



Grays Harbor County
 Grayland FHRP
 APPROXIMATE SURVEY X-SECT. LOCATIONS
 FOR HEC-II INPUT (Corresponds to
 4/18/95 & 4/24/95 Packages & 5/5/95
 FAX with distances).

LEGEND: $\textcircled{\#}$ = Cross-Section Location
 $\text{A} \rightarrow \text{O}$ = Bridge Location
 $\# \rightarrow$ = Photograph Location

N \leftarrow
 1" = 1000'

Grayland CFCMP Data Reference Map 5/95 (T. Platin)

T1 GRAYLAND COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN
T2 MAIN DRAINAGE CHANNEL: X-SECTS. 1 THROUGH 20
T3 TIDE ELEVATION 6 - EXISTING CHANNEL CONDITIONS
* REVISED 5/25/95: INCLUDES EXTRAPOLATED OVERBANK, LB & RB REDEFINED

J1	-10	2	0	0	0	0	0	0	6	0
J2	1	0	-1	0	0	0	-1	0	0	0
J3	38	1	4	13	14	15				
* J3	38	42	21	23	22	24	14	1	4	75
J5	-10	-10								
NC	.05	.05	.035	0.1	0.3	0	0	0	0	0
* CROSS-SECTION #20										
* FLOWS = 2-YR, 10-YR, 25-YR & 100-YR (FROM HEC1 RESULTS)										
QT	4	345	572	695	952					
X1	20	10	1016	1092	0	0				
X3	10									
GR	4.32	1016	2.72	1020	1.32	1030	0.32	1040	-0.28	1050
GR	1.32	1070	3.32	1082	4.42	1092	9.02	1105	9.32	1110
* CROSS-SECTION #19										
X1	19	23	1172	1235	1720	1720	1720			
X3	10									
GR	4	700	4.63	1000	4.13	1005	1.93	1010	1.43	1015
GR	0.83	1025	0.63	1050	0.63	1100	0.43	1125	0.63	1150
GR	0.53	1172	-0.37	1180	-1.37	1188	-2.37	1194	-2.47	1202
GR	-1.87	1210	-1.37	1216	-0.47	1225	0.63	1235	1.13	1245
GR	1.53	1260	1.13	1280	2	1480				
* CROSS-SECTION #18										
X1	18	26	1115	1138	2580	2580	2580			
X3	10									
GR	4.3	800	3.7	1000	3.9	1030	3.7	1056	3.8	1078
GR	4.3	1092	4.69	1100	4.8	1107	3.7	1115	2.3	1118
GR	0.1	1118	1.5	1118	-1.1	1124	-4.5	1128	-3.4	1133
GR	-2.0	1136	2.3	1138	1.5	1148	1.2	1158	3.1	1165
GR	3.7	1184	2.7	1200	4.0	1350	6.0	1490	8.0	1750
GR	30.0	1935								
* CROSS-SECTION #17										

HEC2.DAT

X1	17	23	1113	1145	2010	2010	2010			
X3	10									
GR	6.0	800	3.7	1000	3.7	1010	3.9	1030	4.1	1055
GR	4.1	1076	5.0	1087	5.5	1095	5.73	1100	5.9	1108
GR	5.8	1113	4.5	1115	3.3	1119	2.8	1121	0.3	1121
GR	-0.2	1128	-0.3	1132	1.4	1140	3.3	1145	4.1	1164
GR	4.2	1182	3.7	1210	6.0	1290				
*	CROSS-SECTION #16									
*	FLOWS FROM HEC1 POINT F									
QT	4	273	470	578	807					
X1	16	24	1108.5	1158	2470	2470	2470			
X3	10									
GR	14	650	12	950	11	1000	10	1025	9	1045
GR	9.1	1057	9	1078	11.6	1084	12	1094	12.03	1100
GR	12.1	1106	11.7	1108.5	5.3	1120	3.4	1120	1.3	1124.5
GR	1	1129	1	1133	2	1136	7	1144	9.3	1158
GR	9.2	1177	8.6	1200	10	1230	20	1340		
*	CROSS-SECTION #15.3									
NH	4	.1	1000	.015	1030	0.035	1058.5	.1	1193.5	
*	FLOWS FROM HEC1 POINT E									
QT	4	222	383	471	658					
X1	15.3	12	1030	1058.5	1790	1790	1790			
X3	10									
GR	10	500	10.6	1000	10.5	1030	2	1038	1.1	1043.5
GR	2.0	1047	2.9	1049	4.8	1051.5	11.3	1058.5	11.4	1073.5
GR	10	1093.5	10	1193.5						
*	CROSS-SECTION #15									
NH	4	.1	1057	.035	1091	.015	1118	.1	1190	
*	FLOWS FROM HEC1 POINT D									
QT	4	187	320	392	544					
X1	15	24	1057	1086	1950	1950	1950			
X3	10									
GR	14	250	12	400	12	700	10.4	1000	10.7	1029
GR	10.8	1043	10.9	1057	4.9	1064	4	1064	3.3	1073
GR	4	1080	7.2	1080	8.8	1082	11.8	1086	14.5	1091
GR	15.1	1095	14.82	1100	14.8	1105	14.8	1118	11.1	1126

GR	10.8	1141	11.1	1160	11	1175	10.3	1190		
*	CROSS-SECTION #14									
NH	4	.1	1052	.035	1084	0.015	1118	.1	1230	
X1	14	27	1052	1084	503	503	503			
X3	10									
GR	14	285	12	435	12	685	7.3	1000	7.6	1015
GR	7.1	1035	11.6	1041	11.8	1046	10.8	1052	6.5	1058.7
GR	5.5	1058.7	3.5	1063.5	3.9	1067	4.1	1071	5.7	1074
GR	13.9	1084	14.1	1096	14.06	1100	14.1	1108	14	1113
GR	14.4	1115	14.4	1118	12.6	1131	12.4	1148	13.1	1171
GR	13.1	1200	14	1230						
*	CROSS-SECTION #13									
NH	4	.03	1020	0.035	1077	.015	1093	.03	1315	
X1	13	24	1020	1077	476	476	476			
X3	10									
GR	14	380	12	400	12.2	1000	11.9	1020	12.1	1023
GR	8.7	1039	7.2	1045	5.5	1047	5	1050	5.5	1053
GR	4.9	1057	5.5	1061	8.6	1061	11.6	1066	11.7	1071
GR	12.4	1077	12.5	1079.5	12.72	1085	12.4	1093	11.8	1099
GR	10.7	1105	10.2	1160	10.2	1185	14	1315		
*	CROSS-SECTION #12									
NH	4	.03	1051	.035	1085	0.015	1113	0.03	1330	
X1	12	26	1051	1085	421	421	421			
X3	10									
GR	14	480	12	620	12	900	11.8	1000	13.8	1023
GR	14.1	1048	14.1	1051	12.6	1055	6.8	1059	4.8	1060
GR	3.6	1062	4	1064	5.1	1067	5.5	1071	6.8	1074
GR	11.8	1080	14.3	1085	12.8	1089	12.7	1093	12.79	1100
GR	12.7	1107	12.3	1113	10.9	1122	10.7	1166	10.5	1200
GR	14	1330								
*	CROSS-SECTION #11									
NH	3	.03	1032	.035	1062	0.015	1080			
X1	11	19	1032	1062	411	411	411			
X3	10									
GR	14	570	12	640	12	910	13	1000	12	1023.5
GR	12	1032	10.5	1035	8.4	1039	5.4	1039	6.3	1043

HEC2.DAT

GR	5	1047	4.5	1052	5.2	1057	6.3	1057	9.1	1057
GR	12.4	1062	12.9	1070.5	13.4	1075	13.46	1080		
*	CROSS-SECTION #10									
NH	4	.03	1048	0.035	1079	.015	1111	.03	1170	
X1	10	20	1048	1079	365	365	365			
X3	10									
GR	14	660	12	690	14.7	1000	15.6	1026	15.4	1040
GR	15.6	1048	7.7	1055	5.2	1058	5.4	1063	6.1	1067
GR	7.7	1069	14	1079	14.6	1085	14.39	1095	14.3	1104
GR	13.9	1111	12.4	1117	12.1	1132	11.9	1152	11.4	1170
*	CROSS-SECTION #9									
NH	4	.1	1091	.015	1108	0.035	1140	0.05	1400	
*	FLOWS FROM HEC1 POINT C									
QT	4	146	255	314	440					
X1	9	24	1108	1140	344	344	344			
X3	10									
GR	14	750	12	800	12.4	1000	12.1	1030	12.9	1050
GR	13.8	1066	14.9	1081.5	15.4	1088	16.1	1091	16.4	1093
GR	16.38	1100	16.2	1106.5	15.8	1108	13	1114.5	7.5	1121
GR	5.4	1125	4.6	1129	5.4	1135	7.5	1138	11.3	1140
GR	11.4	1150	10.9	1175	12.4	1200	11.5	1400		
*	CROSS-SECTION #8									
NH	4	.1	1000	.015	1053	0.035	1086.5	0.05	1793.5	
X1	8	18	1053	1086.5	283	283	283			
X3	10									
GR	14	720	12	800	11	900	11.2	1000	12.3	1031
GR	12.32	1043.5	12.3	1047	12.2	1053	9.8	1060	6.8	1061.5
GR	5.5	1067.5	5.7	1070.5	8.2	1075.5	9.8	1081.5	11.9	1086.5
GR	12.4	1093.5	12	1593.5	12	1793.5				
*	CROSS-SECTION #7									
NH	4	.1	1057	.035	1095	0.015	1105.5	0.05	2300	
*	FLOWS FROM HEC1 POINT A									
QT	4	59	103	127	176					
X1	7	21	1057	1095	1180	1180	1180			
X3	10									
GR	14	950	12	960	11.2	1000	9.4	1043	9.2	1057

GR	7.6	1061.5	4.3	1064	2.2	1080	3.2	1082	7.6	1088
GR	12	1095	12.22	1100	12.2	1103	11.9	1105.5	9.8	1108
GR	9.8	1109.7	9.9	1110	9.9	1200	10	1800	12	1950
GR	14	2300								
*	CROSS-SECTION #6									
NC	.1	.1	.035							
X1	6	14	1042	1068	1685	1685	1685			
X3	10									
GR	14	960	11.1	1000	10.6	1025	9.8	1042	8.7	1046
GR	5.1	1049	4	1054	5.1	1057	8.8	1061	10.1	1068
GR	10.46	1075	10.2	1087	12	1107	14	1217		
*	CROSS-SECTION #5									
X1	5	18	1015	1041	1005	1005	1005			
X3	10									
GR	14	830	12	950	11.5	1000	11.6	1007	11.2	1015
GR	7.6	1019	7.2	1019	5.3	1023	4.6	1031	5.4	1041
GR	11	1041	13.2	1048	12.1	1058	11	1071	10.4	1083
GR	10.2	1103	12	1183	14	1263				
*	SPECIAL BRIDGE A									
*	CROSS-SECTION #4 (Special Bridge Section 4.1)									
X1	4.1	20	1063	1090	208	208	208			
GR	14	870	12.97	920	12	970	11.4	1000	11.2	1017
GR	9.9	1029	9.2	1044	9.4	1057	9	1063	7.8	1066
GR	5.5	1069	5.1	1075	5.5	1079	7.8	1084	10	1090
GR	11.05	1100	10.8	1110	10.7	1121	11.70	1140	11.06	1190
*	Special Bridge Section 4.2									
NC			0.3	0.5						
X1	4.2	22	1063	1090	50	50	50			
X3	10								12.2	12.0
GR	14	870	12.97	920	12	970	11.4	1000	11.2	1017
GR	9.9	1029	9.2	1044	9.4	1057	9	1063	8.5	1069
GR	6.5	1072	6.3	1075	6.5	1078	7.3	1081	8.8	1084
GR	9.4	1087	10	1090	11.05	1100	10.8	1110	10.7	1121
GR	11.7	1140	11.06	1190						
SB		1.65	3.0	0	12.9	0	74.9	1.5	7.2	7.2
*	Special Bridge Section 4.3									

HEC2.DAT

X1	4.3	24	1063	1090	16	16	16			
X2	0	0	1	11.2	11.97					
X3	10								12.2	12.0
BT	24	870	14	14	920	12.97	12.97	970	12.72	12.0
BT	1000	12.56	11.4	1017	12.48	11.2	1029	12.42	9.9	1044
BT	12.34	9.2	1057	12.28	9.4	1063	12.25	9.0	1064	12.24
BT	11.24	1069	12.19	11.19	1072	12.15	11.15	1075	12.12	11.12
BT	1078	12.09	11.09	1081	12.06	11.06	1084	12.02	11.02	1087
BT	11.99	10.99	1089	11.97	10.99	1090	11.96	10.0	1100	11.92
BR	11.05	1110	11.86	10.8	1121	11.80	10.70	1140	11.70	11.70
BR	1190	11.06	11.06							
GR	14	870	12.97	920	12	970	11.4	1000	11.2	1017
GR	9.9	1029	9.2	1044	9.4	1057	9	1063	9	1064
GR	8.5	1069	6.5	1072	6.3	1075	6.5	1078	7.3	1081
GR	8.8	1084	9.4	1087	9.8	1089	10	1090	11.05	1100
GR	10.8	1110	10.7	1121	11.7	1140	11.06	1190		
*	Special Bridge Section 4.4									
X1	4.4	20	1063	1090	20	20	20			
GR	14	870	12.97	920	12	970	11.4	1000	11.2	1017
GR	9.9	1029	9.2	1044	9.4	1057	9	1063	7.8	1066
GR	5.5	1069	5.1	1075	5.5	1079	7.8	1084	10	1090
GR	11.05	1100	10.8	1110	10.7	1121	11.70	1140	11.06	1190
NC			0.1	0.3						
*	CROSS-SECTION #3									
X1	3	21	1056	1086	619	619	619			
X3	10									
GR	12	930	10.6	1000	9.6	1025	10.7	1038	11	1056
GR	9.3	1065	7.3	1067	5.5	1069	4.8	1072.5	5	1077
GR	7.3	1080	12.2	1086	15.1	1096	15.66	1100	11.6	1116
GR	13.2	1125	13.1	1138	12.6	1154	11.7	1172	11.5	1200
GR	12	1380								
*	CROSS-SECTION #2									
NH	3	.1	1032	0.035	1055	.015	1065			
X1	2	18	1032	1055	790	790	790			
X3	10									
GR	14	380	10	450	10.5	700	10	750	9.2	1000

GR	9.2	1011	10.1	1018	11.4	1025	12.2	1032	9.9	1037
GR	7	1037	6.5	1042	6.5	1046	9.7	1047.5	10.2	1049
GR	11.6	1055	12	1057.5	12.17	1065				
*	CROSS-SECTION #1									
NH	3	.1	1029	.035	1045	0.015	1060			
X1	1	10	1029	1045	701	701	701			
X3	10									
GR	12	550	12.1	1000	11.6	1029	7.2	1034	7.6	1038
GR	7.4	1041	11.1	1045	11.7	1048	12	1052	12.59	1060
EJ										
T1	SECOND PROFILE									
T2										
T3	Q=10-YR									
J1	-10	3	0	0	0	0	0	0	6	0
J2	2	0	-1	0	0	0	-1	0	0	
T1	THIRD PROFILE									
T2										
T3	Q=25-YR									
J1	-10	4	0	0	0	0	0	0	6	0
J2	3	0	-1	0	0	0	0	0	0	
T1	FOURTH PROFILE									
T2										
T3	Q=100-YR									
J1	-10	5	0	0	0	0	0	0	6	0
J2	4	0	-1	0	0	0	-1	0	0	

ER

This input data file (for a 2-year event with a 6 foot tide) is representative of the input data used during the analysis of the following flow conditions:

- 2-Year Event Flow with 2 and 10 Foot Tides
- 10-Year Event Flow with 2, 6 and 10 Foot Tides
- 25-Year Event Flow with 2, 6 and 10 Foot Tides
- 100-Year Event Flow with 2, 6 and 10 Foot Tides

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

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

TIDE ELEVATION 6 - EXIS

SUMMARY PRINTOUT

	CWSEL	DEPTH	QLOB	QCH	QROB	VCH
	6.000	6.28	.00	344.21	.79	1.02
	6.000	6.28	.00	570.70	1.30	1.70
	6.000	6.28	.00	693.42	1.58	2.06
	6.000	6.28	.00	949.83	2.17	2.82
*	6.027	8.50	134.23	93.35	117.42	.21
*	6.073	8.54	223.47	153.85	194.67	.34
*	6.106	8.58	272.34	186.13	236.53	.41
*	6.196	8.67	375.89	252.14	323.97	.55
*	6.036	10.54	113.13	78.32	153.55	.47
*	6.096	10.60	189.67	126.88	255.45	.75
*	6.140	10.64	232.23	151.63	311.14	.89
*	6.255	10.76	323.98	199.19	428.83	1.16
*	6.083	6.38	137.29	126.53	81.18	.86

*	6.213	6.51	236.03	198.72	137.25	1.31
*	6.300	6.60	293.02	233.30	168.68	1.51
*	6.504	6.80	419.19	296.51	236.30	1.85
*	6.336	5.34	.00	273.00	.00	2.93
*	6.784	5.78	.00	470.00	.00	4.49
*	7.039	6.04	.00	578.00	.00	5.18
*	7.546	6.55	.00	807.00	.00	6.39
	7.721	6.62	.00	222.00	.00	2.32
*	9.162	8.06	.00	383.00	.00	2.96
*	9.845	8.75	.00	471.00	.00	3.20
*	10.853	9.75	85.32	572.68	.00	3.28
	8.724	5.42	.00	187.00	.00	2.05
	10.409	7.11	.00	320.00	.00	2.42
	11.140	7.84	14.86	377.14	.00	2.47
	12.013	8.71	93.95	426.83	23.22	2.41

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	CWSEL	DEPTH	QLOB	QCH	QROB	VCH
	8.966	5.47	.00	187.00	.00	2.25
	10.669	7.17	.00	320.00	.00	2.53
*	11.339	7.84	206.58	185.42	.00	1.27
*	12.180	8.68	323.98	220.02	.00	1.29
*	9.312	4.41	.00	187.00	.00	2.57
	10.984	6.08	.00	320.00	.00	2.56
*	11.392	6.49	.00	392.00	.00	2.79
*	12.233	7.33	35.39	508.61	.00	2.82

	9.698	6.10	.00	187.00	.00	2.39
	11.298	7.70	.00	320.00	.00	2.82
	11.745	8.14	.00	392.00	.00	3.16
	12.610	9.01	.00	544.00	.00	3.72
	9.971	5.47	.00	187.00	.00	2.12
	11.596	7.10	.00	320.00	.00	2.48
	12.096	7.60	8.05	383.95	.00	2.67
*	12.991	8.49	240.76	301.11	2.13	1.77
	10.203	5.00	.00	187.00	.00	2.76
	11.826	6.63	.00	320.00	.00	3.07
	12.339	7.14	.00	392.00	.00	3.36
*	13.003	7.80	.00	544.00	.00	4.05
*	10.468	5.87	.00	146.00	.00	1.61
*	12.100	7.50	.00	229.27	25.73	1.79
*	12.639	8.04	.00	233.78	80.22	1.65
*	13.388	8.79	.00	241.20	198.80	1.50
*	10.566	5.07	.00	146.00	.00	1.98
	12.183	6.68	.00	243.79	11.21	1.99
	12.705	7.20	87.75	144.23	82.03	1.03
*	13.427	7.93	128.81	114.92	196.27	.70
*	10.686	8.49	1.39	57.61	.00	.29
*	12.255	10.06	2.81	28.31	71.88	.11
*	12.719	10.52	3.83	29.60	93.57	.11
*	13.434	11.23	5.87	33.22	136.91	.11
*	10.704	6.70	.59	57.93	.49	.64
*	12.255	8.25	9.24	86.56	7.20	.66
*	12.718	8.72	14.42	100.94	11.64	.71
*	13.432	9.43	25.43	127.78	22.78	.79
*	10.738	6.14	.00	59.00	.00	.46

12.282	7.68	1.79	88.32	12.89	.53
12.745	8.15	5.16	100.03	21.81	.56
13.462	8.86	14.50	120.39	41.11	.61

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CWSEL	DEPTH	QLOB	QCH	QROB	VCH
10.742	5.64	4.47	54.43	.10	.52
12.286	7.19	16.42	78.46	8.13	.53
12.750	7.65	23.46	89.55	14.00	.56
13.466	8.37	39.49	110.49	26.03	.62
* 10.743	4.44	7.26	51.74	.00	.69
12.287	5.99	21.35	71.08	10.57	.61
12.750	6.45	29.23	80.34	17.44	.62
13.467	7.17	46.83	98.31	30.87	.66
10.743	4.44	.00	59.00	.00	.79
* 12.284	5.98	.00	85.01	17.99	.96
12.750	6.45	29.31	80.19	17.50	.62
13.467	7.17	46.92	98.14	30.93	.66
* 10.751	5.65	4.46	54.43	.10	.52
* 12.296	7.20	16.43	78.43	8.14	.53
12.751	7.65	23.46	89.54	14.00	.56
13.468	8.37	39.48	110.49	26.03	.62
* 10.773	5.97	.00	59.00	.00	.68
12.310	7.51	20.16	75.69	7.16	.58
12.765	7.96	28.23	81.32	17.45	.56
13.481	8.68	42.97	93.18	39.85	.56

*	10.852	4.35	.00	59.00	.00	1.30
*	12.323	5.82	86.88	15.76	.36	.21
*	12.775	6.28	107.99	17.67	1.34	.20
*	13.490	6.99	150.50	21.87	3.64	.21
	11.074	3.87	.00	59.00	.00	1.43
*	12.317	5.12	13.49	83.65	5.86	1.37
*	12.777	5.58	45.38	70.28	11.34	1.03
*	13.494	6.29	93.81	61.69	20.51	.77

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SUMMARY OF ERRORS AND SPECIAL NOTES

* CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE



HEC-II RESULTS

Section	Tide			Flow (cfs)	Channel Length (ft)
	2 Ft	6 Ft	10 Ft		
20	2.00	6.00	10.00	345	0
19	2.75	6.03	10.01	↓	1720
18	2.97	6.04	10.01		2580
17	4.89	6.08	10.01		2010
16	6.75	6.34	10.01	273	2470
15.3	7.88	7.72	10.21	222	1790
15	8.81	8.72	10.51	187	1950
14	9.04	8.97	10.60	↓	503
13	9.37	9.31	10.71		476
12	9.74	9.70	10.85		421
11	10.00	9.97	10.98	↓	411
10	10.23	10.20	11.10		365
9	10.49	10.47	11.25		146
8	10.59	10.57	11.31	↓	283
7	10.70	10.69	11.38	59	1180
6	10.72	10.70	11.39		1685
5	10.76	10.74	11.41		1005
4.1	10.76	10.74	11.41		208
4.2	10.76	10.74	11.41		50
4.3	10.76	10.74	11.41		16
4.4	10.77	10.75	11.42		20
3	10.79	10.77	11.43		619
2	10.87	10.85	11.47		790
1	11.09	11.07	11.60		701

Note Grange St bridge - modeled by sections 4.1 → 4.4
 locked cl = 11.20
 top of road (see wire flow) = 11.97

Section	10 ft Flow			Flow (cfs)
	Tide 2 ft	Tide 6 ft	Tide 10 ft	
20	2.34	6.00	10.00	572
19	3.46	6.07	10.02	↓
18	3.70	6.10	10.02	
17	5.75	6.21	10.02	↓
16	7.86	6.78	10.02	
15.3	9.48	9.16	10.56	470
15	10.57	10.71	11.21	383
14	10.80	10.67	11.34	320
13	11.09	10.98	11.38	↓
12	11.38	11.30	11.62	
11	11.67	11.60	11.87	↓
10	11.89	11.83	12.07	
9	12.15	12.10	12.31	255
8	12.24	12.18	12.38	↓
7	12.27	12.26	12.40	
6	12.27	12.25	12.40	↓
5	12.30	12.28	12.42	
4.1	12.30	12.29	12.43	↓
4.2	12.30	12.29	12.43	
4.3	12.30	12.28	12.43	↓
4.4	12.31	12.30	12.44	
3	12.33	12.31	12.45	↓
2	12.34	12.32	12.46	
1	12.33	12.32	12.46	↓



25 ft flow

Section	Tide 2 ft	Tide 6 ft	Tide 10 ft	Flow (cfs)
20	2.56	6.00	10.00	695
19	3.79	6.11	10.02	↓
18	4.05	6.14	10.03	
17	5.83	6.30	10.03	
16	7.35	7.04	10.02	578
15.3	9.91	9.85	10.77	392 471
15	11.17	11.14	11.54	392
14	11.37	11.34	11.69	
13	11.42	11.39	11.73	
12	11.77	11.74	12.03	
11	12.11	12.10	12.33	↓
10	12.35	12.34	12.49	
9	12.65	12.64	12.77	314
8	12.71	12.70	12.82	↓
7	12.73	12.72	12.83	127
6	12.75	12.72	12.83	
5	12.76	12.75	12.86	
4.1	12.76	12.75	12.86	
4.2	12.76	12.75	12.86	
4.3	12.76	12.75	12.86	
4.4	12.76	12.75	12.86	
3	12.77	12.76	12.87	
2	12.78	12.78	12.88	
1	12.79	12.78	12.88	↓

Section	100 ft Flow			Flow (cfs)
	Tide 2 ft	Tide 6 ft	Tide 10 ft	
20	3.00	6.00	10.00	95.2
19	3.79	6.20	10.04	
18	4.05	6.26	10.05	↓
17	6.00	6.50	10.06	
16	8.18	7.55	10.03	807
15.3	10.90	10.85	11.22	658
15	12.20	12.01	12.06	544
14	12.19	12.18	12.22	↓
13	12.24	12.23	12.27	
12	12.61	12.61	12.62	↓
11	12.99	12.99	13.00	
10	13.00	13.00	13.01	440
9	13.39	13.39	13.39	
8	13.43	13.43	13.43	↓
7	13.43	13.43	13.44	176
6	13.43	13.43	13.44	↓
5	13.46	13.46	13.47	
4.1	13.47	13.47	13.47	
4.2	13.47	13.47	13.47	
4.3	13.47	13.47	13.47	
4.4	13.47	13.47	13.47	
3	13.48	13.48	13.48	
2	13.49	13.49	13.49	
1	13.49	13.49	13.50	



Widen from Bridge F to section 14 by 10 feet

2 or flow

Section	Tide 2 ft	Tide 6 ft	Tide 10 ft
15.3	7.88	7.72	10.21
15	8.51	8.40 8.40	10.41
14	8.60	8.50 8.50	10.44
13	8.77	8.68 8.68	10.49
12	9.35	9.30 9.30	10.65
11	9.70	9.66 9.66	10.80
10	9.98	9.95 9.95	10.93
9	10.29	10.26 10.26	11.089
8	10.40	10.38 10.38	11.16
7	10.53	10.51 10.51	11.24
6	10.55	10.53 10.53	11.25
5	10.59	10.57 10.57	11.27
4.1	10.59 10.59	10.58 10.58	11.28
4.2	10.60	10.58	11.28
4.3	10.60	10.58	11.28
4.4	10.60	10.59	11.28
3	10.63	10.61	11.30
2	10.72	10.70	11.34
1	10.97	10.95	11.49



Widen from Bridge F to section 14 by 10 feet

10 ft flow

Section	2 ft	6 ft	10 ft
15.3	9.48	9.16	10.56
15	10.22	10.01	11.01
14	10.32	10.12	11.07
13	10.47	10.29	11.08
12	10.91	10.74	11.38
11	11.28	11.18	11.66
10	11.56	11.48	11.88
9	11.88	11.81	12.15
8	11.98	11.93	12.24
7	12.08	12.02	12.27
6	12.07	12.02	12.27
5	12.11	12.05	12.30
F.1	12.11	12.06	12.30
F.2	12.11	12.06	12.30
F.3	12.10	12.05	12.30
F.4	12.13	12.08	12.31
6	12.15	12.10	12.32
2	12.20	12.15	12.34
1	12.36	12.33	12.33



Widen from Bridge F to section 14 by 10 feet

25 ft flow

Section Tide 2 ft Tide 6 ft Tide 10 ft

15.3	9.91	9.85	10.77
15	10.79	10.75	11.32
14	10.90	10.86	11.40
13	10.92	10.89	11.40
12	11.40	11.37	11.75
11	11.82	11.80	12.10
10	12.12	12.10	12.34
9	12.46	12.45	12.64
8	12.55	12.53	12.71
7	12.57	12.56	12.72
6	12.57	12.56	12.72
5	12.60	12.59	12.75
4.1	12.60	12.59	12.75
4.2	12.60	12.59	12.75
4.3	12.60	12.59	12.75
4.4	12.61	12.60	12.75
3	12.63	12.62	12.77
2	12.64	12.63	12.78
1	12.64	12.63	12.78



Widen from Bridge F to section 14 by 10 feet

100 cfs flow

Section	Tide 2 ft	Tide 6 ft	Tide 10 ft
---------	--------------	--------------	---------------

15.3	10.90	10.85	11.22
15	11.75	11.73	11.86
14	11.87	11.85	11.96
13	11.87	11.87 11.85	11.96
12	12.38	12.37	12.46
11	12.82	12.82	12.88
10	12.89	12.89 12.88	12.92
9	13.29	13.29	13.32
8	13.34	13.33	13.37
7	13.35	13.34	13.37
6	13.34	13.34	13.37
5	13.38	13.38	13.40
4.1	13.38	13.38	13.41
4.2	13.38	13.38	13.41
4.3	13.38	13.38	13.41
4.4	13.38	13.38	13.41
3	13.40	13.39	13.42
2	13.41	13.40	13.43
1	13.41	13.41	13.44



Widen from Section 16 to section 14 by 10 feet

Section	2 yr Flow		
	Tide 2 ft	Tide 6 ft	Tide 10 ft
17	4.89	6.08	10.01
16	6.75	6.34	10.01
15.3	7.46	7.21	10.14
15	7.89	7.71	10.24
14	8.04	7.88	10.28
13	8.31	8.20	10.33
12	9.13	9.09	10.51
11	9.53	9.50	10.67
10	9.85	9.83	10.82
9	10.19	10.17	10.99
8	10.31	10.29	11.06
7	10.45	10.43	11.15
6	10.47	10.46	11.16
5	10.51	10.50	11.19
4.1	10.52	10.50	11.19
4.2	10.52	10.50	11.19
4.3	10.52	10.50	11.19
4.4	10.53	10.51	11.20
3	10.55	10.54	11.21
2	10.65	10.63	11.26
1	10.91	10.90	11.42



Widen from Section 16 to section 14 by 10 feet

Section	10 ft flow		
	Tide 2 ft	Tide 6 ft	Tide 10 ft
17	5.75	6.21	10.02
16	7.86	6.78	10.01
15.3	8.91	8.38	10.38
15	9.44	9.06	10.66
14	9.60	9.26	10.74
13	9.84	9.56	10.86
12	10.52	10.39	11.20
11	10.98	10.88	11.51
10	11.31	11.23	11.76
9	11.68	11.62	12.04
8	11.81	11.75	12.13
7	11.97	11.92	12.21
6	11.99	11.95	12.21
5	12.03	11.98	12.24
4.1	12.03	11.99	12.24
4.2	12.03	11.99	12.24
4.3	12.03	11.98	12.24
4.4	12.05	12.01	12.25
3	12.07	12.03	12.27
2	12.13	12.08	12.28
1	12.31	12.27	12.27



Widen from Section 16 to section 14 by 10 feet

25 yr flow.

Section	Tide 2 ft	Tide 6 ft	Tide 10 ft
17	5.83	6.30	10.03
16	7.35	7.04	10.02
15.3	9.09	8.97	10.55
15	9.79	9.71	10.92
14	9.98	9.91	11.02
13	10.26	10.20	11.04
12	11.00	10.97	11.48
11	11.51	11.49	11.88
10	11.87	11.85	12.17
9	12.26	12.25	12.50
8	12.38	12.36	12.58
7	12.41	12.40	12.60
6	12.41	12.40	12.60
5	12.45	12.44	12.63
4.1	12.45	12.44	12.64
4.2	12.45	12.44	12.64
4.3	12.45	12.44	12.64
4.4	12.47	12.45	12.65
3	12.48	12.47	12.66
2	12.50	12.49	12.67
1	12.50	12.49	12.67



Widen from Section 16 to section 14 by 10 feet

100 yr flow

Section	Tide 2 ft	Tide 6 ft	Tide 10 ft
17	6.00	6.50	10.06
16	8.18	7.55	10.03
15.3	10.26	10.09	10.93
15	11.04	10.93	11.44
14	11.23	11.12	11.59
13	11.25	11.15	11.59
12	11.95	11.90	12.17
11	12.52	12.49	12.67
10	12.72	12.70	12.79
9	13.16	13.15	13.22
8	13.22	13.21	13.27
7	13.23	13.22	13.28
6	13.23	13.21	13.28
5	13.26	13.25	13.31
4.1	13.27	13.25	13.32
4.2	13.27	13.26	13.32
4.3	13.27	13.26	13.32
4.4	13.27	13.26	13.32
3	13.28	13.27	13.33
2	13.29	13.28	13.34
1	13.30	13.29	13.35



Widen from Section 16 to section 14 by 20 Feet

2 or flow

Section	Tide 2 FT	Tide 6 FT	Tide 10 FT
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17	4.89	6.08	10.01
16	6.75	6.34	10.01
15.3	7.25	6.96	10.10
15	7.49	7.25	10.15
14	7.60	7.39	10.17
13	7.72	7.55	10.19
12	8.97	8.44	10.39
11	9.42	9.40	10.56
10	9.77	9.75	10.72
9	10.12	10.11	10.91
8	10.25	10.24	10.98
7	10.40	10.39	11.07
6	10.42	10.41	11.09
5	10.46	10.45	11.11
4.1	10.47	10.46	11.11
4.2	10.47	10.46	11.11
4.3	10.47	10.46	11.11
4.4	10.48	10.47	11.12
3	10.51	10.50	11.14
2	10.60	10.60	11.19
1	10.87	10.87	11.35



Widen from Section 16 to section 14 by 20 feet

10 ft flow

Section	Tide 2 ft	Tide 6 ft	Tide 10 ft
---------	--------------	--------------	---------------

17	5.75	6.21	10.02
16	7.86	6.78	10.01
15.3	8.62	7.98	10.28
15	8.93	8.41	10.13
14	9.04	8.56	10.47
13	9.14	8.70	10.51
12	10.22	10.12	10.94
11	10.76	10.69	11.30
10	11.14	11.09	11.58
9	11.55	11.51	11.89
8	11.69	11.65	12.00
7	11.87	11.83	12.09
6	11.89	11.86	12.09
5	11.93	11.90	12.12
4.1	11.93	11.90	12.12
4.2	11.93	11.90	12.12
4.3	11.93	11.90	12.12
4.4	11.95	11.92	12.14
3	11.97	11.94	12.16
2	12.03	12.01	12.20
1	12.24	12.22	12.36



Widen from Section 16 to section 14 by 20 feet

25 ft flow

Section	Tide 2 FT	Tide 6 FT	Tide 10 FT
---------	--------------	--------------	---------------

17	5.83	6.30	10.03
16	7.35	7.04	10.02
15.3	8.66	8.50	10.04
15	9.10	8.98	10.62
14	9.24	9.13	10.68
13	9.38	9.28	10.74
12	10.66	10.64	11.27
11	11.27	11.26	11.72
10	11.69	11.67	12.04
9	12.12	12.11	12.39
8	12.26	12.25	12.49
7	12.31	12.30	12.52
6	12.30	12.30	12.52
5	12.34	12.34	12.55
4.1	12.35	12.34	12.55
4.2	12.35	12.34	12.55
4.3	12.35	12.34	12.55
4.4	12.36	12.36	12.56
3	12.38	12.38	12.58
2	12.40	12.40	12.59
1	12.39	12.39	12.59



Widen from Section 16 to section 14 by 20 feet

Section	100 ft flow		
	Tide 2 ft	Tide 6 ft	Tide 10 ft
17	6.00	6.50	10.06
16	8.18	7.55	10.03
15.3	9.77	9.52	10.73
15	10.26	10.07	11.05
14	10.40	10.23	11.15
13	10.54	10.38	11.10
12	11.63	11.58	11.87
11	12.31	12.28	12.47
10	12.63	12.63	12.70
9	13.10	13.09	13.15
8	13.16	13.15	13.20
7	13.17	13.17	13.21
6	13.17	13.16	13.21
5	13.20	13.20	13.25
4.1	13.21	13.21	13.25
4.2	13.21	13.21	13.25
4.3	13.21	13.21	13.25
4.4	13.21	13.21	13.25
3	13.23	13.22	13.27
2	13.24	13.24	13.28
1	13.24	13.24	13.28