

# 100-YEAR WATER SURFACE DIFFERENCE

**Method:** At a common section, compare the flow area for pre-project condition and post-project condition for the same flow rate ( $Q_{100}$ ). The differing flow area is then translated to the difference in depth.

Pre-Project

x	y		Depth
0	21.9	20.4	-1.5
31.04	20	20.4	0.4
105.54	18	20.4	2.4
139.84	16	20.4	4.4
236	16.9	20.4	3.5
497.27	16	20.4	4.4
498.04	14	20.4	6.4
499.73	12	20.4	8.4
502.22	10	20.4	10.4
518.96	10	20.4	10.4
522.25	12	20.4	8.4
524.98	14	20.4	6.4
527.05	16	20.4	4.4
602.95	18	20.4	2.4
687.26	18	20.4	2.4
790.67	16.7	20.4	3.7
1028.38	15.4	20.4	5
1156	16	20.4	4.4
1303.8	18	20.4	2.4
1327.8	20	20.4	0.4
1361.91	22	20.4	-1.6
1394.12	24	20.4	-3.6
1406	26	20.4	-5.6

Pre-Project

x	Dist	y	WSEL	Depth	Avg Depth	Area	Σ Area
31.04		20	20.4	0.4			
	74.5				1.4	104.3	104.3
105.54		18	20.4	2.4			
	34.3				3.4	116.62	220.92
139.84		16	20.4	4.4			
	96.16				3.95	379.832	600.752
236		16.9	20.4	3.5			
	261.27				3.95	1032.017	1632.769
497.27		16	20.4	4.4			
	0.77				5.4	4.158	1636.927
498.04		14	20.4	6.4			
	1.69				7.4	12.506	1649.433
499.73		12	20.4	8.4			

	2.49				9.4	23.406	1672.839
502.22		10	20.4	10.4			
	16.74				10.4	174.096	1846.935
518.96		10	20.4	10.4			
	3.29				9.4	30.926	1877.861
522.25		12	20.4	8.4			
	2.73				7.4	20.202	1898.063
524.98		14	20.4	6.4			
	2.07				5.4	11.178	1909.241
527.05		16	20.4	4.4			
	75.9				3.4	258.06	2167.301
602.95		18	20.4	2.4			
	84.31				2.4	202.344	2369.645
687.26		18	20.4	2.4			
	103.41				3.05	315.4005	2685.045
790.67		16.7	20.4	3.7			
	237.71				4.35	1034.039	3719.084
1028.38		15.4	20.4	5			
	127.62				4.7	599.814	4318.898
1156		16	20.4	4.4			
	147.8				3.4	502.52	4821.418
1303.8		18	20.4	2.4			
	24				1.4	33.6	4855.018
1327.8		20	20.4	0.4			

V = 0.968071

Post-Project

x	y		Depth
0	21.9	20.4	-1.5
31.04	20	20.4	0.4
105.54	18	20.4	2.4
139.84	16	20.4	4.4
236	16.9	20.4	3.5
497.27	16	20.4	4.4
502.27	10	20.4	10.4
543.27	10	20.4	10.4
557.27	16.9	20.4	3.5
602.95	18	20.4	2.4
687.26	18	20.4	2.4
790.67	16.7	20.4	3.7
1028.38	15.4	20.4	5
1156	16	20.4	4.4
1303.8	18	20.4	2.4
1327.8	20	20.4	0.4
1361.91	22	20.4	-1.6
1394.12	24	20.4	-3.6
1406	26	20.4	-5.6

x	Dist	y	WSEL	Depth	Avg Depth	Area	Σ Area
31.04		20	20.4	0.4			
	74.5				1.4	104.3	104.3
105.54		18	20.4	2.4			
	34.3				3.4	116.62	220.92
139.84		16	20.4	4.4			
	96.16				3.95	379.832	600.752
236		16.9	20.4	3.5			
	261.27				3.95	1032.017	1632.769
497.27		16	20.4	4.4			
	5				7.4	37	1669.769
502.27		10	20.4	10.4			
	41				10.4	426.4	2096.169
543.27		10	20.4	10.4			
	14				6.95	97.3	2193.469
557.27		16.9	20.4	3.5			
	45.68				2.95	134.756	2328.225
602.95		18	20.4	2.4			
	84.31				2.4	202.344	2530.569
687.26		18	20.4	2.4			
	103.41				3.05	315.4005	2845.969
790.67		16.7	20.4	3.7			
	237.71				4.35	1034.039	3880.008
1028.38		15.4	20.4	5			
	127.62				4.7	599.814	4479.822
1156		16	20.4	4.4			
	147.8				3.4	502.52	4982.342
1303.8		18	20.4	2.4			
	24				1.4	33.6	5015.942
1327.8		20	20.4	0.4			

V<sub>begin</sub> = 0.937013 fps

W<sub>total</sub> = 1296.76 ft

**D<sub>reduced</sub> = 0.12 ft in depth reduction**

ΔA = 160.924 sf