

8-30-2008

Ex. 277-US-438

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Stream: Upper Williamson
 Site: 631
 Date: 4/14/2004
 Habitat: Pool

Date: 8/20/2004
 Habitat: Pool

Date: 6/26/2004
 Habitat: Pool

Flow: High

Flow: Mid

Flow: Low

(1) Level Loop Survey (BM & HP)

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM1	3.65	103.65		100.00
HP1			5.30	98.35
HP2			5.13	98.52
HP3			4.64	99.01
TP				
HP3	4.83	103.84		
HP2			5.32	98.52
HP1			5.49	98.35
BM1			3.84	100.00

Comment:

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM1	4.21	104.21		100.00
HP1			5.85	98.36
HP2			5.69	98.52
HP3			5.20	99.01
TP				
HP3	5.33	104.34		
HP2			5.82	98.52
HP1			5.99	98.35
BM 1			4.34	100.00

Comment:

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	3.56	103.56		100.00
HP1			5.21	98.35
HP2			5.04	98.52
HP3			4.56	99.00
TP				
HP3	4.61	103.61		
HP2			5.09	98.52
HP1			5.26	98.35
BM			3.61	100.00

Comment:

(2) Water Surface Elevation (WSE) Survey

TR	Sta		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	103.84	7.70	0.00	96.14	96.14	88.2
1-R	0	0						
2-L	26	26	103.84	7.67	0.00	96.17	96.17	
2-R	26	26						
3-L	78	55	103.84	7.65	0.00	96.19	96.19	
3-R	31	31						

Note: HC FS=7.71 @ 38.5' D/S of TR1
 WSE slope = 0.092%
 Ave Q= 88.2

(2) Water Surface Elevation (WSE) Survey

TR	Sta		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	104.34	8.86	0.00	95.48	95.49	45.9
1-R	0	0						
2-L	26	26	104.34	8.85	0.00	95.49	95.50	40.0
2-R	26	26						
3-L	78	55	104.34	8.82	0.00	95.52	95.52	44.6
3-R	31	31						

Note: FS @ 100' U/S = 8.81, FS @ 60' D/S = 8.87, HC wse FS=8.86.
 WSE slope = 0.064%
 Ave Q= 46.3

(2) Water Surface Elevation (WSE) Survey

TR	Sta		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	103.61	8.21		95.40	95.40	40.6
1-R	0	0						
2-L	26	26	103.61	8.21		95.40	95.40	43.8
2-R	26	26						
3-L	78	55	103.61	8.20		95.41	95.41	42.7
3-R	31	31						

Note: HC LWSE FS=8.23, RWSE FS=8.22
 WSE slope = 0.018%
 Ave Q= 42.1

(3) Meter and propeller ID for Velocity Correction

Meter ID: 0068
 Propeller ID: na

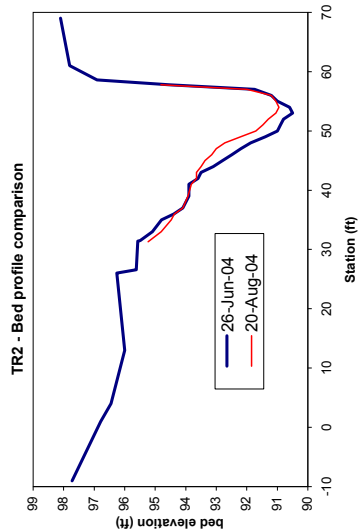
(3) Meter and propeller ID for Velocity Correction

Meter ID: 3602
 Propeller ID: 3A

(3) Meter and propeller ID for Velocity Correction

Meter ID: 4099
 Propeller ID: 1A

Stream: Upper Williams	14-Apr-04											26-Jun-04											20-Aug-04															
	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	V _{0.2,0.6}	V _{0.8}	Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	V _{0.2,0.6}	V _{0.8}	Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	V _{0.2,0.6}	V _{0.8}	Ave	Angle (deg)	q (cfs)	substrate							
Site: 631	-9.0	1.0	6.62	97.72						1.1																												
Transect: 2	1.0	7.55	96.79							1.1																												
Habitat: Pool	4.0	7.89	96.45							1.1																												
Survey	13.0	8.34	96.00							1.2																												
Date	26.0	8.08	96.26							1.1																												
4/14/2004	26.6	8.72	95.62							1.1																												
6/26/2004	31.4	8.77	95.57							1.2																												
8/20/2004	31.5	95.50	0.00							0.00																												
	33.0	95.10	0.40							0.51																												
	35.0	94.80	0.70							0.74																												
	36.0	94.40	1.10							0.65																												
	37.0	94.10	1.40							0.61																												
	39.0	93.90	1.60							0.67																												
	41.0	93.90	1.60							0.80																												
	42.0	93.60	1.90							0.73																												
	43.0	93.50	2.00							0.68																												
	44.0	93.10	2.40							0.64																												
	45.0	92.80	2.70							0.88																												
	46.0	92.50	3.00							0.84																												
	47.0	92.20	3.30							0.83																												
	48.0	91.88	3.62							0.82																												
	49.0	91.40	4.10							0.74																												
	50.0	91.00	4.50							0.69																												
	51.0	90.90	4.60							0.84																												
	52.0	90.80	4.70							0.73																												
	53.0	90.50	5.00							1.00																												
	54.0	90.60	4.90							0.17																												
	55.0	91.00	4.50							-0.15																												
	56.0	91.20	4.30							-0.12																												
	57.0	91.75	3.75							-0.14																												
	57.8	94.55	0.95							-0.19																												
	58.6	7.43	96.91							1.1																												
	61.0	6.54	97.80							1.1																												
	69.0	6.24	98.10							1.1																												

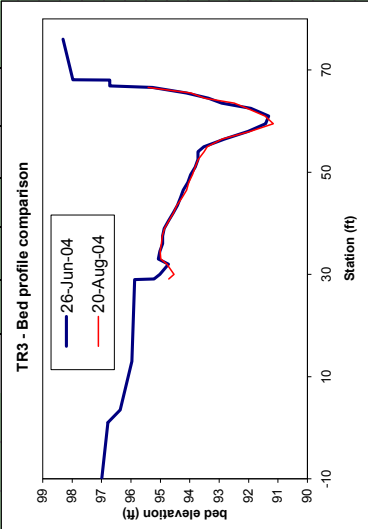


= Angle of Flow

Left UCB = 0.7

See diagram of undercut bank in field notes

14-Apr-04										26-Jun-04										20-Aug-04									
Sta	FS	Ground	Depth	Vel (ft/s)	q	substrate	Sta	FS	Ground	Depth	Vel (ft/s)	q	substrate	Sta	FS	Ground	Depth	Vel (ft/s)	q	substrate									
(ft)	(ft)	(ft)	(ft)	V _{0.20/6}	V _{0.8} Ave	(cfs)	(ft)	(ft)	(ft)	(ft)	V _{0.20/6}	V _{0.8} Ave	(cfs)	(ft)	(ft)	(ft)	(ft)	V _{0.20/6}	V _{0.8} Ave	(cfs)	(ft)								
RWP	-10.0	6.85	96.99	1.0	7.56	96.78	1.1																						
	3.5	7.97	96.37																										
	13.0	8.37	95.97																										
TOB	29.1	8.47	95.87																										
RBE	29.1	95.22	0.30	0.00	0.00	0.00	2.3																						
	30.0	95.02	0.50	0.01	0.03	0.02	2.3																						
	32.0	94.72	0.80	0.20	0.25	0.30	2.4																						
	33.0	95.07	0.45	0.15	0.20	0.11	2.4																						
	34.5	95.02	0.50	0.06	0.17	0.13	2.4																						
	36.0	94.92	0.60	0.22	0.27	0.21	3.2																						
	37.5	94.92	0.60	0.50	0.52	0.40	3.2																						
	39.0	94.87	0.65	0.67	0.69	0.58	3.2																						
	40.5	94.72	0.80	0.78	0.80	0.84	3.2																						
	42.0	94.57	0.95	0.89	0.92	1.13	3.2																						
	43.5	94.42	1.10	0.94	0.97	1.38	3.2																						
	45.0	94.32	1.20	1.09	1.12	1.74	3.2																						
	46.5	94.22	1.30	1.19	1.22	2.06	3.2																						
	48.0	94.07	1.45	1.13	1.16	2.18	3.2																						
	49.5	93.97	1.55	1.27	1.30	2.62	3.2																						
	51.0	93.82	1.70	1.22	1.25	2.76	3.2																						
	52.5	93.72	1.80	1.26	1.29	3.01	3.2																						
	54.0	93.72	1.80	1.16	1.19	3.01	3.2																						
	55.0	93.52	2.00	1.19	1.22	3.33	3.2																						
	56.5	92.82	2.70	1.32	0.53	0.95	3.2																						
	58.0	92.02	3.50	1.25	0.39	0.85	3.2																						
	59.5	91.42	4.10	1.22	0.23	0.76	3.2																						
	61.0	91.32	4.20	1.07	0.41	0.77	10																						
	62.5	91.92	3.60	1.02	0.03	0.57	2.55	2.3																					
	63.5	92.92	2.60	0.72	0.14	0.47	1.22	2.3																					
	64.5	93.37	2.15	0.27	0.31	0.67	2.3																						
	65.5	94.12	1.40	-0.06	-0.17	-0.26	2.3																						
LBE	66.6	95.27	0.25	0.00	0.01	0.00	2.3																						
	66.9	7.62	96.72	0.00	0.00	0.00	1.2																						
	68.0	7.62	96.72				2.1																						
	68.1	6.36	97.98				1.1																						
LWP	76.0	6.03	98.31				1.1																						



*# = Angle of Flow

* Estimated Velocity
Average velocity cell updated

See diagram of undercut
bank in field notes

*# = Angle of Flow

Right UCB = 0.3'
Left UCB = 0.4'

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Pool                      Low
IOC      1101100000001000101000
QARD 19.0
QARD 20.0
QARD 25.0
QARD 30.0
QARD 35.0
QARD 40.0
QARD 42.0
QARD 45.0
QARD 47.2
QARD 50.0
QARD 52.5
QARD 55.0
QARD 57.5
QARD 60.0
QARD 62.5
QARD 65.5
QARD 67.5
QARD 70.0
QARD 75.0
QARD 80.0
QARD 85.0
QARD 88.2
QARD 90.0
QARD 95.0
QARD 100.0
QARD 110.0
QARD 125.0
QARD 140.0
QARD 160.0
QARD 180.0
XSEC  0.0      0.0 1.0      92.10  0.00018
      0.0 -9.0 97.4  1.0 96.8  6.0 95.9  9.4 95.5 10.1 95.5 11.0 95.4
      0.0 12.0 94.7 12.4 94.8 14.0 95.0 14.8 95.4 15.0 95.6 17.1 95.4
      0.0 18.0 95.3 20.0 95.2 22.0 94.9 24.0 94.4 26.0 94.0 28.0 94.1
      0.0 30.0 94.1 32.0 93.9 34.0 93.7 36.0 93.5 37.0 93.3 38.0 93.0
      0.0 40.0 92.4 41.0 92.1 42.3 92.7 44.0 93.0 45.0 93.6 46.0 94.5
      0.0 47.0 95.2 47.7 95.4 47.9 95.5 48.4 95.6 49.0 95.9 50.0 97.8
      0.0 51.0 98.0 54.9 98.1
NS     0.0      1.1      1.1      1.1      1.1      2.9      2.9
NS     0.0 0.2  2.9 0.15 2.9 0.1  3.2      3.2      3.2      3.2
NS     0.0 0.05 3.2 .015 3.2 .017 3.2      3.2      3.2      3.2
NS     0.0      3.2      3.2      3.2      3.2      3.2      3.2
NS     0.0      3.2      3.2      3.2      2.3      2.3 0.1  2.3
NS     0.0 0.2  2.3      2.3      2.3      2.3      3.2      1.1
NS     0.0      1.1      1.1
CAL1   0.0      95.40      42.0
VEL1   0.0      0.00 0.01 0.01 0.00 0.01 0.00      0.00
VEL1   0.0 0.01 0.62 0.90 1.01 1.03 1.07 1.06 1.07 0.97 0.89 0.83 0.85
VEL1   0.0 0.93 1.06 0.95 0.75 0.32 0.01 0.01 0.00
VEL1   0.0
CAL2   0.0      96.14      88.2
VEL2   0.0
VEL2   0.0
VEL2   0.0
VEL2   0.0
CAL3   0.0      95.49      47.2
VEL3   0.0
VEL3   0.0
VEL3   0.0
VEL3   0.0
ENDJ

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Pool                      Low
IOC      1100000100001000101000
QARD 19.0
QARD 20.0
QARD 25.0
QARD 30.0
QARD 35.0
QARD 40.0
QARD 42.0
QARD 45.0
QARD 47.2
QARD 50.0
QARD 52.5
QARD 55.0
QARD 57.5
QARD 60.0
QARD 62.5
QARD 65.5
QARD 67.5
QARD 70.0
QARD 75.0
QARD 80.0
QARD 85.0
QARD 88.2
QARD 90.0
QARD 95.0
QARD 100.0
QARD 110.0
QARD 125.0
QARD 140.0
QARD 160.0
QARD 180.0
XSEC  0.0      0.0 1.0      92.10  0.00018
      0.0 -9.0 97.7  1.0 96.8  4.0 96.5 13.0 96.0 26.0 96.3 26.6 95.6
      0.0 31.3 95.2 33.0 94.8 35.0 94.5 36.0 94.4 37.0 94.1 39.0 93.9
      0.0 41.0 93.8 42.0 93.7 43.0 93.7 44.0 93.5 45.0 93.4 46.0 93.2
      0.0 47.0 93.0 48.0 92.7 49.0 92.2 50.0 91.7 51.0 91.5 52.0 91.3
      0.0 53.0 91.1 54.0 91.0 55.0 91.1 56.0 91.2 57.0 92.0 57.8 94.8
      0.0 58.6 96.9 61.0 97.8 69.0 98.1
NS     0.0      1.1      1.1      1.1  .1  1.2      1.1      1.1
NS     0.0      1.2      3.2      3.2      3.2      3.2      3.2
NS     0.0      3.2      3.2      3.2      3.2      3.2      3.2
NS     0.0      3.2      3.2      3.2      3.2      3.2      3.2
NS     0.0      3.2      2.3      2.3 .15  2.3 .2  2.3      2.3
NS     0.0      1.1      1.1      1.1
WSL    0.0     94.76     94.79     94.96     95.11     95.24     95.36
WSL    0.0     95.41     95.48     95.52     95.57     95.62     95.67
WSL    0.0     95.71     95.75     95.79     95.84     95.87     95.91
WSL    0.0     95.98     96.05     96.12     96.16     96.18     96.24
WSL    0.0     96.30     96.41     96.57     96.71     96.88     97.04
CAL1   0.0     95.40     42.0
VEL1   0.0
      0.00 0.29 0.43 0.42 0.52 0.80
VEL1   0.0 0.89 0.93 0.97 1.08 0.93 0.85 0.95 0.91 0.85 0.88 0.83 1.02
VEL1   0.0 1.02 0.87 0.58 0.21 0.03 0.00
CAL2   0.0     96.17     88.2
VEL2   0.0
VEL2   0.0
VEL2   0.0
CAL3   0.0     95.50     47.2
VEL3   0.0
VEL3   0.0
VEL3   0.0
ENDJ

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Pool	Low											TRANSECT 3	
IOC	1100000100001000101000												
QARD	19.0												
QARD	20.0												
QARD	25.0												
QARD	30.0												
QARD	35.0												
QARD	40.0												
QARD	42.0												
QARD	45.0												
QARD	47.2												
QARD	50.0												
QARD	52.5												
QARD	55.0												
QARD	57.5												
QARD	60.0												
QARD	62.5												
QARD	65.5												
QARD	67.5												
QARD	70.0												
QARD	75.0												
QARD	80.0												
QARD	85.0												
QARD	88.2												
QARD	90.0												
QARD	95.0												
QARD	100.0												
QARD	110.0												
QARD	125.0												
QARD	140.0												
QARD	160.0												
QARD	180.0												
XSEC	0.0	0.0	1.0	92.10	0.00018								
	0.0-10.0	97.0	1.0	96.8	3.5	96.4	13.0	96.0	29.0	95.9	29.1	94.7	
	0.0	30.0	94.5	32.0	94.8	33.0	95.0	34.5	95.0	36.0	95.0	37.5	94.9
	0.0	39.0	94.9	40.5	94.7	42.0	94.6	43.5	94.4	45.0	94.3	46.5	94.1
	0.0	48.0	94.0	49.5	93.9	51.0	93.8	52.5	93.7	54.0	93.5	55.0	93.4
	0.0	56.5	92.9	58.0	91.9	59.5	91.2	61.0	91.4	62.5	92.1	63.5	92.5
	0.0	64.5	93.5	65.5	94.0	66.6	95.4	66.9	96.7	68.0	96.7	68.1	98.0
	0.0	76.0	98.3										
NS	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	.15	2.3			
NS	0.0	.20	2.3	.15	2.4	.15	2.4	2.4	3.2	3.2			
NS	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2			
NS	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2			
NS	0.0	3.2	3.2	3.2	3.2	3.2	2.3	2.3	2.3	2.3			
NS	0.0	2.3	2.3	2.3	2.3	2.3	1.2	2.1	2.1	1.1			
NS	0.0	1.1											
WSL	0.0	94.78	94.81	94.98	95.13	95.26	95.38						
WSL	0.0	95.42	95.49	95.53	95.58	95.63	95.68						
WSL	0.0	95.72	95.76	95.80	95.85	95.88	95.92						
WSL	0.0	95.99	96.06	96.13	96.17	96.19	96.25						
WSL	0.0	96.31	96.42	96.58	96.72	96.89	97.05						
CAL1	0.0	95.41	42.0										
VEL1	0.0												
		0.00	0.01	0.01	0.05	0.20	0.37	0.77					
VEL1	0.0	0.74	0.86	0.98	1.01	1.06	1.17	1.24	1.23	1.20	1.17	1.18	1.08
VEL1	0.0	1.14	0.77	0.87	0.85	0.23	0.10	0.11	0.11	0.00			
VEL1	0.0												
CAL2	0.0	96.19	88.2										
VEL2	0.0												
VEL2	0.0												
VEL2	0.0												
VEL2	0.0												
CAL3	0.0	95.52	47.2										
VEL3	0.0												
VEL3	0.0												
VEL3	0.0												
VEL3	0.0												
ENDJ													

Stream: Upper Williamson River

Site: Williamson River

Date: 9/22/1901

Habitat: Run

Flow: High

(1) Level Loop Survey (BM & HP)

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM1	4.28	104.28		100.00
HP1			4.94	99.34
HP2			5.43	98.85
HP3			4.97	99.31
TP	5.06	104.37		
HP2			5.52	98.85
HP1			5.03	99.34
BM1			4.37	100.00

Comment:

Date: 6/26/2004

Habitat: Run

Flow: Mid

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM1	3.40	103.40		100.00
HP1			4.06	99.34
HP2			4.56	98.84
HP3			4.09	99.31
TP				
HP3	4.27	103.58		
HP2			4.74	98.84
HP1			4.24	99.34
BM 1			3.58	100.00

Comment:

Date: 8/20/2004

Habitat: Run

Flow: Low

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	5.25	105.25		100.00
HP1			5.91	99.34
HP2			6.42	98.83
HP3			5.95	99.30
TP				
HP3	4.66	103.96		
HP2			5.13	98.83
HP1			4.62	99.34
BM			3.96	100.00

Comment:

(2) Water Surface Elevation (WSE) Survey

TR	Sta		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	104.37	8.11	0.00	96.26	96.26	
1-R	0	0	104.37	8.10	0.00	96.27	96.27	
2-L	60	63	104.37	8.10	0.00	96.27	96.27	
2-R	66	66	104.37	8.07	0.00	96.30	96.30	
3-L	140	133	104.37					
3-R	125	125						

Note: WSE slope = 0.0300% Ave Q= 88.2

(2) Water Surface Elevation (WSE) Survey

TR	Sta		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	103.58	7.97	0.00	95.61	95.61	46.5
1-R	0	0	103.58	7.97	0.00	95.61	95.61	
2-L	60	63	103.58	7.94	0.00	95.64	95.64	49.1
2-R	66	66	103.58	7.95	0.00	95.63	95.63	
3-L	140	133	103.58	7.93	0.00	95.65	95.65	49.7
3-R	125	125		7.92	0.00	95.66	95.66	

Note: WSE @75' u/s FS=7.91; @75' d/s FS=7.98 WSE slope = 0.034%

(2) Water Surface Elevation (WSE) Survey

TR	Sta		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	103.96	8.46	0.00	95.50	95.51	41
1-R	0	0	103.96	8.45	0.00	95.51	95.51	
2-L	60	63	103.96	8.45	0.00	95.51	95.52	41.1
2-R	66	66	103.96	8.44	0.00	95.52	95.52	
3-L	140	133	103.96	8.43	0.00	95.53	95.53	43.0
3-R	125	125		8.44	0.00	95.52	95.52	

Note: WSE slope = 0.015% Ave Q= 42.1

(3) Meter and propeller ID for Velocity Correction

Meter ID: 0068
Propeller ID: NA

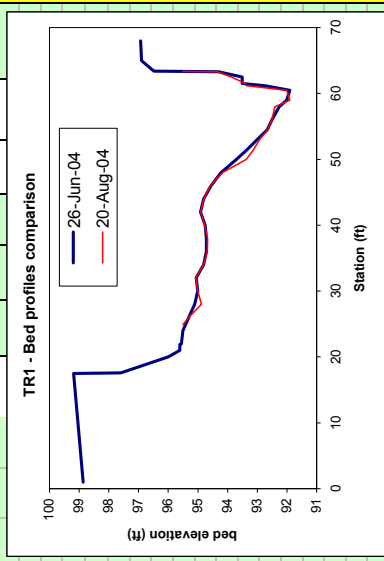
(3) Meter and propeller ID for Velocity Correction

Meter ID: 3602
Propeller ID: 3A

(3) Meter and propeller ID for Velocity Correction

Meter ID: 4099
Propeller ID: 1A

22-Sep-01										26-Jun-04										20-Aug-04										
Sta	FS	Ground	Depth	Vel (ft/s)	V _{0.206}	V _{0.8}	Ave	q	substrate	Sta	FS	Ground	Depth	Vel (ft/s)	V _{0.206}	V _{0.8}	Ave	q	substrate	Sta	FS	Ground	Depth	Vel (ft/s)	V _{0.206}	V _{0.8}	Ave	q	substrate	
100										17.5	4.39	99.19								1.1										
99										17.6	5.98	97.60								1.1										
98										20.0	7.59	95.99								1.2										
97										21.0	7.97	95.61								1.2										
96										RWE	21.9	95.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.9	RWE	24.9	95.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95										24.0	95.51	95.56	0.05	0.00	0.01	0.01	0.00	0.00	0.00	2.9	26.0	95.31	95.31	0.20	0.00	0.01	0.01	0.00	0.00	0.00
94										26.0	95.31	95.31	0.30	0.00	0.01	0.01	0.00	0.00	0.00	9.2	28.0	94.89	94.89	0.62	0.00	0.01	0.01	0.00	0.00	0.00
93										30.0	95.01	95.11	0.50	0.00	0.01	0.01	0.00	0.00	9.2	30.0	95.01	95.01	0.50	0.00	0.01	0.01	0.00	0.00	0.00	
92										32.0	95.06	95.06	0.55	0.01	0.03	0.03	0.03	0.03	2.9	32.0	95.08	95.08	0.43	0.00	0.01	0.01	0.00	0.00	0.00	
										34.0	94.81	94.81	0.80	0.20	0.25	0.40	0.23	0.25	3.4	34.0	94.81	94.81	0.70	0.05	0.11	0.15	0.15	0.15	0.15	
										36.0	94.71	94.71	0.90	0.34	0.37	0.67	0.32	0.37	3.2	36.0	94.69	94.69	0.82	0.07	0.15	0.25	0.25	0.25	0.25	
										38.0	94.71	94.71	0.90	0.46	0.48	0.87	0.34	0.48	3.4	38.0	94.68	94.68	0.83	0.38	0.45	0.75	0.75	0.75	0.75	
										40.0	94.76	94.76	0.85	0.59	0.61	1.04	0.34	0.61	3.4	40.0	94.78	94.78	0.73	0.52	0.58	0.84	0.84	0.84	0.84	
										42.0	94.91	94.91	0.70	0.46	0.48	0.68	0.32	0.48	3.2	42.0	94.91	94.91	0.60	0.32	0.40	0.48	0.48	0.48	0.48	
										44.0	94.81	94.81	0.80	0.98	1.01	1.61	0.32	1.01	3.2	44.0	94.81	94.81	0.70	0.55	0.60	0.84	0.84	0.84	0.84	
										46.0	94.56	94.56	1.05	1.03	1.06	2.22	0.32	1.06	3.2	46.0	94.59	94.59	0.92	0.77	0.82	1.51	1.51	1.51	1.51	
										48.0	94.21	94.21	1.40	1.18	1.21	3.38	0.32	1.21	3.2	48.0	94.17	94.17	1.34	0.89	0.93	2.51	2.51	2.51	2.51	
										50.0	93.71	93.71	1.90	1.20	1.23	4.09	0.32	1.23	3.2	50.0	93.38	93.38	2.13	1.05	1.10	4.10	4.10	4.10	4.10	
										51.5	93.34	93.34	2.27	1.24	1.27	4.32	0.32	1.27	3.2	51.5	93.13	93.13	2.38	1.10	1.15	4.11	4.11	4.11	4.11	
										53.0	93.01	93.01	2.60	1.40	1.24	4.83	0.32	1.24	3.2	53.0	92.93	92.93	2.58	1.22	1.09	4.22	4.22	4.22	4.22	
										54.5	92.66	92.66	2.95	1.38	1.04	5.48	0.32	1.04	3.2	54.5	92.66	92.66	2.85	1.14	1.06	4.92	4.92	4.92	4.92	
										56.0	92.51	92.51	3.10	1.23	1.23	6.83	0.32	1.23	3.2	56.0	92.51	92.51	3.00	1.01	1.18	6.02	6.02	6.02	6.02	
										58.0	92.26	92.26	3.35	0.74	0.85	8.82	0.32	0.85	3.2	58.0	92.41	92.41	3.10	0.71	1.07	0.94	0.94	0.94	0.94	
										59.0	92.01	92.01	3.60	0.79	0.71	7.77	0.32	0.71	3.2	59.0	91.91	91.91	3.60	0.51	0.46	0.55	0.55	0.55	0.55	
										60.5	91.91	91.91	3.70	0.54	0.14	0.38	1.53	0.38	2.3	60.5	92.01	92.01	3.50	0.50	0.07	0.36	0.36	0.36	0.36	
										61.2	92.76	92.76	2.85	0.32	0.02	0.21	0.29	0.21	2.3	61.2	93.38	93.38	2.13	0.64	0.69	0.74	0.74	0.74	0.74	
										61.5	93.51	93.51	2.10	0.26	0.30	0.42	0.23	0.30	2.3	61.5	93.41	93.41	2.10	0.58	0.63	0.86	0.86	0.86	0.86	
										62.5	93.51	93.51	2.10	0.03	0.09	0.16	0.23	0.09	2.3	62.5	93.88	93.88	1.63	0.04	0.09	0.13	0.13	0.13	0.13	
										63.3	94.31	94.31	1.30	0.00	0.01	0.00	0.23	0.01	0.00	0.00	63.3	94.36	94.36	1.15	0.00	0.01	0.00	0.00	0.00	0.00
										63.4	7.10	96.48							1.1	LWE	63.4	95.51	0.00	0.00						
										65.0	6.68	96.90							1.1											
										68.0	6.65	96.93							1.1											



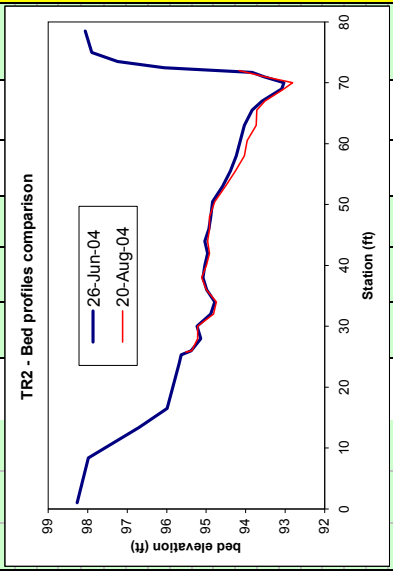
See diagram of undercut bank in field notes

Left UCB=0.5'

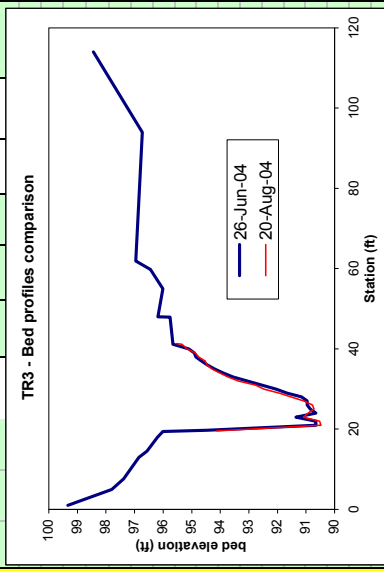
22-Sep-01			26-Jun-04			20-Aug-04										
Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s) V _{0.20.6}	Ave (ft/s) V _{0.8}	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s) V _{0.20.6}	Ave (ft/s) V _{0.8}	q (cfs)	substrate	
RWP	1.0	5.31	98.27				1.1									
	8.4	5.60	97.98				1.1									
	13.4	6.88	96.70				1.1									
	16.5	7.59	95.99				1.1									
	24.0	7.90	95.68				1.2									
RWE	25.3	95.64	0.00	0.00	0.00	0.00	0.00	25.8	95.52	0.00	0.00	0.00	0.00	0.00	0.00	
	26.0	95.39	0.25	0.00	0.01	0.00	2.9	26.0	95.37	0.15	0.00	0.00	0.01	0.00	0.00	
	28.0	95.14	0.50	0.00	0.01	0.00	9.2	28.0	95.22	0.30	0.00	0.00	0.01	0.00	0.00	
	30.0	95.24	0.40	0.10	0.16	0.13	9.2	30.0	95.22	0.30	0.00	0.00	0.01	0.00	0.00	
	32.0	94.89	0.75	0.30	0.34	0.51	2.9	32.0	94.82	0.70	0.24	0.33	0.33	0.46	0.00	
	34.0	94.79	0.85	0.34	0.37	0.63	2.9	34.0	94.75	0.77	0.01	0.02	0.02	0.03	0.00	
	36.0	94.99	0.65	0.28	0.32	0.42	9.2	36.0	95.00	0.52	0.00	0.00	0.00	0.00	0.00	
	38.0	95.09	0.55	0.64	0.66	0.73	3.2	38.0	95.12	0.40	0.63	0.68	0.68	0.54	0.00	
	40.0	95.04	0.60	0.99	1.02	1.22	3.2	40.0	95.00	0.52	0.76	0.81	0.81	0.84	0.00	
	42.0	94.97	0.67	1.01	1.04	1.39	3.2	42.0	94.92	0.60	0.88	0.93	0.93	1.11	0.00	
	44.0	95.04	0.70	1.18	1.22	1.46	2.3	44.0	94.97	0.55	0.82	0.87	0.87	0.96	0.00	
	46.0	94.94	0.70	1.18	1.21	1.69	3.2	46.0	94.92	0.60	0.95	1.00	1.00	1.19	0.00	
	48.0	94.89	0.75	1.24	1.27	2.14	3.2	48.0	94.92	0.60	0.96	1.01	1.01	1.36	0.00	
	50.5	94.84	0.80	1.27	1.30	2.60	3.2	50.5	94.79	0.73	0.99	1.04	1.04	1.89	0.00	
	53.0	94.59	1.05	1.26	1.29	3.38	3.2	53.0	94.52	1.00	1.13	1.18	1.18	2.96	0.00	
	55.5	94.39	1.25	1.35	1.38	4.31	3.2	55.5	94.27	1.25	1.07	1.12	1.12	3.50	0.00	
	58.0	94.24	1.40	1.34	1.37	4.79	3.2	58.0	94.04	1.48	1.16	1.21	1.21	4.49	0.00	
	60.5	94.14	1.50	1.31	1.34	5.02	3.2	60.5	93.97	1.55	1.08	1.13	1.13	4.38	0.00	
	63.0	94.04	1.60	1.22	1.25	5.00	3.2	63.0	93.72	1.80	1.10	1.15	1.15	4.14	0.00	
	65.5	93.84	1.80	1.26	1.29	4.64	3.2	65.5	93.72	1.80	1.10	1.15	1.15	4.14	0.00	
	67.0	93.59	2.05	0.85	0.88	3.14	2.3	67.0	93.52	2.00	0.75	0.80	0.80	2.80	0.00	
	69.0	93.09	2.55	1.00	0.84	0.95	3.62	69.0	93.04	2.48	0.86	0.91	0.91	3.37	0.00	
	70.0	93.04	2.60	0.78	0.67	0.75	1.94	70.0	92.82	2.70	0.69	0.54	0.67	1.80	0.00	
	71.0	93.54	2.10	0.10	0.16	0.28	1.2	71.0	93.52	2.00	0.01	0.02	0.02	0.04	0.00	
	LBE	71.7	93.84	1.80	0.10	0.10	1.1	LBE	72.0	94.17	1.35	0.00	0.01	0.01	0.00	0.00
	72.5	7.51	96.07				1.1									
	73.5	6.34	97.24				1.1									
	75.0	5.68	97.90				1.1									
	LWP	78.5	98.06				1.1									

See diagram of undercut bank in field notes

Left UCB = 0.7'



Stream: Williamson River	22-Sep-01										26-Jun-04										20-Aug-04																
	Site: 631	Transsect: 3	Habitat: Run	Survey	HI	Q	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	V _{0.20.6} Vel (ft/s)	V _{0.8} Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	V _{0.20.6} Vel (ft/s)	V _{0.8} Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	V _{0.20.6} Vel (ft/s)	V _{0.8} Ave	q (cfs)	substrate							
							RWP	1.0	5.03	99.34				1.1																							
								5.0	5.78	97.80				1.1																							
								7.6	6.20	97.38				1.1																							
								13.0	6.73	96.85				1.1																							
								14.5	7.01	96.57				1.1																							
								18.0	7.39	96.19				1.1																							
								19.4	7.57	96.01				1.1																							
								19.7	94.46	1.20	0.00	0.01	0.00	1.2																							
								21.0	90.66	5.00	0.18	0.39	2.21	1.2																							
								22.0	90.66	5.00	0.16	0.45	0.34	1.72	2.3																						
								23.0	91.36	4.30	0.36	0.26	0.35	1.49	2.3																						
								24.0	90.66	5.00	0.73	0.29	0.54	2.71	2.3																						
								25.0	90.86	4.80	0.99	1.02	4.88	3.2																							
								26.0	90.96	4.70	1.07	1.06	1.09	5.14	3.2																						
								27.0	90.96	4.70	1.09	1.12	5.25	3.2																							
								28.0	91.16	4.50	1.12	1.15	1.16	5.23	3.2																						
								29.0	91.66	4.00	1.00	1.21	1.13	4.53	3.2																						
								30.0	92.06	3.60	0.79	0.98	0.91	3.28	3.2																						
								31.0	92.56	3.10	0.78	0.91	0.87	2.70	3.2																						
								32.0	93.06	2.60	0.89	0.80	0.87	2.26	3.2																						
								33.0	93.56	2.10	0.91	0.94	1.97	3.2																							
								34.0	93.91	1.75	0.92	0.95	1.66	3.2																							
								35.0	94.21	1.45	0.89	0.92	1.33	3.2																							
								36.0	94.46	1.20	0.97	1.00	1.20	3.2																							
								37.0	94.66	1.00	0.85	0.88	0.88	2.3																							
								38.0	94.86	0.80	0.73	0.75	0.60	2.3																							
								39.0	94.91	0.75	0.58	0.60	0.45	2.3																							
								40.0	95.11	0.55	0.35	0.38	0.23	3.2																							
								LWE	41.2	95.66	0.00	0.00	0.00	0.00	3.2																						
								41.4	7.92	95.66				2.9																							
								47.9	7.82	95.76				1.1																							
								48.0	7.40	96.18				1.1																							
								55.0	7.57	96.01				1.1																							
								59.8	7.13	96.45				1.1																							
								61.9	6.62	96.96				1.1																							
								94.0	6.85	96.73				1.1																							
								114.0	5.14	98.44				1.1																							



See diagram of undercut bank in field notes

Right UCB = 0.3'

Williamson River WM_7 06/26/04

Run Williamson River

IOC 631

QARD 19.0
 QARD 20.0
 QARD 25.0
 QARD 30.0
 QARD 35.0
 QARD 40.0
 QARD 42.0
 QARD 45.0
 QARD 47.2
 QARD 50.0
 QARD 52.5
 QARD 55.0
 QARD 57.5
 QARD 60.0
 QARD 62.5
 QARD 65.5
 QARD 67.5
 QARD 70.0
 QARD 75.0
 QARD 80.0
 QARD 85.0
 QARD 88.2
 QARD 90.0
 QARD 95.0
 QARD 100.0
 QARD 110.0
 QARD 125.0
 QARD 140.0
 QARD 160.0
 QARD 180.0

XSEC 0.0 0.0 1.0 91.91 0.00034
 0.0 1.0 98.9 17.5 99.2 17.6 97.6 20.0 96.0 21.0 95.6 21.9 95.6
 0.0 22.0 95.6 24.0 95.5 26.0 95.3 28.0 95.1 30.0 95.0 32.0 95.1
 0.0 34.0 94.8 36.0 94.7 38.0 94.7 40.0 94.8 42.0 94.9 44.0 94.8
 0.0 46.0 94.6 48.0 94.2 50.0 93.7 51.5 93.3 53.0 93.0 54.5 92.7
 0.0 56.0 92.5 58.0 92.3 59.0 92.0 60.5 91.9 61.2 92.8 61.5 93.5
 0.0 62.5 93.5 63.3 94.3 63.4 96.5 65.0 96.9 68.0 96.9
 NS 0.0 1.1 1.1 1.1 1.2 1.2 2.9
 NS 0.0 0.2 2.9 .2 9.2 0.2 9.2 0.2 9.2 0.2 9.2 0.15 2.9
 NS 0.0 2.3 3.2 3.4 3.4 3.2 3.2
 NS 0.0 3.2 3.2 3.2 3.2 3.2 3.2
 NS 0.0 3.2 3.2 2.3 2.3 2.3 2.3
 NS 0.0 .2 2.3 .2 2.3 1.1 1.1 1.1
 CAL1 0.0 95.61 47.2
 VEL1 0.0 0.00 0.01 0.01 0.01 0.01 0.03 0.03
 VEL1 0.0 0.25 0.37 0.48 0.61 0.48 1.01 1.06 1.21 1.23 1.27 1.24 1.24
 VEL1 0.0 1.26 0.82 0.77 0.38 0.21 0.30 0.09 0.01
 CAL2 0.0 96.26 88.2
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 95.51 42.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

Williamson River WM_7 06/26/04

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Run      Williamson River
IOC      631
QARD 19.0
QARD 20.0
QARD 25.0
QARD 30.0
QARD 35.0
QARD 40.0
QARD 42.0
QARD 45.0
QARD 47.2
QARD 50.0
QARD 52.5
QARD 55.0
QARD 57.5
QARD 60.0
QARD 62.5
QARD 65.5
QARD 67.5
QARD 70.0
QARD 75.0
QARD 80.0
QARD 85.0
QARD 88.2
QARD 90.0
QARD 95.0
QARD 100.0
QARD 110.0
QARD 125.0
QARD 140.0
QARD 160.0
QARD 180.0
XSEC 0.0      0.0 1.0      93.04  0.00034
      0.0  1.0 98.3  8.4 98.0 13.4 96.7 16.5 96.0 24.0 95.7 25.3 95.6
      0.0 26.0 95.4 28.0 95.1 30.0 95.2 32.0 94.9 34.0 94.8 36.0 95.0
      0.0 38.0 95.1 40.0 95.0 42.0 95.0 44.0 95.0 46.0 94.9 48.0 94.9
      0.0 50.5 94.8 53.0 94.6 55.5 94.4 58.0 94.2 60.5 94.1 63.0 94.0
      0.0 65.5 93.8 67.0 93.6 69.0 93.1 70.0 93.0 71.0 93.5 71.7 93.8
      0.0 72.5 96.1 73.5 97.2 75.0 97.9 78.5 98.1
NS     0.0      1.1      1.1      1.1      1.1      1.1      1.2      9.2
NS     0.0  0.2  2.9 0.2   9.2      9.2      2.9      2.9 .05  9.2
NS     0.0      3.2      3.2      3.2      2.3      3.2      3.2
NS     0.0      3.2      3.2      3.2      3.2      3.2      3.2
NS     0.0      3.2      2.3      2.3      2.3  0.1  1.2 0.1  1.2
NS     0.0      1.1      1.1      1.1      1.1
WSL    0.0      94.88     94.92     95.09     95.24     95.37     95.48
WSL    0.0      95.53     95.59     95.64     95.69     95.74     95.78
WSL    0.0      95.83     95.87     95.91     95.96     95.99     96.03
WSL    0.0      96.10     96.17     96.24     96.28     96.30     96.36
WSL    0.0      96.42     96.53     96.69     96.83     97.01     97.16
CAL1   0.0      95.64      47.2
VEL1   0.0
      0.00 0.01 0.01 0.16 0.34 0.37 0.32
VEL1   0.0 0.66 1.02 1.04 1.22 1.21 1.27 1.30 1.29 1.38 1.37 1.34 1.25
VEL1   0.0 1.29 0.88 0.95 0.75 0.16 0.16
CAL2   0.0      96.27      88.2
VEL2   0.0
VEL2   0.0
VEL2   0.0
CAL3   0.0      95.52      42.0
VEL3   0.0
VEL3   0.0
VEL3   0.0
ENDJ

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Williamson River WM_7 06/26/04

Run Williamson River

IOC 631

QARD 19.0
 QARD 20.0
 QARD 25.0
 QARD 30.0
 QARD 35.0
 QARD 40.0
 QARD 42.0
 QARD 45.0
 QARD 47.2
 QARD 50.0
 QARD 52.5
 QARD 55.0
 QARD 57.5
 QARD 60.0
 QARD 62.5
 QARD 65.5
 QARD 67.5
 QARD 70.0
 QARD 75.0
 QARD 80.0
 QARD 85.0
 QARD 88.2
 QARD 90.0
 QARD 95.0
 QARD 100.0
 QARD 110.0
 QARD 125.0
 QARD 140.0
 QARD 160.0
 QARD 180.0

XSEC 0.0 0.0 1.0 93.04 0.00034
 0.0 1.0 99.3 5.0 97.8 7.6 97.4 13.0 96.8 14.5 96.6 18.0 96.2
 0.0 19.4 96.0 19.7 94.5 21.0 90.7 22.0 90.7 23.0 91.4 24.0 90.7
 0.0 25.0 90.9 26.0 91.0 27.0 91.0 28.0 91.2 29.0 91.7 30.0 92.1
 0.0 31.0 92.6 32.0 93.1 33.0 93.6 34.0 93.9 35.0 94.2 36.0 94.5
 0.0 37.0 94.7 38.0 94.9 39.0 94.9 40.0 95.1 41.2 95.7 41.4 95.7
 0.0 47.9 95.8 48.0 96.2 55.0 96.0 59.8 96.4 61.9 97.0 94.0 96.7
 0.0114.0 98.4

NS 0.0 1.1 1.1 1.1 1.1 1.1 1.1
 NS 0.0 1.1 0.2 1.2 1.2 2.3 2.3 2.3
 NS 0.0 3.2 3.2 3.2 3.2 3.2 3.2
 NS 0.0 3.2 3.2 3.2 3.2 3.2 3.2
 NS 0.0 2.3 2.3 2.3 3.2 0.04 3.2 0.05 2.9
 NS 0.0 .20 2.9 1.1 1.1 1.1 1.1
 NS 0.0 1.1

WSL 0.0 94.90 94.94 95.12 95.26 95.39 95.51
 WSL 0.0 95.55 95.61 95.66 95.71 95.76 95.80
 WSL 0.0 95.85 95.89 95.93 95.98 96.01 96.05
 WSL 0.0 96.12 96.18 96.25 96.29 96.31 96.37
 WSL 0.0 96.43 96.54 96.70 96.84 97.02 97.17

CAL1 0.0 95.66 47.2
 VEL1 0.0 0.01 0.39 0.34 0.35 0.54
 VEL1 0.0 1.02 1.09 1.12 1.16 1.13 0.91 0.87 0.87 0.94 0.95 0.92 1.00
 VEL1 0.0 0.88 0.75 0.60 0.38 0.00

CAL2 0.0 96.30 88.2

VEL2 0.0
 VEL2 0.0
 VEL2 0.0

CAL3 0.0 95.53 42.0

VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0

ENDJ