

WTS 3 Appendix 4

*Hydraulic Modeling for Swift Bypass Reach
and Speelyai Creek*

WTS 3 Appendix 4

This appendix contains input cross sections and output files from WINXSPRO runs for the Swift bypass reach and Speelyai Creek. The bold horizontal lines on the cross section graphs indicate the upper and lower bounds of the hydraulic modeling.

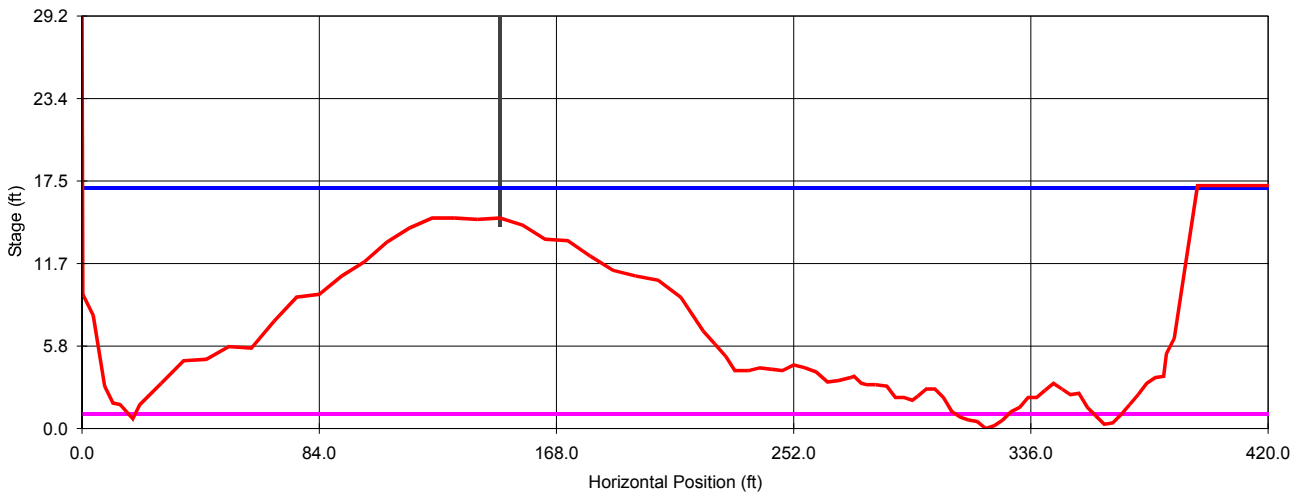
Swift Bypass Reach:

- Habitat Unit 6
- Habitat Unit 18
- Habitat Unit 45

Speelyai Creek:

- Lower Speelyai Site A
- Lower Speelyai Site B
- Lower Speelyai Site C
- Lower Speelyai Site D
- Lower Speelyai Site E
- Lower Speelyai Site F1
- Lower Speelyai Site F2
- Upper Speelyai Site 1
- Upper Speelyai Site 2
- Upper Speelyai Site 3
- Speelyai Bridge at Gravel Sample Site B
- Speelyai Bridge at Habitat Unit 125
- Speelyai Bridge at Habitat Unit 150
- Speelyai Cabin at Habitat Unit 116

Swift Bypass Habitat Unit 6



*****WinXSPRO*****

C:\WXSPRO20\LEWIS\GEO6.OUT
 Input File: C:\WXSPRO20\LEWIS\GEO6.DAT
 Run Date: 06/04/01
 Analysis Procedure: Hydraulics & Regression
 Cross Section Number: 6
 Survey Date: 03/07/01
 Transect 6 - Spawning transect

Subsections/Dividing stations
 B / 148.00/ A

Resistance Method: Manning's n
 SECTION B A
 Low Stage n 0.070 0.070
 High Stage n 0.080 0.070

STAGE#	SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
1	B	13.63	28.27	28	0.48	0.49	0.005	0.07	0.92	12.57	0.15
1	A	0.32	2.19	2.1	0.14	0.15	0.005	0.07	0.41	0.13	0.04
1	T	13.94	30.46	30.1	0.46	0.46	0.005	0.069	0.91	12.7	0.14
2	B	51.71	47.08	46.33	1.1	1.12	0.005	0.071	1.58	81.81	0.34
2	A	6.5	11.87	11.5	0.55	0.57	0.005	0.07	1.01	6.55	0.17
2	T	58.21	58.95	57.83	0.99	1.01	0.005	0.069	1.52	88.36	0.31
3	B	120.69	86.9	85.55	1.39	1.41	0.005	0.072	1.83	221.08	0.43
3	A	21.75	19.66	19	1.11	1.14	0.005	0.07	1.61	35.01	0.35
3	T	142.44	106.56	104.55	1.34	1.36	0.005	0.071	1.8	256.09	0.42
4	B	228.35	121.91	120.19	1.87	1.9	0.005	0.072	2.21	505.61	0.58
4	A	43.65	26.04	24.8	1.68	1.76	0.005	0.07	2.12	92.7	0.52
4	T	272	147.95	144.99	1.84	1.88	0.005	0.072	2.2	598.31	0.57
5	B	372.66	154.95	152.49	2.41	2.44	0.005	0.073	2.59	965.46	0.75
5	A	72.49	40.3	38.49	1.8	1.88	0.005	0.07	2.23	161.39	0.56
5	T	445.16	195.25	190.98	2.28	2.33	0.005	0.072	2.53	1126.85	0.71
6	B	528.04	161.65	158.78	3.27	3.33	0.005	0.074	3.15	1661.82	1.02
6	A	117.84	58.03	55.66	2.03	2.12	0.005	0.07	2.41	284.4	0.63
6	T	645.88	219.69	214.44	2.94	3.01	0.005	0.072	3.01	1946.22	0.92
7	B	689.99	167.95	164.59	4.11	4.19	0.005	0.074	3.63	2506.35	1.28
7	A	176.01	63.64	60.67	2.77	2.9	0.005	0.07	2.97	521.95	0.86
7	T	866	231.59	225.26	3.74	3.84	0.005	0.073	3.5	3028.3	1.17
8	B	856.63	172.69	168.68	4.96	5.08	0.005	0.075	4.08	3495.47	1.55
8	A	239.23	69.44	65.88	3.44	3.63	0.005	0.07	3.43	821.29	1.07
8	T	1095.85	242.13	234.56	4.53	4.67	0.005	0.073	3.94	4316.76	1.41
9	B	1027.35	177.42	172.77	5.79	5.95	0.005	0.076	4.48	4604.6	1.81
9	A	308.69	76.92	73.05	4.01	4.23	0.005	0.07	3.8	1173.39	1.25
9	T	1336.05	254.34	245.83	5.25	5.43	0.005	0.074	4.32	5777.99	1.64
10	B	1202.99	184.44	179.2	6.52	6.71	0.005	0.076	4.81	5783.69	2.04
10	A	389.45	91.31	86.78	4.27	4.49	0.005	0.07	3.96	1541.59	1.33
10	T	1592.44	275.75	265.98	5.77	5.99	0.005	0.074	4.6	7325.29	1.8
11	B	1388.27	201.08	195.29	6.9	7.11	0.005	0.077	4.95	6869.61	2.15

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 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

11	A	479.35	98.91	93.32	4.85	5.14	0.005	0.07	4.31	2066.17	1.51
11	T	1867.62	299.99	288.61	6.23	6.47	0.005	0.075	4.78	8935.78	1.94
12	B	1590.1	212.79	206.45	7.47	7.7	0.005	0.078	5.17	8220.07	2.33
12	A	576.64	107.52	100.88	5.36	5.72	0.005	0.07	4.61	2659.18	1.67
12	T	2166.74	320.31	307.33	6.76	7.05	0.005	0.075	5.02	10879.25	2.11
13	B	1800.7	221.53	214.63	8.13	8.39	0.005	0.079	5.42	9758.06	2.54
13	A	680.38	114.32	106.61	5.95	6.38	0.005	0.07	4.94	3363.1	1.86
13	T	2481.08	335.85	321.24	7.39	7.72	0.005	0.076	5.29	13121.16	2.3
14	B	2024.2	237.82	230.37	8.51	8.79	0.005	0.079	5.54	11211.16	2.66
14	A	790.59	122.93	114.17	6.43	6.92	0.005	0.07	5.21	4115.09	2.01
14	T	2814.79	360.76	344.54	7.8	8.17	0.005	0.076	5.44	15326.25	2.43
15	B	2260.31	250.32	242.33	9.03	9.33	0.005	0.08	5.71	12908.2	2.82
15	A	912.2	149.58	139.78	6.1	6.53	0.005	0.07	5.02	4583	1.9
15	T	3172.52	399.9	382.11	7.93	8.3	0.005	0.076	5.51	17491.21	2.48
16	B	2503.02	251.57	243.09	9.95	10.3	0.005	0.081	6.04	15116.86	3.1
16	A	1051.99	150.58	139.8	6.99	7.53	0.005	0.07	5.5	5786.6	2.18
16	T	3555.01	402.15	382.89	8.84	9.28	0.005	0.077	5.88	20903.46	2.76
17	B	2746.49	252.83	243.85	10.86	11.26	0.005	0.081	6.35	17436.5	3.39
17	A	1191.8	151.58	139.81	7.86	8.52	0.005	0.07	5.95	7092.9	2.45
17	T	3938.29	404.41	383.66	9.74	10.27	0.005	0.077	6.23	24529.4	3

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 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

Bedload Computation
 geo6.p82
 Input File: GEO6.OUT
 Run Date: 02/18/02
 Analysis Procedure: geo6.p82 Parker 1982

Stage	#Sec	Width	Shear	Q	Bedload
(ft)		(ft)	(psf)	(cfs)	(lb/s)
0.10	T	2.10	0.08	0.02	0.00
0.30	T	5.55	0.26	0.49	0.03
0.50	T	12.75	0.36	2.02	1.70
0.70	T	20.50	0.49	5.73	12.03
0.90	T	27.15	0.65	12.81	43.60
1.10	T	32.98	0.82	24.06	105.55
1.30	T	38.79	0.98	39.86	200.18
1.50	T	44.64	1.14	60.82	330.56
1.70	T	48.96	1.33	89.21	513.76
1.90	T	55.62	1.46	120.93	713.33
2.10	T	62.20	1.59	158.93	952.11
2.30	T	76.20	1.58	192.21	1143.88
2.50	T	87.00	1.66	242.70	1452.94
2.70	T	94.90	1.81	311.70	1884.03
2.90	T	101.70	1.98	395.30	2403.62
3.10	T	110.85	2.10	482.40	2933.99
3.30	T	120.01	2.23	586.29	3561.27
3.50	T	130.85	2.33	696.22	4215.36
3.70	T	141.34	2.44	822.38	4959.11
3.90	T	143.77	2.68	1003.47	6011.01
4.10	T	146.96	2.91	1196.46	7103.20
4.30	T	170.35	2.78	1287.00	7617.48
4.50	T	178.28	2.94	1497.13	8789.02
4.70	T	180.20	3.19	1768.14	10262.96
4.90	T	189.62	3.30	1996.56	11491.16
5.10	T	192.33	3.53	2306.08	13108.74
5.30	T	195.28	3.75	2634.03	14783.22
5.50	T	198.62	3.96	2979.17	16513.26
5.70	T	201.95	4.17	3344.92	18308.27
5.90	T	213.24	4.22	3631.09	19735.79
6.10	T	215.64	4.44	4058.98	21765.43
6.30	T	218.04	4.66	4509.13	23854.68
6.50	T	220.26	4.88	4984.06	26007.81
6.70	T	222.31	5.10	5483.74	28220.47
6.90	T	224.35	5.31	6005.48	30482.56
7.10	T	226.17	5.53	6553.91	32808.43
7.30	T	227.99	5.74	7124.35	35178.51
7.50	T	229.81	5.94	7716.70	37590.49
7.70	T	231.68	6.15	8329.50	40037.96
7.90	T	233.60	6.35	8962.61	42519.36
8.10	T	235.69	6.54	9612.92	45028.43
8.30	T	237.94	6.72	10280.37	47565.86
8.50	T	240.19	6.91	10969.35	50140.15
8.70	T	242.45	7.08	11679.88	52749.77
8.90	T	244.70	7.26	12411.97	55393.63
9.10	T	246.95	7.43	13165.63	58070.43
9.30	T	249.21	7.60	13940.90	60778.89
9.50	T	259.18	7.55	14400.14	62532.84
9.70	T	261.90	7.71	15203.67	65263.12
9.90	T	264.62	7.86	16029.32	68023.87
10.10	T	267.34	8.01	16876.92	70813.41
10.30	T	270.06	8.15	17746.56	73630.61
10.50	T	272.78	8.30	18638.32	76474.63
10.70	T	279.49	8.32	19337.20	78767.07
10.90	T	285.73	8.37	20090.00	81197.40
11.10	T	291.49	8.42	20895.71	83757.02
11.30	T	296.04	8.52	21796.21	86550.57
11.50	T	299.40	8.64	22790.15	89560.65
11.70	T	302.75	8.76	23808.14	92599.04
11.90	T	305.88	8.89	24864.69	95700.81
12.10	T	308.78	9.02	25959.96	98862.27
12.30	T	311.60	9.15	27084.48	102057.63
12.50	T	314.36	9.28	28238.38	105285.32
12.70	T	317.11	9.40	29416.83	108531.86
12.90	T	319.86	9.53	30619.89	111796.59
13.10	T	322.61	9.65	31847.67	115078.66
13.30	T	325.59	9.77	33082.30	118336.55
13.50	T	336.15	9.67	33753.70	120286.47
13.70	T	339.50	9.78	35028.18	123603.20
13.90	T	342.86	9.88	36328.70	126939.95
14.10	T	346.21	9.98	37655.43	130295.98

14.30	T	349.91	10.08	38978.88	133606.25
14.50	T	354.75	10.14	40228.91	136723.28
14.70	T	360.39	10.17	41437.56	139725.36
14.90	T	381.99	9.81	41275.86	139752.22
15.00	T	382.11	9.90	42169.79	141903.41

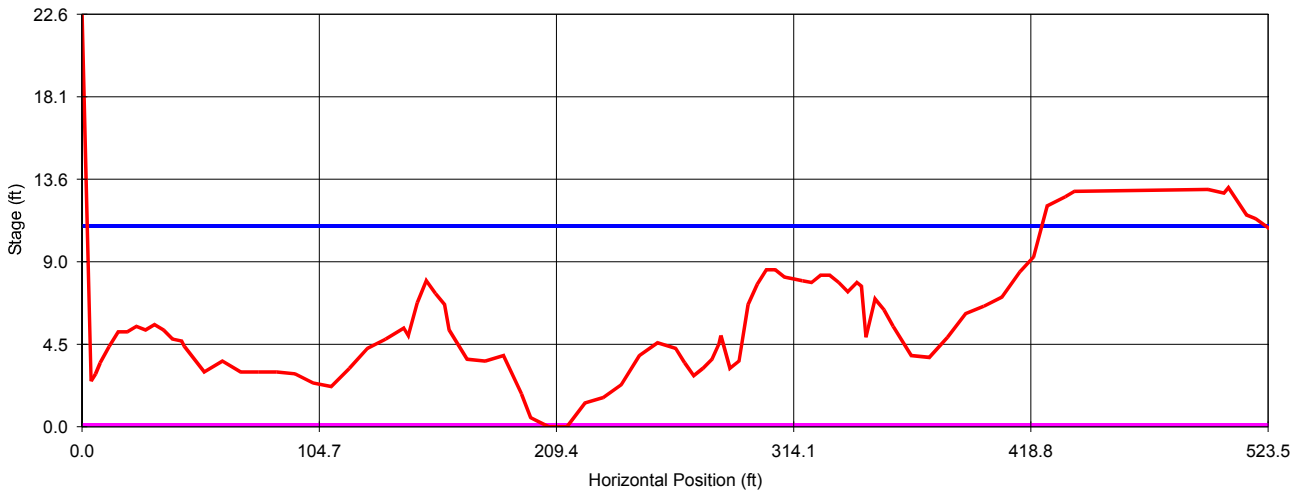
PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

Bedload Computation
 geo6.p90
 Input File: GEO6.OUT
 Run Date: 02/18/02
 Analysis Procedure: geo6.p90 Parker 1990

Stage	#Sec	Width	Shear	Q	Bedload
(ft)		(ft)	(psf)	(cfs)	(lb/s)
0.10	T	2.10	0.08	0.02	0.00
0.30	T	5.55	0.26	0.49	0.01
0.50	T	12.75	0.36	2.02	0.95
0.70	T	20.50	0.49	5.73	94.54
0.90	T	27.15	0.65	12.81	193.50
1.10	T	32.98	0.82	24.06	334.99
1.30	T	38.79	0.98	39.86	519.26
1.50	T	44.64	1.14	60.82	749.17
1.70	T	48.96	1.33	89.21	1036.58
1.90	T	55.62	1.46	120.93	1354.59
2.10	T	62.20	1.59	158.93	1720.22
2.30	T	76.20	1.58	192.21	2077.68
2.50	T	87.00	1.66	242.70	2564.67
2.70	T	94.90	1.81	311.70	3183.05
2.90	T	101.70	1.98	395.30	3897.50
3.10	T	110.85	2.10	482.40	4639.81
3.30	T	120.01	2.23	586.29	5497.96
3.50	T	130.85	2.33	696.22	6401.19
3.70	T	141.34	2.44	822.38	7407.32
3.90	T	143.77	2.68	1003.47	8696.82
4.10	T	146.96	2.91	1196.46	10029.38
4.30	T	170.35	2.78	1287.00	10894.80
4.50	T	178.28	2.94	1497.13	12370.08
4.70	T	180.20	3.19	1768.14	14125.17
4.90	T	189.62	3.30	1996.56	15671.88
5.10	T	192.33	3.53	2306.08	17585.45
5.30	T	195.28	3.75	2634.03	19557.95
5.50	T	198.62	3.96	2979.17	21591.00
5.70	T	201.95	4.17	3344.92	23691.31
5.90	T	213.24	4.22	3631.09	25477.21
6.10	T	215.64	4.44	4058.98	27823.58
6.30	T	218.04	4.66	4509.13	30230.48
6.50	T	220.26	4.88	4984.06	32700.53
6.70	T	222.31	5.10	5483.74	35228.98
6.90	T	224.35	5.31	6005.48	37807.43
7.10	T	226.17	5.53	6553.91	40448.76
7.30	T	227.99	5.74	7124.35	43134.71
7.50	T	229.81	5.94	7716.70	45862.97
7.70	T	231.68	6.15	8329.50	48627.54
7.90	T	233.60	6.35	8962.61	51427.00
8.10	T	235.69	6.54	9612.92	54256.69
8.30	T	237.94	6.72	10280.37	57117.77
8.50	T	240.19	6.91	10969.35	60017.00
8.70	T	242.45	7.08	11679.88	62952.74
8.90	T	244.70	7.26	12411.97	65923.97
9.10	T	246.95	7.43	13165.63	68929.33
9.30	T	249.21	7.60	13940.90	71967.52
9.50	T	259.18	7.55	14400.14	74097.63
9.70	T	261.90	7.71	15203.67	77167.64
9.90	T	264.62	7.86	16029.32	80269.48
10.10	T	267.34	8.01	16876.92	83401.48
10.30	T	270.06	8.15	17746.56	86562.43
10.50	T	272.78	8.30	18638.32	89751.52
10.70	T	279.49	8.32	19337.20	92412.51
10.90	T	285.73	8.37	20090.00	95215.70
11.10	T	291.49	8.42	20895.71	98151.35
11.30	T	296.04	8.52	21796.21	101319.89
11.50	T	299.40	8.64	22790.15	104701.42
11.70	T	302.75	8.76	23808.14	108113.02
11.90	T	305.88	8.89	24864.69	111588.55
12.10	T	308.78	9.02	25959.96	115123.76
12.30	T	311.60	9.15	27084.48	118693.55
12.50	T	314.36	9.28	28238.38	122296.13
12.70	T	317.11	9.40	29416.83	125918.34
12.90	T	319.86	9.53	30619.89	129559.50
13.10	T	322.61	9.65	31847.67	133218.61
13.30	T	325.59	9.77	33082.30	136855.30
13.50	T	336.15	9.67	33753.70	139224.06
13.70	T	339.50	9.78	35028.18	142933.34
13.90	T	342.86	9.88	36328.70	146663.86
14.10	T	346.21	9.98	37655.43	150414.80

14.30	T	349.91	10.08	38978.88	154122.59
14.50	T	354.75	10.14	40228.91	157643.84
14.70	T	360.39	10.17	41437.56	161057.11
14.90	T	381.99	9.81	41275.86	161566.88
15.00	T	382.11	9.90	42169.79	163926.69

Swift Bypass Habitat Unit 18



*****WinXSPRO*****
 18try.out
 Input File: C:\WXSPRO20\LEWIS\GEO18.DAT
 Run Date: 02/18/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 03/13/01

Subsections/Dividing stations
 A

Resistance Method: Manning's n
 SECTION
 Low Stage n 0.016
 High Stage n 0.016

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.91	10.23	10.22	0.09	0.09	0.006	0.016	1.44	1.31	0.03
0.30	T	3.40	14.68	14.65	0.23	0.23	0.006	0.016	2.71	9.21	0.09
0.50	T	6.77	19.13	19.08	0.35	0.35	0.006	0.016	3.59	24.28	0.13
0.70	T	10.77	21.03	20.92	0.51	0.51	0.006	0.016	4.58	49.27	0.19
0.90	T	15.14	22.92	22.77	0.66	0.66	0.006	0.016	5.40	81.80	0.24
1.10	T	19.88	24.81	24.62	0.80	0.81	0.006	0.016	6.13	121.76	0.29
1.30	T	24.98	26.71	26.46	0.94	0.94	0.006	0.016	6.77	169.19	0.34
1.50	T	30.87	32.69	32.41	0.94	0.95	0.006	0.016	6.79	209.70	0.34
1.70	T	37.87	37.16	36.84	1.02	1.03	0.006	0.016	7.12	269.84	0.36
1.90	T	45.53	40.17	39.81	1.13	1.14	0.006	0.016	7.62	347.12	0.40
2.10	T	53.80	43.25	42.86	1.24	1.26	0.006	0.016	8.08	434.93	0.44
2.30	T	62.92	51.14	50.70	1.23	1.24	0.006	0.016	8.00	503.25	0.43
2.50	T	74.07	60.16	59.67	1.23	1.24	0.006	0.016	7.98	590.84	0.43
2.70	T	86.77	68.01	67.27	1.28	1.29	0.006	0.016	8.14	706.33	0.44
2.90	T	101.06	77.45	76.44	1.30	1.32	0.005	0.016	8.24	832.37	0.45
3.10	T	120.03	112.25	110.95	1.07	1.08	0.005	0.016	7.19	862.89	0.36
3.30	T	143.65	127.34	125.70	1.13	1.14	0.005	0.016	7.42	1066.55	0.38
3.50	T	170.36	143.41	141.40	1.19	1.20	0.005	0.016	7.66	1304.78	0.40
3.70	T	200.57	166.70	164.31	1.20	1.22	0.005	0.016	7.70	1544.00	0.40
3.90	T	235.29	190.07	187.22	1.24	1.26	0.005	0.016	7.82	1839.60	0.41
4.10	T	273.92	202.33	199.06	1.35	1.38	0.005	0.016	8.27	2265.34	0.44
4.30	T	314.91	214.60	210.89	1.47	1.49	0.005	0.016	8.70	2738.54	0.48
4.50	T	358.87	232.76	228.63	1.54	1.57	0.005	0.016	8.96	3214.13	0.50
4.70	T	406.13	246.60	242.04	1.65	1.68	0.005	0.016	9.33	3787.40	0.53
4.90	T	456.04	260.34	255.37	1.75	1.79	0.005	0.016	9.68	4415.62	0.56
5.10	T	508.15	271.36	265.83	1.87	1.91	0.005	0.016	10.09	5125.46	0.59
5.30	T	562.83	287.49	281.43	1.96	2.00	0.005	0.016	10.35	5826.63	0.62
5.50	T	620.97	305.67	299.04	2.03	2.08	0.005	0.016	10.57	6564.92	0.63
5.70	T	681.55	312.55	305.38	2.18	2.23	0.005	0.016	11.04	7526.03	0.68
5.90	T	742.99	316.75	309.05	2.35	2.40	0.005	0.016	11.55	8581.66	0.72
6.10	T	805.17	320.95	312.72	2.51	2.57	0.005	0.016	12.03	9689.66	0.77
6.30	T	868.15	326.53	317.78	2.66	2.73	0.005	0.016	12.46	10819.29	0.81
6.50	T	932.36	333.71	324.44	2.79	2.87	0.005	0.016	12.83	11964.86	0.84

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.70	T	997.92	340.70	330.93	2.93	3.02	0.005	0.016	13.19	13165.19	0.88
6.90	T	1064.87	348.83	338.64	3.05	3.14	0.005	0.016	13.51	14385.75	0.91
7.10	T	1133.33	356.18	345.61	3.18	3.28	0.005	0.016	13.83	15679.12	0.94
7.30	T	1202.86	360.58	349.66	3.34	3.44	0.005	0.016	14.22	17106.42	0.97
7.50	T	1273.26	366.42	355.12	3.47	3.59	0.005	0.016	14.56	18534.14	1.01
7.70	T	1344.99	373.86	362.18	3.60	3.71	0.005	0.016	14.84	19957.00	1.03
7.90	T	1418.32	383.20	371.24	3.70	3.82	0.005	0.016	15.06	21361.93	1.06
8.10	T	1494.13	398.54	386.33	3.75	3.87	0.005	0.016	15.13	22605.57	1.06
8.30	T	1572.66	409.95	397.51	3.84	3.96	0.004	0.016	15.30	24063.37	1.08
8.50	T	1652.58	414.34	401.69	3.99	4.11	0.004	0.016	15.64	25844.57	1.11
8.70	T	1733.30	417.58	404.73	4.15	4.28	0.004	0.016	15.99	27723.15	1.15
8.90	T	1814.40	419.29	406.27	4.33	4.47	0.004	0.016	16.38	29712.83	1.18
9.10	T	1895.81	421.01	407.81	4.50	4.65	0.004	0.016	16.75	31747.16	1.22
9.30	T	1977.52	422.73	409.35	4.68	4.83	0.004	0.016	17.10	33824.55	1.26
9.50	T	2059.44	423.40	409.82	4.86	5.03	0.004	0.016	17.48	35999.15	1.30
9.70	T	2141.45	424.08	410.29	5.05	5.22	0.004	0.016	17.84	38214.03	1.34
9.90	T	2223.56	424.76	410.76	5.23	5.41	0.004	0.016	18.20	40467.46	1.37
10.10	T	2305.76	425.43	411.23	5.42	5.61	0.004	0.016	18.54	42757.77	1.41
10.30	T	2388.05	426.11	411.69	5.60	5.80	0.004	0.016	18.88	45083.33	1.44
10.50	T	2470.43	426.79	412.16	5.79	5.99	0.004	0.016	19.20	47442.52	1.48
10.70	T	2552.91	427.46	412.63	5.97	6.19	0.004	0.016	19.52	49833.81	1.51
10.90	T	2635.49	428.14	413.10	6.16	6.38	0.004	0.016	19.83	52255.63	1.54
11.00	T	2676.81	428.48	413.33	6.25	6.48	0.004	0.016	19.98	53477.59	1.56

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

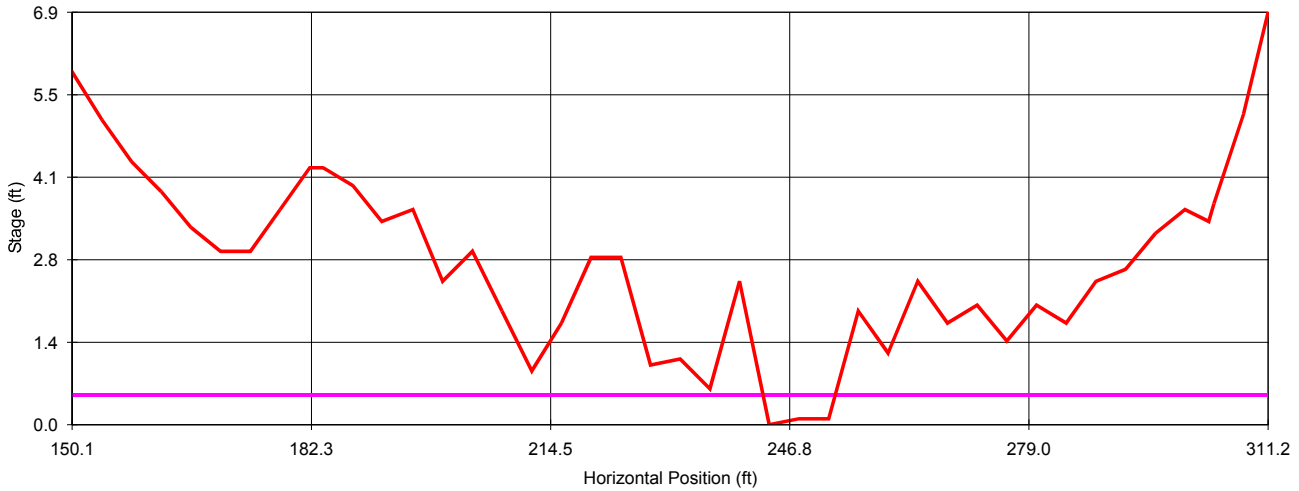
Bedload Computation
 18try.mpm
 Input File: 18TRY.OUT
 Run Date: 02/18/02
 Analysis Procedure: Meyer-Peter & Muller

Stage	#Sec	Width (ft)	Shear (psf)	Q (cfs)	Bedload (lb/s)
0.10	T	10.22	0.03	1.31	0.00
0.30	T	14.65	0.09	9.59	0.00
0.50	T	19.08	0.13	25.50	0.00
0.70	T	20.92	0.19	51.61	0.00
0.90	T	22.77	0.24	85.43	0.00
1.10	T	24.62	0.29	126.81	0.00
1.30	T	26.46	0.34	175.75	0.00
1.50	T	32.41	0.34	219.11	0.00
1.70	T	36.84	0.36	282.04	0.00
1.90	T	39.81	0.40	361.89	0.00
2.10	T	42.86	0.44	452.40	0.00
2.30	T	50.70	0.43	525.95	0.00
2.50	T	59.67	0.43	619.68	0.00
2.70	T	67.27	0.44	741.33	0.00
2.90	T	76.44	0.45	874.83	0.00
3.10	T	110.95	0.36	922.83	0.00
3.30	T	125.70	0.38	1139.26	0.00
3.50	T	141.40	0.40	1391.94	0.00
3.70	T	164.31	0.40	1649.48	0.00
3.90	T	187.22	0.41	1965.49	0.00
4.10	T	199.06	0.44	2409.21	0.00
4.30	T	210.89	0.48	2900.44	0.00
4.50	T	228.63	0.50	3397.62	0.00
4.70	T	242.04	0.53	3990.37	7.27
4.90	T	255.37	0.56	4637.80	27.67
5.10	T	265.83	0.59	5363.84	61.87
5.30	T	281.43	0.62	6085.59	92.84
5.50	T	299.04	0.63	6846.64	125.03
5.70	T	305.38	0.68	7815.65	195.29
5.90	T	309.05	0.72	8871.55	283.47
6.10	T	312.72	0.77	9975.32	380.51
6.30	T	317.78	0.81	11099.25	479.06
6.50	T	324.44	0.84	12239.09	576.56
6.70	T	330.93	0.88	13429.96	680.19
6.90	T	338.64	0.91	14641.03	782.94
7.10	T	345.61	0.94	15919.35	894.52
7.30	T	349.66	0.97	17317.88	1026.91
7.50	T	355.12	1.01	18717.69	1154.39
7.70	T	362.18	1.03	20115.29	1275.34
7.90	T	371.24	1.06	21499.97	1387.52
8.10	T	386.33	1.06	22747.95	1463.90
8.30	T	397.51	1.08	24189.29	1571.70
8.50	T	401.69	1.11	25916.13	1731.01
8.70	T	404.73	1.15	27728.33	1901.55
8.90	T	406.27	1.18	29636.42	2085.55
9.10	T	407.81	1.22	31582.06	2271.28
9.30	T	409.35	1.26	33563.73	2458.27
9.50	T	409.82	1.30	35627.61	2654.82
9.70	T	410.29	1.34	37724.10	2851.79
9.90	T	410.76	1.37	39851.56	3048.68
10.10	T	411.23	1.41	42008.45	3245.07
10.30	T	411.69	1.44	44193.25	3440.68
10.50	T	412.16	1.48	46404.46	3635.02
10.70	T	412.63	1.51	48640.67	3827.86
10.90	T	413.10	1.54	50900.45	4018.87
11.00	T	413.33	1.56	52038.81	4113.59

Bedload Computation
 18try.p82
 Input File: 18TRY.OUT
 Run Date: 02/18/02
 Analysis Procedure: 18try.p82 Parker 1982

Stage	#Sec	Width	Shear	Q	Bedload
(ft)		(ft)	(psf)	(cfs)	(lb/s)
0.10	T	10.22	0.03	1.31	0.00
0.30	T	14.65	0.09	9.59	0.00
0.50	T	19.08	0.13	25.50	0.00
0.70	T	20.92	0.19	51.61	0.00
0.90	T	22.77	0.24	85.43	0.00
1.10	T	24.62	0.29	126.81	0.00
1.30	T	26.46	0.34	175.75	0.00
1.50	T	32.41	0.34	219.11	0.00
1.70	T	36.84	0.36	282.04	0.01
1.90	T	39.81	0.40	361.89	0.06
2.10	T	42.86	0.44	452.40	0.24
2.30	T	50.70	0.43	525.95	0.21
2.50	T	59.67	0.43	619.68	0.23
2.70	T	67.27	0.44	741.33	0.40
2.90	T	76.44	0.45	874.83	0.57
3.10	T	110.95	0.36	922.83	0.04
3.30	T	125.70	0.38	1139.26	0.08
3.50	T	141.40	0.40	1391.94	0.19
3.70	T	164.31	0.40	1649.48	0.24
3.90	T	187.22	0.41	1965.49	0.39
4.10	T	199.06	0.44	2409.21	1.40
4.30	T	210.89	0.48	2900.44	4.15
4.50	T	228.63	0.50	3397.62	7.81
4.70	T	242.04	0.53	3990.37	16.65
4.90	T	255.37	0.56	4637.80	31.01
5.10	T	265.83	0.59	5363.84	53.82
5.30	T	281.43	0.62	6085.59	73.22
5.50	T	299.04	0.63	6846.64	91.53
5.70	T	305.38	0.68	7815.65	133.59
5.90	T	309.05	0.72	8871.55	189.63
6.10	T	312.72	0.77	9975.32	255.21
6.30	T	317.78	0.81	11099.25	325.30
6.50	T	324.44	0.84	12239.09	397.31
6.70	T	330.93	0.88	13429.96	476.45
6.90	T	338.64	0.91	14641.03	556.82
7.10	T	345.61	0.94	15919.35	646.48
7.30	T	349.66	0.97	17317.88	756.75
7.50	T	355.12	1.01	18717.69	864.94
7.70	T	362.18	1.03	20115.29	968.64
7.90	T	371.24	1.06	21499.97	1064.85
8.10	T	386.33	1.06	22747.95	1126.20
8.30	T	397.51	1.08	24189.29	1218.31
8.50	T	401.69	1.11	25916.13	1362.85
8.70	T	404.73	1.15	27728.33	1521.14
8.90	T	406.27	1.18	29636.42	1696.15
9.10	T	407.81	1.22	31582.06	1875.80
9.30	T	409.35	1.26	33563.73	2059.42
9.50	T	409.82	1.30	35627.61	2256.31
9.70	T	410.29	1.34	37724.10	2456.35
9.90	T	410.76	1.37	39851.56	2658.79
10.10	T	411.23	1.41	42008.45	2863.01
10.30	T	411.69	1.44	44193.25	3068.50
10.50	T	412.16	1.48	46404.46	3274.58
10.70	T	412.63	1.51	48640.67	3480.82
10.90	T	413.10	1.54	50900.45	3686.71
11.00	T	413.33	1.56	52038.81	3789.36

Swift Bypass Habitat Unit 45



*****WinXSPRO*****

geo45t1.out
 Input File: C:\WXSPRO20\LEWIS\GEO45R.DAT
 Run Date: 06/04/01
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 06/04/01

Subsections/Dividing stations
 A

Resistance Method: Manning's n
 SECTION
 A
 Low Stage n 0.070
 High Stage n 0.080

STAGE (ft)	#SEC	AREA (sqft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.5	T	3.79	9.95	9.72	0.38	0.39	0.005	0.07	0.79	2.99	0.12
1	T	10	17.26	16.66	0.58	0.6	0.005	0.071	1.03	10.32	0.18
1.5	T	23.12	35.44	34.17	0.65	0.68	0.005	0.072	1.1	25.52	0.2
2	T	46.79	66.34	64.25	0.71	0.73	0.005	0.073	1.15	53.7	0.22
2.5	T	82.54	82.45	79.77	1	1.03	0.005	0.074	1.43	118.19	0.31
3	T	126.81	101.21	98.24	1.25	1.29	0.005	0.075	1.64	208.3	0.39
3.5	T	179.45	119.19	116.01	1.51	1.55	0.005	0.075	1.83	329.17	0.47
4	T	242.4	135.3	131.88	1.79	1.84	0.005	0.076	2.04	493.32	0.56
4.5	T	311.66	146.28	142.7	2.13	2.18	0.005	0.077	2.26	703.59	0.66
5	T	384.06	150.61	146.89	2.55	2.61	0.005	0.078	2.52	966.05	0.8
5.5	T	458.46	154.45	150.58	2.97	3.04	0.005	0.079	2.75	1261.42	0.93
6	T	534.6	157.68	153.55	3.39	3.48	0.005	0.08	2.97	1588.92	* 1.06
6.5	T	611.61	159.27	154.52	3.84	3.96	0.005	0.081	3.19	1953.02	* 1.2
7	T	689.11	160.75	155.3	4.29	4.44	0.005	0.082	3.4	2341.73	* 1.34

Bedload Computation
 geo45T1.mpm
 Input File: GEO45T1.OUT
 Run Date: 06/04/01
 Analysis Procedure: Meyer-Peter & Muller

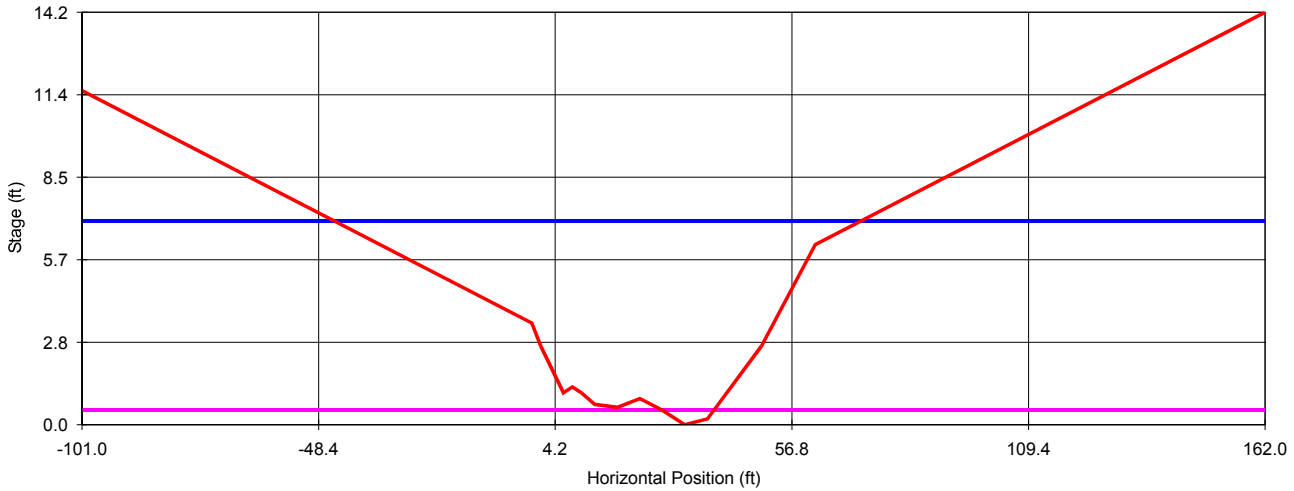
Stage (ft)	#Sec	Width (ft)	Shear (psf)	Q (cfs)	Bedload (lb/s)	Bedload Tons/day
0.5	T	9.72	0.12	2.99	0	0
1	T	16.66	0.18	10.32	0	0
1.5	T	34.17	0.2	25.52	0	0
2	T	64.25	0.22	53.7	0	0
2.5	T	79.77	0.31	118.19	0	0
3	T	98.24	0.39	208.3	0	0

3.5	T	116.01	0.47	329.17		0	0
4	T	131.88	0.56	493.32		14.03	606
4.5	T	142.7	0.66	703.59		81.8	3,534
5	T	146.89	0.8	966.05		209.26	9,040
5.5	T	150.58	0.93	1261.42		375.94	16,241
6	T	153.55	1.06	1588.92	*	577.97	24,968
6.5	T	154.52	1.2	1953.02	*	817.87	35,332
7	T	155.3	1.34	2341.73	*	1083.26	46,797

Bedload Computation
 geo45T1.p82
 Input File: GEO45T1.OUT
 Run Date: 06/04/01
 Analysis Procedure: geo45T1.p82 Parker 1982

Stage (ft)	#Sec	Width (ft)	Shear (psf)	Q (cfs)		Bedload (lb/s)	Bedload Tons/day
0.5	T	9.72	0.12	2.99		0	0
1	T	16.66	0.18	10.32		0	0
1.5	T	34.17	0.2	25.52		0	0
2	T	64.25	0.22	53.7		0	0
2.5	T	79.77	0.31	118.19		0	0
3	T	98.24	0.39	208.3		0.1	4
3.5	T	116.01	0.47	329.17		1.76	76
4	T	131.88	0.56	493.32		15.85	685
4.5	T	142.7	0.66	703.59		56.69	2,449
5	T	146.89	0.8	966.05		141.52	6,114
5.5	T	150.58	0.93	1261.42		270.27	11,676
6	T	153.55	1.06	1588.92	*	444.12	19,186
6.5	T	154.52	1.2	1953.02	*	669	28,901
7	T	155.3	1.34	2341.73	*	933.68	40,335

Lower Speelyai Site A



*****WinXSPRO*****

lspeela.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELA.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 10/28/01

Subsections/Dividing stations
 A / 162.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.17	3.51	3.50	0.05	0.05	0.026	0.157	0.20	0.04	0.08
0.20	T	0.70	7.01	7.00	0.10	0.10	0.026	0.141	0.36	0.25	0.16
0.30	T	1.47	8.51	8.48	0.17	0.17	0.026	0.129	0.57	0.85	0.28
0.40	T	2.40	10.00	9.96	0.24	0.24	0.026	0.122	0.75	1.80	0.39
0.50	T	3.47	11.50	11.44	0.30	0.30	0.026	0.118	0.91	3.15	0.48
0.60	T	4.70	13.24	13.17	0.35	0.36	0.026	0.115	1.04	4.88	0.57
0.70	T	6.43	21.66	21.57	0.30	0.30	0.026	0.118	0.90	5.77	0.48
0.80	T	8.80	25.83	25.71	0.34	0.34	0.026	0.115	1.00	8.83	0.54
0.90	T	11.58	30.00	29.86	0.39	0.39	0.026	0.113	1.11	12.89	0.62
1.00	T	14.62	31.25	31.09	0.47	0.47	0.026	0.109	1.31	19.10	0.75
1.10	T	17.79	32.49	32.32	0.55	0.55	0.025	0.106	1.49	26.48	0.87
1.20	T	21.17	35.32	35.11	0.60	0.60	0.025	0.105	1.60	33.93	0.95
1.30	T	24.82	38.15	37.90	0.65	0.65	0.025	0.103	1.72	42.57	1.03
1.40	T	28.65	38.97	38.70	0.74	0.74	0.025	0.101	1.90	54.38	1.16
1.50	T	32.56	39.79	39.49	0.82	0.82	0.025	0.100	2.07	67.53	1.29
1.60	T	36.54	40.61	40.28	0.90	0.91	0.025	0.098	2.24	82.02	1.42
1.70	T	40.61	41.42	41.07	0.98	0.99	0.025	0.097	2.41	97.84	1.54
1.80	T	44.76	42.24	41.87	1.06	1.07	0.025	0.095	2.57	114.98	1.66
1.90	T	48.99	43.06	42.66	1.14	1.15	0.025	0.094	2.72	133.45	1.78
2.00	T	53.29	43.88	43.45	1.21	1.23	0.025	0.093	2.88	153.24	1.89
2.10	T	57.68	44.70	44.24	1.29	1.30	0.025	0.092	3.02	174.35	2.01
2.20	T	62.14	45.52	45.04	1.37	1.38	0.025	0.091	3.17	196.80	2.12
2.30	T	66.68	46.33	45.83	1.44	1.46	0.025	0.090	3.31	220.58	2.23
2.40	T	71.31	47.15	46.62	1.51	1.53	0.025	0.090	3.45	245.71	2.34
2.50	T	76.01	47.97	47.41	1.58	1.60	0.025	0.089	3.58	272.18	2.44
2.60	T	80.79	48.79	48.21	1.66	1.68	0.025	0.088	3.71	300.01	2.55
2.70	T	85.65	49.61	49.00	1.73	1.75	0.025	0.087	3.84	329.19	2.65
2.80	T	90.58	50.23	49.59	1.80	1.83	0.025	0.087	3.98	360.82	2.76
2.90	T	95.57	50.86	50.19	1.88	1.90	0.025	0.086	4.12	393.84	2.87
3.00	T	100.62	51.49	50.78	1.95	1.98	0.024	0.086	4.26	428.26	2.98
3.10	T	105.72	52.11	51.37	2.03	2.06	0.024	0.085	4.39	464.07	3.09
3.20	T	110.89	52.74	51.96	2.10	2.13	0.024	0.084	4.52	501.29	3.20
3.30	T	116.12	53.37	52.56	2.18	2.21	0.024	0.084	4.65	539.91	3.30
3.40	T	121.40	53.99	53.15	2.25	2.28	0.024	0.083	4.78	579.93	3.40
3.50	T	126.75	54.62	53.74	2.32	2.36	0.024	0.083	4.90	621.36	3.50
3.60	T	132.20	56.23	55.34	2.35	2.39	0.024	0.083	4.95	654.99	3.54

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.70	T	137.81	57.84	56.93	2.38	2.42	0.024	0.082	5.01	690.21	3.58
3.80	T	143.59	59.45	58.52	2.42	2.45	0.024	0.082	5.06	727.07	3.62
3.90	T	149.52	61.06	60.11	2.45	2.49	0.024	0.082	5.12	765.59	3.66
4.00	T	155.61	62.68	61.71	2.48	2.52	0.024	0.082	5.18	805.80	3.71
4.10	T	161.86	64.29	63.30	2.52	2.56	0.024	0.081	5.24	847.74	3.75
4.20	T	168.27	65.90	64.89	2.55	2.59	0.024	0.081	5.30	891.43	3.80
4.30	T	174.84	67.51	66.49	2.59	2.63	0.024	0.081	5.36	936.91	3.84
4.40	T	181.57	69.12	68.08	2.63	2.67	0.024	0.081	5.42	984.22	3.89
4.50	T	188.45	70.73	69.67	2.66	2.70	0.024	0.080	5.48	1033.38	3.93
4.60	T	195.50	72.34	71.26	2.70	2.74	0.024	0.080	5.55	1084.43	3.98
4.70	T	202.71	73.95	72.86	2.74	2.78	0.024	0.080	5.61	1137.39	4.03
4.80	T	210.07	75.56	74.45	2.78	2.82	0.023	0.080	5.68	1192.31	4.08
4.90	T	217.60	77.18	76.04	2.82	2.86	0.023	0.079	5.74	1249.21	4.13
5.00	T	225.28	78.79	77.64	2.86	2.90	0.023	0.079	5.81	1308.13	4.17
5.10	T	233.12	80.40	79.23	2.90	2.94	0.023	0.079	5.87	1369.10	4.22
5.20	T	241.12	82.01	80.82	2.94	2.98	0.023	0.079	5.94	1432.15	4.27
5.30	T	249.29	83.62	82.41	2.98	3.02	0.023	0.078	6.01	1497.31	4.32
5.40	T	257.61	85.23	84.01	3.02	3.07	0.023	0.078	6.07	1564.62	4.37
5.50	T	266.09	86.84	85.60	3.06	3.11	0.023	0.078	6.14	1634.11	4.42
5.60	T	274.73	88.45	87.19	3.11	3.15	0.023	0.078	6.21	1705.81	4.47
5.70	T	283.53	90.06	88.79	3.15	3.19	0.023	0.077	6.28	1779.75	4.52
5.80	T	292.48	91.68	90.38	3.19	3.24	0.023	0.077	6.35	1855.97	4.57
5.90	T	301.60	93.29	91.97	3.23	3.28	0.023	0.077	6.41	1934.49	4.62
6.00	T	310.88	94.90	93.56	3.28	3.32	0.023	0.077	6.48	2015.35	4.67
6.10	T	320.31	96.51	95.16	3.32	3.37	0.023	0.077	6.55	2098.57	4.72
6.20	T	329.91	98.12	96.75	3.36	3.41	0.023	0.076	6.62	2184.20	4.78
6.30	T	339.71	100.63	99.25	3.38	3.42	0.023	0.076	6.64	2255.99	4.78
6.40	T	349.76	103.14	101.75	3.39	3.44	0.023	0.076	6.66	2330.84	4.79
6.50	T	360.06	105.64	104.25	3.41	3.45	0.023	0.076	6.69	2408.78	4.81
6.60	T	370.61	108.15	106.75	3.43	3.47	0.023	0.076	6.72	2489.83	4.82
6.70	T	381.41	110.66	109.25	3.45	3.49	0.023	0.076	6.75	2574.02	4.84
6.80	T	392.46	113.17	111.75	3.47	3.51	0.022	0.076	6.78	2661.39	4.86
6.90	T	403.76	115.68	114.25	3.49	3.53	0.022	0.075	6.82	2751.97	4.88
7.00	T	415.31	118.18	116.75	3.51	3.56	0.022	0.075	6.85	2845.80	4.90
7.10	T	427.11	120.69	119.25	3.54	3.58	0.022	0.075	6.89	2942.91	4.92
7.20	T	439.16	123.20	121.75	3.56	3.61	0.022	0.075	6.93	3043.34	4.94
7.30	T	451.46	125.71	124.25	3.59	3.63	0.022	0.075	6.97	3147.13	4.97
7.40	T	464.01	128.22	126.75	3.62	3.66	0.022	0.075	7.01	3254.32	5.00
7.50	T	476.81	130.72	129.25	3.65	3.69	0.022	0.074	7.06	3364.96	5.02
7.60	T	489.86	133.23	131.75	3.68	3.72	0.022	0.074	7.10	3479.07	5.03
7.70	T	503.16	135.74	134.25	3.71	3.75	0.022	0.074	7.15	3596.71	5.08
7.80	T	516.71	138.25	136.75	3.74	3.78	0.022	0.074	7.20	3717.92	5.11
7.90	T	530.51	140.76	139.25	3.77	3.81	0.022	0.074	7.24	3842.73	5.14
8.00	T	544.56	143.26	141.75	3.80	3.84	0.022	0.074	7.29	3971.20	5.17
8.10	T	558.86	145.77	144.25	3.83	3.87	0.022	0.073	7.34	4103.36	5.20
8.20	T	573.41	148.28	146.75	3.87	3.91	0.022	0.073	7.39	4239.26	5.24
8.30	T	588.21	150.79	149.25	3.90	3.94	0.022	0.073	7.44	4378.94	5.27
8.40	T	603.26	153.30	151.75	3.94	3.98	0.022	0.073	7.50	4522.45	5.30
8.50	T	618.56	155.80	154.25	3.97	4.01	0.022	0.073	7.55	4669.83	5.34
8.60	T	634.11	158.31	156.75	4.01	4.05	0.021	0.073	7.60	4821.13	5.37
8.70	T	649.91	160.82	159.25	4.04	4.08	0.021	0.072	7.66	4976.39	5.40
8.80	T	665.96	163.33	161.75	4.08	4.12	0.021	0.072	7.71	5135.65	5.44
8.90	T	682.26	165.83	164.25	4.11	4.15	0.021	0.072	7.77	5298.97	5.48
9.00	T	698.81	168.34	166.75	4.15	4.19	0.021	0.072	7.82	5466.38	5.51
9.10	T	715.61	170.85	169.25	4.19	4.23	0.021	0.072	7.88	5637.93	5.55
9.20	T	732.66	173.36	171.75	4.23	4.27	0.021	0.072	7.94	5813.66	5.58
9.30	T	749.96	175.87	174.25	4.26	4.30	0.021	0.071	7.99	5993.62	5.62
9.40	T	767.51	178.37	176.75	4.30	4.34	0.021	0.071	8.05	6177.86	5.65
9.50	T	785.31	180.88	179.25	4.34	4.38	0.021	0.071	8.11	6366.42	5.69
9.60	T	803.36	183.39	181.75	4.38	4.42	0.021	0.071	8.16	6559.34	5.73
9.70	T	821.66	185.90	184.25	4.42	4.46	0.021	0.071	8.22	6756.67	5.77
9.80	T	840.21	188.41	186.75	4.46	4.50	0.021	0.071	8.28	6958.45	5.80
9.90	T	859.01	190.91	189.25	4.50	4.54	0.021	0.070	8.34	7164.73	5.84
10.00	T	878.06	193.42	191.75	4.54	4.58	0.021	0.070	8.40	7375.56	5.88
10.10	T	897.36	195.93	194.25	4.58	4.62	0.021	0.070	8.46	7590.97	5.91
10.20	T	916.91	198.44	196.75	4.62	4.66	0.021	0.070	8.52	7811.01	5.95
10.30	T	936.71	200.95	199.25	4.66	4.70	0.021	0.070	8.58	8035.73	5.99
10.40	T	956.75	203.45	201.75	4.70	4.74	0.021	0.070	8.64	8265.17	6.02
10.50	T	977.05	205.96	204.25	4.74	4.78	0.020	0.069	8.70	8499.37	6.06
10.60	T	997.60	208.47	206.75	4.79	4.83	0.020	0.069	8.76	8738.38	6.10
10.70	T	1018.40	210.98	209.25	4.83	4.87	0.020	0.069	8.82	8982.24	6.14
10.80	T	1039.45	213.49	211.75	4.87	4.91	0.020	0.069	8.88	9231.00	6.17
10.90	T	1060.75	215.99	214.25	4.91	4.95	0.020	0.069	8.94	9484.70	6.21
11.00	T	1082.30	218.50	216.75	4.95	4.99	0.020	0.069	9.00	9743.38	6.25
11.10	T	1104.10	221.01	219.25	5.00	5.04	0.020	0.068	9.06	10007.09	6.28
11.20	T	1126.15	223.52	221.75	5.04	5.08	0.020	0.068	9.12	10275.87	6.32
11.30	T	1148.45	226.03	224.25	5.08	5.12	0.020	0.068	9.19	10549.76	6.36
11.40	T	1171.00	228.53	226.75	5.12	5.16	0.020	0.068	9.25	10828.80	6.39

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

*****WinXSPRO*****

lspeela.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELA.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 10/28/01

Subsections/Dividing stations
 A / 162.00/ @

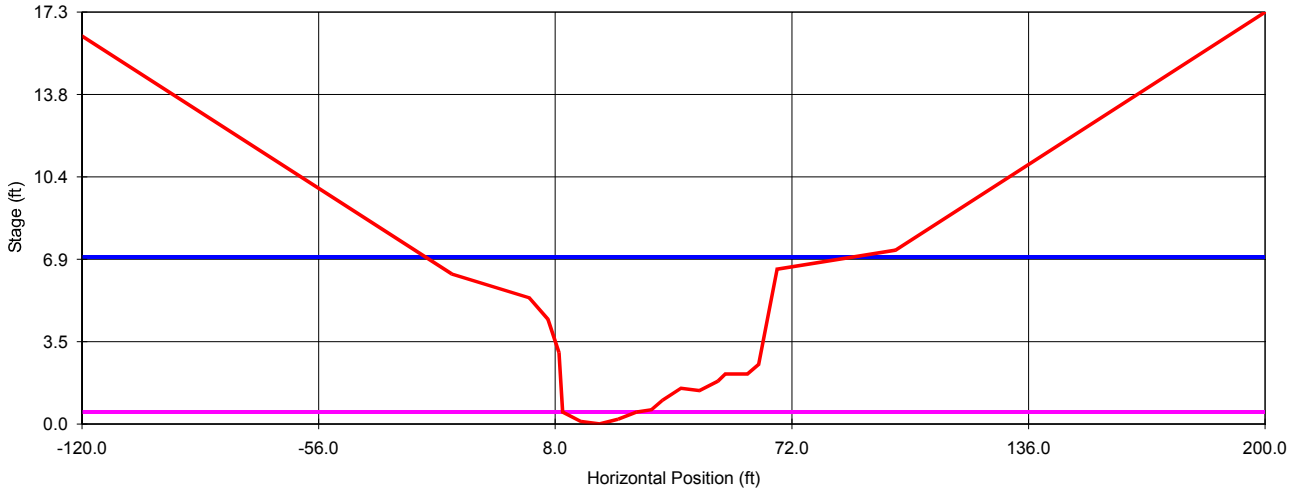
Resistance Method: Thorne and Zevenbergen
 D84: 90.000 mm

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10	T	0.17	3.51	3.50	0.05	0.05	0.026	0.134	0.24	0.04	0.08
0.20	T	0.70	7.01	7.00	0.10	0.10	0.026	0.103	0.50	0.35	0.16
0.30	T	1.47	8.51	8.48	0.17	0.17	0.026	0.082	0.91	1.34	0.28
0.40	T	2.40	10.00	9.96	0.24	0.24	0.026	0.067	1.38	3.31	0.39
0.50	T	3.47	11.50	11.44	0.30	0.30	0.026	0.066	1.63	5.64	0.48
0.60	T	4.70	13.24	13.17	0.35	0.36	0.026	0.060	1.99	9.33	0.57
0.70	T	6.43	21.66	21.57	0.30	0.30	0.026	0.062	1.73	11.12	0.48
0.80	T	8.80	25.83	25.71	0.34	0.34	0.026	0.057	2.02	17.81	0.54
0.90	T	11.58	30.00	29.86	0.39	0.39	0.026	0.054	2.32	26.87	0.62
1.00	T	14.62	31.25	31.09	0.47	0.47	0.026	0.051	2.80	41.00	0.75
1.10	T	17.79	32.49	32.32	0.55	0.55	0.025	0.049	3.25	57.92	0.87
1.20	T	21.17	35.32	35.11	0.60	0.60	0.025	0.048	3.55	75.21	0.95
1.30	T	24.82	38.15	37.90	0.65	0.65	0.025	0.046	3.84	95.37	1.03
1.40	T	28.65	38.97	38.70	0.74	0.74	0.025	0.045	4.28	122.71	1.16
1.50	T	32.56	39.79	39.49	0.82	0.82	0.025	0.044	4.70	153.14	1.29
1.60	T	36.54	40.61	40.28	0.90	0.91	0.025	0.043	5.11	186.62	1.42
1.70	T	40.61	41.42	41.07	0.98	0.99	0.025	0.042	5.49	223.10	1.54
1.80	T	44.76	42.24	41.87	1.06	1.07	0.025	0.042	5.87	262.54	1.66
1.90	T	48.99	43.06	42.66	1.14	1.15	0.025	0.041	6.22	304.93	1.78
2.00	T	53.29	43.88	43.45	1.21	1.23	0.025	0.041	6.57	350.23	1.89
2.10	T	57.68	44.70	44.24	1.29	1.30	0.025	0.040	6.91	398.44	2.01
2.20	T	62.14	45.52	45.04	1.37	1.38	0.025	0.040	7.23	449.54	2.12
2.30	T	66.68	46.33	45.83	1.44	1.46	0.025	0.040	7.55	503.52	2.23
2.40	T	71.31	47.15	46.62	1.51	1.53	0.025	0.039	7.86	560.37	2.34
2.50	T	76.01	47.97	47.41	1.58	1.60	0.025	0.039	8.16	620.10	2.44
2.60	T	80.79	48.79	48.21	1.66	1.68	0.025	0.039	8.45	682.69	2.55
2.70	T	85.65	49.61	49.00	1.73	1.75	0.025	0.039	8.74	748.15	2.65
2.80	T	90.58	50.23	49.59	1.80	1.83	0.025	0.038	9.04	818.58	2.76
2.90	T	95.57	50.86	50.19	1.88	1.90	0.025	0.038	9.33	891.85	2.87
3.00	T	100.62	51.49	50.78	1.95	1.98	0.024	0.038	9.62	967.96	2.98
3.10	T	105.72	52.11	51.37	2.03	2.06	0.024	0.038	9.90	1046.90	3.09
3.20	T	110.89	52.74	51.96	2.10	2.13	0.024	0.038	10.18	1128.64	3.20
3.30	T	116.12	53.37	52.56	2.18	2.21	0.024	0.037	10.45	1213.19	3.30
3.40	T	121.40	53.99	53.15	2.25	2.28	0.024	0.037	10.71	1300.52	3.40
3.50	T	126.75	54.62	53.74	2.32	2.36	0.024	0.037	10.97	1390.63	3.50
3.60	T	132.20	56.23	55.34	2.35	2.39	0.024	0.037	11.09	1466.13	3.54
3.70	T	137.81	57.84	56.93	2.38	2.42	0.024	0.037	11.21	1545.03	3.58
3.80	T	143.59	59.45	58.52	2.42	2.45	0.024	0.037	11.33	1627.37	3.62
3.90	T	149.52	61.06	60.11	2.45	2.49	0.024	0.037	11.46	1713.22	3.66
4.00	T	155.61	62.68	61.71	2.48	2.52	0.024	0.036	11.58	1802.62	3.71
4.10	T	161.86	64.29	63.30	2.52	2.56	0.024	0.036	11.71	1895.64	3.75
4.20	T	168.27	65.90	64.89	2.55	2.59	0.024	0.036	11.84	1992.32	3.80
4.30	T	174.84	67.51	66.49	2.59	2.63	0.024	0.036	11.97	2092.73	3.84
4.40	T	181.57	69.12	68.08	2.63	2.67	0.024	0.036	12.10	2196.90	3.89
4.50	T	188.45	70.73	69.67	2.66	2.70	0.024	0.036	12.23	2304.90	3.93
4.60	T	195.50	72.34	71.26	2.70	2.74	0.024	0.036	12.36	2416.78	3.98
4.70	T	202.71	73.95	72.86	2.74	2.78	0.024	0.036	12.49	2532.58	4.03
4.80	T	210.07	75.56	74.45	2.78	2.82	0.023	0.036	12.63	2652.37	4.08
4.90	T	217.60	77.18	76.04	2.82	2.86	0.023	0.036	12.76	2776.18	4.13
5.00	T	225.28	78.79	77.64	2.86	2.90	0.023	0.036	12.89	2904.08	4.17
5.10	T	233.12	80.40	79.23	2.90	2.94	0.023	0.036	13.02	3036.10	4.22
5.20	T	241.12	82.01	80.82	2.94	2.98	0.023	0.035	13.16	3172.30	4.27
5.30	T	249.29	83.62	82.41	2.98	3.02	0.023	0.035	13.29	3312.73	4.32
5.40	T	257.61	85.23	84.01	3.02	3.07	0.023	0.035	13.42	3457.43	4.37
5.50	T	266.09	86.84	85.60	3.06	3.11	0.023	0.035	13.55	3606.45	4.42
5.60	T	274.73	88.45	87.19	3.11	3.15	0.023	0.035	13.69	3759.83	4.47
5.70	T	283.53	90.06	88.79	3.15	3.19	0.023	0.035	13.82	3917.63	4.52
5.80	T	292.48	91.68	90.38	3.19	3.24	0.023	0.035	13.95	4079.88	4.57
5.90	T	301.60	93.29	91.97	3.23	3.28	0.023	0.035	14.08	4246.63	4.62
6.00	T	310.88	94.90	93.56	3.28	3.32	0.023	0.035	14.21	4417.92	4.67
6.10	T	320.31	96.51	95.16	3.32	3.37	0.023	0.035	14.34	4593.80	4.72

PacifiCorp / Cowlitz PUD
Lewis River Hydroelectric Projects
FERC Project Nos. 935, 2071, 2111, 2213

6.20	T	329.91	98.12	96.75	3.36	3.41	0.023	0.035	14.47	4774.31	4.78
6.30	T	339.71	100.63	99.25	3.38	3.42	0.023	0.035	14.51	4930.45	4.78
6.40	T	349.76	103.14	101.75	3.39	3.44	0.023	0.035	14.56	5092.70	4.79
6.50	T	360.06	105.64	104.25	3.41	3.45	0.023	0.035	14.61	5261.10	4.81
6.60	T	370.61	108.15	106.75	3.43	3.47	0.023	0.035	14.67	5435.70	4.82
6.70	T	381.41	110.66	109.25	3.45	3.49	0.023	0.035	14.73	5616.53	4.84
6.80	T	392.46	113.17	111.75	3.47	3.51	0.022	0.035	14.79	5803.64	4.86
6.90	T	403.76	115.68	114.25	3.49	3.53	0.022	0.035	14.85	5997.08	4.88
7.00	T	415.31	118.18	116.75	3.51	3.56	0.022	0.034	14.92	6196.90	4.90
7.10	T	427.11	120.69	119.25	3.54	3.58	0.022	0.034	14.99	6403.15	4.92
7.20	T	439.16	123.20	121.75	3.56	3.61	0.022	0.034	15.06	6615.89	4.94
7.30	T	451.46	125.71	124.25	3.59	3.63	0.022	0.034	15.14	6835.15	4.97
7.40	T	464.01	128.22	126.75	3.62	3.66	0.022	0.034	15.22	7061.01	5.00
7.50	T	476.81	130.72	129.25	3.65	3.69	0.022	0.034	15.30	7293.51	5.02
7.60	T	489.86	133.23	131.75	3.68	3.72	0.022	0.034	15.38	7532.71	5.05
7.70	T	503.16	135.74	134.25	3.71	3.75	0.022	0.034	15.46	7778.66	5.08
7.80	T	516.71	138.25	136.75	3.74	3.78	0.022	0.034	15.54	8031.42	5.11
7.90	T	530.51	140.76	139.25	3.77	3.81	0.022	0.034	15.63	8291.04	5.14
8.00	T	544.56	143.26	141.75	3.80	3.84	0.022	0.034	15.71	8557.58	5.17
8.10	T	558.86	145.77	144.25	3.83	3.87	0.022	0.034	15.80	8831.10	5.20
8.20	T	573.41	148.28	146.75	3.87	3.91	0.022	0.034	15.89	9111.64	5.24
8.30	T	588.21	150.79	149.25	3.90	3.94	0.022	0.034	15.98	9399.26	5.27
8.40	T	603.26	153.30	151.75	3.94	3.98	0.022	0.034	16.07	9694.02	5.30
8.50	T	618.56	155.80	154.25	3.97	4.01	0.022	0.034	16.16	9995.97	5.34
8.60	T	634.11	158.31	156.75	4.01	4.05	0.021	0.034	16.25	10305.17	5.37
8.70	T	649.91	160.82	159.25	4.04	4.08	0.021	0.034	16.34	10621.66	5.40
8.80	T	665.96	163.33	161.75	4.08	4.12	0.021	0.034	16.44	10945.50	5.44
8.90	T	682.26	165.83	164.25	4.11	4.15	0.021	0.034	16.53	11276.75	5.48
9.00	T	698.81	168.34	166.75	4.15	4.19	0.021	0.034	16.62	11615.44	5.51
9.10	T	715.61	170.85	169.25	4.19	4.23	0.021	0.034	16.72	11961.64	5.55
9.20	T	732.66	173.36	171.75	4.23	4.27	0.021	0.034	16.81	12315.39	5.58
9.30	T	749.96	175.87	174.25	4.26	4.30	0.021	0.034	16.90	12676.75	5.62
9.40	T	767.51	178.37	176.75	4.30	4.34	0.021	0.034	17.00	13045.76	5.65
9.50	T	785.31	180.88	179.25	4.34	4.38	0.021	0.034	17.09	13422.48	5.69
9.60	T	803.36	183.39	181.75	4.38	4.42	0.021	0.034	17.19	13806.94	5.73
9.70	T	821.66	185.90	184.25	4.42	4.46	0.021	0.034	17.28	14199.19	5.77
9.80	T	840.21	188.41	186.75	4.46	4.50	0.021	0.034	17.38	14599.29	5.80
9.90	T	859.01	190.91	189.25	4.50	4.54	0.021	0.034	17.47	15007.27	5.84
10.00	T	878.06	193.42	191.75	4.54	4.58	0.021	0.034	17.57	15423.19	5.88
10.10	T	897.36	195.93	194.25	4.58	4.62	0.021	0.033	17.66	15847.08	5.91
10.20	T	916.91	198.44	196.75	4.62	4.66	0.021	0.033	17.75	16278.99	5.95
10.30	T	936.71	200.95	199.25	4.66	4.70	0.021	0.033	17.85	16718.97	5.99
10.40	T	956.75	203.45	201.75	4.70	4.74	0.021	0.033	17.94	17167.04	6.02
10.50	T	977.05	205.96	204.25	4.74	4.78	0.020	0.033	18.04	17623.27	6.06
10.60	T	997.60	208.47	206.75	4.79	4.83	0.020	0.033	18.13	18087.68	6.10
10.70	T	1018.40	210.98	209.25	4.83	4.87	0.020	0.033	18.22	18560.31	6.14
10.80	T	1039.45	213.49	211.75	4.87	4.91	0.020	0.033	18.32	19041.21	6.17
10.90	T	1060.75	215.99	214.25	4.91	4.95	0.020	0.033	18.41	19530.42	6.21
11.00	T	1082.30	218.50	216.75	4.95	4.99	0.020	0.033	18.50	20027.96	6.25
11.10	T	1104.10	221.01	219.25	5.00	5.04	0.020	0.033	18.60	20533.88	6.28
11.20	T	1126.15	223.52	221.75	5.04	5.08	0.020	0.033	18.69	21048.21	6.32
11.30	T	1148.45	226.03	224.25	5.08	5.12	0.020	0.033	18.78	21570.98	6.36
11.40	T	1171.00	228.53	226.75	5.12	5.16	0.020	0.033	18.87	22102.24	6.39

Lower Speelyai Site B



*****WinXSPRO*****

lspeelb.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELB.DAT
 Run Date: 03/18/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 06/04/01

Subsections/Dividing stations
 A / 200.00/ @

Resistance Method: Jarrett's Equation

STAGE	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.50	T	6.00	20.03	20.00	0.30	0.30	0.005	0.063	0.74	4.45	0.09
0.70	T	10.65	25.00	24.83	0.43	0.43	0.005	0.060	0.99	10.57	0.13
0.90	T	15.77	26.73	26.41	0.59	0.60	0.005	0.057	1.30	20.53	0.18
1.10	T	21.22	28.71	28.24	0.74	0.75	0.005	0.055	1.57	33.32	0.23
1.30	T	27.08	30.93	30.32	0.88	0.89	0.005	0.053	1.81	48.91	0.27
1.50	T	33.66	39.41	38.65	0.85	0.87	0.005	0.053	1.77	59.58	0.27
1.70	T	41.65	42.14	41.23	0.99	1.01	0.005	0.052	2.00	83.22	0.31
1.90	T	50.13	44.28	43.23	1.13	1.16	0.005	0.051	2.24	112.08	0.35
2.10	T	58.91	45.85	44.64	1.29	1.32	0.005	0.050	2.48	146.35	0.40
2.30	T	69.20	53.57	52.22	1.29	1.33	0.005	0.050	2.49	172.64	0.40
2.50	T	79.80	55.30	53.80	1.44	1.48	0.005	0.049	2.74	218.27	0.45
2.70	T	90.59	55.84	54.13	1.62	1.67	0.005	0.048	3.01	273.10	0.51
2.90	T	101.45	56.37	54.46	1.80	1.86	0.005	0.047	3.29	333.32	0.56
3.10	T	112.39	57.04	54.96	1.97	2.04	0.005	0.047	3.54	398.09	0.61
3.30	T	123.45	57.83	55.64	2.13	2.22	0.005	0.046	3.79	467.32	0.67
3.50	T	134.64	58.62	56.32	2.30	2.39	0.005	0.046	4.02	541.63	0.72
3.70	T	145.97	59.42	57.00	2.46	2.56	0.005	0.045	4.25	620.98	0.77
3.90	T	157.44	60.21	57.68	2.61	2.73	0.005	0.045	4.48	705.35	0.82
4.10	T	169.05	61.00	58.36	2.77	2.90	0.005	0.044	4.70	794.70	0.86
4.30	T	180.78	61.80	59.04	2.93	3.06	0.005	0.044	4.92	889.01	0.91
4.50	T	192.68	62.92	60.06	3.06	3.21	0.005	0.044	5.11	984.14	0.96
4.70	T	204.82	64.37	61.42	3.18	3.34	0.005	0.043	5.27	1080.04	0.99
4.90	T	217.24	65.82	62.78	3.30	3.46	0.005	0.043	5.44	1180.86	1.03
5.10	T	229.93	67.26	64.14	3.42	3.58	0.005	0.043	5.60	1286.69	1.07
5.30	T	242.90	68.71	65.50	3.53	3.71	0.005	0.043	5.75	1397.60	1.10
5.50	T	256.44	73.24	69.95	3.50	3.67	0.005	0.043	5.71	1463.93	1.09
5.70	T	270.88	77.76	74.40	3.48	3.64	0.005	0.043	5.68	1539.69	1.09
5.90	T	286.20	82.29	78.85	3.48	3.63	0.005	0.043	5.68	1624.74	1.09
6.10	T	302.42	86.81	83.30	3.48	3.63	0.005	0.043	5.68	1719.04	1.09
6.30	T	319.52	91.34	87.75	3.50	3.64	0.005	0.043	5.70	1822.63	1.09
6.50	T	337.30	93.67	90.00	3.60	3.75	0.005	0.042	5.84	1970.81	1.12
6.70	T	356.30	103.68	100.00	3.44	3.56	0.005	0.043	5.62	2002.58	1.07
6.90	T	377.30	113.69	110.00	3.32	3.43	0.005	0.043	5.46	2060.03	1.04
7.00	T	388.55	118.70	115.00	3.27	3.38	0.005	0.043	5.40	2097.45	1.02

*****WinXSPRO*****

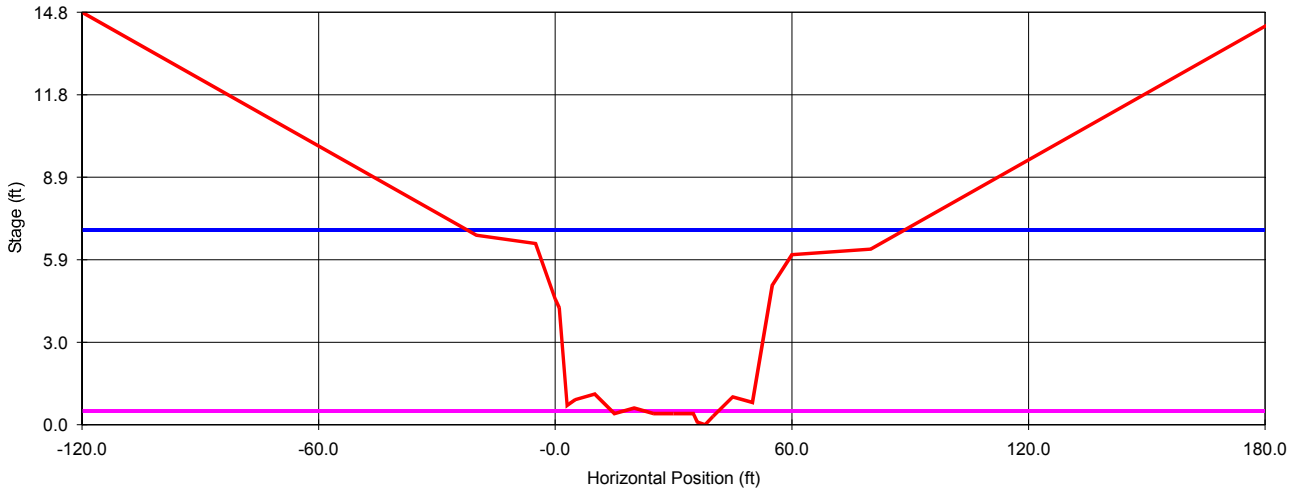
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 Run Date: 03/18/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 06/04/01

Subsections/Dividing stations
 A / 200.00/ @

Resistance Method: Thorne and Zevenbergen
 D84: 65.000 mm

STAGE	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.50	T	6.00	20.03	20.00	0.30	0.30	0.005	0.053	0.89	5.32	0.09
0.70	T	10.65	25.00	24.83	0.43	0.43	0.005	0.047	1.28	13.61	0.13
0.90	T	15.77	26.73	26.41	0.59	0.60	0.005	0.043	1.73	27.32	0.18
1.10	T	21.22	28.71	28.24	0.74	0.75	0.005	0.041	2.12	45.05	0.23
1.30	T	27.08	30.93	30.32	0.88	0.89	0.005	0.039	2.46	66.72	0.27
1.50	T	33.66	39.41	38.65	0.85	0.87	0.005	0.039	2.46	82.79	0.27
1.70	T	41.65	42.14	41.23	0.99	1.01	0.005	0.038	2.78	115.85	0.31
1.90	T	50.13	44.28	43.23	1.13	1.16	0.005	0.037	3.11	155.88	0.35
2.10	T	58.91	45.85	44.64	1.29	1.32	0.005	0.036	3.44	202.94	0.40
2.30	T	69.20	53.57	52.22	1.29	1.33	0.005	0.036	3.49	241.46	0.40
2.50	T	79.80	55.30	53.80	1.44	1.48	0.005	0.035	3.81	303.90	0.45
2.70	T	90.59	55.84	54.13	1.62	1.67	0.005	0.035	4.17	377.64	0.51
2.90	T	101.45	56.37	54.46	1.80	1.86	0.005	0.035	4.51	457.87	0.56
3.10	T	112.39	57.04	54.96	1.97	2.04	0.005	0.034	4.84	543.57	0.61
3.30	T	123.45	57.83	55.64	2.13	2.22	0.005	0.034	5.14	634.61	0.67
3.50	T	134.64	58.62	56.32	2.30	2.39	0.005	0.034	5.43	731.69	0.72
3.70	T	145.97	59.42	57.00	2.46	2.56	0.005	0.034	5.72	834.71	0.77
3.90	T	157.44	60.21	57.68	2.61	2.73	0.005	0.033	5.99	943.58	0.82
4.10	T	169.05	61.00	58.36	2.77	2.90	0.005	0.033	6.26	1058.24	0.86
4.30	T	180.78	61.80	59.04	2.93	3.06	0.005	0.033	6.52	1178.61	0.91
4.50	T	192.68	62.92	60.06	3.06	3.21	0.005	0.033	6.75	1300.26	0.96
4.70	T	204.82	64.37	61.42	3.18	3.34	0.005	0.033	6.95	1423.30	0.99
4.90	T	217.24	65.82	62.78	3.30	3.46	0.005	0.033	7.15	1552.24	1.03
5.10	T	229.93	67.26	64.14	3.42	3.58	0.005	0.033	7.34	1687.15	1.07
5.30	T	242.90	68.71	65.50	3.53	3.71	0.005	0.032	7.53	1828.09	1.10
5.50	T	256.44	73.24	69.95	3.50	3.67	0.005	0.032	7.50	1923.28	1.09
5.70	T	270.88	77.76	74.40	3.48	3.64	0.005	0.032	7.49	2030.06	1.09
5.90	T	286.20	82.29	78.85	3.48	3.63	0.005	0.032	7.51	2148.39	1.09
6.10	T	302.42	86.81	83.30	3.48	3.63	0.005	0.032	7.53	2278.28	1.09
6.30	T	319.52	91.34	87.75	3.50	3.64	0.005	0.032	7.57	2419.83	1.09
6.50	T	337.30	93.67	90.00	3.60	3.75	0.005	0.032	7.74	2610.27	1.12
6.70	T	356.30	103.68	100.00	3.44	3.56	0.005	0.032	7.52	2679.01	1.07
6.90	T	377.30	113.69	110.00	3.32	3.43	0.005	0.032	7.36	2777.90	1.04
7.00	T	388.55	118.70	115.00	3.27	3.38	0.005	0.032	7.30	2837.83	1.02

Lower Speelyai Site C



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*****WinXSPRO*****
lspeelc.out
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Run Date:       01/07/02
Analysis Procedure:  Hydraulics
Cross Section Number:  1
Survey Date:    11/19/01
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Subsections/Dividing stations
 A / 180.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.20	T	0.45	3.70	3.67	0.12	0.12	0.007	0.083	0.37	0.16	0.05
0.40	T	1.39	15.79	15.71	0.09	0.09	0.007	0.087	0.28	0.39	0.04
0.60	T	5.81	28.68	28.57	0.20	0.20	0.007	0.076	0.56	3.25	0.09
0.80	T	11.87	32.69	32.49	0.36	0.37	0.007	0.070	0.91	10.75	0.16
1.00	T	19.46	44.63	44.19	0.44	0.44	0.007	0.068	1.05	20.53	0.19
1.20	T	28.82	48.39	47.76	0.60	0.60	0.007	0.064	1.37	39.37	0.26
1.40	T	38.40	48.93	48.11	0.78	0.80	0.007	0.062	1.72	65.98	0.34
1.60	T	48.06	49.47	48.47	0.97	0.99	0.007	0.059	2.05	98.56	0.42
1.80	T	57.79	50.01	48.82	1.16	1.18	0.007	0.058	2.37	136.86	0.50
2.00	T	67.59	50.56	49.17	1.34	1.37	0.007	0.056	2.67	180.67	0.58
2.20	T	77.46	51.10	49.52	1.52	1.56	0.007	0.055	2.97	229.81	0.66
2.40	T	87.40	51.64	49.88	1.69	1.75	0.007	0.054	3.25	284.14	0.74
2.60	T	97.41	52.18	50.23	1.87	1.94	0.007	0.054	3.53	343.52	0.82
2.80	T	107.49	52.72	50.58	2.04	2.13	0.007	0.053	3.79	407.85	0.89
3.00	T	117.64	53.26	50.93	2.21	2.31	0.007	0.052	4.05	477.02	0.96
3.20	T	127.86	53.80	51.29	2.38	2.49	0.007	0.052	4.31	550.95	1.04
3.40	T	138.16	54.34	51.64	2.54	2.68	0.007	0.051	4.56	629.56	1.11
3.60	T	148.52	54.89	51.99	2.71	2.86	0.007	0.050	4.80	712.77	1.18
3.80	T	158.95	55.43	52.34	2.87	3.04	0.007	0.050	5.04	800.51	1.25
4.00	T	169.46	55.97	52.69	3.03	3.22	0.007	0.050	5.27	892.73	1.32
4.20	T	180.03	56.51	53.05	3.19	3.39	0.007	0.049	5.50	989.37	1.39
4.40	T	190.73	57.52	53.95	3.32	3.54	0.007	0.049	5.68	1083.62	1.45
4.60	T	201.61	58.44	54.77	3.45	3.68	0.007	0.049	5.87	1183.54	1.51
4.80	T	212.64	59.29	55.51	3.59	3.83	0.007	0.048	6.06	1289.17	1.57
5.00	T	223.81	60.14	56.25	3.72	3.98	0.007	0.048	6.25	1399.25	1.63
5.20	T	235.20	61.61	57.66	3.82	4.08	0.007	0.048	6.39	1501.92	1.67
5.40	T	246.87	63.08	59.07	3.91	4.18	0.007	0.048	6.52	1609.34	1.71
5.60	T	258.83	64.55	60.48	4.01	4.28	0.007	0.047	6.65	1721.59	1.75
5.80	T	271.07	66.02	61.89	4.11	4.38	0.007	0.047	6.78	1838.77	1.79
6.00	T	283.58	67.49	63.30	4.20	4.48	0.007	0.047	6.92	1960.98	1.84
6.20	T	296.86	78.49	74.25	3.78	4.00	0.007	0.048	6.34	1881.01	1.65
6.40	T	313.32	90.29	86.00	3.47	3.64	0.007	0.049	5.90	1848.56	1.52
6.60	T	331.06	98.07	93.75	3.38	3.53	0.007	0.049	5.77	1909.01	1.47
6.80	T	351.06	110.58	106.25	3.17	3.30	0.007	0.049	5.48	1923.75	1.39
7.00	T	372.81	115.59	111.25	3.23	3.35	0.007	0.049	5.55	2069.81	1.41

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 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

7.20	T	395.56	120.61	116.25	3.28	3.40	0.007	0.049	5.63	2226.87	1.43
7.40	T	419.31	125.62	121.25	3.34	3.46	0.007	0.049	5.71	2395.23	1.46
7.60	T	444.06	130.64	126.25	3.40	3.52	0.007	0.049	5.80	2575.21	1.48
7.80	T	469.81	135.66	131.25	3.46	3.58	0.007	0.049	5.89	2767.14	1.51
8.00	T	496.56	140.67	136.25	3.53	3.64	0.007	0.048	5.98	2971.35	1.54
8.20	T	524.31	145.69	141.25	3.60	3.71	0.007	0.048	6.08	3188.18	1.57
8.40	T	553.06	150.70	146.25	3.67	3.78	0.007	0.048	6.18	3417.96	1.60
8.60	T	582.81	155.72	151.25	3.74	3.85	0.007	0.048	6.28	3661.05	1.63
8.80	T	613.56	160.73	156.25	3.82	3.93	0.007	0.048	6.39	3917.80	1.67
9.00	T	645.31	165.75	161.25	3.89	4.00	0.007	0.048	6.49	4188.54	1.70

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 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

*****WinXSPRO*****

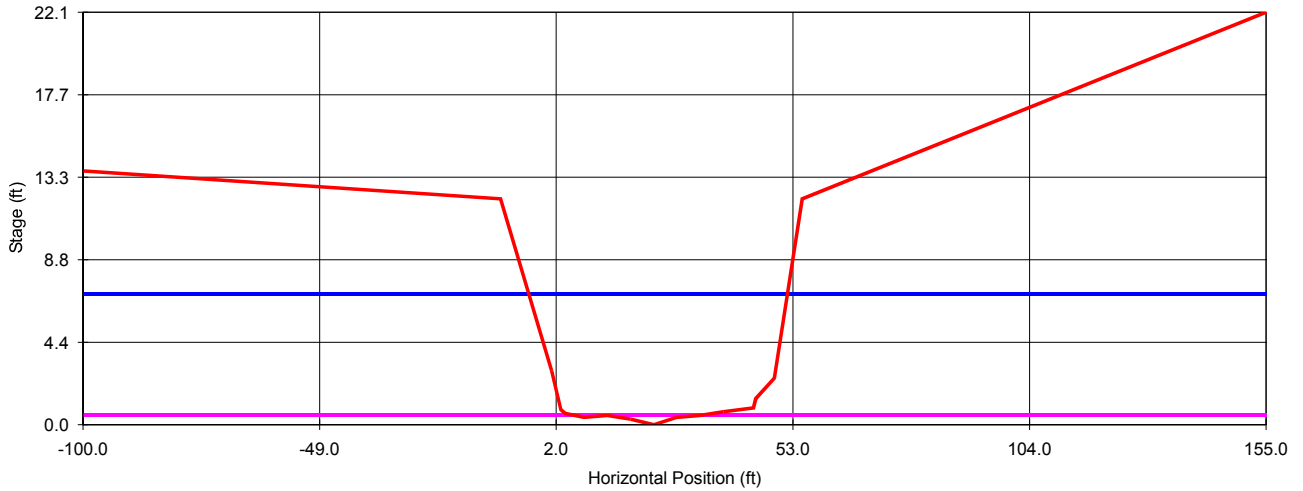
lspeelc.out
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 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 11/19/01

Subsections/Dividing stations
 A / 180.00/ @

Resistance Method: Thorne and Zevenbergen
 D84: 60.000 mm

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.20	T	0.45	3.70	3.67	0.12	0.12	0.007	0.072	0.43	0.19	0.05
0.40	T	1.39	15.79	15.71	0.09	0.09	0.007	0.083	0.30	0.41	0.04
0.60	T	5.81	28.68	28.57	0.20	0.20	0.007	0.054	0.79	4.62	0.09
0.80	T	11.87	32.69	32.49	0.36	0.37	0.007	0.045	1.41	16.68	0.16
1.00	T	19.46	44.63	44.19	0.44	0.44	0.007	0.042	1.69	32.90	0.19
1.20	T	28.82	48.39	47.76	0.60	0.60	0.007	0.040	2.22	63.90	0.26
1.40	T	38.40	48.93	48.11	0.78	0.80	0.007	0.038	2.79	107.14	0.34
1.60	T	48.06	49.47	48.47	0.97	0.99	0.007	0.037	3.32	159.51	0.42
1.80	T	57.79	50.01	48.82	1.16	1.18	0.007	0.036	3.81	220.40	0.50
2.00	T	67.59	50.56	49.17	1.34	1.37	0.007	0.035	4.28	289.33	0.58
2.20	T	77.46	51.10	49.52	1.52	1.56	0.007	0.035	4.72	365.90	0.66
2.40	T	87.40	51.64	49.88	1.69	1.75	0.007	0.034	5.15	449.79	0.74
2.60	T	97.41	52.18	50.23	1.87	1.94	0.007	0.034	5.55	540.73	0.82
2.80	T	107.49	52.72	50.58	2.04	2.13	0.007	0.034	5.94	638.46	0.89
3.00	T	117.64	53.26	50.93	2.21	2.31	0.007	0.033	6.31	742.79	0.96
3.20	T	127.86	53.80	51.29	2.38	2.49	0.007	0.033	6.68	853.52	1.04
3.40	T	138.16	54.34	51.64	2.54	2.68	0.007	0.033	7.02	970.50	1.11
3.60	T	148.52	54.89	51.99	2.71	2.86	0.007	0.033	7.36	1093.56	1.18
3.80	T	158.95	55.43	52.34	2.87	3.04	0.007	0.033	7.69	1222.58	1.25
4.00	T	169.46	55.97	52.69	3.03	3.22	0.007	0.033	8.01	1357.43	1.32
4.20	T	180.03	56.51	53.05	3.19	3.39	0.007	0.032	8.32	1498.02	1.39
4.40	T	190.73	57.52	53.95	3.32	3.54	0.007	0.032	8.58	1636.11	1.45
4.60	T	201.61	58.44	54.77	3.45	3.68	0.007	0.032	8.84	1781.65	1.51
4.80	T	212.64	59.29	55.51	3.59	3.83	0.007	0.032	9.10	1934.61	1.57
5.00	T	223.81	60.14	56.25	3.72	3.98	0.007	0.032	9.35	2093.41	1.63
5.20	T	235.20	61.61	57.66	3.82	4.08	0.007	0.032	9.54	2244.06	1.67
5.40	T	246.87	63.08	59.07	3.91	4.18	0.007	0.032	9.73	2401.25	1.71
5.60	T	258.83	64.55	60.48	4.01	4.28	0.007	0.032	9.91	2565.10	1.75
5.80	T	271.07	66.02	61.89	4.11	4.38	0.007	0.032	10.09	2735.72	1.79
6.00	T	283.58	67.49	63.30	4.20	4.48	0.007	0.032	10.27	2913.21	1.84
6.20	T	296.86	78.49	74.25	3.78	4.00	0.007	0.032	9.61	2851.79	1.65
6.40	T	313.32	90.29	86.00	3.47	3.64	0.007	0.031	9.10	2850.12	1.52
6.60	T	331.06	98.07	93.75	3.38	3.53	0.007	0.031	8.95	2963.71	1.47
6.80	T	351.06	110.58	106.25	3.17	3.30	0.007	0.031	8.61	3024.00	1.39
7.00	T	372.81	115.59	111.25	3.23	3.35	0.007	0.031	8.72	3252.17	1.41
7.20	T	395.56	120.61	116.25	3.28	3.40	0.007	0.031	8.84	3496.54	1.43
7.40	T	419.31	125.62	121.25	3.34	3.46	0.007	0.031	8.96	3757.48	1.46
7.60	T	444.06	130.64	126.25	3.40	3.52	0.007	0.031	9.09	4035.41	1.48
7.80	T	469.81	135.66	131.25	3.46	3.58	0.007	0.031	9.22	4330.75	1.51
8.00	T	496.56	140.67	136.25	3.53	3.64	0.007	0.031	9.35	4643.90	1.54
8.20	T	524.31	145.69	141.25	3.60	3.71	0.007	0.031	9.49	4975.29	1.57
8.40	T	553.06	150.70	146.25	3.67	3.78	0.007	0.031	9.63	5325.34	1.60
8.60	T	582.81	155.72	151.25	3.74	3.85	0.007	0.031	9.77	5694.47	1.63
8.80	T	613.56	160.73	156.25	3.82	3.93	0.007	0.031	9.91	6083.10	1.67
9.00	T	645.31	165.75	161.25	3.89	4.00	0.007	0.031	10.06	6491.65	1.70

Lower Speelyai Site D



*****WinXSPRO*****

lspeeld.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELD.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 155.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.15	2.92	2.92	0.05	0.05	0.018	0.137	0.20	0.03	0.06
0.20	T	0.58	5.85	5.83	0.10	0.10	0.018	0.122	0.35	0.20	0.11
0.30	T	1.31	8.77	8.75	0.15	0.15	0.018	0.115	0.49	0.64	0.17
0.40	T	2.37	12.53	12.50	0.19	0.19	0.018	0.110	0.59	1.40	0.21
0.50	T	4.35	27.03	27.00	0.16	0.16	0.018	0.113	0.52	2.24	0.18
0.60	T	7.27	31.54	31.50	0.23	0.23	0.018	0.106	0.69	5.06	0.25
0.70	T	10.57	34.55	34.50	0.31	0.31	0.018	0.102	0.88	9.29	0.34
0.80	T	14.21	38.31	38.25	0.37	0.37	0.018	0.098	1.03	14.64	0.41
0.90	T	18.20	41.70	41.59	0.44	0.44	0.018	0.096	1.18	21.45	0.48
1.00	T	22.37	41.98	41.79	0.53	0.54	0.017	0.093	1.39	31.10	0.58
1.10	T	26.56	42.26	41.99	0.63	0.63	0.017	0.090	1.59	42.33	0.68
1.20	T	30.77	42.54	42.18	0.72	0.73	0.017	0.088	1.79	55.07	0.78
1.30	T	35.00	42.82	42.38	0.82	0.83	0.017	0.086	1.98	69.30	0.88
1.40	T	39.25	43.10	42.57	0.91	0.92	0.017	0.085	2.16	84.96	0.98
1.50	T	43.53	43.61	43.03	1.00	1.01	0.017	0.083	2.33	101.63	1.07
1.60	T	47.85	44.13	43.49	1.08	1.10	0.017	0.082	2.50	119.64	1.16
1.70	T	52.22	44.64	43.95	1.17	1.19	0.017	0.081	2.66	139.00	1.24
1.80	T	56.64	45.16	44.41	1.25	1.28	0.017	0.080	2.82	159.67	1.33
1.90	T	61.11	45.67	44.87	1.34	1.36	0.017	0.079	2.97	181.64	1.41
2.00	T	65.61	46.19	45.32	1.42	1.45	0.017	0.078	3.12	204.91	1.49
2.10	T	70.17	46.70	45.78	1.50	1.53	0.017	0.077	3.27	229.47	1.57
2.20	T	74.77	47.22	46.24	1.58	1.62	0.017	0.077	3.41	255.30	1.65
2.30	T	79.42	47.74	46.70	1.66	1.70	0.017	0.076	3.56	282.40	1.73
2.40	T	84.11	48.25	47.16	1.74	1.78	0.017	0.075	3.69	310.77	1.80
2.50	T	88.85	48.77	47.62	1.82	1.87	0.017	0.075	3.83	340.39	1.88
2.60	T	93.62	49.02	47.78	1.91	1.96	0.016	0.074	3.98	372.78	1.96
2.70	T	98.41	49.28	47.93	2.00	2.05	0.016	0.073	4.13	406.44	2.04
2.80	T	103.21	49.53	48.09	2.08	2.15	0.016	0.073	4.28	441.36	2.12
2.90	T	108.02	49.79	48.25	2.17	2.24	0.016	0.072	4.42	477.51	2.20
3.00	T	112.86	50.06	48.43	2.25	2.33	0.016	0.071	4.56	514.76	2.28
3.10	T	117.71	50.34	48.61	2.34	2.42	0.016	0.071	4.70	553.21	2.36
3.20	T	122.58	50.61	48.80	2.42	2.51	0.016	0.070	4.84	592.87	2.43
3.30	T	127.47	50.88	48.98	2.51	2.60	0.016	0.070	4.97	633.72	2.50
3.40	T	132.38	51.16	49.16	2.59	2.69	0.016	0.070	5.10	675.74	2.58
3.50	T	137.30	51.43	49.34	2.67	2.78	0.016	0.069	5.24	718.92	2.65

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.60	T	142.24	51.71	49.52	2.75	2.87	0.016	0.069	5.37	763.27	2.72
3.70	T	147.21	51.98	49.71	2.83	2.96	0.016	0.068	5.49	808.75	2.79
3.80	T	152.19	52.25	49.89	2.91	3.05	0.016	0.068	5.62	855.38	2.85
3.90	T	157.18	52.53	50.07	2.99	3.14	0.016	0.067	5.75	903.13	2.92
4.00	T	162.20	52.80	50.25	3.07	3.23	0.016	0.067	5.87	952.00	2.99
4.10	T	167.23	53.08	50.43	3.15	3.32	0.016	0.067	5.99	1001.97	3.05
4.20	T	172.29	53.35	50.62	3.23	3.40	0.015	0.066	6.11	1053.05	3.11
4.30	T	177.36	53.62	50.80	3.31	3.49	0.015	0.066	6.23	1105.21	3.18
4.40	T	182.45	53.90	50.98	3.39	3.58	0.015	0.066	6.35	1158.47	3.24
4.50	T	187.55	54.17	51.16	3.46	3.67	0.015	0.065	6.47	1212.80	3.30
4.60	T	192.68	54.44	51.34	3.54	3.75	0.015	0.065	6.58	1268.19	3.36
4.70	T	197.82	54.72	51.53	3.62	3.84	0.015	0.065	6.70	1324.65	3.42
4.80	T	202.98	54.99	51.71	3.69	3.93	0.015	0.064	6.81	1382.17	3.47
4.90	T	208.16	55.27	51.89	3.77	4.01	0.015	0.064	6.92	1440.73	3.53
5.00	T	213.36	55.54	52.07	3.84	4.10	0.015	0.064	7.03	1500.34	3.59
5.10	T	218.58	55.81	52.26	3.92	4.18	0.015	0.063	7.14	1560.98	3.64
5.20	T	223.81	56.09	52.44	3.99	4.27	0.015	0.063	7.25	1622.65	3.69
5.30	T	229.07	56.36	52.62	4.06	4.35	0.015	0.063	7.36	1685.34	3.75
5.40	T	234.34	56.63	52.80	4.14	4.44	0.015	0.063	7.46	1749.05	3.80
5.50	T	239.63	56.91	52.98	4.21	4.52	0.015	0.062	7.57	1813.77	3.85
5.60	T	244.93	57.18	53.17	4.28	4.61	0.015	0.062	7.67	1879.50	3.90
5.70	T	250.26	57.46	53.35	4.36	4.69	0.015	0.062	7.78	1946.23	3.95
5.80	T	255.60	57.73	53.53	4.43	4.78	0.014	0.061	7.88	2013.95	4.00
5.90	T	260.97	58.00	53.71	4.50	4.86	0.014	0.061	7.98	2082.67	4.04
6.00	T	266.35	58.28	53.89	4.57	4.94	0.014	0.061	8.08	2152.37	4.09
6.10	T	271.74	58.55	54.08	4.64	5.03	0.014	0.061	8.18	2223.04	4.14
6.20	T	277.16	58.83	54.26	4.71	5.11	0.014	0.060	8.28	2294.70	4.18
6.30	T	282.60	59.10	54.44	4.78	5.19	0.014	0.060	8.38	2367.32	4.22
6.40	T	288.05	59.37	54.62	4.85	5.27	0.014	0.060	8.47	2440.92	4.27
6.50	T	293.52	59.65	54.80	4.92	5.36	0.014	0.060	8.57	2515.47	4.31
6.60	T	299.01	59.92	54.99	4.99	5.44	0.014	0.060	8.67	2590.98	4.35
6.70	T	304.52	60.19	55.17	5.06	5.52	0.014	0.059	8.76	2667.44	4.39
6.80	T	310.04	60.47	55.35	5.13	5.60	0.014	0.059	8.85	2744.85	4.43
6.90	T	315.59	60.74	55.53	5.20	5.68	0.014	0.059	8.95	2823.20	4.47
7.00	T	321.15	61.02	55.71	5.26	5.76	0.014	0.059	9.04	2902.50	4.51
7.10	T	326.73	61.29	55.90	5.33	5.85	0.014	0.058	9.13	2982.73	4.54
7.20	T	332.33	61.56	56.08	5.40	5.93	0.014	0.058	9.22	3063.89	4.58
7.30	T	337.95	61.84	56.26	5.47	6.01	0.014	0.058	9.31	3145.98	4.62
7.40	T	343.58	62.11	56.44	5.53	6.09	0.013	0.058	9.40	3228.99	4.65
7.50	T	349.23	62.38	56.62	5.60	6.17	0.013	0.058	9.49	3312.92	4.68
7.60	T	354.91	62.66	56.81	5.66	6.25	0.013	0.057	9.57	3397.77	4.72
7.70	T	360.60	62.93	56.99	5.73	6.33	0.013	0.057	9.66	3483.54	4.75
7.80	T	366.30	63.21	57.17	5.80	6.41	0.013	0.057	9.75	3570.21	4.78
7.90	T	372.03	63.48	57.35	5.86	6.49	0.013	0.057	9.83	3657.79	4.81
8.00	T	377.77	63.75	57.53	5.93	6.57	0.013	0.056	9.92	3746.27	4.84
8.10	T	383.54	64.03	57.72	5.99	6.65	0.013	0.056	10.00	3835.65	4.87
8.20	T	389.32	64.30	57.90	6.05	6.72	0.013	0.056	10.08	3925.92	4.90
8.30	T	395.12	64.57	58.08	6.12	6.80	0.013	0.056	10.17	4017.09	4.93
8.40	T	400.93	64.85	58.26	6.18	6.88	0.013	0.056	10.25	4109.14	4.96
8.50	T	406.77	65.12	58.45	6.25	6.96	0.013	0.056	10.33	4202.08	4.99
8.60	T	412.62	65.40	58.63	6.31	7.04	0.013	0.055	10.41	4295.90	5.01
8.70	T	418.49	65.67	58.81	6.37	7.12	0.013	0.055	10.49	4390.59	5.04
8.80	T	424.39	65.94	58.99	6.44	7.19	0.013	0.055	10.57	4486.17	5.06
8.90	T	430.29	66.22	59.17	6.50	7.27	0.013	0.055	10.65	4582.61	5.09
9.00	T	436.22	66.49	59.36	6.56	7.35	0.012	0.055	10.73	4679.93	5.11
9.10	T	442.16	66.77	59.54	6.62	7.43	0.012	0.054	10.81	4778.11	5.13
9.20	T	448.13	67.04	59.72	6.68	7.50	0.012	0.054	10.88	4877.15	5.15
9.30	T	454.11	67.31	59.90	6.75	7.58	0.012	0.054	10.96	4977.05	5.18
9.40	T	460.11	67.59	60.08	6.81	7.66	0.012	0.054	11.04	5077.80	5.20
9.50	T	466.13	67.86	60.27	6.87	7.73	0.012	0.054	11.11	5179.41	5.22
9.60	T	472.16	68.13	60.45	6.93	7.81	0.012	0.053	11.19	5281.87	5.24
9.70	T	478.21	68.41	60.63	6.99	7.89	0.012	0.053	11.26	5385.18	5.25
9.80	T	484.29	68.68	60.81	7.05	7.96	0.012	0.053	11.33	5489.33	5.27
9.90	T	490.38	68.96	60.99	7.11	8.04	0.012	0.053	11.41	5594.32	5.29
10.00	T	496.49	69.23	61.18	7.17	8.12	0.012	0.053	11.48	5700.14	5.31
10.10	T	502.61	69.50	61.36	7.23	8.19	0.012	0.053	11.55	5806.80	5.32
10.20	T	508.76	69.78	61.54	7.29	8.27	0.012	0.052	11.62	5914.30	5.34
10.30	T	514.92	70.05	61.72	7.35	8.34	0.012	0.052	11.70	6022.62	5.35
10.40	T	521.10	70.32	61.90	7.41	8.42	0.012	0.052	11.77	6131.77	5.37
10.50	T	527.30	70.60	62.09	7.47	8.49	0.012	0.052	11.84	6241.73	5.38
10.60	T	533.52	70.87	62.27	7.53	8.57	0.011	0.052	11.91	6352.52	5.40
10.70	T	539.75	71.15	62.45	7.59	8.64	0.011	0.052	11.98	6464.13	5.41
10.80	T	546.01	71.42	62.63	7.65	8.72	0.011	0.051	12.04	6576.54	5.42
10.90	T	552.28	71.69	62.81	7.70	8.79	0.011	0.051	12.11	6689.77	5.43
11.00	T	558.57	71.97	63.00	7.76	8.87	0.011	0.051	12.18	6803.80	5.44
11.10	T	564.88	72.24	63.18	7.82	8.94	0.011	0.051	12.25	6918.64	5.45
11.20	T	571.21	72.51	63.36	7.88	9.02	0.011	0.051	12.31	7034.28	5.46
11.30	T	577.55	72.79	63.54	7.93	9.09	0.011	0.051	12.38	7150.71	5.47
11.40	T	583.92	73.06	63.73	7.99	9.16	0.011	0.050	12.45	7267.94	5.48
11.50	T	590.30	73.34	63.91	8.05	9.24	0.011	0.050	12.51	7385.96	5.49

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

11.60	T	596.70	73.61	64.09	8.11	9.31	0.011	0.050	12.58	7504.77	5.50
11.70	T	603.12	73.88	64.27	8.16	9.38	0.011	0.050	12.64	7624.36	5.50
11.80	T	609.55	74.16	64.45	8.22	9.46	0.011	0.050	12.71	7744.74	5.51
11.90	T	616.01	74.43	64.64	8.28	9.53	0.011	0.050	12.77	7865.89	5.52
12.00	T	622.48	74.71	64.82	8.33	9.60	0.011	0.049	12.83	7987.82	5.52
12.10	T	628.97	74.98	65.00	8.39	9.68	0.011	0.049	12.89	8110.52	5.53
12.20	T	635.82	81.98	72.00	7.76	8.83	0.010	0.050	12.07	7676.33	5.08
12.30	T	643.37	88.99	79.00	7.23	8.14	0.010	0.050	11.38	7322.67	4.71
12.40	T	651.62	96.00	86.00	6.79	7.58	0.010	0.051	10.79	7033.46	4.39
12.50	T	660.57	103.00	93.00	6.41	7.10	0.010	0.051	10.29	6796.84	4.13
12.60	T	670.22	110.01	100.00	6.09	6.70	0.010	0.051	9.85	6603.88	3.90
12.70	T	680.57	117.01	107.00	5.82	6.36	0.010	0.051	9.47	6447.74	3.70
12.80	T	691.62	124.02	114.00	5.58	6.07	0.010	0.052	9.14	6323.09	3.52
12.90	T	703.37	131.02	121.00	5.37	5.81	0.010	0.052	8.85	6225.72	3.37
13.00	T	715.82	138.03	128.00	5.19	5.59	0.010	0.052	8.59	6152.28	3.24

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

*****WinXSPRO*****

lspeeld.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELD.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 155.00/ @

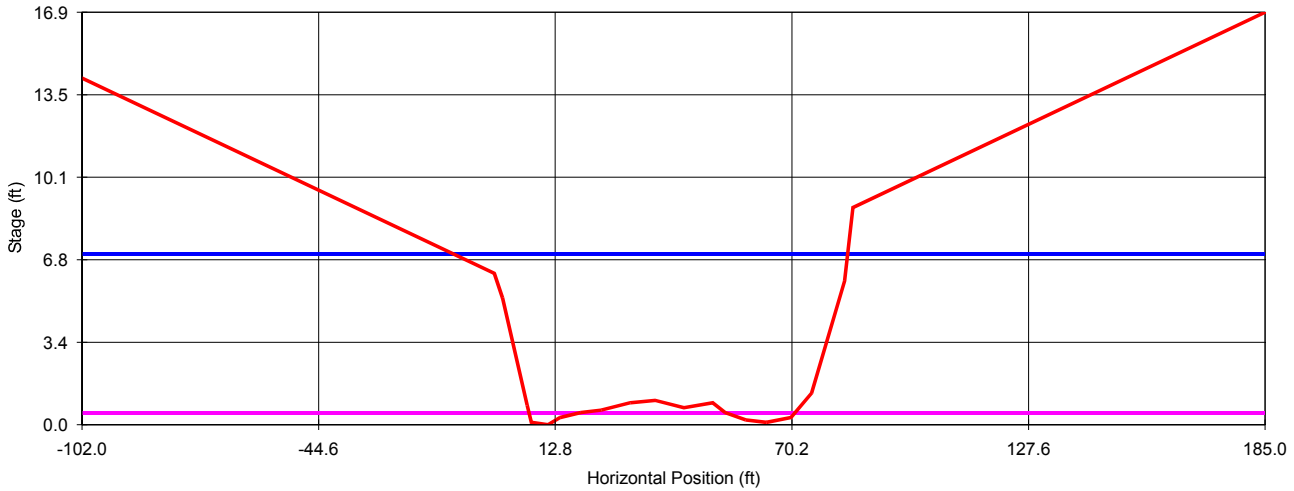
Resistance Method: Thorne and Zevenbergen
 D84: 70.000 mm

STAGE	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.15	2.92	2.92	0.05	0.05	0.018	0.125	0.22	0.03	0.06
0.20	T	0.58	5.85	5.83	0.10	0.10	0.018	0.091	0.47	0.27	0.11
0.30	T	1.31	8.77	8.75	0.15	0.15	0.018	0.076	0.74	0.97	0.17
0.40	T	2.37	12.53	12.50	0.19	0.19	0.018	0.070	0.94	2.24	0.21
0.50	T	4.35	27.03	27.00	0.16	0.16	0.018	0.085	0.69	3.02	0.18
0.60	T	7.27	31.54	31.50	0.23	0.23	0.018	0.058	1.29	9.38	0.25
0.70	T	10.57	34.55	34.50	0.31	0.31	0.018	0.052	1.73	18.29	0.34
0.80	T	14.21	38.31	38.25	0.37	0.37	0.018	0.049	2.10	29.78	0.41
0.90	T	18.20	41.70	41.59	0.44	0.44	0.018	0.046	2.45	44.58	0.48
1.00	T	22.37	41.98	41.79	0.53	0.54	0.017	0.044	2.93	65.51	0.58
1.10	T	26.56	42.26	41.99	0.63	0.63	0.017	0.043	3.38	89.81	0.68
1.20	T	30.77	42.54	42.18	0.72	0.73	0.017	0.041	3.81	117.31	0.78
1.30	T	35.00	42.82	42.38	0.82	0.83	0.017	0.041	4.22	147.84	0.88
1.40	T	39.25	43.10	42.57	0.91	0.92	0.017	0.040	4.62	181.29	0.98
1.50	T	43.53	43.61	43.03	1.00	1.01	0.017	0.039	4.98	216.77	1.07
1.60	T	47.85	44.13	43.49	1.08	1.10	0.017	0.039	5.33	254.92	1.16
1.70	T	52.22	44.64	43.95	1.17	1.19	0.017	0.038	5.66	295.68	1.24
1.80	T	56.64	45.16	44.41	1.25	1.28	0.017	0.038	5.98	338.98	1.33
1.90	T	61.11	45.67	44.87	1.34	1.36	0.017	0.037	6.30	384.78	1.41
2.00	T	65.61	46.19	45.32	1.42	1.45	0.017	0.037	6.60	433.01	1.49
2.10	T	70.17	46.70	45.78	1.50	1.53	0.017	0.037	6.89	483.64	1.57
2.20	T	74.77	47.22	46.24	1.58	1.62	0.017	0.036	7.18	536.61	1.65
2.30	T	79.42	47.74	46.70	1.66	1.70	0.017	0.036	7.45	591.90	1.73
2.40	T	84.11	48.25	47.16	1.74	1.78	0.017	0.036	7.72	649.47	1.80
2.50	T	88.85	48.77	47.62	1.82	1.87	0.017	0.036	7.98	709.27	1.88
2.60	T	93.62	49.02	47.78	1.91	1.96	0.016	0.036	8.27	773.95	1.96
2.70	T	98.41	49.28	47.93	2.00	2.05	0.016	0.035	8.54	840.77	2.04
2.80	T	103.21	49.53	48.09	2.08	2.15	0.016	0.035	8.81	909.69	2.12
2.90	T	108.02	49.79	48.25	2.17	2.24	0.016	0.035	9.08	980.65	2.20
3.00	T	112.86	50.06	48.43	2.25	2.33	0.016	0.035	9.33	1053.37	2.28
3.10	T	117.71	50.34	48.61	2.34	2.42	0.016	0.035	9.58	1128.04	2.36
3.20	T	122.58	50.61	48.80	2.42	2.51	0.016	0.035	9.83	1204.64	2.43
3.30	T	127.47	50.88	48.98	2.51	2.60	0.016	0.035	10.07	1283.10	2.50
3.40	T	132.38	51.16	49.16	2.59	2.69	0.016	0.034	10.30	1363.40	2.58
3.50	T	137.30	51.43	49.34	2.67	2.78	0.016	0.034	10.53	1445.50	2.65
3.60	T	142.24	51.71	49.52	2.75	2.87	0.016	0.034	10.75	1529.36	2.72
3.70	T	147.21	51.98	49.71	2.83	2.96	0.016	0.034	10.97	1614.95	2.79
3.80	T	152.19	52.25	49.89	2.91	3.05	0.016	0.034	11.19	1702.24	2.85
3.90	T	157.18	52.53	50.07	2.99	3.14	0.016	0.034	11.40	1791.18	2.92
4.00	T	162.20	52.80	50.25	3.07	3.23	0.016	0.034	11.60	1881.75	2.99
4.10	T	167.23	53.08	50.43	3.15	3.32	0.016	0.034	11.80	1973.92	3.05
4.20	T	172.29	53.35	50.62	3.23	3.40	0.015	0.034	12.00	2067.66	3.11
4.30	T	177.36	53.62	50.80	3.31	3.49	0.015	0.034	12.20	2162.94	3.18
4.40	T	182.45	53.90	50.98	3.39	3.58	0.015	0.034	12.39	2259.72	3.24
4.50	T	187.55	54.17	51.16	3.46	3.67	0.015	0.034	12.57	2358.00	3.30
4.60	T	192.68	54.44	51.34	3.54	3.75	0.015	0.033	12.76	2457.73	3.36
4.70	T	197.82	54.72	51.53	3.62	3.84	0.015	0.033	12.94	2558.89	3.42
4.80	T	202.98	54.99	51.71	3.69	3.93	0.015	0.033	13.11	2661.46	3.47
4.90	T	208.16	55.27	51.89	3.77	4.01	0.015	0.033	13.28	2765.41	3.53
5.00	T	213.36	55.54	52.07	3.84	4.10	0.015	0.033	13.45	2870.71	3.59
5.10	T	218.58	55.81	52.26	3.92	4.18	0.015	0.033	13.62	2977.35	3.64
5.20	T	223.81	56.09	52.44	3.99	4.27	0.015	0.033	13.79	3085.30	3.69
5.30	T	229.07	56.36	52.62	4.06	4.35	0.015	0.033	13.95	3194.53	3.75
5.40	T	234.34	56.63	52.80	4.14	4.44	0.015	0.033	14.10	3305.03	3.80
5.50	T	239.63	56.91	52.98	4.21	4.52	0.015	0.033	14.26	3416.77	3.85
5.60	T	244.93	57.18	53.17	4.28	4.61	0.015	0.033	14.41	3529.73	3.90
5.70	T	250.26	57.46	53.35	4.36	4.69	0.015	0.033	14.56	3643.89	3.95
5.80	T	255.60	57.73	53.53	4.43	4.78	0.014	0.033	14.71	3759.22	4.00
5.90	T	260.97	58.00	53.71	4.50	4.86	0.014	0.033	14.85	3875.71	4.04
6.00	T	266.35	58.28	53.89	4.57	4.94	0.014	0.033	14.99	3993.34	4.09
6.10	T	271.74	58.55	54.08	4.64	5.03	0.014	0.033	15.13	4112.09	4.14

PacifiCorp / Cowlitz PUD
Lewis River Hydroelectric Projects
FERC Project Nos. 935, 2071, 2111, 2213

6.20	T	277.16	58.83	54.26	4.71	5.11	0.014	0.033	15.27	4231.93	4.18
6.30	T	282.60	59.10	54.44	4.78	5.19	0.014	0.033	15.40	4352.85	4.22
6.40	T	288.05	59.37	54.62	4.85	5.27	0.014	0.033	15.53	4474.82	4.27
6.50	T	293.52	59.65	54.80	4.92	5.36	0.014	0.033	15.66	4597.84	4.31
6.60	T	299.01	59.92	54.99	4.99	5.44	0.014	0.033	15.79	4721.88	4.35
6.70	T	304.52	60.19	55.17	5.06	5.52	0.014	0.033	15.92	4846.91	4.39
6.80	T	310.04	60.47	55.35	5.13	5.60	0.014	0.032	16.04	4972.93	4.43
6.90	T	315.59	60.74	55.53	5.20	5.68	0.014	0.032	16.16	5099.92	4.47
7.00	T	321.15	61.02	55.71	5.26	5.76	0.014	0.032	16.28	5227.85	4.51
7.10	T	326.73	61.29	55.90	5.33	5.85	0.014	0.032	16.39	5356.71	4.54
7.20	T	332.33	61.56	56.08	5.40	5.93	0.014	0.032	16.51	5486.48	4.58
7.30	T	337.95	61.84	56.26	5.47	6.01	0.014	0.032	16.62	5617.14	4.62
7.40	T	343.58	62.11	56.44	5.53	6.09	0.013	0.032	16.73	5748.68	4.65
7.50	T	349.23	62.38	56.62	5.60	6.17	0.013	0.032	16.84	5881.08	4.68
7.60	T	354.91	62.66	56.81	5.66	6.25	0.013	0.032	16.95	6014.32	4.72
7.70	T	360.60	62.93	56.99	5.73	6.33	0.013	0.032	17.05	6148.38	4.75
7.80	T	366.30	63.21	57.17	5.80	6.41	0.013	0.032	17.15	6283.25	4.78
7.90	T	372.03	63.48	57.35	5.86	6.49	0.013	0.032	17.25	6418.91	4.81
8.00	T	377.77	63.75	57.53	5.93	6.57	0.013	0.032	17.35	6555.35	4.84
8.10	T	383.54	64.03	57.72	5.99	6.65	0.013	0.032	17.45	6692.54	4.87
8.20	T	389.32	64.30	57.90	6.05	6.72	0.013	0.032	17.54	6830.47	4.90
8.30	T	395.12	64.57	58.08	6.12	6.80	0.013	0.032	17.64	6969.12	4.93
8.40	T	400.93	64.85	58.26	6.18	6.88	0.013	0.032	17.73	7108.48	4.96
8.50	T	406.77	65.12	58.45	6.25	6.96	0.013	0.032	17.82	7248.53	4.99
8.60	T	412.62	65.40	58.63	6.31	7.04	0.013	0.032	17.91	7389.25	5.01
8.70	T	418.49	65.67	58.81	6.37	7.12	0.013	0.032	17.99	7530.63	5.04
8.80	T	424.39	65.94	58.99	6.44	7.19	0.013	0.032	18.08	7672.65	5.06
8.90	T	430.29	66.22	59.17	6.50	7.27	0.013	0.032	18.16	7815.30	5.09
9.00	T	436.22	66.49	59.36	6.56	7.35	0.012	0.032	18.24	7958.56	5.11
9.10	T	442.16	66.77	59.54	6.62	7.43	0.012	0.032	18.32	8102.40	5.13
9.20	T	448.13	67.04	59.72	6.68	7.50	0.012	0.032	18.40	8246.83	5.15
9.30	T	454.11	67.31	59.90	6.75	7.58	0.012	0.032	18.48	8391.81	5.18
9.40	T	460.11	67.59	60.08	6.81	7.66	0.012	0.032	18.56	8537.34	5.20
9.50	T	466.13	67.86	60.27	6.87	7.73	0.012	0.032	18.63	8683.39	5.22
9.60	T	472.16	68.13	60.45	6.93	7.81	0.012	0.032	18.70	8829.96	5.24
9.70	T	478.21	68.41	60.63	6.99	7.89	0.012	0.032	18.77	8977.02	5.25
9.80	T	484.29	68.68	60.81	7.05	7.96	0.012	0.032	18.84	9124.56	5.27
9.90	T	490.38	68.96	60.99	7.11	8.04	0.012	0.032	18.91	9272.56	5.29
10.00	T	496.49	69.23	61.18	7.17	8.12	0.012	0.032	18.98	9421.01	5.31
10.10	T	502.61	69.50	61.36	7.23	8.19	0.012	0.032	19.04	9569.89	5.32
10.20	T	508.76	69.78	61.54	7.29	8.27	0.012	0.032	19.10	9719.18	5.34
10.30	T	514.92	70.05	61.72	7.35	8.34	0.012	0.032	19.17	9868.87	5.35
10.40	T	521.10	70.32	61.90	7.41	8.42	0.012	0.032	19.23	10018.94	5.37
10.50	T	527.30	70.60	62.09	7.47	8.49	0.012	0.032	19.29	10169.38	5.38
10.60	T	533.52	70.87	62.27	7.53	8.57	0.011	0.032	19.34	10320.16	5.40
10.70	T	539.75	71.15	62.45	7.59	8.64	0.011	0.032	19.40	10471.28	5.41
10.80	T	546.01	71.42	62.63	7.65	8.72	0.011	0.032	19.46	10622.71	5.42
10.90	T	552.28	71.69	62.81	7.70	8.79	0.011	0.032	19.51	10774.44	5.43
11.00	T	558.57	71.97	63.00	7.76	8.87	0.011	0.032	19.56	10926.46	5.44
11.10	T	564.88	72.24	63.18	7.82	8.94	0.011	0.032	19.61	11078.74	5.45
11.20	T	571.21	72.51	63.36	7.88	9.02	0.011	0.032	19.66	11231.26	5.46
11.30	T	577.55	72.79	63.54	7.93	9.09	0.011	0.032	19.71	11384.03	5.47
11.40	T	583.92	73.06	63.73	7.99	9.16	0.011	0.032	19.76	11537.00	5.48
11.50	T	590.30	73.34	63.91	8.05	9.24	0.011	0.032	19.80	11690.17	5.49
11.60	T	596.70	73.61	64.09	8.11	9.31	0.011	0.032	19.85	11843.53	5.50
11.70	T	603.12	73.88	64.27	8.16	9.38	0.011	0.032	19.89	11997.05	5.50
11.80	T	609.55	74.16	64.45	8.22	9.46	0.011	0.032	19.93	12150.72	5.51
11.90	T	616.01	74.43	64.64	8.28	9.53	0.011	0.032	19.97	12304.51	5.52
12.00	T	622.48	74.71	64.82	8.33	9.60	0.011	0.032	20.01	12458.42	5.52
12.10	T	628.97	74.98	65.00	8.39	9.68	0.011	0.032	20.05	12612.42	5.53
12.20	T	635.82	81.98	72.00	7.76	8.83	0.010	0.031	19.02	12094.34	5.08
12.30	T	643.37	88.99	79.00	7.23	8.14	0.010	0.031	18.14	11669.41	4.71
12.40	T	651.62	96.00	86.00	6.79	7.58	0.010	0.031	17.37	11320.82	4.39
12.50	T	660.57	103.00	93.00	6.41	7.10	0.010	0.031	16.71	11035.89	4.13
12.60	T	670.22	110.01	100.00	6.09	6.70	0.010	0.031	16.12	10804.89	3.90
12.70	T	680.57	117.01	107.00	5.82	6.36	0.010	0.031	15.60	10620.25	3.70
12.80	T	691.62	124.02	114.00	5.58	6.07	0.010	0.031	15.15	10475.95	3.52
12.90	T	703.37	131.02	121.00	5.37	5.81	0.010	0.031	14.74	10367.17	3.37
13.00	T	715.82	138.03	128.00	5.19	5.59	0.010	0.031	14.38	10290.00	3.24

Lower Speelyai Site E



*****WinXSPRO*****

lspeelee.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELE.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 185.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.25	5.01	5.00	0.05	0.05	0.010	0.109	0.18	0.05	0.03
0.20	T	1.21	14.19	14.14	0.09	0.09	0.010	0.101	0.28	0.34	0.05
0.30	T	2.91	20.04	19.95	0.15	0.15	0.010	0.092	0.44	1.29	0.09
0.40	T	5.15	24.89	24.76	0.21	0.21	0.010	0.087	0.59	3.05	0.13
0.50	T	7.86	29.75	29.57	0.26	0.27	0.010	0.084	0.73	5.71	0.16
0.60	T	11.14	36.19	35.96	0.31	0.31	0.010	0.082	0.82	9.19	0.19
0.70	T	14.92	39.97	39.69	0.37	0.38	0.010	0.079	0.97	14.44	0.23
0.80	T	19.37	49.58	49.25	0.39	0.39	0.010	0.079	1.00	19.47	0.24
0.90	T	24.77	59.19	58.80	0.42	0.42	0.010	0.078	1.06	26.36	0.26
1.00	T	31.10	68.21	67.77	0.46	0.46	0.010	0.077	1.14	35.54	0.28
1.10	T	37.91	68.88	68.41	0.55	0.55	0.010	0.075	1.34	50.63	0.34
1.20	T	44.78	69.56	69.05	0.64	0.65	0.010	0.073	1.52	68.12	0.40
1.30	T	51.72	70.24	69.68	0.74	0.74	0.010	0.071	1.70	87.95	0.46
1.40	T	58.70	70.61	69.99	0.83	0.84	0.010	0.070	1.88	110.41	0.52
1.50	T	65.72	70.98	70.30	0.93	0.93	0.010	0.069	2.06	135.16	0.58
1.60	T	72.76	71.35	70.61	1.02	1.03	0.010	0.068	2.23	162.15	0.64
1.70	T	79.84	71.72	70.92	1.11	1.13	0.010	0.067	2.40	191.34	0.69
1.80	T	86.95	72.09	71.23	1.21	1.22	0.010	0.066	2.56	222.71	0.75
1.90	T	94.09	72.46	71.54	1.30	1.32	0.010	0.065	2.72	256.21	0.81
2.00	T	101.26	72.83	71.85	1.39	1.41	0.010	0.064	2.88	291.83	0.87
2.10	T	108.46	73.20	72.16	1.48	1.50	0.010	0.064	3.04	329.54	0.92
2.20	T	115.69	73.57	72.47	1.57	1.60	0.010	0.063	3.19	369.31	0.98
2.30	T	122.95	73.94	72.78	1.66	1.69	0.010	0.062	3.34	411.13	1.04
2.40	T	130.25	74.31	73.09	1.75	1.78	0.010	0.062	3.49	454.97	1.09
2.50	T	137.57	74.68	73.40	1.84	1.87	0.010	0.061	3.64	500.82	1.15
2.60	T	144.93	75.05	73.71	1.93	1.97	0.010	0.061	3.79	548.65	1.21
2.70	T	152.31	75.42	74.03	2.02	2.06	0.010	0.061	3.93	598.46	1.26
2.80	T	159.73	75.79	74.34	2.11	2.15	0.010	0.060	4.07	650.23	1.32
2.90	T	167.18	76.16	74.65	2.20	2.24	0.010	0.060	4.21	703.94	1.37
3.00	T	174.66	76.53	74.96	2.28	2.33	0.010	0.059	4.35	759.59	1.42
3.10	T	182.17	76.90	75.27	2.37	2.42	0.010	0.059	4.49	817.16	1.48
3.20	T	189.72	77.27	75.58	2.46	2.51	0.010	0.059	4.62	876.63	1.53
3.30	T	197.29	77.64	75.89	2.54	2.60	0.010	0.058	4.75	938.00	1.59
3.40	T	204.89	78.01	76.20	2.63	2.69	0.010	0.058	4.89	1001.27	1.64

PacifiCorp / Cowlitz PUD
Lewis River Hydroelectric Projects
FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	212.53	78.38	76.51	2.71	2.78	0.010	0.058	5.02	1066.41	1.69
3.60	T	220.19	78.75	76.82	2.80	2.87	0.010	0.057	5.15	1133.42	1.74
3.70	T	227.89	79.12	77.13	2.88	2.95	0.010	0.057	5.28	1202.29	1.80
3.80	T	235.62	79.49	77.44	2.96	3.04	0.010	0.057	5.40	1273.02	1.85
3.90	T	243.38	79.85	77.75	3.05	3.13	0.010	0.057	5.53	1345.59	1.90
4.00	T	251.17	80.22	78.06	3.13	3.22	0.010	0.056	5.65	1420.00	1.95
4.10	T	258.99	80.59	78.37	3.21	3.30	0.010	0.056	5.78	1496.24	2.01
4.20	T	266.84	80.96	78.68	3.30	3.39	0.010	0.056	5.90	1574.31	2.06
4.30	T	274.73	81.33	78.99	3.38	3.48	0.010	0.056	6.02	1654.20	2.11
4.40	T	282.64	81.70	79.30	3.46	3.56	0.010	0.056	6.14	1735.90	2.16
4.50	T	290.59	82.07	79.61	3.54	3.65	0.010	0.055	6.26	1819.41	2.21
4.60	T	298.56	82.44	79.92	3.62	3.74	0.010	0.055	6.38	1904.73	2.26
4.70	T	306.57	82.81	80.23	3.70	3.82	0.010	0.055	6.50	1991.85	2.31
4.80	T	314.61	83.18	80.54	3.78	3.91	0.010	0.055	6.61	2080.75	2.36
4.90	T	322.68	83.55	80.85	3.86	3.99	0.010	0.055	6.73	2171.45	2.41
5.00	T	330.78	83.92	81.16	3.94	4.08	0.010	0.054	6.84	2263.94	2.46
5.10	T	338.91	84.29	81.47	4.02	4.16	0.010	0.054	6.96	2358.20	2.51
5.20	T	347.07	84.66	81.78	4.10	4.24	0.010	0.054	7.07	2454.25	2.56
5.30	T	355.27	85.09	82.16	4.18	4.32	0.010	0.054	7.18	2550.76	2.61
5.40	T	363.50	85.51	82.53	4.25	4.40	0.010	0.054	7.29	2649.03	2.65
5.50	T	371.78	85.93	82.90	4.33	4.48	0.010	0.054	7.39	2749.06	2.70
5.60	T	380.09	86.36	83.28	4.40	4.56	0.010	0.053	7.50	2850.87	2.75
5.70	T	388.43	86.78	83.65	4.48	4.64	0.010	0.053	7.61	2954.43	2.79
5.80	T	396.82	87.21	84.03	4.55	4.72	0.010	0.053	7.71	3059.76	2.84
5.90	T	405.24	87.63	84.40	4.62	4.80	0.010	0.053	7.81	3166.86	2.89
6.00	T	413.69	87.97	84.67	4.70	4.89	0.010	0.053	7.92	3278.13	2.93
6.10	T	422.17	88.32	84.93	4.78	4.97	0.010	0.053	8.03	3391.14	2.98
6.20	T	430.68	88.66	85.20	4.86	5.05	0.010	0.053	8.14	3505.91	3.03
6.30	T	439.26	90.04	86.52	4.88	5.08	0.010	0.053	8.17	3588.76	3.04
6.40	T	447.98	91.41	87.83	4.90	5.10	0.010	0.053	8.20	3673.69	3.06
6.50	T	456.83	92.78	89.15	4.92	5.12	0.010	0.053	8.23	3760.72	3.07
6.60	T	465.81	94.16	90.47	4.95	5.15	0.010	0.052	8.26	3849.85	3.09
6.70	T	474.92	95.53	91.78	4.97	5.17	0.010	0.052	8.30	3941.11	3.10
6.80	T	484.17	96.91	93.10	5.00	5.20	0.010	0.052	8.33	4034.51	3.12
6.90	T	493.54	98.28	94.42	5.02	5.23	0.010	0.052	8.37	4130.08	3.13
7.00	T	503.05	99.66	95.73	5.05	5.25	0.010	0.052	8.40	4227.83	3.15
7.10	T	512.69	101.03	97.05	5.07	5.28	0.010	0.052	8.44	4327.79	3.17
7.20	T	522.46	102.40	98.37	5.10	5.31	0.010	0.052	8.48	4429.96	3.18
7.30	T	532.36	103.78	99.68	5.13	5.34	0.010	0.052	8.52	4534.38	3.20
7.40	T	542.40	105.15	101.00	5.16	5.37	0.010	0.052	8.56	4641.05	3.22
7.50	T	552.56	106.53	102.32	5.19	5.40	0.010	0.052	8.60	4750.00	3.24
7.60	T	562.86	107.90	103.63	5.22	5.43	0.010	0.052	8.64	4861.25	3.26
7.70	T	573.29	109.27	104.95	5.25	5.46	0.010	0.052	8.68	4974.82	3.27
7.80	T	583.85	110.65	106.27	5.28	5.49	0.010	0.052	8.72	5090.73	3.29
7.90	T	594.54	112.02	107.58	5.31	5.53	0.010	0.052	8.76	5209.00	3.31
8.00	T	605.37	113.40	108.90	5.34	5.56	0.010	0.052	8.80	5329.65	3.33
8.10	T	616.32	114.77	110.22	5.37	5.59	0.010	0.052	8.85	5452.70	3.35
8.20	T	627.41	116.15	111.53	5.40	5.63	0.010	0.052	8.89	5578.17	3.37
8.30	T	638.63	117.52	112.85	5.43	5.66	0.010	0.052	8.93	5706.08	3.39
8.40	T	649.98	118.89	114.17	5.47	5.69	0.010	0.052	8.98	5836.45	3.41
8.50	T	661.46	120.27	115.48	5.50	5.73	0.010	0.052	9.02	5969.31	3.43
8.60	T	673.08	121.64	116.80	5.53	5.76	0.010	0.052	9.07	6104.67	3.45
8.70	T	684.82	123.02	118.12	5.57	5.80	0.010	0.052	9.12	6242.56	3.47
8.80	T	696.70	124.39	119.43	5.60	5.83	0.010	0.051	9.16	6382.99	3.49
8.90	T	708.71	125.76	120.75	5.64	5.87	0.010	0.051	9.21	6525.99	3.52
9.00	T	720.91	128.27	123.25	5.62	5.85	0.010	0.051	9.19	6623.59	3.51
9.10	T	733.36	130.78	125.75	5.61	5.83	0.010	0.051	9.17	6725.46	3.50
9.20	T	746.06	133.29	128.25	5.60	5.82	0.010	0.051	9.16	6831.57	3.49
9.30	T	759.01	135.80	130.75	5.59	5.81	0.010	0.051	9.15	6941.89	3.49
9.40	T	772.21	138.30	133.25	5.58	5.80	0.010	0.051	9.14	7056.41	3.48
9.50	T	785.66	140.81	135.75	5.58	5.79	0.010	0.051	9.13	7175.13	3.48
9.60	T	799.36	143.32	138.25	5.58	5.78	0.010	0.051	9.13	7298.02	3.48
9.70	T	813.31	145.83	140.75	5.58	5.78	0.010	0.051	9.13	7425.09	3.48
9.80	T	827.51	148.34	143.25	5.58	5.78	0.010	0.051	9.13	7556.34	3.48
9.90	T	841.96	150.84	145.75	5.58	5.78	0.010	0.051	9.14	7691.77	3.48
10.00	T	856.66	153.35	148.25	5.59	5.78	0.010	0.051	9.14	7831.39	3.49
10.10	T	871.61	155.86	150.75	5.59	5.78	0.010	0.051	9.15	7975.19	3.49
10.20	T	886.81	158.37	153.25	5.60	5.79	0.010	0.051	9.16	8123.20	3.49
10.30	T	902.26	160.88	155.75	5.61	5.79	0.010	0.051	9.17	8275.43	3.50
10.40	T	917.96	163.38	158.25	5.62	5.80	0.010	0.051	9.19	8431.89	3.51
10.50	T	933.91	165.89	160.75	5.63	5.81	0.010	0.051	9.20	8592.60	3.51
10.60	T	950.11	168.40	163.25	5.64	5.82	0.010	0.051	9.22	8757.57	3.52
10.70	T	966.56	170.91	165.75	5.66	5.83	0.010	0.051	9.24	8926.84	3.53
10.80	T	983.26	173.42	168.25	5.67	5.84	0.010	0.051	9.26	9100.41	3.54
10.90	T	1000.21	175.92	170.75	5.69	5.86	0.010	0.051	9.28	9278.31	3.55
11.00	T	1017.41	178.43	173.25	5.70	5.87	0.010	0.051	9.30	9460.56	3.56
11.10	T	1034.86	180.94	175.75	5.72	5.89	0.010	0.051	9.32	9647.20	3.57
11.20	T	1052.56	183.45	178.25	5.74	5.90	0.010	0.051	9.35	9838.25	3.58
11.30	T	1070.51	185.96	180.75	5.76	5.92	0.010	0.051	9.37	10033.73	3.59
11.40	T	1088.70	188.46	183.25	5.78	5.94	0.010	0.051	9.40	10233.67	3.60

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

11.50	T	1107.15	190.97	185.75	5.80	5.96	0.010	0.051	9.43	10438.11	3.62
11.60	T	1125.85	193.48	188.25	5.82	5.98	0.010	0.051	9.46	10647.07	3.63
11.70	T	1144.80	195.99	190.75	5.84	6.00	0.010	0.051	9.49	10860.59	3.64
11.80	T	1164.00	198.50	193.25	5.86	6.02	0.010	0.051	9.52	11078.69	3.66
11.90	T	1183.45	201.00	195.75	5.89	6.05	0.010	0.051	9.55	11301.42	3.67
12.00	T	1203.15	203.51	198.25	5.91	6.07	0.010	0.051	9.58	11528.79	3.69

*****WinXSPRO*****

lspeelee.out
 Input File: C:\WXSPRO20\LEWIS\LSPEELE.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 185.00/ @

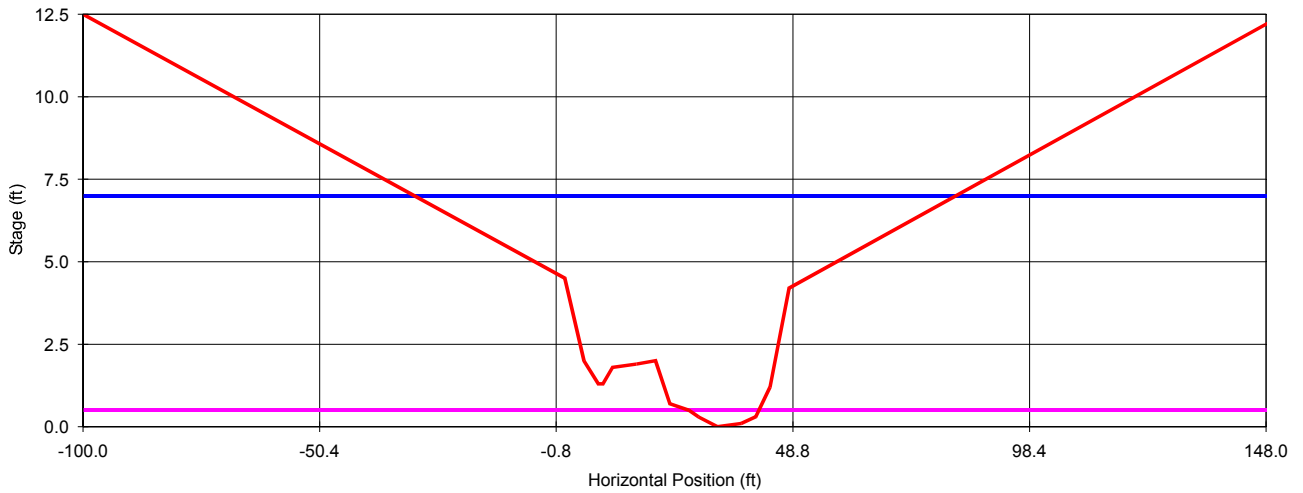
Resistance Method: Thorne and Zevenbergen
 D84: 70.000 mm

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10	T	0.25	5.01	5.00	0.05	0.05	0.010	0.103	0.20	0.05	0.03
0.20	T	1.21	14.19	14.14	0.09	0.09	0.010	0.085	0.34	0.41	0.05
0.30	T	2.91	20.04	19.95	0.15	0.15	0.010	0.083	0.50	1.44	0.09
0.40	T	5.15	24.89	24.76	0.21	0.21	0.010	0.078	0.67	3.45	0.13
0.50	T	7.86	29.75	29.57	0.26	0.27	0.010	0.058	1.06	8.37	0.16
0.60	T	11.14	36.19	35.96	0.31	0.31	0.010	0.053	1.27	14.18	0.19
0.70	T	14.92	39.97	39.69	0.37	0.38	0.010	0.050	1.55	23.20	0.23
0.80	T	19.37	49.58	49.25	0.39	0.39	0.010	0.048	1.65	32.02	0.24
0.90	T	24.77	59.19	58.80	0.42	0.42	0.010	0.047	1.79	44.26	0.26
1.00	T	31.10	68.21	67.77	0.46	0.46	0.010	0.045	1.95	60.67	0.28
1.10	T	37.91	68.88	68.41	0.55	0.55	0.010	0.043	2.31	87.43	0.34
1.20	T	44.78	69.56	69.05	0.64	0.65	0.010	0.042	2.64	118.41	0.40
1.30	T	51.72	70.24	69.68	0.74	0.74	0.010	0.041	2.97	153.46	0.46
1.40	T	58.70	70.61	69.99	0.83	0.84	0.010	0.040	3.29	192.97	0.52
1.50	T	65.72	70.98	70.30	0.93	0.93	0.010	0.039	3.60	236.34	0.58
1.60	T	72.76	71.35	70.61	1.02	1.03	0.010	0.039	3.90	283.44	0.64
1.70	T	79.84	71.72	70.92	1.11	1.13	0.010	0.038	4.19	334.17	0.69
1.80	T	86.95	72.09	71.23	1.21	1.22	0.010	0.038	4.47	388.44	0.75
1.90	T	94.09	72.46	71.54	1.30	1.32	0.010	0.037	4.74	446.16	0.81
2.00	T	101.26	72.83	71.85	1.39	1.41	0.010	0.037	5.01	507.26	0.87
2.10	T	108.46	73.20	72.16	1.48	1.50	0.010	0.037	5.27	571.68	0.92
2.20	T	115.69	73.57	72.47	1.57	1.60	0.010	0.036	5.53	639.35	0.98
2.30	T	122.95	73.94	72.78	1.66	1.69	0.010	0.036	5.78	710.21	1.04
2.40	T	130.25	74.31	73.09	1.75	1.78	0.010	0.036	6.02	784.22	1.09
2.50	T	137.57	74.68	73.40	1.84	1.87	0.010	0.036	6.26	861.33	1.15
2.60	T	144.93	75.05	73.71	1.93	1.97	0.010	0.036	6.50	941.48	1.21
2.70	T	152.31	75.42	74.03	2.02	2.06	0.010	0.035	6.73	1024.64	1.26
2.80	T	159.73	75.79	74.34	2.11	2.15	0.010	0.035	6.95	1110.77	1.32
2.90	T	167.18	76.16	74.65	2.20	2.24	0.010	0.035	7.18	1199.84	1.37
3.00	T	174.66	76.53	74.96	2.28	2.33	0.010	0.035	7.40	1291.80	1.42
3.10	T	182.17	76.90	75.27	2.37	2.42	0.010	0.035	7.61	1386.63	1.48
3.20	T	189.72	77.27	75.58	2.46	2.51	0.010	0.035	7.82	1484.30	1.53
3.30	T	197.29	77.64	75.89	2.54	2.60	0.010	0.035	8.03	1584.78	1.59
3.40	T	204.89	78.01	76.20	2.63	2.69	0.010	0.034	8.24	1688.04	1.64
3.50	T	212.53	78.38	76.51	2.71	2.78	0.010	0.034	8.44	1794.05	1.69
3.60	T	220.19	78.75	76.82	2.80	2.87	0.010	0.034	8.64	1902.80	1.74
3.70	T	227.89	79.12	77.13	2.88	2.95	0.010	0.034	8.84	2014.26	1.80
3.80	T	235.62	79.49	77.44	2.96	3.04	0.010	0.034	9.03	2128.41	1.85
3.90	T	243.38	79.85	77.75	3.05	3.13	0.010	0.034	9.23	2245.23	1.90
4.00	T	251.17	80.22	78.06	3.13	3.22	0.010	0.034	9.41	2364.70	1.95
4.10	T	258.99	80.59	78.37	3.21	3.30	0.010	0.034	9.60	2486.80	2.01
4.20	T	266.84	80.96	78.68	3.30	3.39	0.010	0.034	9.79	2611.52	2.06
4.30	T	274.73	81.33	78.99	3.38	3.48	0.010	0.034	9.97	2738.83	2.11
4.40	T	282.64	81.70	79.30	3.46	3.56	0.010	0.034	10.15	2868.73	2.16
4.50	T	290.59	82.07	79.61	3.54	3.65	0.010	0.034	10.33	3001.19	2.21
4.60	T	298.56	82.44	79.92	3.62	3.74	0.010	0.033	10.50	3136.21	2.26
4.70	T	306.57	82.81	80.23	3.70	3.82	0.010	0.033	10.68	3273.76	2.31
4.80	T	314.61	83.18	80.54	3.78	3.91	0.010	0.033	10.85	3413.84	2.36
4.90	T	322.68	83.55	80.85	3.86	3.99	0.010	0.033	11.02	3556.44	2.41
5.00	T	330.78	83.92	81.16	3.94	4.08	0.010	0.033	11.19	3701.53	2.46
5.10	T	338.91	84.29	81.47	4.02	4.16	0.010	0.033	11.36	3849.12	2.51
5.20	T	347.07	84.66	81.78	4.10	4.24	0.010	0.033	11.52	3999.19	2.56
5.30	T	355.27	85.09	82.16	4.18	4.32	0.010	0.033	11.68	4150.02	2.61
5.40	T	363.50	85.51	82.53	4.25	4.40	0.010	0.033	11.84	4303.32	2.65
5.50	T	371.78	85.93	82.90	4.33	4.48	0.010	0.033	11.99	4459.10	2.70
5.60	T	380.09	86.36	83.28	4.40	4.56	0.010	0.033	12.15	4617.34	2.75
5.70	T	388.43	86.78	83.65	4.48	4.64	0.010	0.033	12.30	4778.80	2.79
5.80	T	396.82	87.21	84.03	4.55	4.72	0.010	0.033	12.45	4941.19	2.84
5.90	T	405.24	87.63	84.40	4.62	4.80	0.010	0.033	12.60	5106.80	2.89
6.00	T	413.69	87.97	84.67	4.70	4.89	0.010	0.033	12.76	5277.93	2.93
6.10	T	422.17	88.32	84.93	4.78	4.97	0.010	0.033	12.91	5451.44	2.98

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.20	T	430.68	88.66	85.20	4.86	5.05	0.010	0.033	13.07	5627.32	3.03
6.30	T	439.26	90.04	86.52	4.88	5.08	0.010	0.033	13.12	5762.80	3.04
6.40	T	447.98	91.41	87.83	4.90	5.10	0.010	0.033	13.17	5901.44	3.06
6.50	T	456.83	92.78	89.15	4.92	5.12	0.010	0.033	13.23	6043.29	3.07
6.60	T	465.81	94.16	90.47	4.95	5.15	0.010	0.033	13.29	6188.37	3.09
6.70	T	474.92	95.53	91.78	4.97	5.17	0.010	0.033	13.34	6336.69	3.10
6.80	T	484.17	96.91	93.10	5.00	5.20	0.010	0.032	13.40	6488.29	3.12
6.90	T	493.54	98.28	94.42	5.02	5.23	0.010	0.032	13.46	6643.19	3.13
7.00	T	503.05	99.66	95.73	5.05	5.25	0.010	0.032	13.52	6801.42	3.15
7.10	T	512.69	101.03	97.05	5.07	5.28	0.010	0.032	13.58	6963.00	3.17
7.20	T	522.46	102.40	98.37	5.10	5.31	0.010	0.032	13.64	7127.97	3.18
7.30	T	532.36	103.78	99.68	5.13	5.34	0.010	0.032	13.71	7296.34	3.20
7.40	T	542.40	105.15	101.00	5.16	5.37	0.010	0.032	13.77	7468.14	3.22
7.50	T	552.56	106.53	102.32	5.19	5.40	0.010	0.032	13.83	7643.40	3.24
7.60	T	562.86	107.90	103.63	5.22	5.43	0.010	0.032	13.90	7822.15	3.26
7.70	T	573.29	109.27	104.95	5.25	5.46	0.010	0.032	13.96	8004.42	3.27
7.80	T	583.85	110.65	106.27	5.28	5.49	0.010	0.032	14.03	8190.22	3.29
7.90	T	594.54	112.02	107.58	5.31	5.53	0.010	0.032	14.09	8379.60	3.31
8.00	T	605.37	113.40	108.90	5.34	5.56	0.010	0.032	14.16	8572.56	3.33
8.10	T	616.32	114.77	110.22	5.37	5.59	0.010	0.032	14.23	8769.15	3.35
8.20	T	627.41	116.15	111.53	5.40	5.63	0.010	0.032	14.30	8969.39	3.37
8.30	T	638.63	117.52	112.85	5.43	5.66	0.010	0.032	14.36	9173.30	3.39
8.40	T	649.98	118.89	114.17	5.47	5.69	0.010	0.032	14.43	9380.92	3.41
8.50	T	661.46	120.27	115.48	5.50	5.73	0.010	0.032	14.50	9592.27	3.43
8.60	T	673.08	121.64	116.80	5.53	5.76	0.010	0.032	14.57	9807.38	3.45
8.70	T	684.82	123.02	118.12	5.57	5.80	0.010	0.032	14.64	10026.27	3.47
8.80	T	696.70	124.39	119.43	5.60	5.83	0.010	0.032	14.71	10248.97	3.49
8.90	T	708.71	125.76	120.75	5.64	5.87	0.010	0.032	14.78	10475.51	3.52
9.00	T	720.91	128.27	123.25	5.62	5.85	0.010	0.032	14.77	10645.54	3.51
9.10	T	733.36	130.78	125.75	5.61	5.83	0.010	0.032	14.76	10821.91	3.50
9.20	T	746.06	133.29	128.25	5.60	5.82	0.010	0.032	14.75	11004.59	3.49
9.30	T	759.01	135.80	130.75	5.59	5.81	0.010	0.032	14.75	11193.58	3.49
9.40	T	772.21	138.30	133.25	5.58	5.80	0.010	0.032	14.75	11388.87	3.48
9.50	T	785.66	140.81	135.75	5.58	5.79	0.010	0.032	14.75	11590.46	3.48
9.60	T	799.36	143.32	138.25	5.58	5.78	0.010	0.032	14.76	11798.34	3.48
9.70	T	813.31	145.83	140.75	5.58	5.78	0.010	0.032	14.77	12012.52	3.48
9.80	T	827.51	148.34	143.25	5.58	5.78	0.010	0.032	14.78	12233.02	3.48
9.90	T	841.96	150.84	145.75	5.58	5.78	0.010	0.032	14.80	12459.83	3.48
10.00	T	856.66	153.35	148.25	5.59	5.78	0.010	0.032	14.82	12692.98	3.49
10.10	T	871.61	155.86	150.75	5.59	5.78	0.010	0.032	14.84	12932.49	3.49
10.20	T	886.81	158.37	153.25	5.60	5.79	0.010	0.032	14.86	13178.37	3.49
10.30	T	902.26	160.88	155.75	5.61	5.79	0.010	0.032	14.89	13430.65	3.50
10.40	T	917.96	163.38	158.25	5.62	5.80	0.010	0.032	14.91	13689.35	3.51
10.50	T	933.91	165.89	160.75	5.63	5.81	0.010	0.032	14.94	13954.51	3.51
10.60	T	950.11	168.40	163.25	5.64	5.82	0.010	0.032	14.97	14226.14	3.52
10.70	T	966.56	170.91	165.75	5.66	5.83	0.010	0.032	15.01	14504.28	3.53
10.80	T	983.26	173.42	168.25	5.67	5.84	0.010	0.032	15.04	14788.96	3.54
10.90	T	1000.21	175.92	170.75	5.69	5.86	0.010	0.031	15.08	15080.22	3.55
11.00	T	1017.41	178.43	173.25	5.70	5.87	0.010	0.031	15.11	15378.08	3.56
11.10	T	1034.86	180.94	175.75	5.72	5.89	0.010	0.031	15.15	15682.60	3.57
11.20	T	1052.56	183.45	178.25	5.74	5.90	0.010	0.031	15.20	15993.79	3.58
11.30	T	1070.51	185.96	180.75	5.76	5.92	0.010	0.031	15.24	16311.71	3.59
11.40	T	1088.70	188.46	183.25	5.78	5.94	0.010	0.031	15.28	16636.39	3.60
11.50	T	1107.15	190.97	185.75	5.80	5.96	0.010	0.031	15.33	16967.87	3.62
11.60	T	1125.85	193.48	188.25	5.82	5.98	0.010	0.031	15.37	17306.19	3.63
11.70	T	1144.80	195.99	190.75	5.84	6.00	0.010	0.031	15.42	17651.39	3.64
11.80	T	1164.00	198.50	193.25	5.86	6.02	0.010	0.031	15.47	18003.53	3.66
11.90	T	1183.45	201.00	195.75	5.89	6.05	0.010	0.031	15.52	18362.63	3.67
12.00	T	1203.15	203.51	198.25	5.91	6.07	0.010	0.031	15.57	18728.74	3.69

Lower Speelyai Site F1



*****WinXSPRO*****

lspeelf1.out
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 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 148.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.32	6.34	6.33	0.05	0.05	0.009	0.105	0.18	0.06	0.03
0.20	T	1.09	9.18	9.17	0.12	0.12	0.009	0.092	0.37	0.40	0.07
0.30	T	2.15	12.02	12.00	0.18	0.18	0.009	0.086	0.52	1.12	0.10
0.40	T	3.42	13.37	13.33	0.26	0.26	0.009	0.081	0.70	2.38	0.14
0.50	T	4.82	14.72	14.67	0.33	0.33	0.009	0.078	0.86	4.13	0.18
0.60	T	6.40	17.08	17.00	0.37	0.38	0.009	0.076	0.96	6.14	0.21
0.70	T	8.22	19.43	19.33	0.42	0.43	0.009	0.075	1.06	8.72	0.24
0.80	T	10.18	20.03	19.90	0.51	0.51	0.009	0.073	1.24	12.58	0.29
0.90	T	12.20	20.62	20.46	0.59	0.60	0.009	0.071	1.40	17.10	0.34
1.00	T	14.27	21.22	21.03	0.67	0.68	0.009	0.070	1.56	22.26	0.38
1.10	T	16.40	21.82	21.59	0.75	0.76	0.009	0.069	1.71	28.06	0.43
1.20	T	18.59	22.42	22.15	0.83	0.84	0.009	0.068	1.86	34.51	0.47
1.30	T	20.82	22.84	22.52	0.91	0.92	0.009	0.067	2.01	41.83	0.52
1.40	T	23.23	25.11	24.71	0.93	0.94	0.009	0.066	2.03	47.26	0.53
1.50	T	25.76	26.38	25.90	0.98	0.99	0.009	0.066	2.13	54.82	0.56
1.60	T	28.41	27.65	27.10	1.03	1.05	0.009	0.065	2.22	63.08	0.59
1.70	T	31.18	28.92	28.29	1.08	1.10	0.009	0.065	2.31	72.06	0.62
1.80	T	34.07	30.19	29.48	1.13	1.16	0.009	0.064	2.40	81.79	0.65
1.90	T	37.31	36.05	35.27	1.03	1.06	0.009	0.065	2.23	83.36	0.60
2.00	T	41.08	40.91	40.07	1.00	1.03	0.009	0.066	2.18	89.52	0.58
2.10	T	45.10	41.27	40.36	1.09	1.12	0.009	0.065	2.34	105.47	0.63
2.20	T	49.15	41.62	40.65	1.18	1.21	0.009	0.064	2.49	122.59	0.68
2.30	T	53.23	41.98	40.95	1.27	1.30	0.009	0.063	2.65	140.88	0.74
2.40	T	57.34	42.33	41.24	1.35	1.39	0.009	0.063	2.80	160.32	0.79
2.50	T	61.48	42.69	41.53	1.44	1.48	0.009	0.062	2.94	180.90	0.84
2.60	T	65.64	43.04	41.83	1.53	1.57	0.009	0.062	3.09	202.61	0.89
2.70	T	69.84	43.40	42.12	1.61	1.66	0.009	0.061	3.23	225.44	0.94
2.80	T	74.07	43.76	42.41	1.69	1.75	0.009	0.061	3.37	249.38	0.99
2.90	T	78.32	44.11	42.71	1.78	1.83	0.009	0.060	3.50	274.43	1.04
3.00	T	82.61	44.47	43.00	1.86	1.92	0.009	0.060	3.64	300.57	1.09
3.10	T	86.92	44.82	43.29	1.94	2.01	0.009	0.060	3.77	327.81	1.14
3.20	T	91.27	45.18	43.59	2.02	2.09	0.009	0.059	3.90	356.13	1.19
3.30	T	95.64	45.53	43.88	2.10	2.18	0.009	0.059	4.03	385.53	1.24
3.40	T	100.04	45.89	44.17	2.18	2.26	0.009	0.059	4.16	416.00	1.29

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	104.48	46.24	44.47	2.26	2.35	0.009	0.058	4.28	447.55	1.33
3.60	T	108.94	46.60	44.76	2.34	2.43	0.009	0.058	4.41	480.16	1.38
3.70	T	113.43	46.95	45.05	2.42	2.52	0.009	0.058	4.53	513.84	1.43
3.80	T	117.95	47.31	45.35	2.49	2.60	0.009	0.057	4.65	548.58	1.48
3.90	T	122.50	47.66	45.64	2.57	2.68	0.010	0.057	4.77	584.38	1.53
4.00	T	127.08	48.02	45.93	2.65	2.77	0.010	0.057	4.89	621.23	1.57
4.10	T	131.68	48.38	46.23	2.72	2.85	0.010	0.057	5.01	659.14	1.62
4.20	T	136.32	48.73	46.52	2.80	2.93	0.010	0.056	5.12	698.11	1.67
4.30	T	141.04	50.17	47.93	2.81	2.94	0.010	0.056	5.14	725.34	1.68
4.40	T	145.91	51.62	49.34	2.83	2.96	0.010	0.056	5.17	753.95	1.69
4.50	T	150.91	53.06	50.75	2.84	2.97	0.010	0.056	5.19	783.94	1.70
4.60	T	156.11	55.58	53.26	2.81	2.93	0.010	0.057	5.14	802.70	1.68
4.70	T	161.56	58.10	55.77	2.78	2.90	0.010	0.057	5.10	823.99	1.67
4.80	T	167.27	60.62	58.29	2.76	2.87	0.010	0.057	5.07	847.73	1.66
4.90	T	173.22	63.14	60.80	2.74	2.85	0.010	0.057	5.04	873.87	1.65
5.00	T	179.43	65.66	63.31	2.73	2.83	0.010	0.057	5.03	902.37	1.65
5.10	T	185.88	68.18	65.82	2.73	2.82	0.010	0.057	5.02	933.20	1.65
5.20	T	192.59	70.70	68.34	2.72	2.82	0.010	0.057	5.02	966.36	1.65
5.30	T	199.55	73.22	70.85	2.73	2.82	0.010	0.057	5.02	1001.84	1.65
5.40	T	206.76	75.74	73.36	2.73	2.82	0.010	0.057	5.03	1039.64	1.66
5.50	T	214.22	78.26	75.87	2.74	2.82	0.010	0.057	5.04	1079.77	1.66
5.60	T	221.94	80.78	78.39	2.75	2.83	0.010	0.057	5.06	1122.25	1.67
5.70	T	229.90	83.30	80.90	2.76	2.84	0.010	0.057	5.08	1167.10	1.68
5.80	T	238.12	85.82	83.41	2.77	2.85	0.010	0.057	5.10	1214.34	1.69
5.90	T	246.58	88.34	85.92	2.79	2.87	0.010	0.057	5.13	1264.00	1.70
6.00	T	255.30	90.86	88.44	2.81	2.89	0.010	0.057	5.16	1316.12	1.72
6.10	T	264.27	93.39	90.95	2.83	2.91	0.010	0.057	5.19	1370.71	1.73
6.20	T	273.49	95.91	93.46	2.85	2.93	0.010	0.057	5.22	1427.83	1.75
6.30	T	282.96	98.43	95.97	2.87	2.95	0.010	0.057	5.26	1487.49	1.76
6.40	T	292.69	100.95	98.49	2.90	2.97	0.010	0.057	5.29	1549.75	1.78
6.50	T	302.66	103.47	101.00	2.93	3.00	0.010	0.057	5.33	1614.65	1.80
6.60	T	312.89	105.99	103.51	2.95	3.02	0.010	0.057	5.38	1682.21	1.82
6.70	T	323.36	108.51	106.02	2.98	3.05	0.010	0.057	5.42	1752.49	1.84
6.80	T	334.09	111.03	108.54	3.01	3.08	0.010	0.057	5.46	1825.54	1.86
6.90	T	345.07	113.55	111.05	3.04	3.11	0.010	0.057	5.51	1901.38	1.88
7.00	T	356.30	116.07	113.56	3.07	3.14	0.010	0.056	5.56	1980.07	1.90
7.10	T	367.78	118.59	116.07	3.10	3.17	0.010	0.056	5.61	2061.65	1.92
7.20	T	379.51	121.11	118.59	3.13	3.20	0.010	0.056	5.66	2146.16	1.95
7.30	T	391.50	123.63	121.10	3.17	3.23	0.010	0.056	5.71	2233.66	1.97
7.40	T	403.73	126.15	123.61	3.20	3.27	0.010	0.056	5.76	2324.19	1.99
7.50	T	416.22	128.67	126.12	3.23	3.30	0.010	0.056	5.81	2417.79	2.02

*****WinXSPRO*****

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 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 148.00/ @

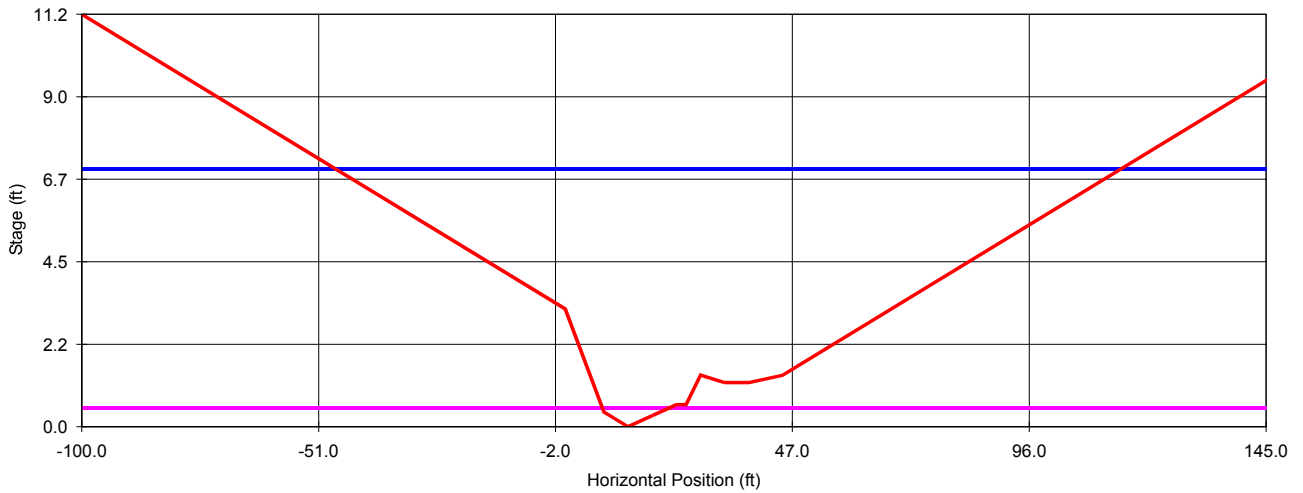
Resistance Method: Thorne and Zevenbergen
 D84: 55.000 mm

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10	T	0.32	6.34	6.33	0.05	0.05	0.009	0.088	0.22	0.07	0.03
0.20	T	1.09	9.18	9.17	0.12	0.12	0.009	0.075	0.46	0.50	0.07
0.30	T	2.15	12.02	12.00	0.18	0.18	0.009	0.063	0.72	1.55	0.10
0.40	T	3.42	13.37	13.33	0.26	0.26	0.009	0.052	1.09	3.73	0.14
0.50	T	4.82	14.72	14.67	0.33	0.33	0.009	0.047	1.42	6.83	0.18
0.60	T	6.40	17.08	17.00	0.37	0.38	0.009	0.045	1.64	10.50	0.21
0.70	T	8.22	19.43	19.33	0.42	0.43	0.009	0.043	1.86	15.26	0.24
0.80	T	10.18	20.03	19.90	0.51	0.51	0.009	0.041	2.20	22.34	0.29
0.90	T	12.20	20.62	20.46	0.59	0.60	0.009	0.040	2.51	30.64	0.34
1.00	T	14.27	21.22	21.03	0.67	0.68	0.009	0.039	2.81	40.13	0.38
1.10	T	16.40	21.82	21.59	0.75	0.76	0.009	0.038	3.10	50.80	0.43
1.20	T	18.59	22.42	22.15	0.83	0.84	0.009	0.037	3.37	62.64	0.47
1.30	T	20.82	22.84	22.52	0.91	0.92	0.009	0.037	3.65	76.01	0.52
1.40	T	23.23	25.11	24.71	0.93	0.94	0.009	0.036	3.72	86.50	0.53
1.50	T	25.76	26.38	25.90	0.98	0.99	0.009	0.036	3.90	100.60	0.56
1.60	T	28.41	27.65	27.10	1.03	1.05	0.009	0.036	4.08	116.00	0.59
1.70	T	31.18	28.92	28.29	1.08	1.10	0.009	0.035	4.26	132.74	0.62
1.80	T	34.07	30.19	29.48	1.13	1.16	0.009	0.035	4.43	150.85	0.65
1.90	T	37.31	36.05	35.27	1.03	1.06	0.009	0.035	4.19	156.17	0.60
2.00	T	41.08	40.91	40.07	1.00	1.03	0.009	0.035	4.12	169.22	0.58
2.10	T	45.10	41.27	40.36	1.09	1.12	0.009	0.035	4.40	198.59	0.63
2.20	T	49.15	41.62	40.65	1.18	1.21	0.009	0.034	4.68	229.96	0.68
2.30	T	53.23	41.98	40.95	1.27	1.30	0.009	0.034	4.95	263.29	0.74
2.40	T	57.34	42.33	41.24	1.35	1.39	0.009	0.034	5.21	298.56	0.79
2.50	T	61.48	42.69	41.53	1.44	1.48	0.009	0.034	5.46	335.73	0.84
2.60	T	65.64	43.04	41.83	1.53	1.57	0.009	0.033	5.71	374.78	0.89
2.70	T	69.84	43.40	42.12	1.61	1.66	0.009	0.033	5.95	415.68	0.94
2.80	T	74.07	43.76	42.41	1.69	1.75	0.009	0.033	6.19	458.42	0.99
2.90	T	78.32	44.11	42.71	1.78	1.83	0.009	0.033	6.42	502.97	1.04
3.00	T	82.61	44.47	43.00	1.86	1.92	0.009	0.033	6.65	549.31	1.09
3.10	T	86.92	44.82	43.29	1.94	2.01	0.009	0.033	6.87	597.43	1.14
3.20	T	91.27	45.18	43.59	2.02	2.09	0.009	0.033	7.09	647.32	1.19
3.30	T	95.64	45.53	43.88	2.10	2.18	0.009	0.032	7.31	698.97	1.24
3.40	T	100.04	45.89	44.17	2.18	2.26	0.009	0.032	7.52	752.35	1.29
3.50	T	104.48	46.24	44.47	2.26	2.35	0.009	0.032	7.73	807.47	1.33
3.60	T	108.94	46.60	44.76	2.34	2.43	0.009	0.032	7.93	864.31	1.38
3.70	T	113.43	46.95	45.05	2.42	2.52	0.009	0.032	8.14	922.87	1.43
3.80	T	117.95	47.31	45.35	2.49	2.60	0.009	0.032	8.34	983.13	1.48
3.90	T	122.50	47.66	45.64	2.57	2.68	0.010	0.032	8.53	1045.09	1.53
4.00	T	127.08	48.02	45.93	2.65	2.77	0.010	0.032	8.73	1108.74	1.57
4.10	T	131.68	48.38	46.23	2.72	2.85	0.010	0.032	8.92	1174.09	1.62
4.20	T	136.32	48.73	46.52	2.80	2.93	0.010	0.032	9.10	1241.12	1.67
4.30	T	141.04	50.17	47.93	2.81	2.94	0.010	0.032	9.16	1291.60	1.68
4.40	T	145.91	51.62	49.34	2.83	2.96	0.010	0.032	9.21	1344.46	1.69
4.50	T	150.91	53.06	50.75	2.84	2.97	0.010	0.032	9.28	1399.74	1.70
4.60	T	156.11	55.58	53.26	2.81	2.93	0.010	0.032	9.22	1439.34	1.68
4.70	T	161.56	58.10	55.77	2.78	2.90	0.010	0.031	9.18	1483.16	1.67
4.80	T	167.27	60.62	58.29	2.76	2.87	0.010	0.031	9.15	1531.11	1.66
4.90	T	173.22	63.14	60.80	2.74	2.85	0.010	0.031	9.14	1583.15	1.65
5.00	T	179.43	65.66	63.31	2.73	2.83	0.010	0.031	9.14	1639.25	1.65
5.10	T	185.88	68.18	65.82	2.73	2.82	0.010	0.031	9.14	1699.40	1.65
5.20	T	192.59	70.70	68.34	2.72	2.82	0.010	0.031	9.16	1763.59	1.65
5.30	T	199.55	73.22	70.85	2.73	2.82	0.010	0.031	9.18	1831.86	1.65
5.40	T	206.76	75.74	73.36	2.73	2.82	0.010	0.031	9.21	1904.21	1.66
5.50	T	214.22	78.26	75.87	2.74	2.82	0.010	0.031	9.25	1980.68	1.66
5.60	T	221.94	80.78	78.39	2.75	2.83	0.010	0.031	9.29	2061.30	1.67
5.70	T	229.90	83.30	80.90	2.76	2.84	0.010	0.031	9.34	2146.13	1.68
5.80	T	238.12	85.82	83.41	2.77	2.85	0.010	0.031	9.39	2235.20	1.69
5.90	T	246.58	88.34	85.92	2.79	2.87	0.010	0.031	9.44	2328.59	1.70
6.00	T	255.30	90.86	88.44	2.81	2.89	0.010	0.031	9.50	2426.33	1.72
6.10	T	264.27	93.39	90.95	2.83	2.91	0.010	0.031	9.57	2528.49	1.73

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.20	T	273.49	95.91	93.46	2.85	2.93	0.010	0.031	9.64	2635.13	1.75
6.30	T	282.96	98.43	95.97	2.87	2.95	0.010	0.031	9.71	2746.32	1.76
6.40	T	292.69	100.95	98.49	2.90	2.97	0.010	0.031	9.78	2862.12	1.78
6.50	T	302.66	103.47	101.00	2.93	3.00	0.010	0.031	9.85	2982.61	1.80
6.60	T	312.89	105.99	103.51	2.95	3.02	0.010	0.031	9.93	3107.85	1.82
6.70	T	323.36	108.51	106.02	2.98	3.05	0.010	0.031	10.01	3237.91	1.84
6.80	T	334.09	111.03	108.54	3.01	3.08	0.010	0.031	10.10	3372.86	1.86
6.90	T	345.07	113.55	111.05	3.04	3.11	0.010	0.031	10.18	3512.79	1.88
7.00	T	356.30	116.07	113.56	3.07	3.14	0.010	0.031	10.27	3657.75	1.90
7.10	T	367.78	118.59	116.07	3.10	3.17	0.010	0.031	10.35	3807.83	1.92
7.20	T	379.51	121.11	118.59	3.13	3.20	0.010	0.030	10.44	3963.11	1.95
7.30	T	391.50	123.63	121.10	3.17	3.23	0.010	0.030	10.53	4123.65	1.97
7.40	T	403.73	126.15	123.61	3.20	3.27	0.010	0.030	10.62	4289.53	1.99
7.50	T	416.22	128.67	126.12	3.23	3.30	0.010	0.030	10.72	4460.84	2.02

Lower Speelyai Site F2



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*****WinXSPRO*****
lspeelf2.out
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Run Date:       01/07/02
Analysis Procedure:  Hydraulics
Cross Section Number:  1
Survey Date:    01/07/02
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Subsections/Dividing stations
 A / 145.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.15	2.92	2.92	0.05	0.05	0.021	0.145	0.20	0.03	0.07
0.20	T	0.58	5.85	5.83	0.10	0.10	0.021	0.130	0.35	0.21	0.13
0.30	T	1.31	8.77	8.75	0.15	0.15	0.021	0.121	0.49	0.65	0.19
0.40	T	2.33	11.69	11.67	0.20	0.20	0.021	0.115	0.63	1.46	0.26
0.50	T	3.60	13.67	13.62	0.26	0.26	0.020	0.110	0.79	2.84	0.33
0.60	T	5.06	15.64	15.57	0.32	0.32	0.020	0.106	0.93	4.73	0.41
0.70	T	6.85	18.33	18.23	0.37	0.38	0.020	0.103	1.05	7.21	0.47
0.80	T	8.70	19.02	18.89	0.46	0.46	0.020	0.100	1.24	10.83	0.57
0.90	T	10.63	19.71	19.55	0.54	0.54	0.020	0.097	1.42	15.13	0.66
1.00	T	12.61	20.40	20.21	0.62	0.62	0.020	0.094	1.59	20.11	0.75
1.10	T	14.67	21.09	20.87	0.70	0.70	0.019	0.092	1.76	25.76	0.84
1.20	T	16.79	21.78	21.54	0.77	0.78	0.019	0.091	1.91	32.08	0.93
1.30	T	19.78	33.48	33.20	0.59	0.60	0.019	0.094	1.53	30.27	0.70
1.40	T	23.43	40.17	39.86	0.58	0.59	0.019	0.094	1.51	35.44	0.69
1.50	T	27.49	41.73	41.39	0.66	0.66	0.019	0.092	1.67	45.97	0.77
1.60	T	31.71	43.29	42.93	0.73	0.74	0.019	0.090	1.82	57.84	0.85
1.70	T	36.08	44.84	44.46	0.80	0.81	0.018	0.089	1.97	71.07	0.93
1.80	T	40.60	46.40	46.00	0.88	0.88	0.018	0.087	2.11	85.66	1.00
1.90	T	45.28	47.96	47.54	0.94	0.95	0.018	0.086	2.24	101.64	1.07
2.00	T	50.11	49.51	49.07	1.01	1.02	0.018	0.085	2.38	119.03	1.13
2.10	T	55.09	51.07	50.61	1.08	1.09	0.018	0.083	2.50	137.85	1.20
2.20	T	60.23	52.63	52.14	1.14	1.16	0.018	0.082	2.63	158.12	1.26
2.30	T	65.52	54.18	53.68	1.21	1.22	0.017	0.081	2.75	179.85	1.32
2.40	T	70.96	55.74	55.21	1.27	1.29	0.017	0.080	2.86	203.08	1.38
2.50	T	76.56	57.30	56.75	1.34	1.35	0.017	0.079	2.98	227.83	1.43
2.60	T	82.31	58.85	58.29	1.40	1.41	0.017	0.079	3.09	254.11	1.48
2.70	T	88.22	60.41	59.82	1.46	1.47	0.017	0.078	3.20	281.96	1.54
2.80	T	94.28	61.97	61.36	1.52	1.54	0.017	0.077	3.30	311.40	1.59
2.90	T	100.49	63.52	62.89	1.58	1.60	0.017	0.076	3.41	342.45	1.63
3.00	T	106.86	65.08	64.43	1.64	1.66	0.016	0.076	3.51	375.13	1.68
3.10	T	113.38	66.64	65.96	1.70	1.72	0.016	0.075	3.61	409.46	1.72
3.20	T	120.05	68.19	67.50	1.76	1.78	0.016	0.074	3.71	445.48	1.76
3.30	T	126.92	70.70	70.00	1.80	1.81	0.016	0.074	3.77	478.13	1.78
3.40	T	134.05	73.21	72.50	1.83	1.85	0.016	0.073	3.82	512.70	1.80

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	141.42	75.72	75.00	1.87	1.89	0.016	0.073	3.88	549.23	1.82
3.60	T	149.05	78.22	77.50	1.91	1.92	0.015	0.072	3.94	587.77	1.83
3.70	T	156.92	80.73	80.00	1.94	1.96	0.015	0.072	4.00	628.37	1.85
3.80	T	165.05	83.24	82.50	1.98	2.00	0.015	0.071	4.07	671.05	1.87
3.90	T	173.42	85.75	85.00	2.02	2.04	0.015	0.071	4.13	715.88	1.89
4.00	T	182.05	88.26	87.50	2.06	2.08	0.015	0.070	4.19	762.90	1.90
4.10	T	190.92	90.76	90.00	2.10	2.12	0.015	0.070	4.25	812.14	1.92
4.20	T	200.05	93.27	92.50	2.14	2.16	0.014	0.069	4.32	863.65	1.94
4.30	T	209.42	95.78	95.00	2.19	2.20	0.014	0.069	4.38	917.48	1.95
4.40	T	219.05	98.29	97.50	2.23	2.25	0.014	0.068	4.44	973.66	1.97
4.50	T	228.92	100.80	100.00	2.27	2.29	0.014	0.068	4.51	1032.23	1.98
4.60	T	239.05	103.30	102.50	2.31	2.33	0.014	0.067	4.57	1093.24	2.00
4.70	T	249.42	105.81	105.00	2.36	2.38	0.014	0.067	4.64	1156.73	2.01
4.80	T	260.05	108.32	107.50	2.40	2.42	0.014	0.066	4.70	1222.73	2.02
4.90	T	270.92	110.83	110.00	2.44	2.46	0.013	0.066	4.77	1291.28	2.04
5.00	T	282.05	113.34	112.50	2.49	2.51	0.013	0.065	4.83	1362.42	2.05
5.10	T	293.42	115.84	115.00	2.53	2.55	0.013	0.065	4.89	1436.19	2.06
5.20	T	305.05	118.35	117.50	2.58	2.60	0.013	0.064	4.96	1512.61	2.07
5.30	T	316.92	120.86	120.00	2.62	2.64	0.013	0.064	5.02	1591.74	2.08
5.40	T	329.05	123.37	122.50	2.67	2.69	0.013	0.063	5.09	1673.59	2.09
5.50	T	341.42	125.88	125.00	2.71	2.73	0.012	0.063	5.15	1758.20	2.10
5.60	T	354.05	128.38	127.50	2.76	2.78	0.012	0.062	5.21	1845.61	2.10
5.70	T	366.92	130.89	130.00	2.80	2.82	0.012	0.062	5.28	1935.85	2.11
5.80	T	380.05	133.40	132.50	2.85	2.87	0.012	0.061	5.34	2028.94	2.12
5.90	T	393.42	135.91	135.00	2.89	2.91	0.012	0.061	5.40	2124.92	2.12
6.00	T	407.05	138.42	137.50	2.94	2.96	0.012	0.060	5.46	2223.81	2.13
6.10	T	420.92	140.92	140.00	2.99	3.01	0.011	0.060	5.53	2325.64	2.13
6.20	T	435.05	143.43	142.50	3.03	3.05	0.011	0.059	5.59	2430.44	2.13
6.30	T	449.42	145.94	145.00	3.08	3.10	0.011	0.059	5.65	2538.22	2.14
6.40	T	464.05	148.45	147.50	3.13	3.15	0.011	0.058	5.71	2649.02	2.14
6.50	T	478.92	150.96	150.00	3.17	3.19	0.011	0.058	5.77	2762.86	2.14
6.60	T	494.05	153.46	152.50	3.22	3.24	0.011	0.058	5.83	2879.76	2.14
6.70	T	509.42	155.97	155.00	3.27	3.29	0.010	0.057	5.89	2999.73	2.14
6.80	T	525.05	158.48	157.50	3.31	3.33	0.010	0.057	5.95	3122.79	2.13
6.90	T	540.92	160.99	160.00	3.36	3.38	0.010	0.056	6.01	3248.97	2.13
7.00	T	557.04	163.50	162.50	3.41	3.43	0.010	0.056	6.06	3378.27	2.13

*****WinXSPRO*****

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 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 145.00/ @

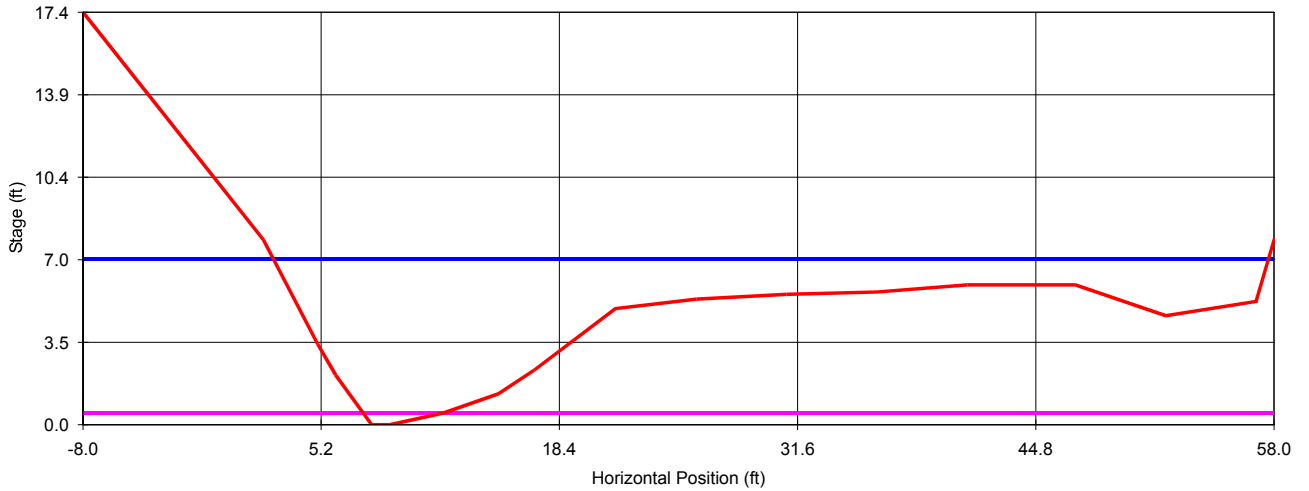
Resistance Method: Thorne and Zevenbergen
 D84: 75.000 mm

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10	T	0.15	2.92	2.92	0.05	0.05	0.021	0.130	0.22	0.03	0.07
0.20	T	0.58	5.85	5.83	0.10	0.10	0.021	0.095	0.49	0.28	0.13
0.30	T	1.31	8.77	8.75	0.15	0.15	0.021	0.079	0.76	1.00	0.19
0.40	T	2.33	11.69	11.67	0.20	0.20	0.021	0.069	1.05	2.45	0.26
0.50	T	3.60	13.67	13.62	0.26	0.26	0.020	0.061	1.44	5.19	0.33
0.60	T	5.06	15.64	15.57	0.32	0.32	0.020	0.055	1.81	9.17	0.41
0.70	T	6.85	18.33	18.23	0.37	0.38	0.020	0.052	2.12	14.51	0.47
0.80	T	8.70	19.02	18.89	0.46	0.46	0.020	0.048	2.57	22.41	0.57
0.90	T	10.63	19.71	19.55	0.54	0.54	0.020	0.046	3.00	31.84	0.66
1.00	T	12.61	20.40	20.21	0.62	0.62	0.020	0.045	3.39	42.76	0.75
1.10	T	14.67	21.09	20.87	0.70	0.70	0.019	0.043	3.76	55.13	0.84
1.20	T	16.79	21.78	21.54	0.77	0.78	0.019	0.042	4.11	68.93	0.93
1.30	T	19.78	33.48	33.20	0.59	0.60	0.019	0.043	3.35	66.21	0.70
1.40	T	23.43	40.17	39.86	0.58	0.59	0.019	0.043	3.33	78.10	0.69
1.50	T	27.49	41.73	41.39	0.66	0.66	0.019	0.042	3.69	101.45	0.77
1.60	T	31.71	43.29	42.93	0.73	0.74	0.019	0.041	4.03	127.62	0.85
1.70	T	36.08	44.84	44.46	0.80	0.81	0.018	0.040	4.34	156.60	0.93
1.80	T	40.60	46.40	46.00	0.88	0.88	0.018	0.040	4.64	188.37	1.00
1.90	T	45.28	47.96	47.54	0.94	0.95	0.018	0.039	4.92	222.92	1.07
2.00	T	50.11	49.51	49.07	1.01	1.02	0.018	0.039	5.19	260.26	1.13
2.10	T	55.09	51.07	50.61	1.08	1.09	0.018	0.038	5.45	300.37	1.20
2.20	T	60.23	52.63	52.14	1.14	1.16	0.018	0.038	5.70	343.25	1.26
2.30	T	65.52	54.18	53.68	1.21	1.22	0.017	0.038	5.94	388.91	1.32
2.40	T	70.96	55.74	55.21	1.27	1.29	0.017	0.037	6.16	437.35	1.38
2.50	T	76.56	57.30	56.75	1.34	1.35	0.017	0.037	6.38	488.57	1.43
2.60	T	82.31	58.85	58.29	1.40	1.41	0.017	0.037	6.59	542.56	1.48
2.70	T	88.22	60.41	59.82	1.46	1.47	0.017	0.037	6.79	599.33	1.54
2.80	T	94.28	61.97	61.36	1.52	1.54	0.017	0.036	6.99	658.88	1.59
2.90	T	100.49	63.52	62.89	1.58	1.60	0.017	0.036	7.18	721.20	1.63
3.00	T	106.86	65.08	64.43	1.64	1.66	0.016	0.036	7.36	786.29	1.68
3.10	T	113.38	66.64	65.96	1.70	1.72	0.016	0.036	7.53	854.14	1.72
3.20	T	120.05	68.19	67.50	1.76	1.78	0.016	0.036	7.70	924.76	1.76
3.30	T	126.92	70.70	70.00	1.80	1.81	0.016	0.036	7.79	989.27	1.78
3.40	T	134.05	73.21	72.50	1.83	1.85	0.016	0.035	7.89	1057.10	1.80
3.50	T	141.42	75.72	75.00	1.87	1.89	0.016	0.035	7.98	1128.27	1.82
3.60	T	149.05	78.22	77.50	1.91	1.92	0.015	0.035	8.07	1202.81	1.83
3.70	T	156.92	80.73	80.00	1.94	1.96	0.015	0.035	8.16	1280.74	1.85
3.80	T	165.05	83.24	82.50	1.98	2.00	0.015	0.035	8.25	1362.10	1.87
3.90	T	173.42	85.75	85.00	2.02	2.04	0.015	0.035	8.34	1446.89	1.89
4.00	T	182.05	88.26	87.50	2.06	2.08	0.015	0.035	8.43	1535.13	1.90
4.10	T	190.92	90.76	90.00	2.10	2.12	0.015	0.035	8.52	1626.84	1.92
4.20	T	200.05	93.27	92.50	2.14	2.16	0.014	0.035	8.61	1722.01	1.94
4.30	T	209.42	95.78	95.00	2.19	2.20	0.014	0.035	8.69	1820.67	1.95
4.40	T	219.05	98.29	97.50	2.23	2.25	0.014	0.034	8.78	1922.80	1.97
4.50	T	228.92	100.80	100.00	2.27	2.29	0.014	0.034	8.86	2028.40	1.98
4.60	T	239.05	103.30	102.50	2.31	2.33	0.014	0.034	8.94	2137.47	2.00
4.70	T	249.42	105.81	105.00	2.36	2.38	0.014	0.034	9.02	2249.99	2.01
4.80	T	260.05	108.32	107.50	2.40	2.42	0.014	0.034	9.10	2365.96	2.02
4.90	T	270.92	110.83	110.00	2.44	2.46	0.013	0.034	9.17	2485.35	2.04
5.00	T	282.05	113.34	112.50	2.49	2.51	0.013	0.034	9.25	2608.15	2.05
5.10	T	293.42	115.84	115.00	2.53	2.55	0.013	0.034	9.32	2734.31	2.06
5.20	T	305.05	118.35	117.50	2.58	2.60	0.013	0.034	9.39	2863.82	2.07
5.30	T	316.92	120.86	120.00	2.62	2.64	0.013	0.034	9.46	2996.64	2.08
5.40	T	329.05	123.37	122.50	2.67	2.69	0.013	0.034	9.52	3132.73	2.09
5.50	T	341.42	125.88	125.00	2.71	2.73	0.012	0.034	9.58	3272.04	2.10
5.60	T	354.05	128.38	127.50	2.76	2.78	0.012	0.034	9.64	3414.54	2.10
5.70	T	366.92	130.89	130.00	2.80	2.82	0.012	0.034	9.70	3560.16	2.11
5.80	T	380.05	133.40	132.50	2.85	2.87	0.012	0.033	9.76	3708.85	2.12
5.90	T	393.42	135.91	135.00	2.89	2.91	0.012	0.033	9.81	3860.55	2.12
6.00	T	407.05	138.42	137.50	2.94	2.96	0.012	0.033	9.86	4015.19	2.13
6.10	T	420.92	140.92	140.00	2.99	3.01	0.011	0.033	9.91	4172.70	2.13

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.20	T	435.05	143.43	142.50	3.03	3.05	0.011	0.033	9.96	4333.02	2.13
6.30	T	449.42	145.94	145.00	3.08	3.10	0.011	0.033	10.00	4496.04	2.14
6.40	T	464.05	148.45	147.50	3.13	3.15	0.011	0.033	10.05	4661.70	2.14
6.50	T	478.92	150.96	150.00	3.17	3.19	0.011	0.033	10.08	4829.90	2.14
6.60	T	494.05	153.46	152.50	3.22	3.24	0.011	0.033	10.12	5000.55	2.14
6.70	T	509.42	155.97	155.00	3.27	3.29	0.010	0.033	10.16	5173.53	2.14
6.80	T	525.05	158.48	157.50	3.31	3.33	0.010	0.033	10.19	5348.75	2.13
6.90	T	540.92	160.99	160.00	3.36	3.38	0.010	0.033	10.22	5526.10	2.13
7.00	T	557.04	163.50	162.50	3.41	3.43	0.010	0.033	10.24	5705.45	2.13

Upper Speelyai Site 1



*****WinXSPRO*****

uspeell.out
 Input File: C:\WXSPRO20\LEWIS\USPEEL1.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 57.99/ @

Resistance Method: Thorne and Zevenbergen
 D84: 80.000 mm

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.13	1.75	1.70	0.08	0.08	0.018	0.140	0.26	0.03	0.09
0.20	T	0.34	2.49	2.39	0.14	0.14	0.018	0.085	0.62	0.21	0.15
0.30	T	0.61	3.24	3.09	0.19	0.20	0.018	0.061	1.08	0.66	0.21
0.40	T	0.96	3.99	3.78	0.24	0.25	0.018	0.047	1.63	1.56	0.27
0.50	T	1.37	4.73	4.48	0.29	0.31	0.018	0.062	1.42	1.95	0.32
0.60	T	1.84	5.26	4.95	0.35	0.37	0.018	0.056	1.77	3.26	0.39
0.70	T	2.36	5.78	5.42	0.41	0.44	0.018	0.053	2.09	4.93	0.46
0.80	T	2.92	6.31	5.89	0.46	0.50	0.018	0.050	2.39	7.00	0.52
0.90	T	3.54	6.84	6.36	0.52	0.56	0.018	0.048	2.68	9.47	0.58
1.00	T	4.19	7.36	6.83	0.57	0.61	0.018	0.047	2.95	12.38	0.64
1.10	T	4.90	7.89	7.30	0.62	0.67	0.018	0.045	3.21	15.75	0.70
1.20	T	5.65	8.41	7.77	0.67	0.73	0.018	0.044	3.47	19.59	0.75
1.30	T	6.45	8.94	8.24	0.72	0.78	0.018	0.043	3.71	23.94	0.81
1.40	T	7.29	9.30	8.53	0.78	0.85	0.018	0.043	4.00	29.15	0.88
1.50	T	8.16	9.66	8.83	0.84	0.92	0.018	0.042	4.27	34.86	0.95
1.60	T	9.06	10.03	9.12	0.90	0.99	0.018	0.041	4.54	41.09	1.01
1.70	T	9.99	10.39	9.42	0.96	1.06	0.018	0.041	4.79	47.85	1.08
1.80	T	10.94	10.75	9.71	1.02	1.13	0.018	0.040	5.04	55.12	1.14
1.90	T	11.93	11.11	10.01	1.07	1.19	0.018	0.040	5.28	62.94	1.21
2.00	T	12.94	11.47	10.30	1.13	1.26	0.018	0.039	5.51	71.30	1.27
2.10	T	13.99	11.83	10.60	1.18	1.32	0.018	0.039	5.73	80.21	1.33
2.20	T	15.06	12.18	10.88	1.24	1.38	0.018	0.039	5.96	89.73	1.39
2.30	T	16.16	12.53	11.15	1.29	1.45	0.018	0.038	6.18	99.82	1.45
2.40	T	17.29	12.86	11.40	1.34	1.52	0.018	0.038	6.40	110.60	1.51
2.50	T	18.44	13.19	11.65	1.40	1.58	0.018	0.038	6.61	121.94	1.57
2.60	T	19.62	13.51	11.90	1.45	1.65	0.018	0.038	6.82	133.85	1.63
2.70	T	20.82	13.84	12.15	1.50	1.71	0.018	0.037	7.03	146.33	1.69
2.80	T	22.05	14.16	12.40	1.56	1.78	0.018	0.037	7.23	159.39	1.75
2.90	T	23.31	14.49	12.65	1.61	1.84	0.018	0.037	7.42	173.04	1.81
3.00	T	24.58	14.82	12.90	1.66	1.91	0.018	0.037	7.62	187.27	1.86
3.10	T	25.89	15.14	13.15	1.71	1.97	0.018	0.037	7.81	202.09	1.92
3.20	T	27.21	15.47	13.40	1.76	2.03	0.018	0.036	7.99	217.52	1.98
3.30	T	28.57	15.79	13.65	1.81	2.09	0.018	0.036	8.18	233.56	2.03

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.40	T	29.94	16.12	13.90	1.86	2.15	0.018	0.036	8.36	250.20	2.09
3.50	T	31.35	16.44	14.14	1.91	2.22	0.018	0.036	8.53	267.53	2.14
3.60	T	32.77	16.76	14.38	1.96	2.28	0.018	0.036	8.71	285.46	2.20
3.70	T	34.22	17.08	14.63	2.00	2.34	0.018	0.036	8.88	304.03	2.25
3.80	T	35.70	17.40	14.87	2.05	2.40	0.018	0.036	9.05	323.22	2.30
3.90	T	37.20	17.72	15.11	2.10	2.46	0.018	0.036	9.22	343.04	2.36
4.00	T	38.72	18.05	15.35	2.15	2.52	0.018	0.035	9.39	363.51	2.41
4.10	T	40.27	18.37	15.59	2.19	2.58	0.018	0.035	9.55	384.63	2.46
4.20	T	41.84	18.69	15.83	2.24	2.64	0.018	0.035	9.71	406.40	2.51
4.30	T	43.43	19.01	16.07	2.28	2.70	0.018	0.035	9.87	428.82	2.57
4.40	T	45.05	19.33	16.31	2.33	2.76	0.018	0.035	10.03	451.91	2.62
4.50	T	46.70	19.65	16.56	2.38	2.82	0.018	0.035	10.19	475.68	2.67
4.60	T	48.36	19.97	16.80	2.42	2.88	0.018	0.035	10.34	500.12	2.72
4.70	T	50.12	21.53	18.26	2.33	2.75	0.018	0.035	10.08	505.22	2.61
4.80	T	52.01	23.09	19.72	2.25	2.64	0.018	0.035	9.87	513.57	2.53
4.90	T	54.06	24.64	21.17	2.19	2.55	0.018	0.035	9.71	524.90	2.46
5.00	T	56.30	27.13	23.59	2.08	2.39	0.018	0.035	9.36	526.87	2.33
5.10	T	58.78	29.62	26.00	1.98	2.26	0.018	0.035	9.09	534.18	2.23
5.20	T	61.50	32.10	28.41	1.92	2.16	0.018	0.035	8.88	546.23	2.15
5.30	T	64.42	33.86	30.02	1.90	2.15	0.018	0.035	8.86	570.45	2.14
5.40	T	67.57	36.99	33.01	1.83	2.05	0.018	0.035	8.62	582.62	2.05
5.50	T	71.02	40.11	36.00	1.77	1.97	0.018	0.035	8.45	600.08	1.99
5.60	T	74.90	45.74	41.50	1.64	1.80	0.018	0.035	8.01	600.05	1.84
5.70	T	79.15	48.03	43.65	1.65	1.81	0.018	0.035	8.06	638.04	1.85
5.80	T	83.63	50.33	45.81	1.66	1.83	0.018	0.035	8.12	679.13	1.87
5.90	T	88.32	52.62	47.97	1.68	1.84	0.018	0.034	8.19	723.39	1.88
6.00	T	93.12	52.85	48.07	1.76	1.94	0.018	0.034	8.49	790.36	1.98
6.10	T	97.93	53.08	48.18	1.84	2.03	0.018	0.034	8.78	859.68	2.07
6.20	T	102.75	53.31	48.29	1.93	2.13	0.018	0.034	9.06	931.31	2.16
6.30	T	107.59	53.54	48.39	2.01	2.22	0.018	0.034	9.34	1005.19	2.26
6.40	T	112.43	53.76	48.50	2.09	2.32	0.018	0.034	9.62	1081.30	2.35
6.50	T	117.29	53.99	48.61	2.17	2.41	0.018	0.034	9.89	1159.61	2.44
6.60	T	122.15	54.22	48.71	2.25	2.51	0.018	0.034	10.15	1240.06	2.53
6.70	T	127.03	54.45	48.82	2.33	2.60	0.018	0.034	10.41	1322.64	2.62
6.80	T	131.92	54.68	48.93	2.41	2.70	0.018	0.034	10.67	1407.32	2.71
6.90	T	136.82	54.91	49.03	2.49	2.79	0.018	0.034	10.92	1494.05	2.80
7.00	T	141.73	55.13	49.14	2.57	2.88	0.018	0.034	11.17	1582.82	2.89

*****WinXSPRO*****

uspeell.out
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 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 57.99/ @

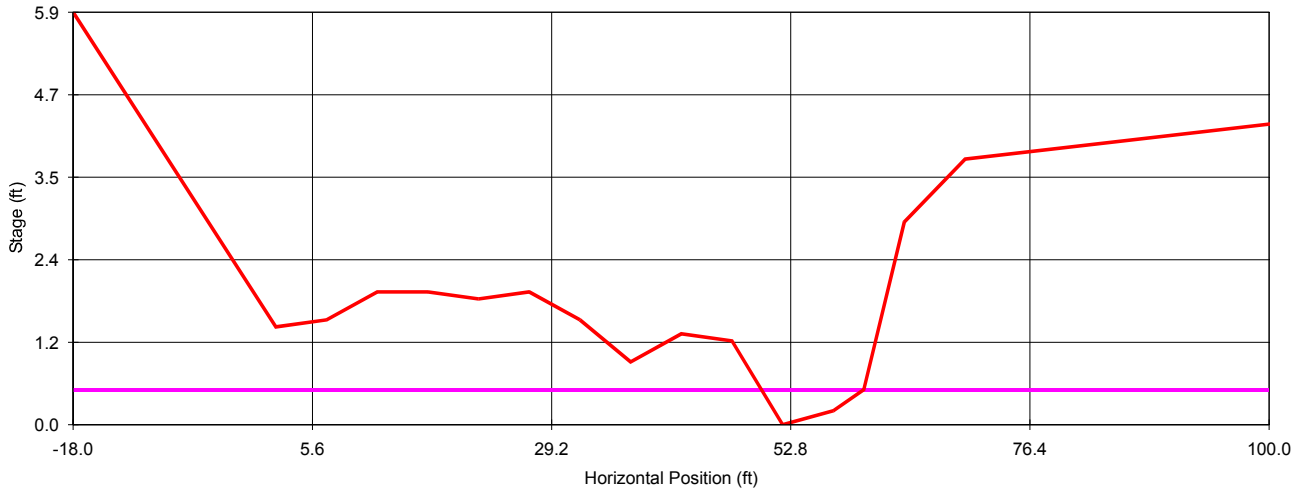
Resistance Method: Jarrett's Equation

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10	T	0.13	1.75	1.70	0.08	0.08	0.018	0.128	0.28	0.04	0.09
0.20	T	0.34	2.49	2.39	0.14	0.14	0.018	0.117	0.45	0.15	0.15
0.30	T	0.61	3.24	3.09	0.19	0.20	0.018	0.111	0.59	0.36	0.21
0.40	T	0.96	3.99	3.78	0.24	0.25	0.018	0.106	0.72	0.69	0.27
0.50	T	1.37	4.73	4.48	0.29	0.31	0.018	0.103	0.84	1.15	0.32
0.60	T	1.84	5.26	4.95	0.35	0.37	0.018	0.100	0.98	1.81	0.39
0.70	T	2.36	5.78	5.42	0.41	0.44	0.018	0.098	1.12	2.63	0.46
0.80	T	2.92	6.31	5.89	0.46	0.50	0.018	0.096	1.24	3.63	0.52
0.90	T	3.54	6.84	6.36	0.52	0.56	0.018	0.094	1.36	4.81	0.58
1.00	T	4.19	7.36	6.83	0.57	0.61	0.018	0.093	1.47	6.19	0.64
1.10	T	4.90	7.89	7.30	0.62	0.67	0.018	0.091	1.58	7.77	0.70
1.20	T	5.65	8.41	7.77	0.67	0.73	0.018	0.090	1.69	9.56	0.75
1.30	T	6.45	8.94	8.24	0.72	0.78	0.018	0.089	1.80	11.59	0.81
1.40	T	7.29	9.30	8.53	0.78	0.85	0.018	0.088	1.92	14.02	0.88
1.50	T	8.16	9.66	8.83	0.84	0.92	0.018	0.087	2.04	16.68	0.95
1.60	T	9.06	10.03	9.12	0.90	0.99	0.018	0.086	2.16	19.59	1.01
1.70	T	9.99	10.39	9.42	0.96	1.06	0.018	0.085	2.28	22.73	1.08
1.80	T	10.94	10.75	9.71	1.02	1.13	0.018	0.084	2.39	26.12	1.14
1.90	T	11.93	11.11	10.01	1.07	1.19	0.018	0.084	2.50	29.76	1.21
2.00	T	12.94	11.47	10.30	1.13	1.26	0.018	0.083	2.60	33.66	1.27
2.10	T	13.99	11.83	10.60	1.18	1.32	0.018	0.083	2.70	37.81	1.33
2.20	T	15.06	12.18	10.88	1.24	1.38	0.018	0.082	2.81	42.26	1.39
2.30	T	16.16	12.53	11.15	1.29	1.45	0.018	0.081	2.91	46.97	1.45
2.40	T	17.29	12.86	11.40	1.34	1.52	0.018	0.081	3.01	52.02	1.51
2.50	T	18.44	13.19	11.65	1.40	1.58	0.018	0.080	3.11	57.33	1.57
2.60	T	19.62	13.51	11.90	1.45	1.65	0.018	0.080	3.21	62.92	1.63
2.70	T	20.82	13.84	12.15	1.50	1.71	0.018	0.079	3.30	68.78	1.69
2.80	T	22.05	14.16	12.40	1.56	1.78	0.018	0.079	3.40	74.92	1.75
2.90	T	23.31	14.49	12.65	1.61	1.84	0.018	0.079	3.49	81.34	1.81
3.00	T	24.58	14.82	12.90	1.66	1.91	0.018	0.078	3.58	88.05	1.86
3.10	T	25.89	15.14	13.15	1.71	1.97	0.018	0.078	3.67	95.04	1.92
3.20	T	27.21	15.47	13.40	1.76	2.03	0.018	0.077	3.76	102.33	1.98
3.30	T	28.57	15.79	13.65	1.81	2.09	0.018	0.077	3.85	109.91	2.03
3.40	T	29.94	16.12	13.90	1.86	2.15	0.018	0.077	3.93	117.79	2.09
3.50	T	31.35	16.44	14.14	1.91	2.22	0.018	0.076	4.02	126.00	2.14
3.60	T	32.77	16.76	14.38	1.96	2.28	0.018	0.076	4.10	134.51	2.20
3.70	T	34.22	17.08	14.63	2.00	2.34	0.018	0.076	4.19	143.33	2.25
3.80	T	35.70	17.40	14.87	2.05	2.40	0.018	0.076	4.27	152.46	2.30
3.90	T	37.20	17.72	15.11	2.10	2.46	0.018	0.075	4.35	161.91	2.36
4.00	T	38.72	18.05	15.35	2.15	2.52	0.018	0.075	4.43	171.67	2.41
4.10	T	40.27	18.37	15.59	2.19	2.58	0.018	0.075	4.51	181.75	2.46
4.20	T	41.84	18.69	15.83	2.24	2.64	0.018	0.074	4.59	192.15	2.51
4.30	T	43.43	19.01	16.07	2.28	2.70	0.018	0.074	4.67	202.88	2.57
4.40	T	45.05	19.33	16.31	2.33	2.76	0.018	0.074	4.75	213.95	2.62
4.50	T	46.70	19.65	16.56	2.38	2.82	0.018	0.074	4.83	225.35	2.67
4.60	T	48.36	19.97	16.80	2.42	2.88	0.018	0.074	4.90	237.08	2.72
4.70	T	50.12	21.53	18.26	2.33	2.75	0.018	0.074	4.74	237.75	2.61
4.80	T	52.01	23.09	19.72	2.25	2.64	0.018	0.074	4.62	240.16	2.53
4.90	T	54.06	24.64	21.17	2.19	2.55	0.018	0.075	4.52	244.12	2.46
5.00	T	56.30	27.13	23.59	2.08	2.39	0.018	0.075	4.31	242.76	2.33
5.10	T	58.78	29.62	26.00	1.98	2.26	0.018	0.076	4.16	244.24	2.23
5.20	T	61.50	32.10	28.41	1.92	2.16	0.018	0.076	4.04	248.15	2.15
5.30	T	64.42	33.86	30.02	1.90	2.15	0.018	0.076	4.01	258.47	2.14
5.40	T	67.57	36.99	33.01	1.83	2.05	0.018	0.077	3.88	262.14	2.05
5.50	T	71.02	40.11	36.00	1.77	1.97	0.018	0.077	3.78	268.45	1.99
5.60	T	74.90	45.74	41.50	1.64	1.80	0.018	0.078	3.54	265.32	1.84
5.70	T	79.15	48.03	43.65	1.65	1.81	0.018	0.078	3.56	281.88	1.85
5.80	T	83.63	50.33	45.81	1.66	1.83	0.018	0.078	3.59	299.87	1.87
5.90	T	88.32	52.62	47.97	1.68	1.84	0.018	0.078	3.62	319.31	1.88
6.00	T	93.12	52.85	48.07	1.76	1.94	0.018	0.077	3.76	350.54	1.98
6.10	T	97.93	53.08	48.18	1.84	2.03	0.018	0.077	3.91	383.04	2.07
6.20	T	102.75	53.31	48.29	1.93	2.13	0.018	0.076	4.06	416.78	2.16

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.30	T	107.59	53.54	48.39	2.01	2.22	0.018	0.076	4.20	451.75	2.26
6.40	T	112.43	53.76	48.50	2.09	2.32	0.018	0.075	4.34	487.95	2.35
6.50	T	117.29	53.99	48.61	2.17	2.41	0.018	0.075	4.48	525.35	2.44
6.60	T	122.15	54.22	48.71	2.25	2.51	0.018	0.074	4.62	563.95	2.53
6.70	T	127.03	54.45	48.82	2.33	2.60	0.018	0.074	4.75	603.72	2.62
6.80	T	131.92	54.68	48.93	2.41	2.70	0.018	0.074	4.89	644.67	2.71
6.90	T	136.82	54.91	49.03	2.49	2.79	0.018	0.073	5.02	686.77	2.80
7.00	T	141.73	55.13	49.14	2.57	2.88	0.018	0.073	5.15	730.01	2.89

Upper Speelyai Site 2



*****WinXSPRO*****

uspeel2.out
 Input File: C:\WXSPRO20\LEWIS\USPEEL2.DAT
 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 100.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.15	2.93	2.92	0.05	0.05	0.022	0.148	0.20	0.03	0.07
0.20	T	0.58	5.86	5.83	0.10	0.10	0.022	0.132	0.35	0.21	0.14
0.30	T	1.24	7.29	7.25	0.17	0.17	0.022	0.121	0.55	0.68	0.23
0.40	T	2.03	8.73	8.67	0.23	0.23	0.022	0.115	0.72	1.46	0.32
0.50	T	2.97	10.16	10.08	0.29	0.29	0.022	0.111	0.87	2.57	0.39
0.60	T	4.01	10.78	10.67	0.37	0.38	0.021	0.106	1.06	4.24	0.50
0.70	T	5.10	11.41	11.25	0.45	0.45	0.021	0.103	1.23	6.29	0.60
0.80	T	6.26	12.03	11.83	0.52	0.53	0.021	0.100	1.40	8.73	0.69
0.90	T	7.47	12.65	12.42	0.59	0.60	0.021	0.098	1.55	11.57	0.78
1.00	T	8.85	15.37	15.08	0.58	0.59	0.021	0.098	1.52	13.41	0.76
1.10	T	10.49	18.08	17.75	0.58	0.59	0.021	0.098	1.52	15.99	0.76
1.20	T	12.40	20.80	20.42	0.60	0.61	0.021	0.097	1.56	19.32	0.78
1.30	T	14.80	28.09	27.67	0.53	0.53	0.021	0.099	1.41	20.81	0.68
1.40	T	17.62	29.12	28.67	0.60	0.61	0.021	0.097	1.58	27.76	0.78
1.50	T	20.80	35.61	35.11	0.58	0.59	0.021	0.097	1.53	31.83	0.75
1.60	T	24.47	38.77	38.22	0.63	0.64	0.020	0.096	1.63	39.90	0.81
1.70	T	28.45	41.93	41.33	0.68	0.69	0.020	0.094	1.73	49.23	0.86
1.80	T	32.74	45.09	44.44	0.73	0.74	0.020	0.093	1.83	59.90	0.92
1.90	T	37.84	58.25	57.55	0.65	0.66	0.020	0.095	1.67	63.08	0.82
2.00	T	43.62	58.90	58.16	0.74	0.75	0.020	0.093	1.86	81.04	0.93
2.10	T	49.47	59.55	58.78	0.83	0.84	0.020	0.091	2.04	101.03	1.03
2.20	T	55.38	60.20	59.39	0.92	0.93	0.020	0.089	2.22	123.01	1.14
2.30	T	61.35	60.85	60.00	1.01	1.02	0.020	0.088	2.40	146.94	1.24
2.40	T	67.38	61.50	60.61	1.10	1.11	0.020	0.086	2.56	172.80	1.34
2.50	T	73.47	62.14	61.22	1.18	1.20	0.020	0.085	2.73	200.58	1.44
2.60	T	79.62	62.79	61.83	1.27	1.29	0.019	0.084	2.89	230.23	1.54
2.70	T	85.84	63.44	62.44	1.35	1.37	0.019	0.083	3.05	261.76	1.63
2.80	T	92.11	64.09	63.05	1.44	1.46	0.019	0.082	3.20	295.14	1.72
2.90	T	98.45	64.74	63.66	1.52	1.55	0.019	0.081	3.36	330.36	1.81
3.00	T	104.87	65.39	64.27	1.59	1.62	0.019	0.080	3.48	365.33	1.89
3.10	T	111.40	67.00	65.89	1.66	1.69	0.019	0.080	3.61	402.08	1.96
3.20	T	118.05	68.13	67.00	1.73	1.76	0.019	0.079	3.73	440.60	2.03
3.30	T	124.80	69.26	68.11	1.80	1.83	0.019	0.078	3.85	480.90	2.10
3.40	T	131.67	70.39	69.22	1.87	1.90	0.019	0.078	3.97	523.00	2.17

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	138.64	71.52	70.33	1.94	1.97	0.019	0.077	4.09	566.92	2.24
3.60	T	145.73	72.65	71.44	2.01	2.04	0.018	0.076	4.20	612.65	2.30
3.70	T	152.93	73.78	72.55	2.07	2.11	0.018	0.076	4.32	660.21	2.37
3.80	T	160.24	74.91	73.66	2.14	2.18	0.018	0.075	4.43	709.62	2.43
3.90	T	167.93	81.37	80.11	2.06	2.10	0.018	0.076	4.30	721.40	2.33
4.00	T	176.27	87.82	86.55	2.01	2.04	0.018	0.076	4.19	739.35	2.25

*****WinXSPRO*****

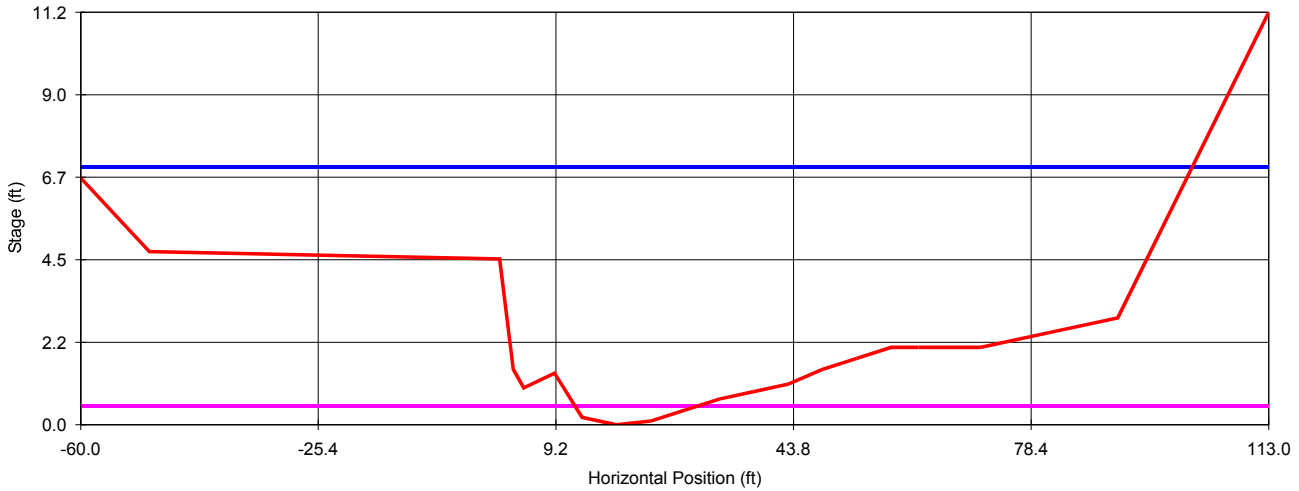
uspeel2.out
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 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 100.00/ @

Resistance Method: Thorne and Zevenbergen
 D84: 120.000 mm

STAGE	#SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)		(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10	T	0.15	2.93	2.92	0.05	0.05	0.022	0.175	0.17	0.02	0.07
0.20	T	0.58	5.86	5.83	0.10	0.10	0.022	0.128	0.37	0.22	0.14
0.30	T	1.24	7.29	7.25	0.17	0.17	0.022	0.102	0.66	0.82	0.23
0.40	T	2.03	8.73	8.67	0.23	0.23	0.022	0.084	0.99	2.01	0.32
0.50	T	2.97	10.16	10.08	0.29	0.29	0.022	0.072	1.35	4.00	0.39
0.60	T	4.01	10.78	10.67	0.37	0.38	0.021	0.058	1.95	7.81	0.50
0.70	T	5.10	11.41	11.25	0.45	0.45	0.021	0.066	1.93	9.83	0.60
0.80	T	6.26	12.03	11.83	0.52	0.53	0.021	0.062	2.28	14.29	0.69
0.90	T	7.47	12.65	12.42	0.59	0.60	0.021	0.058	2.62	19.57	0.78
1.00	T	8.85	15.37	15.08	0.58	0.59	0.021	0.057	2.60	23.03	0.76
1.10	T	10.49	18.08	17.75	0.58	0.59	0.021	0.056	2.66	27.90	0.76
1.20	T	12.40	20.80	20.42	0.60	0.61	0.021	0.055	2.76	34.23	0.78
1.30	T	14.80	28.09	27.67	0.53	0.53	0.021	0.056	2.50	37.06	0.68
1.40	T	17.62	29.12	28.67	0.60	0.61	0.021	0.054	2.86	50.36	0.78
1.50	T	20.80	35.61	35.11	0.58	0.59	0.021	0.053	2.80	58.24	0.75
1.60	T	24.47	38.77	38.22	0.63	0.64	0.020	0.052	3.02	73.85	0.81
1.70	T	28.45	41.93	41.33	0.68	0.69	0.020	0.051	3.23	91.97	0.86
1.80	T	32.74	45.09	44.44	0.73	0.74	0.020	0.050	3.44	112.75	0.92
1.90	T	37.84	58.25	57.55	0.65	0.66	0.020	0.050	3.16	119.39	0.82
2.00	T	43.62	58.90	58.16	0.74	0.75	0.020	0.049	3.54	154.41	0.93
2.10	T	49.47	59.55	58.78	0.83	0.84	0.020	0.048	3.91	193.27	1.03
2.20	T	55.38	60.20	59.39	0.92	0.93	0.020	0.047	4.26	235.84	1.14
2.30	T	61.35	60.85	60.00	1.01	1.02	0.020	0.046	4.60	282.01	1.24
2.40	T	67.38	61.50	60.61	1.10	1.11	0.020	0.045	4.92	331.67	1.34
2.50	T	73.47	62.14	61.22	1.18	1.20	0.020	0.044	5.24	384.73	1.44
2.60	T	79.62	62.79	61.83	1.27	1.29	0.019	0.044	5.54	441.11	1.54
2.70	T	85.84	63.44	62.44	1.35	1.37	0.019	0.043	5.83	500.73	1.63
2.80	T	92.11	64.09	63.05	1.44	1.46	0.019	0.043	6.12	563.53	1.72
2.90	T	98.45	64.74	63.66	1.52	1.55	0.019	0.043	6.39	629.44	1.81
3.00	T	104.87	65.87	64.78	1.59	1.62	0.019	0.042	6.63	694.86	1.89
3.10	T	111.40	67.00	65.89	1.66	1.69	0.019	0.042	6.85	763.29	1.96
3.20	T	118.05	68.13	67.00	1.73	1.76	0.019	0.042	7.07	834.70	2.03
3.30	T	124.80	69.26	68.11	1.80	1.83	0.019	0.041	7.28	909.07	2.10
3.40	T	131.67	70.39	69.22	1.87	1.90	0.019	0.041	7.49	986.41	2.17
3.50	T	138.64	71.52	70.33	1.94	1.97	0.019	0.041	7.69	1066.70	2.24
3.60	T	145.73	72.65	71.44	2.01	2.04	0.018	0.041	7.89	1149.94	2.30
3.70	T	152.93	73.78	72.55	2.07	2.11	0.018	0.041	8.08	1236.10	2.37
3.80	T	160.24	74.91	73.66	2.14	2.18	0.018	0.040	8.27	1325.19	2.43
3.90	T	167.93	81.37	80.11	2.06	2.10	0.018	0.040	8.06	1352.91	2.33
4.00	T	176.27	87.82	86.55	2.01	2.04	0.018	0.040	7.89	1391.19	2.25

Upper Speelyai Site 3



*****WinXSPRO*****

uspeel3.out
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 Run Date: 01/07/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 113.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.37	7.50	7.50	0.05	0.05	0.020	0.142	0.20	0.07	0.06
0.20	T	1.33	11.67	11.67	0.11	0.11	0.020	0.125	0.39	0.52	0.14
0.30	T	2.60	13.69	13.67	0.19	0.19	0.020	0.115	0.60	1.56	0.24
0.40	T	4.07	15.71	15.67	0.26	0.26	0.020	0.109	0.78	3.16	0.32
0.50	T	5.73	17.73	17.67	0.32	0.32	0.020	0.106	0.93	5.35	0.40
0.60	T	7.60	19.75	19.67	0.38	0.39	0.020	0.103	1.08	8.20	0.48
0.70	T	9.67	21.76	21.67	0.44	0.45	0.020	0.100	1.21	11.74	0.55
0.80	T	11.97	24.61	24.50	0.49	0.49	0.020	0.099	1.31	15.69	0.61
0.90	T	14.57	27.46	27.33	0.53	0.53	0.020	0.098	1.41	20.50	0.66
1.00	T	17.44	30.31	30.17	0.58	0.58	0.020	0.096	1.51	26.27	0.72
1.10	T	20.67	34.61	34.42	0.60	0.60	0.020	0.096	1.55	32.11	0.75
1.20	T	24.26	37.66	37.43	0.64	0.65	0.020	0.095	1.65	40.14	0.80
1.30	T	28.16	40.70	40.44	0.69	0.70	0.020	0.094	1.75	49.41	0.86
1.40	T	32.35	43.75	43.45	0.74	0.74	0.020	0.093	1.85	60.00	0.92
1.50	T	36.77	45.32	45.00	0.81	0.82	0.020	0.091	2.00	73.67	1.01
1.60	T	41.36	47.11	46.73	0.88	0.89	0.020	0.090	2.14	88.45	1.10
1.70	T	46.12	48.90	48.47	0.94	0.95	0.020	0.089	2.27	104.68	1.18
1.80	T	51.05	50.69	50.20	1.01	1.02	0.020	0.088	2.40	122.36	1.26
1.90	T	56.16	52.48	51.93	1.07	1.08	0.020	0.087	2.52	141.55	1.34
2.00	T	61.44	54.27	53.67	1.13	1.14	0.020	0.086	2.64	162.27	1.41
2.10	T	66.89	56.06	55.40	1.19	1.21	0.020	0.086	2.76	184.55	1.49
2.20	T	73.86	71.68	70.97	1.03	1.04	0.020	0.088	2.44	180.41	1.29
2.30	T	81.09	74.30	73.53	1.09	1.10	0.020	0.087	2.56	207.72	1.36
2.40	T	88.57	76.93	76.10	1.15	1.16	0.020	0.086	2.68	237.21	1.44
2.50	T	96.31	79.55	78.67	1.21	1.22	0.020	0.086	2.79	268.91	1.51
2.60	T	104.30	82.17	81.23	1.27	1.28	0.020	0.085	2.90	302.90	1.58
2.70	T	112.55	84.79	83.80	1.33	1.34	0.020	0.084	3.01	339.23	1.66
2.80	T	121.06	87.41	86.37	1.38	1.40	0.020	0.084	3.12	377.95	1.73
2.90	T	129.83	90.04	88.93	1.44	1.46	0.020	0.083	3.23	419.11	1.80
3.00	T	138.74	90.44	89.26	1.53	1.55	0.020	0.082	3.40	471.49	1.91
3.10	T	147.68	90.84	89.60	1.63	1.65	0.020	0.082	3.57	526.64	2.03
3.20	T	156.65	91.25	89.93	1.72	1.74	0.020	0.081	3.73	584.54	2.14
3.30	T	165.66	91.65	90.26	1.81	1.84	0.020	0.080	3.89	645.15	2.26
3.40	T	174.71	92.05	90.59	1.90	1.93	0.020	0.080	4.06	708.46	2.37

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	183.78	92.46	90.92	1.99	2.02	0.020	0.079	4.21	774.44	2.48
3.60	T	192.89	92.86	91.25	2.08	2.11	0.020	0.078	4.37	843.07	2.59
3.70	T	202.03	93.26	91.59	2.17	2.21	0.020	0.078	4.53	914.33	2.70
3.80	T	211.21	93.67	91.92	2.25	2.30	0.020	0.077	4.68	988.20	2.81
3.90	T	220.42	94.07	92.25	2.34	2.39	0.020	0.077	4.83	1064.67	2.92
4.00	T	229.66	94.48	92.58	2.43	2.48	0.020	0.077	4.98	1143.70	3.03
4.10	T	238.93	94.88	92.91	2.52	2.57	0.020	0.076	5.13	1225.30	3.14
4.20	T	248.24	95.28	93.24	2.61	2.66	0.020	0.076	5.27	1309.44	3.25
4.30	T	257.58	95.69	93.58	2.69	2.75	0.020	0.075	5.42	1396.11	3.36
4.40	T	266.96	96.09	93.91	2.78	2.84	0.020	0.075	5.56	1485.29	3.47
4.50	T	276.36	96.49	94.24	2.86	2.93	0.020	0.075	5.71	1576.98	3.57
4.60	T	287.07	122.27	120.00	2.35	2.39	0.020	0.077	4.84	1388.96	2.93
4.70	T	300.36	148.06	145.77	2.03	2.06	0.020	0.079	4.29	1287.31	2.53
4.80	T	314.98	148.85	146.53	2.12	2.15	0.020	0.078	4.44	1398.03	2.64
4.90	T	329.67	149.65	147.30	2.20	2.24	0.020	0.078	4.59	1512.98	2.75
5.00	T	344.44	150.44	148.06	2.29	2.33	0.020	0.077	4.74	1632.13	2.86
5.10	T	359.28	151.23	148.83	2.38	2.41	0.020	0.077	4.89	1755.47	2.96
5.20	T	374.20	152.02	149.59	2.46	2.50	0.020	0.076	5.03	1882.99	3.07
5.30	T	389.20	152.82	150.36	2.55	2.59	0.020	0.076	5.18	2014.67	3.18
5.40	T	404.28	153.61	151.12	2.63	2.68	0.020	0.076	5.32	2150.49	3.28
5.50	T	419.43	154.40	151.89	2.72	2.76	0.020	0.075	5.46	2290.45	3.39
5.60	T	434.65	155.20	152.65	2.80	2.85	0.020	0.075	5.60	2434.54	3.50
5.70	T	449.96	155.99	153.42	2.88	2.93	0.020	0.074	5.74	2582.74	3.60
5.80	T	465.34	156.78	154.18	2.97	3.02	0.020	0.074	5.88	2735.04	3.70
5.90	T	480.79	157.58	154.95	3.05	3.10	0.020	0.074	6.01	2891.44	3.81
6.00	T	496.33	158.37	155.71	3.13	3.19	0.020	0.073	6.15	3051.93	3.91
6.10	T	511.94	159.16	156.48	3.22	3.27	0.020	0.073	6.28	3216.51	4.01
6.20	T	527.62	159.96	157.24	3.30	3.36	0.020	0.073	6.42	3385.16	4.12
6.30	T	543.39	160.75	158.01	3.38	3.44	0.020	0.073	6.55	3557.89	4.22
6.40	T	559.22	161.54	158.77	3.46	3.52	0.020	0.072	6.68	3734.68	4.32
6.50	T	575.14	162.34	159.54	3.54	3.61	0.020	0.072	6.81	3915.53	4.42
6.60	T	591.13	163.13	160.30	3.62	3.69	0.020	0.072	6.94	4100.44	4.52
6.70	T	607.20	163.92	161.07	3.70	3.77	0.020	0.072	7.06	4289.41	4.62

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

*****WinXSPRO*****

uspeel3.out
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 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/07/02

Subsections/Dividing stations
 A / 113.00/ @

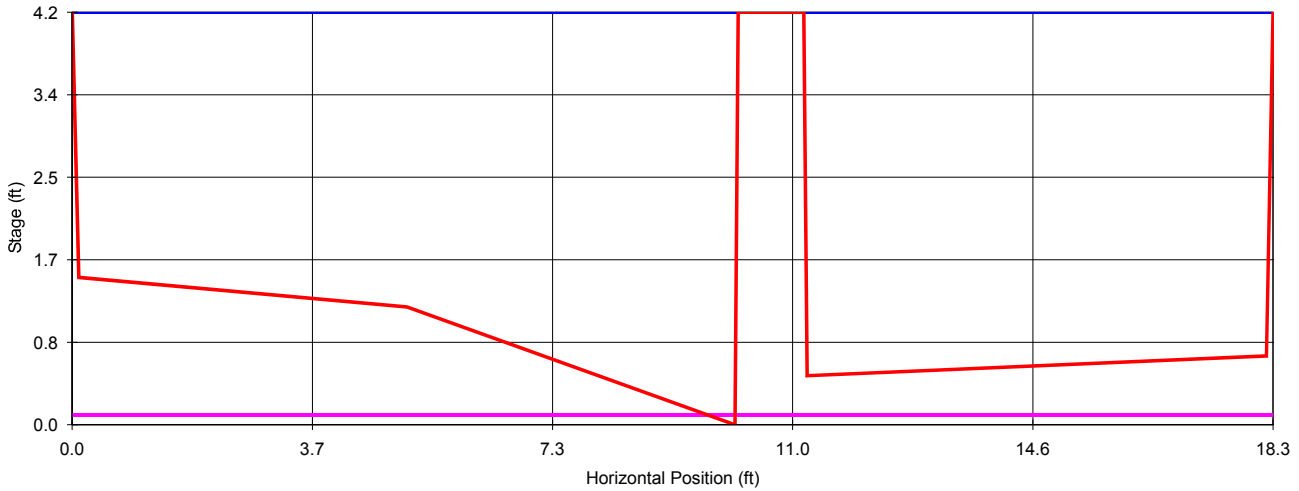
Resistance Method: Thorne and Zevenbergen
 D84: 90.000 mm

STAGE	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.37	7.50	7.50	0.05	0.05	0.020	0.094	0.30	0.11	0.06
0.20	T	1.33	11.67	11.67	0.11	0.11	0.020	0.094	0.53	0.70	0.14
0.30	T	2.60	13.69	13.67	0.19	0.19	0.020	0.081	0.86	2.23	0.24
0.40	T	4.07	15.71	15.67	0.26	0.26	0.020	0.070	1.23	5.00	0.32
0.50	T	5.73	17.73	17.67	0.32	0.32	0.020	0.065	1.54	8.82	0.40
0.60	T	7.60	19.75	19.67	0.38	0.39	0.020	0.059	1.89	14.39	0.48
0.70	T	9.67	21.76	21.67	0.44	0.45	0.020	0.055	2.23	21.51	0.55
0.80	T	11.97	24.61	24.50	0.49	0.49	0.020	0.053	2.47	29.59	0.61
0.90	T	14.57	27.46	27.33	0.53	0.53	0.020	0.051	2.72	39.58	0.66
1.00	T	17.44	30.31	30.17	0.58	0.58	0.020	0.049	2.96	51.67	0.72
1.10	T	20.67	34.61	34.42	0.60	0.60	0.020	0.048	3.10	64.13	0.75
1.20	T	24.26	37.66	37.43	0.64	0.65	0.020	0.047	3.35	81.21	0.80
1.30	T	28.16	40.70	40.44	0.69	0.70	0.020	0.046	3.59	101.03	0.86
1.40	T	32.35	43.75	43.45	0.74	0.74	0.020	0.045	3.83	123.78	0.92
1.50	T	36.77	45.32	45.00	0.81	0.82	0.020	0.044	4.16	152.92	1.01
1.60	T	41.36	47.11	46.73	0.88	0.89	0.020	0.043	4.46	184.55	1.10
1.70	T	46.12	48.90	48.47	0.94	0.95	0.020	0.043	4.75	219.27	1.18
1.80	T	51.05	50.69	50.20	1.01	1.02	0.020	0.042	5.04	257.14	1.26
1.90	T	56.16	52.48	51.93	1.07	1.08	0.020	0.042	5.31	298.23	1.34
2.00	T	61.44	54.27	53.67	1.13	1.14	0.020	0.041	5.58	342.59	1.41
2.10	T	66.89	56.06	55.40	1.19	1.21	0.020	0.041	5.83	390.29	1.49
2.20	T	73.86	71.68	70.97	1.03	1.04	0.020	0.041	5.25	387.83	1.29
2.30	T	81.09	74.30	73.53	1.09	1.10	0.020	0.041	5.51	447.01	1.36
2.40	T	88.57	76.93	76.10	1.15	1.16	0.020	0.040	5.77	510.83	1.44
2.50	T	96.31	79.55	78.67	1.21	1.22	0.020	0.040	6.02	579.41	1.51
2.60	T	104.30	82.17	81.23	1.27	1.28	0.020	0.039	6.26	652.83	1.58
2.70	T	112.55	84.79	83.80	1.33	1.34	0.020	0.039	6.50	731.20	1.66
2.80	T	121.06	87.41	86.37	1.38	1.40	0.020	0.039	6.73	814.64	1.73
2.90	T	129.83	90.04	88.93	1.44	1.46	0.020	0.039	6.96	903.23	1.80
3.00	T	138.74	90.44	89.26	1.53	1.55	0.020	0.038	7.30	1013.42	1.91
3.10	T	147.68	90.84	89.60	1.63	1.65	0.020	0.038	7.64	1128.97	2.03
3.20	T	156.65	91.25	89.93	1.72	1.74	0.020	0.038	7.98	1249.77	2.14
3.30	T	165.66	91.65	90.26	1.81	1.84	0.020	0.038	8.30	1375.74	2.26
3.40	T	174.71	92.05	90.59	1.90	1.93	0.020	0.037	8.62	1506.81	2.37
3.50	T	183.78	92.46	90.92	1.99	2.02	0.020	0.037	8.94	1642.90	2.48
3.60	T	192.89	92.86	91.25	2.08	2.11	0.020	0.037	9.25	1783.95	2.59
3.70	T	202.03	93.26	91.59	2.17	2.21	0.020	0.037	9.55	1929.89	2.70
3.80	T	211.21	93.67	91.92	2.25	2.30	0.020	0.037	9.85	2080.67	2.81
3.90	T	220.42	94.07	92.25	2.34	2.39	0.020	0.037	10.15	2236.23	2.92
4.00	T	229.66	94.48	92.58	2.43	2.48	0.020	0.037	10.44	2396.52	3.03
4.10	T	238.93	94.88	92.91	2.52	2.57	0.020	0.036	10.72	2561.48	3.14
4.20	T	248.24	95.28	93.24	2.61	2.66	0.020	0.036	11.00	2731.07	3.25
4.30	T	257.58	95.69	93.58	2.69	2.75	0.020	0.036	11.28	2905.25	3.36
4.40	T	266.96	96.09	93.91	2.78	2.84	0.020	0.036	11.55	3083.98	3.47
4.50	T	276.36	96.49	94.24	2.86	2.93	0.020	0.036	11.82	3267.20	3.57
4.60	T	287.07	122.27	120.00	2.35	2.39	0.020	0.036	10.32	2961.28	2.93
4.70	T	300.36	148.06	145.77	2.03	2.06	0.020	0.036	9.33	2801.83	2.53
4.80	T	314.98	148.85	146.53	2.12	2.15	0.020	0.036	9.63	3032.64	2.64
4.90	T	329.67	149.65	147.30	2.20	2.24	0.020	0.036	9.92	3271.32	2.75
5.00	T	344.44	150.44	148.06	2.29	2.33	0.020	0.036	10.21	3517.80	2.86
5.10	T	359.28	151.23	148.83	2.38	2.41	0.020	0.036	10.50	3772.02	2.96
5.20	T	374.20	152.02	149.59	2.46	2.50	0.020	0.036	10.78	4033.92	3.07
5.30	T	389.20	152.82	150.36	2.55	2.59	0.020	0.036	11.06	4303.44	3.18
5.40	T	404.28	153.61	151.12	2.63	2.68	0.020	0.035	11.33	4580.53	3.28
5.50	T	419.43	154.40	151.89	2.72	2.76	0.020	0.035	11.60	4865.14	3.39
5.60	T	434.65	155.20	152.65	2.80	2.85	0.020	0.035	11.87	5157.23	3.50
5.70	T	449.96	155.99	153.42	2.88	2.93	0.020	0.035	12.13	5456.76	3.60
5.80	T	465.34	156.78	154.18	2.97	3.02	0.020	0.035	12.39	5763.68	3.70
5.90	T	480.79	157.58	154.95	3.05	3.10	0.020	0.035	12.64	6077.95	3.81
6.00	T	496.33	158.37	155.71	3.13	3.19	0.020	0.035	12.89	6399.55	3.91
6.10	T	511.94	159.16	156.48	3.22	3.27	0.020	0.035	13.14	6728.44	4.01

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.20	T	527.62	159.96	157.24	3.30	3.36	0.020	0.035	13.39	7064.60	4.12
6.30	T	543.39	160.75	158.01	3.38	3.44	0.020	0.035	13.63	7407.98	4.22
6.40	T	559.22	161.54	158.77	3.46	3.52	0.020	0.035	13.87	7758.56	4.32
6.50	T	575.14	162.34	159.54	3.54	3.61	0.020	0.035	14.11	8116.33	4.42
6.60	T	591.13	163.13	160.30	3.62	3.69	0.020	0.035	14.35	8481.25	4.52
6.70	T	607.20	163.92	161.07	3.70	3.77	0.020	0.035	14.58	8853.31	4.62

Lower Speelyai Bridge at Gravel Sample Station (road bridge – 2.7 to 3.5 feet of clearance)



*****WinXSPRO*****

speelbbridge.out
 Input File: C:\WXSPRO20\LEWIS\BBRIDGE.DAT
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 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/09/02

Subsections/Dividing stations
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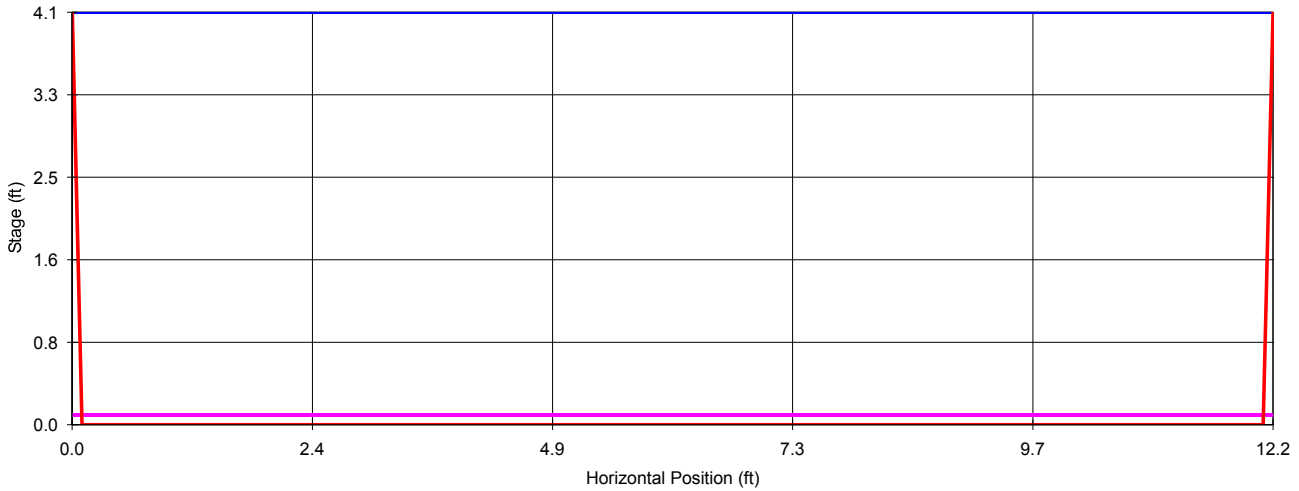
Resistance Method: Jarrett's Equation

STAGE #SEC	AREA	PERIM	WIDTH	R	DHYD	SLOPE	n	VAVG	Q	SHEAR
(ft)	(sq ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)		(ft/s)	(cfs)	(psf)
0.10 T	0.02	0.53	0.42	0.04	0.05	0.007	0.099	0.14	0.00	0.02
0.20 T	0.08	1.06	0.83	0.08	0.10	0.007	0.089	0.26	0.02	0.03
0.30 T	0.19	1.58	1.25	0.12	0.15	0.007	0.083	0.36	0.07	0.05
0.40 T	0.33	2.11	1.67	0.16	0.20	0.007	0.079	0.45	0.15	0.07
0.50 T	0.52	2.64	2.09	0.20	0.25	0.007	0.077	0.55	0.29	0.09
0.60 T	0.93	6.76	6.00	0.14	0.15	0.007	0.081	0.40	0.37	0.06
0.70 T	1.72	10.89	9.91	0.16	0.17	0.007	0.079	0.45	0.78	0.07
0.80 T	2.73	11.62	10.33	0.24	0.26	0.007	0.075	0.63	1.73	0.10
0.90 T	3.79	12.34	10.76	0.31	0.35	0.007	0.072	0.79	2.99	0.13
1.00 T	4.88	13.07	11.18	0.37	0.44	0.007	0.069	0.93	4.53	0.16
1.10 T	6.02	13.80	11.60	0.44	0.52	0.007	0.068	1.06	6.36	0.19
1.20 T	7.20	14.53	12.02	0.50	0.60	0.007	0.066	1.17	8.46	0.22
1.30 T	8.49	16.49	13.69	0.51	0.62	0.007	0.066	1.21	10.28	0.22
1.40 T	9.94	18.46	15.36	0.54	0.65	0.007	0.065	1.26	12.50	0.24
1.50 T	11.56	20.43	17.03	0.57	0.68	0.007	0.065	1.31	15.14	0.25
1.60 T	13.27	20.83	17.04	0.64	0.78	0.007	0.064	1.44	19.16	0.28
1.70 T	14.97	21.23	17.05	0.71	0.88	0.007	0.063	1.57	23.53	0.31
1.80 T	16.67	21.63	17.06	0.77	0.98	0.007	0.062	1.69	28.22	0.34
1.90 T	18.38	22.03	17.07	0.83	1.08	0.007	0.061	1.81	33.22	0.36
2.00 T	20.09	22.43	17.07	0.90	1.18	0.007	0.060	1.92	38.50	0.39
2.10 T	21.80	22.83	17.08	0.95	1.28	0.007	0.060	2.02	44.05	0.42
2.20 T	23.50	23.23	17.09	1.01	1.38	0.007	0.059	2.12	49.86	0.44
2.30 T	25.21	23.63	17.10	1.07	1.47	0.007	0.059	2.22	55.89	0.47
2.40 T	26.92	24.03	17.11	1.12	1.57	0.007	0.058	2.31	62.16	0.49
2.50 T	28.64	24.43	17.12	1.17	1.67	0.007	0.058	2.40	68.63	0.51
2.60 T	30.35	24.83	17.13	1.22	1.77	0.007	0.057	2.48	75.30	0.53
2.70 T	32.06	25.23	17.14	1.27	1.87	0.007	0.057	2.56	82.17	0.56
2.80 T	33.78	25.63	17.15	1.32	1.97	0.007	0.057	2.64	89.21	0.58
2.90 T	35.49	26.03	17.16	1.36	2.07	0.007	0.056	2.72	96.43	0.60
3.00 T	37.21	26.43	17.17	1.41	2.17	0.007	0.056	2.79	103.81	0.61
3.10 T	38.92	26.83	17.17	1.45	2.27	0.007	0.056	2.86	111.34	0.63
3.20 T	40.64	27.23	17.18	1.49	2.37	0.007	0.056	2.93	119.03	0.65
3.30 T	42.36	27.63	17.19	1.53	2.46	0.007	0.055	2.99	126.86	0.67
3.40 T	44.08	28.03	17.20	1.57	2.56	0.007	0.055	3.06	134.82	0.69

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	45.80	28.43	17.21	1.61	2.66	0.007	0.055	3.12	142.92	0.70
3.60	T	47.52	28.83	17.22	1.65	2.76	0.007	0.055	3.18	151.14	0.72
3.70	T	49.25	29.23	17.23	1.68	2.86	0.007	0.054	3.24	159.48	0.74
3.80	T	50.97	29.63	17.24	1.72	2.96	0.007	0.054	3.29	167.93	0.75
3.90	T	52.69	30.03	17.25	1.75	3.06	0.007	0.054	3.35	176.50	0.77
4.00	T	54.42	30.43	17.26	1.79	3.15	0.007	0.054	3.40	185.17	0.78
4.10	T	56.14	30.83	17.27	1.82	3.25	0.007	0.054	3.45	193.95	0.80
4.20	T	57.87	31.23	17.27	1.85	3.35	0.007	0.054	3.50	202.82	0.81

Lower Speelyai Bridge at Habitat Unit 125 (foot bridge – 4.1 feet of clearance)



*****WinXSPRO*****

brigl25.out
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 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/09/02

Subsections/Dividing stations
 A / 12.16/ @

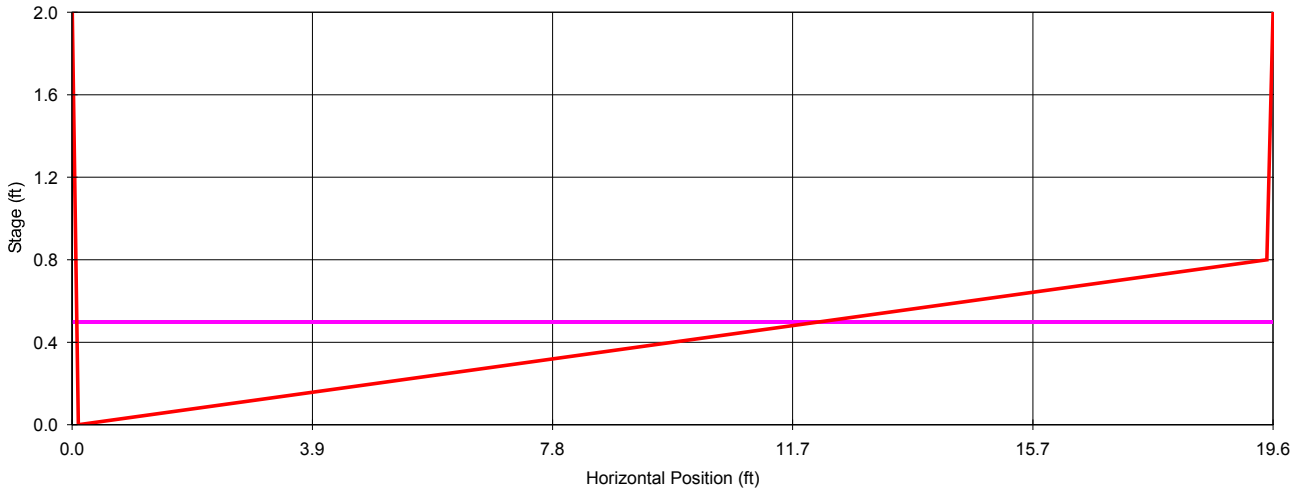
Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	1.20	12.16	11.96	0.10	0.10	0.001	0.041	0.24	0.29	0.01
0.20	T	2.39	12.36	11.97	0.19	0.20	0.001	0.038	0.43	1.03	0.01
0.30	T	3.59	12.56	11.97	0.29	0.30	0.001	0.036	0.60	2.15	0.02
0.40	T	4.79	12.76	11.98	0.38	0.40	0.001	0.036	0.76	3.62	0.03
0.50	T	5.99	12.96	11.98	0.46	0.50	0.001	0.035	0.90	5.41	0.04
0.60	T	7.18	13.16	11.99	0.55	0.60	0.001	0.035	1.05	7.51	0.05
0.70	T	8.38	13.36	11.99	0.63	0.70	0.001	0.035	1.18	9.90	0.06
0.80	T	9.58	13.56	12.00	0.71	0.80	0.002	0.035	1.31	12.57	0.07
0.90	T	10.78	13.76	12.00	0.78	0.90	0.002	0.035	1.44	15.50	0.08
1.00	T	11.98	13.96	12.01	0.86	1.00	0.002	0.035	1.56	18.68	0.09
1.10	T	13.18	14.16	12.01	0.93	1.10	0.002	0.035	1.68	22.10	0.10
1.20	T	14.39	14.36	12.02	1.00	1.20	0.002	0.036	1.79	25.76	0.11
1.30	T	15.59	14.56	12.02	1.07	1.30	0.002	0.036	1.90	29.63	0.13
1.40	T	16.79	14.76	12.03	1.14	1.40	0.002	0.036	2.01	33.72	0.14
1.50	T	17.99	14.96	12.03	1.20	1.50	0.002	0.036	2.11	38.02	0.15
1.60	T	19.20	15.16	12.04	1.27	1.59	0.002	0.036	2.21	42.52	0.17
1.70	T	20.40	15.36	12.04	1.33	1.69	0.002	0.036	2.31	47.20	0.18
1.80	T	21.61	15.56	12.05	1.39	1.79	0.002	0.037	2.41	52.08	0.20
1.90	T	22.81	15.76	12.05	1.45	1.89	0.002	0.037	2.50	57.13	0.21
2.00	T	24.02	15.96	12.06	1.50	1.99	0.002	0.037	2.60	62.36	0.23
2.10	T	25.22	16.16	12.06	1.56	2.09	0.002	0.037	2.69	67.75	0.24
2.20	T	26.43	16.36	12.07	1.62	2.19	0.003	0.037	2.77	73.31	0.26
2.30	T	27.64	16.56	12.07	1.67	2.29	0.003	0.038	2.86	79.02	0.28
2.40	T	28.84	16.76	12.08	1.72	2.39	0.003	0.038	2.94	84.89	0.29
2.50	T	30.05	16.96	12.08	1.77	2.49	0.003	0.038	3.03	90.91	0.31
2.60	T	31.26	17.16	12.09	1.82	2.59	0.003	0.038	3.11	97.07	0.33
2.70	T	32.47	17.36	12.09	1.87	2.69	0.003	0.039	3.18	103.38	0.34
2.80	T	33.68	17.56	12.10	1.92	2.78	0.003	0.039	3.26	109.82	0.36
2.90	T	34.89	17.76	12.10	1.96	2.88	0.003	0.039	3.34	116.39	0.38
3.00	T	36.10	17.96	12.11	2.01	2.98	0.003	0.039	3.41	123.09	0.40
3.10	T	37.31	18.16	12.11	2.05	3.08	0.003	0.039	3.48	129.92	0.42
3.20	T	38.52	18.36	12.12	2.10	3.18	0.003	0.040	3.55	136.87	0.44
3.30	T	39.73	18.56	12.12	2.14	3.28	0.003	0.040	3.62	143.94	0.45
3.40	T	40.94	18.76	12.12	2.18	3.38	0.003	0.040	3.69	151.12	0.47

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

3.50	T	42.16	18.96	12.13	2.22	3.48	0.004	0.040	3.76	158.42	0.49
3.60	T	43.37	19.16	12.13	2.26	3.57	0.004	0.040	3.82	165.83	0.51
3.70	T	44.58	19.36	12.14	2.30	3.67	0.004	0.041	3.89	173.35	0.53
3.80	T	45.80	19.56	12.14	2.34	3.77	0.004	0.041	3.95	180.98	0.55
3.90	T	47.01	19.76	12.15	2.38	3.87	0.004	0.041	4.01	188.71	0.57
4.00	T	48.23	19.96	12.15	2.42	3.97	0.004	0.041	4.08	196.54	0.59
4.10	T	49.44	20.16	12.16	2.45	4.07	0.004	0.041	4.14	204.47	0.61

Lower Speelyai Bridge at Habitat Unit 150 (road bridge – 1.2 to 2 feet of clearance)



*****WinXSPRO*****

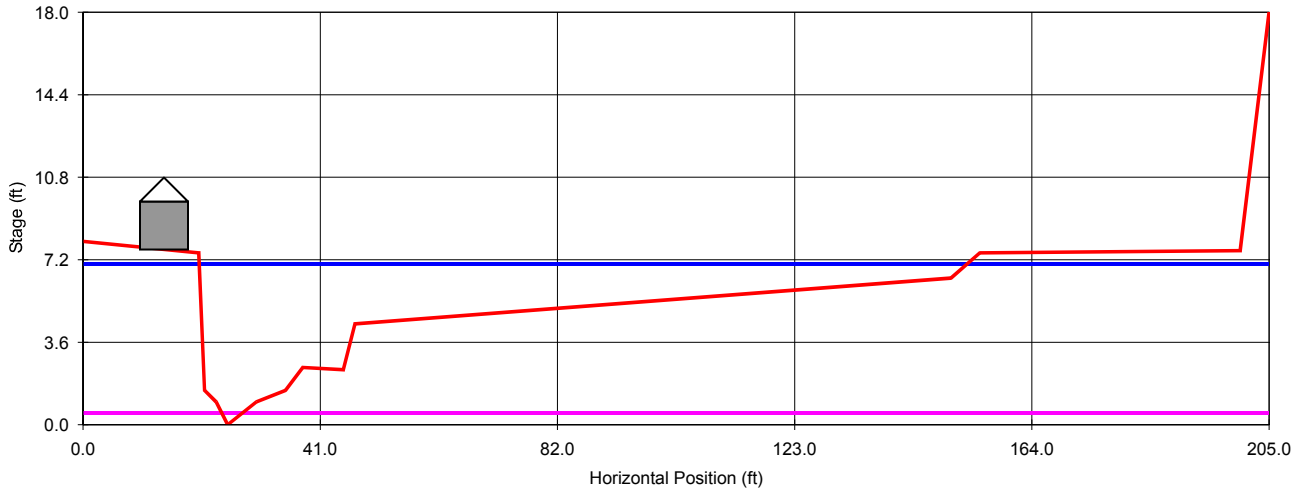
brigl50.out
 Input File: C:\WXSPRO20\LEWIS\BRIG150.DAT
 Run Date: 01/09/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/09/02

Subsections/Dividing stations
 A / 19.57/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.12	2.52	2.43	0.05	0.05	0.001	0.046	0.13	0.02	0.00
0.20	T	0.49	5.05	4.85	0.10	0.10	0.001	0.046	0.25	0.12	0.01
0.30	T	1.09	7.57	7.28	0.14	0.15	0.002	0.046	0.35	0.39	0.01
0.40	T	1.94	10.10	9.71	0.19	0.20	0.002	0.047	0.46	0.89	0.02
0.50	T	3.03	12.62	12.13	0.24	0.25	0.002	0.048	0.56	1.70	0.03
0.60	T	4.37	15.14	14.56	0.29	0.30	0.003	0.049	0.66	2.90	0.05
0.70	T	5.95	17.67	16.99	0.34	0.35	0.003	0.050	0.77	4.55	0.06
0.80	T	7.77	20.19	19.41	0.38	0.40	0.003	0.051	0.87	6.72	0.08
0.90	T	9.71	20.39	19.43	0.48	0.50	0.004	0.051	1.04	10.14	0.10
1.00	T	11.65	20.59	19.44	0.57	0.60	0.004	0.052	1.22	14.20	0.14
1.10	T	13.60	20.79	19.45	0.65	0.70	0.004	0.052	1.39	18.86	0.17
1.20	T	15.54	20.99	19.47	0.74	0.80	0.004	0.052	1.55	24.11	0.21
1.30	T	17.49	21.19	19.48	0.83	0.90	0.005	0.053	1.71	29.93	0.25
1.40	T	19.44	21.40	19.49	0.91	1.00	0.005	0.053	1.87	36.31	0.29
1.50	T	21.39	21.60	19.51	0.99	1.10	0.005	0.054	2.02	43.22	0.34
1.60	T	23.34	21.80	19.52	1.07	1.20	0.006	0.054	2.17	50.67	0.38
1.70	T	25.29	22.00	19.53	1.15	1.29	0.006	0.055	2.32	58.63	0.43
1.80	T	27.25	22.20	19.55	1.23	1.39	0.006	0.055	2.46	67.08	0.49
1.90	T	29.20	22.40	19.56	1.30	1.49	0.007	0.056	2.60	76.03	0.54
2.00	T	31.16	22.60	19.57	1.38	1.59	0.007	0.056	2.74	85.45	0.60

Lower Speelyai Cabin at Habitat Unit 116



*****WinXSPRO*****

cabl16.out
 Input File: C:\WXSPRO20\LEWIS\CAB116.DAT
 Run Date: 01/09/02
 Analysis Procedure: Hydraulics
 Cross Section Number: 1
 Survey Date: 01/09/02

Subsections/Dividing stations
 A / 205.00/ @

Resistance Method: Jarrett's Equation

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0.10	T	0.04	0.73	0.70	0.05	0.05	0.010	0.110	0.18	0.01	0.03
0.30	T	0.31	2.20	2.10	0.14	0.15	0.010	0.093	0.44	0.14	0.09
0.50	T	0.87	3.67	3.50	0.24	0.25	0.010	0.085	0.67	0.58	0.15
0.70	T	1.71	5.13	4.90	0.33	0.35	0.010	0.081	0.88	1.51	0.21
0.90	T	2.83	6.60	6.30	0.43	0.45	0.010	0.078	1.09	3.08	0.27
1.10	T	4.27	8.75	8.40	0.49	0.51	0.010	0.076	1.21	5.16	0.30
1.30	T	6.23	11.59	11.20	0.54	0.56	0.010	0.075	1.31	8.16	0.34
1.50	T	8.75	14.42	14.00	0.61	0.63	0.010	0.073	1.45	12.67	0.38
1.70	T	11.61	15.26	14.63	0.76	0.79	0.010	0.071	1.75	20.30	0.47
1.90	T	14.60	16.09	15.27	0.91	0.96	0.010	0.069	2.02	29.54	0.57
2.10	T	17.72	16.93	15.90	1.05	1.11	0.010	0.067	2.28	40.35	0.65
2.30	T	20.96	17.76	16.53	1.18	1.27	0.010	0.066	2.52	52.74	0.74
2.50	T	24.69	25.74	24.27	0.96	1.02	0.010	0.068	2.12	52.29	0.60
2.70	T	29.56	26.23	24.50	1.13	1.21	0.010	0.066	2.42	71.60	0.70
2.90	T	34.49	26.71	24.73	1.29	1.39	0.010	0.065	2.71	93.48	0.81
3.10	T	39.46	27.20	24.97	1.45	1.58	0.010	0.064	2.99	117.82	0.91
3.30	T	44.47	27.68	25.20	1.61	1.76	0.010	0.063	3.25	144.53	1.00
3.50	T	49.54	28.17	25.43	1.76	1.95	0.010	0.062	3.50	173.53	1.10
3.70	T	54.65	28.65	25.67	1.91	2.13	0.010	0.061	3.75	204.75	1.19
3.90	T	59.80	29.14	25.90	2.05	2.31	0.010	0.060	3.98	238.14	1.28
4.10	T	65.01	29.62	26.13	2.19	2.49	0.010	0.060	4.21	273.64	1.37
4.30	T	70.26	30.11	26.37	2.33	2.66	0.010	0.059	4.43	311.20	1.46
4.50	T	75.81	35.60	31.65	2.13	2.40	0.010	0.060	4.11	311.20	1.33
4.70	T	83.17	46.11	41.98	1.80	1.98	0.010	0.062	3.58	297.52	1.13
4.90	T	92.60	56.61	52.32	1.64	1.77	0.010	0.063	3.30	305.42	1.02
5.10	T	104.10	67.12	62.65	1.55	1.66	0.010	0.063	3.16	328.51	0.97
5.30	T	117.66	77.62	72.98	1.52	1.61	0.010	0.063	3.10	364.32	0.95
5.50	T	133.29	88.13	83.32	1.51	1.60	0.010	0.063	3.09	411.96	0.94
5.70	T	150.99	98.63	93.65	1.53	1.61	0.010	0.063	3.12	471.35	0.96
5.90	T	170.75	109.14	103.98	1.56	1.64	0.010	0.063	3.18	542.78	0.98
6.10	T	192.58	119.64	114.32	1.61	1.68	0.010	0.063	3.25	626.78	1.00
6.30	T	216.47	130.15	124.65	1.66	1.74	0.010	0.062	3.34	724.01	1.04
6.50	T	242.20	135.97	130.29	1.78	1.86	0.010	0.062	3.54	857.49	1.11
6.70	T	268.35	137.10	131.23	1.96	2.04	0.010	0.061	3.83	1027.36	1.22

PacifiCorp / Cowlitz PUD
 Lewis River Hydroelectric Projects
 FERC Project Nos. 935, 2071, 2111, 2213

6.90	T	294.69	138.23	132.17	2.13	2.23	0.010	0.060	4.11	1211.07	1.33
7.10	T	321.22	139.37	133.11	2.30	2.41	0.010	0.059	4.38	1408.41	1.44
7.30	T	347.94	140.50	134.06	2.48	2.60	0.010	0.059	4.65	1619.22	1.55
7.50	T	374.85	141.63	135.00	2.65	2.78	0.010	0.058	4.92	1843.35	1.65
7.70	T	409.40	194.75	188.05	2.10	2.18	0.010	0.060	4.06	1662.99	1.31
7.90	T	447.82	202.97	196.14	2.21	2.28	0.010	0.060	4.23	1893.51	1.38
8.00	T	467.63	207.08	200.19	2.26	2.34	0.010	0.059	4.31	2015.82	1.41