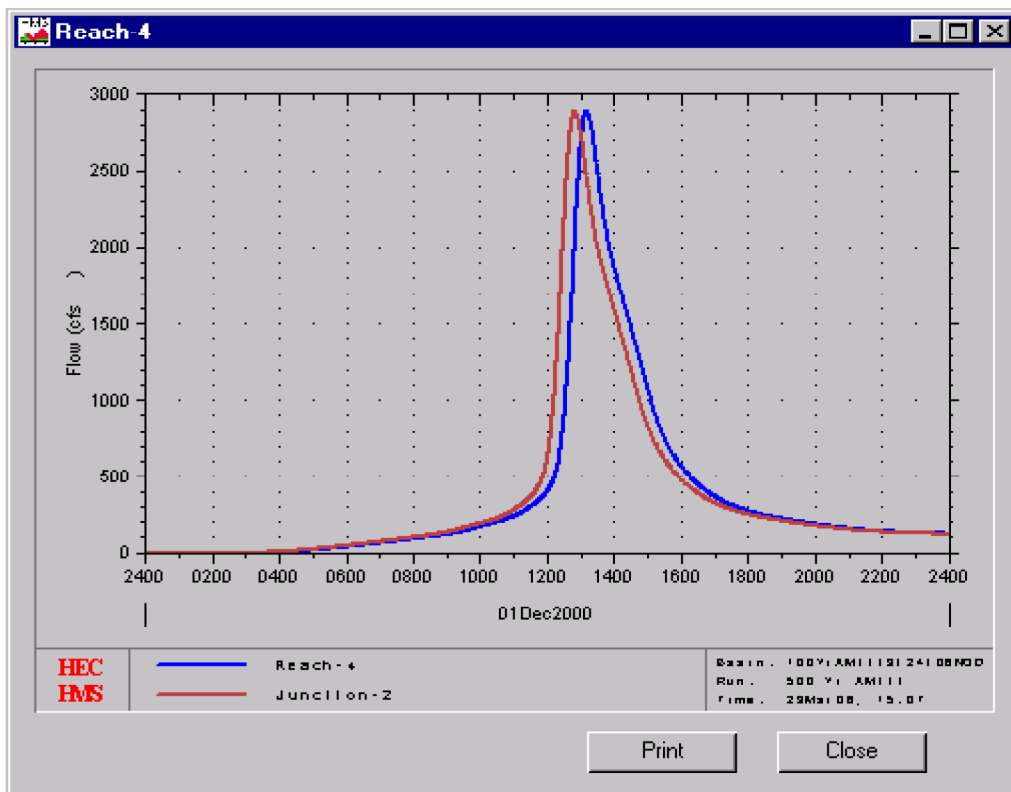
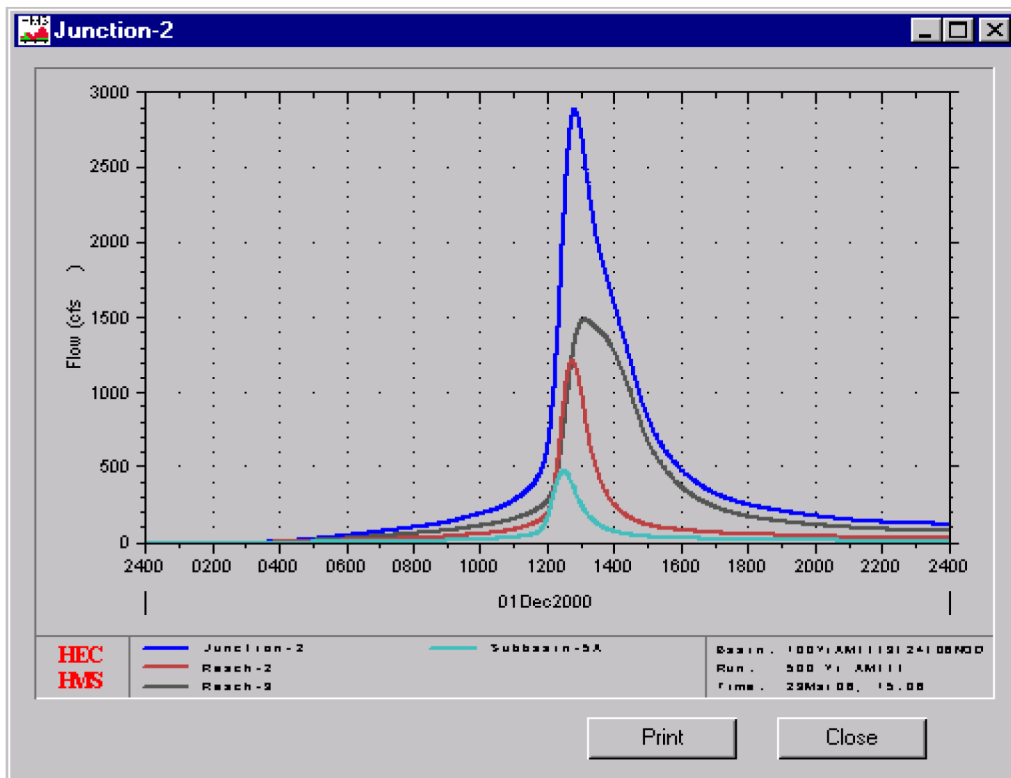
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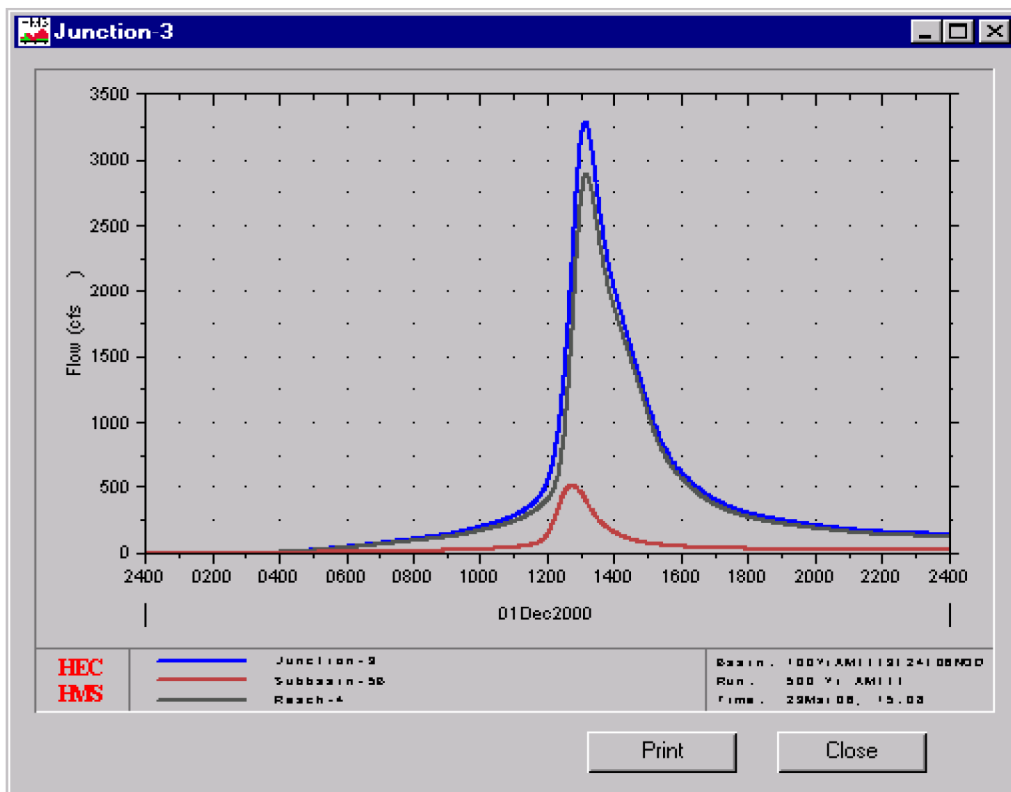
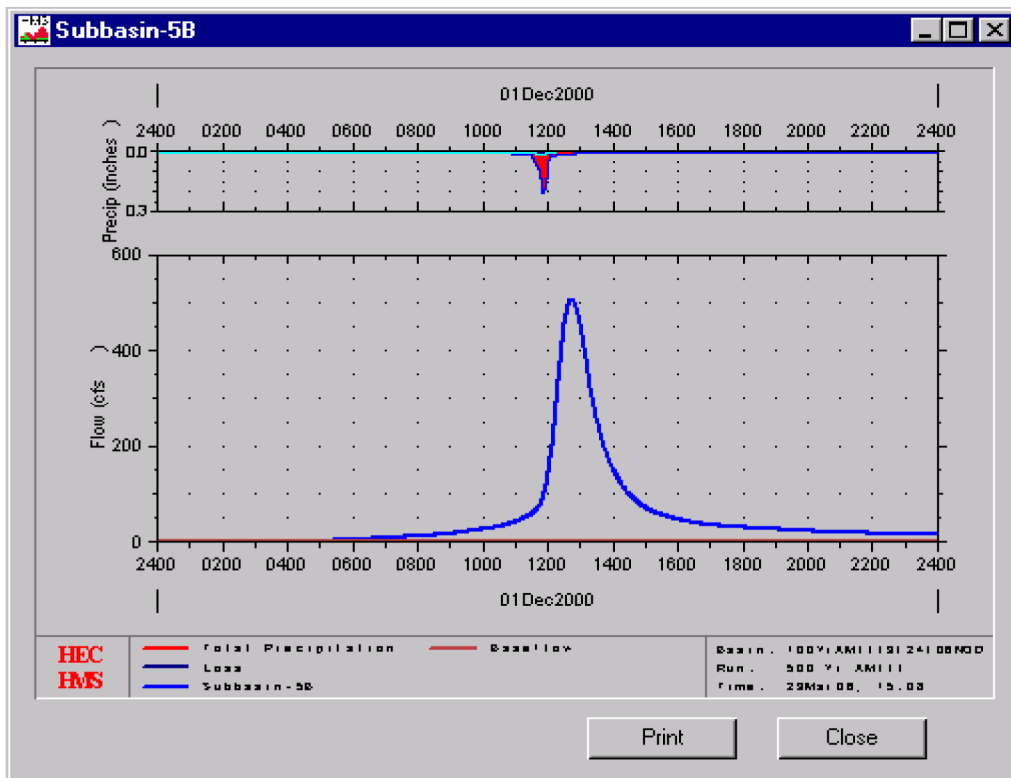
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

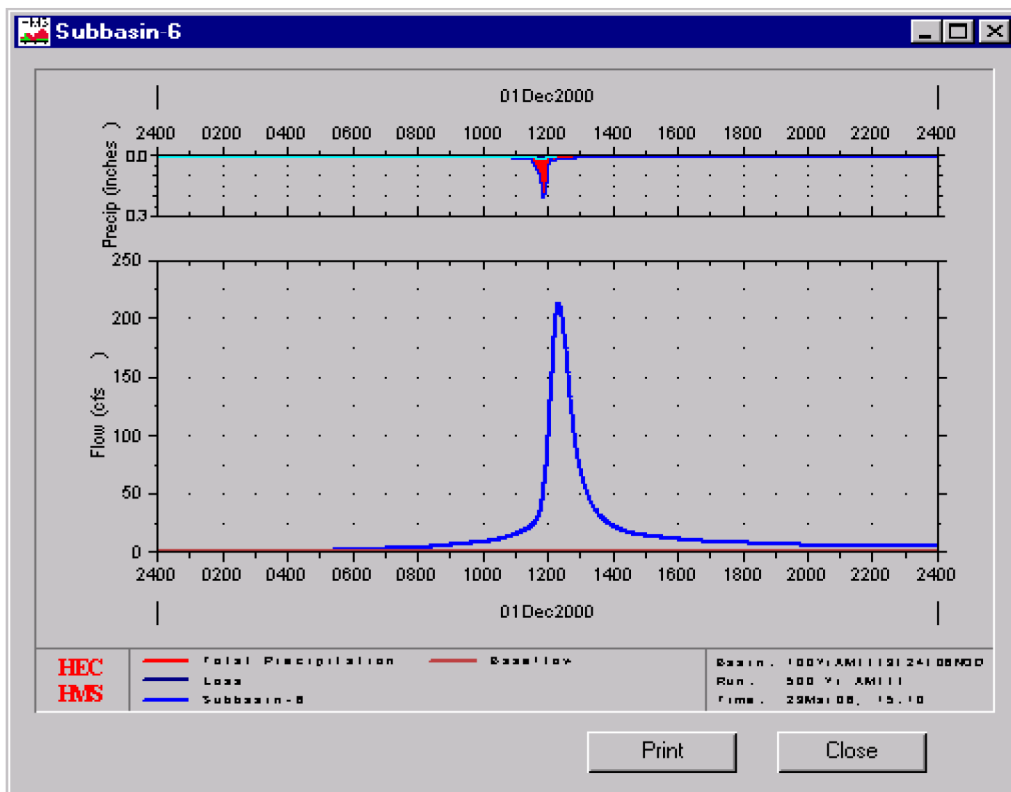
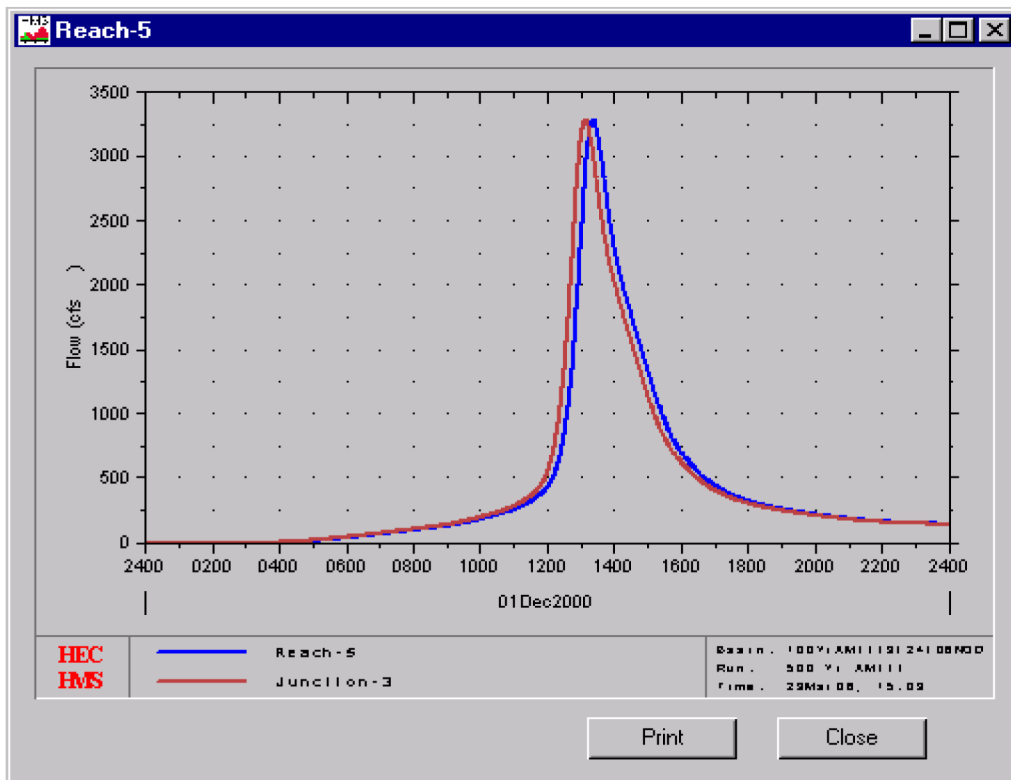


# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

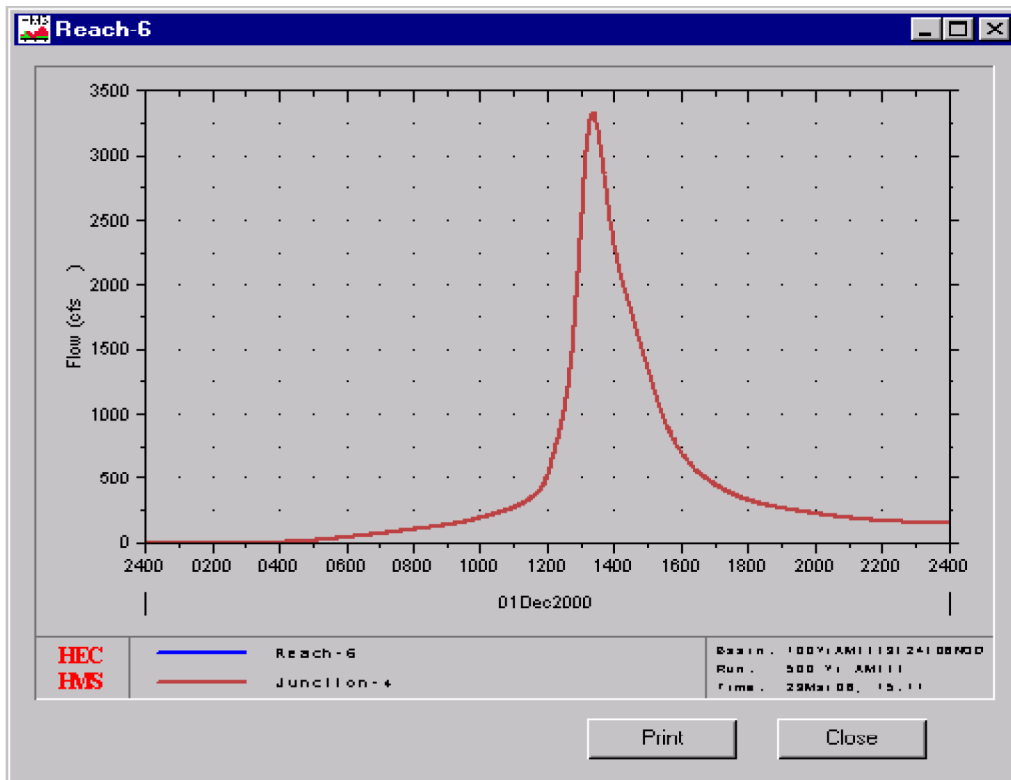
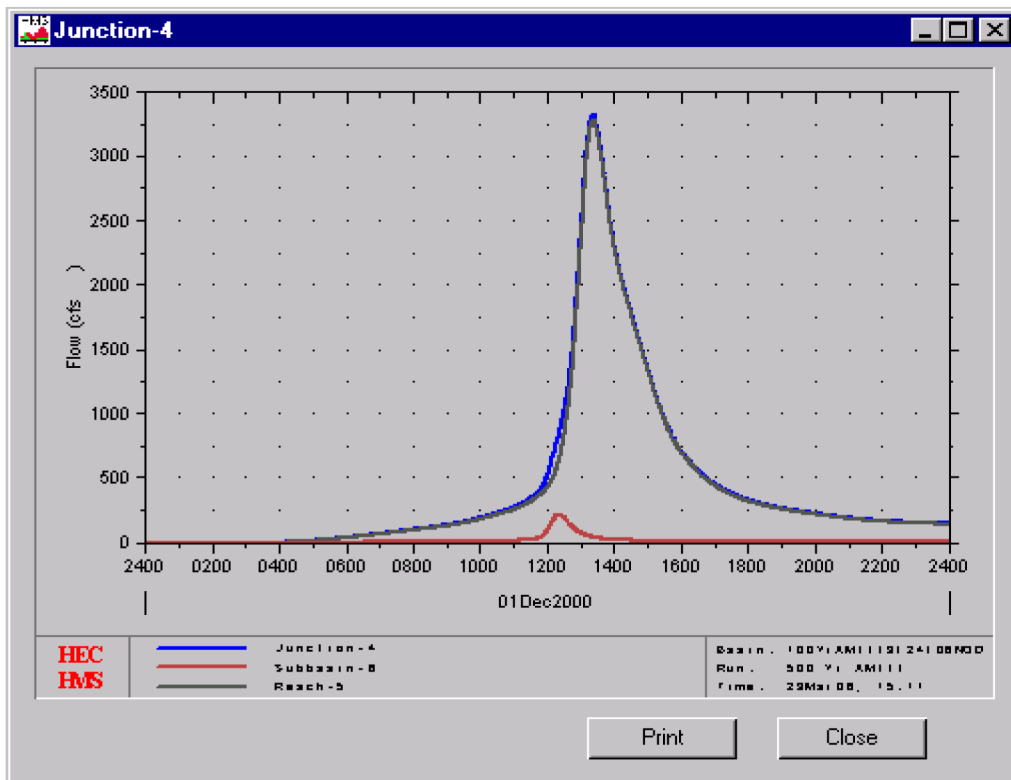




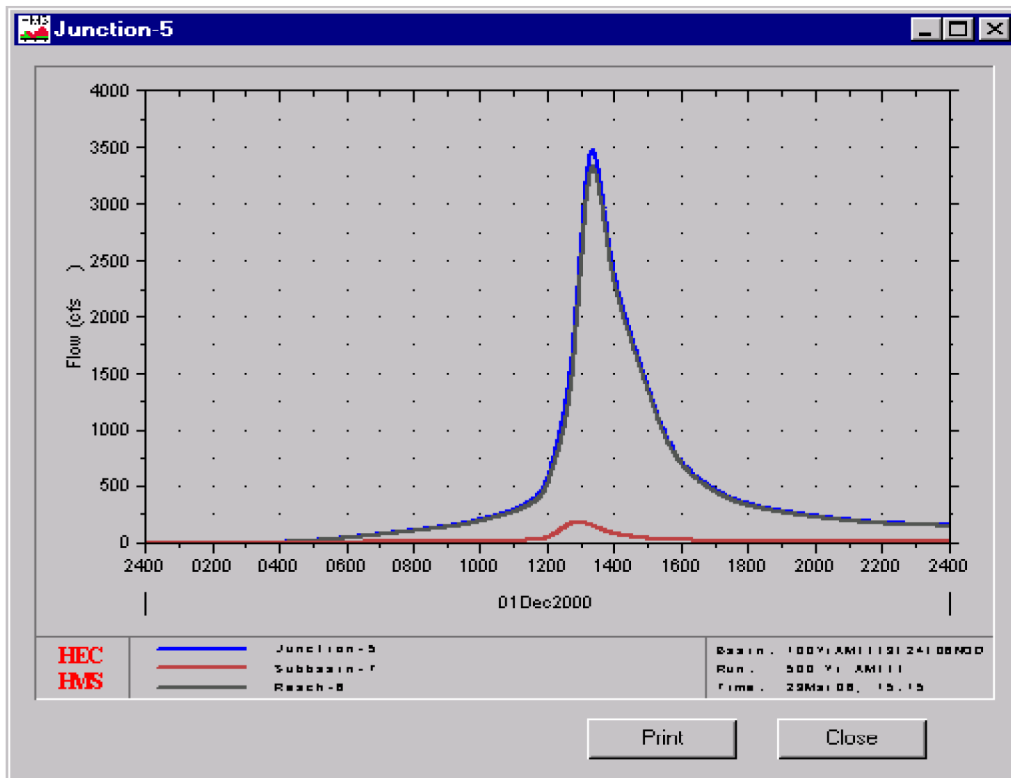
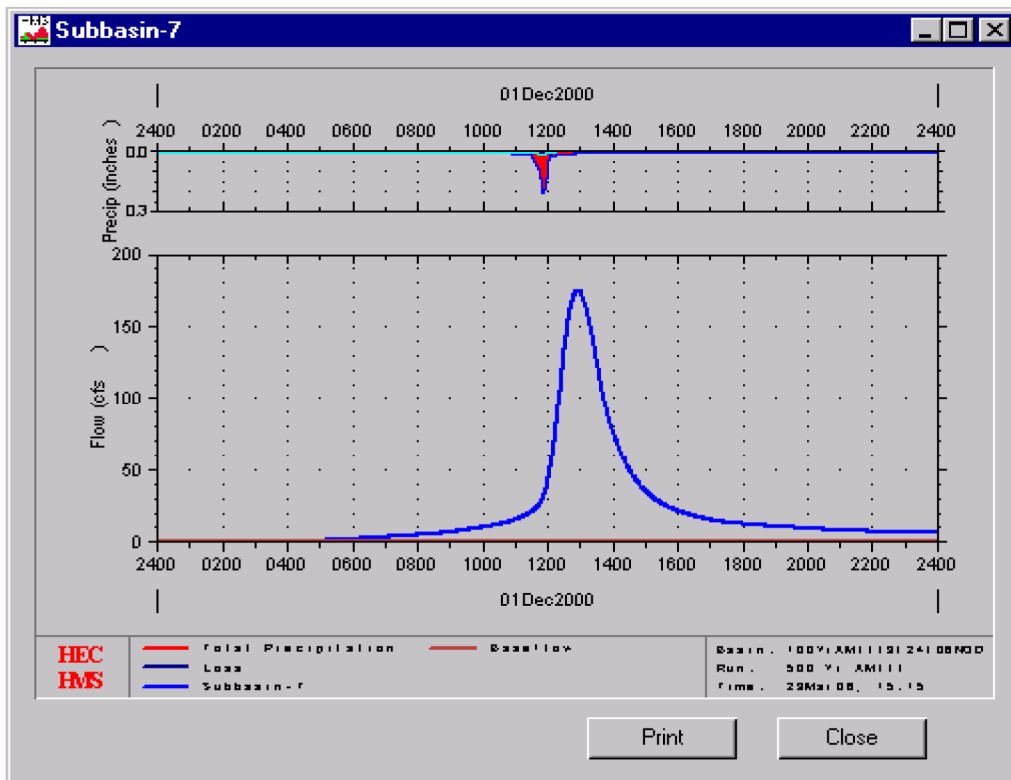
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



## **APPENDIX T**

### **HEC-HMS MODEL FOR THE CALCULATION OF THE PMP PEAK DISCHARGE, ANTECEDENT MOISTURE CONDITION III**

# HMS \* Summary of Results

Project : WCS

Run Name : PMP Dist A AMIII

Start of Run : 01Dec00 0000 Basin Model : 100YrAMIII3/24/06NOD  
 End of Run : 05Dec00 0000 Met. Model : PMP Dist. A NOD  
 Execution Time : 30Mar06 0838 Control Specs : Control PMP

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4	1314.7	03 Dec 00 0600	1020.6	0.490
Reach-2	1314.7	03 Dec 00 0615	1020.6	0.490
Subbasin-2	2846.6	03 Dec 00 0600	2188.9	1.063
playa	2519.0	03 Dec 00 0644	1731.9	1.063
Reach-1	2519.0	03 Dec 00 0719	1731.9	1.063
Subbasin-1A	1849.8	03 Dec 00 0603	1449.7	0.691
Reach-1A	1849.8	03 Dec 00 0620	1449.7	0.691
Subbasin-1B	842.09	03 Dec 00 0600	651.59	0.314
Junction-1A	2689.0	03 Dec 00 0602	2101.3	1.005
Reach-1B	2689.0	03 Dec 00 0605	2101.3	1.005
Subbasin-3	418.53	03 Dec 00 0600	324.93	0.156
Junction-1	5399.3	03 Dec 00 0619	4158.1	2.224
Reach-3	5399.3	03 Dec 00 0636	4158.1	2.224
Subbasin-5A	514.51	03 Dec 00 0600	395.37	0.192
Junction-2	7143.7	03 Dec 00 0620	5574.0	2.906
Reach-4	7143.7	03 Dec 00 0641	5574.0	2.906
Subbasin-5B	709.89	03 Dec 00 0600	545.69	0.265
Junction-3	7765.5	03 Dec 00 0631	6119.7	3.171
Reach-5	7765.5	03 Dec 00 0645	6119.7	3.171
Subbasin-6	198.33	03 Dec 00 0600	152.38	0.074
Junction-4	7864.0	03 Dec 00 0638	6272.1	3.245
Reach-6	7864.0	03 Dec 00 0638	6272.1	3.245
Subbasin-7	278.66	03 Dec 00 0600	214.99	0.104
Junction-5	8123.7	03 Dec 00 0633	6487.1	3.349

File: StorageNOD11.xls

PLAYA ELEVATION, STORAGE, OUTFLOW

## ELEVATION AND STORAGE

Elev	Area S.F.	Elev. Change	Ave S.F.	Storage C.F.	Total Storage C.F.	AC.-FT.
3478	402,878			0	0	
		2	517,775	1,035,550		
3480	632,672				1,035,550	24
		2	811,325	1,622,649		
3482	989,977				2,658,199	61
		2	2,375,467	4,750,934		
3484	3,760,957				7,409,133	170
		2	6,247,780	12,495,559		
3486	8,734,602				19,904,692	457
		2	10,261,979	20,523,958		
3488	11,789,356				40,428,650	928
		2	13,334,447	26,668,893		
3,490	14,879,537				67,097,543	1,540

## OUTFLOW

## WEIR EQUATION

$$Q = C * L * H^{3/2}$$

WHERE:

Q= FLOW, CFS

C= WEIR COEFFICIENT

L= HORIZONTAL LENGTH, FT

H= HEAD ON WEIR, FT

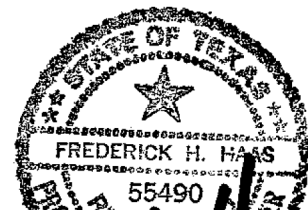
ASSUME TOP OF PLAYA IS ELEVATION 3486

LENGTH OF 3486 CONTOUR IS

241 FT.

ELEV FT	HEAD FT	CW	Q CU FT/SEC
3,486.5	0.5	3.58	305
3,487.0	1.0	3.58	863
3,487.5	1.5	3.58	1,585
3,488.0	2.0	3.56	2,427
3,490.0	4.0	3.62	6,979

NOTE: Cw IS FROM WATER-RESOURCES ENGINEERING, LINSLEY AND FRANZINI



*Handwritten signature and date:*  
 3/31/06

## Meteorologic Model Input

**HMS - Meteorologic Model**

File Edit Help

Meteorologic Model: PMP Distribution A Subbasin List

Description: PMP with Distribution per figure in HMR 51 ...

Precipitation Evapotranspiration

Method : User Hyetograph

Subbasin	"Gage" ID
Subbasin-1A	PMP Distribution A
Subbasin-2	PMP Distribution A
Subbasin-3	PMP Distribution A
Subbasin-4	PMP Distribution A
Subbasin-6	PMP Distribution A
Subbasin-1B	PMP Distribution A
Subbasin-7	PMP Distribution A
Subbasin-5B	PMP Distribution A
Subbasin-5A	PMP Distribution A

OK Apply Cancel

**HMS \* Basin Model \* SCS Curve Number**

Sort Help

Basin Model ID: 100YrAMIII3/24/06NOD

Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	91		0.0
Subbasin-2	86		0.0
Subbasin-3	89		0.0
Subbasin-4	89		0.0
Subbasin-5B	86		0.0
Subbasin-6	86		0.0
Subbasin-1B	88		0.0
Subbasin-5A	86		0.0
Subbasin-7	87		0.0

OK Apply Cancel

**HMS \* Basin Model \* SCS UH**

Sort Help

Basin Model ID: 100YrAMIII3/24/06NOD

Time Units : Minutes

Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3	44
Subbasin-4	39
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64

OK Apply Cancel



**HMS \* Basin Model \* Lag Routing**

Help

Basin Model ID : 100YrAMIII3/24/06NOD

Interval : Minutes

Reach Name	Lag (min)
Reach-1	35
Reach-2	15
Reach-3	17
Reach-4	21
Reach-5	14
Reach-1A	17
Reach-1B	3
Reach-6	0

OK Apply Cancel

**HMS \* Basin Model \* Reservoir Editor**

Edit File Help

Reservoir Name:

Description:

Storage Outlet Spillway Overflow Dam Break

Method:

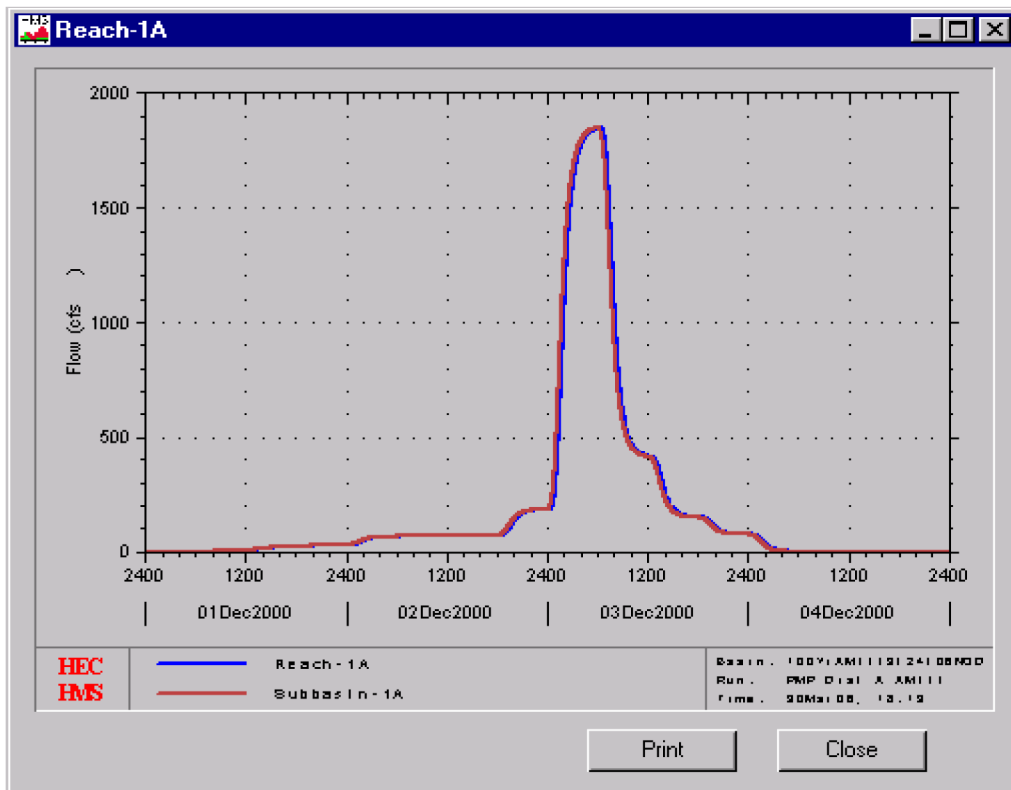
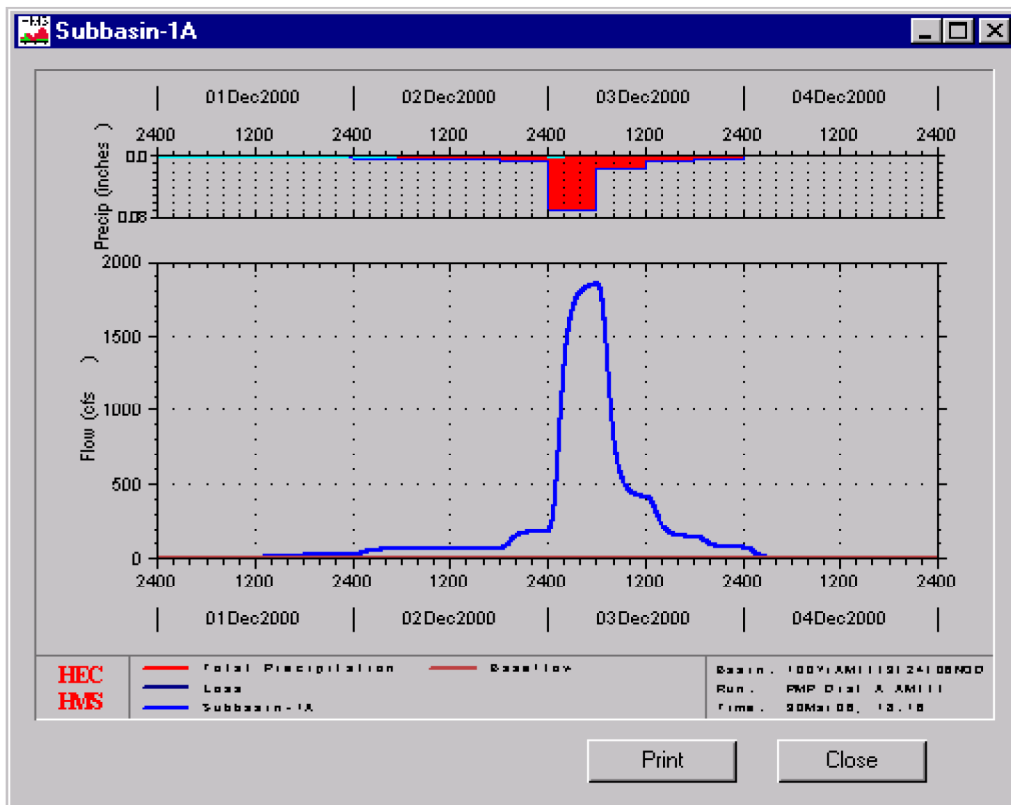
Initial

Elevation (ft)	Storage (acre-feet)	Outflow (cfs)
3478.0	0.0	0.0
3480.0	24.0	0.0
3482.0	61.0	0.0
3484.0	170.0	0.0
3486.0	457.0	0.0
3487.0	693.0	863.0
3488.0	928.0	2427.0
3490.0	1540.0	6979.0

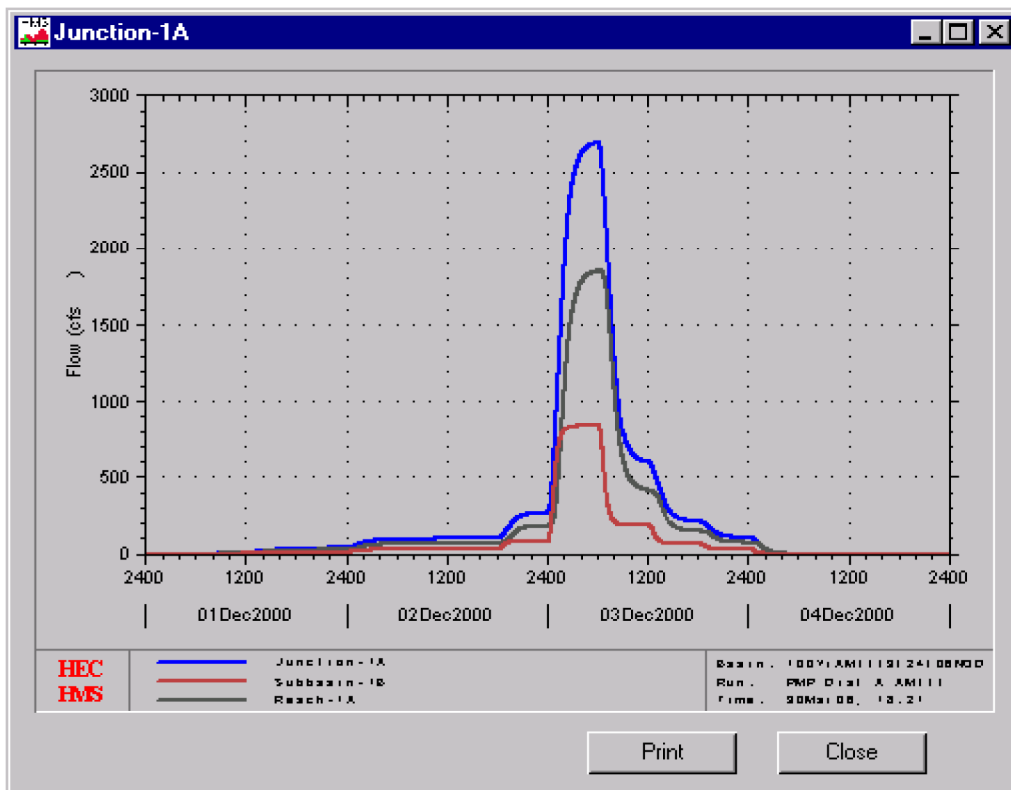
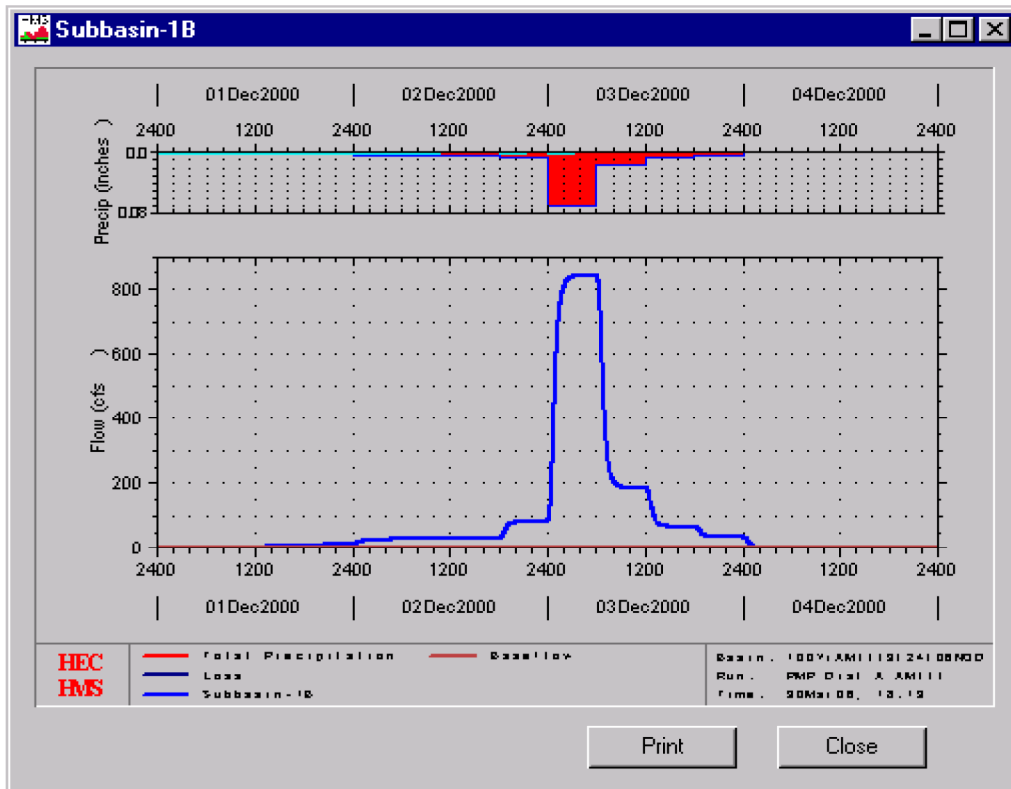
Graph

OK Apply Cancel

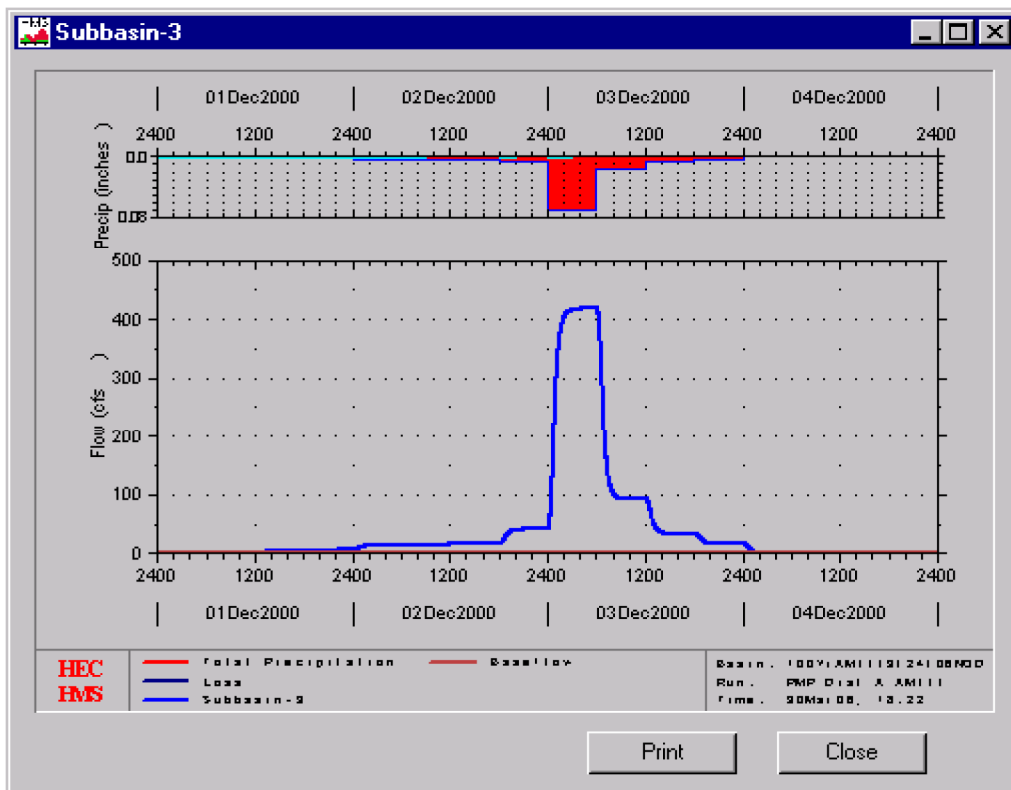
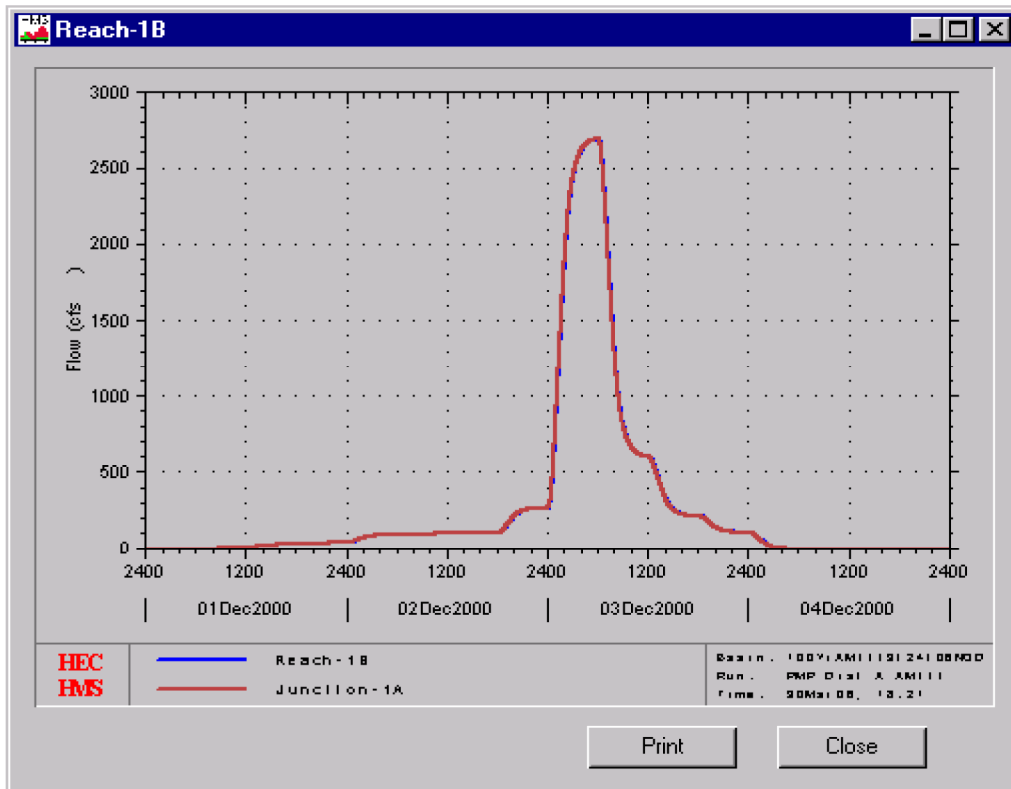
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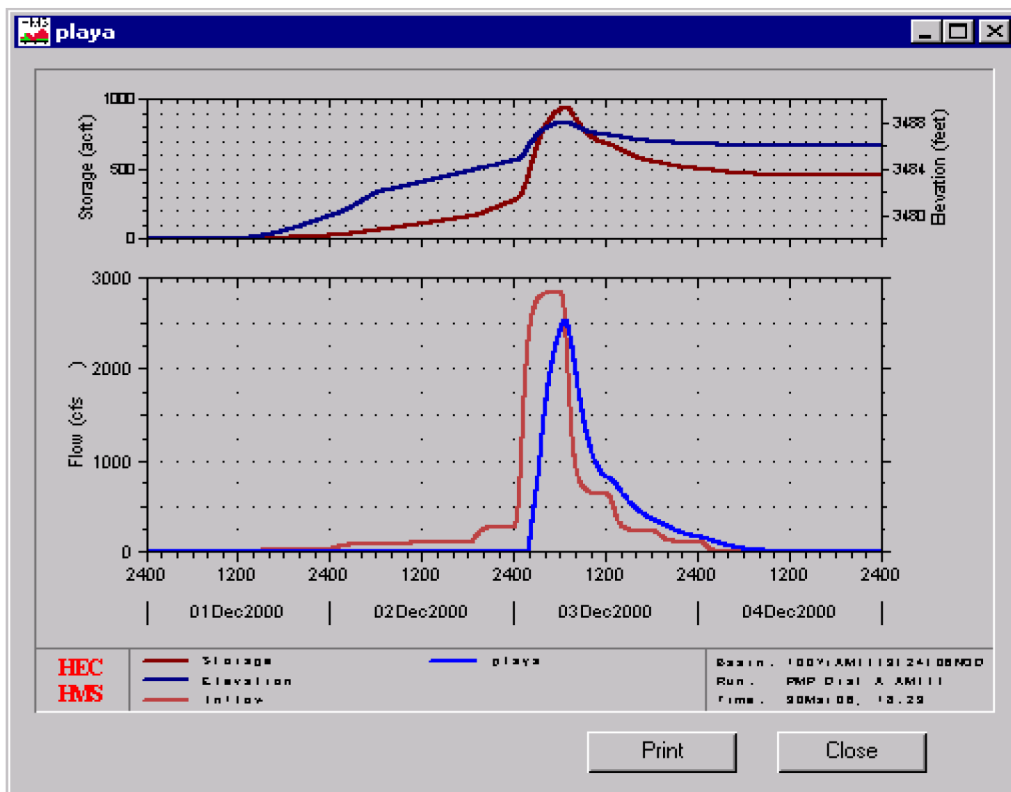
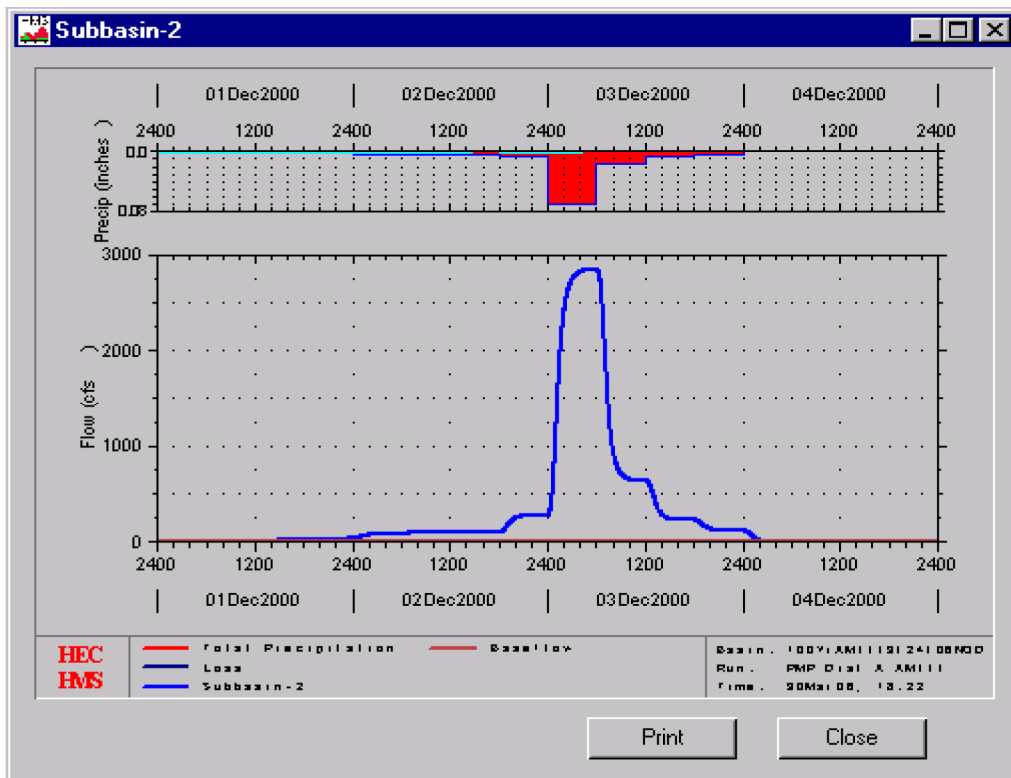
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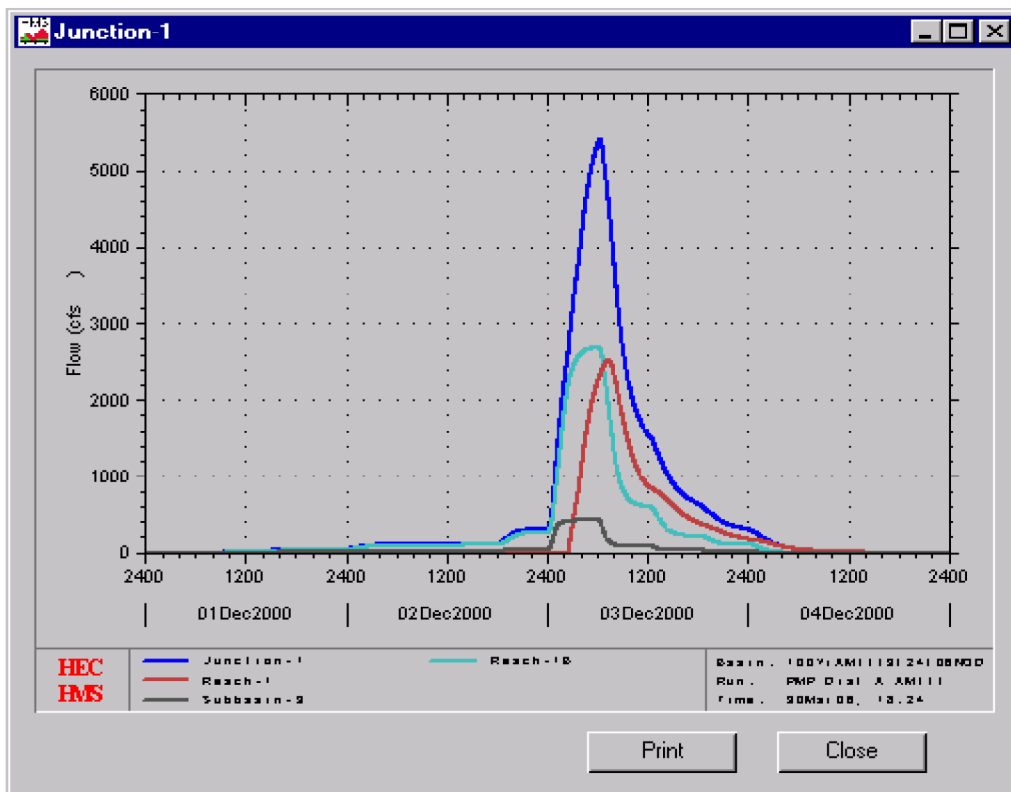
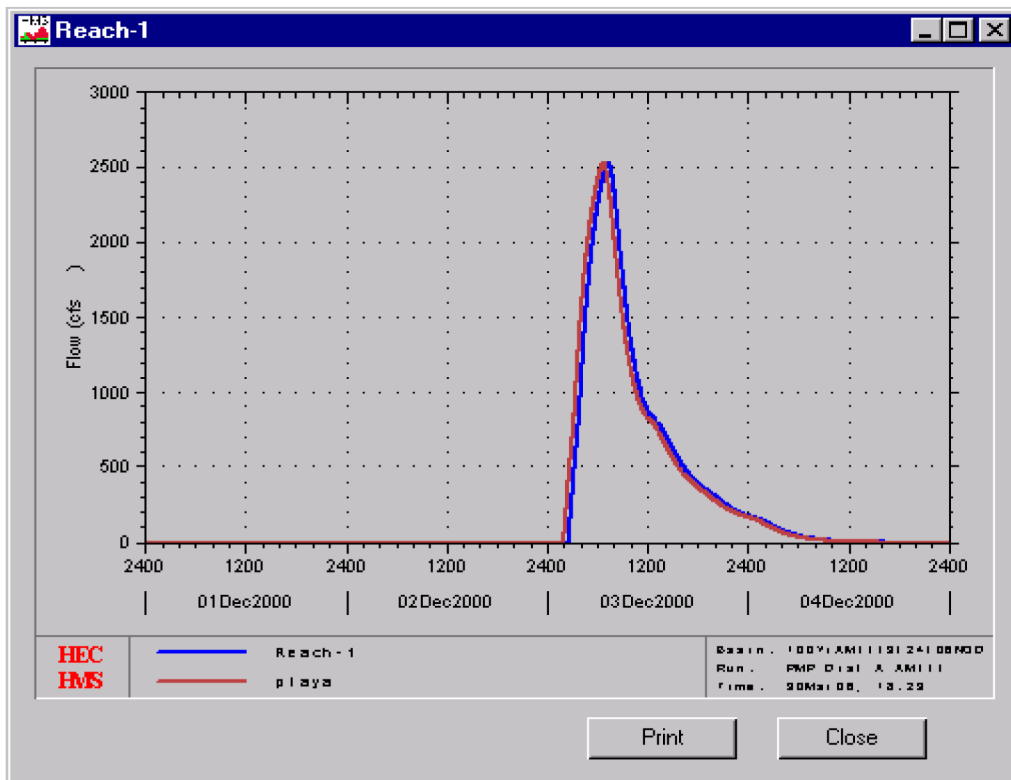
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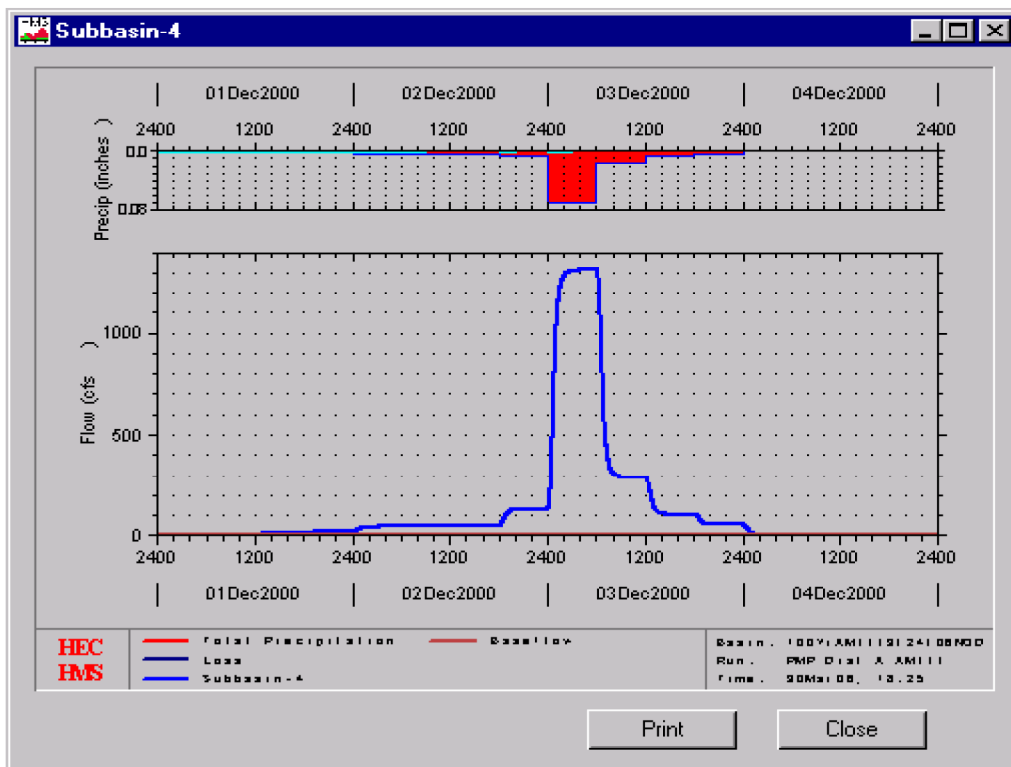
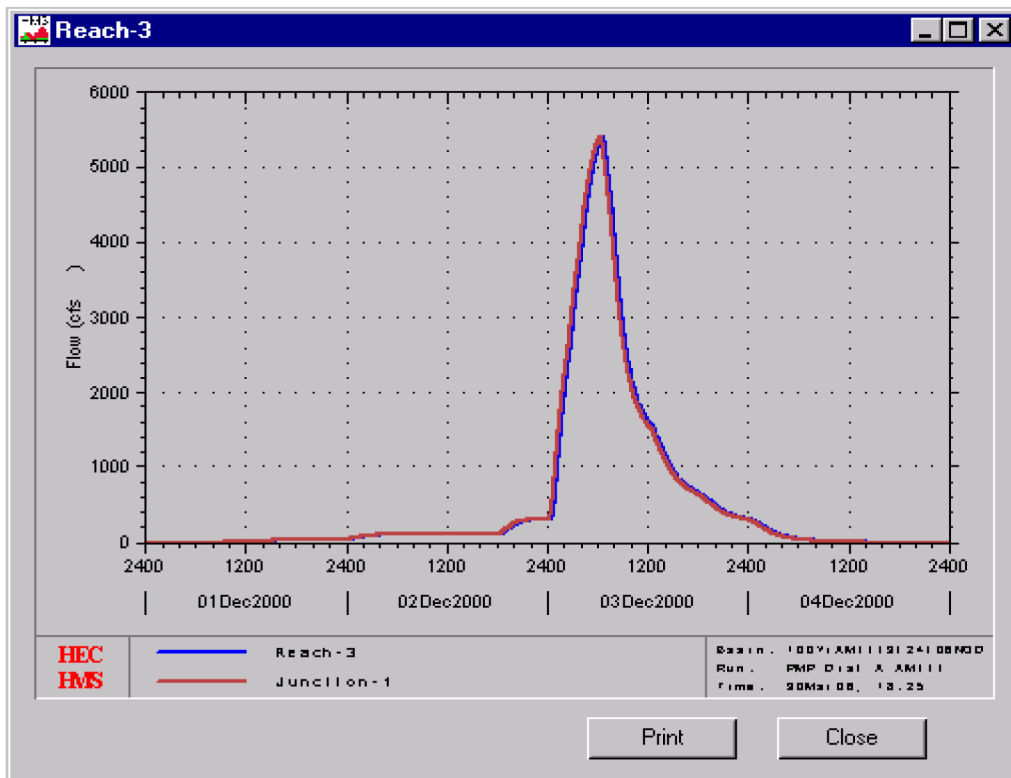
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS

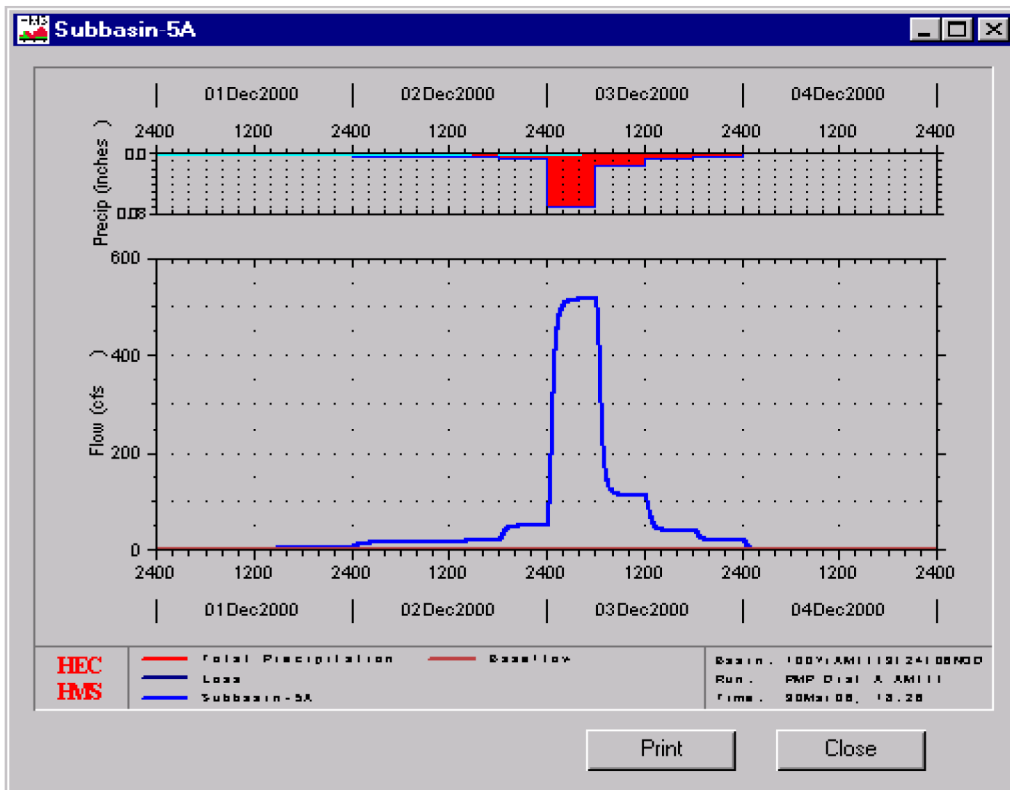
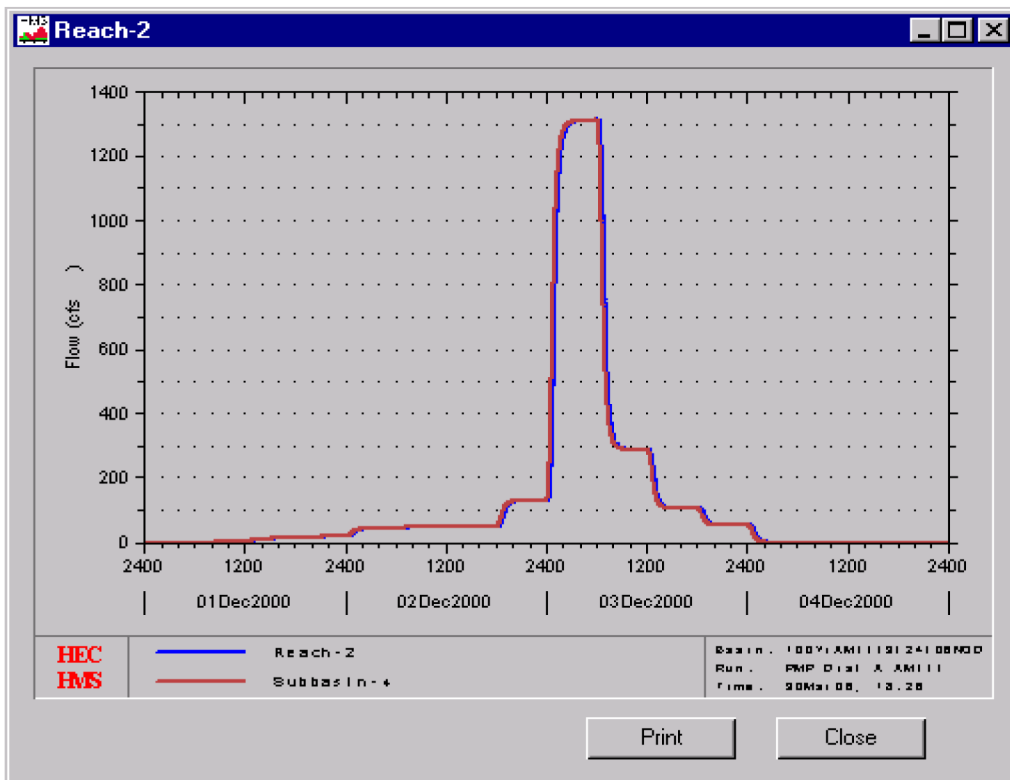


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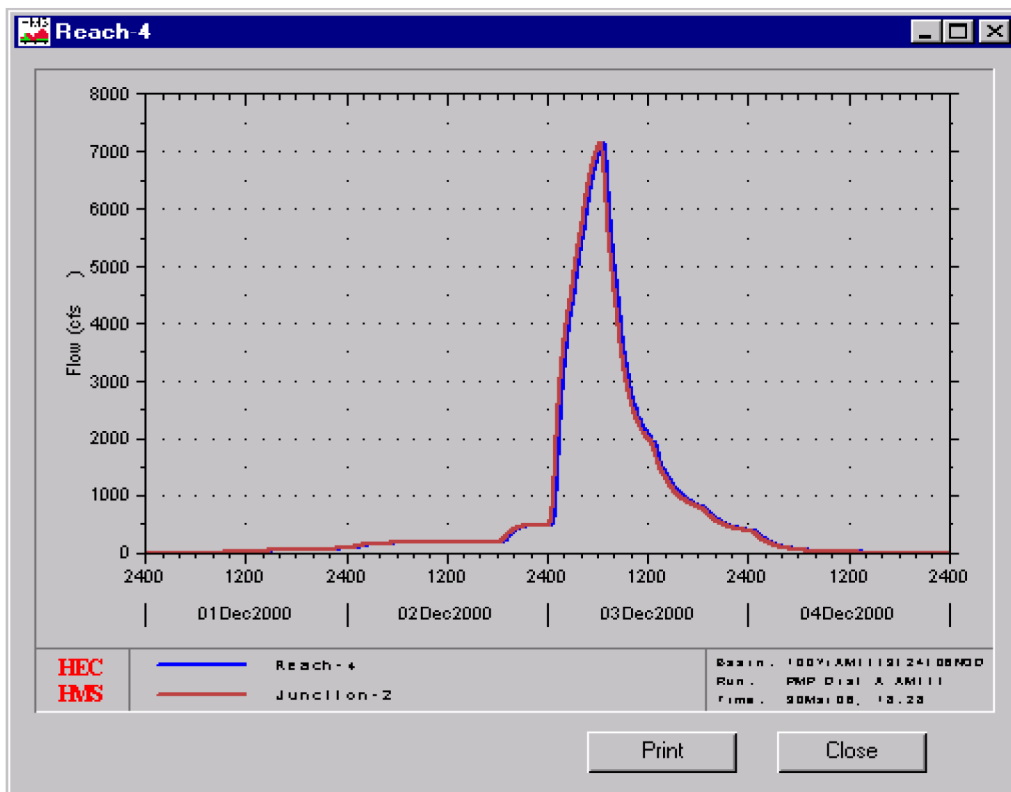
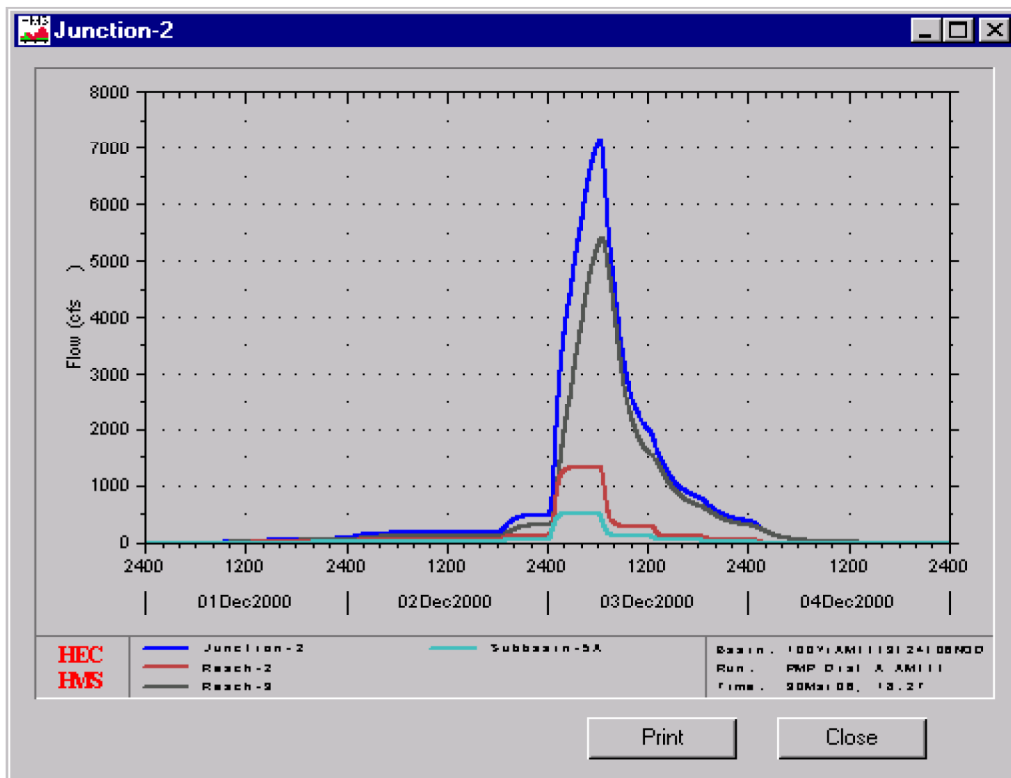




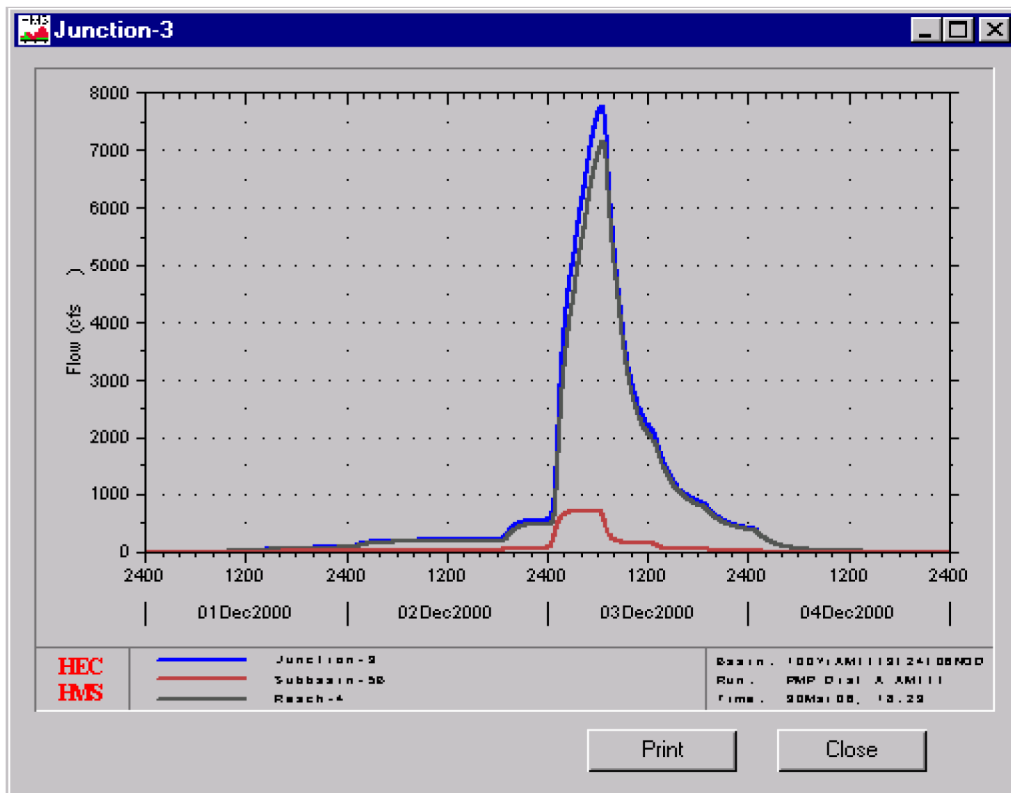
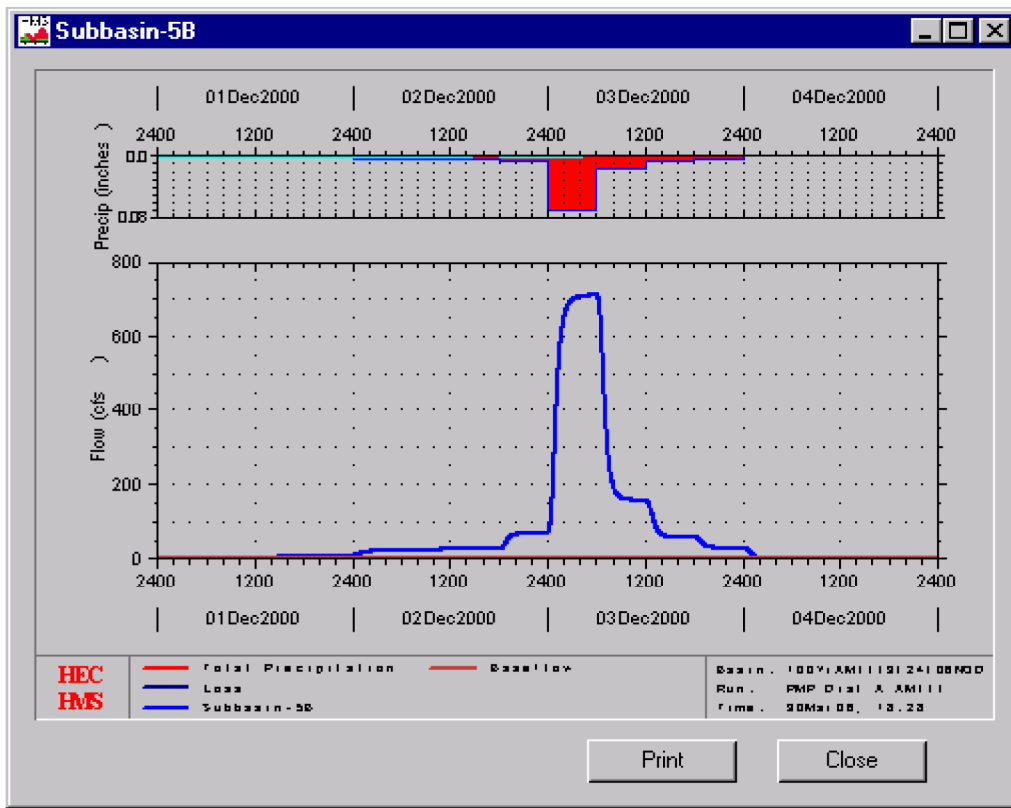
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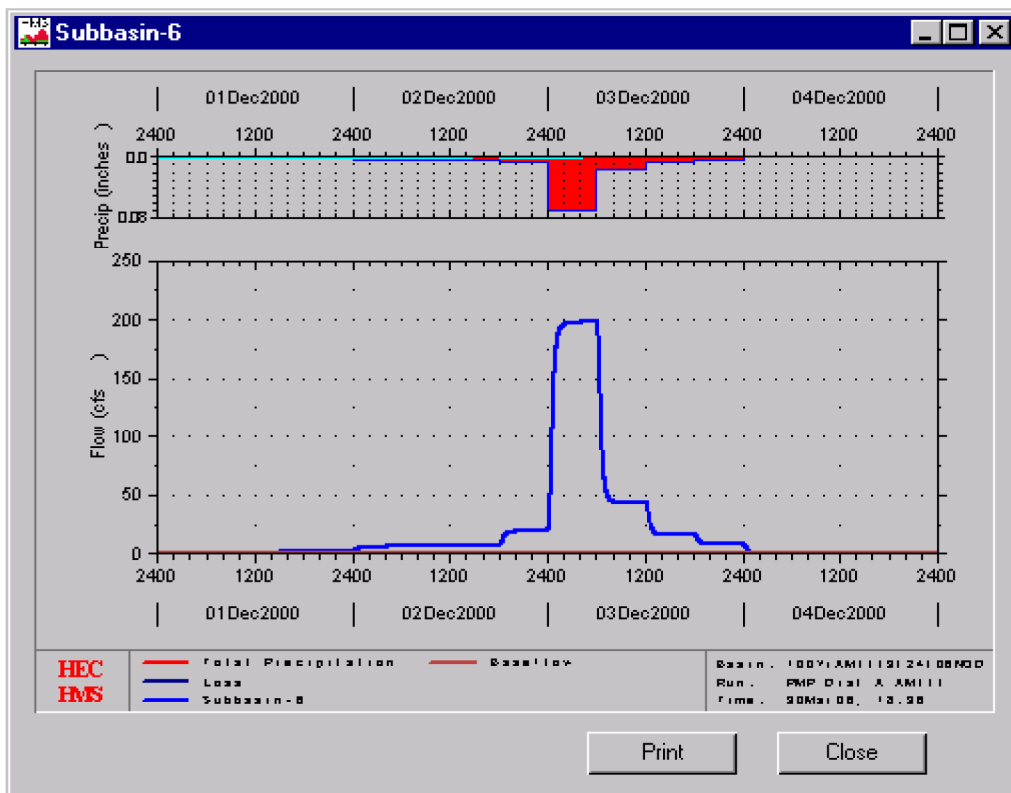
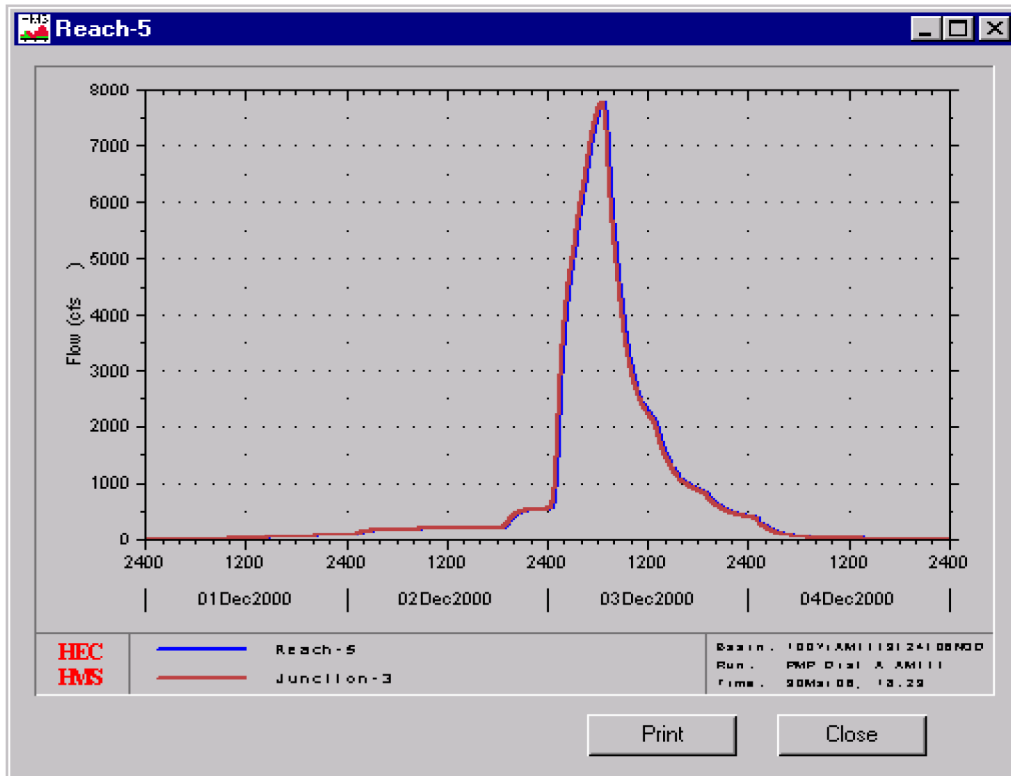
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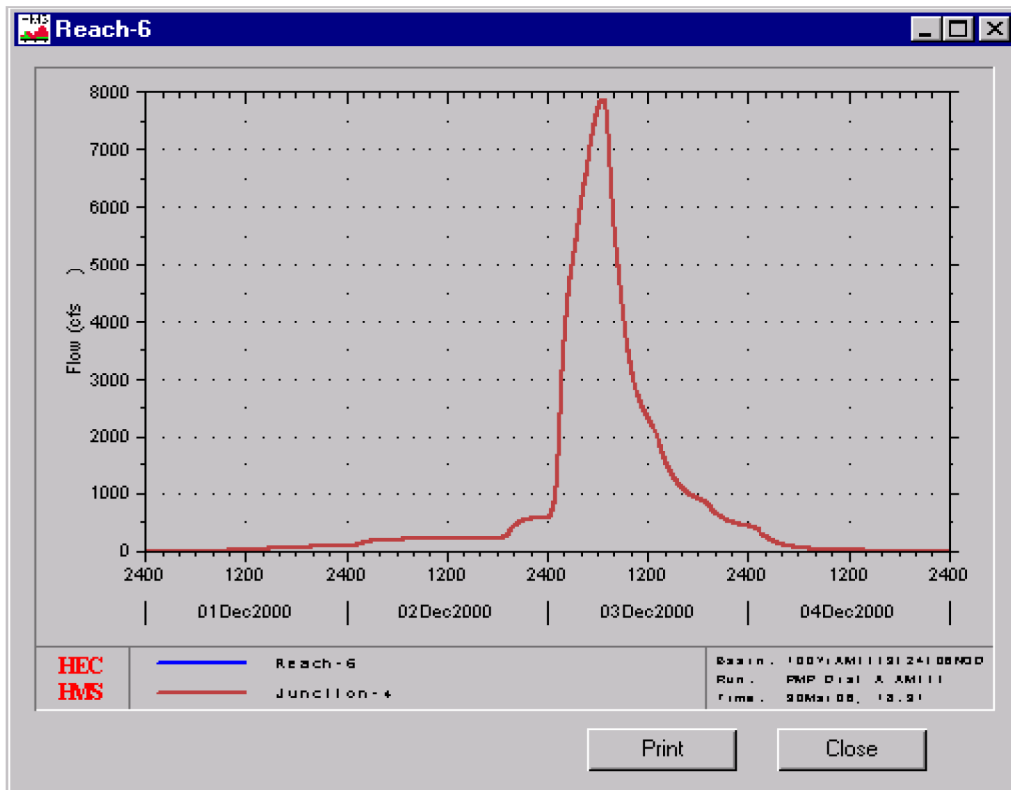
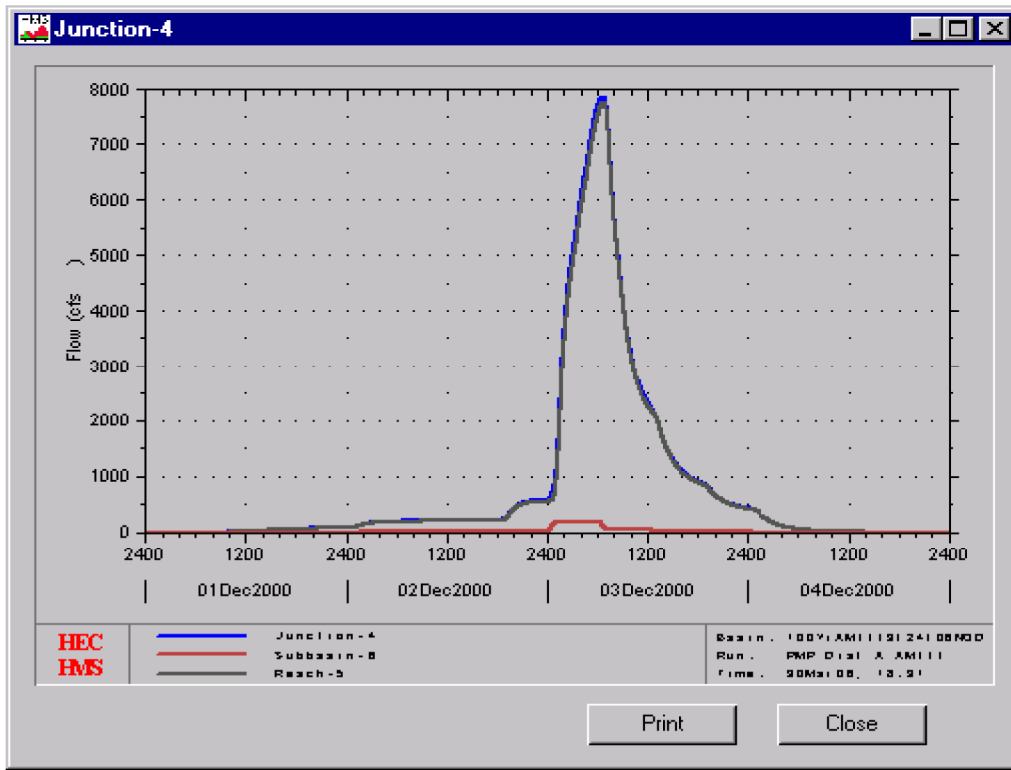
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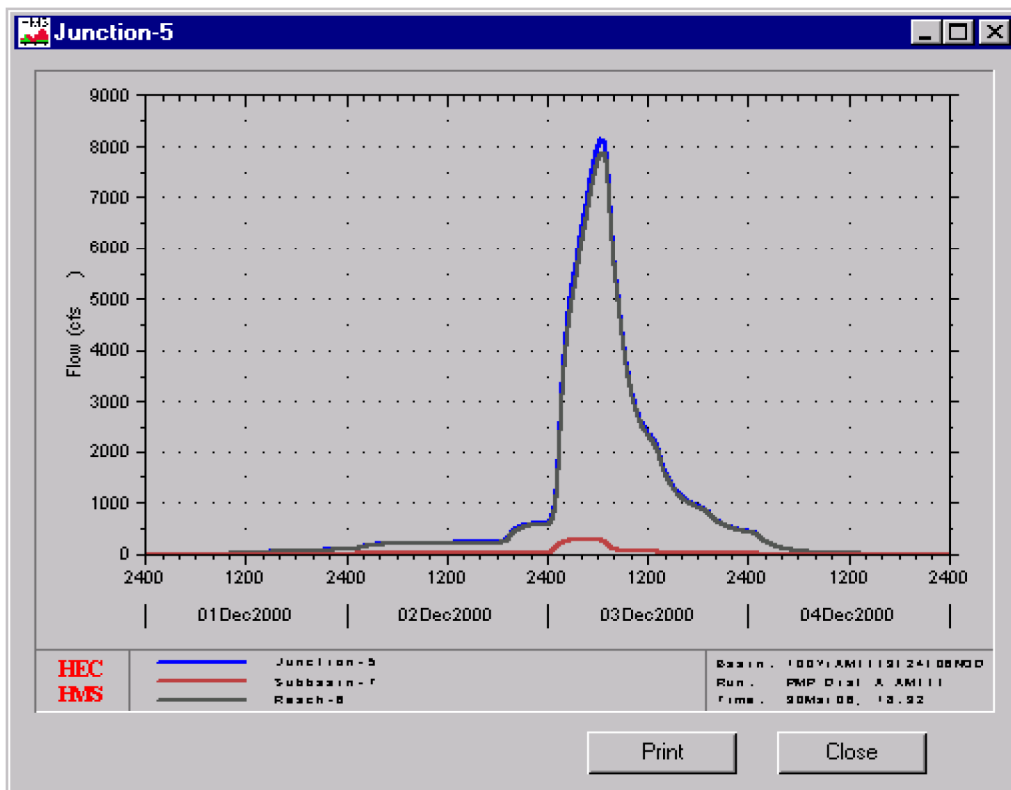
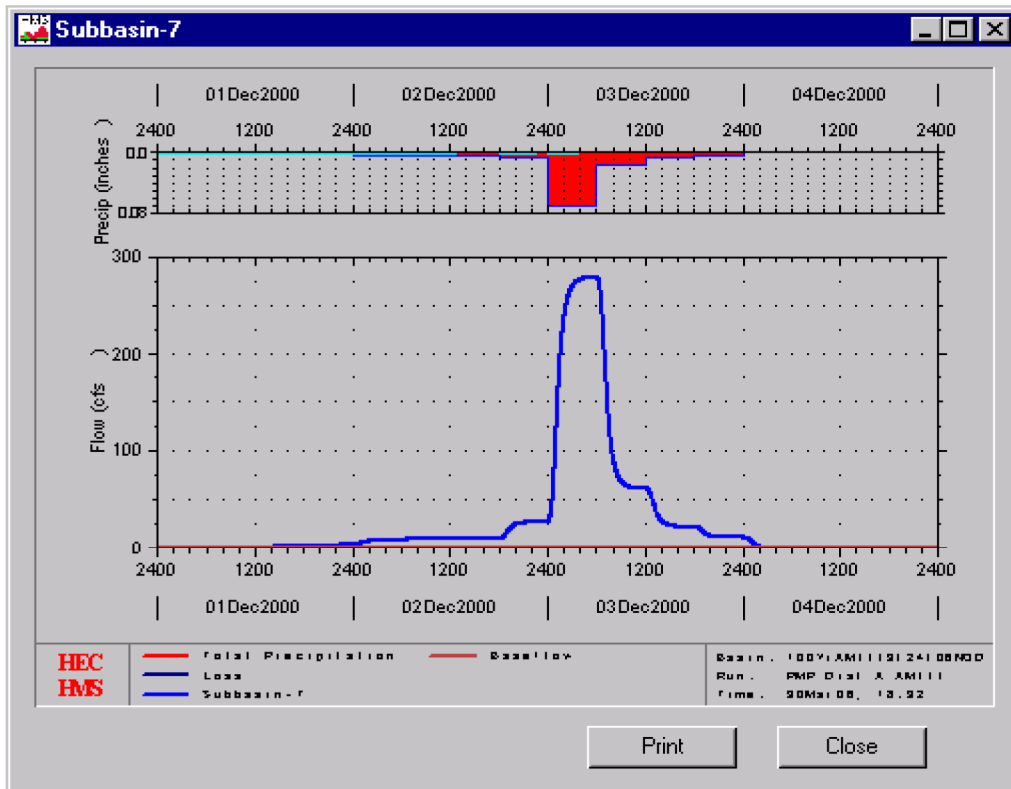
# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



# WCS FACILITY FLOOD PLAIN STUDY HYDROGRAPHS



## **APPENDIX U**

### **HEC-RAS MODEL FOR THE CALCULATION OF THE 500-YEAR AND PMP WATER SURFACE PROFILES ANTECEDENT MOISTURE CONDITION III**

HEC-RAS Plan: PMP AMIII River: Ditch A Reach: 5

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Ch W/S (ft)	Max Ch Dpth (ft)	E.G. Elev (ft)	E.G. Slope (ft/m)	Vel Chnl (ft/s)	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
5	12674	976.00	3477.00	3478.76	3478.27	1.75	3478.88	0.003056	2.90	327.16	682.56	357.89	355.40	0.46
5	12674	1850.00	3477.00	3479.26	3478.68	2.26	3479.45	0.003167	3.69	291.95	714.24	553.45	422.29	0.49
5	11337	976.00	3469.00	3470.81	3470.81	1.81	3471.39	0.013220	6.21	417.53	566.66	164.80	149.13	0.95
5	11337	1650.00	3469.00	3471.47	3471.46	2.47	3472.26	0.010885	7.39	403.34	580.18	272.35	176.84	0.93
5	10937	976.00	3464.00	3466.24	3466.08	2.24	3466.66	0.010235	5.21	455.99	618.01	188.24	162.01	0.83
5	10937	1850.00	3464.00	3466.72	3466.72	2.72	3467.45	0.013153	6.91	438.39	635.61	273.71	197.22	0.98
5	10288	976.00	3456.00	3457.22	3457.22	1.22	3457.51	0.020477	4.31	374.31	788.29	226.46	419.97	1.03
5	10288	1850.00	3456.00	3457.57	3457.53	1.57	3457.93	0.015410	4.82	339.97	819.21	383.80	479.25	0.95
5	9590	1242.00	3450.00	3451.93	3451.51	1.93	3452.09	0.004969	3.13	389.43	793.60	396.40	404.17	0.56
5	9590	2689.00	3450.00	3452.40	3452.06	2.40	3452.72	0.006338	4.52	345.06	818.68	603.04	473.62	0.67
5	9009	1242.00	3445.00	3446.90	3446.75	1.90	3447.19	0.011195	4.31	416.94	751.61	288.10	334.67	0.82
5	9009	2689.00	3445.00	3447.65		2.65	3447.98	0.007751	4.51	354.62	846.77	596.64	492.15	0.72
5	8130	1242.00	3440.00	3442.03	3441.49	2.03	3442.15	0.003422	2.73	417.16	854.27	455.81	437.11	0.47
5	8130	2689.00	3440.00	3442.50	3442.03	2.50	3442.75	0.004647	4.06	390.07	887.68	674.08	497.59	0.58
5	7717	1242.00	3437.80	3439.01	3439.01	1.21	3439.38	0.018011	4.88	307.18	657.99	254.54	350.81	1.01
5	7717	2689.00	3437.80	3439.74		1.94	3440.11	0.009311	4.84	252.35	723.77	555.05	471.42	0.79
5	7253	1483.00	3435.00	3436.81	3436.18	1.81	3436.89	0.001808	2.29	382.26	946.12	664.88	583.87	0.35
5	7253	5399.00	3435.00	3437.84	3437.06	2.84	3438.13	0.003105	4.42	329.17	997.14	1299.73	667.97	0.51
5	6343	2888.00	3430.00	3431.11	3431.11	1.11	3431.57	0.016513	5.44	724.42	1307.78	531.28	583.36	1.00
5	6343	7144.00	3430.00	3431.94	3431.94	1.94	3432.64	0.012039	6.76	867.41	1534.53	1091.24	867.12	0.94
5	5383	2888.00	3425.00	3426.84	3426.14	1.84	3426.94	0.001869	2.54	660.98	1645.22	1198.09	984.24	0.37
5	5383	7144.00	3425.00	3427.72	3426.80	2.72	3427.91	0.002096	3.65	577.26	1820.07	2169.17	1242.81	0.42
5	4221	3286.00	3420.00	3421.49	3421.49	1.49	3421.84	0.015261	5.39	444.14	1172.66	624.24	728.53	0.97
5	4221	7766.00	3420.00	3422.20	3422.20	2.20	3422.82	0.013358	6.51	293.84	1337.10	1256.74	1043.46	0.97
5	3489	3286.00	3416.00	3417.66	3417.07	2.66	3417.76	0.002329	2.66	-122.29	803.15	1293.45	1025.44	0.40
5	3489	7766.00	3416.00	3418.44	3417.60	3.44	3418.65	0.002671	3.78	-136.55	950.96	2110.92	1087.51	0.46
5	2989	3286.00	3413.80	3414.95	3414.95	1.15	3415.36	0.016461	5.40	47.78	836.22	645.74	788.45	1.09
5	2989	7766.00	3413.80	3415.68	3415.59	1.88	3416.28	0.011352	6.62	-5.70	894.15	1259.21	900.85	0.92
5	2774	3286.00	3409.00	3414.41	3412.71	5.41	3414.50	0.000645	3.37	-418.02	658.08	1773.70	1076.10	0.26
5	2774	7766.00	3409.00	3415.12	3413.54	6.12	3415.31	0.001303	5.22	-438.85	687.85	2554.86	1126.70	0.38
5	2773	Culvert												
5	2734	3286.00	3408.90	3412.71	3412.71	3.81	3413.25	0.004812	7.06	83.74	515.65	665.51	431.91	0.67
5	2734	7766.00	3408.90	3414.37	3414.37	5.47	3414.83	0.003331	7.66	-1467.17	584.55	2185.05	2051.72	0.60
5	1888	3327.00	3408.00	3409.80	3409.14	1.80	3409.92	0.002775	2.72	131.77	1131.73	1225.09	699.96	0.43
5	1888	7894.00	3408.00	3410.58	3409.82	2.59	3410.80	0.002839	3.70	-259.09	1206.15	2224.23	1465.23	0.47
5	1060	3473.00	3402.70	3404.67	3404.67	1.97	3405.20	0.016121	5.85	589.60	1163.09	593.57	573.29	1.01
5	1060	8124.00	3402.70	3405.55	3405.55	2.85	3406.22	0.014413	6.58	460.16	1380.29	1235.07	920.12	1.00



# FloodPlain.rep

HEC-RAS Version 3.0.1 Mar 2001  
 U.S. Army Corp of Engineers  
 Hydrologic Engineering Center  
 609 Second Street, Suite D  
 Davis, California 95616-4687  
 (916) 756-1104

```

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## PROJECT DATA

Project Title: WCS  
 Project File : FloodPlain.prj  
 Run Date and Time: 3/30/06 9:32:01 AM

Project in English units

## PLAN DATA

Plan Title: Plan 38  
 Plan File : D:\program files\WCS\FloodPlain.p38

Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04

Flow Title : pmp NOD AMIII  
 Flow File : D:\program files\WCS\FloodPlain.f30

## Plan Summary Information:

Number of: Cross Sections	= 18	Multitple Openings	= 0
Culverts	= 1	Inline Weirs	= 0
Bridges	= 0		

## Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 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:	Mixed Flow

## FLOW DATA

Flow Title: pmp NOD AMIII  
 Flow File : D:\program files\WCS\FloodPlain.f30

FloodPlain.rep

Flow Data (cfs)

River	Reach	RS	PF 2	PF 3
Ditch A	5	12674	976	1850
Ditch A	5	9690	1242	2689
Ditch A	5	7253	1483	5399
Ditch A	5	6343	2888	7144
Ditch A	5	4221	3286	7766
Ditch A	5	1888	3327	7864
Ditch A	5	1060	3473	8124

Boundary Conditions

River stream	Reach	Profile	Upstream	Down
Ditch A ritical	5	PF 2	Critical	Cr

GEOMETRY DATA

Geometry Title: PMP1-20-04SecRemoved  
 Geometry File : D:\program files\WCS\FloodPlain.g04

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 12674

INPUT

Description: Sta. 12674

Station Elevation Data		num= 6	
Sta	Elev	Sta	Elev
100	3482	380	3478
964	3482	560	3477
		635	3478
		761	3480

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	380	.033
		635	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	380	635		1206	1337	1433	.1
							.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3478.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.76	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.27	Flow Area (sq ft)	19.94	320.00	17.95
E.G. Slope (ft/ft)	0.003056	Area (sq ft)	19.94	320.00	17.95
Q Total (cfs)	976.00	Flow (cfs)	25.93	926.74	23.34
Top Width (ft)	355.40	Top Width (ft)	52.84	255.00	47.56

## FloodPlain.rep

Vel Total (ft/s)	2.73	Avg. Vel. (ft/s)	1.30	2.90	1.30
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)	0.38	1.25	0.38
Conv. Total (cfs)	17654.0	Conv. (cfs)	469.0	16762.9	422.1
Length Wtd. (ft)	1336.00	Wetted Per. (ft)	52.85	255.01	47.56
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.07	0.24	0.07
Alpha	1.08	Stream Power (lb/ft s)	0.09	0.69	0.09
Frctn Loss (ft)	7.45	Cum Volume (acre-ft)	22.71	137.88	4.08
C & E Loss (ft)	0.05	Cum SA (acres)	24.33	121.69	6.69

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3479.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3479.26	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.68	Flow Area (sq ft)	55.37	448.24	49.84
E.G. Slope (ft/ft)	0.003167	Area (sq ft)	55.37	448.24	49.84
Q Total (cfs)	1850.00	Flow (cfs)	102.99	1654.32	92.69
Top Width (ft)	422.29	Top Width (ft)	88.05	255.00	79.24
Vel Total (ft/s)	3.34	Avg. Vel. (ft/s)	1.86	3.69	1.86
Max Chl Dpth (ft)	2.26	Hydr. Depth (ft)	0.63	1.76	0.63
Conv. Total (cfs)	32873.9	Conv. (cfs)	1830.1	29396.7	1647.1
Length Wtd. (ft)	1334.81	Wetted Per. (ft)	88.06	255.01	79.25
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.12	0.35	0.12
Alpha	1.12	Stream Power (lb/ft s)	0.23	1.28	0.23
Frctn Loss (ft)	7.14	Cum Volume (acre-ft)	54.74	234.96	14.97
C & E Loss (ft)	0.06	Cum SA (acres)	51.06	137.20	20.21

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

## FloodPlain.rep

additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 11337

## INPUT

Description: Sta. 11337

Station Elevation Data		num= 8							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3477	315	3474	392	3472	435	3470	499	3469
550	3470	591	3472	694	3474				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	435	.033	550	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	435	550		545	400	332	.1 .3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3471.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.81	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.81	Flow Area (sq ft)	7.10	150.94	6.77
E.G. Slope (ft/ft)	0.013220	Area (sq ft)	7.10	150.94	6.77
Q Total (cfs)	976.00	Flow (cfs)	20.14	936.66	19.20
Top Width (ft)	149.13	Top Width (ft)	17.47	115.00	16.66
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)	2.84	6.21	2.84
Max Chl Dpth (ft)	1.81	Hydr. Depth (ft)	0.41	1.31	0.41
Conv. Total (cfs)	8488.6	Conv. (cfs)	175.2	8146.4	167.0
Length Wtd. (ft)	400.78	Wetted Per. (ft)	17.49	115.02	16.68
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.33	1.08	0.33
Alpha	1.06	Stream Power (lb/ft s)	0.95	6.72	0.95
Frctn Loss (ft)	4.64	Cum Volume (acre-ft)	22.34	130.65	3.67
C & E Loss (ft)	0.05	Cum SA (acres)	23.35	116.01	5.64

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program selected the water surface that had the least amount of error between computed

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and assumed values.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3472.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3471.47	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3471.46	Flow Area (sq ft)	23.31	226.83	22.22
E.G. Slope (ft/ft)	0.010885	Area (sq ft)	23.31	226.83	22.22
Q Total (cfs)	1850.00	Flow (cfs)	89.20	1675.75	85.05
Top Width (ft)	176.84	Top Width (ft)	31.66	115.00	30.18
Vel Total (ft/s)	6.79	Avg. Vel. (ft/s)	3.83	7.39	3.83
Max Chl Dpth (ft)	2.47	Hydr. Depth (ft)	0.74	1.97	0.74
Conv. Total (cfs)	17732.1	Conv. (cfs)	855.0	16061.9	815.2
Length Wtd. (ft)	401.47	Wetted Per. (ft)	31.69	115.02	30.22
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.50	1.34	0.50
Alpha	1.10	Stream Power (lb/ft s)	1.91	9.90	1.91
Frctn Loss (ft)	4.79	Cum Volume (acre-ft)	53.65	224.60	13.78
C & E Loss (ft)	0.02	Cum SA (acres)	49.40	131.52	18.41

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 10937

INPUT

Description: Sta. 10937

Station Elevation Data		num=	9						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3470	351	3468	428	3467	465	3466	536	3464
543	3464	609	3466	683	3468	811	3472		

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	428	.033	609	.033

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Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
428	609	729	649	445	.1	.3

CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3466.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3466.24	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3466.08	Flow Area (sq ft)		187.15	1.10
E.G. Slope (ft/ft)	0.010235	Area (sq ft)		187.15	1.10
Q Total (cfs)	976.00	Flow (cfs)		974.77	1.23
Top Width (ft)	162.01	Top Width (ft)		153.01	9.01
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.21	1.12
Max Chl Dpth (ft)	2.24	Hydr. Depth (ft)		1.22	0.12
Conv. Total (cfs)	9647.4	Conv. (cfs)		9635.2	12.1
Length Wtd. (ft)	648.87	Wetted Per. (ft)		153.07	9.01
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.78	0.08
Alpha	1.01	Stream Power (lb/ft s)		4.07	0.09
Frctn Loss (ft)	9.12	Cum Volume (acre-ft)	22.29	129.10	3.64
C & E Loss (ft)	0.04	Cum SA (acres)	23.25	114.78	5.54

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3467.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3466.72	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3466.72	Flow Area (sq ft)		264.14	9.57
E.G. Slope (ft/ft)	0.013153	Area (sq ft)		264.14	9.57
Q Total (cfs)	1850.00	Flow (cfs)		1825.01	24.99
Top Width (ft)	197.22	Top Width (ft)		170.61	26.61
Vel Total (ft/s)	6.76	Avg. Vel. (ft/s)		6.91	2.61

Max Chl Dpth (ft)	2.72	FloodPlain.rep Hydr. Depth (ft)	1.55	0.36
Conv. Total (cfs)	16130.8	Conv. (cfs)	15913.0	217.9
Length Wtd. (ft)	647.62	Wetted Per. (ft)	170.68	26.62
Min Ch El (ft)	3464.00	Shear (lb/sq ft)	1.27	0.30
Alpha	1.03	Stream Power (lb/ft s)	8.78	0.77
Frctn Loss (ft)	9.21	Cum Volume (acre-ft)	53.50	222.35
C & E Loss (ft)	0.11	Cum SA (acres)	49.20	130.21
			18.19	

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program selected the water surface that had the least amount of error between computed and assumed values.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 10288

#### INPUT

Description: Sta. 10288

Station	Elevation	Data	num=	12						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
100	3464	177	3462	238	3460	298	3458	493	3456	
519	3456	662	3457	778	3457.1	857	3458	903	3460	
947	3462	989	3464							

Manning's n	Values	num=	3							
Sta	n Val	Sta	n Val	Sta	n Val					
100	.033	298	.033	857	.033					

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	298	857		552	598	633	.1
							.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3457.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.22	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.22	Flow Area (sq ft)		226.46	
E.G. Slope (ft/ft)	0.020477	Area (sq ft)		226.46	
Q Total (cfs)	976.00	Flow (cfs)		976.00	

		FloodPlain.rep			
Top Width (ft)	413.97	Top Width (ft)		413.97	
Vel Total (ft/s)	4.31	Avg. Vel. (ft/s)		4.31	
Max Chl Dpth (ft)	1.22	Hydr. Depth (ft)		0.55	
Conv. Total (cfs)	6820.4	Conv. (cfs)		6820.4	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		413.98	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		3.01	
Frctn Loss (ft)	4.93	Cum Volume (acre-ft)	22.29	126.01	3.64
C & E Loss (ft)	0.04	Cum SA (acres)	23.25	110.56	5.49

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3457.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.57	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.53	Flow Area (sq ft)		383.80	
E.G. Slope (ft/ft)	0.015410	Area (sq ft)		383.80	
Q Total (cfs)	1850.00	Flow (cfs)		1850.00	
Top Width (ft)	479.25	Top Width (ft)		479.25	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82	
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)		0.80	
Conv. Total (cfs)	14902.9	Conv. (cfs)		14902.9	
Length Wtd. (ft)	597.95	Wetted Per. (ft)		479.26	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.77	



Alpha	1.00	FloodPlain.rep Stream Power (lb/ft s)	3.71		
Frctn Loss (ft)	5.20	Cum Volume (acre-ft)	53.50	217.52	13.61
C & E Loss (ft)	0.01	Cum SA (acres)	49.20	125.36	18.06

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 9690

#### INPUT

Description: Sta. 9690

Station Elevation Data		num= 8							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3454.5	202	3454	381	3452	632	3450	638	3450
799	3452	897	3454	1010	3458				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	381	.033	799	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	381	799		639 681	658	.1	.3

#### CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3452.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.93	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.51	Flow Area (sq ft)		396.40	
E.G. Slope (ft/ft)	0.004969	Area (sq ft)		396.40	
Q Total (cfs)	1242.00	Flow (cfs)		1242.00	
Top Width (ft)	404.17	Top Width (ft)		404.17	
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)		3.13	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		0.98	
Conv. Total (cfs)	17619.0	Conv. (cfs)		17619.0	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		404.19	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.30	
Alpha	1.00	Stream Power (lb/ft s)		0.95	
Frctn Loss (ft)	4.88	Cum Volume (acre-ft)	22.29	121.74	3.64
C & E Loss (ft)	0.01	Cum SA (acres)	23.25	104.94	5.49

# FloodPlain rep

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3452.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3452.40	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3452.06	Flow Area (sq ft)	7.22	591.87	3.95
E.G. Slope (ft/ft)	0.006338	Area (sq ft)	7.22	591.87	3.95
Q Total (cfs)	2689.00	Flow (cfs)	8.87	2675.27	4.86
Top Width (ft)	473.62	Top Width (ft)	35.94	418.00	19.68
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)	1.23	4.52	1.23
Max Chl Dpth (ft)	2.40	Hydr. Depth (ft)	0.20	1.42	0.20
Conv. Total (cfs)	33777.0	Conv. (cfs)	111.4	33604.5	61.0
Length Wtd. (ft)	680.91	Wetted Per. (ft)	35.95	418.02	19.68
Min Ch El (ft)	3450.00	Shear (lb/sq ft)	0.08	0.56	0.08
Alpha	1.02	Stream Power (lb/ft s)	0.10	2.53	0.10
Frctn Loss (ft)	4.76	Cum Volume (acre-ft)	53.46	210.83	13.59
C & E Loss (ft)	0.00	Cum SA (acres)	48.97	119.21	17.91

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

## CROSS SECTION RIVER: Ditch A REACH: 5 RS: 9009

### INPUT

Description: Sta. 9009

Station Elevation Data		num=		9					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3452	203	3450	325	3448	492	3446	596	3445
637	3446	892	3448	1007	3450	1124	3452		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	325	.033	892	.033

Bank Sta:		FloodPlain.rep		Coeff Contr.		Expan.
Left	Right	Lengths:	Left Channel	Right		
325	892		898 879	794	.1	.3

CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3447.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.90	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.75	Flow Area (sq ft)		288.10	
E.G. Slope (ft/ft)	0.011195	Area (sq ft)		288.10	
Q Total (cfs)	1242.00	Flow (cfs)		1242.00	
Top Width (ft)	334.67	Top Width (ft)		334.67	
Vel Total (ft/s)	4.31	Avg. Vel. (ft/s)		4.31	
Max Chl Dpth (ft)	1.90	Hydr. Depth (ft)		0.86	
Conv. Total (cfs)	11738.3	Conv. (cfs)		11738.3	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		334.70	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)		2.59	
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	22.29	116.39	3.64
C & E Loss (ft)	0.05	Cum SA (acres)	23.25	99.17	5.49

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3447.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.033	
W.S. Elev (ft)	3447.65	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)		Flow Area (sq ft)		596.64	
E.G. Slope (ft/ft)	0.007751	Area (sq ft)		596.64	
Q Total (cfs)	2689.00	Flow (cfs)		2689.00	
Top Width (ft)	492.15	Top Width (ft)		492.15	
Vel Total (ft/s)	4.51	Avg. Vel. (ft/s)		4.51	

Max Chl Dpth (ft)	2.65	FloodPlain.rep Hydr. Depth (ft)	1.21		
Conv. Total (cfs)	30543.4	Conv. (cfs)	30543.4		
Length Wtd. (ft)	878.86	Wetted Per. (ft)	492.18		
Min Ch El (ft)	3445.00	Shear (lb/sq ft)	0.59		
Alpha	1.00	Stream Power (lb/ft s)	2.64		
Frctn Loss (ft)	5.19	Cum Volume (acre-ft)	53.40	201.54	13.56
C & E Loss (ft)	0.02	Cum SA (acres)	48.71	112.09	17.77

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 8130

INPUT									
Description: Sta. 8130									
Station Elevation Data num= 8									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3448	303	3444	419	3442	654	3440	663	3440
852	3442	995	3444	1104	3446				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	419	.033	852	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
419	852	399	413	456	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3442.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3442.03	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.49	Flow Area (sq ft)	0.03	455.74	0.04
E.G. Slope (ft/ft)	0.003422	Area (sq ft)	0.03	455.74	0.04
Q Total (cfs)	1242.00	Flow (cfs)	0.00	1241.99	0.01
Top Width (ft)	437.11	Top Width (ft)	1.84	433.00	2.27
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)	0.17	2.73	0.17
Max Chl Dpth (ft)	2.03	Hydr. Depth (ft)	0.02	1.05	0.02
Conv. Total (cfs)	21233.1	Conv. (cfs)	0.1	21232.9	0.1
Length Wtd. (ft)	413.00	Wetted Per. (ft)	1.84	433.02	2.27
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.00	0.22	0.00

Alpha	1.00	FloodPlain.rep Stream Power (lb/ft s)	0.00	0.61	0.00
Frctn Loss (ft)	2.74	Cum Volume (acre-ft)	22.29	108.88	3.63
C & E Loss (ft)	0.03	Cum SA (acres)	23.23	91.42	5.47

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

# CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3442.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3442.50	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3442.03	Flow Area (sq ft)	7.21	657.97	8.89
E.G. Slope (ft/ft)	0.004647	Area (sq ft)	7.21	657.97	8.89
Q Total (cfs)	2689.00	Flow (cfs)	8.77	2669.41	10.82
Top Width (ft)	497.59	Top Width (ft)	28.93	433.00	35.66
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)	1.22	4.06	1.22
Max Chl Dpth (ft)	2.50	Hydr. Depth (ft)	0.25	1.52	0.25
Conv. Total (cfs)	39445.5	Conv. (cfs)	128.7	39158.1	158.7
Length Wtd. (ft)	413.06	Wetted Per. (ft)	28.93	433.02	35.67
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.07	0.44	0.07
Alpha	1.03	Stream Power (lb/ft s)	0.09	1.79	0.09
Frctn Loss (ft)	2.64	Cum Volume (acre-ft)	53.33	188.88	13.47
C & E Loss (ft)	0.01	Cum SA (acres)	48.41	102.76	17.44

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION      RIVER: Ditch A  
REACH: 5      RS: 7717

INPUT  
Description: Sta 7717  
Station Elevation Data      num=      8

FloodPlain.rep									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values		num=		3					
Sta	n Val	Sta	n Val	Sta	n Val				
100	.033	233	.033	747	.033				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	233	747		444 464	510		.1	.3

CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3439.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.033	
W.S. Elev (ft)	3439.01	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3439.01	Flow Area (sq ft)		254.54	
E.G. Slope (ft/ft)	0.018011	Area (sq ft)		254.54	
Q Total (cfs)	1242.00	Flow (cfs)		1242.00	
Top Width (ft)	350.81	Top Width (ft)		350.81	
Vel Total (ft/s)	4.88	Avg. Vel. (ft/s)		4.88	
Max Chl Dpth (ft)	1.21	Hydr. Depth (ft)		0.73	
Conv. Total (cfs)	9254.5	Conv. (cfs)		9254.5	
Length Wtd. (ft)	464.16	Wetted Per. (ft)		350.82	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)		3.98	
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	22.29	105.52	3.63
C & E Loss (ft)	0.09	Cum SA (acres)	23.22	87.70	5.46

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #PF 3

## FloodPlain.rep

E.G. Elev (ft)	3440.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.033	
W.S. Elev (ft)	3439.74	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)		Flow Area (sq ft)		555.05	
E.G. Slope (ft/ft)	0.009311	Area (sq ft)		555.05	
Q Total (cfs)	2689.00	Flow (cfs)		2689.00	
Top Width (ft)	471.42	Top Width (ft)		471.42	
Vel Total (ft/s)	4.84	Avg. Vel. (ft/s)		4.84	
Max Chl Dpth (ft)	1.94	Hydr. Depth (ft)		1.18	
Conv. Total (cfs)	27866.5	Conv. (cfs)		27866.5	
Length Wtd. (ft)	464.62	Wetted Per. (ft)		471.44	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)		3.32	
Frctn Loss (ft)	1.95	Cum Volume (acre-ft)	53.30	183.13	13.43
C & E Loss (ft)	0.02	Cum SA (acres)	48.28	98.47	17.25

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 7253

## INPUT

Description: Sta. 7253

Station Elevation Data		num=	9						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3438	109	3438.7	321	3438	424	3436	668	3435
906	3436	1005	3438	1200	3440	1365	3442		

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	424	.033	906	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	424	906		756	910	980	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3436.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.033	0.033

## FloodPlain.rep

W.S. Elev (ft)	3436.81	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3436.16	Flow Area (sq ft)	16.92	631.68	16.26
E.G. Slope (ft/ft)	0.001808	Area (sq ft)	16.92	631.68	16.26
Q Total (cfs)	1483.00	Flow (cfs)	17.73	1448.22	17.05
Top Width (ft)	563.87	Top Width (ft)	41.74	482.00	40.12
Vel Total (ft/s)	2.23	Avg. Vel. (ft/s)	1.05	2.29	1.05
Max Chl Dpth (ft)	1.81	Hydr. Depth (ft)	0.41	1.31	0.41
Conv. Total (cfs)	34880.8	Conv. (cfs)	417.1	34062.8	400.9
Length Wtd. (ft)	909.65	Wetted Per. (ft)	41.75	482.00	40.13
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.05	0.15	0.05
Alpha	1.04	Stream Power (lb/ft s)	0.05	0.34	0.05
Frctn Loss (ft)	5.28	Cum Volume (acre-ft)	22.21	100.80	3.54
C & E Loss (ft)	0.04	Cum SA (acres)	23.01	83.27	5.22

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3438.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3437.84	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3437.06	Flow Area (sq ft)	87.30	1128.51	83.91
E.G. Slope (ft/ft)	0.003105	Area (sq ft)	87.30	1128.51	83.91
Q Total (cfs)	5399.00	Flow (cfs)	207.28	4992.50	199.22
Top Width (ft)	667.97	Top Width (ft)	94.83	482.00	91.14
Vel Total (ft/s)	4.15	Avg. Vel. (ft/s)	2.37	4.42	2.37
Max Chl Dpth (ft)	2.84	Hydr. Depth (ft)	0.92	2.34	0.92
Conv. Total (cfs)	96891.5	Conv. (cfs)	3719.8	89596.3	3575.3
Length Wtd. (ft)	909.03	Wetted Per. (ft)	94.85	482.00	91.16
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.18	0.45	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.42	2.01	0.42



## FloodPlain.rep

Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	52.85	174.16	12.94
C & E Loss (ft)	0.04	Cum SA (acres)	47.79	93.39	16.72

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 6343

## INPUT

Description: Sta. 6343

Station Elevation Data		num=		9					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3434	346	3433	663	3432	732	3431	860	3430.2
981	3430	1273	3430	1320	3431.5	1566	3432		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	663	.033	1320	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	663	1320		767 980	1051	.1	.3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3431.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.033	
W.S. Elev (ft)	3431.11	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3431.11	Flow Area (sq ft)		531.26	
E.G. Slope (ft/ft)	0.016513	Area (sq ft)		531.26	
Q Total (cfs)	2888.00	Flow (cfs)		2888.00	
Top Width (ft)	583.36	Top Width (ft)		583.36	
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)		5.44	
Max Chl Dpth (ft)	1.11	Hydr. Depth (ft)		0.91	
Conv. Total (cfs)	22474.4	Conv. (cfs)		22474.4	
Length Wtd. (ft)	979.58	Wetted Per. (ft)		583.38	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)		5.10	
Frctn Loss (ft)	4.10	Cum Volume (acre-ft)	22.06	88.65	3.36
C & E Loss (ft)	0.11	Cum SA (acres)	22.64	72.14	4.77

Warning: The energy equation could not be balanced within the specified number of iterations.  
 The program used critical depth for the water surface and continued on with the calculations.  
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3432.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3431.94	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3431.94	Flow Area (sq ft)		1044.47	46.77
E.G. Slope (ft/ft)	0.012039	Area (sq ft)		1044.47	46.77
Q Total (cfs)	7144.00	Flow (cfs)		7060.30	83.70
Top Width (ft)	867.12	Top Width (ft)		652.59	214.53
Vel Total (ft/s)	6.55	Avg. Vel. (ft/s)		6.76	1.79
Max Chl Dpth (ft)	1.94	Hydr. Depth (ft)		1.60	0.22
Conv. Total (cfs)	65111.0	Conv. (cfs)		64348.1	762.9
Length Wtd. (ft)	979.22	Wetted Per. (ft)		652.62	214.53
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		1.20	0.16
Alpha	1.05	Stream Power (lb/ft s)		8.13	0.29
Frctn Loss (ft)	4.09	Cum Volume (acre-ft)	52.09	151.46	11.47
C & E Loss (ft)	0.15	Cum SA (acres)	46.97	81.54	13.28

Warning: The energy equation could not be balanced within the specified number of iterations.  
 The program selected the water surface that had the least amount of error between computed and assumed values.  
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.  
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less

than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 5363

## INPUT

Description: Sta. 5363

Station Elevation Data		num= 10	
Sta	Elev	Sta	Elev
100	3432	282	3430
1097	3425	1476	3426

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
100	.033	742	.033
		1476	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	742	1476		1199 1142	713	.1	.3

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3426.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.84	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3426.14	Flow Area (sq ft)	34.19	1092.49	71.41
E.G. Slope (ft/ft)	0.001869	Area (sq ft)	34.19	1092.49	71.41
Q Total (cfs)	2888.00	Flow (cfs)	37.45	2772.35	78.21
Top Width (ft)	984.24	Top Width (ft)	81.02	734.00	169.22
Vel Total (ft/s)	2.41	Avg. Vel. (ft/s)	1.10	2.54	1.10
Max Chl Dpth (ft)	1.84	Hydr. Depth (ft)	0.42	1.49	0.42
Conv. Total (cfs)	66802.9	Conv. (cfs)	866.1	64127.7	1809.0
Length Wtd. (ft)	1137.41	Wetted Per. (ft)	81.03	734.00	169.22
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.05	0.17	0.05
Alpha	1.07	Stream Power (lb/ft s)	0.05	0.44	0.05
Frctn Loss (ft)	4.97	Cum Volume (acre-ft)	21.76	70.38	2.50
C & E Loss (ft)	0.03	Cum SA (acres)	21.93	57.32	2.73

## FloodPlain.rep

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3427.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3427.72	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3426.80	Flow Area (sq ft)	141.35	1732.59	295.22
E.G. Slope (ft/ft)	0.002096	Area (sq ft)	141.35	1732.59	295.22
Q Total (cfs)	7144.00	Flow (cfs)	263.09	6331.42	549.49
Top Width (ft)	1242.81	Top Width (ft)	164.74	734.00	344.07
Vel Total (ft/s)	3.29	Avg. Vel. (ft/s)	1.86	3.65	1.86
Max Chl Dpth (ft)	2.72	Hydr. Depth (ft)	0.86	2.36	0.86
Conv. Total (cfs)	156056.6	Conv. (cfs)	5747.0	138306.4	12003.2
Length Wtd. (ft)	1129.22	Wetted Per. (ft)	164.75	734.00	344.08
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.11	0.31	0.11
Alpha	1.13	Stream Power (lb/ft s)	0.21	1.13	0.21
Frctn Loss (ft)	5.04	Cum Volume (acre-ft)	50.85	120.22	7.34
C & E Loss (ft)	0.04	Cum SA (acres)	45.52	65.94	6.54

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 4221

## INPUT

Description: Sta. 4221

Station Elevation Data		num= 12							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3423	341	3422	544	3421	640	3420	669	3420
753	3420.2	829	3420	837	3420	1030	3421	1320	3422
1407	3423	1497	3424						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	544	.033	1407	.033

FloodPlain.rep

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	544	1407		749	732	843	.1 .3

CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3421.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.49	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.49	Flow Area (sq ft)	24.56	599.68	
E.G. Slope (ft/ft)	0.015261	Area (sq ft)	24.56	599.68	
Q Total (cfs)	3286.00	Flow (cfs)	53.64	3232.36	
Top Width (ft)	728.53	Top Width (ft)	99.86	628.66	
Vel Total (ft/s)	5.26	Avg. Vel. (ft/s)	2.18	5.39	
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)	0.25	0.95	
Conv. Total (cfs)	26599.8	Conv. (cfs)	434.2	26165.6	
Length Wtd. (ft)	737.24	Wetted Per. (ft)	99.87	628.67	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.23	0.91	
Alpha	1.03	Stream Power (lb/ft s)	0.51	4.90	
Frctn Loss (ft)	3.55	Cum Volume (acre-ft)	20.95	48.20	1.91
C & E Loss (ft)	0.10	Cum SA (acres)	19.44	39.46	1.35

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program used critical depth for the water surface and continued on with the calculations.  
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.  
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.  
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3422.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3422.20	Reach Len. (ft)	749.00	732.00	843.00

		FloodPlain.rep			
Crit W.S. (ft)	3422.20	Flow Area (sq ft)	146.05	1110.69	
E.G. Slope (ft/ft)	0.013358	Area (sq ft)	146.05	1110.69	
Q Total (cfs)	7766.00	Flow (cfs)	530.65	7235.35	
Top Width (ft)	1043.46	Top Width (ft)	250.36	793.10	
Vel Total (ft/s)	6.18	Avg. Vel. (ft/s)	3.63	6.51	
Max Chl Dpth (ft)	2.20	Hydr. Depth (ft)	0.58	1.40	
Conv. Total (cfs)	67192.6	Conv. (cfs)	4591.3	62601.3	
Length Wtd. (ft)	737.87	Wetted Per. (ft)	250.37	793.11	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.49	1.17	
Alpha	1.06	Stream Power (lb/ft s)	1.77	7.61	
Frctn Loss (ft)	3.76	Cum Volume (acre-ft)	46.89	82.95	4.92
C & E Loss (ft)	0.12	Cum SA (acres)	39.81	45.93	3.73

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program selected the water surface that had the least amount of error between computed and assumed values.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION                    RIVER: Ditch A  
REACH: 5                            RS: 3489

INPUT

Description: Sta. 3489

Station Elevation Data		num= 22							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-286	3420	-138	3418.5	-126	3418	-104	3416	-91	3415.5
-76	3416	-21	3417	100	3417	258	3416.5	299	3416
309	3415	318	3416	405	3416	422	3416	539	3416.4
581	3416.2	642	3416.4	744	3416	830	3416	918	3418
1068	3420	1159	3421						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-286	.033	539	.033	918	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
539	918	464	500	457	.1	.3	

## CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3417.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.66	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3417.07	Flow Area (sq ft)	800.11	493.34	
E.G. Slope (ft/ft)	0.002329	Area (sq ft)	800.11	493.34	
Q Total (cfs)	3286.00	Flow (cfs)	1973.59	1312.41	
Top Width (ft)	1025.44	Top Width (ft)	661.29	364.15	
Vel Total (ft/s)	2.54	Avg. Vel. (ft/s)	2.47	2.66	
Max Chl Dpth (ft)	2.66	Hydr. Depth (ft)	1.21	1.35	
Conv. Total (cfs)	68095.7	Conv. (cfs)	40898.7	27197.0	
Length Wtd. (ft)	481.91	Wetted Per. (ft)	661.50	364.17	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.18	0.20	
Alpha	1.00	Stream Power (lb/ft s)	0.43	0.52	
Frctn Loss (ft)	2.37	Cum Volume (acre-ft)	13.86	39.02	1.91
C & E Loss (ft)	0.03	Cum SA (acres)	12.90	31.12	1.35

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

## CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3418.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3418.44	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3417.60	Flow Area (sq ft)	1318.41	785.27	7.24
E.G. Slope (ft/ft)	0.002671	Area (sq ft)	1318.41	785.27	7.24
Q Total (cfs)	7766.00	Flow (cfs)	4790.13	2969.74	6.14
Top Width (ft)	1087.51	Top Width (ft)	675.55	379.00	32.96
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)	3.63	3.78	0.85
Max Chl Dpth (ft)	3.44	Hydr. Depth (ft)	1.95	2.07	0.22
Conv. Total (cfs)	150271.6	Conv. (cfs)	92688.7	57464.2	118.7



## FloodPlain.rep

Length Wtd. (ft)	480.92	Wetted Per. (ft)	675.78	379.02	32.96
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.33	0.35	0.04
Alpha	1.01	Stream Power (lb/ft s)	1.18	1.31	0.03
Frctn Loss (ft)	2.33	Cum Volume (acre-ft)	34.30	67.02	4.85
C & E Loss (ft)	0.04	Cum SA (acres)	31.85	36.08	3.41

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 2989

## INPUT

Description: Sta. 2989

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-31	3416	59	3414.8	170	3414.8	196	3414	436	3413.8
613	3414	651	3414	700	3414	747	3414	761	3414
841	3415.01	920	3416	976	3418	1067	3420		

Sta	n Val	Sta	n Val	Sta	n Val
-31	.033	436	.033	841	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
436	841	317	215	.3	.5

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3415.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.95	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.95	Flow Area (sq ft)	283.67	362.07	
E.G. Slope (ft/ft)	0.016461	Area (sq ft)	283.67	362.07	
Q Total (cfs)	3286.00	Flow (cfs)	1329.43	1956.57	
Top Width (ft)	788.45	Top Width (ft)	388.22	400.22	
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)	4.69	5.40	
Max Chl Dpth (ft)	1.15	Hydr. Depth (ft)	0.73	0.90	
Conv. Total (cfs)	25611.5	Conv. (cfs)	10361.7	15249.8	
Length Wtd. (ft)	255.96	Wetted Per. (ft)	388.24	400.23	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.75	0.93	



## FloodPlain.rep

Alpha	1.01	Stream Power (lb/ft s)	3.52	5.02	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	8.09	34.11	1.91
C & E Loss (ft)	0.16	Cum SA (acres)	7.31	26.73	1.35

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program selected the water surface that had the least amount of error between computed and assumed values.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3416.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3415.68	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3415.59	Flow Area (sq ft)	585.43	656.09	17.70
E.G. Slope (ft/ft)	0.011352	Area (sq ft)	585.43	656.09	17.70
Q Total (cfs)	7766.00	Flow (cfs)	3383.66	4341.55	40.79
Top Width (ft)	900.85	Top Width (ft)	442.70	405.00	53.15
Vel Total (ft/s)	6.17	Avg. Vel. (ft/s)	5.78	6.62	2.30
Max Chl Dpth (ft)	1.88	Hydr. Depth (ft)	1.32	1.62	0.33
Conv. Total (cfs)	72888.6	Conv. (cfs)	31757.7	40748.1	382.9
Length Wtd. (ft)	263.06	Wetted Per. (ft)	442.72	405.01	53.15
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.94	1.15	0.24
Alpha	1.03	Stream Power (lb/ft s)	5.42	7.60	0.54
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	24.16	58.75	4.72
C & E Loss (ft)	0.20	Cum SA (acres)	25.89	31.58	2.96

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION  
REACH: 5

RIVER: Ditch A  
RS: 2774

## INPUT

Description: Sta. 2774 Upstream of culverts

Station	Elevation	Data	num=	18
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
-453	3416	-437	3415	-405 3414 -289 3413.8 -13 3413.8
100	3413.8	175	3413.8	204 3412 261 3412 298 3411.2
402	3410.9	437	3410	469 3409 491 3409 511 3410
560	3412	641	3414	725 3416

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
-453	.033	437	.033
		511	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	437	511		40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

## CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3414.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.41	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	1115.26	374.10	284.35
E.G. Slope (ft/ft)	0.000645	Area (sq ft)	1115.26	374.10	284.35
Q Total (cfs)	3286.00	Flow (cfs)	1522.17	1259.45	504.38
Top Width (ft)	1076.10	Top Width (ft)	855.02	74.00	147.08
Vel Total (ft/s)	1.85	Avg. Vel. (ft/s)	1.36	3.37	1.77
Max Chl Dpth (ft)	5.41	Hydr. Depth (ft)	1.30	5.06	1.93
Conv. Total (cfs)	129409.2	Conv. (cfs)	59946.0	49599.6	19863.6
Length Wtd. (ft)	40.00	Wetted Per. (ft)	855.10	74.04	147.15
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.05	0.20	0.08
Alpha	1.66	Stream Power (lb/ft s)	0.07	0.68	0.14
Frctn Loss (ft)		Cum Volume (acre-ft)	3.00	32.29	1.35
C & E Loss (ft)		Cum SA (acres)	2.78	25.56	1.06

Warning: The cross section had to be extended vertically during the critical depth calculations.

Warning: The parabolic search method failed to converge on critical depth. The program will try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT

Profile #PF 3

E.G. Elev (ft)	3415.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3415.12	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3413.54	Flow Area (sq ft)	1729.17	426.55	399.14
E.G. Slope (ft/ft)	0.001303	Area (sq ft)	1729.17	426.55	399.14
Q Total (cfs)	7766.00	Flow (cfs)	4422.39	2227.79	1115.82
Top Width (ft)	1126.70	Top Width (ft)	875.85	74.00	176.85
Vel Total (ft/s)	3.04	Avg. Vel. (ft/s)	2.56	5.22	2.80
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)	1.97	5.76	2.26
Conv. Total (cfs)	215162.4	Conv. (cfs)	122525.4	61722.5	30914.5
Length Wtd. (ft)	40.00	Wetted Per. (ft)	875.94	74.04	176.93
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.16	0.47	0.18
Alpha	1.37	Stream Power (lb/ft s)	0.41	2.45	0.51
Frctn Loss (ft)		Cum Volume (acre-ft)	15.74	56.08	3.90
C & E Loss (ft)		Cum SA (acres)	21.09	30.40	2.50

CULVERT  
REACH: 5

RIVER: Ditch A  
RS: 2773

## INPUT

## Description:

Distance from Upstream XS = 8

Deck/Roadway Width = 24

Weir Coefficient = 3

Upstream Deck/Roadway Coordinates

num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
26	3413.8				100	3413.8				402	3412.7			
500	3412.8				600	3413.9				700	3415.7			

## Upstream Bridge Cross Section Data

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

## Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	437	511	.3		.5

Ineffective Flow num= 2

## FloodPlain.rep

Sta L Sta R Elev Permanent  
 -888 F  
 888 F

## Downstream Deck/Roadway Coordinates

num= 6  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
26	3413.8				100	3413.8				402	3412.7			
500	3412.8				600	3413.9				700	3415.7			

## Downstream Bridge Cross Section Data

Station Elevation Data num= 17  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

## Manning's n Values

num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta: Left Right Coeff Contr. Expan.  
 349 434 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -888 F  
 888 F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins = 3412.7  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Pipe Arch 1.833 2.43  
 FHWA Chart # 34- 18 inch corner radius; Corrugated metal  
 FHWA Scale # 1 - 90 Degree headwall  
 Solution Criteria = Highest U.S. EG  

Culvert Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
1	39	.024	.5	1

Number of Barrels = 6

Upstream Elevation = 3409

## Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
469	473.4	477.8	482.2	486.6	491

Downstream Elevation = 3408.9

## Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
387	391.4	395.8	400.2	404.6	409

CROSS SECTION RIVER: Ditch A  
 REACH: 5 RS: 2734

## INPUT

Description: Sta. 2734 Downstream of culverts

Station Elevation Data num= 17  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9

FloodPlain.rep

400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

Manning's n Values      num=      3

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

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

	349	434	745	846	1015	.3	.5
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Ineffective Flow      num=      2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

CROSS SECTION OUTPUT      Profile #PF 2

E.G. Elev (ft)	3413.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.004812	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	3286.00	Flow (cfs)	884.51	2040.31	361.18
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	4.94	Avg. Vel. (ft/s)	3.21	7.06	3.59
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.72	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.31	1.02	0.37
Alpha	1.44	Stream Power (lb/ft s)	1.00	7.21	1.33
Frctn Loss (ft)	3.01	Cum Volume (acre-ft)	2.36	31.99	1.17
C & E Loss (ft)	0.22	Cum SA (acres)	2.27	25.49	0.95

Warning: The energy equation could not be balanced within the specified number of iterations.  
The program selected the water surface that had the least amount of error between computed and assumed values.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The parabolic search method failed to converge on critical depth. The program will

try the

cross section slice/secant method to find critical depth.

## CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3414.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.37	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3414.37	Flow Area (sq ft)	1462.63	430.11	292.31
E.G. Slope (ft/ft)	0.003331	Area (sq ft)	1462.63	430.11	292.31
Q Total (cfs)	7766.00	Flow (cfs)	3290.35	3293.62	1182.03
Top Width (ft)	2051.72	Top Width (ft)	1816.17	85.00	150.55
Vel Total (ft/s)	3.55	Avg. Vel. (ft/s)	2.25	7.66	4.04
Max Chl Dpth (ft)	5.47	Hydr. Depth (ft)	0.81	5.06	1.94
Conv. Total (cfs)	134550.1	Conv. (cfs)	57007.1	57063.8	20479.3
Length Wtd. (ft)		Wetted Per. (ft)	1816.21	85.04	150.61
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.17	1.05	0.40
Alpha	2.34	Stream Power (lb/ft s)	0.38	8.06	1.63
Frctn Loss (ft)		Cum Volume (acre-ft)	14.28	55.69	3.58
C & E Loss (ft)		Cum SA (acres)	19.86	30.32	2.35

Warning: The energy equation could not be balanced within the specified number of iterations.  
The

program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION                      RIVER: Ditch A  
REACH: 5                              RS: 1888

## INPUT

Description: Sta. 1888

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-775	3412	-41	3410	81	3410	100	3410.2	110	3410
331	3408	532	3408	690	3408	1180	3410	1268	3412

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-775	.033	100	.033	1180	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	1180		305	828	980	
						.1	.3

CROSS SECTION OUTPUT      Profile #PF 2

## FloodPlain.rep

E.G. Elev (ft)	3409.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.033	
W.S. Elev (ft)	3409.80	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3409.14	Flow Area (sq ft)		1225.09	
E.G. Slope (ft/ft)	0.002775	Area (sq ft)		1225.09	
Q Total (cfs)	3327.00	Flow (cfs)		3327.00	
Top Width (ft)	999.96	Top Width (ft)		999.96	
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)		2.72	
Max Chl Dpth (ft)	1.80	Hydr. Depth (ft)		1.23	
Conv. Total (cfs)	63158.9	Conv. (cfs)		63158.9	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		999.97	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)		17.28	
C & E Loss (ft)	0.04	Cum SA (acres)		14.95	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross

section. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

## CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3410.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3410.59	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3409.82	Flow Area (sq ft)	146.69	2069.78	7.77
E.G. Slope (ft/ft)	0.002839	Area (sq ft)	146.69	2069.78	7.77
Q Total (cfs)	7864.00	Flow (cfs)	193.76	7661.94	8.30
Top Width (ft)	1465.23	Top Width (ft)	359.09	1080.00	26.15
Vel Total (ft/s)	3.54	Avg. Vel. (ft/s)	1.32	3.70	1.07
Max Chl Dpth (ft)	2.59	Hydr. Depth (ft)	0.41	1.92	0.30

Conv. Total (cfs)	147583.8	FloodPlain.rep Conv. (cfs)	3636.3	143791.8	155.7
Length Wtd. (ft)	821.74	Wetted Per. (ft)	359.09	1080.02	26.15
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.07	0.34	0.05
Alpha	1.07	Stream Power (lb/ft s)	0.10	1.26	0.06
Frctn Loss (ft)	4.53	Cum Volume (acre-ft)	0.51	31.41	0.09
C & E Loss (ft)	0.05	Cum SA (acres)	1.26	19.01	0.29

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION RIVER: Ditch A  
REACH: 5 RS: 1060

#### INPUT

Description: Sta. 1060

Station Elevation Data		num= 6							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3408	394	3406	879	3402.7	909	3402.7	1206	3405
1523	3406								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
100	.033	394	.033	1523	.033

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	394	1523		60	60	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3405.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.		0.033	
W.S. Elev (ft)	3404.67	Reach Len. (ft)			
Crit W.S. (ft)	3404.67	Flow Area (sq ft)		593.57	
E.G. Slope (ft/ft)	0.016121	Area (sq ft)		593.57	
Q Total (cfs)	3473.00	Flow (cfs)		3473.00	
Top Width (ft)	573.29	Top Width (ft)		573.29	
Vel Total (ft/s)	5.85	Avg. Vel. (ft/s)		5.85	
Max Chl Dpth (ft)	1.97	Hydr. Depth (ft)		1.04	
Conv. Total (cfs)	27353.4	Conv. (cfs)		27353.4	
Length Wtd. (ft)		Wetted Per. (ft)		573.31	



FloodPlain.rep

Min Ch El (ft)	3402.70	Shear (lb/sq ft)	1.04
Alpha	1.00	Stream Power (lb/ft s)	6.10
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

CROSS SECTION OUTPUT      Profile #PF 3

E.G. Elev (ft)	3406.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.		0.033	
W.S. Elev (ft)	3405.55	Reach Len. (ft)			
Crit W.S. (ft)	3405.55	Flow Area (sq ft)		1235.07	
E.G. Slope (ft/ft)	0.014413	Area (sq ft)		1235.07	
Q Total (cfs)	8124.00	Flow (cfs)		8124.00	
Top Width (ft)	920.12	Top Width (ft)		920.12	
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		6.58	
Max Chl Dpth (ft)	2.85	Hydr. Depth (ft)		1.34	
Conv. Total (cfs)	67669.9	Conv. (cfs)		67669.9	
Length Wtd. (ft)		Wetted Per. (ft)		920.14	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)		7.94	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033

		FloodPlain.rep		
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

# SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta..	Left	Channel	Right
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

# SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Ditch A

Reach	River Sta..	Contr..	Expan..
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	

		FloodPlain.rep
5	2734	.3 .5
5	1888	.1 .3
5	1060	.1 .3

Profile Output Table - Standard Table 1

Reach lope	Vel (ft/s)	River Sta Chnl Flow Area (sq ft)	Q Total Top Width (ft) (cfs)	Min Ch El Froude # Chl (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. S (ft)
5		12674	976.00	3477.00	3478.76	3478.27	3478.88	0.00
3056	2.90	357.89	355.40	0.46				
5		12674	1850.00	3477.00	3479.26	3478.68	3479.45	0.00
3167	3.69	553.45	422.29	0.49				
5		11337	976.00	3469.00	3470.81	3470.81	3471.39	0.01
3220	6.21	164.80	149.13	0.95				
5		11337	1850.00	3469.00	3471.47	3471.46	3472.26	0.01
0885	7.39	272.36	176.84	0.93				
5		10937	976.00	3464.00	3466.24	3466.08	3466.66	0.01
0235	5.21	188.24	162.01	0.83				
5		10937	1850.00	3464.00	3466.72	3466.72	3467.45	0.01
3153	6.91	273.71	197.22	0.98				
5		10288	976.00	3456.00	3457.22	3457.22	3457.51	0.02
0477	4.31	226.46	413.97	1.03				
5		10288	1850.00	3456.00	3457.57	3457.53	3457.93	0.01
5410	4.82	383.80	479.25	0.95				
5		9690	1242.00	3450.00	3451.93	3451.51	3452.09	0.00
4969	3.13	396.40	404.17	0.56				
5		9690	2689.00	3450.00	3452.40	3452.06	3452.72	0.00
6338	4.52	603.04	473.62	0.67				
5		9009	1242.00	3445.00	3446.90	3446.75	3447.19	0.01
1195	4.31	288.10	334.67	0.82				
5		9009	2689.00	3445.00	3447.65		3447.96	0.00
7751	4.51	596.64	492.15	0.72				
5		8130	1242.00	3440.00	3442.03	3441.49	3442.15	0.00
3422	2.73	455.81	437.11	0.47				
5		8130	2689.00	3440.00	3442.50	3442.03	3442.75	0.00
4647	4.06	674.08	497.59	0.58				
5		7717	1242.00	3437.80	3439.01	3439.01	3439.38	0.01
8011	4.88	254.54	350.81	1.01				
5		7717	2689.00	3437.80	3439.74		3440.11	0.00
9311	4.84	555.05	471.42	0.79				
5		7253	1483.00	3435.00	3436.81	3436.16	3436.89	0.00
1808	2.29	664.86	563.87	0.35				
5		7253	5399.00	3435.00	3437.84	3437.06	3438.13	0.00

				FloodPlain.rep					
3105	4.42	1299.73	667.97	0.51					
5		6343	2888.00	3430.00	3431.11	3431.11	3431.57	0.01	
6513	5.44	531.26	583.36	1.00					
5		6343	7144.00	3430.00	3431.94	3431.94	3432.64	0.01	
2039	6.76	1091.24	867.12	0.94					
5		5363	2888.00	3425.00	3426.84	3426.14	3426.94	0.00	
1869	2.54	1198.09	984.24	0.37					
5		5363	7144.00	3425.00	3427.72	3426.80	3427.91	0.00	
2096	3.65	2169.17	1242.81	0.42					
5		4221	3286.00	3420.00	3421.49	3421.49	3421.94	0.01	
5261	5.39	624.24	728.53	0.97					
5		4221	7766.00	3420.00	3422.20	3422.20	3422.82	0.01	
3358	6.51	1256.74	1043.46	0.97					
5		3489	3286.00	3416.00	3417.66	3417.07	3417.76	0.00	
2329	2.66	1293.45	1025.44	0.40					
5		3489	7766.00	3416.00	3418.44	3417.60	3418.65	0.00	
2671	3.78	2110.92	1087.51	0.46					
5		2989	3286.00	3413.80	3414.95	3414.95	3415.36	0.01	
6461	5.40	645.74	788.45	1.00					
5		2989	7766.00	3413.80	3415.68	3415.59	3416.28	0.01	
1352	6.62	1259.21	900.85	0.92					
5		2774	3286.00	3409.00	3414.41	3412.71	3414.50	0.00	
0645	3.37	1773.70	1076.10	0.26					
5		2774	7766.00	3409.00	3415.12	3413.54	3415.31	0.00	
1303	5.22	2554.86	1126.70	0.38					
5		2773	Culvert						
5		2734	3286.00	3408.90	3412.71	3412.71	3413.25	0.00	
4812	7.06	665.51	431.91	0.67					
5		2734	7766.00	3408.90	3414.37	3414.37	3414.83	0.00	
3331	7.66	2185.05	2051.72	0.60					
5		1888	3327.00	3408.00	3409.80	3409.14	3409.92	0.00	
2775	2.72	1225.09	999.96	0.43					
5		1888	7864.00	3408.00	3410.59	3409.82	3410.80	0.00	
2839	3.70	2224.23	1465.23	0.47					
5		1060	3473.00	3402.70	3404.67	3404.67	3405.20	0.01	
6121	5.85	593.57	573.29	1.01					
5		1060	8124.00	3402.70	3405.55	3405.55	3406.22	0.01	
4413	6.58	1235.07	920.12	1.00					

Profile Output Table - Report Standard Table 1

## FloodPlain.rep

Reach	River Sta		Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G
Elev	E.G. Slope	Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude #	Chl
(ft)	(ft/ft)	(ft/s)	(cfs)	(ft)	(ft)	(sq ft)	(ft)	(ft)
			(ft)	(ft)	(ft)			
5	12674		976.00	3477.00	3478.76	3478.27	1.75	3
478.88	0.003056	2.90	327.16	682.56	357.89	355.40		0.46
5	12674		1850.00	3477.00	3479.26	3478.68	2.26	3
479.45	0.003167	3.69	291.95	714.24	553.45	422.29		0.49
5	11337		976.00	3469.00	3470.81	3470.81	1.81	3
471.39	0.013220	6.21	417.53	566.66	164.80	149.13		0.95
5	11337		1850.00	3469.00	3471.47	3471.46	2.47	3
472.26	0.010885	7.39	403.34	580.18	272.36	176.84		0.93
5	10937		976.00	3464.00	3466.24	3466.08	2.24	3
466.66	0.010235	5.21	455.99	618.01	188.24	162.01		0.83
5	10937		1850.00	3464.00	3466.72	3466.72	2.72	3
467.45	0.013153	6.91	438.39	635.61	273.71	197.22		0.98
5	10288		976.00	3456.00	3457.22	3457.22	1.22	3
457.51	0.020477	4.31	374.31	788.29	226.46	413.97		1.03
5	10288		1850.00	3456.00	3457.57	3457.53	1.57	3
457.93	0.015410	4.82	339.97	819.21	383.80	479.25		0.95
5	9690		1242.00	3450.00	3451.93	3451.51	1.93	3
452.09	0.004969	3.13	389.43	793.60	396.40	404.17		0.56
5	9690		2689.00	3450.00	3452.40	3452.06	2.40	3
452.72	0.006338	4.52	345.06	818.68	603.04	473.62		0.67
5	9009		1242.00	3445.00	3446.90	3446.75	1.90	3
447.19	0.011195	4.31	416.94	751.61	288.10	334.67		0.82
5	9009		2689.00	3445.00	3447.65		2.65	3
447.96	0.007751	4.51	354.62	846.77	596.64	492.15		0.72
5	8130		1242.00	3440.00	3442.03	3441.49	2.03	3

FloodPlain.rep									
442.15	0.003422	2.73	417.16	854.27	455.81	437.11		0.47	
5	8130		2689.00	3440.00	3442.50	3442.03		2.50	3
442.75	0.004647	4.06	390.07	887.66	674.08	497.59		0.58	
5	7717		1242.00	3437.80	3439.01	3439.01		1.21	3
439.38	0.018011	4.88	307.18	657.99	254.54	350.81		1.01	
5	7717		2689.00	3437.80	3439.74			1.94	3
440.11	0.009311	4.84	252.35	723.77	555.05	471.42		0.79	
5	7253		1483.00	3435.00	3436.81	3436.16		1.81	3
436.89	0.001808	2.29	382.26	946.12	664.86	563.87		0.35	
5	7253		5399.00	3435.00	3437.84	3437.06		2.84	3
438.13	0.003105	4.42	329.17	997.14	1299.73	667.97		0.51	
5	6343		2888.00	3430.00	3431.11	3431.11		1.11	3
431.57	0.016513	5.44	724.42	1307.78	531.26	583.36		1.00	
5	6343		7144.00	3430.00	3431.94	3431.94		1.94	3
432.64	0.012039	6.76	667.41	1534.53	1091.24	867.12		0.94	
5	5363		2888.00	3425.00	3426.84	3426.14		1.84	3
426.94	0.001869	2.54	660.98	1645.22	1198.09	984.24		0.37	
5	5363		7144.00	3425.00	3427.72	3426.80		2.72	3
427.91	0.002096	3.65	577.26	1820.07	2169.17	1242.81		0.42	
5	4221		3286.00	3420.00	3421.49	3421.49		1.49	3
421.94	0.015261	5.39	444.14	1172.66	624.24	728.53		0.97	
5	4221		7766.00	3420.00	3422.20	3422.20		2.20	3
422.82	0.013358	6.51	293.64	1337.10	1256.74	1043.46		0.97	
5	3489		3286.00	3416.00	3417.66	3417.07		2.66	3
417.76	0.002329	2.66	-122.29	903.15	1293.45	1025.44		0.40	
5	3489		7766.00	3416.00	3418.44	3417.60		3.44	3
418.65	0.002671	3.78	-136.55	950.96	2110.92	1087.51		0.46	
5	2989		3286.00	3413.80	3414.95	3414.95		1.15	3
415.36	0.016461	5.40	47.78	836.22	645.74	788.45		1.00	

FloodPlain.rep									
5	2989		7766.00	3413.80	3415.68	3415.59	1.88	3	
416.28	0.011352	6.62	-6.70	894.15	1259.21	900.85		0.92	
5	2774		3286.00	3409.00	3414.41	3412.71	5.41	3	
414.50	0.000645	3.37	-418.02	658.08	1773.70	1076.10		0.26	
5	2774		7766.00	3409.00	3415.12	3413.54	6.12	3	
415.31	0.001303	5.22	-438.85	687.85	2554.86	1126.70		0.38	
5	2773		Culvert						
5	2734		3286.00	3408.90	3412.71	3412.71	3.81	3	
413.25	0.004812	7.06	83.74	515.65	665.51	431.91		0.67	
5	2734		7766.00	3408.90	3414.37	3414.37	5.47	3	
414.83	0.003331	7.66	-1467.17	584.55	2185.05	2051.72		0.60	
5	1888		3327.00	3408.00	3409.80	3409.14	1.80	3	
409.92	0.002775	2.72	131.77	1131.73	1225.09	999.96		0.43	
5	1888		7864.00	3408.00	3410.59	3409.82	2.59	3	
410.80	0.002839	3.70	-259.09	1206.15	2224.23	1465.23		0.47	
5	1060		3473.00	3402.70	3404.67	3404.67	1.97	3	
405.20	0.016121	5.85	589.80	1163.09	593.57	573.29		1.01	
5	1060		8124.00	3402.70	3405.55	3405.55	2.85	3	
406.22	0.014413	6.58	460.16	1380.29	1235.07	920.12		1.00	

