

SavDrnCan.rep

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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PROJECT DATA

Project Title: Savina Drainage Canal
Project File : SavDrnCan.prj
Run Date and Time: 3/23/2007 8:11:50 AM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : f:\HYDRO\Projects\Savina 4th\HEC\SavDrnCan.p01

Geometry Title: Exist Geo
Geometry File : f:\HYDRO\Projects\Savina 4th\HEC\SavDrnCan.g01

Flow Title : 100yr_Flow
Flow File : f:\HYDRO\Projects\Savina 4th\HEC\SavDrnCan.f01

Plan Summary Information:

Number of: Cross Sections	=	8	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information

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

Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 100yr_Flow

Flow File : f:\HYDRO\Projects\Savina 4th\HEC\SavDrnCan.f01

Flow Data (cfs)

River	Reach	RS	Calced 100 yr Flow	PF 2	PF 3
Savina Drainage 1		9940	800	1000	2000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Savina Drainage 1		Calced 100 yr Flow		Normal S = 0.002

GEOMETRY DATA

Geometry Title: Exist Geo

Geometry File : f:\HYDRO\Projects\Savina 4th\HEC\SavDrnCan.g01

CROSS SECTION

RIVER: Savina Drainage

REACH: 1 RS: 9940

INPUT

Description:

Station Elevation Data				num=	14				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4951	130	4960	129	4979	122	4983	121	4988	120
4993	119	5000	119	5012	119	5015	120	5018	121
5031	125	5045	130	5051	131	5078	131		

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Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4951 .04 4960 .035 5045 .04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4960 5045 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	125.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.64	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		285.65	
E.G. Slope (ft/ft)	0.000613	Area (sq ft)		285.65	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	63.66	Top Width (ft)		63.66	
Vel Total (ft/s)	2.80	Avg. Vel. (ft/s)		2.80	
Max Chl Dpth (ft)	6.64	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	32317.8	Conv. (cfs)		32317.8	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		65.66	
Min Ch El (ft)	119.00	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.47	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)		3.38	
C & E Loss (ft)	0.00	Cum SA (acres)		0.90	

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	126.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.035	
W.S. Elev (ft)	126.24	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		325.17	
E.G. Slope (ft/ft)	0.000667	Area (sq ft)		325.17	
Q Total (cfs)	1000.00	Flow (cfs)		1000.00	
Top Width (ft)	66.99	Top Width (ft)		66.99	
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)		3.08	
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)		4.85	
Conv. Total (cfs)	38726.1	Conv. (cfs)		38726.1	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		69.21	
Min Ch El (ft)	119.00	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)		3.92	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		0.96	0.00

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	128.67	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.27	Wt. n-Val.	0.035	
W.S. Elev (ft)	128.40	Reach Len. (ft)	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	482.89	
E.G. Slope (ft/ft)	0.000893	Area (sq ft)	482.89	
Q Total (cfs)	2000.00	Flow (cfs)	2000.00	
Top Width (ft)	78.91	Top Width (ft)	78.91	
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)	4.14	
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)	6.12	
Conv. Total (cfs)	66913.1	Conv. (cfs)	66913.1	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	81.89	
Min Ch El (ft)	119.00	Shear (lb/sq ft)	0.33	
Alpha	1.00	Stream Power (lb/ft s)	1.36	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	6.09	0.25
C & E Loss (ft)	0.01	Cum SA (acres)	1.12	0.61

CROSS SECTION

RIVER: Savina Drainage

REACH: 1 RS: 9840

INPUT

Description:

Station Elevation Data				num=	13				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4951	130	4959	129	4977	122	4979	121	4984	120
4990	119	5000	119	5010	119	5016	120	5019	121
5032	125	5042	128	5114	128				

Manning's n Values				num=	3		
Sta	n Val	Sta	n Val	Sta	n Val		
4951	.04	4959	.035	5042	.04		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4959	5042		100	100	.1	.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	125.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.59	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		304.66	
E.G. Slope (ft/ft)	0.000520	Area (sq ft)		304.66	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	66.20	Top Width (ft)		66.20	
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)		2.63	
Max Chl Dpth (ft)	6.59	Hydr. Depth (ft)		4.60	
Conv. Total (cfs)	35072.9	Conv. (cfs)		35072.9	

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Length Wtd. (ft)	100.00	Wetted Per. (ft)	68.23
Min Ch El (ft)	119.00	Shear (lb/sq ft)	0.15
Alpha	1.00	Stream Power (lb/ft s)	0.38
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	2.71
C & E Loss (ft)	0.01	Cum SA (acres)	0.75

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.

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	126.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.035	
W.S. Elev (ft)	126.19	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		345.51	
E.G. Slope (ft/ft)	0.000574	Area (sq ft)		345.51	
Q Total (cfs)	1000.00	Flow (cfs)		1000.00	
Top Width (ft)	69.75	Top Width (ft)		69.75	
Vel Total (ft/s)	2.89	Avg. Vel. (ft/s)		2.89	
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)		4.95	
Conv. Total (cfs)	41741.5	Conv. (cfs)		41741.5	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		71.98	
Min Ch El (ft)	119.00	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		3.15	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		0.80	0.00

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 OUTPUT Profile #PF 3

E.G. Elev (ft)	128.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.035	0.040
W.S. Elev (ft)	128.34	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		509.03	24.70
E.G. Slope (ft/ft)	0.000768	Area (sq ft)		509.03	24.70
Q Total (cfs)	2000.00	Flow (cfs)		1987.58	12.42
Top Width (ft)	153.31	Top Width (ft)		81.31	72.00
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)		3.90	0.50
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)		6.26	0.34
Conv. Total (cfs)	72162.2	Conv. (cfs)		71714.0	448.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)		84.21	72.34
Min Ch El (ft)	119.00	Shear (lb/sq ft)		0.29	0.02
Alpha	1.08	Stream Power (lb/ft s)		1.13	0.01
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		4.95	0.22
C & E Loss (ft)	0.01	Cum SA (acres)		0.93	0.53

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Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: Savina Drainage

REACH: 1 RS: 9740

INPUT

Description:

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4961	129	4987	120	5000	120	5013	120	5031	126
5049	127	5062	128	5156	128				

Sta	n Val	Sta	n Val	Sta	n Val
4961	.04	4961	.035	5031	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4961	5031		100	100		.1	.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	125.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.42	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		227.61	
E.G. Slope (ft/ft)	0.001151	Area (sq ft)		227.61	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	57.94	Top Width (ft)		57.94	
Vel Total (ft/s)	3.51	Avg. Vel. (ft/s)		3.51	
Max Chl Dpth (ft)	5.42	Hydr. Depth (ft)		3.93	
Conv. Total (cfs)	23575.4	Conv. (cfs)		23575.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		59.73	
Min Ch El (ft)	120.00	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		0.96	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		2.10	
C & E Loss (ft)	0.01	Cum SA (acres)		0.61	

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	126.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.035	0.000
W.S. Elev (ft)	126.01	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		262.39	0.00

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E.G. Slope (ft/ft)	0.001211	Area (sq ft)	262.39	0.00
Q Total (cfs)	1000.00	Flow (cfs)	1000.00	0.00
Top Width (ft)	61.47	Top Width (ft)	61.35	0.11
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)	3.81	0.03
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)	4.28	0.00
Conv. Total (cfs)	28734.4	Conv. (cfs)	28734.4	0.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)	63.34	0.11
Min Ch El (ft)	120.00	Shear (lb/sq ft)	0.31	
Alpha	1.00	Stream Power (lb/ft s)	1.19	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	2.45	0.00
C & E Loss (ft)	0.01	Cum SA (acres)	0.65	0.00

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	128.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.035	0.040
W.S. Elev (ft)	128.09	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		396.24	44.27
E.G. Slope (ft/ft)	0.001351	Area (sq ft)		396.24	44.27
Q Total (cfs)	2000.00	Flow (cfs)		1969.77	30.23
Top Width (ft)	192.36	Top Width (ft)		67.36	125.00
Vel Total (ft/s)	4.54	Avg. Vel. (ft/s)		4.97	0.68
Max Chl Dpth (ft)	8.09	Hydr. Depth (ft)		5.88	0.35
Conv. Total (cfs)	54409.2	Conv. (cfs)		53586.7	822.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)		69.69	125.15
Min Ch El (ft)	120.00	Shear (lb/sq ft)		0.48	0.03
Alpha	1.18	Stream Power (lb/ft s)		2.38	0.02
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		3.91	0.14
C & E Loss (ft)	0.01	Cum SA (acres)		0.76	0.31

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: Savina Drainage

REACH: 1 RS: 9640

INPUT

Description:

Station	Elevation	Data	num=	10	Sta	Elev	Sta	Elev	Sta	Elev
4963	129	4988	121	4994	120	5000	119.8	5007	120	
5015	121	5035	127	5060	128	5080	129	5101	129	

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

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4963 .04 4963 .035 5035 .04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4963	5035		95 100	108	.1	.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	125.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.19	Reach Len. (ft)	95.00	100.00	108.00
Crit W.S. (ft)		Flow Area (sq ft)		191.19	
E.G. Slope (ft/ft)	0.001867	Area (sq ft)		191.19	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	54.07	Top Width (ft)		54.07	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)		3.54	
Conv. Total (cfs)	18516.5	Conv. (cfs)		18516.5	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		55.49	
Min Ch El (ft)	119.80	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.68	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		1.61	
C & E Loss (ft)	0.00	Cum SA (acres)		0.48	

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	126.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.76	Reach Len. (ft)	95.00	100.00	108.00
Crit W.S. (ft)		Flow Area (sq ft)		223.04	
E.G. Slope (ft/ft)	0.001908	Area (sq ft)		223.04	
Q Total (cfs)	1000.00	Flow (cfs)		1000.00	
Top Width (ft)	57.75	Top Width (ft)		57.75	
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)		4.48	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		3.86	
Conv. Total (cfs)	22891.1	Conv. (cfs)		22891.1	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		59.34	
Min Ch El (ft)	119.80	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)		2.01	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		1.90	
C & E Loss (ft)	0.00	Cum SA (acres)		0.51	

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	128.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.035	0.040
W.S. Elev (ft)	127.79	Reach Len. (ft)	95.00	100.00	108.00
Crit W.S. (ft)		Flow Area (sq ft)		352.71	7.87

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E.G. Slope (ft/ft)	0.002063	Area (sq ft)	352.71	7.87
Q Total (cfs)	2000.00	Flow (cfs)	1992.83	7.17
Top Width (ft)	88.07	Top Width (ft)	68.23	19.84
Vel Total (ft/s)	5.55	Avg. Vel. (ft/s)	5.65	0.91
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)	5.17	0.40
Conv. Total (cfs)	44033.6	Conv. (cfs)	43875.8	157.8
Length Wtd. (ft)	100.02	Wetted Per. (ft)	70.32	19.85
Min Ch El (ft)	119.80	Shear (lb/sq ft)	0.65	0.05
Alpha	1.03	Stream Power (lb/ft s)	3.65	0.05
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	3.05	0.08
C & E Loss (ft)	0.00	Cum SA (acres)	0.61	0.14

CROSS SECTION

RIVER: Savina Drainage
 REACH: 1

RS: 9540

INPUT

Description:

Station	Elevation	Data	num=	10	Sta	Elev	Sta	Elev	Sta	Elev
4962	129	4990	121	4994	120	5000	119.59	5007	120	
5016	121	5037	127	5057	128	5062	129	5076	129	

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val
4962	.04	4962	.035	5037	.04		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4962	5037		95	100	105	.1
							.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	125.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.035	
W.S. Elev (ft)	124.94	Reach Len. (ft)	95.00	100.00	105.00
Crit W.S. (ft)		Flow Area (sq ft)		179.12	
E.G. Slope (ft/ft)	0.002288	Area (sq ft)		179.12	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	53.60	Top Width (ft)		53.60	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	5.35	Hydr. Depth (ft)		3.34	
Conv. Total (cfs)	16726.3	Conv. (cfs)		16726.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		54.91	
Min Ch El (ft)	119.59	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)		2.08	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		1.19	

C & E Loss (ft)	0.01	Cum SA (acres)	0.35
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CROSS SECTION OUTPUT Profile #PF 2

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	125.86	Wt. n-Val.		0.035	
Vel Head (ft)	0.35	Reach Len. (ft)	95.00	100.00	105.00
W.S. Elev (ft)	125.51	Flow Area (sq ft)		210.65	
Crit W.S. (ft)		Area (sq ft)		210.65	
E.G. Slope (ft/ft)	0.002293	Flow (cfs)		1000.00	
Q Total (cfs)	1000.00	Top Width (ft)		57.57	
Top Width (ft)	57.57	Avg. Vel. (ft/s)		4.75	
Vel Total (ft/s)	4.75	Hydr. Depth (ft)		3.66	
Max Chl Dpth (ft)	5.92	Conv. (cfs)		20881.5	
Conv. Total (cfs)	20881.5	Wetted Per. (ft)		59.04	
Length Wtd. (ft)	100.00	Shear (lb/sq ft)		0.51	
Min Ch El (ft)	119.59	Stream Power (lb/ft s)		2.42	
Alpha	1.00	Cum Volume (acre-ft)		1.40	
Frctn Loss (ft)	0.21	Cum SA (acres)		0.38	
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #PF 3

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	128.06	Wt. n-Val.		0.035	0.040
Vel Head (ft)	0.53	Reach Len. (ft)	95.00	100.00	105.00
W.S. Elev (ft)	127.53	Flow Area (sq ft)		340.51	2.78
Crit W.S. (ft)		Area (sq ft)		340.51	2.78
E.G. Slope (ft/ft)	0.002397	Flow (cfs)		1997.92	2.08
Q Total (cfs)	2000.00	Top Width (ft)		69.85	10.55
Top Width (ft)	80.39	Avg. Vel. (ft/s)		5.87	0.75
Vel Total (ft/s)	5.83	Hydr. Depth (ft)		4.88	0.26
Max Chl Dpth (ft)	7.94	Conv. (cfs)		40804.7	42.4
Conv. Total (cfs)	40847.1	Wetted Per. (ft)		71.80	10.56
Length Wtd. (ft)	100.03	Shear (lb/sq ft)		0.71	0.04
Min Ch El (ft)	119.59	Stream Power (lb/ft s)		4.16	0.03
Alpha	1.01	Cum Volume (acre-ft)		2.26	0.07
Frctn Loss (ft)	0.22	Cum SA (acres)		0.45	0.10
C & E Loss (ft)	0.02				

CROSS SECTION

RIVER: Savina Drainage
 REACH: 1

RS: 9440

INPUT
 Description:

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Station Elevation Data						num= 8			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4964	128	4989	121	4993	120	5000	119.38	5011	120
5018	121	5038	126	5055	127				

Manning's n Values						num= 3			
Sta	n Val	Sta	n Val	Sta	n Val				
4964	.04	4964	.035	5038	.04				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4964	5038		100	100		.1	.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	125.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.035	
W.S. Elev (ft)	124.76	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		191.43	
E.G. Slope (ft/ft)	0.002002	Area (sq ft)		191.43	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	57.44	Top Width (ft)		57.44	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	5.38	Hydr. Depth (ft)		3.33	
Conv. Total (cfs)	17881.6	Conv. (cfs)		17881.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		58.66	
Min Ch El (ft)	119.38	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		1.70	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		0.76	
C & E Loss (ft)	0.00	Cum SA (acres)		0.23	

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	125.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.33	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		225.47	
E.G. Slope (ft/ft)	0.001999	Area (sq ft)		225.47	
Q Total (cfs)	1000.00	Flow (cfs)		1000.00	
Top Width (ft)	61.76	Top Width (ft)		61.76	
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)		4.44	
Max Chl Dpth (ft)	5.95	Hydr. Depth (ft)		3.65	
Conv. Total (cfs)	22365.3	Conv. (cfs)		22365.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		63.13	
Min Ch El (ft)	119.38	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)		1.98	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		0.90	
C & E Loss (ft)	0.00	Cum SA (acres)		0.24	

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CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	127.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.035	0.040
W.S. Elev (ft)	127.37	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		363.42	14.73
E.G. Slope (ft/ft)	0.001951	Area (sq ft)		363.42	14.73
Q Total (cfs)	2000.00	Flow (cfs)		1978.37	21.63
Top Width (ft)	88.74	Top Width (ft)		71.74	17.00
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)		5.44	1.47
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)		5.07	0.87
Conv. Total (cfs)	45283.3	Conv. (cfs)		44793.5	489.8
Length Wtd. (ft)	100.00	Wetted Per. (ft)		73.47	17.40
Min Ch El (ft)	119.38	Shear (lb/sq ft)		0.60	0.10
Alpha	1.05	Stream Power (lb/ft s)		3.28	0.15
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		1.45	0.05
C & E Loss (ft)	0.00	Cum SA (acres)		0.29	0.07

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: Savina Drainage

REACH: 1 RS: 9340

INPUT

Description:

Station	Elevation	Data	num=	8						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4961	128	4984	121	4988	120	5000	119.17	5011	120	
5015	121	5035	126	5056	127					

Manning's n	Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
4961	.04	4961	.035	5035	.04	

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4961	5035		73	73	73		.1	.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	124.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.035	
W.S. Elev (ft)	124.56	Reach Len. (ft)	73.00	73.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)		193.29	
E.G. Slope (ft/ft)	0.001920	Area (sq ft)		193.29	

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Q Total (cfs)	800.00	Flow (cfs)	800.00
Top Width (ft)	56.97	Top Width (ft)	56.97
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)	4.14
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)	3.39
Conv. Total (cfs)	18258.6	Conv. (cfs)	18258.6
Length Wtd. (ft)	73.00	Wetted Per. (ft)	58.24
Min Ch El (ft)	119.17	Shear (lb/sq ft)	0.40
Alpha	1.00	Stream Power (lb/ft s)	1.65
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	0.10

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)		Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.035	
W.S. Elev (ft)	125.13	Reach Len. (ft)	73.00	73.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)		226.92	
E.G. Slope (ft/ft)	0.001933	Area (sq ft)		226.92	
Q Total (cfs)	1000.00	Flow (cfs)		1000.00	
Top Width (ft)	61.11	Top Width (ft)		61.11	
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)		4.41	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	22746.2	Conv. (cfs)		22746.2	
Length Wtd. (ft)	73.00	Wetted Per. (ft)		62.54	
Min Ch El (ft)	119.17	Shear (lb/sq ft)		0.44	
Alpha	1.00	Stream Power (lb/ft s)		1.93	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		0.38	
C & E Loss (ft)	0.00	Cum SA (acres)		0.10	

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)		Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.035	0.040
W.S. Elev (ft)	127.17	Reach Len. (ft)	73.00	73.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)		363.68	14.05
E.G. Slope (ft/ft)	0.001942	Area (sq ft)		363.68	14.05
Q Total (cfs)	2000.00	Flow (cfs)		1982.52	17.48
Top Width (ft)	92.27	Top Width (ft)		71.27	21.00
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)		5.45	1.24
Max Chl Dpth (ft)	8.00	Hydr. Depth (ft)		5.10	0.67
Conv. Total (cfs)	45389.6	Conv. (cfs)		44992.9	396.7
Length Wtd. (ft)	73.00	Wetted Per. (ft)		73.11	21.19
Min Ch El (ft)	119.17	Shear (lb/sq ft)		0.60	0.08
Alpha	1.05	Stream Power (lb/ft s)		3.29	0.10
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		0.61	0.02
C & E Loss (ft)	0.00	Cum SA (acres)		0.12	0.03

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Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: Savina Drainage

REACH: 1 RS: 9267

INPUT

Description:

Station Elevation Data				num=	8
Sta	Elev	Sta	Elev	Sta	Elev
4957	128	4984	121	4986	120
5015	121	5035	126	5044	127

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
4957	.04	4957	.035	5035	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4957	5035		1	1	.1	.3

CROSS SECTION OUTPUT Profile #Calced 100 yr Fl

E.G. Elev (ft)	124.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.035	
W.S. Elev (ft)	124.42	Reach Len. (ft)			
Crit W.S. (ft)	122.48	Flow Area (sq ft)		192.02	
E.G. Slope (ft/ft)	0.002003	Area (sq ft)		192.02	
Q Total (cfs)	800.00	Flow (cfs)		800.00	
Top Width (ft)	57.84	Top Width (ft)		57.84	
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)		4.17	
Max Chl Dpth (ft)	5.40	Hydr. Depth (ft)		3.32	
Conv. Total (cfs)	17875.5	Conv. (cfs)		17875.5	
Length Wtd. (ft)		Wetted Per. (ft)		59.14	
Min Ch El (ft)	119.02	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		1.69	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	125.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.035	
W.S. Elev (ft)	124.99	Reach Len. (ft)			
Crit W.S. (ft)	122.87	Flow Area (sq ft)		226.33	
E.G. Slope (ft/ft)	0.002000	Area (sq ft)		226.33	

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Q Total (cfs)	1000.00	Flow (cfs)	1000.00
Top Width (ft)	62.33	Top Width (ft)	62.33
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)	4.42
Max Chl Dpth (ft)	5.97	Hydr. Depth (ft)	3.63
Conv. Total (cfs)	22358.4	Conv. (cfs)	22358.4
Length Wtd. (ft)		Wetted Per. (ft)	63.77
Min Ch El (ft)	119.02	Shear (lb/sq ft)	0.44
Alpha	1.00	Stream Power (lb/ft s)	1.96
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)		Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.035	0.040
W.S. Elev (ft)	127.03	Reach Len. (ft)			
Crit W.S. (ft)	124.41	Flow Area (sq ft)		367.56	4.73
E.G. Slope (ft/ft)	0.002000	Area (sq ft)		367.56	4.73
Q Total (cfs)	2000.00	Flow (cfs)		1994.92	5.08
Top Width (ft)	83.24	Top Width (ft)		74.24	9.00
Vel Total (ft/s)	5.37	Avg. Vel. (ft/s)		5.43	1.08
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)		4.95	0.53
Conv. Total (cfs)	44716.4	Conv. (cfs)		44602.7	113.7
Length Wtd. (ft)		Wetted Per. (ft)		76.06	9.08
Min Ch El (ft)	119.02	Shear (lb/sq ft)		0.60	0.07
Alpha	1.02	Stream Power (lb/ft s)		3.28	0.07
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Savina Drainage

Reach	River Sta.	n1	n2	n3
1	9940	.04	.035	.04
1	9840	.04	.035	.04
1	9740	.04	.035	.04
1	9640	.04	.035	.04
1	9540	.04	.035	.04
1	9440	.04	.035	.04
1	9340	.04	.035	.04
1	9267	.04	.035	.04

SUMMARY OF REACH LENGTHS

River: Savina Drainage

Reach	River Sta.	Left	Channel	Right
1	9940	100	100	100
1	9840	100	100	100
1	9740	100	100	100
1	9640	95	100	108
1	9540	95	100	105
1	9440	100	100	100
1	9340	73	73	73
1	9267	1	1	1

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Savina Drainage

Reach	River Sta.	Contr.	Expan.
1	9940	.1	.3
1	9840	.1	.3
1	9740	.1	.3
1	9640	.1	.3
1	9540	.1	.3
1	9440	.1	.3
1	9340	.1	.3
1	9267	.1	.3