

Appendix B – Hydraulic Models Results – Dellateroy Creek

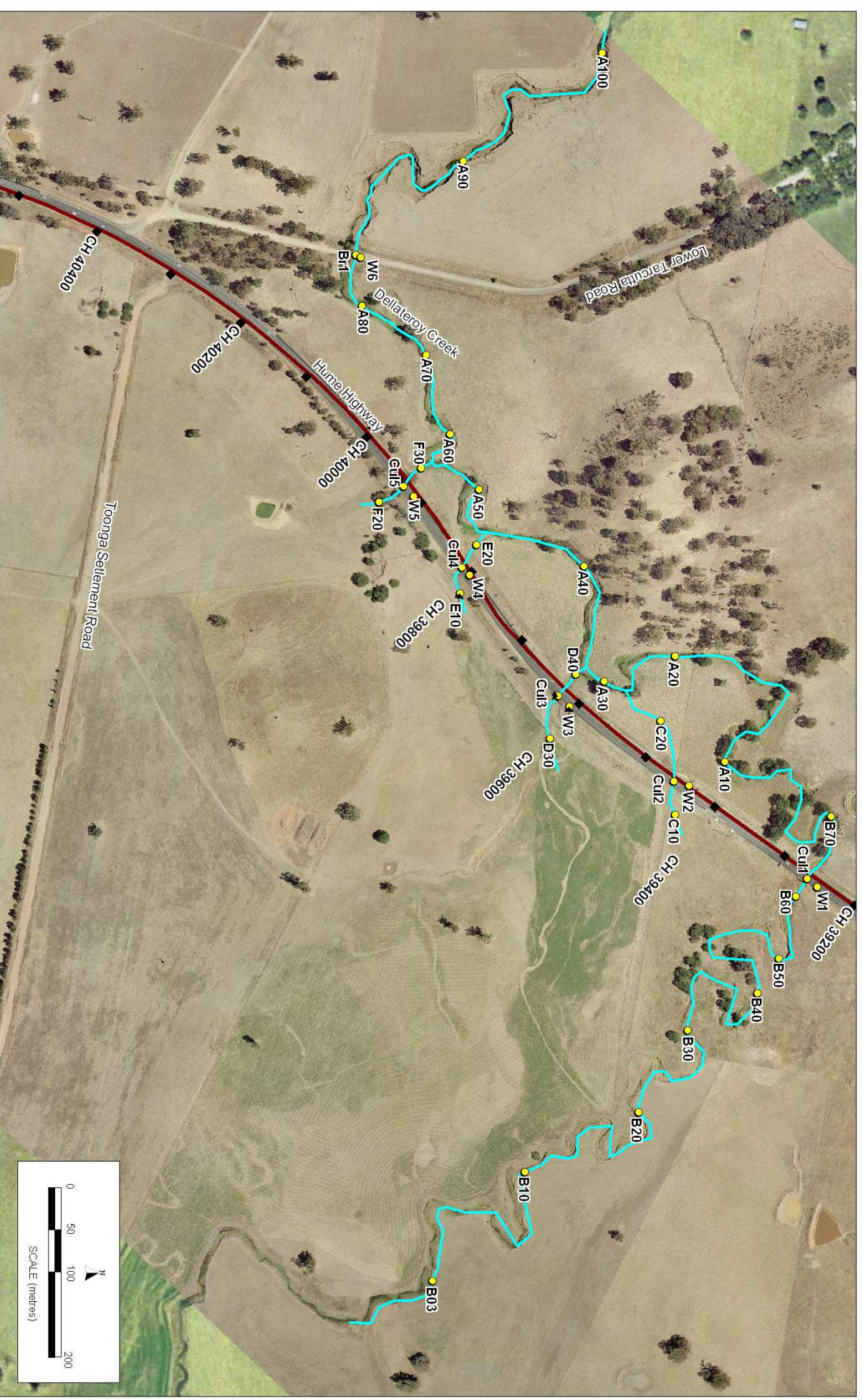


Figure B.2

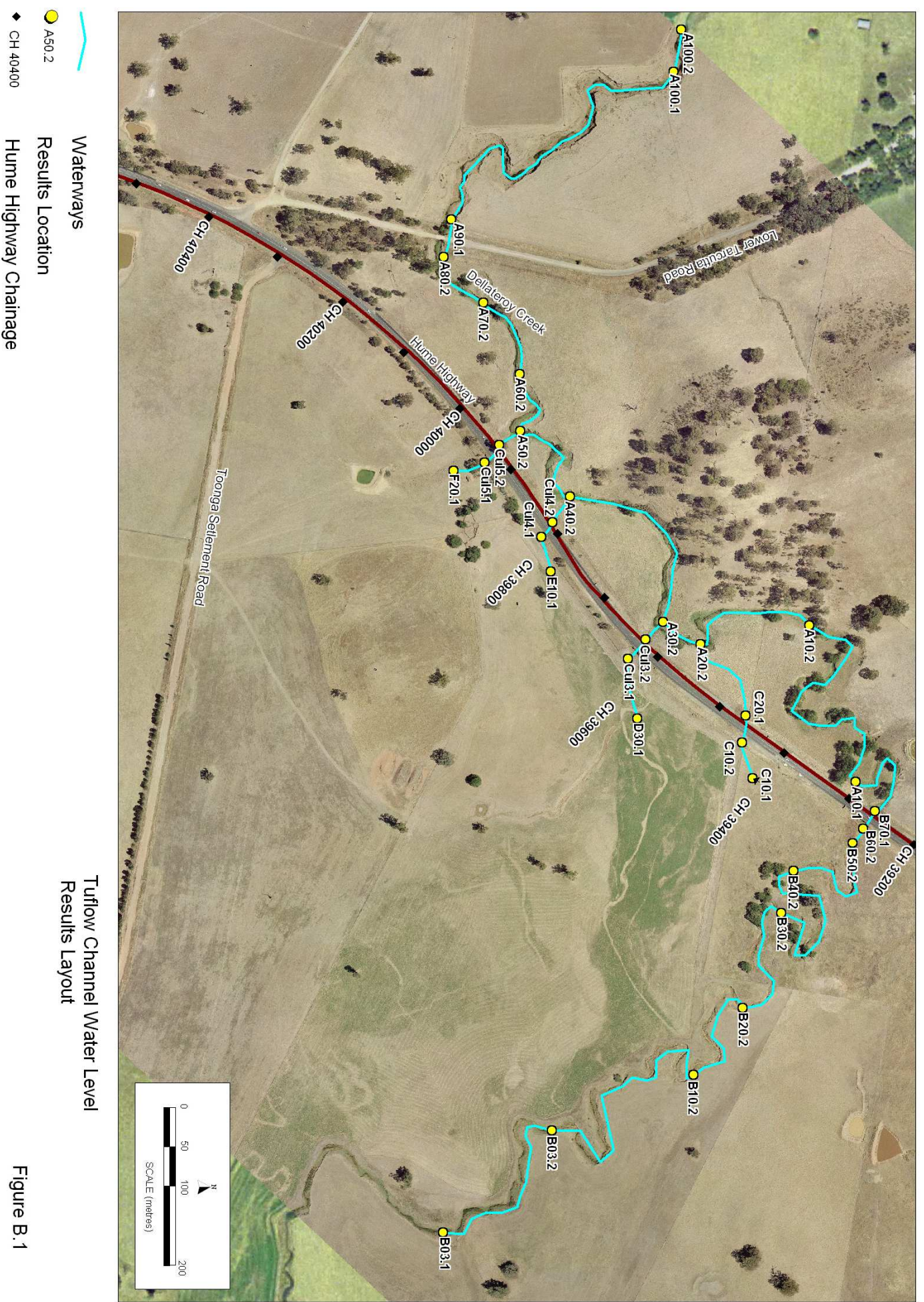


TABLE B.1

N-1 Tuflow Channel Water Levels (m AHD)						
Point	Existing Condition				Option 8	Option 9A
	50 yr	100 yr	2000 yr	PMF	100 yr	100 yr
A10.1	231.90	231.91	231.93	232.41	231.78	231.78
A10.2	229.83	229.92	230.98	232.16	229.83	229.82
A100.1	222.07	222.11	222.42	222.81	222.11	222.11
A100.2	222.00	222.00	222.00	222.00	222.00	222.00
A20.2	229.40	229.56	230.81	232.02	229.50	229.47
A30.2	229.26	229.35	230.29	231.40	229.31	229.36
A40.2	228.03	228.31	229.45	230.57	228.35	228.52
A50.2	227.04	227.22	227.93	228.60	227.21	227.18
A60.2	226.86	226.98	227.60	228.23	226.97	226.96
A70.2	224.86	225.15	225.88	226.58	225.17	225.15
A80.2	224.40	224.77	225.40	226.00	224.76	224.77
A90.1	224.39	224.76	225.39	225.98	224.75	224.76
B03.1	238.68	238.80	239.31	239.75	238.80	238.80
B03.2	236.62	236.77	237.26	237.64	236.77	236.77
B10.2	234.71	234.82	235.25	235.63	234.82	234.82
B20.2	234.64	234.74	235.08	235.35	234.74	234.74
B30.2	233.33	233.42	233.83	234.22	233.45	233.45
B40.2	233.21	233.29	233.54	233.69	233.33	233.33
B50.2	232.22	232.26	232.62	233.08	231.85	231.94
B60.2	232.20	232.25	232.60	233.06	n/a	231.90
B70.1	232.17	232.21	232.49	232.89	231.84	231.88
C10.1	232.11	232.21	232.62	233.10	232.36	232.24
C10.2	231.70	231.86	232.30	232.77	232.28	231.99
C20.1	230.71	230.82	231.42	232.22	230.58	230.38
Cul3.1	230.30	230.57	231.27	231.82	230.64	230.75
Cul3.2	229.54	229.66	230.39	231.43	229.46	229.51
Cul4.1	229.40	229.73	230.19	230.72	229.48	229.69
Cul4.2	228.05	228.36	229.51	230.61	228.36	228.52
Cul4A.1	n/a	n/a	n/a	n/a	229.38	229.67
Cul4A.2	n/a	n/a	n/a	n/a	228.37	228.53
Cul5.1	228.01	228.26	229.64	229.92	228.32	228.32
Cul5.2	227.04	227.22	227.94	228.61	227.21	227.18
D30.1	231.21	231.37	231.88	232.30	231.62	231.36
E10.1	229.49	229.86	230.38	230.84	229.62	229.78
E10A.1	n/a	n/a	n/a	n/a	229.62	229.81
F20.1	228.02	228.27	229.64	229.92	228.32	228.33

TUFLOW Files:

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TABLE B.2

N-1 Tuflow Channel Maximum Flow (m3/s)						
Point	Existing Condition				Option 8	Option 9A
	50 yr	100 yr	2000 yr	PMF	100 yr	100 yr
A10	8.7	10.3	24.2	39.3	12.4	12.5
A100	38.4	49.1	68	84.2	49.7	49.5
A20	21.9	23.8	44.2	78.3	20.5	20.8
A30	31.1	41.9	170.3	396.9	38.2	29.7
A40	54.8	58.5	102.9	183.7	55.9	57.1
A50	84.4	103.9	201.3	333.8	107.1	119.9
A60	83.7	105.7	181.1	257.0	103.9	100.1
A70	52.1	60.8	108.9	168.0	60.1	59.1
A80	62.6	72.4	123.1	205.4	74.5	71.9
A90	92.8	118.0	181.5	253.5	118.3	118.6
B03	66.0	87.2	186.3	280.9	87.2	87.2
B10	30.0	34.4	58.4	84.5	34.4	34.4
B20	49.7	59.6	109.0	169.1	59.8	59.8
B30	26.6	30.0	48.5	69.5	30.1	30.1
B40	26.3	30.7	60.5	98.5	29.7	29.8
B50	22.4	23.9	34.6	46.2	22.3	22.3
B60	23.4	25.4	40.7	58.7	n/a	22.8
B70	23.4	25.4	41.1	54.1	18.2	22.8
Br1	62.9	72.6	118.3	166.7	75.0	72.5
C10	10.3	14.6	38.4	76.1	27.7	13.9
C20	8.2	12.2	60.7	178.6	16.5	10.3
Cul1	23.4	25.4	41.2	54.2	22.7	22.8
Cul2	7.5	7.7	7.8	7.8	6.4	5.9
Cul3	67.0	74.0	101.6	106.0	75.0	72.9
Cul4	21.4	26.8	36.5	37.6	17.6	20.6
Cul4A	n/a	n/a	n/a	n/a	31.7	39.7
Cul5	3.3	4.5	8.5	9.4	4.5	4.9
D30	53.8	60.4	114.7	166.1	85.1	67.1
D40	65.3	73.9	174.2	186.1	73.5	76.7
E10	19.5	36.2	75.3	105.4	18.7	22.5
E10A	n/a	n/a	n/a	n/a	29.9	34.8
E20	42.7	49.7	107.8	162.5	42.1	35.4
E20A	n/a	n/a	n/a	n/a	43.6	41.3
F20	3.3	4.4	11.5	19.8	4.4	4.5
F30	31.4	29.5	35.9	48.0	15.5	16.0
W1	0	0	0	0	0	0
W2	0	3.5	35.7	88.8	11.8	0.5
W3	0	0	16.2	69.2	0	0
W4	1.6	21.4	67.1	120.6	0	0
W4A	n/a	n/a	n/a	n/a	0	0
W5	0	0	0	5.5	0	0
W6	0	0	0	6.8	0	0

TUFLOW Files:

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TABLE B.3

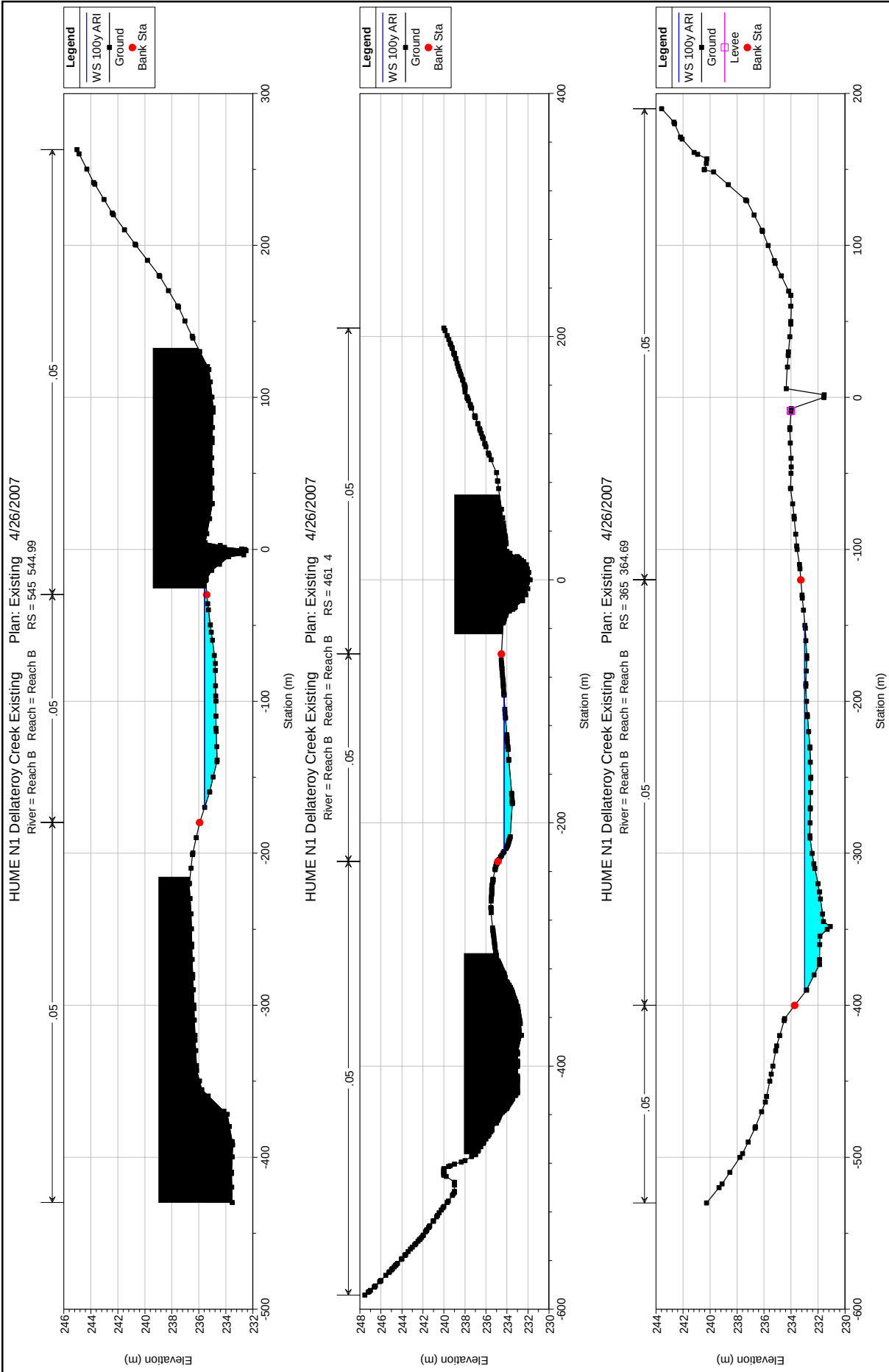
N-1 Tuflow Channel Maximum Average Velocities (m/s)						
Point	Existing Condition				Option 8	Option 9A
	50 yr	100 yr	2000 yr	PMF	100 yr	100 yr
A10	0.79	0.83	0.96	1.00	0.92	0.92
A100	2.73	3.10	3.36	3.70	3.12	3.11
A20	0.87	0.84	0.83	1.05	0.78	0.77
A30	1.03	1.14	2.11	2.90	1.10	0.98
A40	1.59	1.60	1.61	1.84	1.64	1.66
A50	1.89	2.09	2.67	3.20	2.14	2.27
A60	1.10	1.31	1.81	2.16	1.29	1.25
A70	2.10	2.24	2.81	3.31	2.23	2.21
A80	1.64	1.64	1.95	2.55	1.64	1.63
A90	2.36	2.67	3.21	3.85	2.66	2.67
B03	1.63	1.82	2.47	2.86	1.82	1.82
B10	1.32	1.35	1.54	1.78	1.35	1.35
B20	0.53	0.57	0.84	1.16	0.57	0.57
B30	1.42	1.44	1.54	1.72	1.42	1.42
B40	0.62	0.68	0.81	1.17	0.67	0.67
B50	1.29	1.32	1.38	1.45	1.45	1.45
B60	0.54	0.57	0.61	0.67	n/a	0.91
B70	0.75	0.80	1.20	1.27	0.64	0.69
Br1	2.68	2.69	2.90	3.27	2.72	2.67
C10	0.93	1.00	1.34	1.75	2.17	0.94
C20	1.10	1.25	2.06	2.95	1.31	1.06
Cul1	0.85	0.88	1.43	1.88	1.43	1.48
Cul2	3.17	3.20	3.20	3.22	2.85	2.86
Cul3	5.46	6.03	6.13	6.12	6.12	5.76
Cul4	3.65	5.02	6.18	5.71	3.42	3.61
Cul4A	n/a	n/a	n/a	n/a	3.37	3.64
Cul5	1.93	2.53	4.80	5.32	2.54	2.76
D30	2.11	2.26	2.72	3.32	2.62	2.10
D40	3.77	3.85	4.19	4.22	3.02	3.04
E10	0.97	1.07	1.66	1.85	0.82	0.86
E10A	n/a	n/a	n/a	n/a	1.40	1.43
E20	1.61	1.62	1.86	1.99	1.77	1.71
E20A	n/a	n/a	n/a	n/a	0.59	0.53
F20	0.61	0.61	0.64	0.75	0.72	0.54
F30	1.32	1.36	1.55	1.82	1.21	1.28
W1	0.00	0.00	0.00	0.00	0.00	0.00
W2	0.00	0.58	1.26	1.71	0.87	0.30
W3	0.00	0.00	0.97	1.58	0.00	0.00
W4	0.45	1.07	1.56	1.79	0.00	0.00
W4A	n/a	n/a	n/a	n/a	0.00	0.00
W5	0.00	0.00	0.00	0.68	0.00	0.00
W6	0.00	0.00	0.00	0.70	0.00	0.00

TUFLOW Files:

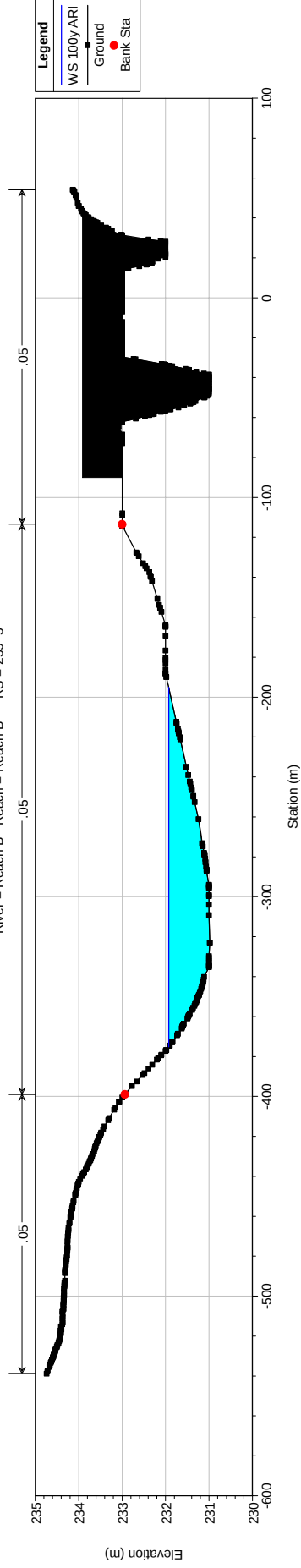
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HEC-RAS Plan: Pro_6 River: Reach B Reach: Reach B

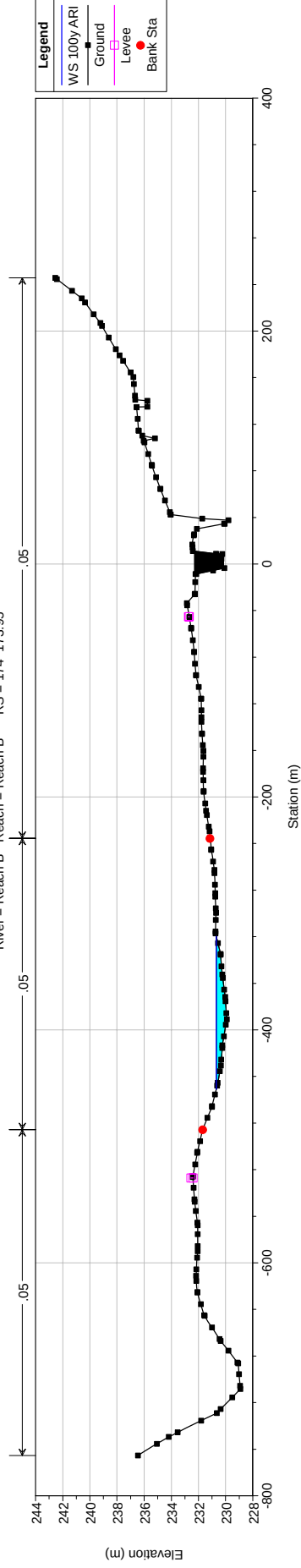
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach B	545	50y ARI	69.00	234.64	235.39	235.16	235.45	0.007316	1.06	65.01	133.03	0.48
Reach B	545	100y ARI	120.00	234.64	235.59	235.32	235.67	0.007443	1.30	92.66	144.83	0.51
Reach B	545	2000y ARI	426.00	234.64	236.23	235.91	236.48	0.009450	2.25	192.05	168.96	0.64
Reach B	545	PMF	810.00	234.64	236.67	236.42	237.15	0.011850	3.09	273.99	201.55	0.76
Reach B	461	50y ARI	69.00	233.49	234.10	234.10	234.28	0.035278	1.88	36.67	103.45	1.01
Reach B	461	100y ARI	120.00	233.49	234.28	234.28	234.51	0.033142	2.11	56.82	128.58	1.01
Reach B	461	2000y ARI	426.00	233.49	234.84	234.84	235.25	0.025031	2.85	152.56	195.39	0.98
Reach B	461	PMF	810.00	233.49	235.30	235.30	235.86	0.020123	3.40	250.94	241.71	0.95
Reach B	365	50y ARI	69.00	231.10	232.81	232.31	232.84	0.003273	0.73	93.88	182.21	0.33
Reach B	365	100y ARI	120.00	231.10	233.00	232.61	233.04	0.004207	0.88	136.54	244.73	0.38
Reach B	365	2000y ARI	426.00	231.10	233.76	233.13	233.84	0.002899	1.23	352.24	320.90	0.36
Reach B	365	PMF	810.00	231.10	234.19	233.49	234.32	0.003512	1.65	528.92	451.17	0.41
Reach B	259	50y ARI	69.00	230.98	231.62	231.46	231.69	0.010917	1.17	58.80	139.74	0.58
Reach B	259	100y ARI	120.00	230.98	231.93	231.62	231.99	0.005983	1.10	108.68	180.20	0.45
Reach B	259	2000y ARI	426.00	230.98	232.27	232.18	232.55	0.019490	2.34	182.24	237.87	0.85
Reach B	259	PMF	810.00	230.98	233.01	233.01	233.25	0.007886	2.14	378.53	310.81	0.59
Reach B	174	50y ARI	69.00	229.92	230.77	230.54	230.82	0.008443	1.00	68.75	170.33	0.50
Reach B	174	100y ARI	120.00	229.92	230.69	230.69	230.91	0.032203	2.08	57.77	131.21	1.00
Reach B	174	2000y ARI	426.00	229.92	231.88	231.22	231.96	0.002758	1.26	361.64	383.63	0.35
Reach B	174	PMF	810.00	229.92	231.60	231.60	232.09	0.022715	3.10	266.81	285.62	0.97
Reach B	33	50y ARI	69.00	227.31	228.62	228.62	228.95	0.026180	2.62	27.15	150.21	0.98
Reach B	33	100y ARI	120.00	227.31	229.85	228.94	229.94	0.002026	1.41	91.27	375.47	0.32
Reach B	33	2000y ARI	426.00	227.31	229.83	229.83	231.01	0.026783	5.07	89.94	374.77	1.16
Reach B	33	PMF	810.00	227.31	231.46	230.62	231.51	0.001225	1.63	846.19	593.23	0.27
Reach B	25		Culvert									
Reach B	15	50y ARI	69.00	225.97	227.71	227.71	228.20	0.025205	3.11	22.19	189.35	0.99
Reach B	15	100y ARI	120.00	225.97	228.52	228.52	228.63	0.039757	1.50	80.00	348.73	0.99
Reach B	15	2000y ARI	426.00	225.97	228.83	228.83	229.09	0.031054	2.28	186.80	366.11	1.01
Reach B	15	PMF	810.00	225.97	229.11	229.11	229.51	0.027498	2.81	288.42	380.31	1.01
Reach B	0	50y ARI	69.00	226.32	226.67	226.83	227.29	0.313682	3.50	19.73	113.07	2.67
Reach B	0	100y ARI	120.00	226.32	227.50	226.96	227.53	0.002258	0.83	145.10	178.69	0.29
Reach B	0	2000y ARI	426.00	226.32	227.20	227.52	228.25	0.104017	4.54	93.74	158.49	1.89
Reach B	0	PMF	810.00	226.32	227.62	227.99	228.82	0.068223	4.85	167.01	186.65	1.64



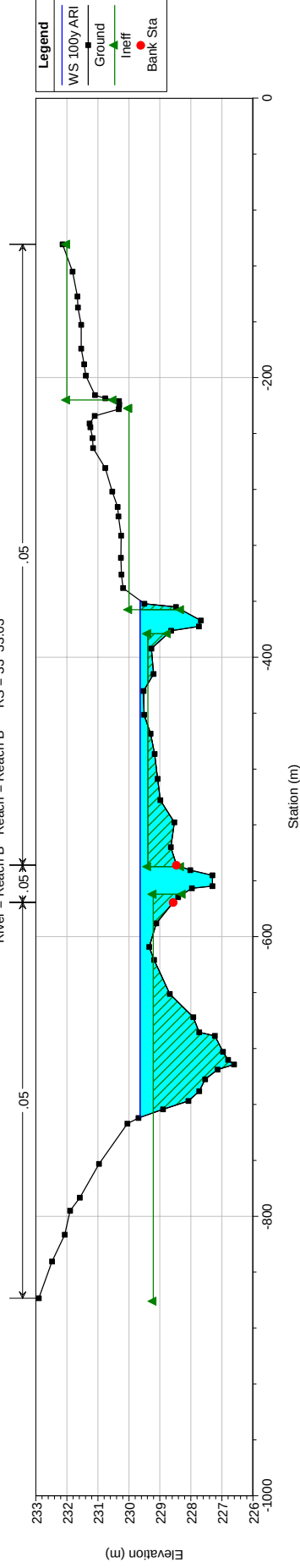
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River = Reach B Reach = Reach B RS = 259.5

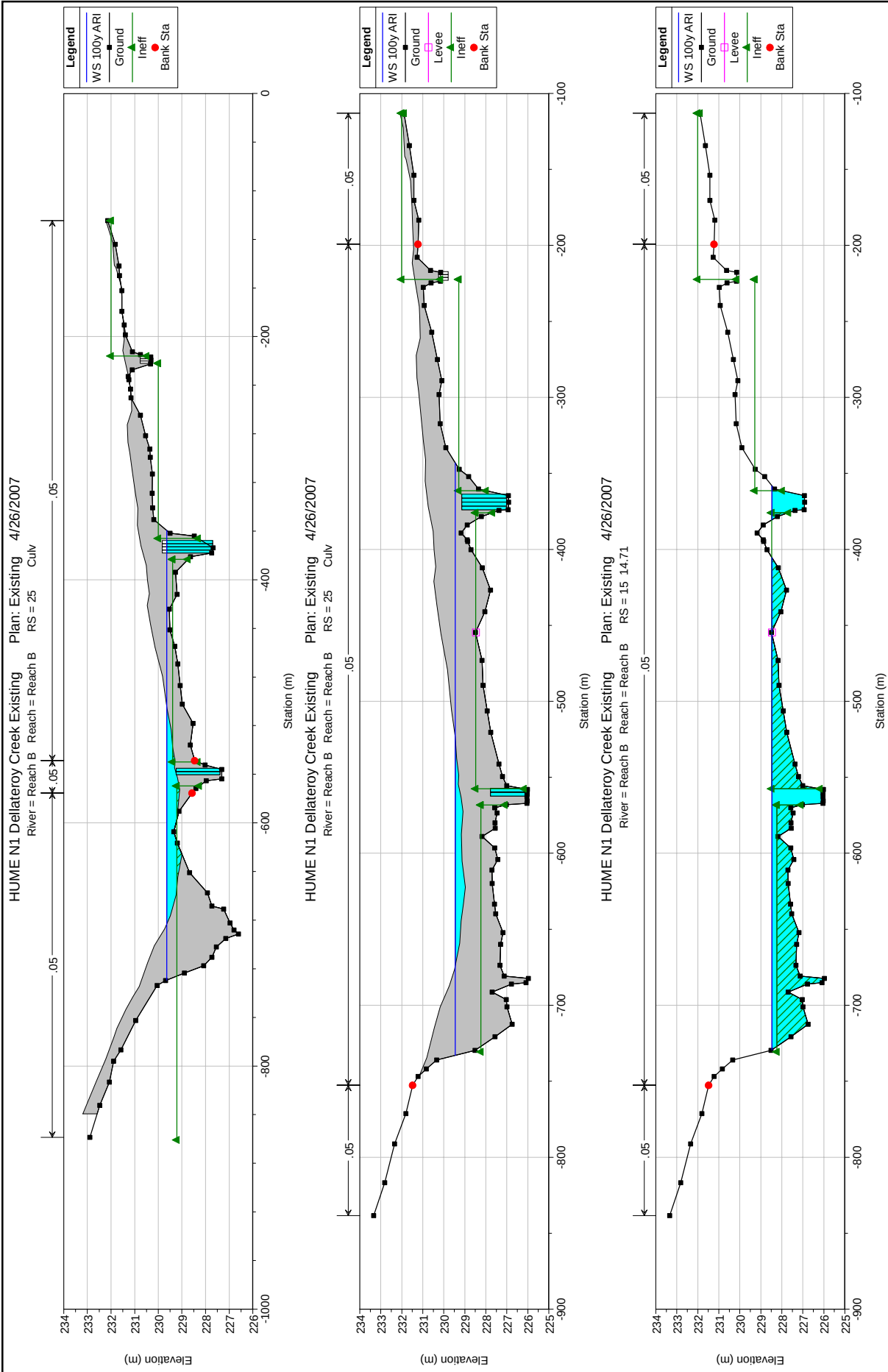


HUME N1 Dellateroy Creek Existing Plan: Existing 4/26/2007
River = Reach B Reach = Reach B RS = 174.173.95

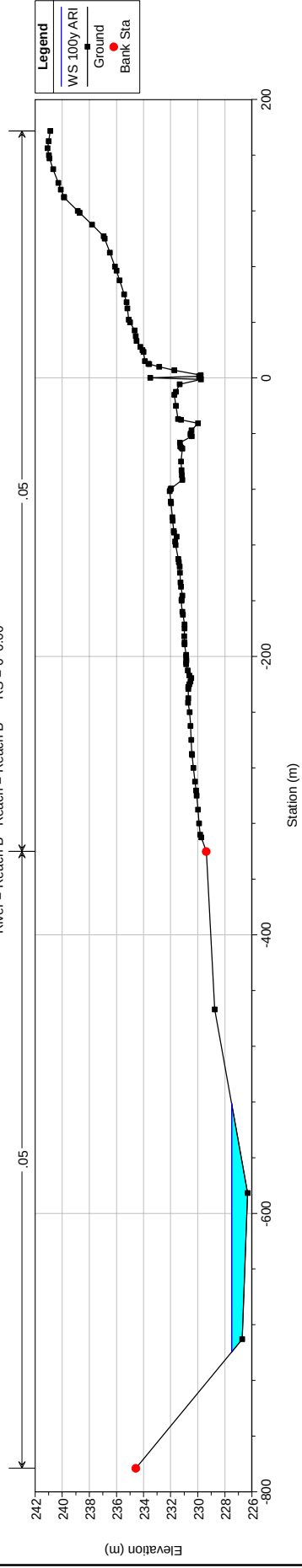


HUME N1 Dellateroy Creek Existing Plan: Existing 4/26/2007
River = Reach B Reach = Reach B RS = 33.33.03

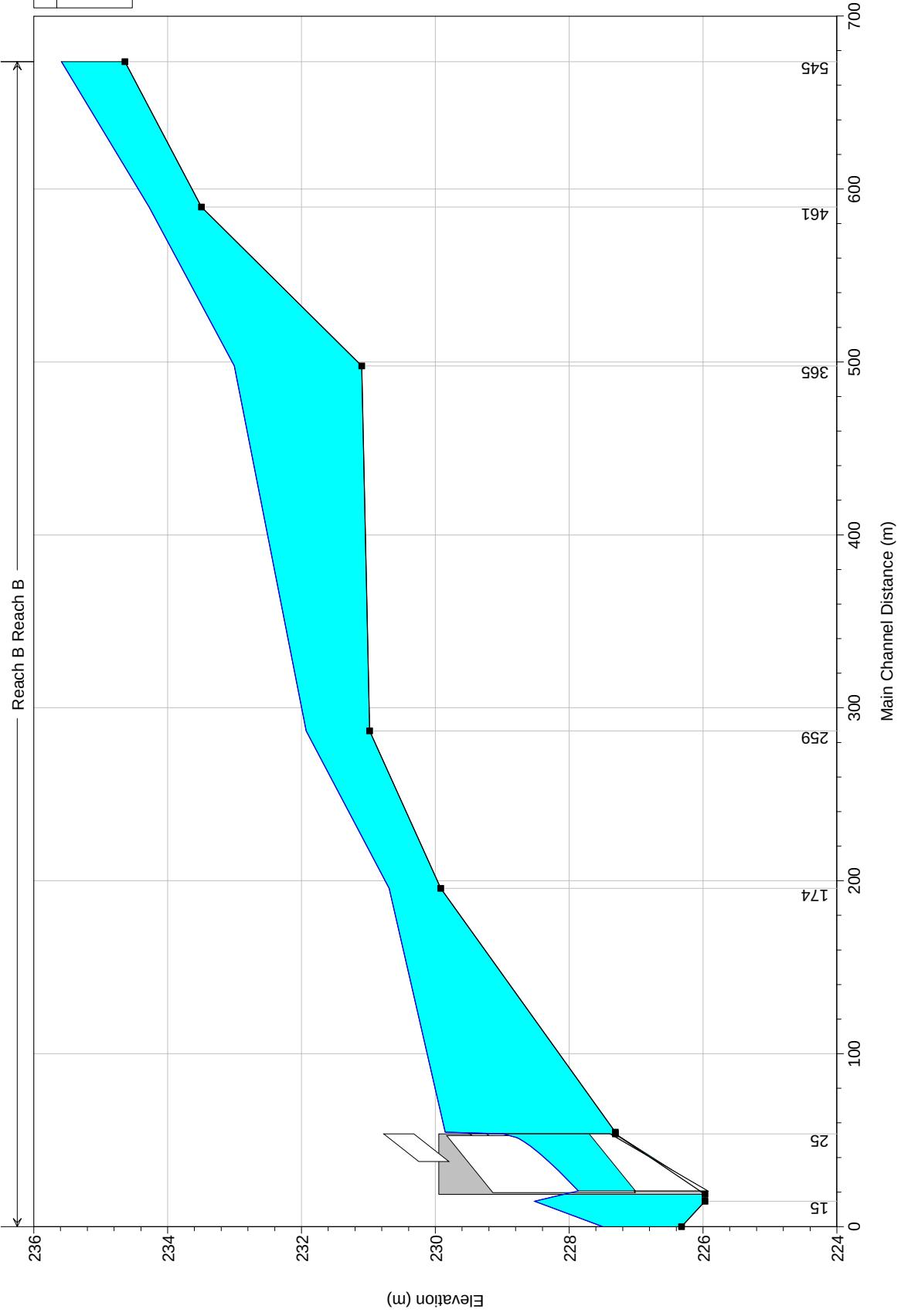




HUME N1 Dellateroy Creek Existing Plan: Existing 4/26/2007
River = Reach B Reach = Reach B RS = 0 0.00



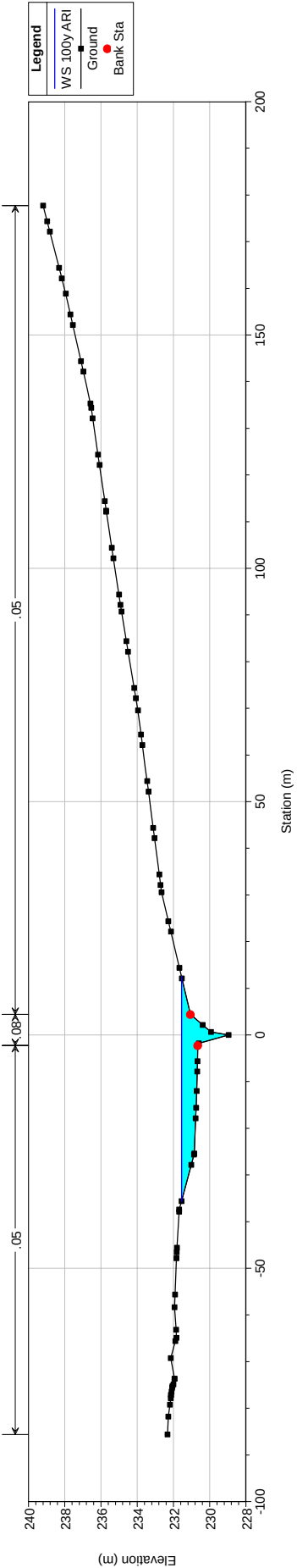
HUME N1 Dellateroy Creek Existing Plan: Proposed_6 4/26/2007



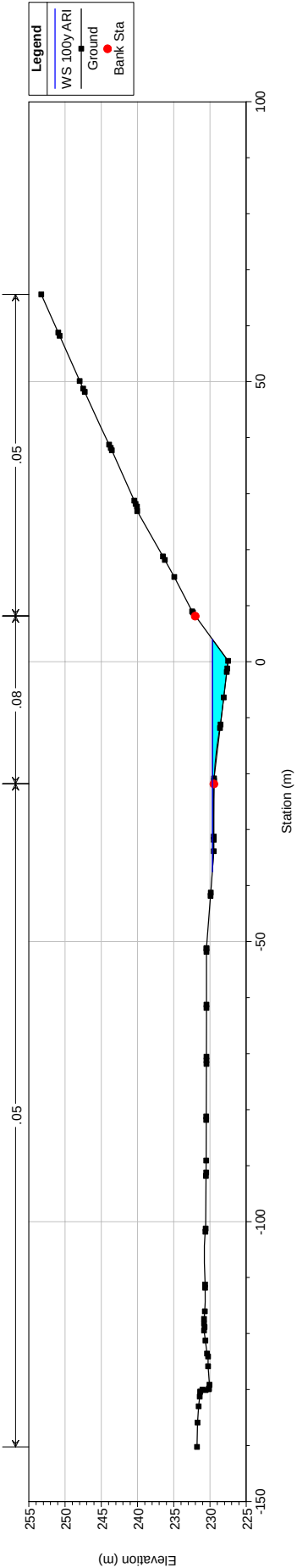
HEC-RAS Plan: Reach A River: Reach A Reach: Reach A

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach A	969	50y ARI	45.00	228.95	231.47	231.24	231.59	0.012441	1.43	29.55	45.61	0.41
Reach A	969	100y ARI	45.00	228.95	231.47	231.24	231.59	0.012543	1.44	29.47	45.56	0.41
Reach A	969	2000y	213.00	228.95	232.42	232.14	232.70	0.013416	2.17	91.96	84.96	0.47
Reach A	969	PMF	405.00	228.95	232.99	232.68	233.32	0.011859	2.38	162.79	126.31	0.46
Reach A	778	50y ARI	45.00	227.51	229.73		229.82	0.007304	1.42	34.97	42.47	0.36
Reach A	778	100y ARI	45.00	227.51	229.73		229.82	0.007206	1.41	35.14	42.54	0.35
Reach A	778	2000y	213.00	227.51	231.25		231.36	0.004142	1.47	147.40	112.84	0.29
Reach A	778	PMF	405.00	227.51	232.23		232.34	0.002630	1.34	279.83	148.81	0.24
Reach A	683	50y ARI	45.00	225.74	229.00		229.13	0.007014	1.58	29.01	33.08	0.36
Reach A	683	100y ARI	45.00	225.74	229.11		229.21	0.005576	1.46	32.91	38.96	0.32
Reach A	683	2000y	213.00	225.74	230.71		230.90	0.005388	2.10	109.04	62.34	0.35
Reach A	683	PMF	405.00	225.74	231.79		232.01	0.004229	2.20	198.72	89.99	0.32
Reach A	577	50y ARI	75.00	224.94	228.64	227.55	228.69	0.002946	1.12	77.06	76.00	0.23
Reach A	577	100y ARI	81.00	224.94	228.91		228.95	0.001624	0.89	97.74	77.04	0.18
Reach A	577	2000y	426.00	224.94	230.15		230.39	0.004600	1.95	203.73	103.09	0.32
Reach A	577	PMF	810.00	224.94	231.19		231.54	0.004469	2.26	323.31	118.54	0.33
Reach A	456	50y ARI	114.00	224.18	226.91		227.51	0.040237	3.42	33.28	19.82	0.84
Reach A	456	100y ARI	165.00	224.18	227.53	227.53	228.09	0.028320	3.37	53.33	53.34	0.74
Reach A	456	2000y	426.00	224.18	228.47	228.47	229.24	0.026827	4.18	111.83	67.44	0.76
Reach A	456	PMF	810.00	224.18	229.38	229.38	230.43	0.024265	4.73	183.26	98.35	0.76
Reach A	331	50y ARI	114.00	223.76	226.32		226.37	0.003210	1.07	120.53	129.84	0.25
Reach A	331	100y ARI	165.00	223.76	226.51	225.87	226.58	0.003755	1.22	146.44	139.56	0.27
Reach A	331	2000y	426.00	223.76	227.16	226.46	227.32	0.005124	1.71	243.80	152.27	0.33
Reach A	331	PMF	810.00	223.76	227.78	226.98	228.08	0.006299	2.17	339.33	153.53	0.38
Reach A	267	50y ARI	114.00	222.93	226.07		226.13	0.004716	1.13	108.65	149.47	0.28
Reach A	267	100y ARI	165.00	222.93	226.23		226.30	0.005235	1.26	134.48	169.96	0.30
Reach A	267	2000y	426.00	222.93	226.77		226.96	0.006579	1.68	229.78	177.52	0.35
Reach A	267	PMF	810.00	222.93	227.35		227.66	0.007282	2.04	334.24	185.79	0.38
Reach A	115	50y ARI	114.00	222.01	225.22		225.38	0.007677	1.85	77.00	163.83	0.38
Reach A	115	100y ARI	165.00	222.01	225.47		225.60	0.006960	1.87	122.52	198.10	0.37
Reach A	115	2000y	426.00	222.01	226.05		226.22	0.007277	2.15	240.16	203.34	0.38
Reach A	115	PMF	810.00	222.01	226.57		226.85	0.008387	2.52	347.25	209.50	0.41
Reach A	0	50y ARI	114.00	221.04	224.16	223.46	224.29	0.010012	1.73	81.86	158.80	0.43
Reach A	0	100y ARI	165.00	221.04	224.36	224.17	224.49	0.010007	1.82	125.41	293.08	0.43
Reach A	0	2000y	426.00	221.04	224.77	224.59	224.92	0.010010	2.07	258.93	332.14	0.45
Reach A	0	PMF	810.00	221.04	225.16	224.86	225.39	0.010002	2.31	390.78	339.83	0.46

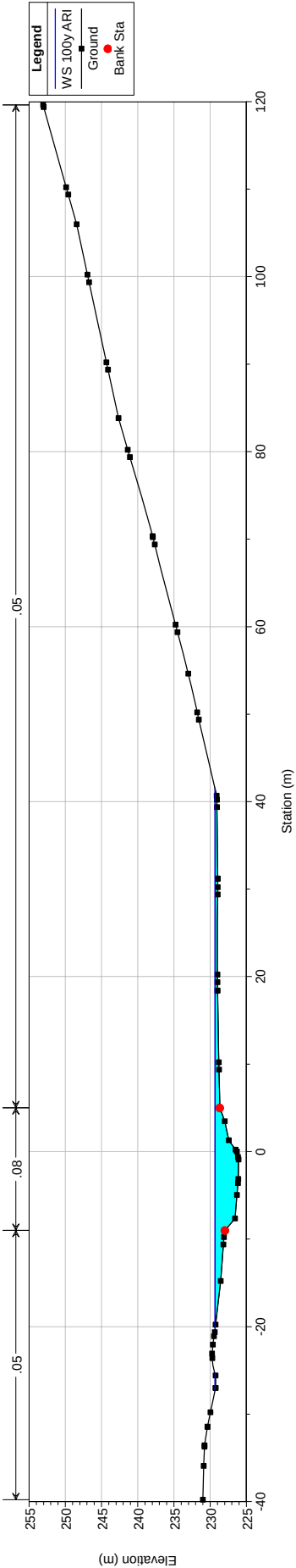
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 1031 1031 A1 1030.87



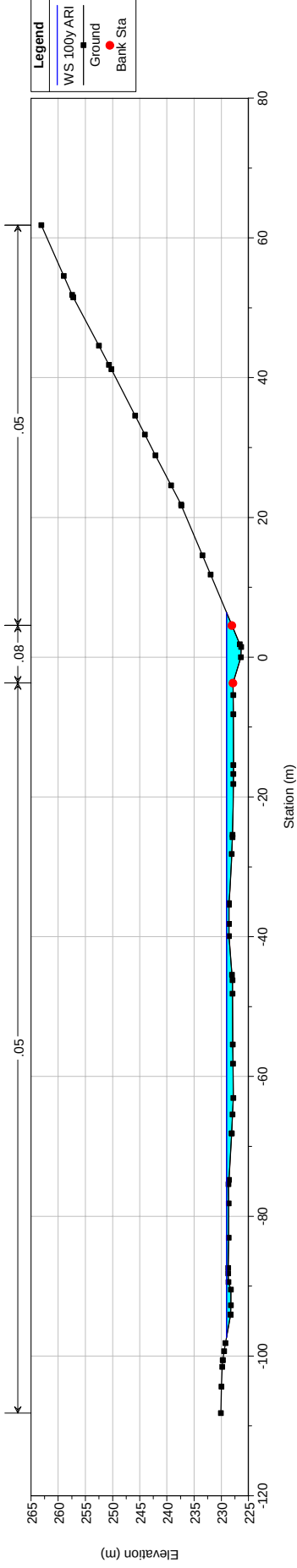
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 840 840 A2 840.09



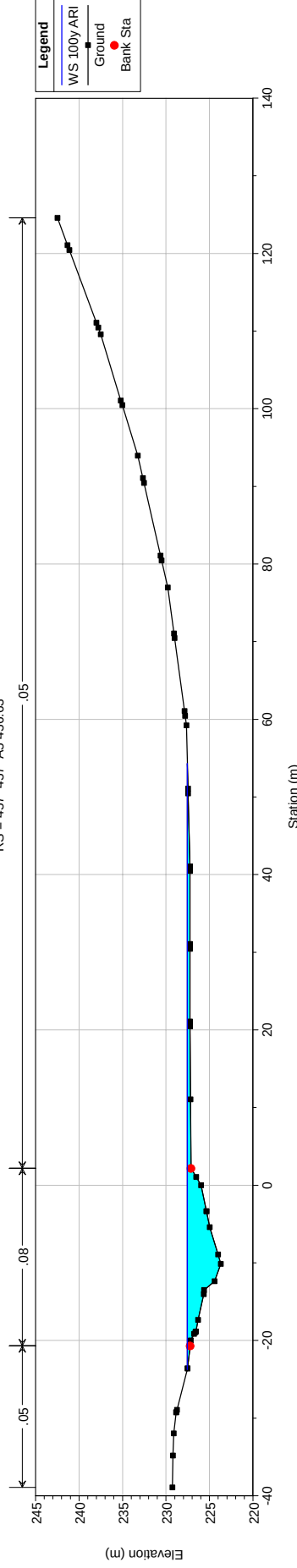
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 737 737 A3 737.04



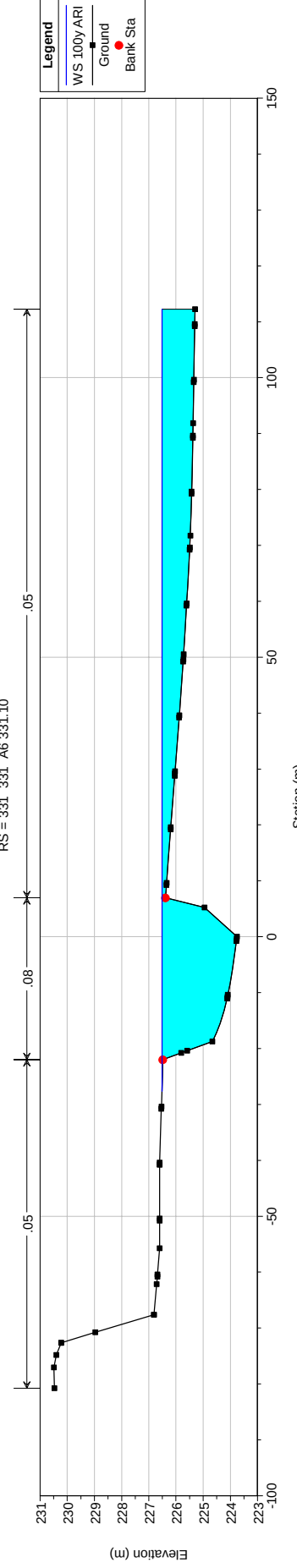
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 598 598 A4 598.15



HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 457 457 A5 456.63

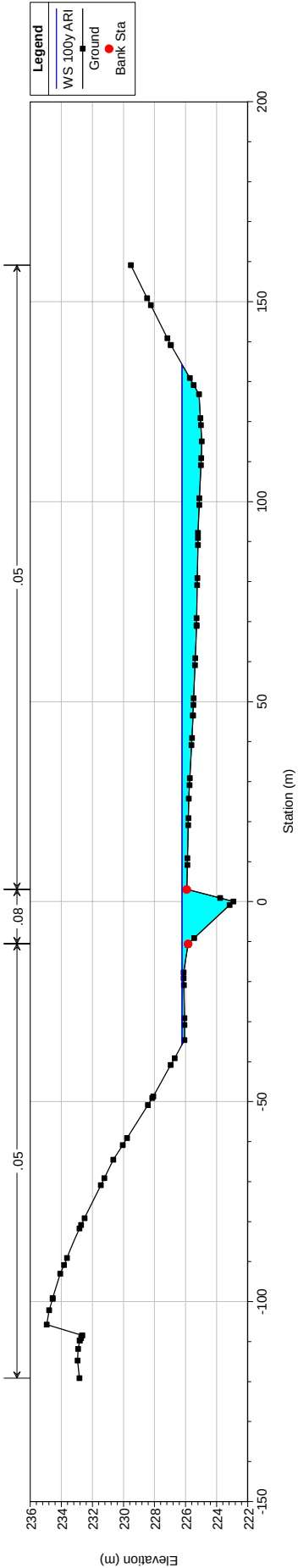


HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 331 331 A6 331.10



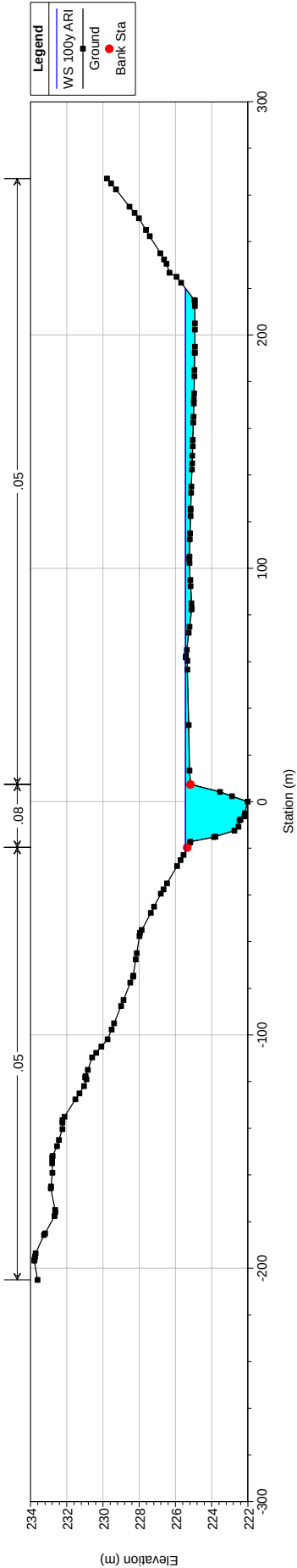
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007

RS = 267 267 A7 267.47



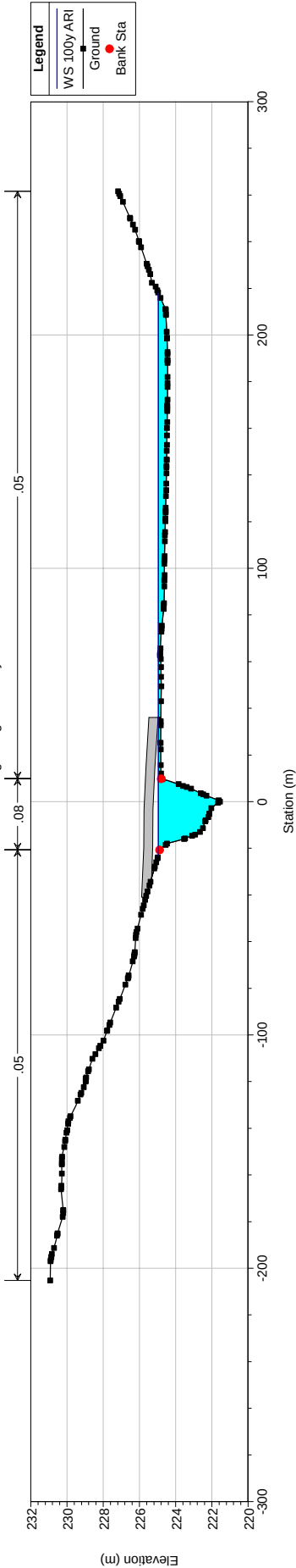
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007

RS = 115 115 A8 114.59

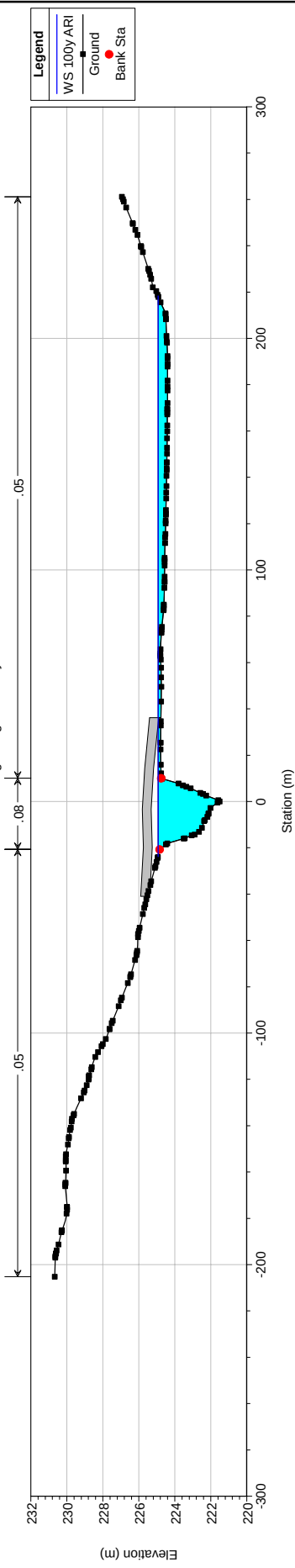


HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007

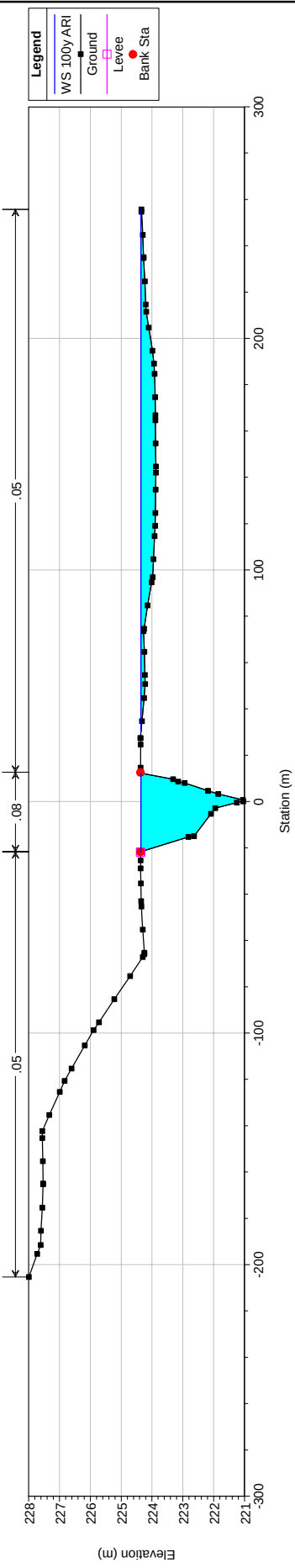
RS = 57 BR 57.5 Coonga Bridge Dellateroy Creek



HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 57 BR 57.5 Coorga Bridge Dellateroy Creek



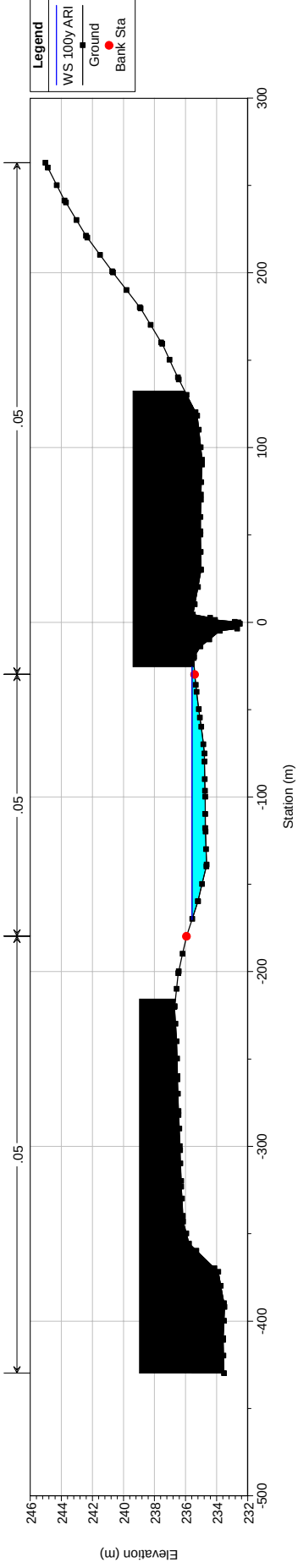
HUME N1 Dellateroy Creek Existing Plan: Exg_Reach A 4/26/2007
RS = 0 0 A9 0.00



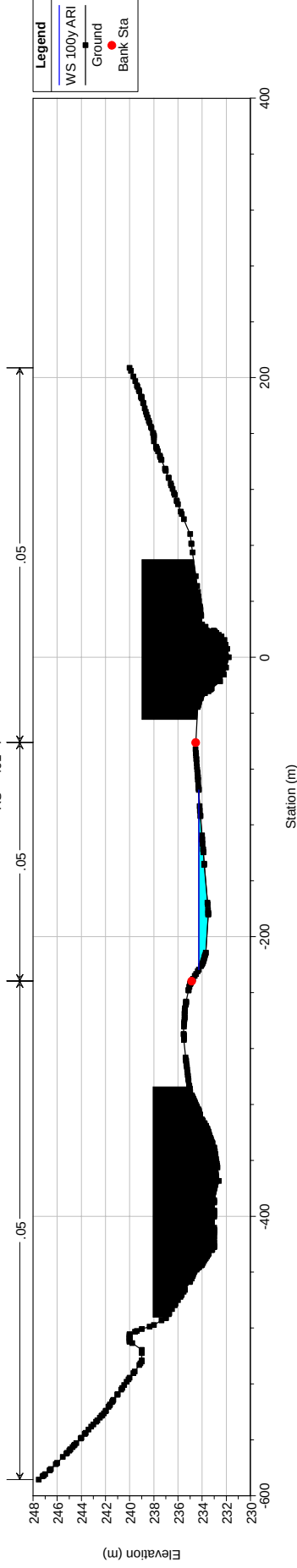
HEC-RAS Plan: Exg_1 River: Reach B Reach: Reach B

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach B	545	50y ARI	69.00	234.64	235.39	235.16	235.45	0.007322	1.06	64.99	133.01	0.48
Reach B	545	100y ARI	120.00	234.64	235.59	235.32	235.67	0.007443	1.30	92.66	144.83	0.51
Reach B	545	2000y ARI	426.00	234.64	236.23	235.91	236.48	0.009473	2.25	191.90	168.91	0.64
Reach B	545	PMF	810.00	234.64	236.67	236.42	237.15	0.011845	3.09	274.03	201.56	0.76
Reach B	461	50y ARI	69.00	233.49	234.10	234.10	234.28	0.035162	1.88	36.72	103.50	1.01
Reach B	461	100y ARI	120.00	233.49	234.28	234.28	234.51	0.033142	2.11	56.82	128.58	1.01
Reach B	461	2000y ARI	426.00	233.49	234.84	234.84	235.25	0.024911	2.85	152.80	195.49	0.98
Reach B	461	PMF	810.00	233.49	235.30	235.30	235.86	0.020132	3.40	250.90	241.70	0.95
Reach B	365	50y ARI	69.00	231.10	232.77	232.31	232.80	0.004205	0.80	85.79	175.57	0.37
Reach B	365	100y ARI	120.00	231.10	233.00	232.61	233.04	0.004207	0.88	136.54	244.73	0.38
Reach B	365	2000y ARI	426.00	231.10	233.68	233.13	233.77	0.003713	1.33	324.93	311.29	0.40
Reach B	365	PMF	810.00	231.10	234.19	233.49	234.32	0.003512	1.65	528.92	451.17	0.41
Reach B	259	50y ARI	69.00	230.98	231.72	231.46	231.77	0.005769	0.93	73.89	153.29	0.43
Reach B	259	100y ARI	120.00	230.98	231.93	231.62	231.99	0.005983	1.10	108.68	180.20	0.45
Reach B	259	2000y ARI	426.00	230.98	232.56		232.70	0.007153	1.67	254.44	258.35	0.54
Reach B	259	PMF	810.00	230.98	233.01		233.25	0.007886	2.14	378.53	310.81	0.59
Reach B	174	50y ARI	69.00	229.92	230.54	230.54	230.70	0.034306	1.78	38.67	115.65	0.99
Reach B	174	100y ARI	120.00	229.92	230.69	230.69	230.91	0.032203	2.08	57.77	131.21	1.00
Reach B	174	2000y ARI	426.00	229.92	231.22	231.22	231.56	0.026936	2.58	165.22	244.10	0.99
Reach B	174	PMF	810.00	229.92	231.60	231.60	232.09	0.022715	3.10	266.81	285.62	0.97
Reach B	33	50y ARI	69.00	227.31	229.40	228.55	229.46	0.002860	1.28	87.62	336.95	0.36
Reach B	33	100y ARI	120.00	227.31	229.64	228.89	229.69	0.002379	1.30	169.96	369.76	0.33
Reach B	33	2000y ARI	426.00	227.31	230.34	229.81	230.40	0.002204	1.60	434.35	448.86	0.34
Reach B	33	PMF	810.00	227.31	230.84	230.07	230.92	0.002282	1.86	674.15	508.22	0.36
Reach B	25		Culvert									
Reach B	15	50y ARI	69.00	225.97	228.36	228.36	228.49	0.040682	1.60	43.08	265.93	1.02
Reach B	15	100y ARI	120.00	225.97	228.47	228.47	228.58	0.016504	1.47	81.53	344.48	0.71
Reach B	15	2000y ARI	426.00	225.97	228.78	228.78	229.05	0.030672	2.28	187.07	363.33	1.00
Reach B	15	PMF	810.00	225.97	229.07	229.07	229.47	0.027022	2.80	289.49	378.47	1.00
Reach B	0	50y ARI	69.00	226.32	226.68	226.83	227.22	0.259424	3.26	21.18	117.16	2.45
Reach B	0	100y ARI	120.00	226.32	227.50	226.97	227.53	0.002258	0.83	145.10	178.69	0.29
Reach B	0	2000y ARI	426.00	226.32	227.20	227.52	228.22	0.099211	4.47	95.23	159.12	1.85
Reach B	0	PMF	810.00	226.32	227.63	227.99	228.80	0.065440	4.78	169.42	187.50	1.61

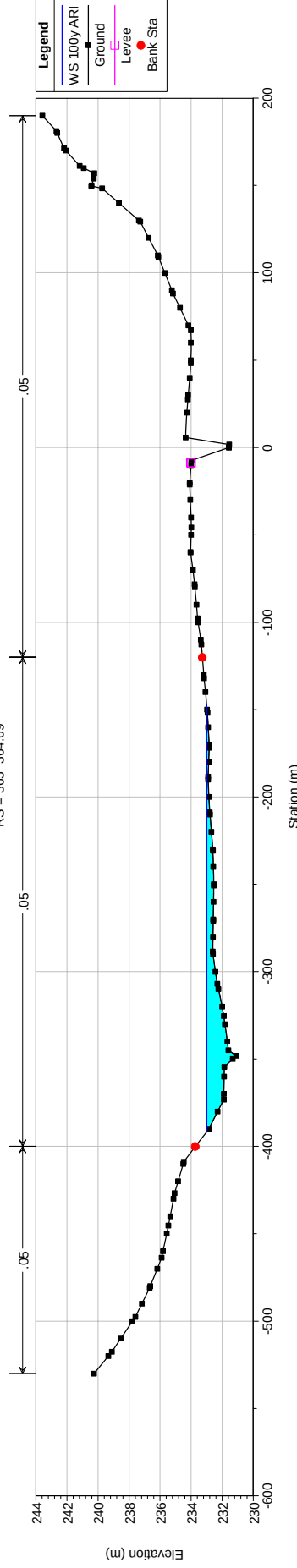
HUME N1 Dellateroy Creek Existing Plan: Proposed_1 4/26/2007
RS = 545 544.99

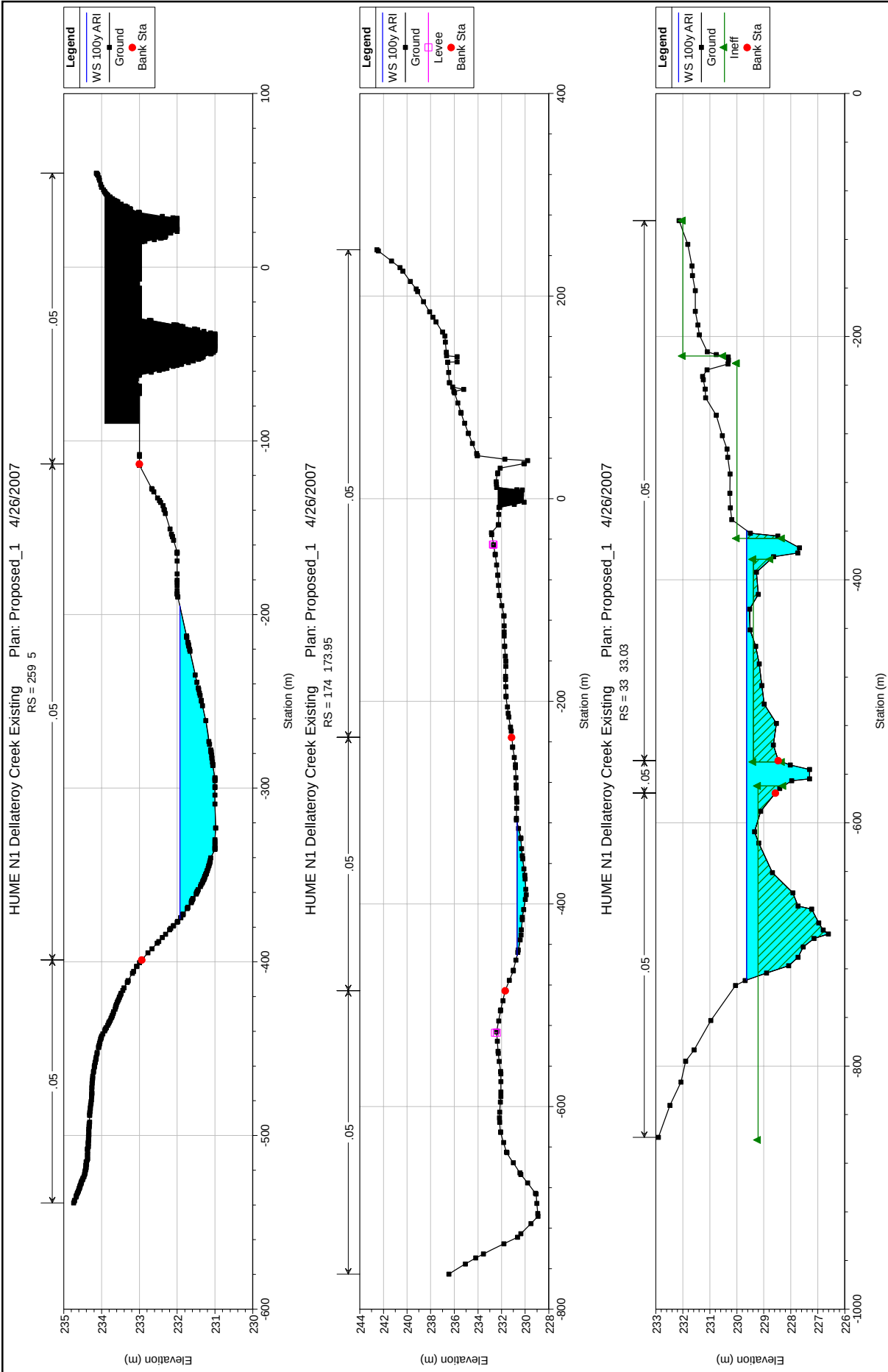


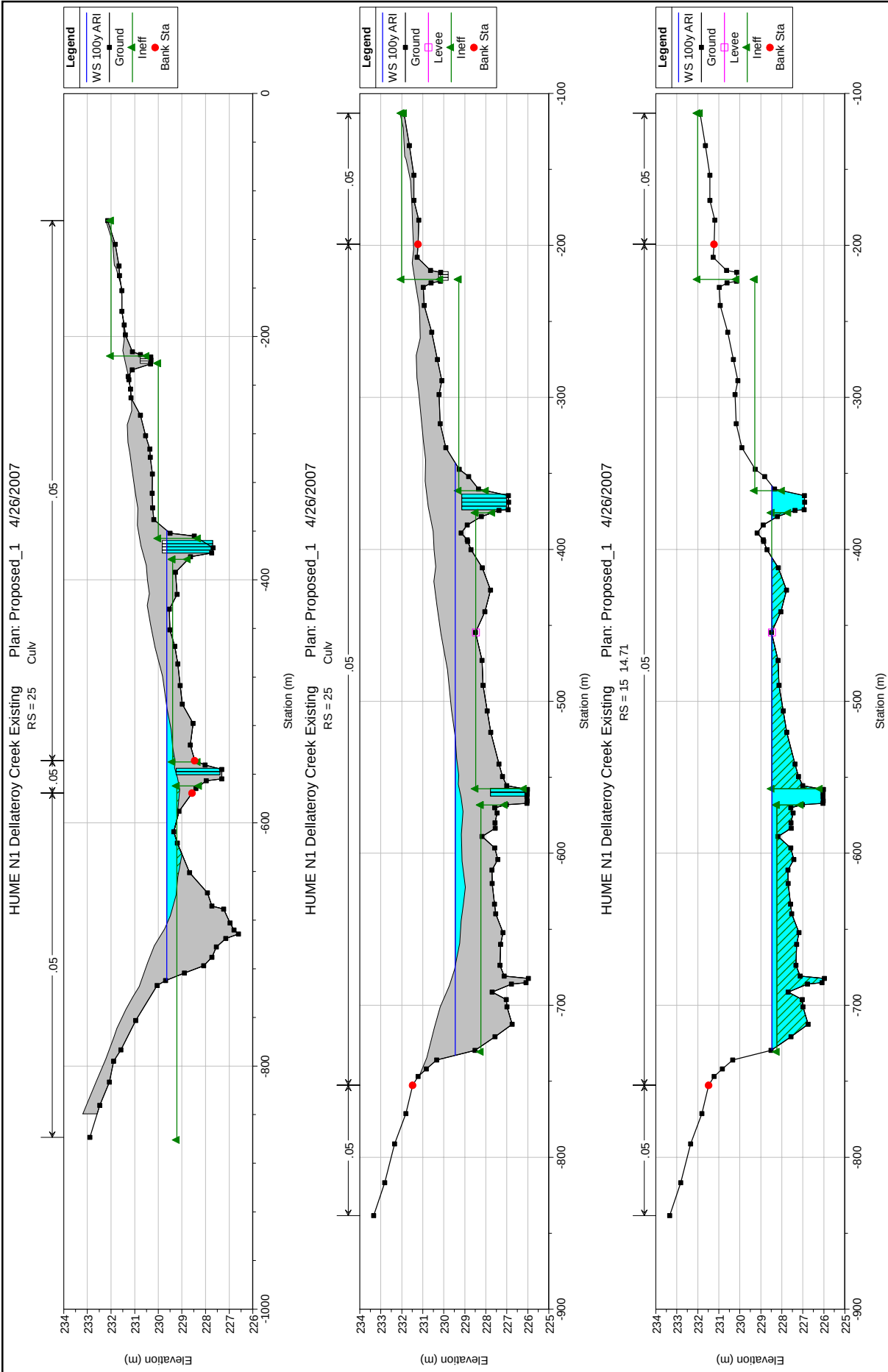
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RS = 461.4



HUME N1 Dellateroy Creek Existing Plan: Proposed_1 4/26/2007
RS = 365 364.69

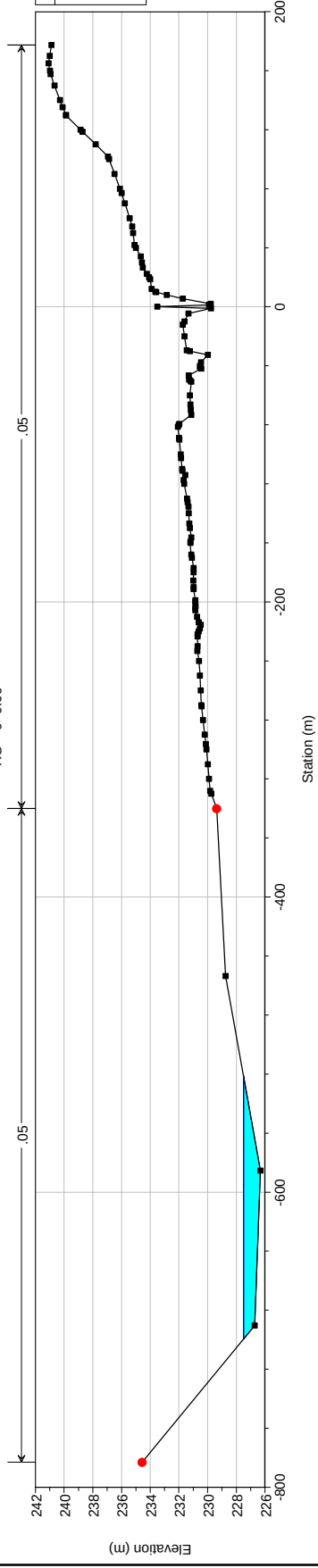






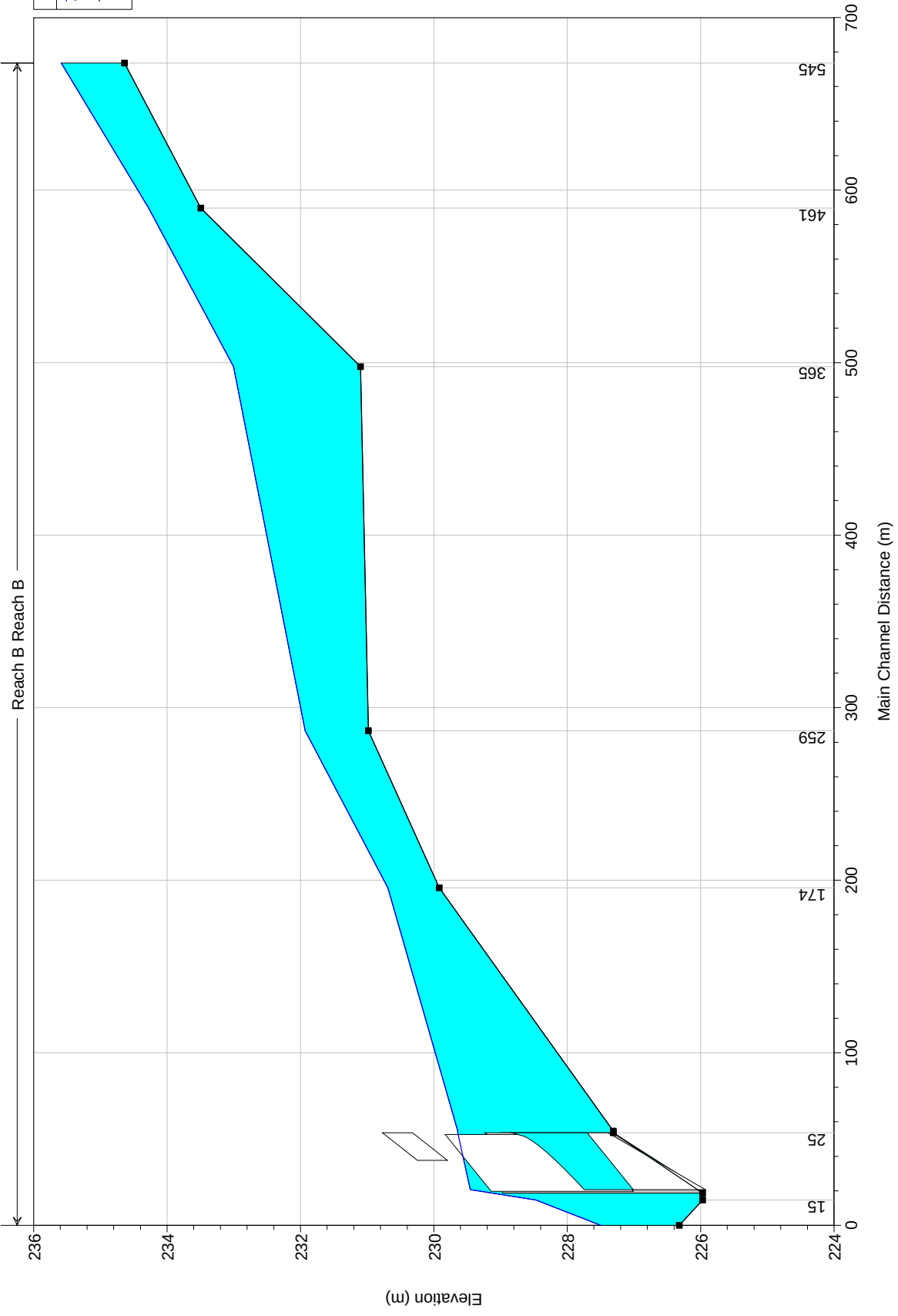
HUME N1 Dellateroy Creek Existing Plan: Proposed_1 4/26/2007

RS = 0 0.00



Legend	
WS 100y ARI	
Ground	
Bank Sta	

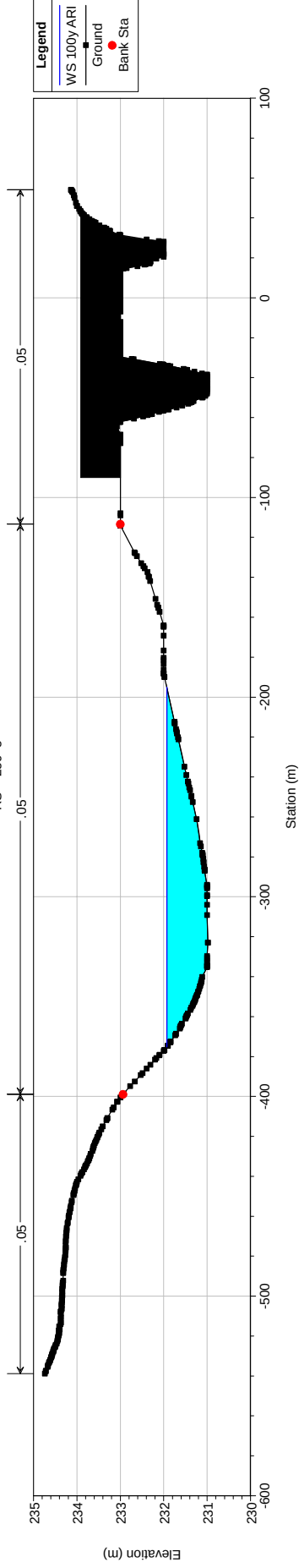
HUME N1 Dellateroy Creek Existing Plan: Proposed_1 4/26/2007



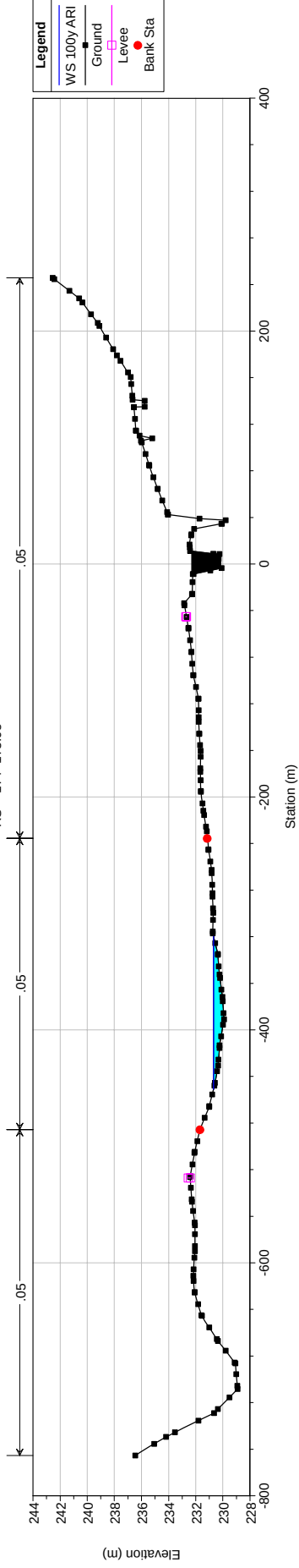
HEC-RAS Plan: Pro_1 River: Reach B Reach: Reach B Profile: 100y ARI

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach B	545	100y ARI	120.00	234.64	235.59	235.32	235.67	0.007443	1.30	92.66	144.83	0.51
Reach B	461	100y ARI	120.00	233.49	234.28	234.28	234.51	0.033142	2.11	56.82	128.58	1.01
Reach B	365	100y ARI	120.00	231.10	233.00	232.61	233.04	0.004207	0.88	136.54	244.73	0.38
Reach B	259	100y ARI	120.00	230.98	231.93	231.62	231.99	0.005983	1.10	108.68	180.20	0.45
Reach B	174	100y ARI	120.00	229.92	230.69	230.69	230.91	0.032203	2.08	57.77	131.21	1.00
Reach B	33	100y ARI	120.00	227.31	229.64	228.89	229.69	0.002379	1.30	169.96	369.76	0.33
Reach B	25		Culvert									
Reach B	15	100y ARI	120.00	225.97	228.47	228.47	228.58	0.016504	1.47	81.53	344.48	0.71
Reach B	0	100y ARI	120.00	226.32	227.50	226.97	227.53	0.002258	0.83	145.10	178.69	0.29

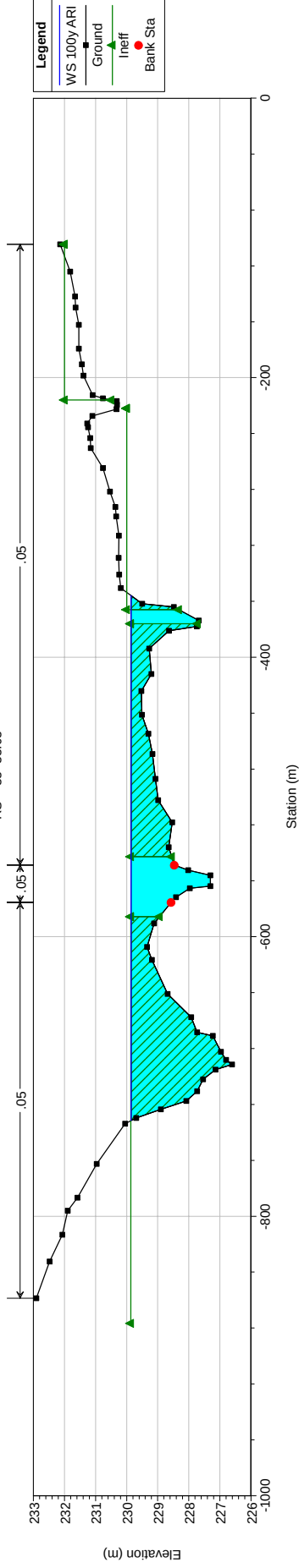
HUME N1 Dellateroy Creek Existing Plan: Proposed_6 4/26/2007
RS = 259.5

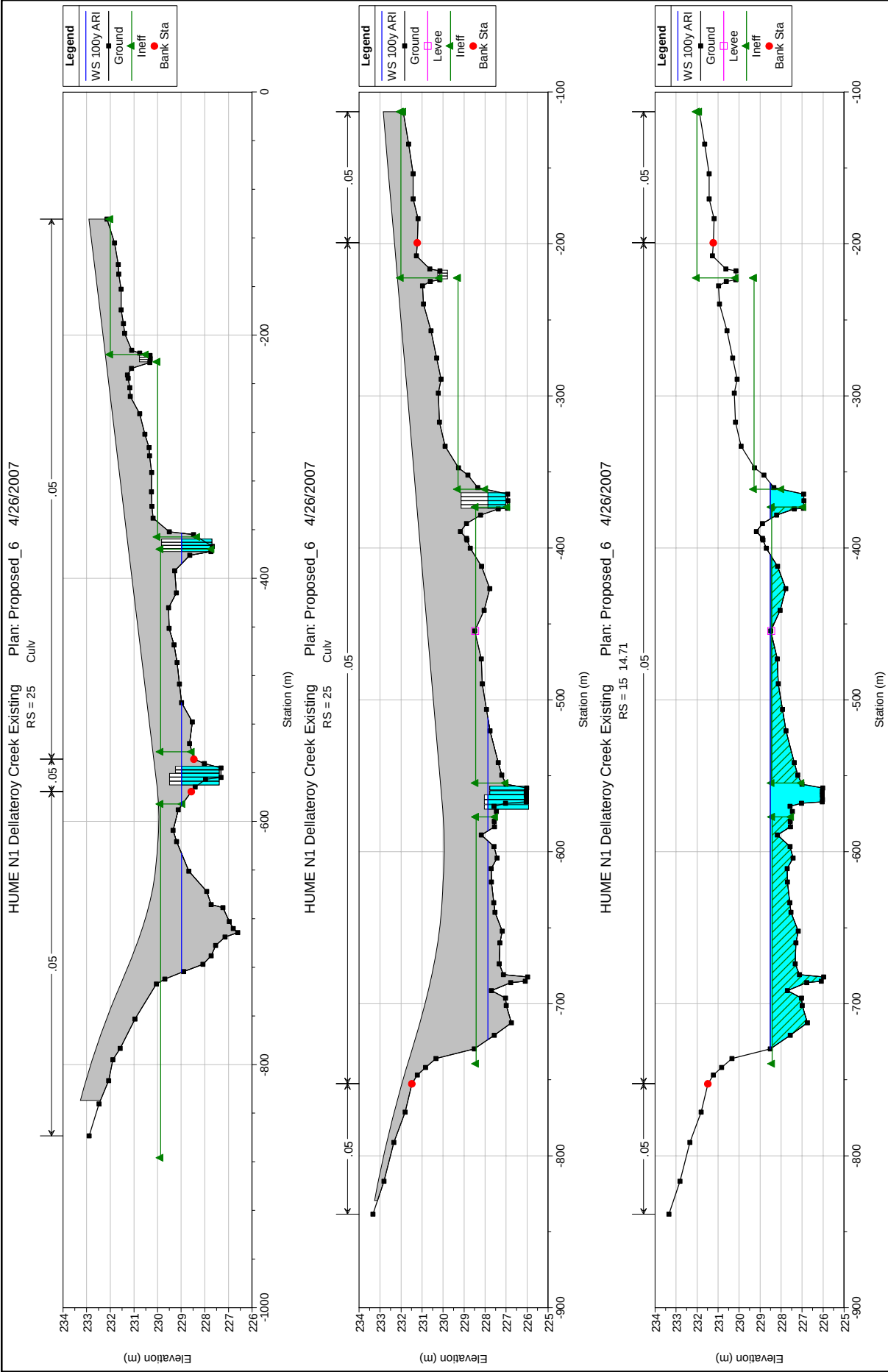


HUME N1 Dellateroy Creek Existing Plan: Proposed_6 4/26/2007
RS = 174.173.95



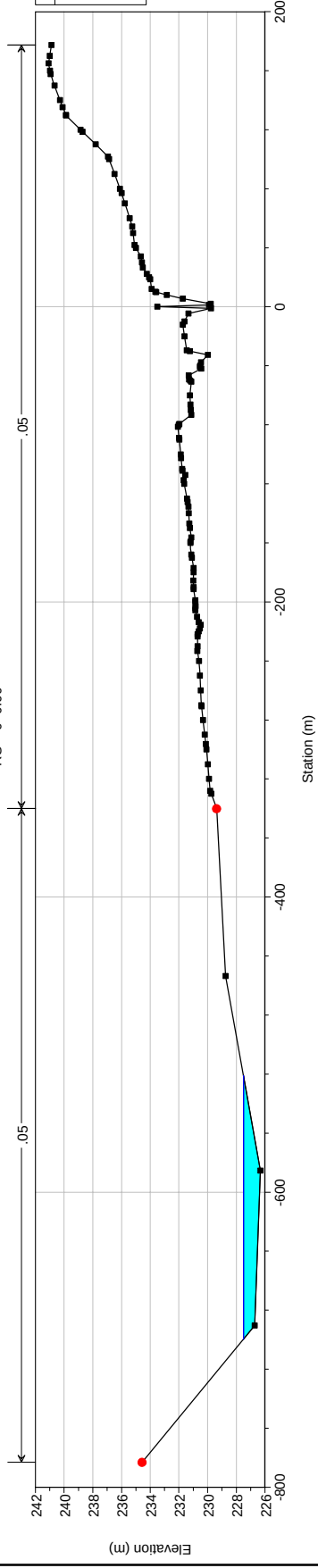
HUME N1 Dellateroy Creek Existing Plan: Proposed_6 4/26/2007
RS = 33.33.03





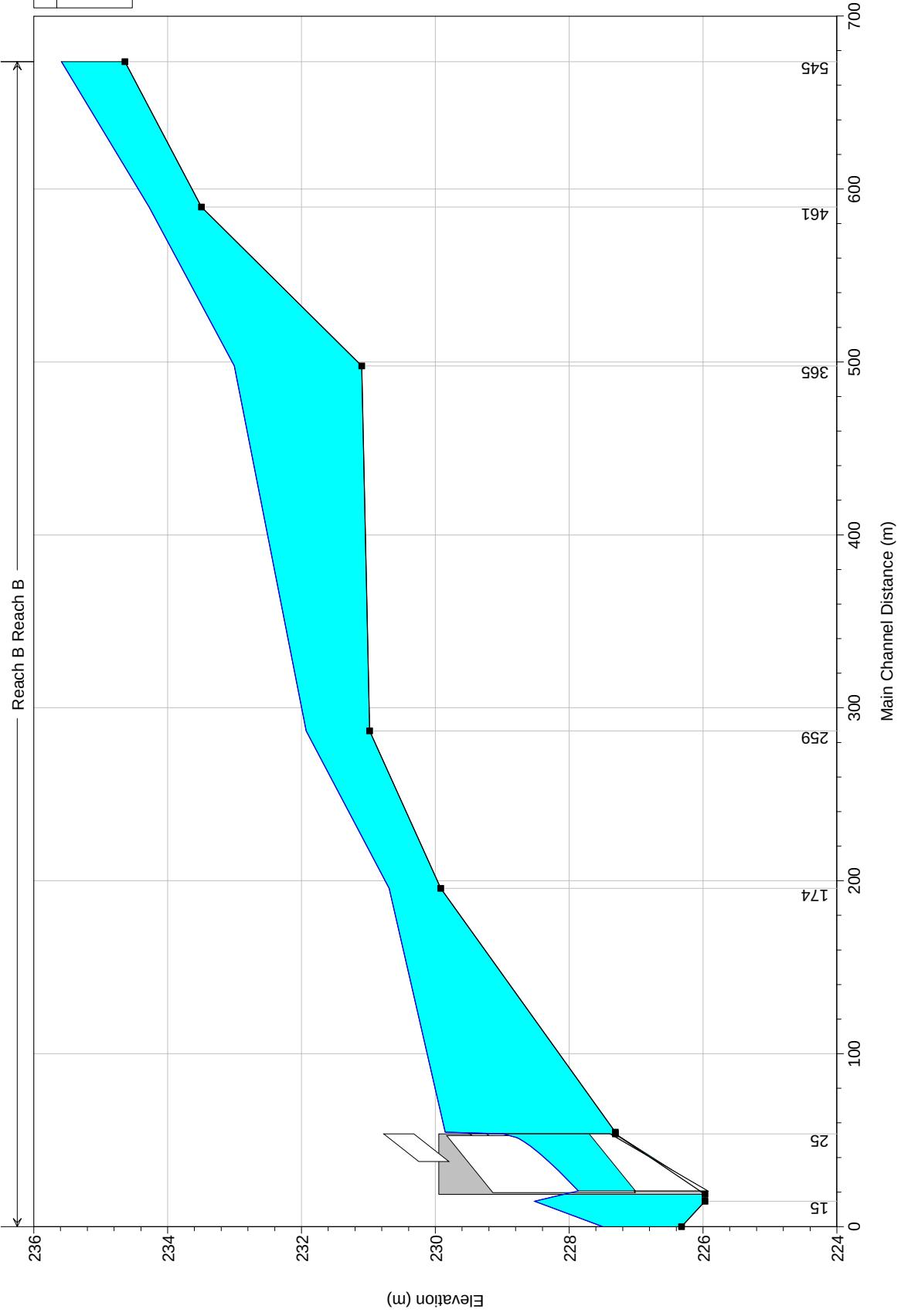
HUME N1 Dellateroy Creek Existing Plan: Proposed_6 4/26/2007

RS = 0 0.00



Legend	
WS 100y ARI	
Ground	
Bank Sta	

HUME N1 Dellateroy Creek Existing Plan: Proposed_6 4/26/2007

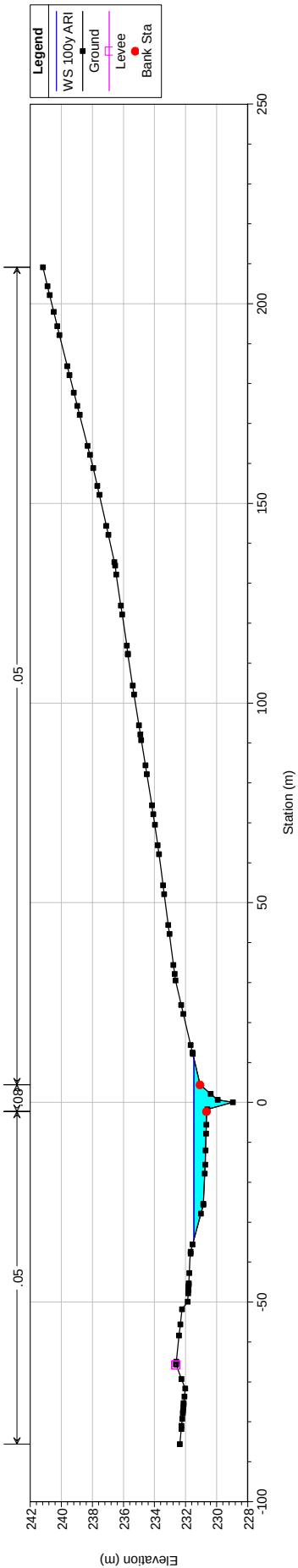


HEC-RAS Plan: Reach A River: Reach A Reach: Reach A

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach A	969	50y ARI	45.00	228.95	231.47	231.24	231.59	0.012441	1.43	29.55	45.61	0.41
Reach A	969	100y ARI	45.00	228.95	231.47	231.24	231.59	0.012543	1.44	29.47	45.56	0.41
Reach A	969	2000y	213.00	228.95	232.42	232.14	232.70	0.013416	2.17	91.96	84.96	0.47
Reach A	969	PMF	405.00	228.95	232.99	232.68	233.32	0.011859	2.38	162.79	126.31	0.46
Reach A	778	50y ARI	45.00	227.51	229.73		229.82	0.007304	1.42	34.97	42.47	0.36
Reach A	778	100y ARI	45.00	227.51	229.73		229.82	0.007206	1.41	35.14	42.54	0.35
Reach A	778	2000y	213.00	227.51	231.25		231.36	0.004142	1.47	147.40	112.84	0.29
Reach A	778	PMF	405.00	227.51	232.23		232.34	0.002630	1.34	279.83	148.81	0.24
Reach A	683	50y ARI	45.00	225.74	229.00		229.13	0.007014	1.58	29.01	33.08	0.36
Reach A	683	100y ARI	45.00	225.74	229.11		229.21	0.005576	1.46	32.91	38.96	0.32
Reach A	683	2000y	213.00	225.74	230.71		230.90	0.005388	2.10	109.04	62.34	0.35
Reach A	683	PMF	405.00	225.74	231.79		232.01	0.004229	2.20	198.72	89.99	0.32
Reach A	577	50y ARI	75.00	224.94	228.64	227.55	228.69	0.002946	1.12	77.06	76.00	0.23
Reach A	577	100y ARI	81.00	224.94	228.91		228.95	0.001624	0.89	97.74	77.04	0.18
Reach A	577	2000y	426.00	224.94	230.15		230.39	0.004600	1.95	203.73	103.09	0.32
Reach A	577	PMF	810.00	224.94	231.19		231.54	0.004469	2.26	323.31	118.54	0.33
Reach A	456	50y ARI	114.00	224.18	226.91		227.51	0.040237	3.42	33.28	19.82	0.84
Reach A	456	100y ARI	165.00	224.18	227.53	227.53	228.09	0.028320	3.37	53.33	53.34	0.74
Reach A	456	2000y	426.00	224.18	228.47	228.47	229.24	0.026827	4.18	111.83	67.44	0.76
Reach A	456	PMF	810.00	224.18	229.38	229.38	230.43	0.024265	4.73	183.26	98.35	0.76
Reach A	331	50y ARI	114.00	223.76	226.32		226.37	0.003210	1.07	120.53	129.84	0.25
Reach A	331	100y ARI	165.00	223.76	226.51	225.87	226.58	0.003755	1.22	146.44	139.56	0.27
Reach A	331	2000y	426.00	223.76	227.16	226.46	227.32	0.005124	1.71	243.80	152.27	0.33
Reach A	331	PMF	810.00	223.76	227.78	226.98	228.08	0.006299	2.17	339.33	153.53	0.38
Reach A	267	50y ARI	114.00	222.93	226.07		226.13	0.004716	1.13	108.65	149.47	0.28
Reach A	267	100y ARI	165.00	222.93	226.23		226.30	0.005235	1.26	134.48	169.96	0.30
Reach A	267	2000y	426.00	222.93	226.77		226.96	0.006579	1.68	229.78	177.52	0.35
Reach A	267	PMF	810.00	222.93	227.35		227.66	0.007282	2.04	334.24	185.79	0.38
Reach A	115	50y ARI	114.00	222.01	225.22		225.38	0.007677	1.85	77.00	163.83	0.38
Reach A	115	100y ARI	165.00	222.01	225.47		225.60	0.006960	1.87	122.52	198.10	0.37
Reach A	115	2000y	426.00	222.01	226.05		226.22	0.007277	2.15	240.16	203.34	0.38
Reach A	115	PMF	810.00	222.01	226.57		226.85	0.008387	2.52	347.25	209.50	0.41
Reach A	0	50y ARI	114.00	221.04	224.16	223.46	224.29	0.010012	1.73	81.86	158.80	0.43
Reach A	0	100y ARI	165.00	221.04	224.36	224.17	224.49	0.010007	1.82	125.41	293.08	0.43
Reach A	0	2000y	426.00	221.04	224.77	224.59	224.92	0.010010	2.07	258.93	332.14	0.45
Reach A	0	PMF	810.00	221.04	225.16	224.86	225.39	0.010002	2.31	390.78	339.83	0.46

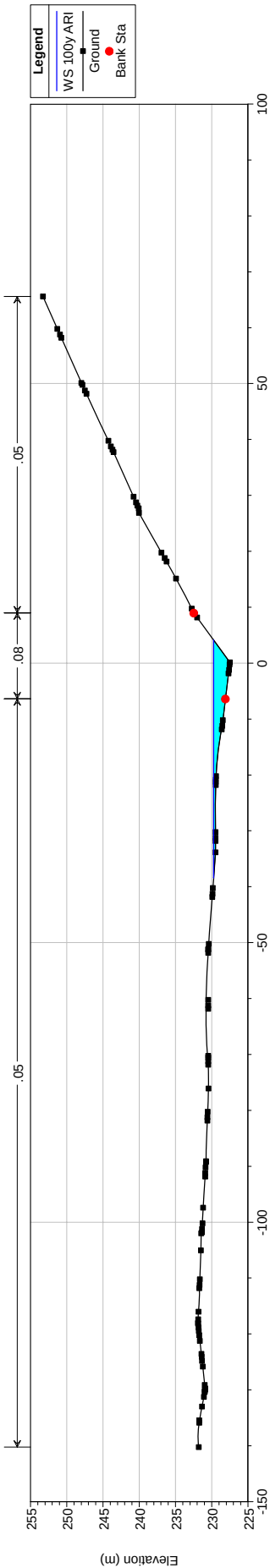
HUME N1 Dellateroy Creek Existing Plan: Proposed Reach A 4/26/2007

RS = 969 A1 969.15



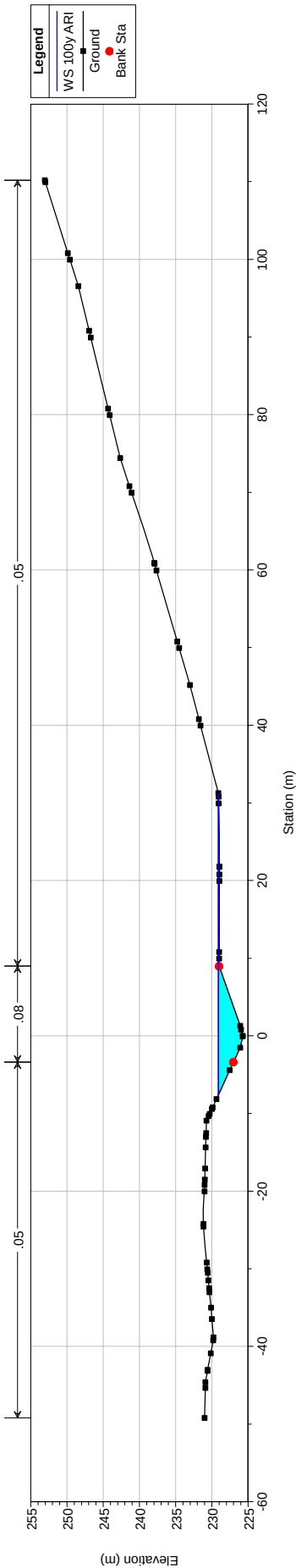
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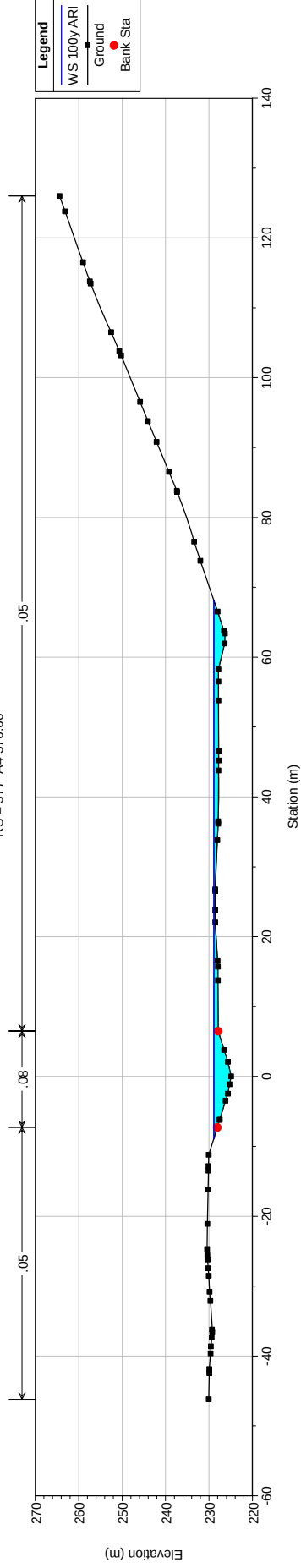


HUME N1 Dellateroy Creek Existing Plan: Proposed Reach A 4/26/2007

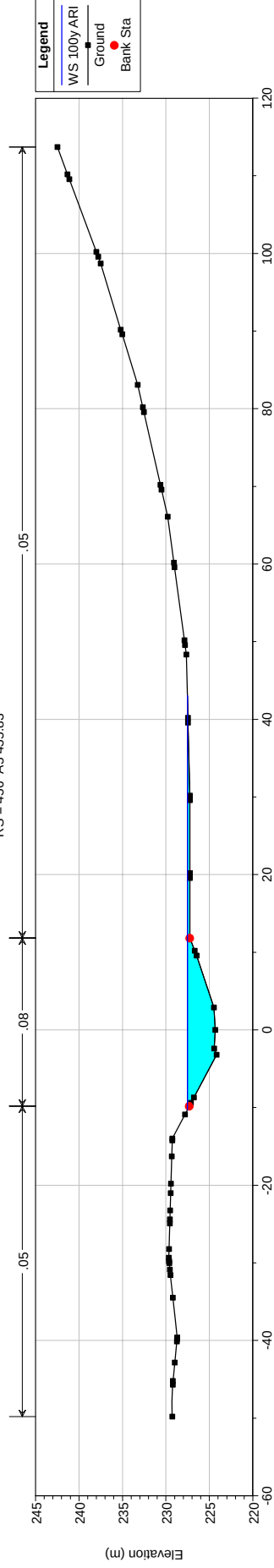
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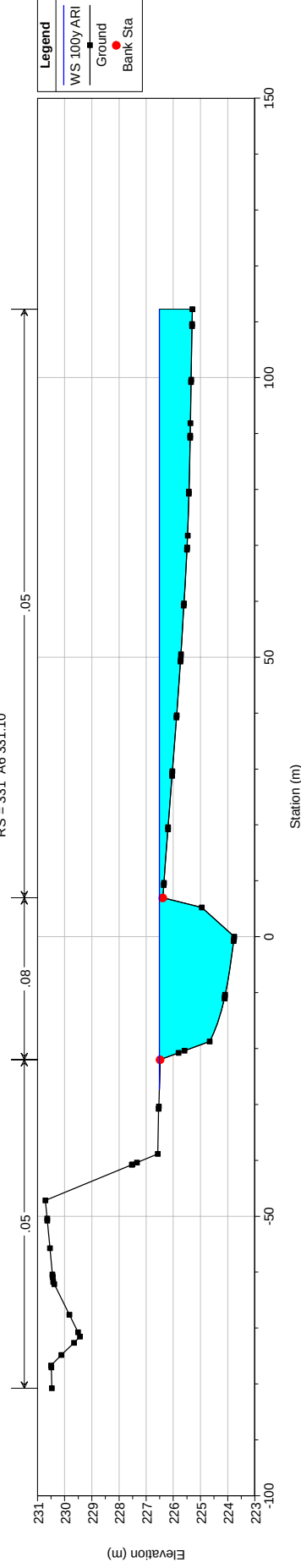
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RS = 577 A4 576.60



HUME N1 Dellateroy Creek Existing Plan: Proposed Reach A 4/26/2007
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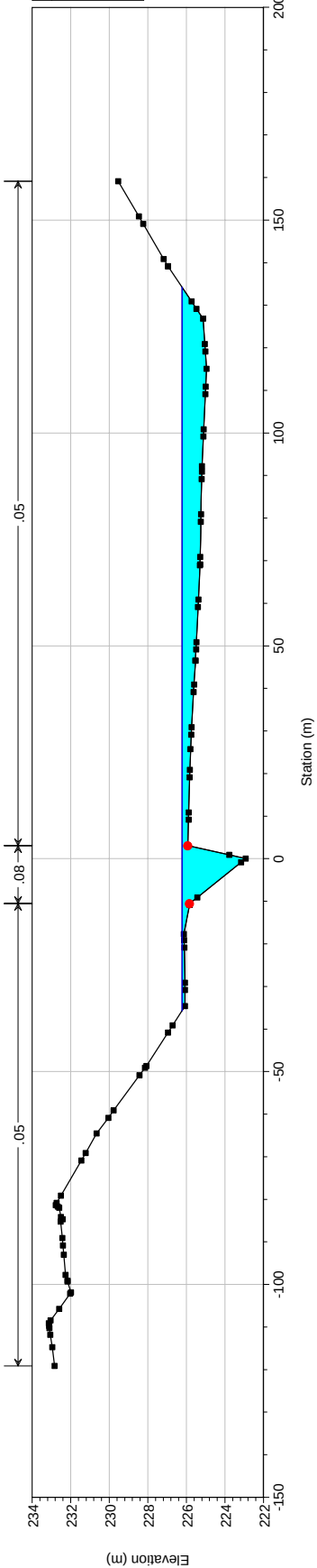


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RS = 331 A6 331.10



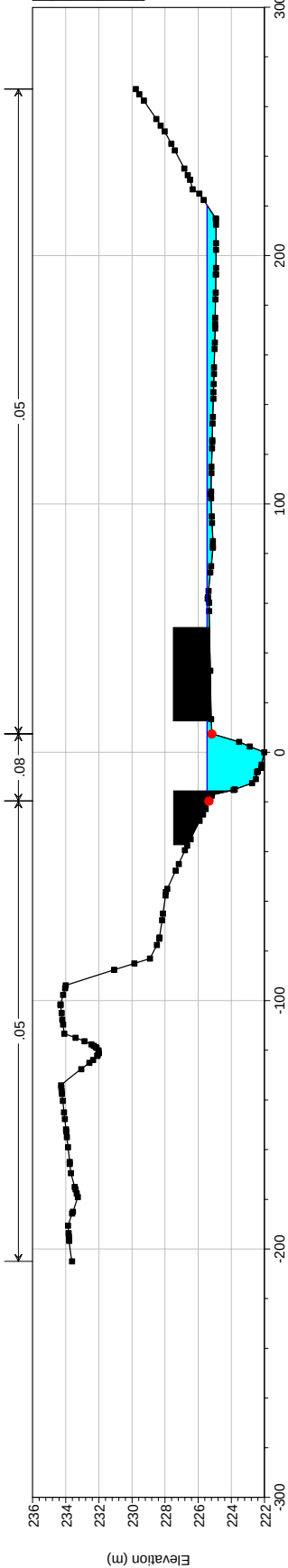
HUME N1 Dellatroy Creek Existing Plan: Proposed Reach A 4/26/2007

RS = 267 A7 267.47



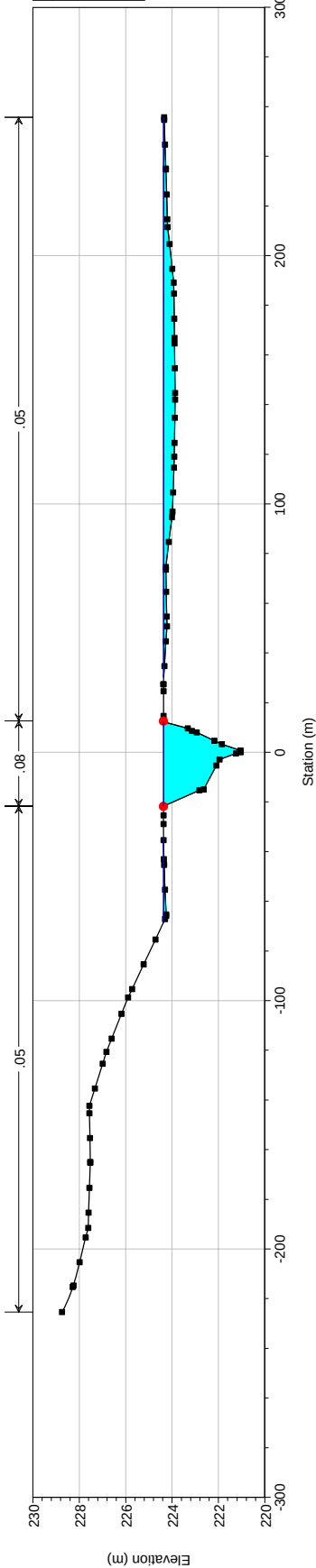
HUME N1 Dellatroy Creek Existing Plan: Proposed Reach A 4/26/2007

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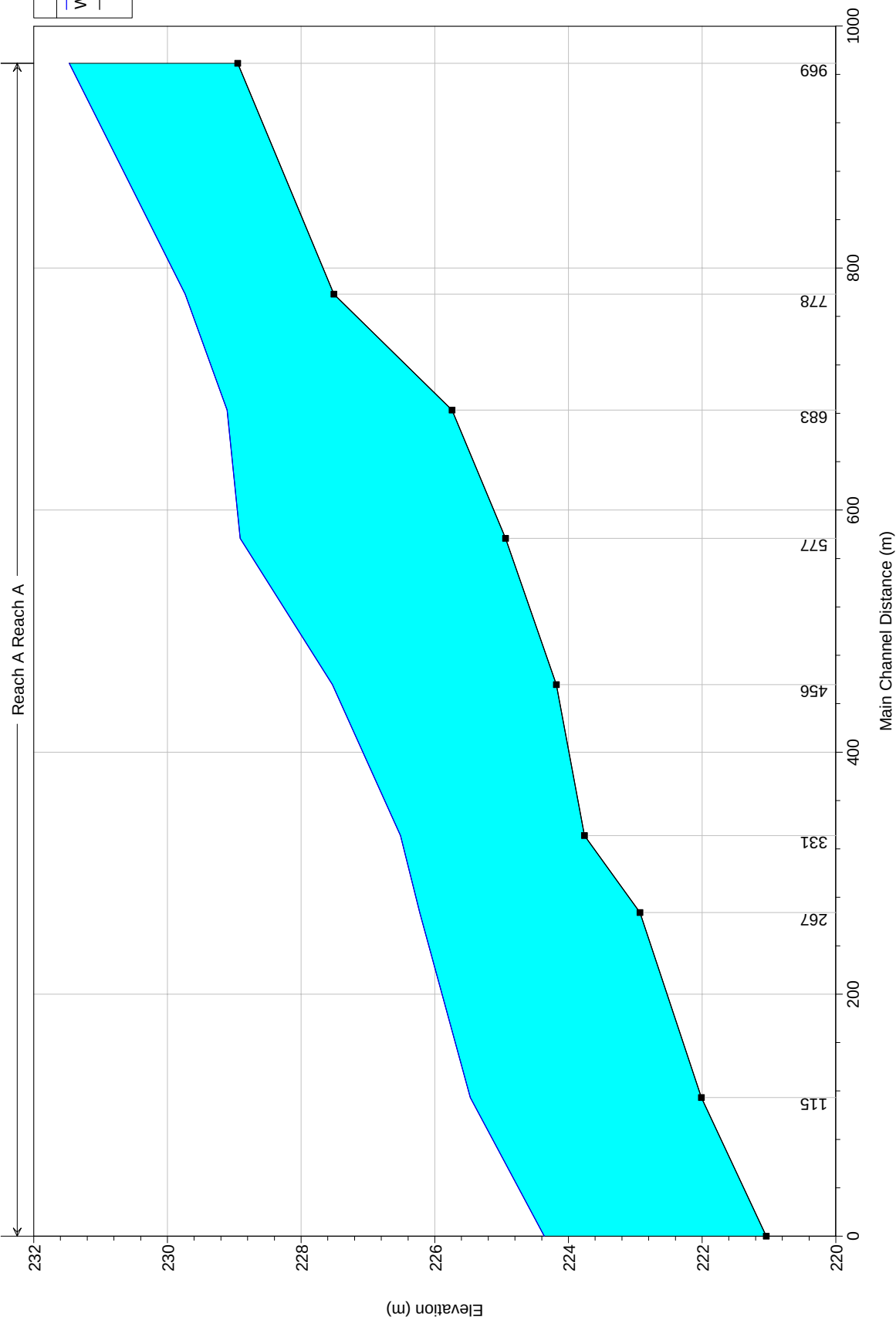


HUME N1 Dellatroy Creek Existing Plan: Proposed Reach A 4/26/2007

RS = 0 A9 0.00



HUME N1 Dellateroy Creek Existing Plan: Proposed Reach A 4/26/2007



Legend

- WS 100y ARI
- Ground

Appendix C – Hydraulic Models Results – Kyeamba Creek

HEC-RAS Plan: Option River: Kyeamba Creek Reach: KY

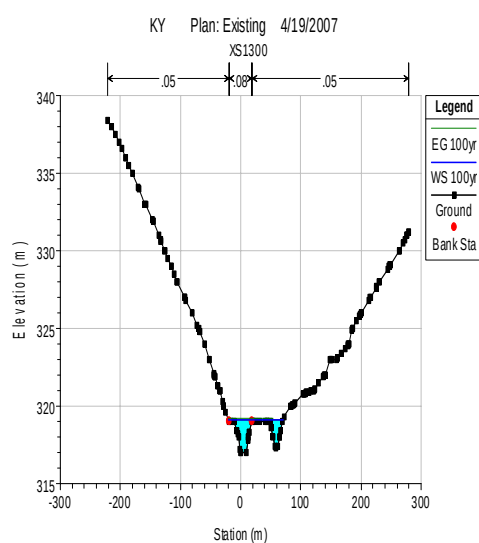
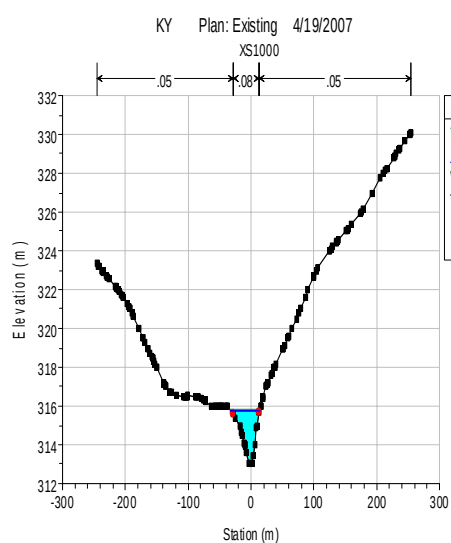
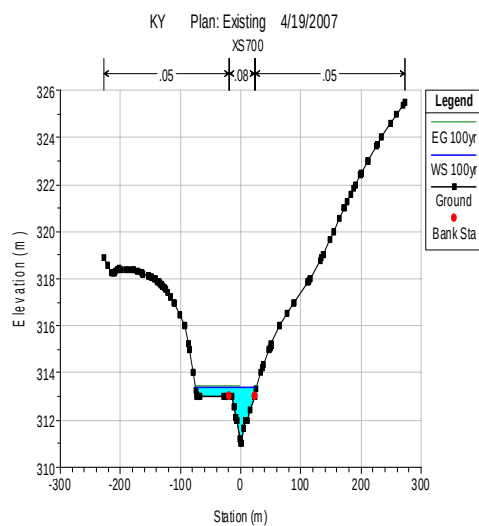
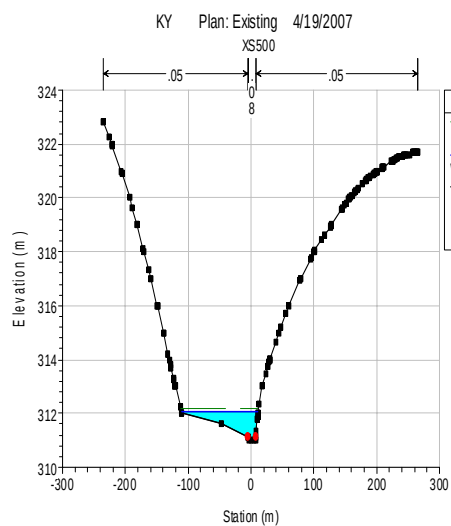
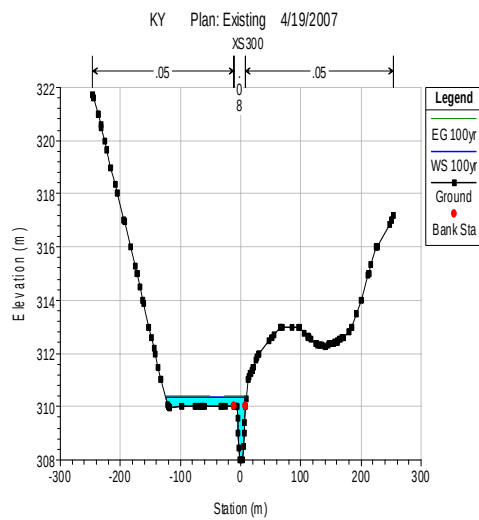
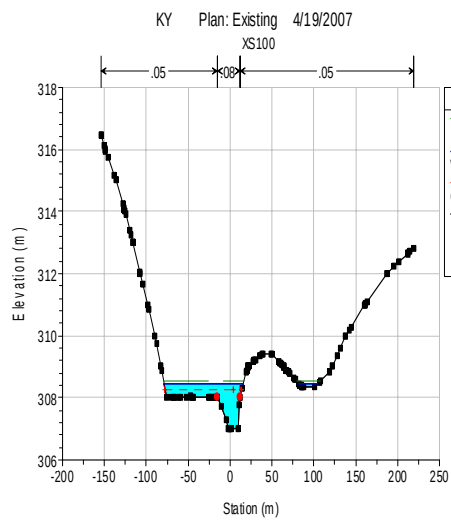
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
			(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
KY	4500.00	50yr	25.72	356.00	357.58	357.65	1.16	22.09	18.37
KY	4500.00	100yr	37.11	356.00	357.89	357.98	1.32	28.16	20.16
KY	4500.00	2000yr	96.80	356.00	358.91	359.09	1.90	52.56	28.08
KY	4500.00	5x100yr	185.55	356.00	359.81	360.09	2.41	81.62	36.73
KY	4300.00	50yr	25.72	354.00	355.64	355.79	1.71	15.86	17.28
KY	4300.00	100yr	37.11	354.00	355.91	356.08	1.90	20.80	20.25
KY	4300.00	2000yr	96.80	354.00	356.74	357.02	2.52	41.87	30.64
KY	4300.00	5x100yr	185.55	354.00	357.47	357.77	2.84	82.22	73.82
KY	4100.00	50yr	25.72	350.39	352.42	352.54	1.56	16.51	14.52
KY	4100.00	100yr	37.11	350.39	352.75	352.90	1.72	21.59	16.73
KY	4100.00	2000yr	96.80	350.39	353.83	354.08	2.24	43.25	23.26
KY	4100.00	5x100yr	185.55	350.39	354.71	355.02	2.57	83.28	98.62
KY	3900.00	50yr	25.72	348.00	349.54	349.61	1.18	21.81	22.55
KY	3900.00	100yr	37.11	348.00	349.83	349.91	1.29	28.80	25.08
KY	3900.00	2000yr	96.80	348.00	350.74	350.90	1.77	54.70	31.70
KY	3900.00	5x100yr	185.55	348.00	351.35	351.60	2.30	86.87	76.00
KY	3800.00	50yr	40.66	347.00	348.49	348.61	1.59	26.39	29.51
KY	3800.00	100yr	58.86	347.00	348.76	348.91	1.73	35.25	35.46
KY	3800.00	2000yr	152.70	347.00	349.39	349.56	2.08	90.66	133.56
KY	3800.00	5x100yr	294.00	347.00	349.74	349.98	2.46	140.54	152.30
KY	3600.00	50yr	40.66	344.00	345.21	345.34	1.61	25.51	37.75
KY	3600.00	100yr	58.86	344.00	345.50	345.63	1.56	37.87	47.39
KY	3600.00	2000yr	152.70	344.00	345.86	346.18	2.53	63.69	103.68
KY	3600.00	5x100yr	294.00	344.00	346.32	346.64	2.73	123.03	168.10
KY	3500	50yr	40.66	340.91	342.10	342.32	2.08	19.57	40.08
KY	3500	100yr	58.86	340.91	342.71	342.84	1.57	37.49	61.20
KY	3500	2000yr	152.70	340.91	345.32	345.39	1.21	134.62	215.09
KY	3500	5x100yr	294.00	340.91	345.80	345.88	1.43	257.41	289.87
KY	3300		Culvert						
KY	3200	50yr	40.66	339.80	341.23	341.33	1.39	29.15	45.09
KY	3200	100yr	58.86	339.80	341.47	341.60	1.62	36.44	48.72
KY	3200	2000yr	152.70	339.80	342.25	342.56	2.48	61.80	94.83
KY	3200	5x100yr	294.00	339.80	342.95	343.56	3.46	84.83	287.16
KY	3100.00	50yr	40.66	336.00	337.82	337.87	0.98	41.49	36.09
KY	3100.00	100yr	58.86	336.00	338.17	338.23	1.07	54.86	39.26
KY	3100.00	2000yr	152.70	336.00	339.31	339.42	1.49	104.47	48.21
KY	3100.00	5x100yr	294.00	336.00	340.38	340.55	1.90	161.54	59.48
KY	2900.00	50yr	40.66	334.00	336.23	336.35	1.50	27.17	19.41
KY	2900.00	100yr	58.86	334.00	336.65	336.78	1.64	35.88	22.68
KY	2900.00	2000yr	152.70	334.00	337.83	338.08	2.24	69.46	34.78
KY	2900.00	5x100yr	294.00	334.00	338.83	339.20	2.79	112.65	52.68
KY	2700.00	50yr	40.66	332.00	334.17	334.26	1.34	30.49	21.53
KY	2700.00	100yr	58.86	332.00	334.57	334.69	1.51	39.78	24.64
KY	2700.00	2000yr	152.70	332.00	335.77	335.99	2.14	75.40	35.22
KY	2700.00	5x100yr	294.00	332.00	336.80	337.13	2.72	117.62	47.89

HEC-RAS Plan: Option River: Kyeamba Creek Reach: KY (Continued)

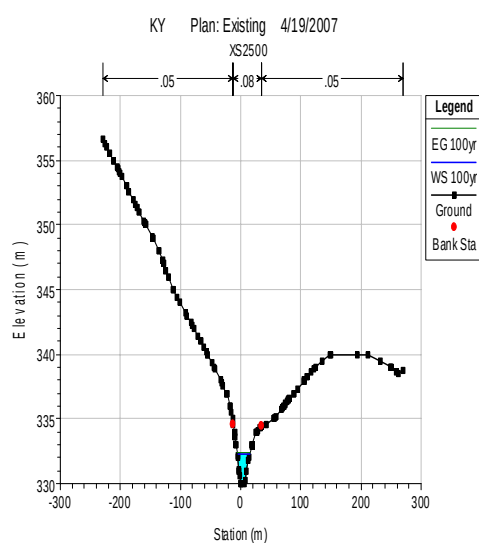
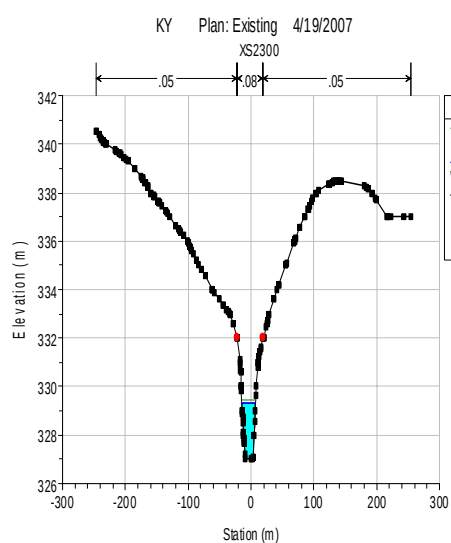
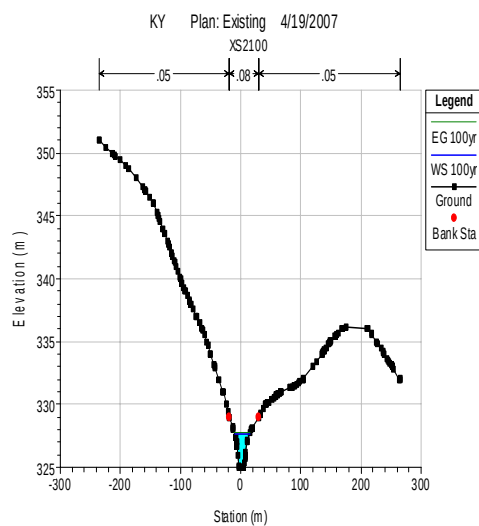
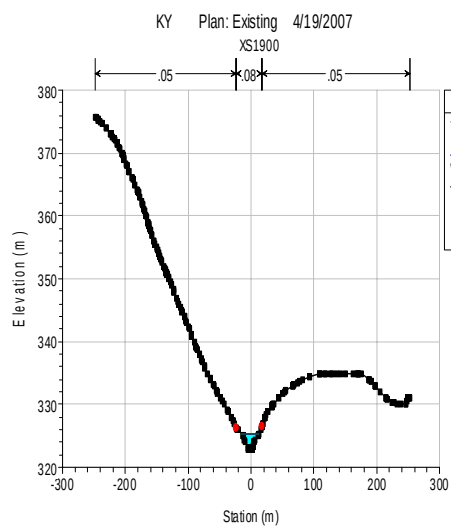
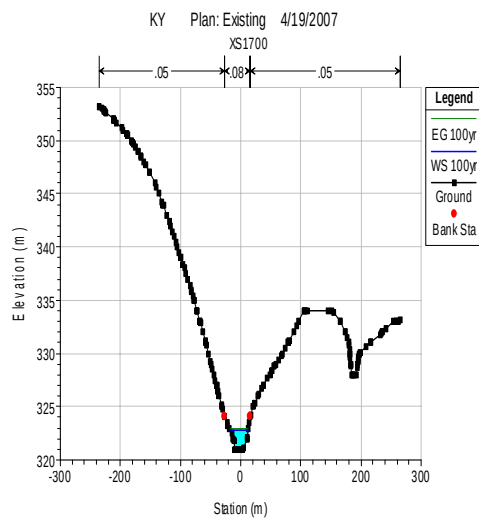
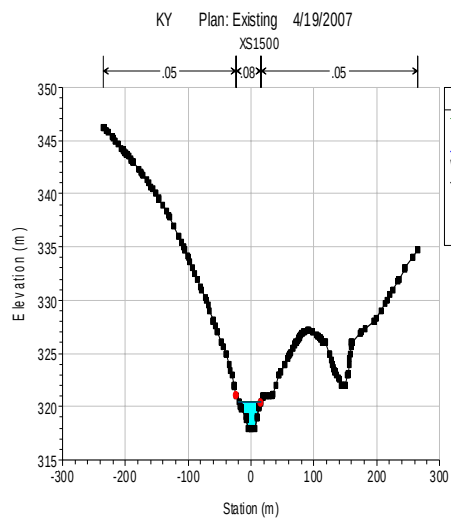
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	E.G. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)
KY	2500.00	50yr	40.66	330.00	331.85	332.01	1.77	22.95	17.55
KY	2500.00	100yr	58.86	330.00	332.24	332.43	1.94	30.42	20.53
KY	2500.00	2000yr	152.70	330.00	333.57	333.85	2.34	65.29	32.13
KY	2500.00	5x100yr	294.00	330.00	334.84	335.16	2.49	120.27	63.48
KY	2300.00	50yr	40.66	327.00	328.89	328.99	1.36	29.83	19.82
KY	2300.00	100yr	58.86	327.00	329.32	329.44	1.52	38.76	21.26
KY	2300.00	2000yr	152.70	327.00	330.86	331.06	2.02	75.57	27.42
KY	2300.00	5x100yr	294.00	327.00	332.10	332.42	2.50	117.87	43.42
KY	2100.00	50yr	40.66	325.00	327.22	327.32	1.40	28.99	19.66
KY	2100.00	100yr	58.86	325.00	327.66	327.78	1.51	38.99	25.41
KY	2100.00	2000yr	152.70	325.00	328.94	329.11	1.80	84.85	48.10
KY	2100.00	5x100yr	294.00	325.00	329.80	330.06	2.28	131.97	62.08
KY	1900.00	50yr	40.66	323.00	324.93	325.04	1.49	27.34	24.01
KY	1900.00	100yr	58.86	323.00	325.27	325.40	1.64	35.99	27.88
KY	1900.00	2000yr	152.70	323.00	326.35	326.57	2.08	73.62	40.26
KY	1900.00	5x100yr	294.00	323.00	327.23	327.59	2.67	111.69	46.77
KY	1700.00	50yr	40.66	321.00	322.46	322.56	1.41	28.92	26.91
KY	1700.00	100yr	58.86	321.00	322.77	322.90	1.56	37.82	30.02
KY	1700.00	2000yr	152.70	321.00	323.84	324.04	2.02	75.65	40.76
KY	1700.00	5x100yr	294.00	321.00	324.71	325.05	2.59	114.92	48.86
KY	1500.00	50yr	40.66	318.00	320.07	320.12	1.02	39.99	31.11
KY	1500.00	100yr	58.86	318.00	320.44	320.51	1.12	52.48	35.88
KY	1500.00	2000yr	152.70	318.00	321.34	321.48	1.69	94.63	60.43
KY	1500.00	5x100yr	294.00	318.00	322.08	322.30	2.17	141.93	74.09
KY	1300.00	50yr	52.76	317.00	318.75	318.83	1.06	44.51	44.26
KY	1300.00	100yr	75.25	317.00	319.12	319.19	1.16	66.84	90.36
KY	1300.00	2000yr	189.31	317.00	319.71	319.83	1.46	125.12	105.91
KY	1300.00	5x100yr	376.25	317.00	320.35	320.54	1.81	198.52	124.77
KY	1000.00	50yr	52.76	313.00	315.51	315.57	1.09	48.39	40.04
KY	1000.00	100yr	75.25	313.00	315.79	315.87	1.25	60.71	47.71
KY	1000.00	2000yr	189.31	313.00	316.50	316.65	1.81	116.59	111.04
KY	1000.00	5x100yr	376.25	313.00	317.10	317.28	2.11	206.82	162.83
KY	700.00	50yr	52.76	311.00	313.25	313.29	0.97	60.00	99.62
KY	700.00	100yr	75.25	311.00	313.41	313.47	1.07	76.53	102.41
KY	700.00	2000yr	189.31	311.00	313.99	314.09	1.37	138.13	112.15
KY	700.00	5x100yr	376.25	311.00	314.62	314.79	1.68	213.07	124.62
KY	500.00	50yr	52.76	311.00	311.99	312.04	1.14	52.60	120.58
KY	500.00	100yr	75.25	311.00	312.09	312.16	1.24	65.31	122.56
KY	500.00	2000yr	189.31	311.00	312.48	312.63	1.55	114.35	129.14
KY	500.00	5x100yr	376.25	311.00	312.94	313.18	1.87	174.77	136.99
KY	300.00	50yr	52.76	308.00	310.23	310.30	1.37	51.21	132.79
KY	300.00	100yr	75.25	308.00	310.35	310.42	1.44	66.34	134.63
KY	300.00	2000yr	189.31	308.00	310.75	310.88	1.68	122.39	141.17
KY	300.00	5x100yr	376.25	308.00	311.24	311.43	1.89	192.89	151.32
KY	100.00	50yr	52.76	307.00	308.33	308.39	1.24	47.69	92.47
KY	100.00	100yr	75.25	307.00	308.45	308.53	1.35	61.63	117.34

HEC-RAS Plan: Option River: Kyeamba Creek Reach: KY (Continued)

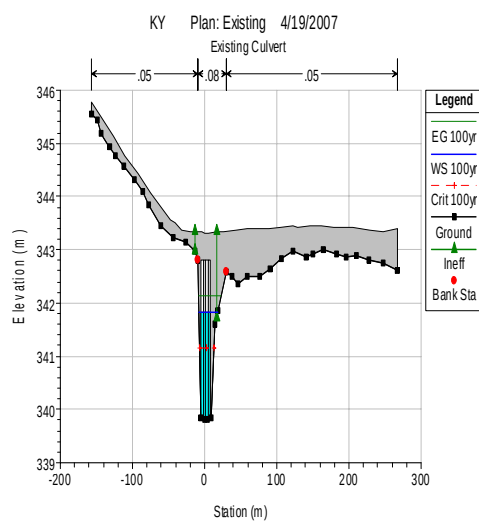
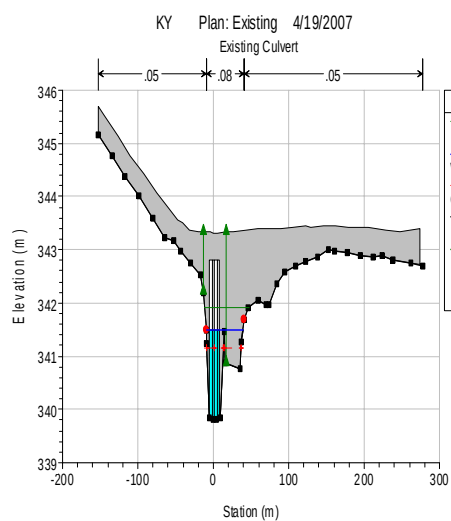
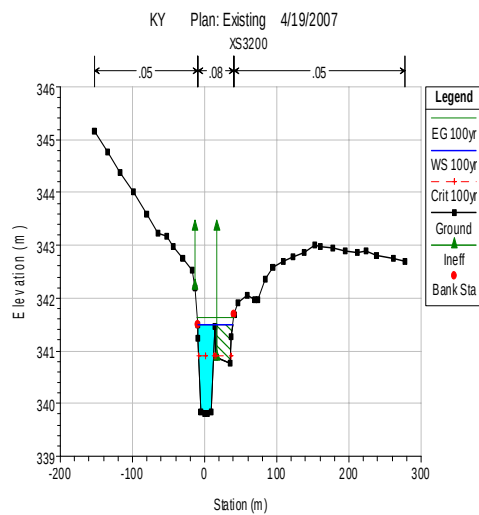
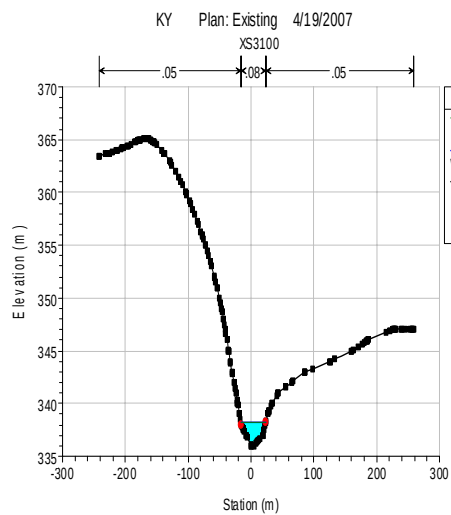
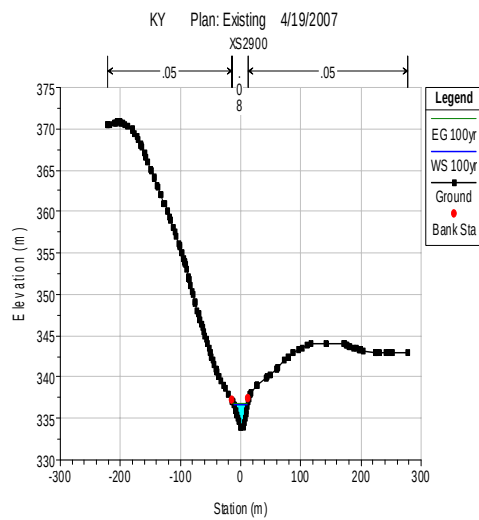
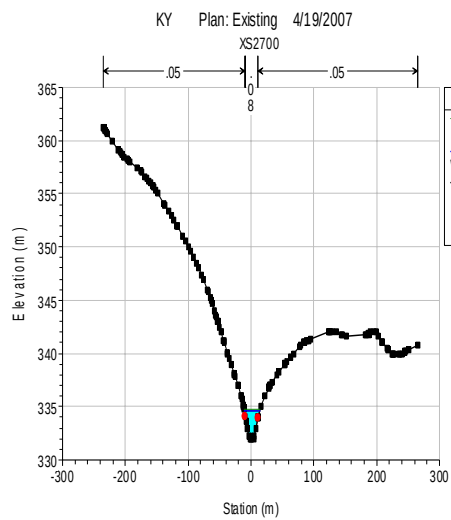
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	E.G. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)
KY	100.00	2000yr	189.31	307.00	308.87	309.01	1.66	118.62	152.84
KY	100.00	5x100yr	376.25	307.00	309.31	309.52	1.96	193.91	193.76



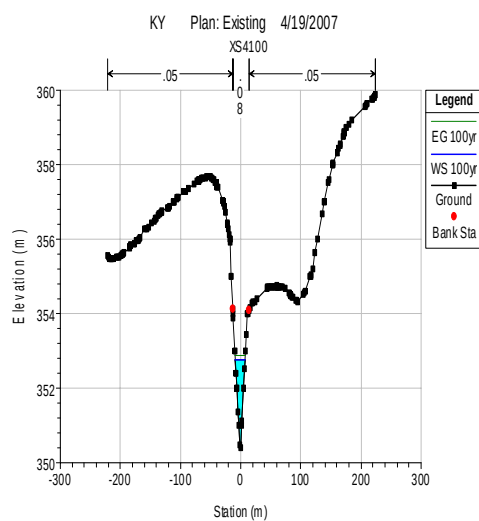
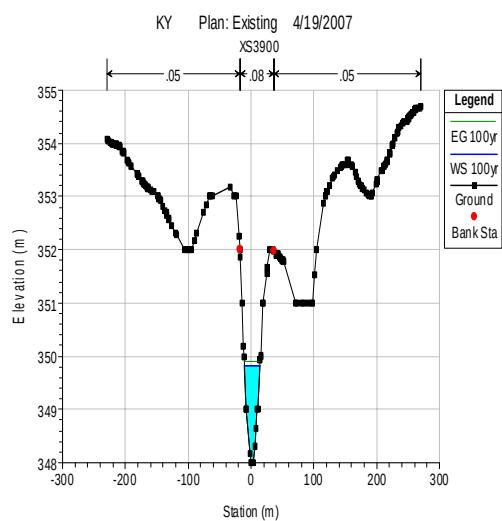
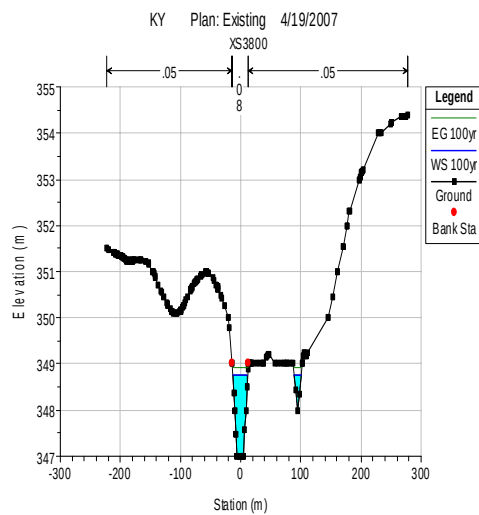
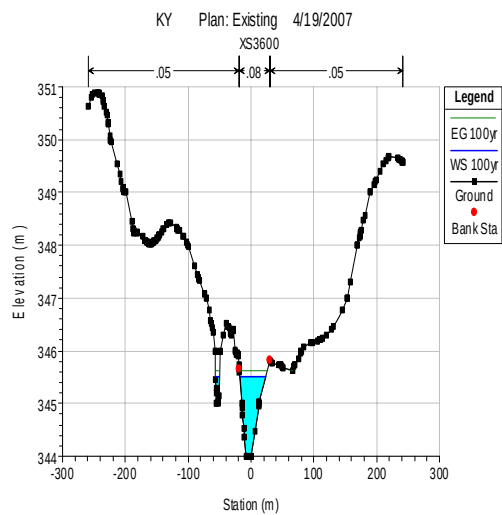
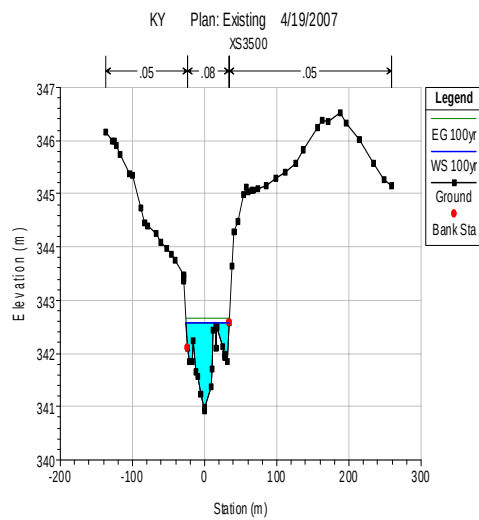
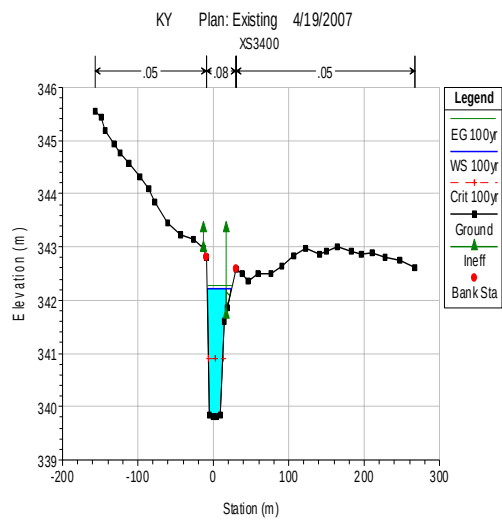
Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



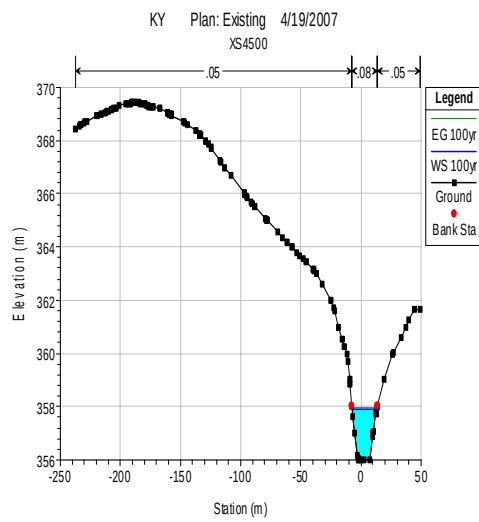
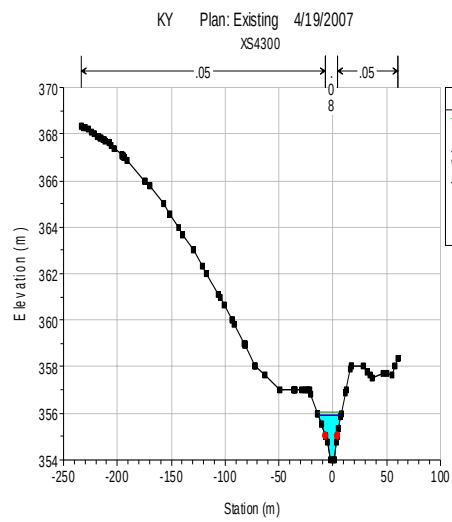
Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



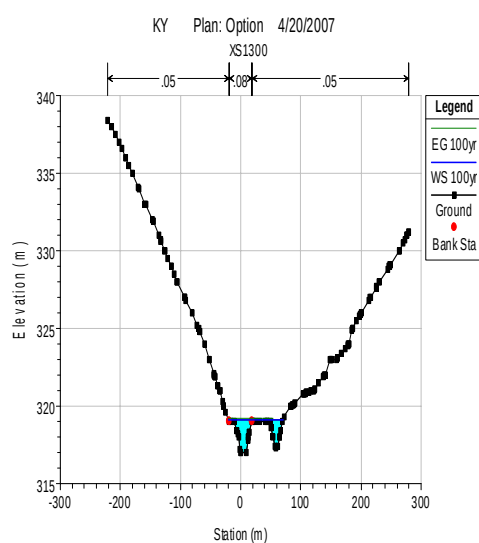
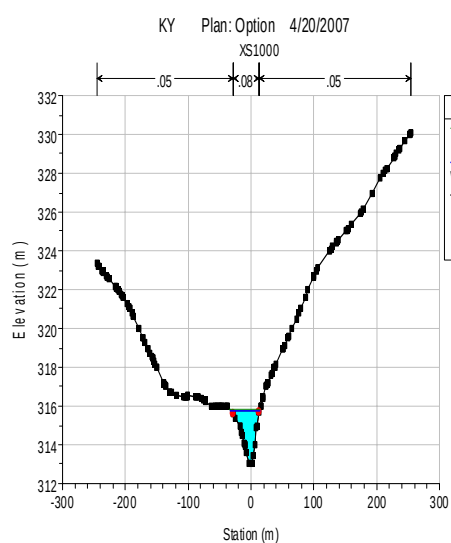
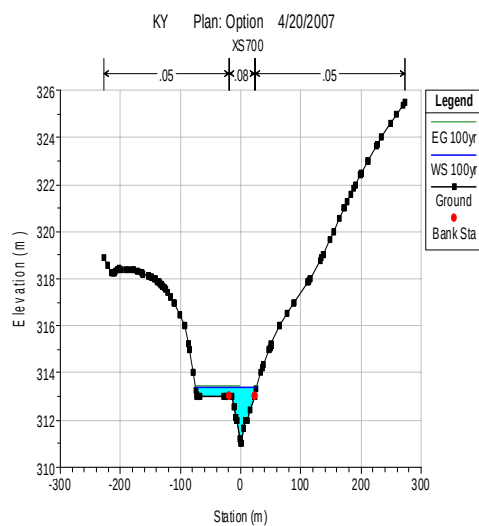
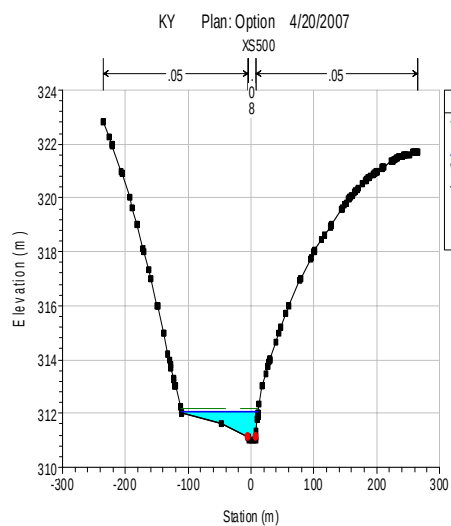
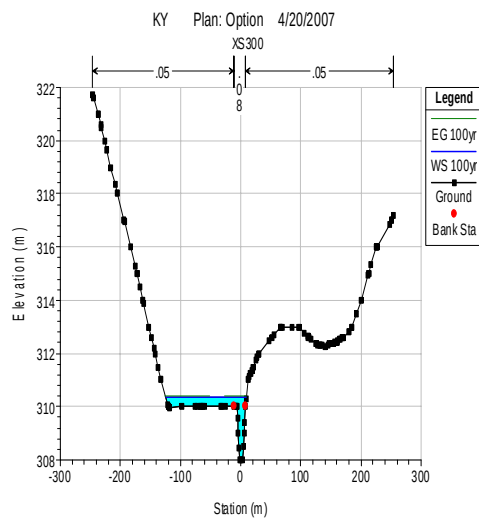
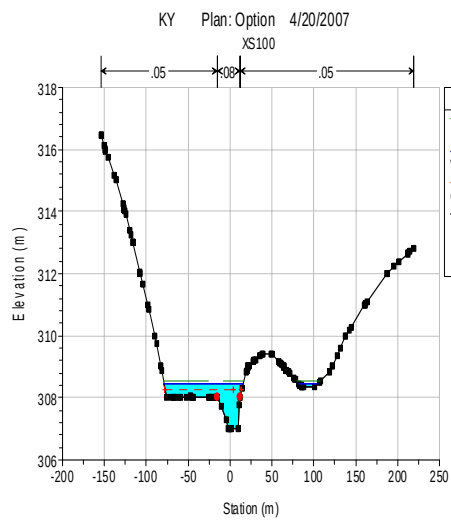
Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions

HEC-RAS Plan: Existing River: Kyeamba Creek Reach: KY

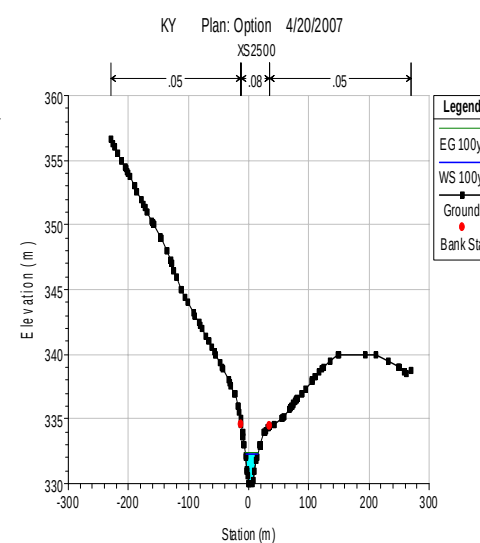
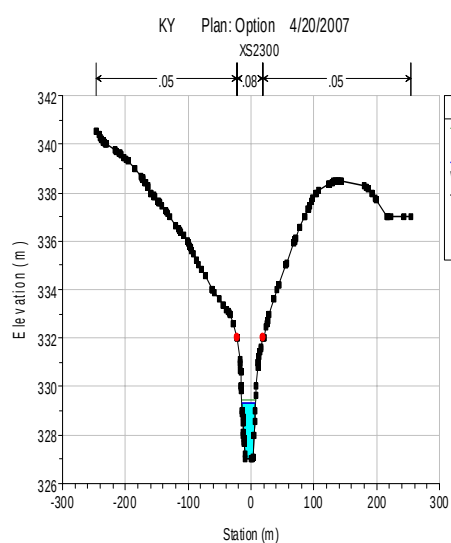
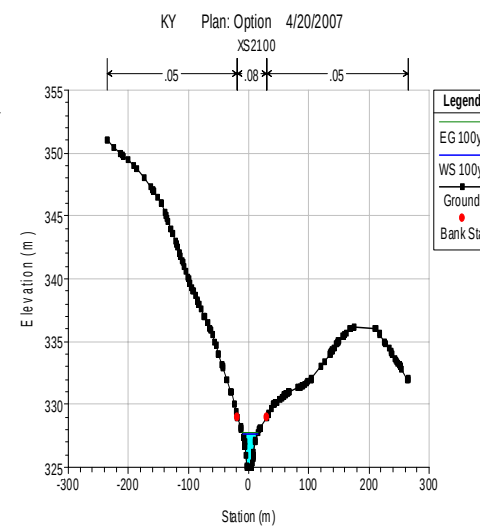
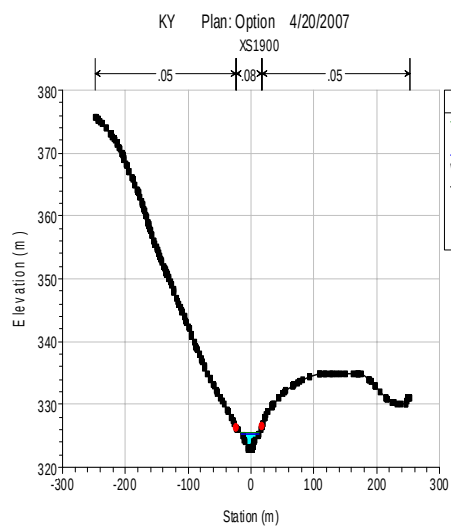
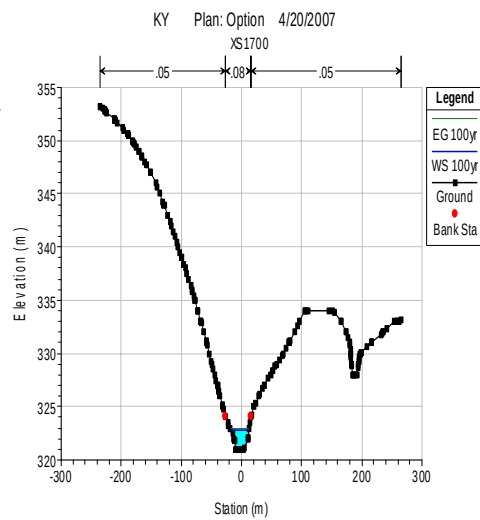
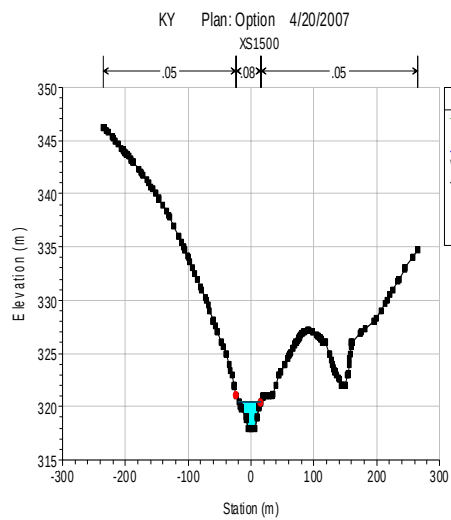
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	E.G. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)
KY	4500.00	50yr	25.72	356.00	357.58	357.65	1.16	22.15	18.39
KY	4500.00	100yr	37.11	356.00	357.89	357.98	1.32	28.17	20.16
KY	4500.00	2000yr	96.80	356.00	358.91	359.09	1.90	52.50	28.06
KY	4500.00	5x100yr	185.55	356.00	359.81	360.09	2.41	81.61	36.72
KY	4300.00	50yr	25.72	354.00	355.64	355.79	1.71	15.86	17.28
KY	4300.00	100yr	37.11	354.00	355.91	356.08	1.90	20.82	20.26
KY	4300.00	2000yr	96.80	354.00	356.74	357.02	2.52	41.87	30.64
KY	4300.00	5x100yr	185.55	354.00	357.47	357.77	2.84	82.07	73.76
KY	4100.00	50yr	25.72	350.39	352.42	352.55	1.56	16.52	14.52
KY	4100.00	100yr	37.11	350.39	352.75	352.90	1.72	21.60	16.74
KY	4100.00	2000yr	96.80	350.39	353.83	354.08	2.24	43.25	23.26
KY	4100.00	5x100yr	185.55	350.39	354.71	355.02	2.57	83.26	98.59
KY	3900.00	50yr	25.72	348.00	349.54	349.61	1.18	21.78	22.54
KY	3900.00	100yr	37.11	348.00	349.83	349.91	1.29	28.81	25.08
KY	3900.00	2000yr	96.80	348.00	350.75	350.91	1.76	54.95	31.76
KY	3900.00	5x100yr	185.55	348.00	351.33	351.59	2.32	85.71	75.30
KY	3800.00	50yr	40.66	347.00	348.49	348.61	1.59	26.38	29.50
KY	3800.00	100yr	58.86	347.00	348.76	348.91	1.73	35.25	35.46
KY	3800.00	2000yr	152.70	347.00	349.34	349.54	2.28	83.17	130.51
KY	3800.00	5x100yr	294.00	347.00	349.70	349.96	2.58	134.49	150.15
KY	3600.00	50yr	40.66	344.00	345.24	345.36	1.55	26.60	38.73
KY	3600.00	100yr	58.86	344.00	345.52	345.64	1.53	38.54	47.86
KY	3600.00	2000yr	152.70	344.00	346.17	346.30	1.72	98.73	138.47
KY	3600.00	5x100yr	294.00	344.00	346.58	346.74	1.98	170.46	200.18
KY	3500	50yr	40.66	340.91	342.19	342.32	1.58	25.81	44.17
KY	3500	100yr	58.86	340.91	342.57	342.65	1.30	45.24	59.92
KY	3500	2000yr	152.70	340.91	343.79	343.87	1.25	126.85	81.67
KY	3500	5x100yr	294.00	340.91	344.12	344.31	1.99	157.12	102.16
KY	3400	50yr	40.66	339.81	341.74	341.80	1.10	37.03	24.59
KY	3400	100yr	58.86	339.81	342.21	342.28	1.21	48.51	32.35
KY	3400	2000yr	152.70	339.81	343.45	343.59	1.70	115.96	327.67
KY	3400	5x100yr	294.00	339.81	343.91	343.98	1.48	267.85	346.10
KY	3300		Culvert						
KY	3200	50yr	40.66	339.80	341.22	341.34	1.51	26.87	44.97
KY	3200	100yr	58.86	339.80	341.48	341.64	1.76	33.37	48.82
KY	3200	2000yr	152.70	339.80	342.28	342.66	2.77	55.72	95.93
KY	3200	5x100yr	294.00	339.80	342.96	343.72	3.89	76.00	291.49
KY	3100.00	50yr	40.66	336.00	337.82	337.87	0.98	41.41	36.07
KY	3100.00	100yr	58.86	336.00	338.17	338.23	1.07	54.86	39.26
KY	3100.00	2000yr	152.70	336.00	339.31	339.42	1.49	104.47	48.21
KY	3100.00	5x100yr	294.00	336.00	340.38	340.55	1.90	161.54	59.48
KY	2900.00	50yr	40.66	334.00	336.23	336.34	1.50	27.14	19.40
KY	2900.00	100yr	58.86	334.00	336.65	336.78	1.64	35.87	22.68
KY	2900.00	2000yr	152.70	334.00	337.83	338.08	2.24	69.50	34.79
KY	2900.00	5x100yr	294.00	334.00	338.83	339.20	2.79	112.69	52.70
KY	2700.00	50yr	40.66	332.00	334.18	334.27	1.33	30.58	21.57
KY	2700.00	100yr	58.86	332.00	334.58	334.69	1.51	39.81	24.66
KY	2700.00	2000yr	152.70	332.00	335.77	335.99	2.14	75.40	35.22
KY	2700.00	5x100yr	294.00	332.00	336.80	337.13	2.72	117.62	47.89
KY	2500.00	50yr	40.66	330.00	331.85	332.01	1.77	22.96	17.55
KY	2500.00	100yr	58.86	330.00	332.24	332.43	1.94	30.38	20.52

HEC-RAS Plan: Existing River: Kyeamba Creek Reach: KY (Continued)

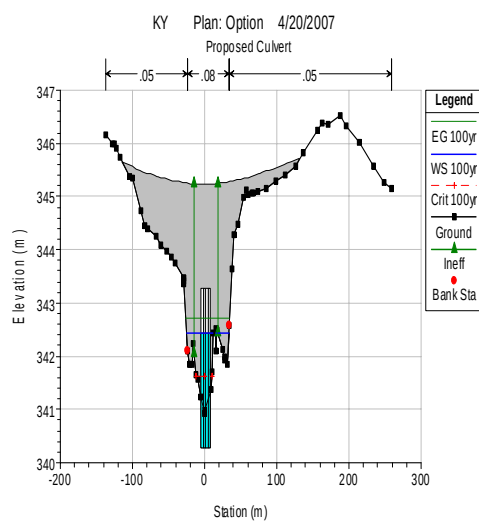
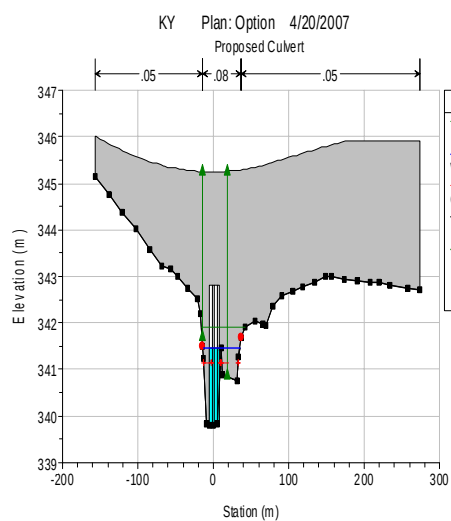
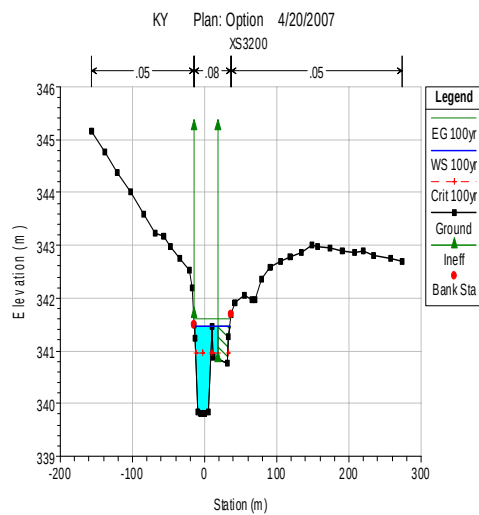
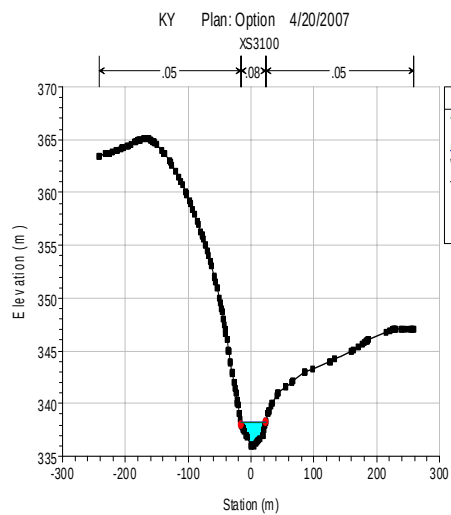
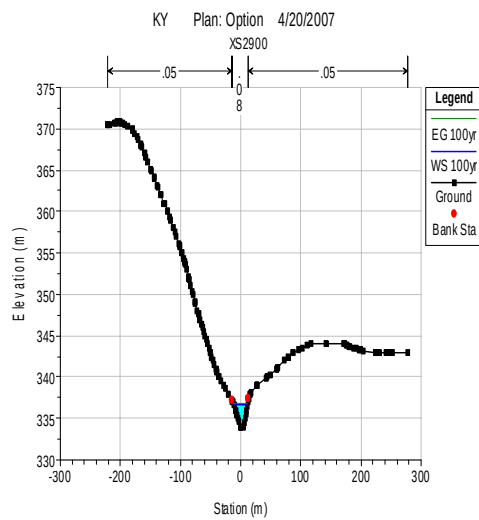
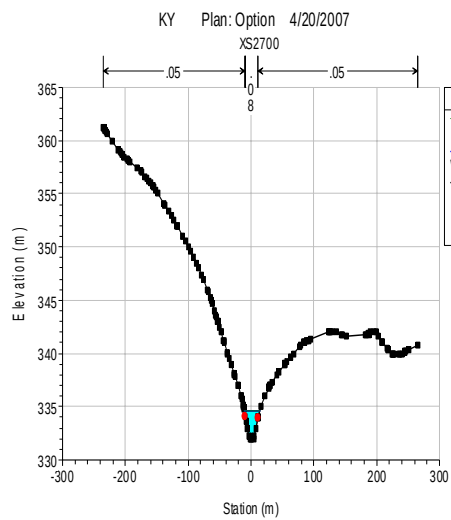
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	E.G. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)
KY	2500.00	2000yr	152.70	330.00	333.57	333.85	2.34	65.32	32.13
KY	2500.00	5x100yr	294.00	330.00	334.84	335.16	2.49	120.27	63.48
KY	2300.00	50yr	40.66	327.00	328.89	328.98	1.37	29.77	19.81
KY	2300.00	100yr	58.86	327.00	329.32	329.44	1.52	38.75	21.26
KY	2300.00	2000yr	152.70	327.00	330.86	331.06	2.02	75.56	27.42
KY	2300.00	5x100yr	294.00	327.00	332.10	332.42	2.50	117.87	43.42
KY	2100.00	50yr	40.66	325.00	327.22	327.32	1.40	28.99	19.66
KY	2100.00	100yr	58.86	325.00	327.66	327.78	1.51	38.99	25.41
KY	2100.00	2000yr	152.70	325.00	328.94	329.11	1.80	84.86	48.11
KY	2100.00	5x100yr	294.00	325.00	329.80	330.06	2.28	132.09	62.11
KY	1900.00	50yr	40.66	323.00	324.93	325.04	1.49	27.33	24.01
KY	1900.00	100yr	58.86	323.00	325.26	325.40	1.64	35.92	27.84
KY	1900.00	2000yr	152.70	323.00	326.35	326.57	2.08	73.62	40.26
KY	1900.00	5x100yr	294.00	323.00	327.23	327.59	2.67	111.69	46.77
KY	1700.00	50yr	40.66	321.00	322.46	322.56	1.41	28.92	26.91
KY	1700.00	100yr	58.86	321.00	322.77	322.90	1.56	37.82	30.02
KY	1700.00	2000yr	152.70	321.00	323.84	324.04	2.02	75.65	40.76
KY	1700.00	5x100yr	294.00	321.00	324.71	325.05	2.59	114.86	48.85
KY	1500.00	50yr	40.66	318.00	320.07	320.12	1.02	39.91	31.07
KY	1500.00	100yr	58.86	318.00	320.44	320.51	1.12	52.47	35.88
KY	1500.00	2000yr	152.70	318.00	321.34	321.48	1.69	94.63	60.43
KY	1500.00	5x100yr	294.00	318.00	322.08	322.30	2.17	141.95	74.09
KY	1300.00	50yr	52.76	317.00	318.75	318.83	1.06	44.51	44.26
KY	1300.00	100yr	75.25	317.00	319.12	319.18	1.16	66.66	90.30
KY	1300.00	2000yr	189.31	317.00	319.71	319.83	1.46	125.12	105.91
KY	1300.00	5x100yr	376.25	317.00	320.35	320.54	1.81	198.52	124.77
KY	1000.00	50yr	52.76	313.00	315.51	315.57	1.09	48.39	40.04
KY	1000.00	100yr	75.25	313.00	315.79	315.87	1.25	60.78	47.75
KY	1000.00	2000yr	189.31	313.00	316.50	316.65	1.81	116.59	111.04
KY	1000.00	5x100yr	376.25	313.00	317.10	317.28	2.11	206.82	162.83
KY	700.00	50yr	52.76	311.00	313.25	313.29	0.97	60.00	99.62
KY	700.00	100yr	75.25	311.00	313.42	313.47	1.07	76.71	102.44
KY	700.00	2000yr	189.31	311.00	313.99	314.08	1.38	137.96	112.13
KY	700.00	5x100yr	376.25	311.00	314.62	314.79	1.68	213.06	124.62
KY	500.00	50yr	52.76	311.00	311.99	312.04	1.14	52.60	120.58
KY	500.00	100yr	75.25	311.00	312.09	312.16	1.24	65.32	122.56
KY	500.00	2000yr	189.31	311.00	312.48	312.63	1.55	114.35	129.14
KY	500.00	5x100yr	376.25	311.00	312.94	313.18	1.86	175.11	137.03
KY	300.00	50yr	52.76	308.00	310.24	310.30	1.36	51.42	132.82
KY	300.00	100yr	75.25	308.00	310.35	310.42	1.44	66.53	134.65
KY	300.00	2000yr	189.31	308.00	310.75	310.88	1.68	122.37	141.17
KY	300.00	5x100yr	376.25	308.00	311.24	311.43	1.90	192.54	151.25
KY	100.00	50yr	52.76	307.00	308.33	308.39	1.24	47.69	92.47
KY	100.00	100yr	75.25	307.00	308.45	308.53	1.35	61.63	117.34
KY	100.00	2000yr	189.31	307.00	308.87	309.01	1.66	118.63	152.84
KY	100.00	5x100yr	376.25	307.00	309.31	309.52	1.96	193.89	193.76



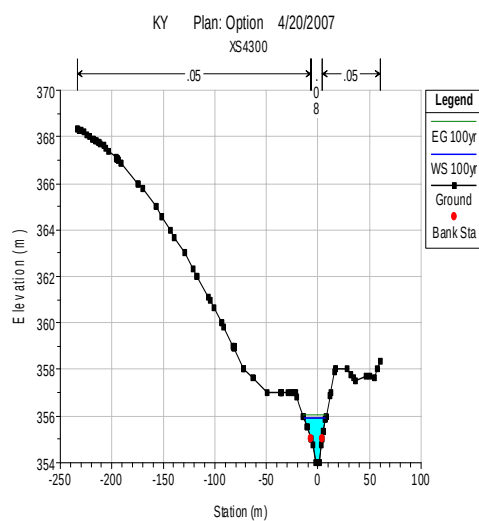
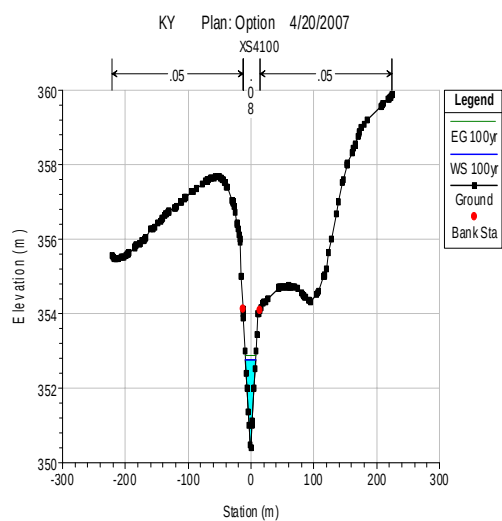
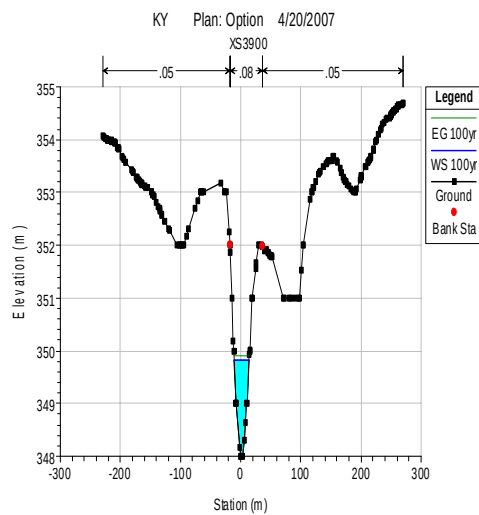
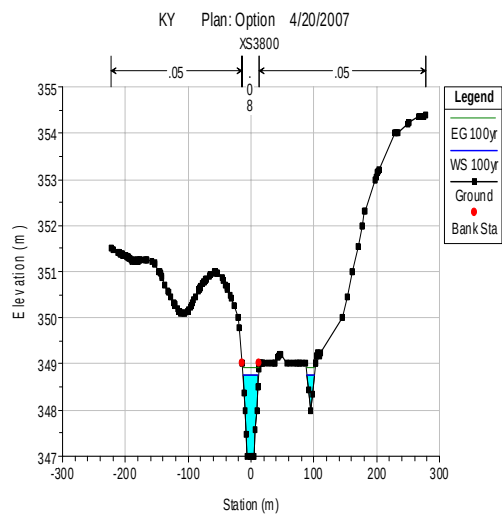
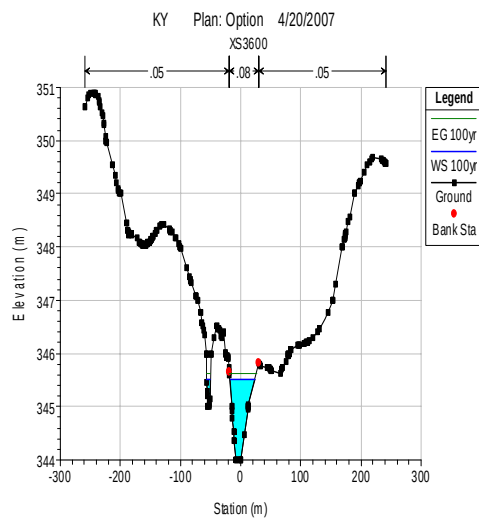
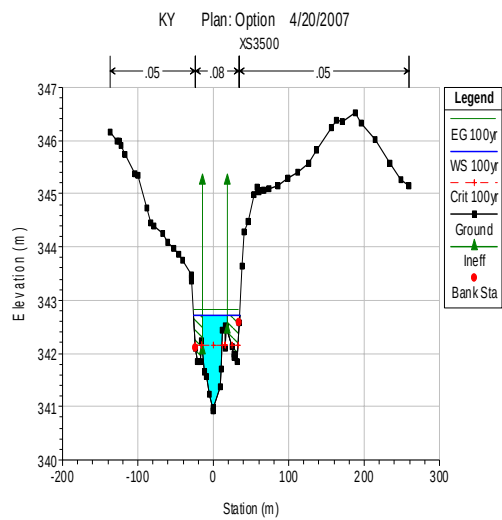
Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Option 1 Conditions



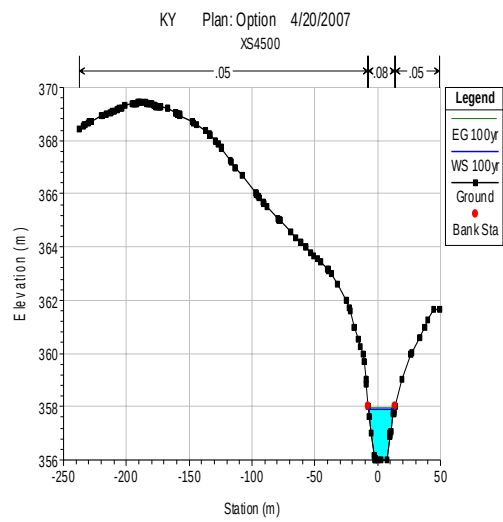
Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Option 1 Conditions



Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Option 1
Conditions



Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Option 1
Conditions



Kyeamba Creek (N2) Hec-Ras Cross Sections for 100yr ARI flood, Option 1 Conditions

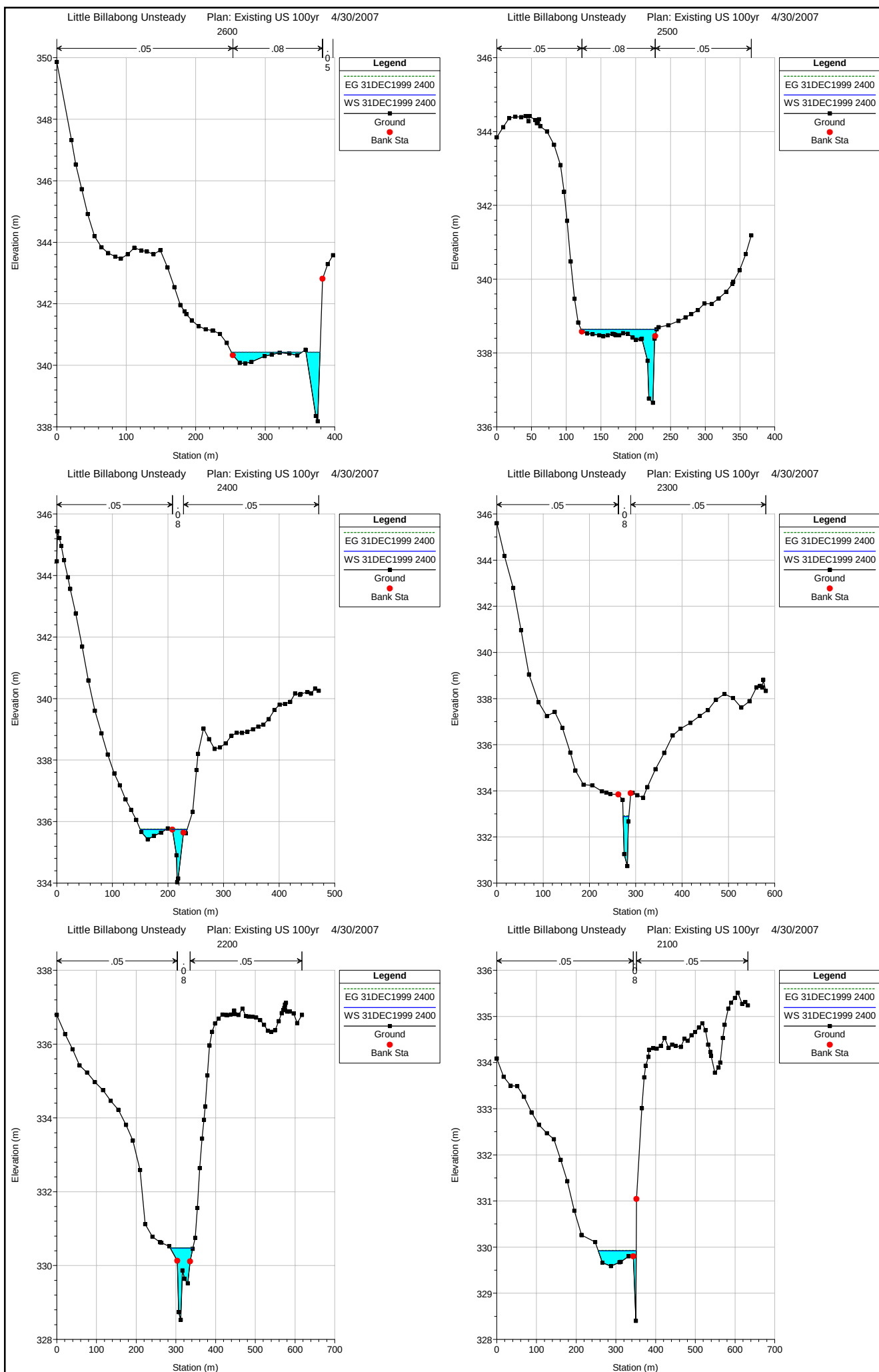
Appendix D – Hydraulic Models Results – Little Billabong Creek

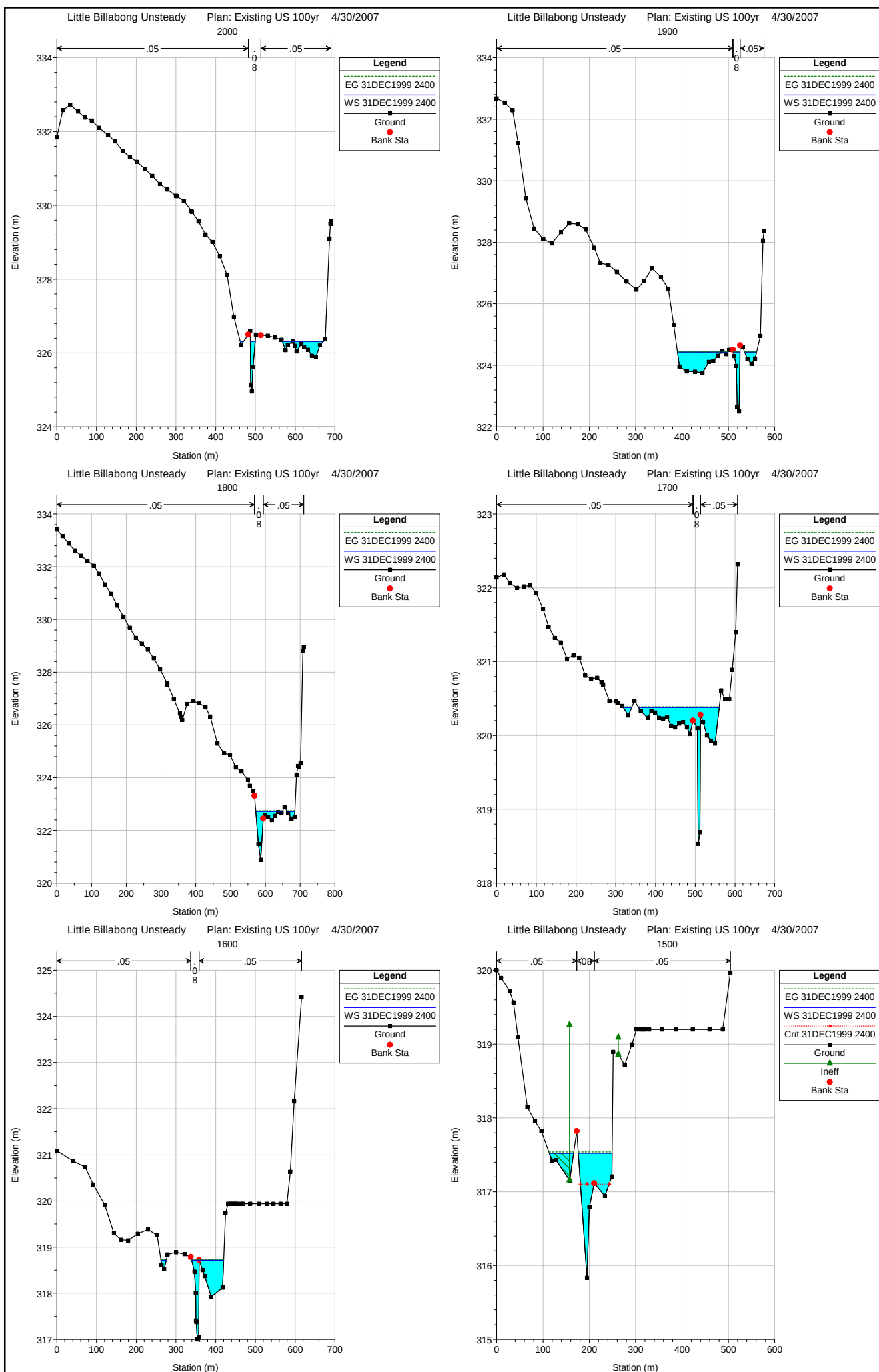
HEC-RAS River: Billabong Reach: Main Profile: Max WS

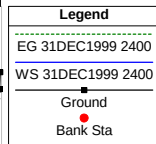
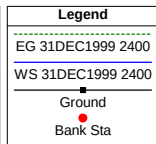
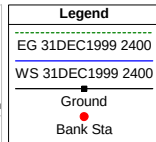
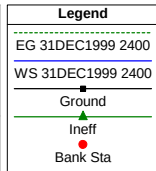
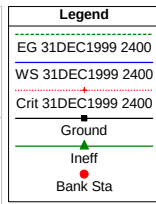
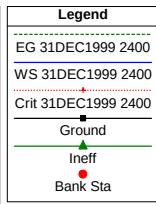
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
Main	2600	Max WS	Ex US 50 yr	83.88	338.18	341.10	341.12	0.65	131.91	152.36
Main	2600	Max WS	Ex US 100 yr	116.46	338.18	341.31	341.33	0.72	166.33	177.98
Main	2600	Max WS	Ex US 2000	325.19	338.18	342.17	342.21	0.98	334.36	206.86
Main	2600	Max WS	Exist US PMF	582.31	338.18	342.83	342.91	1.20	475.67	218.08
Main	2500	Max WS	Ex US 50 yr	83.72	336.65	339.26	339.28	0.68	127.76	180.86
Main	2500	Max WS	Ex US 100 yr	116.34	336.65	339.44	339.46	0.74	162.66	204.49
Main	2500	Max WS	Ex US 2000	324.40	336.65	340.17	340.22	0.97	328.30	239.37
Main	2500	Max WS	Exist US PMF	582.08	336.65	340.75	340.83	1.17	471.37	254.34
Main	2400	Max WS	Ex US 50 yr	83.64	334.03	336.37	336.42	1.02	85.07	110.86
Main	2400	Max WS	Ex US 100 yr	116.25	334.03	336.54	336.61	1.12	104.86	116.88
Main	2400	Max WS	Ex US 2000	324.02	334.03	337.29	337.42	1.51	199.94	138.76
Main	2400	Max WS	Exist US PMF	581.89	334.03	337.91	338.11	1.81	291.64	155.67
Main	2300	Max WS	Ex US 50 yr	83.61	330.74	334.35	334.41	1.17	88.42	144.76
Main	2300	Max WS	Ex US 100 yr	116.21	330.74	334.52	334.58	1.24	113.03	153.18
Main	2300	Max WS	Ex US 2000	323.86	330.74	335.19	335.29	1.55	226.43	183.93
Main	2300	Max WS	Exist US PMF	581.77	330.74	335.75	335.91	1.76	337.12	206.88
Main	2200	Max WS	Ex US 50 yr	83.56	328.53	331.24	331.27	0.78	119.40	130.47
Main	2200	Max WS	Ex US 100 yr	116.14	328.53	331.45	331.48	0.86	146.01	133.64
Main	2200	Max WS	Ex US 2000	323.59	328.53	332.28	332.36	1.19	263.19	145.84
Main	2200	Max WS	Exist US PMF	581.52	328.53	332.96	333.09	1.50	365.85	161.10
Main	2100	Max WS	Ex US 50 yr	83.53	328.40	330.49	330.53	0.83	96.04	146.28
Main	2100	Max WS	Ex US 100 yr	116.10	328.40	330.66	330.71	0.85	121.06	152.21
Main	2100	Max WS	Ex US 2000	323.45	328.40	331.34	331.44	1.09	231.83	174.14
Main	2100	Max WS	Exist US PMF	581.45	328.40	331.89	332.05	1.34	334.08	196.73
Main	2000	Max WS	Ex US 50 yr	83.49	324.96	326.75	326.78	0.56	113.07	226.43
Main	2000	Max WS	Ex US 100 yr	116.04	324.96	326.87	326.91	0.61	139.97	229.71
Main	2000	Max WS	Ex US 2000	323.26	324.96	327.44	327.51	0.84	273.95	241.39
Main	2000	Max WS	Exist US PMF	581.33	324.96	327.95	328.06	1.03	400.19	251.05
Main	1900	Max WS	Ex US 50 yr	82.87	322.50	324.94	324.95	0.48	151.24	183.47
Main	1900	Max WS	Ex US 100 yr	114.93	322.50	325.12	325.14	0.52	184.75	185.76
Main	1900	Max WS	Ex US 2000	316.92	322.50	325.90	325.95	0.72	333.46	194.77
Main	1900	Max WS	Exist US PMF	574.37	322.50	326.61	326.69	0.90	477.16	229.28
Main	1800	Max WS	Ex US 50 yr	111.62	320.89	323.33	323.39	1.06	104.43	118.40
Main	1800	Max WS	Ex US 100 yr	156.10	320.89	323.51	323.59	1.17	126.79	124.44
Main	1800	Max WS	Ex US 2000	434.51	320.89	324.33	324.50	1.60	242.90	170.71
Main	1800	Max WS	Exist US PMF	796.22	320.89	324.95	325.23	2.00	364.40	221.84
Main	1700	Max WS	Ex US 50 yr	111.58	318.53	320.78	320.80	0.69	171.45	349.26
Main	1700	Max WS	Ex US 100 yr	156.04	318.53	320.90	320.93	0.75	217.64	376.16
Main	1700	Max WS	Ex US 2000	434.28	318.53	321.49	321.53	0.86	470.12	472.64
Main	1700	Max WS	Exist US PMF	795.70	318.53	322.04	322.10	0.98	740.35	564.57
Main	1600	Max WS	Ex US 50 yr	111.13	317.00	319.53	319.55	0.50	207.11	288.75
Main	1600	Max WS	Ex US 100 yr	155.45	317.00	319.89	319.90	0.45	312.61	307.85
Main	1600	Max WS	Ex US 2000	432.32	317.00	321.04	321.05	0.48	886.97	581.58
Main	1600	Max WS	Exist US PMF	795.36	317.00	321.58	321.60	0.60	1203.23	594.02
Main	1500	Max WS	Ex US 50 yr	217.94	315.83	318.65	318.77	1.21	151.29	195.44
Main	1500	Max WS	Ex US 100 yr	303.08	315.83	319.09	319.22	1.56	195.51	250.44
Main	1500	Max WS	Ex US 2000	807.18	315.83	320.72	320.75	0.92	937.96	504.39
Main	1500	Max WS	Exist US PMF	1550.94	315.83	320.87	320.99	1.60	1013.91	504.39
Main	1475			Bridge						
Main	1450	Max WS	Ex US 50 yr	217.94	315.83	318.39	318.55	1.46	127.15	189.58
Main	1450	Max WS	Ex US 100 yr	303.08	315.83	318.59	318.83	1.75	145.18	193.96
Main	1450	Max WS	Ex US 2000	852.89	315.83	319.49	319.66	1.83	503.59	456.23
Main	1450	Max WS	Exist US PMF	1027.62	315.83	320.19	320.27	1.25	845.65	504.39

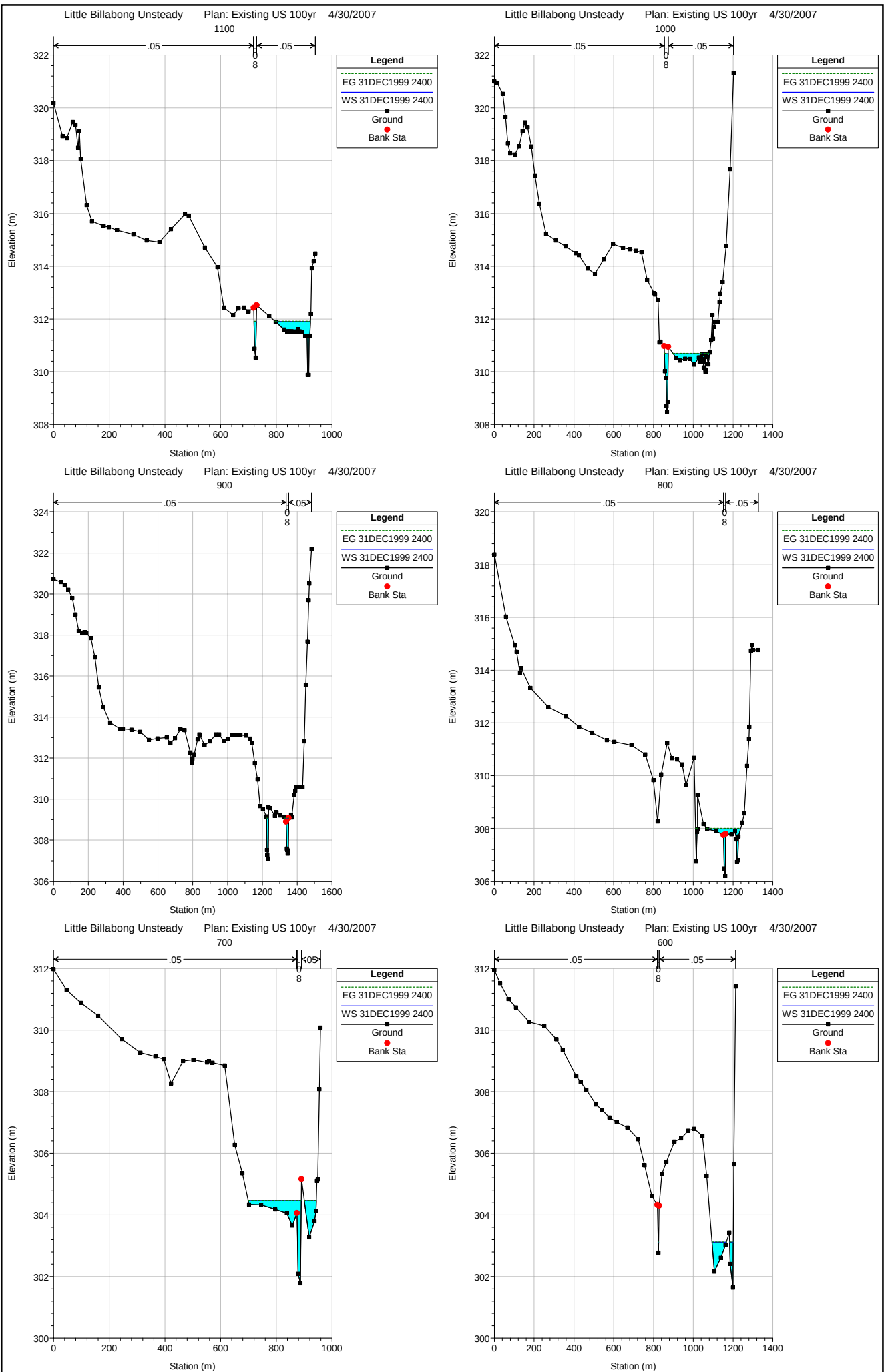
HEC-RAS River: Billabong Reach: Main Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
Main	1400	Max WS	Ex US 50 yr	217.93	316.26	318.33	318.37	0.78	245.77	225.85
Main	1400	Max WS	Ex US 100 yr	303.07	316.26	318.54	318.59	0.88	293.57	232.58
Main	1400	Max WS	Ex US 2000	852.87	316.26	319.34	319.49	1.38	540.05	445.04
Main	1400	Max WS	Exist US PMF	1551.91	316.26	320.01	320.21	1.63	844.67	462.00
Main	1300	Max WS	Ex US 50 yr	217.89	313.42	315.98	316.07	1.10	168.95	207.96
Main	1300	Max WS	Ex US 100 yr	303.02	313.42	316.18	316.29	1.19	209.94	212.97
Main	1300	Max WS	Ex US 2000	852.64	313.42	317.06	317.30	1.60	402.28	221.92
Main	1300	Max WS	Exist US PMF	1551.75	313.42	317.83	318.22	1.97	575.56	230.29
Main	1200	Max WS	Ex US 50 yr	217.85	312.25	314.20	314.30	0.98	164.25	216.57
Main	1200	Max WS	Ex US 100 yr	302.99	312.25	314.40	314.51	1.09	208.18	238.77
Main	1200	Max WS	Ex US 2000	852.46	312.25	315.16	315.41	1.57	401.23	260.47
Main	1200	Max WS	Exist US PMF	1551.66	312.25	315.83	316.22	1.95	579.57	274.08
Main	1100	Max WS	Ex US 50 yr	217.80	310.54	312.64	312.70	0.86	222.41	316.78
Main	1100	Max WS	Ex US 100 yr	302.96	310.54	312.81	312.88	0.93	276.04	319.60
Main	1100	Max WS	Ex US 2000	852.30	310.54	313.60	313.74	1.22	533.84	332.77
Main	1100	Max WS	Exist US PMF	1551.50	310.54	314.30	314.51	1.52	775.14	367.91
Main	1000	Max WS	Ex US 50 yr	217.76	308.48	311.47	311.51	0.87	252.04	266.26
Main	1000	Max WS	Ex US 100 yr	302.92	308.48	311.69	311.74	0.93	311.00	271.11
Main	1000	Max WS	Ex US 2000	851.99	308.48	312.58	312.70	1.29	576.77	308.13
Main	1000	Max WS	Exist US PMF	1551.36	308.48	313.34	313.53	1.61	828.53	367.65
Main	900	Max WS	Ex US 50 yr	217.73	307.34	310.06	310.13	1.33	187.77	198.46
Main	900	Max WS	Ex US 100 yr	302.89	307.34	310.27	310.36	1.44	228.23	204.37
Main	900	Max WS	Ex US 2000	851.77	307.34	311.13	311.33	1.92	435.98	264.80
Main	900	Max WS	Exist US PMF	1551.18	307.34	311.88	312.18	2.22	642.97	286.84
Main	800	Max WS	Ex US 50 yr	217.69	306.21	308.67	308.73	1.24	194.02	240.66
Main	800	Max WS	Ex US 100 yr	302.85	306.21	308.87	308.95	1.31	242.37	252.76
Main	800	Max WS	Ex US 2000	851.44	306.21	309.74	309.90	1.60	483.61	299.75
Main	800	Max WS	Exist US PMF	1550.87	306.21	310.54	310.75	1.79	764.76	418.87
Main	700	Max WS	Ex US 50 yr	217.12	301.78	305.58	305.60	0.53	402.71	278.48
Main	700	Max WS	Ex US 100 yr	302.62	301.78	305.83	305.86	0.61	473.75	286.50
Main	700	Max WS	Ex US 2000	848.18	301.78	306.79	306.85	0.97	759.88	308.62
Main	700	Max WS	Exist US PMF	1550.26	301.78	307.53	307.66	1.29	993.22	320.46
Main	600	Max WS	Ex US 50 yr	216.44	302.77	304.26	304.33	0.44	187.13	129.73
Main	600	Max WS	Ex US 100 yr	301.60	302.77	304.51	304.61	0.57	221.93	154.77
Main	600	Max WS	Ex US 2000	843.47	302.77	305.49	305.73	1.16	412.11	232.12
Main	600	Max WS	Exist US PMF	1543.54	302.77	306.27	306.61	1.61	627.48	322.46
Main	500	Max WS	Ex US 50 yr	236.46	299.86	301.98	302.04	0.91	233.22	363.56
Main	500	Max WS	Ex US 100 yr	330.25	299.86	302.12	302.19	1.02	281.87	368.57
Main	500	Max WS	Ex US 2000	927.11	299.86	302.74	302.88	1.40	569.69	667.78
Main	500	Max WS	Exist US PMF	1720.77	299.86	303.24	303.42	1.64	922.42	761.15

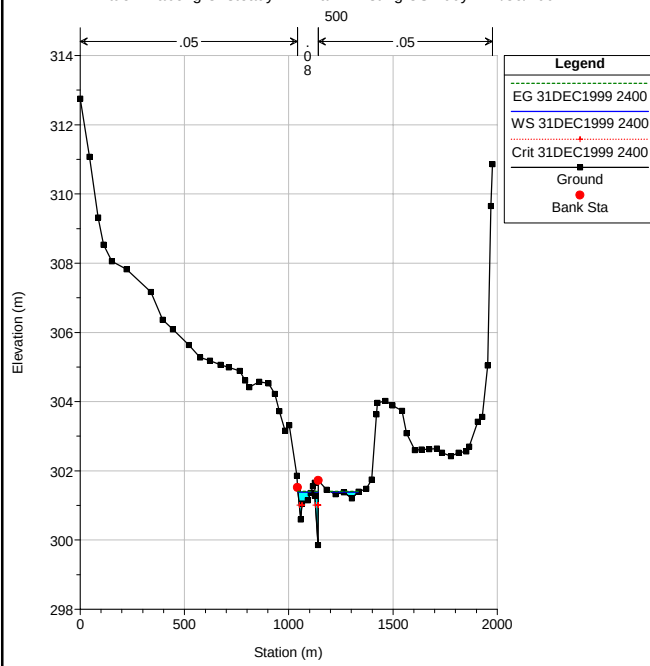








Little Billabong Unsteady Plan: Existing US 100yr 4/30/2007

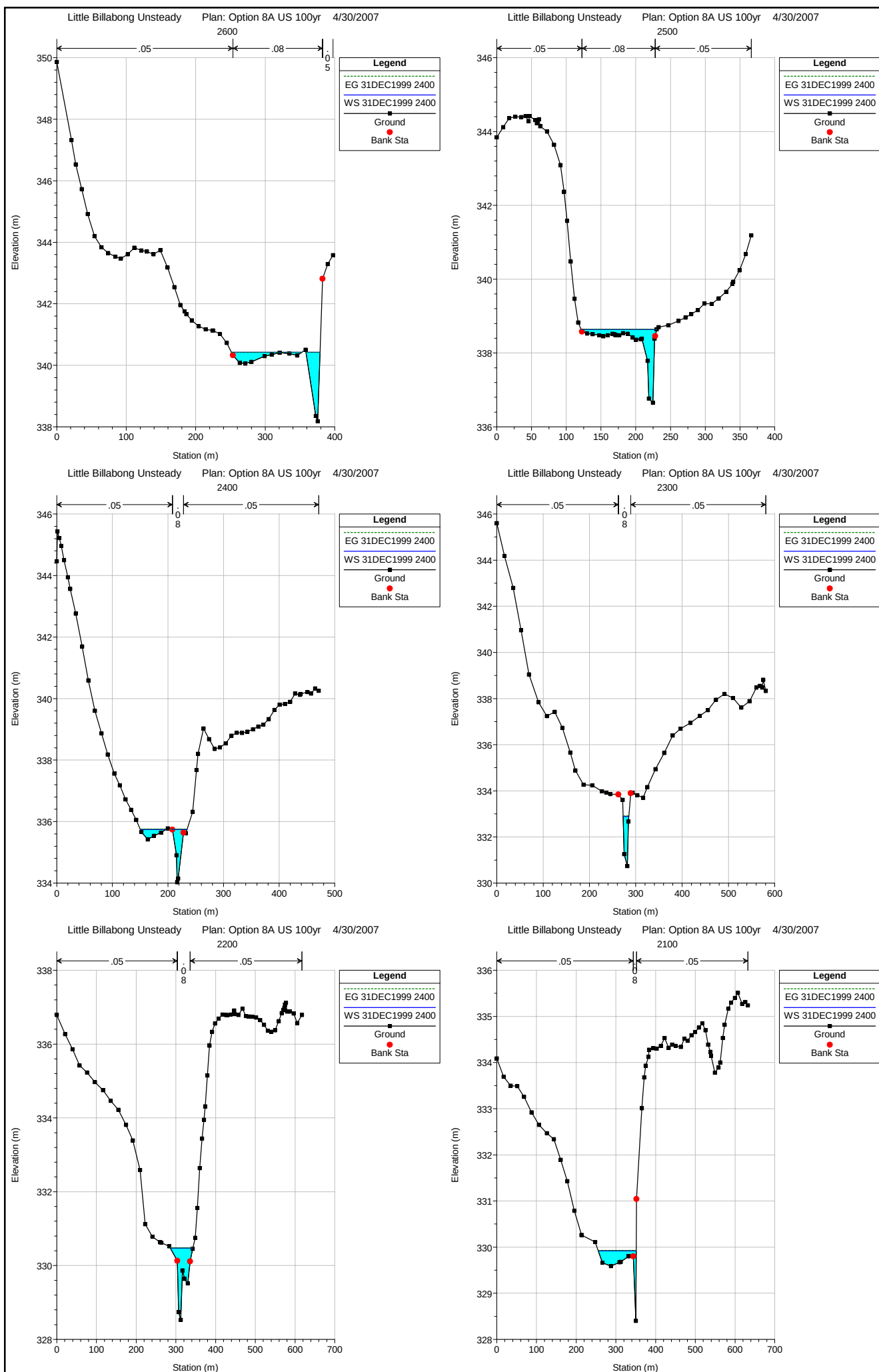


HEC-RAS River: Billabong Reach: Main Profile: Max WS

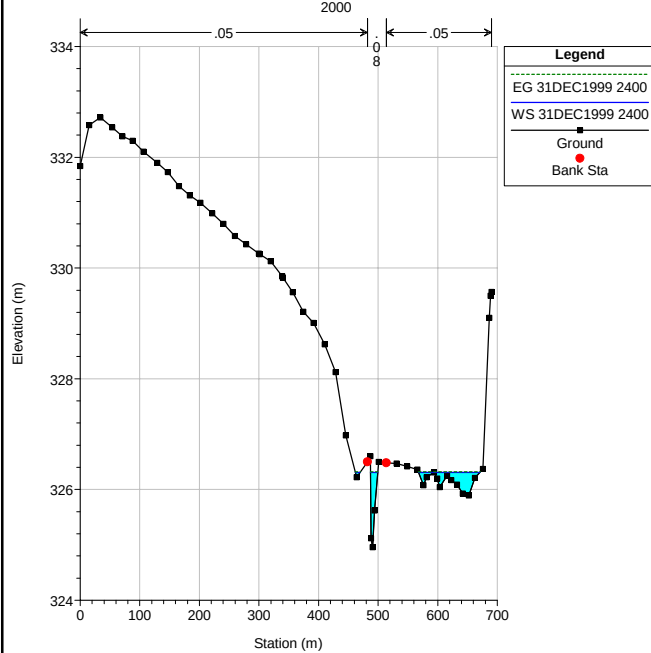
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HEC-RAS River: Billabong Reach: Main Profile: Max WS (Continued)

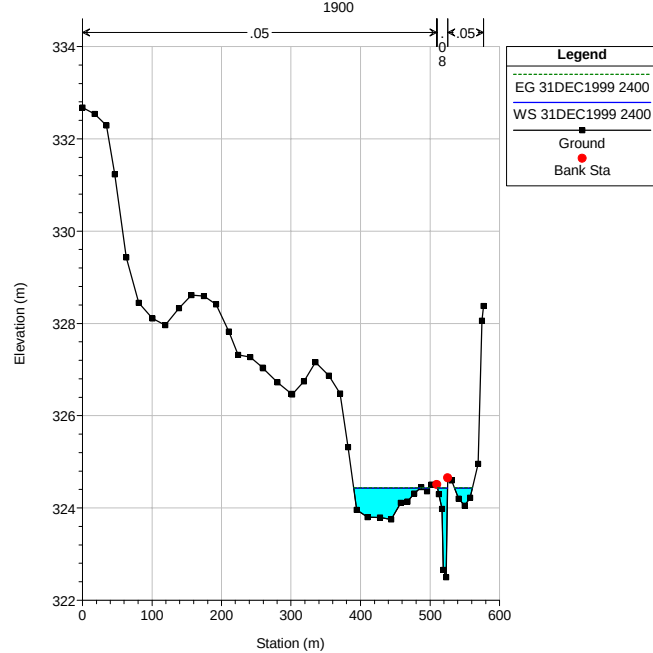
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
Main	1400	Max WS	Ex US 50 yr	217.93	316.26	318.33	318.37	0.78	245.77	225.85
Main	1400	Max WS	Ex US 100 yr	303.07	316.26	318.54	318.59	0.88	293.57	232.58
Main	1400	Max WS	Ex US 2000	852.87	316.26	319.34	319.49	1.38	540.05	445.04
Main	1400	Max WS	Exist US PMF	1551.91	316.26	320.01	320.21	1.63	844.67	462.00
Main	1300	Max WS	Ex US 50 yr	217.89	313.42	315.98	316.07	1.10	168.95	207.96
Main	1300	Max WS	Ex US 100 yr	303.02	313.42	316.18	316.29	1.19	209.94	212.97
Main	1300	Max WS	Ex US 2000	852.64	313.42	317.06	317.30	1.60	402.28	221.92
Main	1300	Max WS	Exist US PMF	1551.75	313.42	317.83	318.22	1.97	575.56	230.29
Main	1200	Max WS	Ex US 50 yr	217.85	312.25	314.20	314.30	0.98	164.25	216.57
Main	1200	Max WS	Ex US 100 yr	302.99	312.25	314.40	314.51	1.09	208.18	238.77
Main	1200	Max WS	Ex US 2000	852.46	312.25	315.16	315.41	1.57	401.23	260.47
Main	1200	Max WS	Exist US PMF	1551.66	312.25	315.83	316.22	1.95	579.57	274.08
Main	1100	Max WS	Ex US 50 yr	217.80	310.54	312.64	312.70	0.86	222.41	316.78
Main	1100	Max WS	Ex US 100 yr	302.96	310.54	312.81	312.88	0.93	276.04	319.60
Main	1100	Max WS	Ex US 2000	852.30	310.54	313.60	313.74	1.22	533.84	332.77
Main	1100	Max WS	Exist US PMF	1551.50	310.54	314.30	314.51	1.52	775.14	367.91
Main	1000	Max WS	Ex US 50 yr	217.76	308.48	311.47	311.51	0.87	252.04	266.26
Main	1000	Max WS	Ex US 100 yr	302.92	308.48	311.69	311.74	0.93	311.00	271.11
Main	1000	Max WS	Ex US 2000	851.99	308.48	312.58	312.70	1.29	576.77	308.13
Main	1000	Max WS	Exist US PMF	1551.36	308.48	313.34	313.53	1.61	828.53	367.65
Main	900	Max WS	Ex US 50 yr	217.73	307.34	310.06	310.13	1.33	187.77	198.46
Main	900	Max WS	Ex US 100 yr	302.89	307.34	310.27	310.36	1.44	228.23	204.37
Main	900	Max WS	Ex US 2000	851.77	307.34	311.13	311.33	1.92	435.98	264.80
Main	900	Max WS	Exist US PMF	1551.18	307.34	311.88	312.18	2.22	642.97	286.84
Main	800	Max WS	Ex US 50 yr	217.69	306.21	308.67	308.73	1.24	194.02	240.66
Main	800	Max WS	Ex US 100 yr	302.85	306.21	308.87	308.95	1.31	242.37	252.76
Main	800	Max WS	Ex US 2000	851.44	306.21	309.74	309.90	1.60	483.61	299.75
Main	800	Max WS	Exist US PMF	1550.87	306.21	310.54	310.75	1.79	764.76	418.87
Main	700	Max WS	Ex US 50 yr	217.12	301.78	305.58	305.60	0.53	402.71	278.48
Main	700	Max WS	Ex US 100 yr	302.62	301.78	305.83	305.86	0.61	473.75	286.50
Main	700	Max WS	Ex US 2000	848.18	301.78	306.79	306.85	0.97	759.88	308.62
Main	700	Max WS	Exist US PMF	1550.26	301.78	307.53	307.66	1.29	993.22	320.46
Main	600	Max WS	Ex US 50 yr	216.44	302.77	304.26	304.33	0.44	187.13	129.73
Main	600	Max WS	Ex US 100 yr	301.60	302.77	304.51	304.61	0.57	221.93	154.77
Main	600	Max WS	Ex US 2000	843.47	302.77	305.49	305.73	1.16	412.11	232.12
Main	600	Max WS	Exist US PMF	1543.54	302.77	306.27	306.61	1.61	627.48	322.46
Main	500	Max WS	Ex US 50 yr	236.46	299.86	301.98	302.04	0.91	233.22	363.56
Main	500	Max WS	Ex US 100 yr	330.25	299.86	302.12	302.19	1.02	281.87	368.57
Main	500	Max WS	Ex US 2000	927.11	299.86	302.74	302.88	1.40	569.69	667.78
Main	500	Max WS	Exist US PMF	1720.77	299.86	303.24	303.42	1.64	922.42	761.15



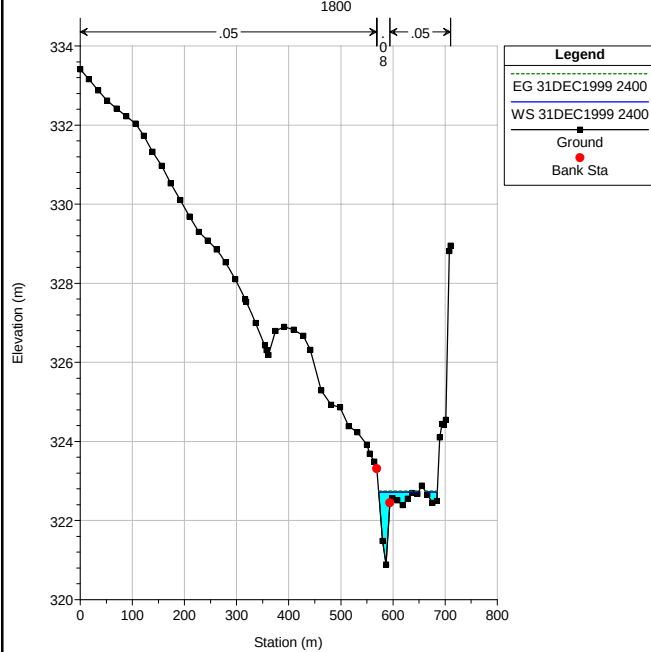
Little Billabong Unsteady Plan: Option 8A US 100yr 4/30/2007



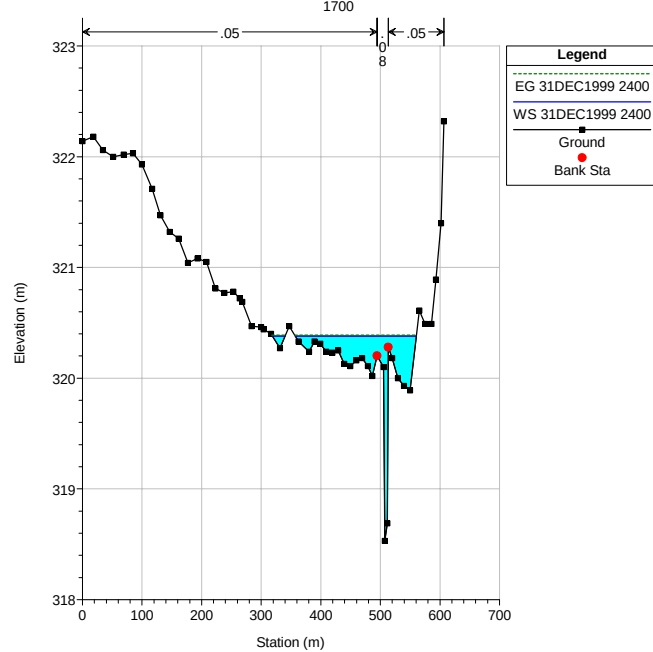
Little Billabong Unsteady Plan: Option 8A US 100yr 4/30/2007



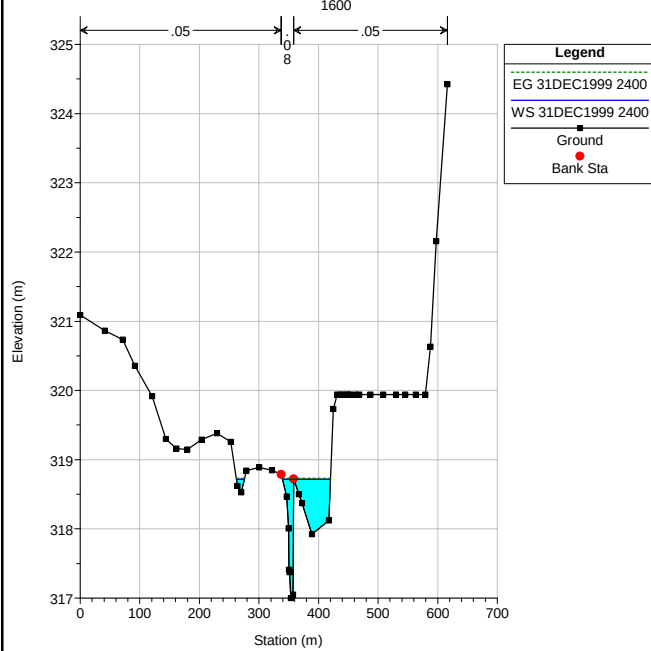
Little Billabong Unsteady Plan: Option 8A US 100yr 4/30/2007



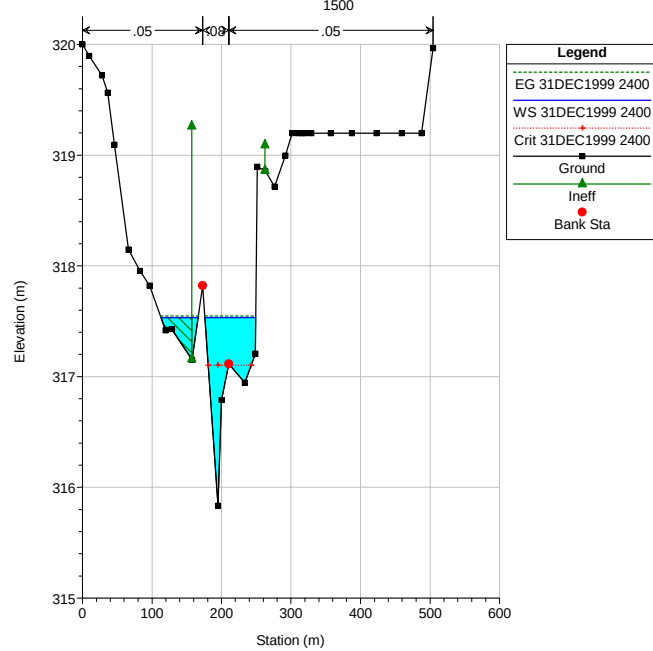
Little Billabong Unsteady Plan: Option 8A US 100yr 4/30/2007

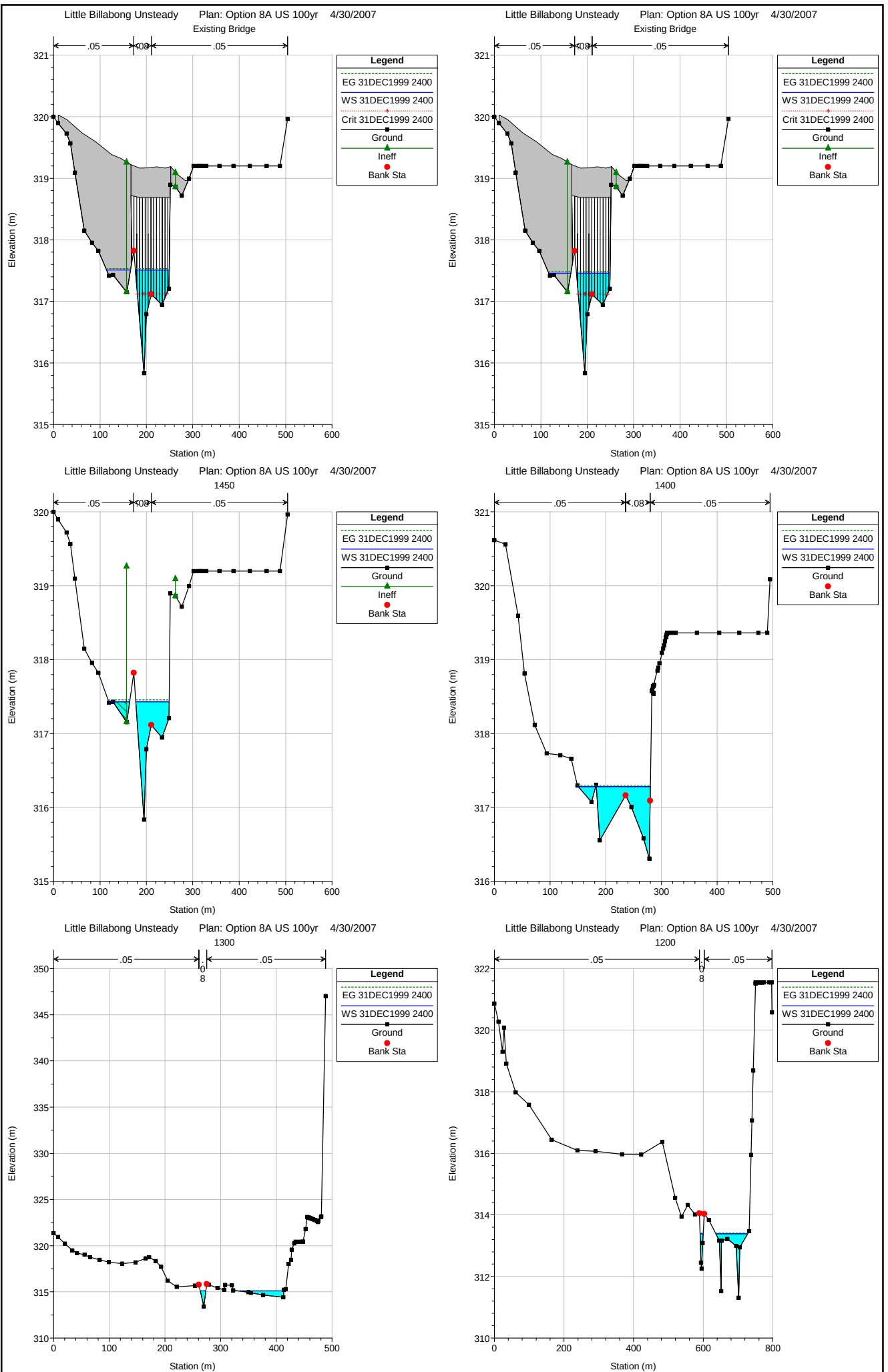


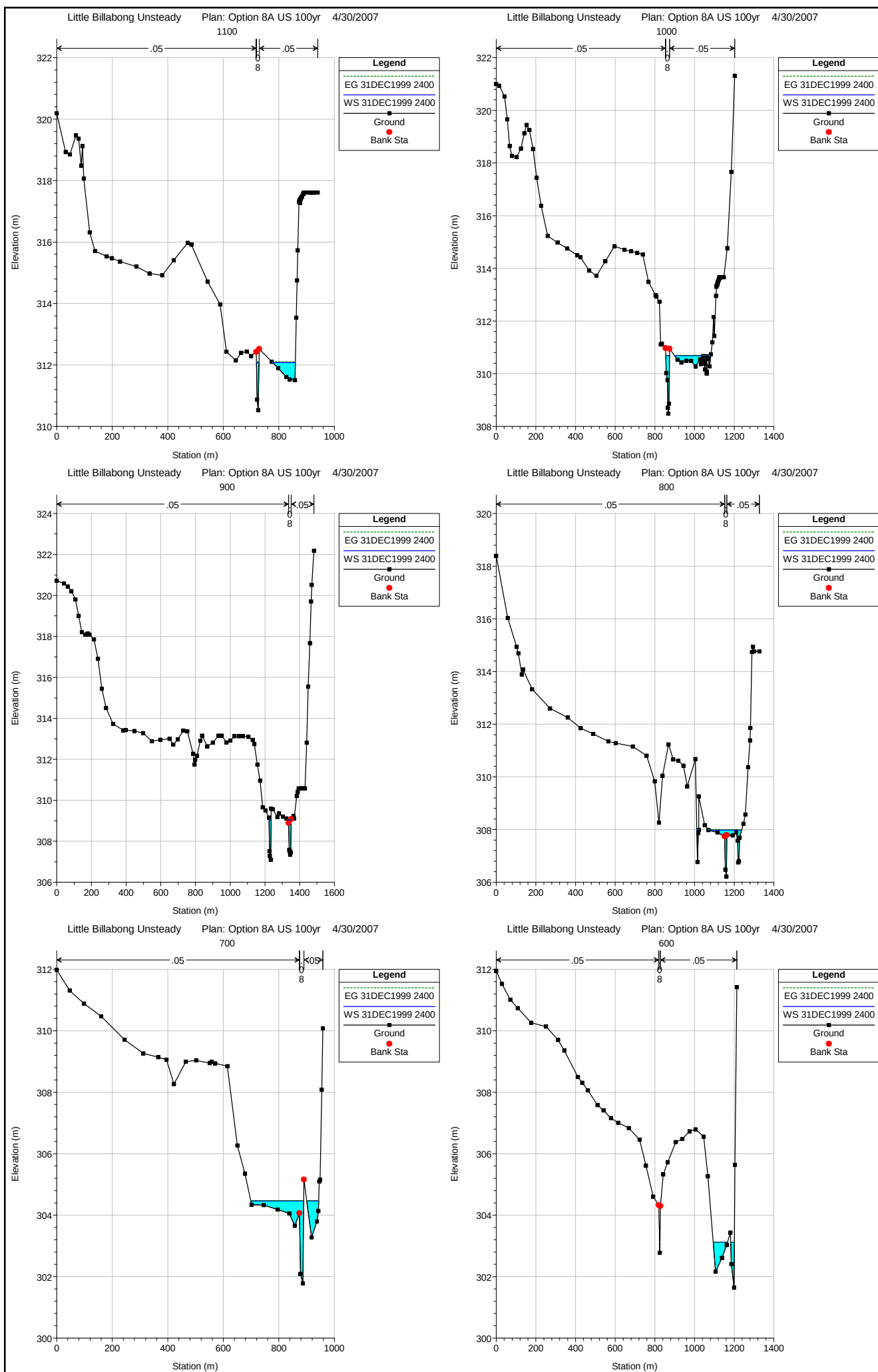
Little Billabong Unsteady Plan: Option 8A US 100yr 4/30/2007

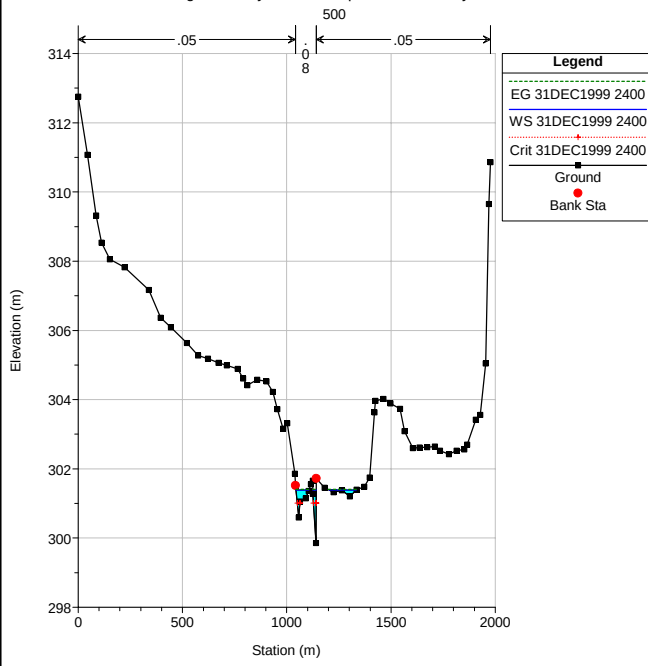


Little Billabong Unsteady Plan: Option 8A US 100yr 4/30/2007









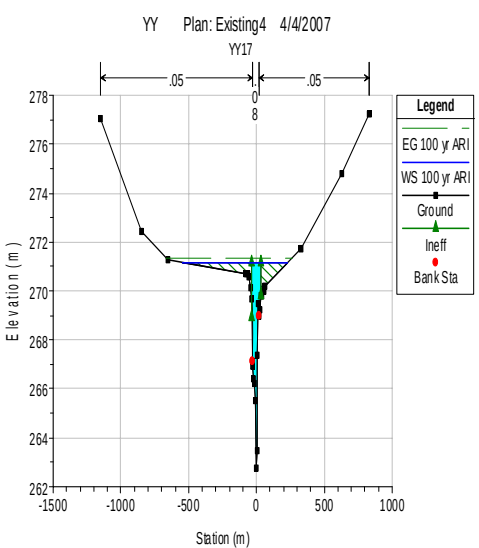
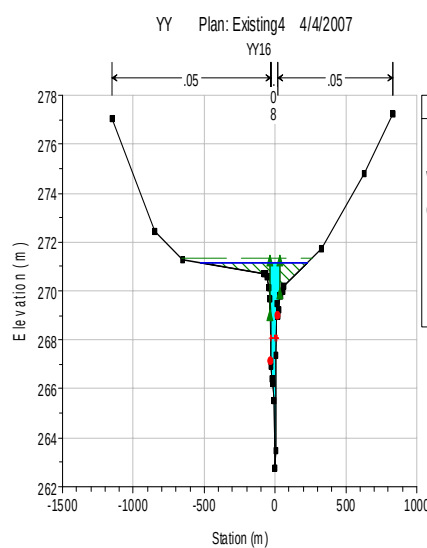
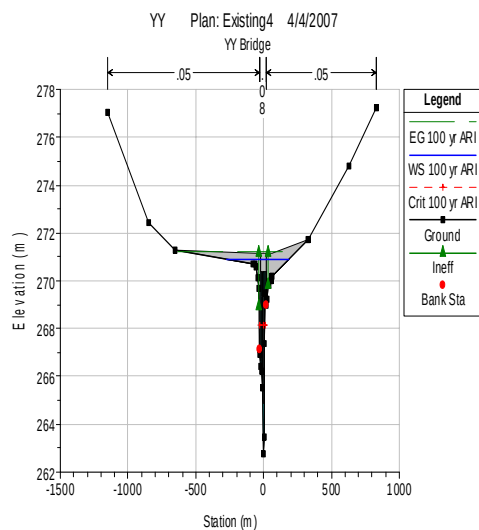
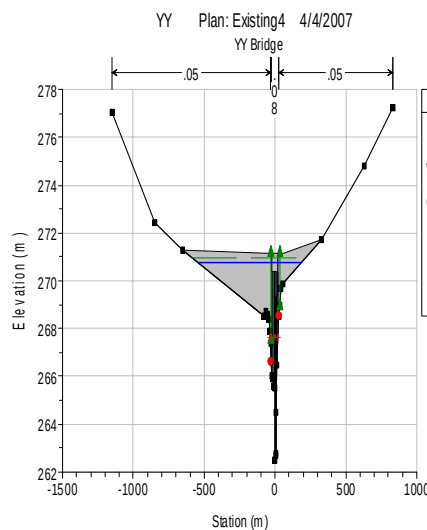
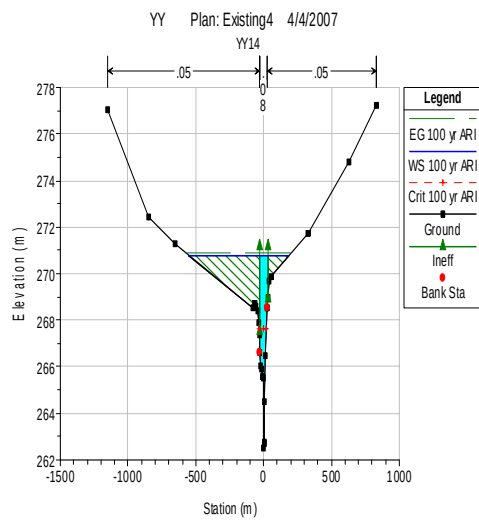
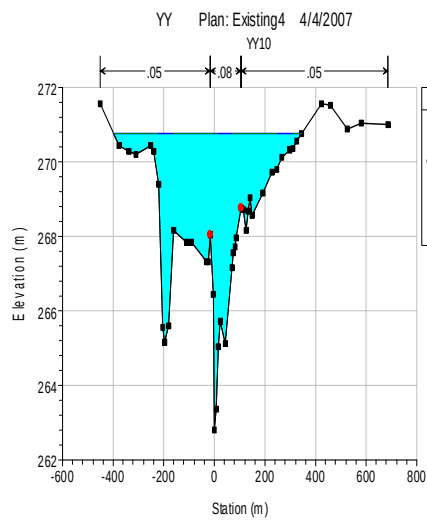
Appendix E – Hydraulic Models Results – Yarra Yarra Creek

HEC-RAS Plan: Existing4

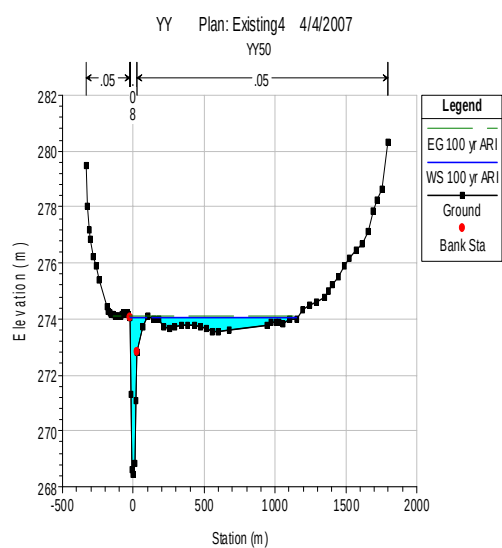
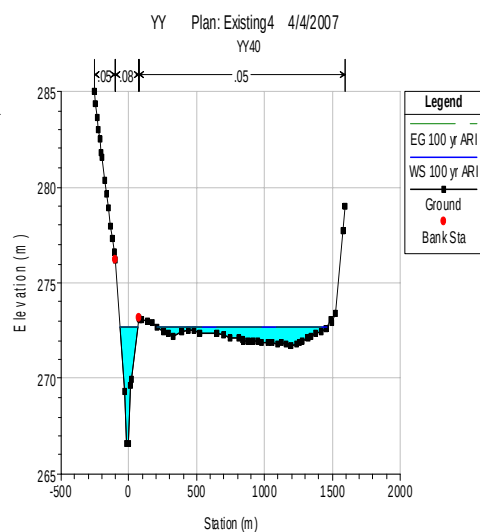
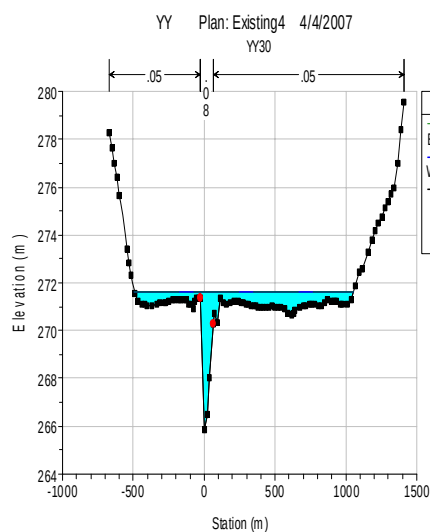
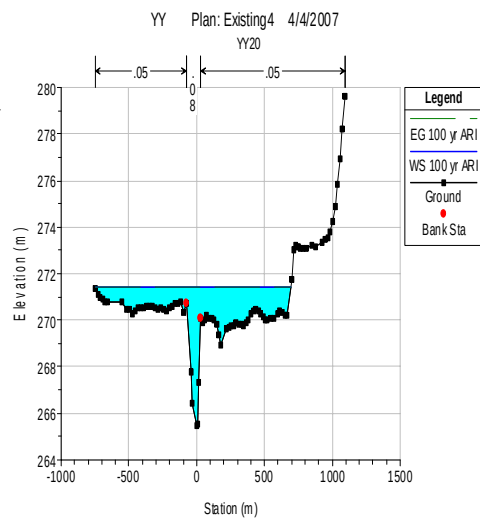
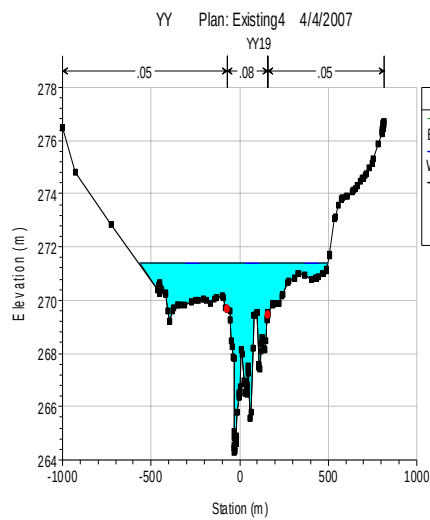
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
YY	YY	50	50 yr ARI	350.30	268.45	273.75	273.92	1.86	242.60	628.74
YY	YY	50	100 yr ARI	469.67	268.45	274.03	274.13	1.70	500.56	1143.09
YY	YY	50	2000 yr ARI	1362.25	268.45	274.70	274.76	1.62	1423.35	1532.80
YY	YY	50	5x100 yr ARI	2348.35	268.45	275.15	275.22	1.64	2144.36	1625.09
YY	YY	40	50 yr ARI	350.30	266.60	272.49	272.51	0.67	752.02	1237.87
YY	YY	40	100 yr ARI	469.67	266.60	272.66	272.68	0.70	974.88	1383.15
YY	YY	40	2000 yr ARI	1362.25	266.60	273.42	273.44	0.75	2123.97	1599.27
YY	YY	40	5x100 yr ARI	2348.35	266.60	274.05	274.07	0.76	3129.52	1612.75
YY	YY	30	50 yr ARI	350.30	265.83	271.28	271.31	0.91	575.16	1375.86
YY	YY	30	100 yr ARI	469.67	265.83	271.60	271.61	0.71	1064.33	1546.46
YY	YY	30	2000 yr ARI	1362.25	265.83	272.64	272.66	0.63	2728.36	1642.91
YY	YY	30	5x100 yr ARI	2348.35	265.83	273.41	273.43	0.65	4016.94	1713.17
YY	YY	20	50 yr ARI	350.30	265.44	270.77	270.78	0.51	972.00	1221.87
YY	YY	20	100 yr ARI	469.67	265.44	271.42	271.42	0.32	1880.55	1441.77
YY	YY	20	2000 yr ARI	1362.25	265.44	272.52	272.52	0.42	3470.39	1458.58
YY	YY	20	5x100 yr ARI	2348.35	265.44	273.28	273.30	0.54	4616.89	1652.56
YY	YY	19	50 yr ARI	350.30	264.26	270.66	270.67	0.39	1033.59	759.12
YY	YY	19	100 yr ARI	469.67	264.26	271.38	271.38	0.32	1712.03	1061.25
YY	YY	19	2000 yr ARI	1362.25	264.26	272.45	272.46	0.51	2931.21	1204.76
YY	YY	19	5x100 yr ARI	2348.35	264.26	273.20	273.22	0.64	3871.97	1303.00
YY	YY	17	50 yr ARI	350.30	262.80	270.51	270.63	1.51	235.58	172.64
YY	YY	17	100 yr ARI	469.67	262.80	271.16	271.34	1.93	291.04	778.74
YY	YY	17	2000 yr ARI	1362.25	262.80	272.38	272.43	1.51	1508.04	1232.78
YY	YY	17	5x100 yr ARI	2348.35	262.80	273.14	273.19	1.37	2505.00	1364.12
YY	YY	16	50 yr ARI	350.30	262.80	270.50	270.61	1.52	234.74	170.22
YY	YY	16	100 yr ARI	469.67	262.80	271.14	271.33	1.94	281.83	754.99
YY	YY	16	2000 yr ARI	1362.25	262.80	272.37	272.43	1.52	1497.91	1230.58
YY	YY	16	5x100 yr ARI	2348.35	262.80	273.14	273.19	1.37	2497.82	1363.26
YY	YY	15		Bridge						
YY	YY	14	50 yr ARI	350.30	262.50	270.35	270.43	1.25	276.17	583.11
YY	YY	14	100 yr ARI	469.67	262.50	270.79	270.91	1.51	305.09	741.42
YY	YY	14	2000 yr ARI	1362.25	262.50	272.35	272.37	0.69	2600.57	1226.39
YY	YY	14	5x100 yr ARI	2348.35	262.50	273.13	273.15	0.80	3607.95	1361.85
YY	YY	10	50 yr ARI	350.30	262.79	270.31	270.31	0.26	1297.46	604.72
YY	YY	10	100 yr ARI	469.67	262.79	270.77	270.78	0.32	1622.42	745.19
YY	YY	10	2000 yr ARI	1362.25	262.79	272.28	272.29	0.46	3195.17	1138.00
YY	YY	10	5x100 yr ARI	2348.35	262.79	273.03	273.05	0.58	4051.74	1138.00
LB	LB	80	50 yr ARI	424.25	269.84	276.99	277.06	1.11	382.58	231.49
LB	LB	80	100 yr ARI	599.40	269.84	277.46	277.53	1.15	613.85	809.27
LB	LB	80	2000 yr ARI	1751.34	269.84	278.28	278.33	1.22	1927.17	2033.97
LB	LB	80	5x100 yr ARI	2997.00	269.84	278.66	278.72	1.26	2740.71	2169.96
LB	LB	70	50 yr ARI	424.25	268.28	275.24	275.27	0.81	687.55	695.74
LB	LB	70	100 yr ARI	599.40	268.28	275.53	275.56	0.87	926.04	861.10
LB	LB	70	2000 yr ARI	1751.34	268.28	276.40	276.43	1.15	2284.34	2199.30
LB	LB	70	5x100 yr ARI	2997.00	268.28	276.82	276.87	1.24	3251.30	2315.71
LB	LB	60	50 yr ARI	424.25	267.23	273.75	273.78	0.86	567.84	561.40
LB	LB	60	100 yr ARI	599.40	267.23	274.05	274.08	0.93	763.18	848.50
LB	LB	60	2000 yr ARI	1751.34	267.23	274.81	274.87	1.26	1719.55	1544.97
LB	LB	60	5x100 yr ARI	2997.00	267.23	275.28	275.36	1.40	2468.00	1641.04
LB	LB	50	50 yr ARI	424.25	265.09	271.52	271.58	1.18	440.95	465.32
LB	LB	50	100 yr ARI	599.40	265.09	271.85	271.91	1.15	632.88	717.17

HEC-RAS Plan: Existing4 (Continued)

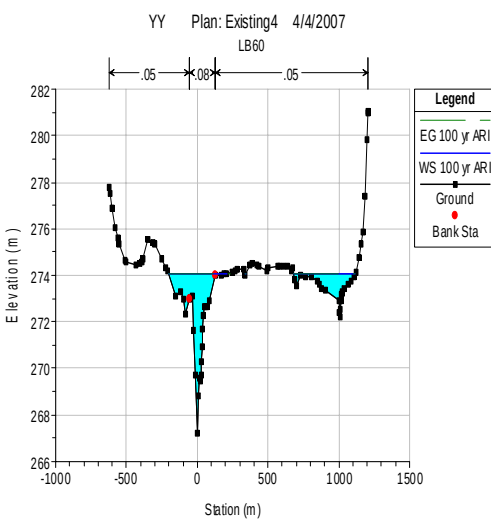
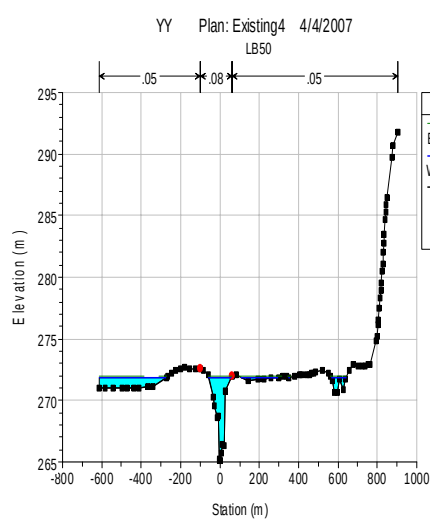
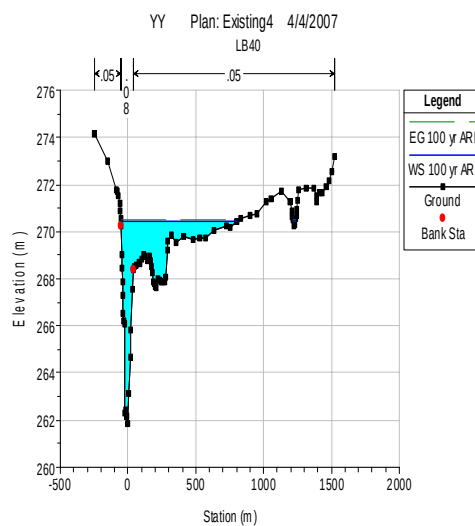
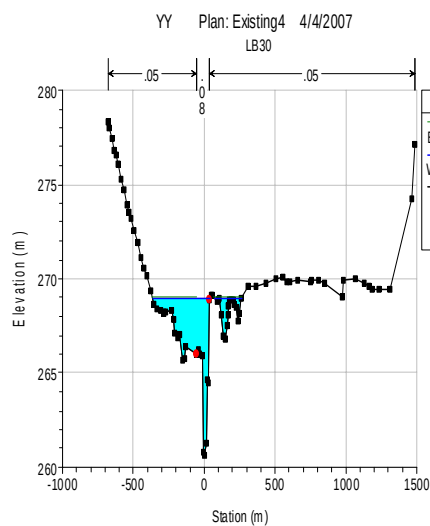
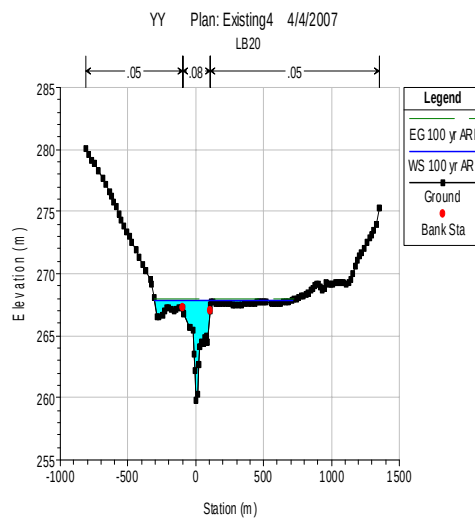
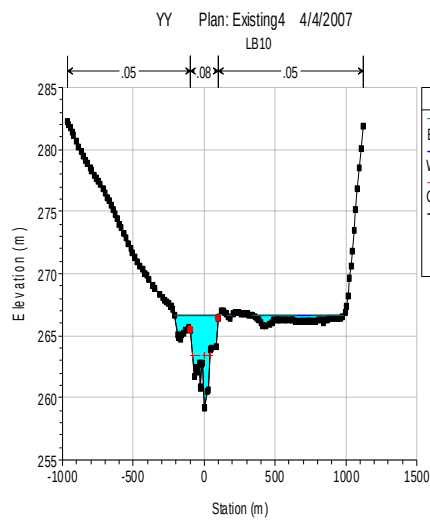
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
LB	LB	50	2000 yr ARI	1751.34	265.09	273.18	273.21	0.85	2144.58	1379.77
LB	LB	50	5x100 yr ARI	2997.00	265.09	273.88	273.93	0.90	3123.02	1390.62
LB	YY	40	50 yr ARI	719.25	261.85	270.02	270.06	1.03	945.26	682.74
LB	YY	40	100 yr ARI	962.27	261.85	270.45	270.49	1.03	1290.61	878.26
LB	YY	40	2000 yr ARI	2947.17	261.85	271.82	271.88	1.41	2836.55	1462.10
LB	YY	40	5x100 yr ARI	4811.35	261.85	272.43	272.52	1.65	3812.47	1615.29
LB	YY	30	50 yr ARI	719.25	260.62	268.59	268.62	0.98	859.85	483.90
LB	YY	30	100 yr ARI	962.27	260.62	269.00	269.04	1.05	1079.41	605.45
LB	YY	30	2000 yr ARI	2947.17	260.62	270.40	270.48	1.44	2713.77	1760.70
LB	YY	30	5x100 yr ARI	4811.35	260.62	271.05	271.14	1.56	3873.61	1804.71
LB	YY	20	50 yr ARI	719.25	259.77	267.46	267.52	1.17	661.39	407.48
LB	YY	20	100 yr ARI	962.27	259.77	267.84	267.91	1.21	956.61	1018.89
LB	YY	20	2000 yr ARI	2947.17	259.77	269.08	269.16	1.45	2367.44	1257.43
LB	YY	20	5x100 yr ARI	4811.35	259.77	269.79	269.90	1.63	3391.36	1499.70
LB	YY	10	50 yr ARI	719.25	259.15	266.17	266.21	0.93	830.26	498.26
LB	YY	10	100 yr ARI	962.27	259.15	266.59	266.63	0.99	1163.28	984.00
LB	YY	10	2000 yr ARI	2947.17	259.15	268.03	268.09	1.22	2917.56	1305.48
LB	YY	10	5x100 yr ARI	4811.35	259.15	268.86	268.94	1.34	4029.67	1370.68



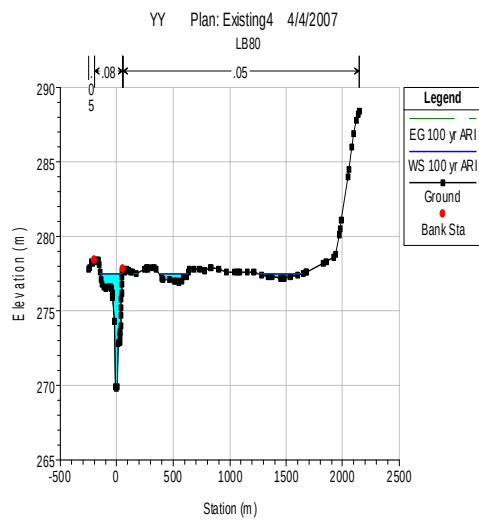
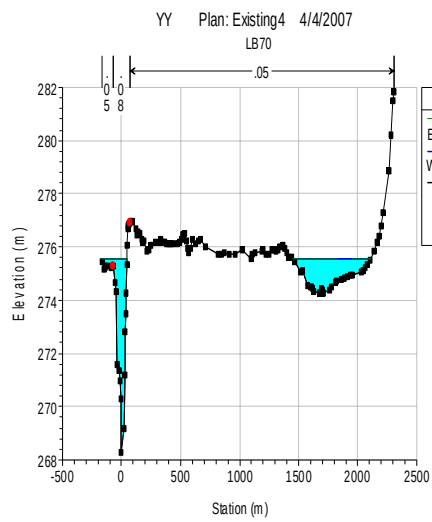
Yarra Yarra Creek (N4) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



Yarra Yarra Creek (N4) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



Billabong Creek (N4) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions



Billabong Creek (N4) Hec-Ras Cross Sections for 100yr ARI flood, Existing Conditions

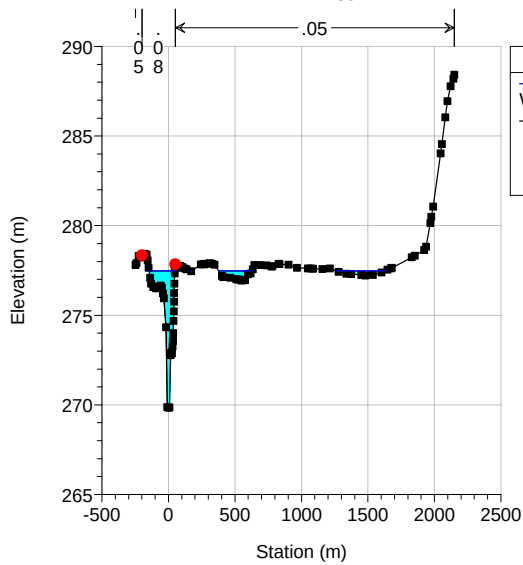
HEC-RAS Plan: Option 4B

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
YY	YY	50	50 yr ARI	350.30	268.45	273.75	273.92	1.86	242.62	628.89
YY	YY	50	100 yr ARI	469.67	268.45	274.03	274.13	1.70	500.56	1143.09
YY	YY	50	2000 yr ARI	1362.25	268.45	275.07	275.09	1.04	2008.05	1609.92
YY	YY	50	5x100 yr ARI	2348.35	268.45	275.74	275.77	0.99	3122.50	1727.09
YY	YY	40	50 yr ARI	350.30	266.60	272.49	272.51	0.67	752.32	1238.21
YY	YY	40	100 yr ARI	469.67	266.60	272.66	272.68	0.70	975.71	1383.32
YY	YY	40	2000 yr ARI	1362.25	266.60	274.86	274.86	0.28	4442.60	1630.19
YY	YY	40	5x100 yr ARI	2348.35	266.60	275.52	275.53	0.35	5537.56	1644.59
YY	YY	30	50 yr ARI	350.30	265.83	271.30	271.33	0.88	615.80	1473.78
YY	YY	30	100 yr ARI	469.67	265.83	271.63	271.65	0.67	1119.71	1549.55
YY	YY	30	2000 yr ARI	1362.25	265.83	274.81	274.81	0.21	6483.51	1833.20
YY	YY	30	5x100 yr ARI	2348.35	265.83	275.45	275.45	0.29	7680.79	1892.17
YY	YY	20	50 yr ARI	350.30	265.44	270.92	270.92	0.42	1165.14	1384.36
YY	YY	20	100 yr ARI	469.67	265.44	271.48	271.49	0.31	1967.86	1443.03
YY	YY	20	2000 yr ARI	1362.25	265.44	274.80	274.80	0.18	7242.52	1767.09
YY	YY	20	5x100 yr ARI	2348.35	265.44	275.43	275.44	0.26	8369.69	1779.57
YY	YY	19	50 yr ARI	350.30	264.26	270.77	270.82	1.04	335.30	794.65
YY	YY	19	100 yr ARI	469.67	264.26	271.35	271.42	1.23	381.82	1057.09
YY	YY	19	2000 yr ARI	1362.25	264.26	274.73	274.78	1.13	1550.81	1628.28
YY	YY	19	5x100 yr ARI	2348.35	264.26	275.37	275.41	1.07	2610.53	1708.18
YY	YY	18		Bridge						
YY	YY	17	50 yr ARI	350.30	262.80	270.48	270.59	1.51	242.59	165.66
YY	YY	17	100 yr ARI	469.67	262.80	270.98	271.12	1.72	282.88	561.98
YY	YY	17	2000 yr ARI	1362.25	262.80	273.16	273.62	2.89	457.36	1367.17
YY	YY	17	5x100 yr ARI	2348.35	262.80	274.36	274.94	3.60	1009.50	1562.74
YY	YY	16	50 yr ARI	350.30	262.80	270.46	270.57	1.52	241.56	163.15
YY	YY	16	100 yr ARI	469.67	262.80	270.96	271.11	1.72	281.72	544.57
YY	YY	16	2000 yr ARI	1362.25	262.80	273.13	273.59	2.91	455.17	1362.73
YY	YY	16	5x100 yr ARI	2348.35	262.80	274.37	274.88	3.46	1067.67	1563.57
YY	YY	15		Bridge						
YY	YY	14	50 yr ARI	350.30	262.50	270.36	270.43	1.15	302.70	584.79
YY	YY	14	100 yr ARI	469.67	262.50	270.80	270.90	1.36	338.30	744.81
YY	YY	14	2000 yr ARI	1362.25	262.50	272.14	272.63	2.91	445.37	1169.64
YY	YY	14	5x100 yr ARI	2348.35	262.50	272.54	273.82	4.64	477.12	1265.64
YY	YY	10	50 yr ARI	350.30	262.79	270.31	270.31	0.26	1297.46	604.72
YY	YY	10	100 yr ARI	469.67	262.79	270.77	270.78	0.32	1622.42	745.19
YY	YY	10	2000 yr ARI	1362.25	262.79	272.28	272.29	0.46	3195.17	1138.00
YY	YY	10	5x100 yr ARI	2348.35	262.79	273.03	273.05	0.58	4051.74	1138.00
LB	LB	80	50 yr ARI	424.25	269.84	276.99	277.06	1.11	382.58	231.49
LB	LB	80	100 yr ARI	599.40	269.84	277.47	277.53	1.14	615.40	811.77
LB	LB	80	2000 yr ARI	1751.34	269.84	278.28	278.33	1.22	1927.97	2034.19
LB	LB	80	5x100 yr ARI	2997.00	269.84	278.66	278.72	1.26	2741.32	2169.99
LB	LB	70	50 yr ARI	424.25	268.28	275.24	275.27	0.81	687.55	695.74
LB	LB	70	100 yr ARI	599.40	268.28	275.53	275.56	0.87	926.04	861.10
LB	LB	70	2000 yr ARI	1751.34	268.28	276.40	276.43	1.15	2284.34	2199.30
LB	LB	70	5x100 yr ARI	2997.00	268.28	276.82	276.87	1.24	3251.30	2315.71
LB	LB	60	50 yr ARI	424.25	267.23	273.75	273.78	0.86	567.84	561.40
LB	LB	60	100 yr ARI	599.40	267.23	274.05	274.08	0.93	763.18	848.50
LB	LB	60	2000 yr ARI	1751.34	267.23	274.81	274.87	1.26	1719.55	1544.97
LB	LB	60	5x100 yr ARI	2997.00	267.23	275.28	275.36	1.40	2468.00	1641.04
LB	LB	50	50 yr ARI	424.25	265.09	271.52	271.58	1.18	440.95	465.32
LB	LB	50	100 yr ARI	599.40	265.09	271.85	271.91	1.15	632.88	717.17
LB	LB	50	2000 yr ARI	1751.34	265.09	273.18	273.21	0.85	2144.58	1379.77
LB	LB	50	5x100 yr ARI	2997.00	265.09	273.88	273.93	0.90	3123.02	1390.62
LB	YY	40	50 yr ARI	719.25	261.85	270.02	270.06	1.03	945.26	682.74
LB	YY	40	100 yr ARI	962.27	261.85	270.45	270.49	1.03	1290.61	878.26

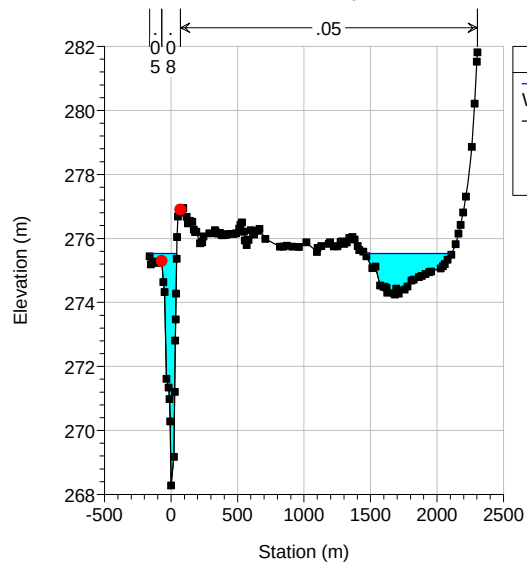
HEC-RAS Plan: Option 4B (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Vel Chnl	Flow Area	Top Width
				(m3/s)	(m)	(m)	(m)	(m/s)	(m2)	(m)
LB	YY	40	2000 yr ARI	2947.17	261.85	271.82	271.88	1.41	2836.55	1462.10
LB	YY	40	5x100 yr ARI	4811.35	261.85	272.43	272.52	1.65	3812.47	1615.29
LB	YY	30	50 yr ARI	719.25	260.62	268.59	268.62	0.98	859.85	483.90
LB	YY	30	100 yr ARI	962.27	260.62	269.00	269.04	1.05	1079.41	605.45
LB	YY	30	2000 yr ARI	2947.17	260.62	270.40	270.48	1.44	2713.77	1760.70
LB	YY	30	5x100 yr ARI	4811.35	260.62	271.05	271.14	1.56	3873.75	1804.71
LB	YY	20	50 yr ARI	719.25	259.77	267.46	267.52	1.17	661.39	407.48
LB	YY	20	100 yr ARI	962.27	259.77	267.84	267.91	1.21	956.61	1018.89
LB	YY	20	2000 yr ARI	2947.17	259.77	269.08	269.16	1.45	2367.44	1257.43
LB	YY	20	5x100 yr ARI	4811.35	259.77	269.79	269.90	1.63	3391.98	1499.74
LB	YY	10	50 yr ARI	719.25	259.15	266.17	266.21	0.93	830.26	498.26
LB	YY	10	100 yr ARI	962.27	259.15	266.59	266.63	0.99	1163.30	984.00
LB	YY	10	2000 yr ARI	2947.17	259.15	268.03	268.09	1.22	2917.56	1305.48
LB	YY	10	5x100 yr ARI	4811.35	259.15	268.86	268.94	1.34	4031.53	1370.79

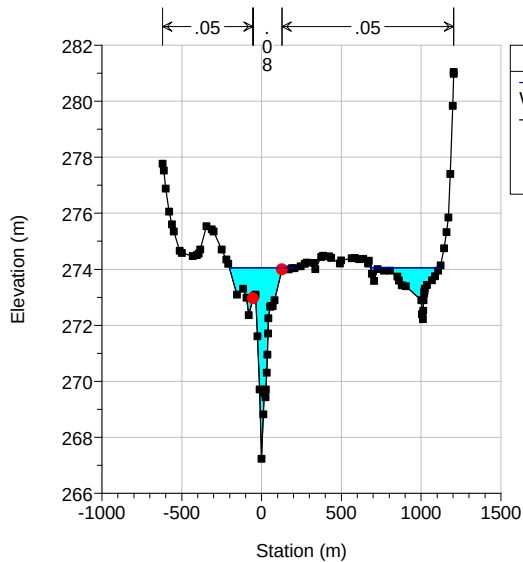
YY Plan: Option 4B 5/4/2007
LB80



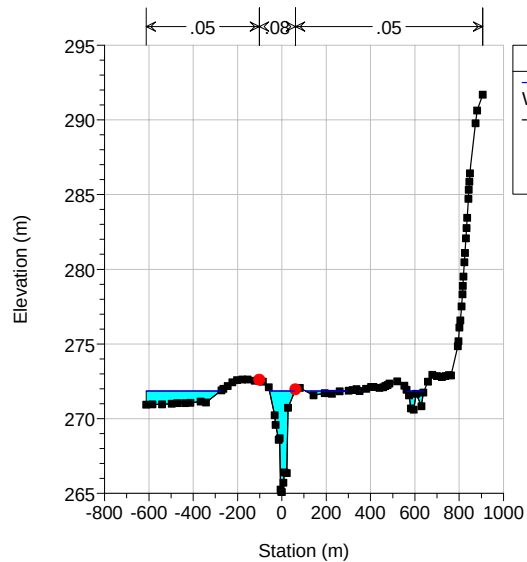
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LB70



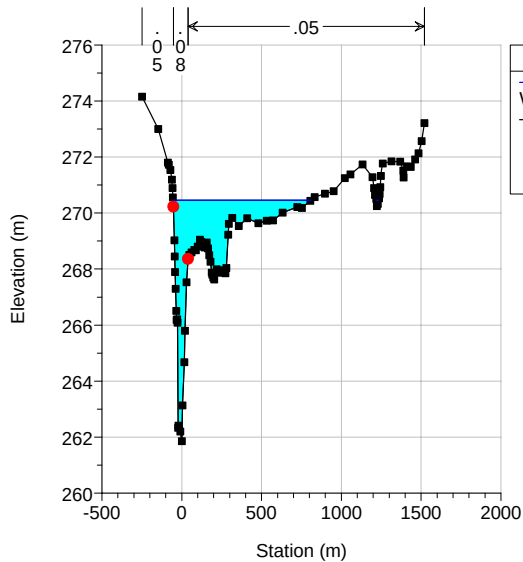
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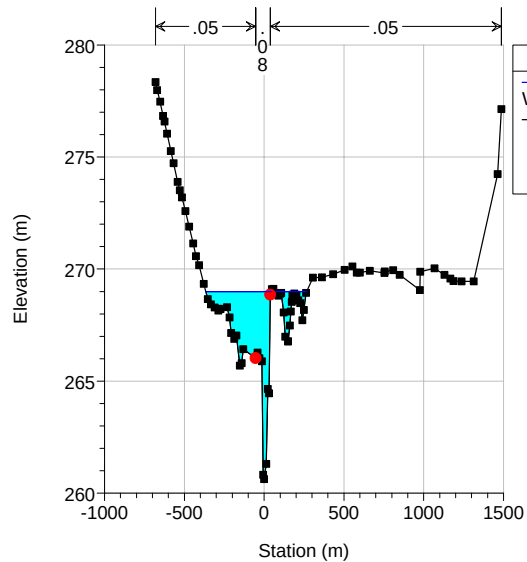
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LB50



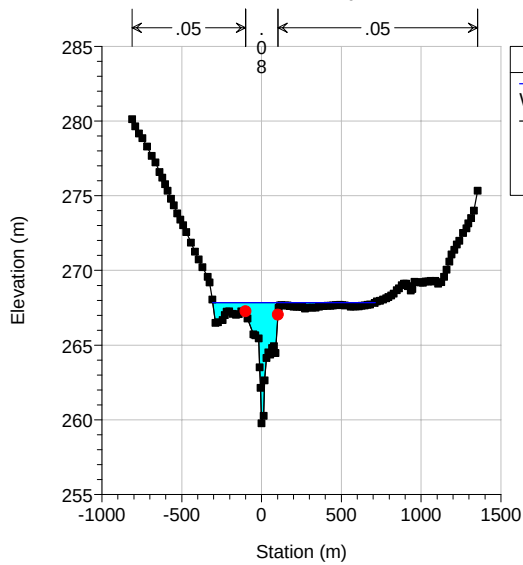
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LB40



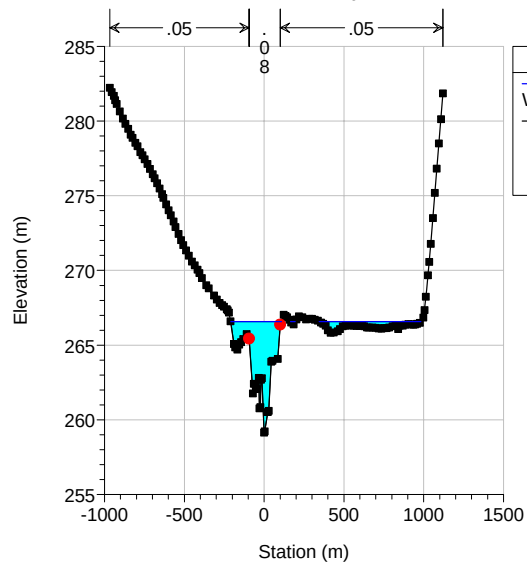
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LB30



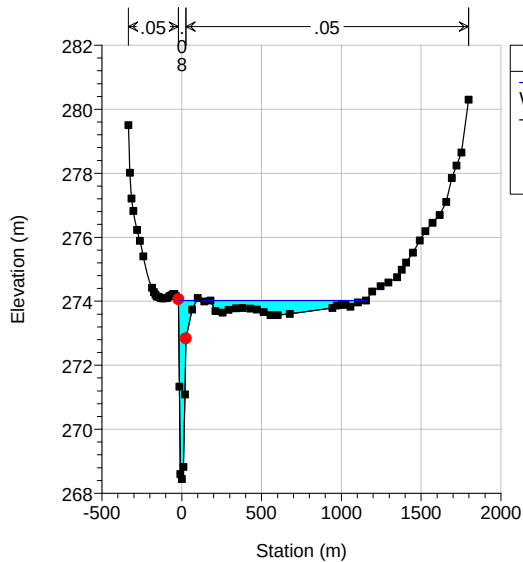
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LB20



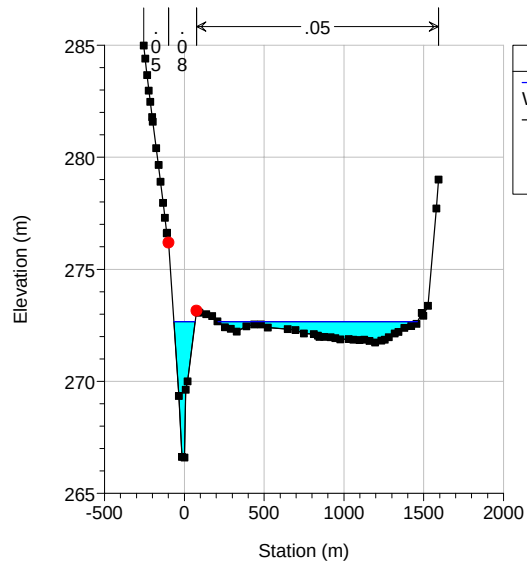
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LB10



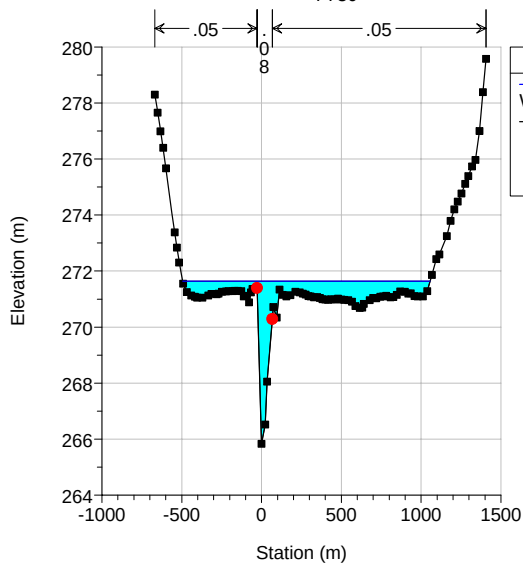
YY Plan: Option 4B 5/4/2007
YY50



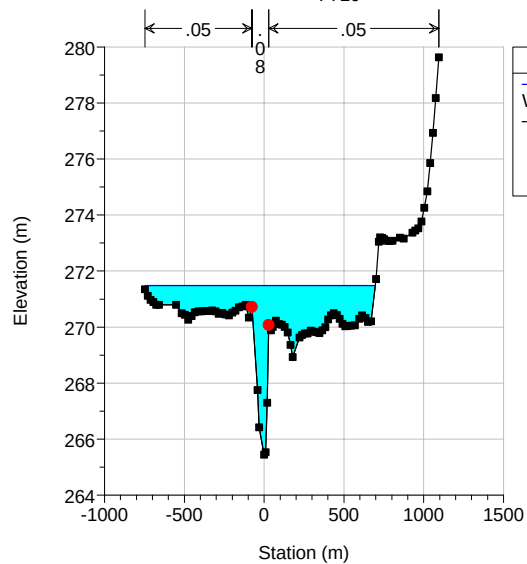
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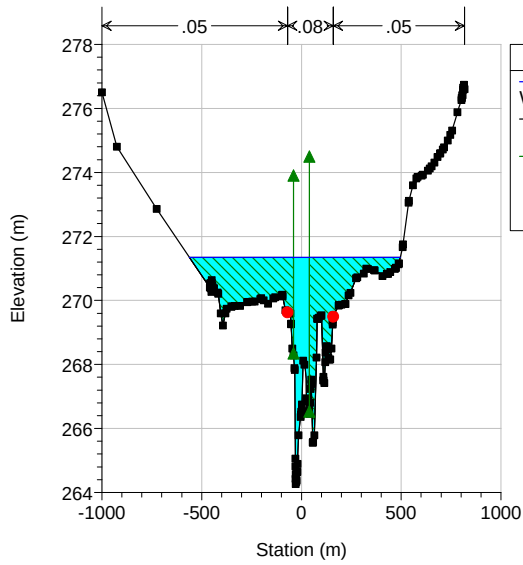
YY Plan: Option 4B 5/4/2007
YY30



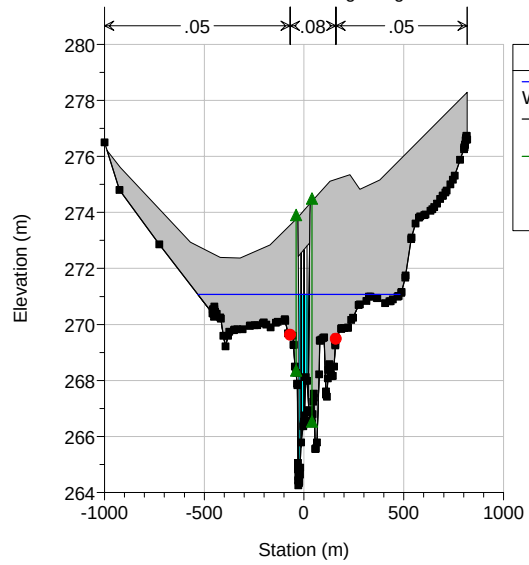
YY Plan: Option 4B 5/4/2007
YY20



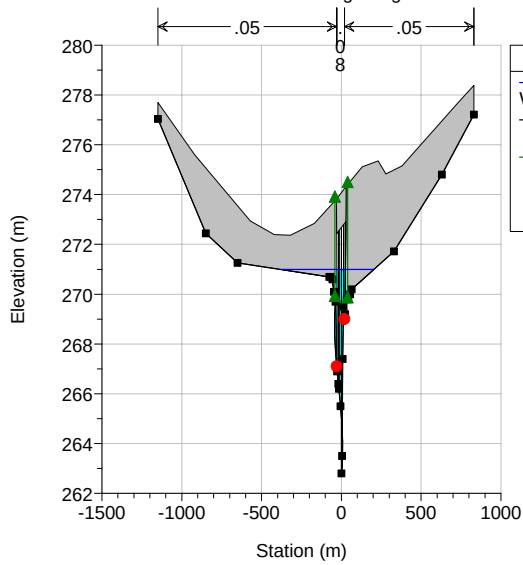
YY Plan: Option 4B 5/4/2007
YY 19



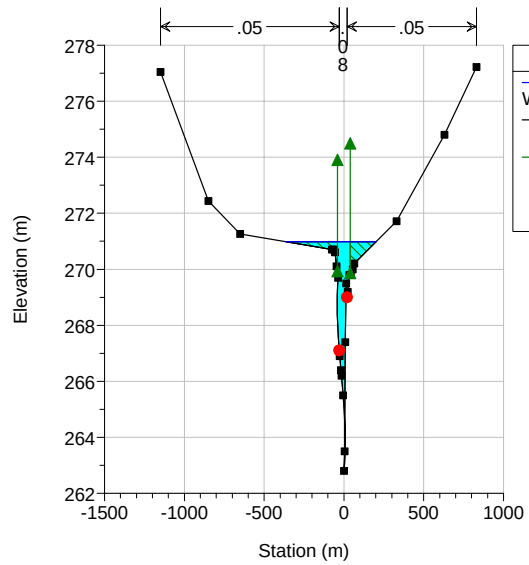
YY Plan: Option 4B 5/4/2007
YY Existing Bridge



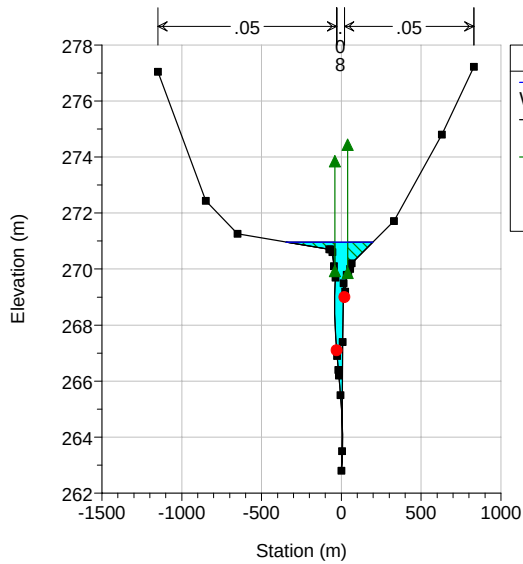
YY Plan: Option 4B 5/4/2007
YY Existing Bridge



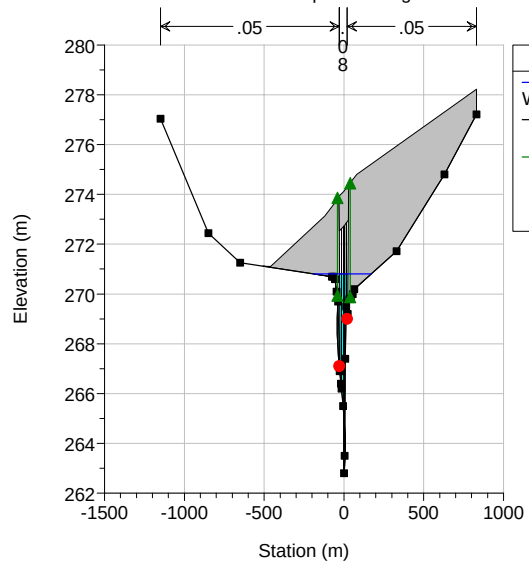
YY Plan: Option 4B 5/4/2007
YY16

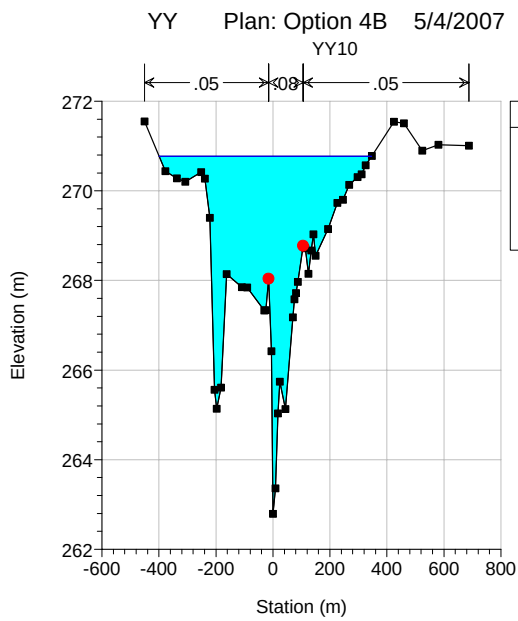
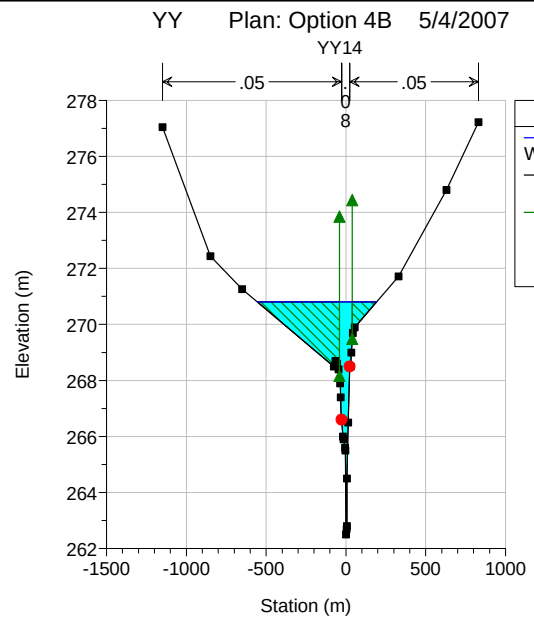
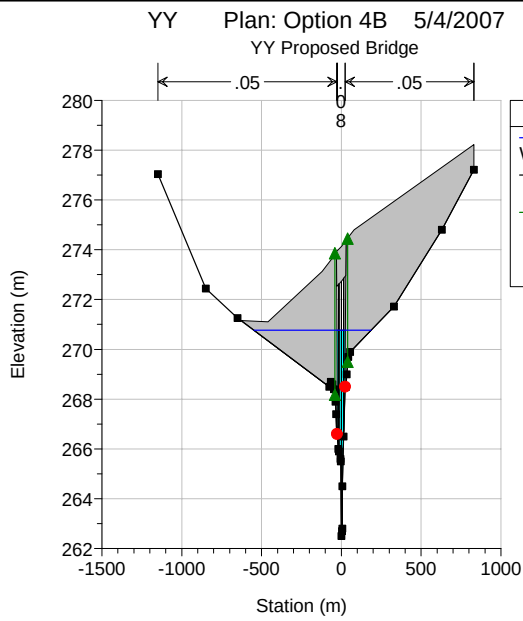


YY Plan: Option 4B 5/4/2007
YY16

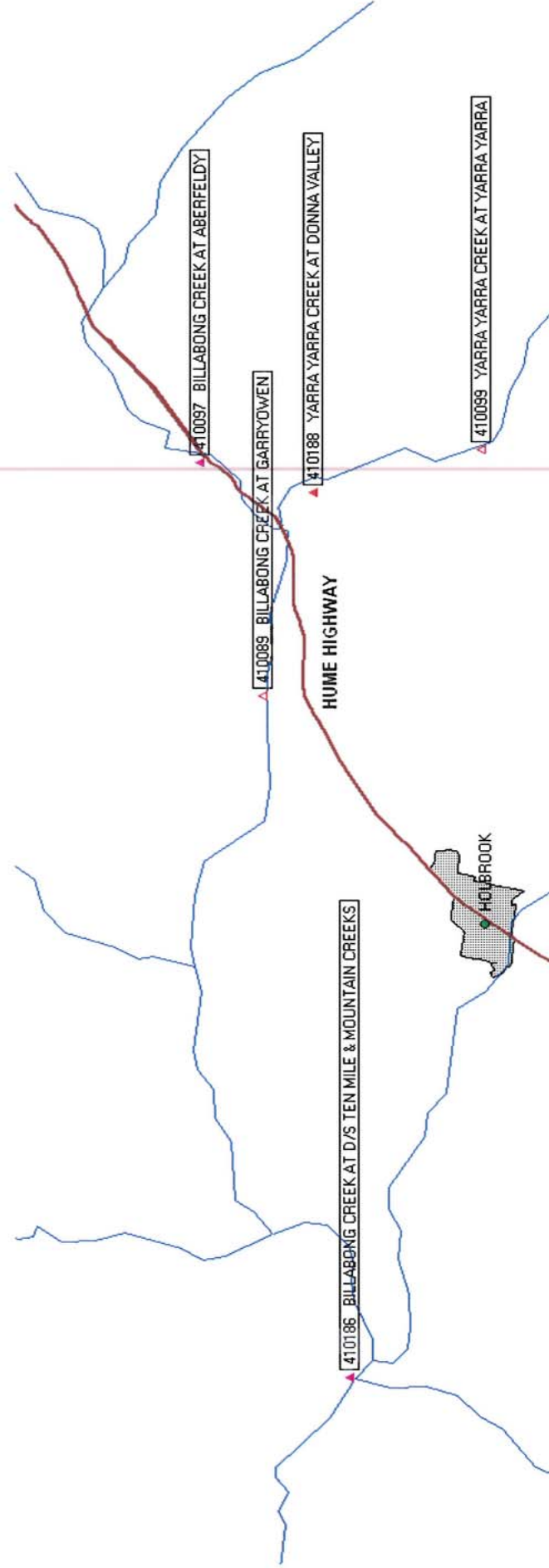


YY Plan: Option 4B 5/4/2007
YY Proposed Bridge





Appendix F – Flood Frequency



Locality Sketch – Streamflow Gauges – Billabong and Yarra Yarra Creeks

Summary of Data
Instantaneous Annual Max

Year	410089 - Billabong Ck @ Garryowen			410097 - Billabong Ck @ Aberfeldy			410099 - Yarra Yarra Ck @ Yarra Yarra		
	ML/d	m ³ /s	Days missing	ML/d	m ³ /s	Days missing	ML/d	m ³ /s	Days missing
1960	38124	441	31						
1961	3921	45.4							
1962	2299	26.6							
1963	2417	28.0							
1964	7645	88.5							
1965	787.7	9.12							
1966	3907	45.2							
1967	51.37	0.59					1.076	0.01	334
1968	5871	68.0		1781	20.6		2179	25.2	31
1969	4704	54.4		4208	48.7		3743	43.3	31
1970	20404	236		6825	79.0		10446	121	
1971	3009	34.8		961.5	11.1		3890	45.0	
1972	1781	20.6		1568	18.1		530.9	6.14	
1973	8978	104		4550	52.7	28	90.52	1.05	275
1974	36958	428		7270	84.1	61			
1975	22090	256		6180	71.5	62			
1976	5049	58.4		2799	32.4				
1977	1615	18.7		876	10.1	61			
1978	4559	52.8		4619	53.5				
1979	3131	36.2		488.4	5.65				
1980	7039	81.5		3918	45.3				
1981	22201	257		2707	31.3	62			
1982	35.23	0.41		10.72	0.12				
1983	46090	533		11672	135				
1984	13115	152		6046	70.0				
1985	3061	35.4		1413	16.4				
1986	23078	267		6400	74.1				
1987	5982	69.2		3242	37.5				
1988	9046	105		2753	31.9				
1989	4766	55.2	122	2905	33.6				
1990				131.5	1.52	214			
1991				108.8	1.26	273			
1992				9638	112				
1993				7131	82.5				
1994				70.49	0.82				
1995				4206	48.7	62			
1996				240.6	2.78	184			
1997				445.5	5.16	181			
1998				2977	34.5				
1999				304.2	3.52	184			
2000				3967	45.9				
2001				33.45	0.39				
2002				7.4	0.09				
2003				1350	15.6				
2004				637.2	7.38				
2005				3789	43.9	31			

Source: Pinneena Version 9 (DNR, 2006)

Frequency Curve - excluding 1967 & 1982

