

VESTAL

CREEK

3.00

1.00

WATER SURFACE ELEVATION AND ENERGY GRADIENT AT THE STARTING CROSS-SECTION OF A  
 STREAM DETERMINED BY AN INTERATIVE PROCEDURE USING THE STANDARD STEP METHOD.  
 COMPUTATIONAL PROCEDURE FORMULATED AND COMPUTER PROGRAM WRITTEN BY  
 DR. CHIRANJIB K. SARKAR, P. E.  
 DALTON \* DALTON \* LITTLE \* NEWPORT, BETHESDA, MARYLAND,

RANDOLPH VESTAL 3 .00866670 1

THE DATA ARE REPRODUCED AS FOLLOWS.

QT	4	642.00	1179.00	1485.00	2280.00							
NC		.1360	.1360	.0610	.1000	.3000						
X1	202.0090		12	1088.00	1125.00	0.	0.	0.				
GR	659.80	1000.00	654.30	1020.00	647.50	1040.00	646.40	1050.00	644.20	1088.00		
	642.00	1090.00	641.50	1124.00	646.10	1125.00	650.40	1150.00	652.00	1165.00		
	655.00	1170.00	658.40	1191.00								
ELMIN( 1)		641.50										
NC		.1360	.1360	.0610	.1000	.3000						
X1	192.0000		10	1057.00	1084.00	400.00	0.	0.				
GR	659.10	1000.00	648.90	1036.00	647.80	1050.00	646.20	1057.00	645.00	1060.00		
	645.30	1075.00	648.90	1084.00	653.30	1087.00	654.40	1100.00	660.20	1128.00		
ELMIN( 2)		645.00										

RESULTS ARE PRINTED AS FOLLOWS.

ADDITIONAL INFORMATION OTHER THAN THOSE PRINTED, IF DESIRED, MAY BE OBTAINED BY INCORPORATING ADDITIONAL PRINT STATEMENTS IN THE MAIN PROGRAM.

642.50	503.58	647.50	16312.59	644.52	16312.59	6896.18
644.52	4342.35	647.50	16312.59	645.16	4342.35	6896.18
645.16	6180.11	647.50	16312.59	645.32	6180.11	6896.18
645.32	6710.96	647.50	16312.59	645.36	6710.96	6896.18

NO. OF TRIALS FOR CONVEYANCE BALANCING AT DOWNSTREAM SECTION = 6 DIS= 642.0

DISCHARGE = 642.0 TRIAL NO.= 1 DIFF. BET. TWO SUCC. WATER EL.= -.893 WSEL(1) = 645.365 WSEL(2) = 648.879

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
645.36	.008786	.370006	8.	634.	0.	.713	4.910	0.	1.144	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
648.88	.022231	.819395	33.	609.	0.	1.609	7.445	0.	1.340	1	0

DISCHARGE = 642.0 TRIAL NO.= 2 DIFF. BET. TWO SUCC. WATER EL.= -.564 WSEL(1) = 644.472 WSEL(2) = 649.457

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
644.47	.023238	.690681	0.	642.	0.	.440	6.667	0.	1.012	1	1

SECTION NUMBER = 192.00

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WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
649.46	.011770	.532279	50.	592.	0.	1.504	6.078	.345	1.420	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 3 DIFF. BET. TWO SUCC. WATER EL.= 1.043 WSEL(1) = 643.908 WSEL(2) = 650.510

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
643.91	.0502081	.119188	0.	642.	0.	0.	8.484	0.	1.000	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
650.51	.004605	.282225	74.	567.	0.	1.250	4.509	.438	1.525	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 4 DIFF. BET. TWO SUCC. WATER EL.= .473 WSEL(1) = 644.952 WSEL(2) = 650.213

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
644.95	.013375	.487030	3.	639.	0.	.657	5.611	0.	1.071	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
650.21	.005862	.332212	68.	574.	0.	1.320	4.869	.431	1.498	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 5 DIFF. BET. TWO SUCC. WATER FL.= -.737 WSEL(1) = 645.424 WSEL(2) = 648.990

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
645.42	.008298	.356189	9.	633.	0.	.717	4.821	0.	1.156	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
648.99	.019560	.750429	36.	606.	0.	1.591	7.143	.132	1.358	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 6 DIFF. BET. TWO SUCC. WATER EL.= -.741 WSEL(1) = 644.688 WSEL(2) = 649.280

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
644.69	.017946	.587426	1.	641.	0.	.571	6.152	0.	1.034	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
649.28	.014149	.602873	45.	597.	0.	1.542	6.444	.293	1.398	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 7 DIFF. BET. TWO SUCC. WATER EL.= .719 WSEL(1) = 643.946 WSEL(2) = 650.284

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
643.95	.047424	1.079522	0.	642.	0.	0.	8.333	0.	1.000	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
650.28	.005526	.319235	70.	572.	0.	1.303	4.779	.433	1.505	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 8 DIFF. BET. TWO SUCC. WATER EL.= .736 WSEL(1) = 644.665 WSEL(2) = 650.415

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
644.66	.018426	.597285	1.	641.	0.	.560	6.203	0.	1.031	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
650.42	.004965	.296929	72.	569.	0.	1.272	4.619	.436	1.517	1	1

DISCHARGE = 642.0 TRIAL NO.= 9 DIFF. BET. TWO SUCC. WATER EL.= -.545 WSEL(1) = 645.401 WSEL(2) = 649.174

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
645.40	.008487	.361566	9.	533.	0.	.716	4.856	0.	1.151	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.17	.015887	.652017	42.	600.	0.	1.563	6.686	.249	1.384	1	1

DISCHARGE = 642.0 TRIAL NO.= 10 DIFF. BET. TWO SUCC. WATER EL.= -.785 WSEL(1) = 644.856 WSEL(2) = 649.185

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
644.86	.014841	.520647	2.	640.	0.	.632	5.797	0.	1.057	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.18	.015691	.646559	42.	600.	0.	1.561	6.660	.255	1.386	1	1

DISCHARGE = 642.0 TRIAL NO.= 11 DIFF. BET. TWO SUCC. WATER EL.= .366 WSEL(1) = 644.071 WSEL(2) = 650.060

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
644.07	.039609	.963172	0.	642.	0.	0.	7.871	0.	1.000	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
650.06	.006681	.362929	65.	577.	0.	1.357	5.076	.424	1.484	1	1	1

DISCHARGE = 642.0 TRIAL NO. = 12 DIFF. BET. TWO SUCC. WATER EL. = .856 WSEL(1) = 644.436 WSEL(2) = 650.468

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
644.44	.024303	.710191	0.	642.	0.	.410	6.760	0.	1.009	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
650.47	.004761	.288631	73.	568.	0.	1.260	4.557	.437	1.521	1	1	1

DISCHARGE = 642.0 TRIAL NO. = 13 DIFF. BET. TWO SUCC. WATER EL. = -.313 WSEL(1) = 645.292 WSEL(2) = 649.416

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
645.29	.009433	.387831	7.	635.	0.	.708	5.023	0.	1.130	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR	
649.42	.012279	.547747	49.	593.	0.	1.513	6.160	.335	1.415	1	1	1

DISCHARGE = 642.0 TRIAL NO.= 14 DIFF. BET. TWO SUCC. WATER EL.= -.753 WSEL(1) = 644.979 WSEL(2) = 649.153

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
644.98	.012989	.477933	3.	639.	0.	.663	5.559	0.	1.076	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.15	.016250	.662034	41.	601.	0.	1.567	6.734	.239	1.381	1	1

DISCHARGE = 642.0 TRIAL NO.= 15 DIFF. BET. TWO SUCC. WATER EL.= .105 WSEL(1) = 644.225 WSEL(2) = 649.890

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
644.23	.03733	.842278	0.	642	0.	.106	7.360	0.	1.000	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.89	.007773	.402062	61.	581.	0.	1.399	5.327	.411	1.467	1	1

DISCHARGE = 642.0 TRIAL NO.= 16 DIFF. BET. TWO SUCC. WATER EL.= .808 WSEL(1) = 644.331 WSEL(2) = 650.397

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
644.33	.027828	.772321	0.	642.	0.	.296	7.048	0.	1.003	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
650.40	.005037	.299838	72.	570.	0.	1.276	4.640	.436	1.515	1	1

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DISCHARGE = 642.0 TRIAL NO.= 17 DIFF. BET. TWO SUCC. WATER EL.= -.109 WSEL(1) = 645.139 WSEL(2) = 649.625

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
645.14	.010994	.428902	5.	637.	0.	.691	5.274	0.	1.103	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.62	.009966	.475641	54.	588.	0.	1.464	5.765	.378	1.439	1	1

DISCHARGE = 642.0 TRIAL NO.= 18 DIFF. BET. TWO SUCC. WATER EL.= -.695 WSEL(1) = 645.030 WSEL(2) = 649.172

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
645.03	.012310	.461618	4.	638.	0.	.674	5.466	0.	1.084	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.17	.015911	.652670	42.	600.	0.	1.563	6.689	.249	1.384	1	1

RESULTS CORRESPONDING TO DISCHARGE = 642.00

NO. OF TRIALS TO ACHIEVE CONVERGENCE = 19

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
644.33	.027693	.770008	0.	642.	0.	.300	7.038	0.	1.003	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VROB	ALPHA	NCL	NC	NCR
649.78	.008632	.431594	58.	584.	0.	1.427	5.507	.399	1.455	1	1

HOWEVER, IF THE INITIAL ESTIMATE OF ENERGY SLOPE OF THIS PROGRAM IS USED IN HEC2 AT THE STARTING X-SEC. (NO. = 192.00), THE WATER SURFACE ELEVATION AT THIS SECTION WILL BE IN ERROR BY .016 FEET. NEGATIVE ERROR INDICATES THAT THE INCORRECT WATER SURFACE ELEVATION WOULD HAVE BEEN HIGHER, AND THE POSITIVE, LOWER.

642.50 503.59 647.50 16312.59 646.35 16312.59 12664.49

646.35 10545.06 647.50 16312.59 646.77 10545.06 12664.49

646.77 12500.84 647.50 16312.59 646.80 12500.84 12664.49

NO. OF TRIALS FOR CONVEYANCE BALANCING AT DOWNSTREAM SECTION = 5 DIS= 1179.0

DISCHARGE = 1179.0 TRIAL NO.= 1 DIFF. BET. TWO SUCC. WATER EL.= -.725 WSEL(1) = 646.802 WSEL(2) = 650.274

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVL0B	VCH	VROB	ALPHA	NCL	NC	NCR
646.80	.008682	.538029	73.	1105.	1.	1.265	6.067	.501	1.451	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVL0B	VCH	VROB	ALPHA	NCL	NC	NCR
650.27	.0187821	.082294	128.	1051.	1.	2.397	8.798	.795	1.504	1	1

DISCHARGE = 1179.0 TRIAL NO.= 2 DIFF. BET. TWO SUCC. WATER EL.= -.529 WSEL(1) = 646.077 WSEL(2) = 650.618

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVL0B	VCH	VROB	ALPHA	NCL	NC	NCR
646.08	.015673	.808760	40.	1139.	0.	1.310	7.333	0.	1.291	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVL0B	VCH	VROB	ALPHA	NCL	NC	NCR
650.62	.014277	.899137	140.	1038.	1.	2.250	8.062	.805	1.534	1	1

DISCHARGE = 1179.0 TRIAL NO.= 3 DIFF. BET. TWO SUCC. WATER EL.= .396 WSEL(1) = 645.548 WSEL(2) = 651.447

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
645.55	.0249191	111384	21.	1158.	0.	1.324	8.529	0.	1.180	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
651.45	.007935	.604452	167.	1011.	2.	1.939	6.688	.780	1.601	1	1	1

DISCHARGE = 1179.0 TRIAL NO.= 4 DIFF. BET. TWO SUCC. WATER EL.= .531 WSEL(1) = 645.944 WSEL(2) = 651.690

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
645.94	.017529	.874166	35.	1144.	0.	1.319	7.608	0.	1.263	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
651.69	.006789	.543922	173.	1004.	2.	1.859	6.364	.757	1.619	1	1	1

DISCHARGE = 1179.0 TRIAL NO.= 5 DIFF. BET. TWO SUCC. WATER EL.= -.165 WSEL(1) = 646.474 WSEL(2) = 650.965

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
646.47	.011253	.645237	57.	1122.	0.	1.274	6.598	.376	1.382	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
650.96	.011039	.755653	152.	1026.	1.	2.113	7.429	.800	1.563	1	1	1

DISCHARGE = 1179.0 TRIAL NO. = 6 DIFF. BET. TWO SUCC. WATER EL. = -.411 WSEL(1) = 646.309 WSEL(2) = 650.690

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
646.31	.012890	.708438	49.	1130.	0.	1.284	6.891	.273	1.344	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
650.69	.013519	.866611	143.	1035.	1.	2.221	7.924	.805	1.541	1	1	1

RESULTS CORRESPONDING TO DISCHARGE = 1179.00

NO. OF TRIALS TO ACHIEVE CONVERGENCE = 7

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
645.90	.018228	.898099	33.	1146.	0.	1.321	7.705	0.	1.253	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
651.07	.010266	.719475	155.	1023.	1.	2.074	7.260	.797	1.571	1	1	1

HOWEVER, IF THE INITIAL ESTIMATE OF ENERGY SLOPE OF THIS PROGRAM IS USED IN HEC2 AT THE STARTING X-SEC. (NO. = 192.00), THE WATER SURFACE ELEVATION AT THIS SECTION WILL BE IN ERROR BY -.227 FEET. NEGATIVE ERROR INDICATES THAT THE INCORRECT WATER SURFACE ELEVATION WOULD HAVE BEEN HIGHER, AND THE POSITIVE, LOWER.

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642.50 503.58 647.50 16312.59 647.39 16312.59 15951.46

647.39 15678.73 647.50 16312.59 647.43 15678.73 15951.46

NO. OF TRIALS FOR CONVEYANCE BALANCING AT DOWNSTREAM SECTION = 4 DIS= 1485.0

DISCHARGE = 1485.0 TRIAL NO.= 1 DIFF. BET. TWO SUCC. WATER EL.= -.701 WSEL(1) = 647.435 WSEL(2) = 650.902

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
647.43	.008669	.614054	130.	1351.	4.	1.511	6.572	.769	1.577	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
650.90	.0183211	.235919	189.	1295.	1.	2.691	9.493	1.010	1.558	1	1

DISCHARGE = 1485.0 TRIAL NO.= 2 DIFF. BET. TWO SUCC. WATER EL.= -.534 WSEL(1) = 646.734 WSEL(2) = 651.168

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
646.73	.014509	.885375	88.	1396.	1.	1.598	7.772	.606	1.437	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
651.17	.0151871	.088706	199.	1284.	2.	2.566	8.943	.999	1.579	1	1

DISCHARGE = 1485.0 TRIAL NO.= 3 DIFF. BET. TWO SUCC. WATER EL.= .284 WSEL(1) = 646.200 WSEL(2) = 651.995

SECTION NUMBER = 202.00

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WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
646.20	.0223971	.195292	56.	1429.	0.	1.633	8.934	.220	1.319	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
651.99	.008935	.760365	229.	1253.	3.	2.223	7.553	.942	1.642	1	1	1

DISCHARGE = 1485.0 TRIAL NO. = 4 DIFF. BET. TWO SUCC. WATER EL. = .511 WSEL(1) = 646.484 WSEL(2) = 652.332

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
646.48	.0177181	.018268	72.	1413.	0.	1.605	8.290	.479	1.384	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
652.33	.007343	.665700	239.	1242.	4.	2.103	7.096	.915	1.666	1	1	1

RESULTS CORRESPONDING TO DISCHARGE = 1485.00

NO. OF TRIALS TO ACHIEVE CONVERGENCE = 5

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
646.99	.011900	.769739	104.	1380.	2.	1.574	7.288	.690	1.490	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
651.73	.010500	.848146	220.	1262.	3.	2.325	7.951	.963	1.622	1	1	1

HOWEVER, IF THE INITIAL ESTIMATE OF ENERGY SLOPE OF THIS PROGRAM IS USED IN HEC2 AT THE STARTING X-SEC.(NO.= 192.00), THE WATER SURFACE ELEVATION AT THIS SECTION WILL BE IN ERROR BY -.293 FEET.

NEGATIVE ERROR INDICATES THAT THE INCORRECT WATER SURFACE ELEVATION WOULD HAVE BEEN HIGHER, AND THE POSITIVE, LOWER.

647.50 16312.59 652.50 58441.68 648.47 58441.68 24491.12

648.47 22382.75 652.50 58441.68 648.71 22382.75 24491.12

648.71 24007.45 652.50 58441.68 648.76 24007.45 24491.12

NO. OF TRIALS FOR CONVEYANCE BALANCING AT DOWNSTREAM SECTION = 6 DIS= 2280.0

DISCHARGE = 2280.0 TRIAL NO.= 1 DIFF. BET. TWO SUCC. WATER EL.= -.684 WSEL(1) = 648.760 WSEL(2) = 652.257

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
648.76	.008744	.775213	317.	1938.	25.	2.087	7.611	1.224	1.749	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
652.26	.0180661	.615440	364.	1910.	5.	3.269	11.044	1.415	1.660	1	1

DISCHARGE = 2280.0 TRIAL NO.= 2 DIFF. BET. TWO SUCC. WATER EL.= -.569 WSEL(1) = 648.076 WSEL(2) = 652.353

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
648.08	.0132721	.054750	261.	2005.	14.	2.224	8.745	1.236	1.671	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR
652.35	.0171071	.556798	369.	1906.	6.	3.219	10.853	1.403	1.667	1	1

DISCHARGE = 2280.0 TRIAL NO.= 3 DIFF. BET. TWO SUCC. WATER EL.= .116 WSEL(1) = 647.507 WSEL(2) = 653.158

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SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
647.51	.0194431	.396632	206.	2067.	7.	2.302	9.927	1.193	1.591	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
653.16	.0111321	.162974	404.	1868.	8.	2.840	9.464	1.301	1.722	1	1	1

DISCHARGE = 2280.0 TRIAL NO. = 4 DIFF. BET. TWO SUCC. WATER EL. = .457 WSEL(1) = 647.622 WSEL(2) = 653.651

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
647.62	.0179411	.316586	218.	2054.	8.	2.291	9.666	1.208	1.609	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
653.65	.008764	.989440	425.	1847.	8.	2.644	8.771	.942	1.764	1	1	1

RESULTS CORRESPONDING TO DISCHARGE = 2280.00

NO. OF TRIALS TO ACHIEVE CONVERGENCE = 5

SECTION NUMBER = 202.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
648.08	.0132421	.052991	261.	2005.	14.	2.223	9.739	1.237	1.672	1	1	1

SECTION NUMBER = 192.00

WSEL	EG	HV	QLOB	QCH	QROBVLOB	VCH	VR0B	ALPHA	NCL	NC	NCR	
653.30	.0103861	.109381	410.	1861.	8.	2.781	9.257	1.284	1.731	1	1	1

1.		RANDOLPH	VESTAL	3	.00866667	1					
2.	QT	4	1017	1837	2299	3500					
3.	NC	.136	.136	.061	.1	.3					
4.	X1	201	11	1132	1215						
5.	GR	650.8	1000	647.3	1050	644.1	1100	639.9	1132	638.2	1134
6.	GR	638.9	1212	640.2	1215	640.8	1250	644.2	1300	646.7	1350
7.	GR	649.3	1385								
8.	NC	.136	.136	.061	.1	.3					
9.	X1	202	12	1088	1125	300.81	300.96	300.			
10.	GR	659.8	1000	654.3	1020	647.5	1040	646.4	1050	644.2	1088
11.	GR	642.	1090	641.5	1124	646.1	1125	650.4	1150	652.	1165
12.	GR	655.	1170	658.4	1191						

4

	RANDOLPH	VESTAL										
1.	OT 4	1017	1837	3	2299	.014	3500	1				
2.	NC .136	.136	.061		.1	.3						
3.	X1 201	11	1132		1215							
4.	GR 650.8	1000	647.3		1050	644.1	1100	639.9	1132	638.2	1134	
5.	GR 638.9	1212	640.2		1215	640.8	1250	644.2	1300	646.7	1350	
6.	GR 649.3	1385										
7.	NC .136	.136	.061		.1	.3						
8.	X1 202	12	1088		1125	300.81	300.96	300.	1050	644.2	1088	
9.	GR 659.8	1000	654.3		1020	647.5	1040	646.4	1050	644.2	1088	
10.	GR 642.	1090	641.5		1124	646.1	1125	650.4	1150	652.	1165	
11.	GR 655.	1170	658.4		1191							
12.												

4A

1.		RANDOLPH	VESTAL	3	.00866667	1					
2.	OT	4	642	1179	1485	2280					
3.	NC	.136	.136	.061	.1	.3					
4.1	X1	202	12	1088	1125						
4.2	GR	659.8	1000	654.3	1020	647.5	1040	646.4	1050	644.2	1088
4.3	GR	642.	1090	641.5	1124	646.1	1125	650.4	1150	652.	1165
4.4	GR	655.	1170	658.4	1191						
8.	NC	.136	.136	.061	.1	.3					
11.	X1	192	10	1057	1084	400.	400.	400.			
12.	GR	659.1	1000	648.9	1036	647.8	1050	646.2	1057	645.0	1060
13.	GR	645.3	1075	648.9	1084	653.3	1087	654.4	1100	660.2	1128

4B