12-4-2009

Ex. 277-US-434

Mike Gagner
R2 Resource Consultants

WM-5

"Keuffel & Esser Co."

ALL-WEATHER

LEVEL BOOK

No. 310 F

April 13, 2004

sampling

1418.01

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PAGE	REFERENCE	DATE

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

ALL-WEATHER
LEVEL BOOK

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Project 1418.01 PHABSIM site

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
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WM-5 04/13/04

Crew: M. Gagner
A. Waybright

	In	Out
Time	9:00	6:45
5.6	0.50	0.49

Equipment: Nikon Level SN:
Marsh McBirney Model 2000
SN: 2005068

Directions: From K-Falls travel N on Hwy 97 toward Chiloquin. Approx. 12 miles past Chiloquin look for FS Rd 43 on the right. Turn right on Rd 43 and follow for ~ 1/4 - 1/2 mile to Williamson River crossing. Park on East side of bridge. First transects are located ~ 200 yards downstream of bridge crossing.

WM-5 04/13/04

* This reach was habitat mapped by M. Gagner & C. Yoder on 04/ /04. The habitat composition is 38% cascade, 38% riffle, and 24% glide/run. All three habitat units/Types will be sampled.

Habitat Unit Selection

Transect Placement

Riffle (2, 4, 6) Unit #1

49 yds x .2 = 9.8 x3 = 29.4'
.4 = ~~58.8~~ 19.6 yds x3 = 58.8'
.6 = 29.4 x3 = 88.2'

Cascade (3, 5, 9) Unit # 2 102 yds (306')

306 x .3 = 91.8'
.5 = 153.0'
.9 = 275.0'

measured d/s from u/s end of unit

WM-5 Photo Log 04/13/04

Photo # Roll 5 Description

#17 Island control Lt -> Rt
16 " TR-1 Lt -> Rt
15 " TR-2 "
14 " TR-3 "
13 " looking d/s
12 " " u/s
11 " u/s from bottom of case
10 " " " "
9 " looking Rt -> Lt TR-1
8 " " " TR-2
7 " " " TR-3
6 " d/s from top of case
5 " looking u/s from left channel
4 " " " " right channel
3 " TR-1 Rt -> Rt on left channel
2 " TR-1 Rt " Lt " right channel
#1 " TR-2 Rt -> Lt left channel

Roll #6

#25 looking Lt -> Rt across right channel TR-2
24 " TR-3 Rt -> Lt across left channel
23 " TR-3 Lt -> Rt across right channel
22 " looking d/s at left channel
21 " d/s at right channel

WM-5 Cascade Dr. Lt 04/13/04

Site Map

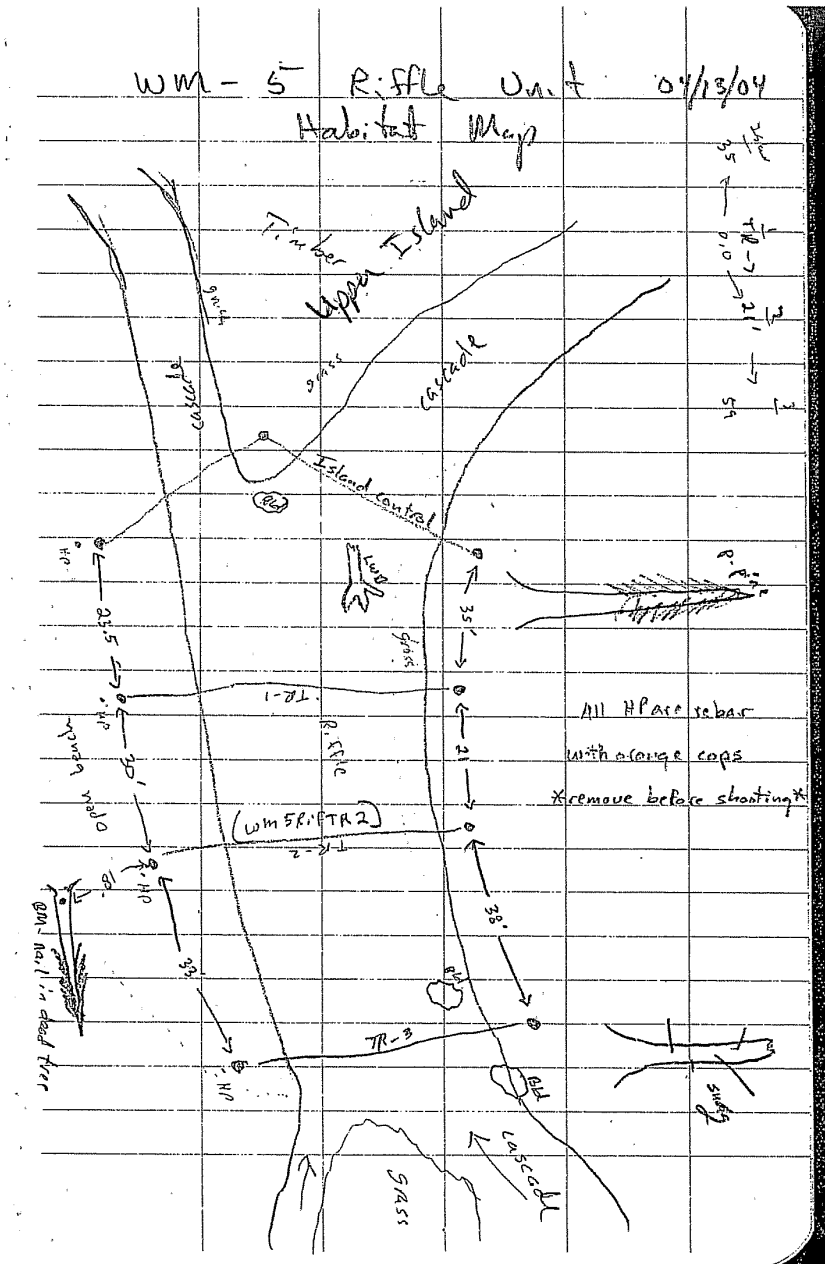
WM-5 Cascade Unit 04/13/04

Level Loop & WSE

STA	BS	HI	FS	Elevation	Rod
BM	1.95			100.00	
		101.95			
TR-1			6.44	95.51	
TR-2			4.23	97.72	
TR-3			2.19	99.76	
TP					
TR-3				99.76	
	1.89	101.65			
TR-2			3.94	97.71	
TR-1			6.14	95.51	
BM			1.65	100.00	OK
		101.65			
TR-3 LWS-			3.75	97.90	
RWS-			3.78	97.87	
TR-2 LWS-			5.18	96.47	
RWS-			5.15	96.50	
TR-1 LWS-			7.70	93.95	
RWS-			7.72	93.93	

WM-5 Riffle Unit 04/13/04

Habitat Map



WM-5 Riffle Unit 04/13/04
Level loop & WSE

STA	BS	HI	FS	Elevation	Rod
BM	2.89			100.00	
		102.89			
TR-3 HP			4.15	98.74	
TR-2 HP			4.42	98.47	
TR-1 HP			4.93	97.96	
Island HP			5.50	97.39	
Island HP (TP)	5.38			97.39	
		102.77			
TR-1			4.81	97.96	
TR-2			4.31	98.46	
TR-3			4.03	98.74	
BM			2.77	100.00	

WM-5 Riffle Unit 04/13/04
Level loop & WSE cont.

STA	BS	HI	FS	Elevation	Rod
		102.77			
TR-3					
LWS			5.98	96.79	
RWS			5.59	97.18	
TR-2					
LWS			6.10	96.67	
RWS			6.39	96.38	
TR-1					
LWS			6.25	96.52	
RWS			6.45	96.32	
Island control					
Left bank LWS	(mid 6.99)		6.92	95.85	95.78
RWS			7.02	95.75	
Right ext channel LWS	(mid 7.20)		7.39	95.38	95.57
RWS			7.47	95.30	
Right edge (side channel)			7.85	94.92	

WM-5 Riff & Casc. Tie

04/13/04

STA	BS	HI	FS	Elevn
Casc. TR-3 HP	6.53			99.76
		106.29		
Island control rebar			3.96	102.33
Riffle BM			1.35	104.94

WM-5 Run/Glide Unit Transect Placement

Unit length

146 yds = 438 ft

438 X .3 = 131' TR-3

.5 219 TR-2

.7 307' TR-1

transects placed in d/s direct from top of unit (i.e. measured d/s from start of unit)

WM-5 ~~Casc.~~ Glide

04/13/04

Level loop

STA	BS	HI	FS	Elevn
BM	4.37			100.00
		104.37		
TR-3			5.88	98.49 ✓
TR-2			5.45	98.92 ✓
TR-1 (TP)			5.47	98.90
TR-1	5.36			98.90
		104.26		
TR-2			5.34	98.92 ✓
TR-3			5.77	98.49 ✓
BM			4.27	99.99 OK

* All HP are rebar with caps — remove before shooting *

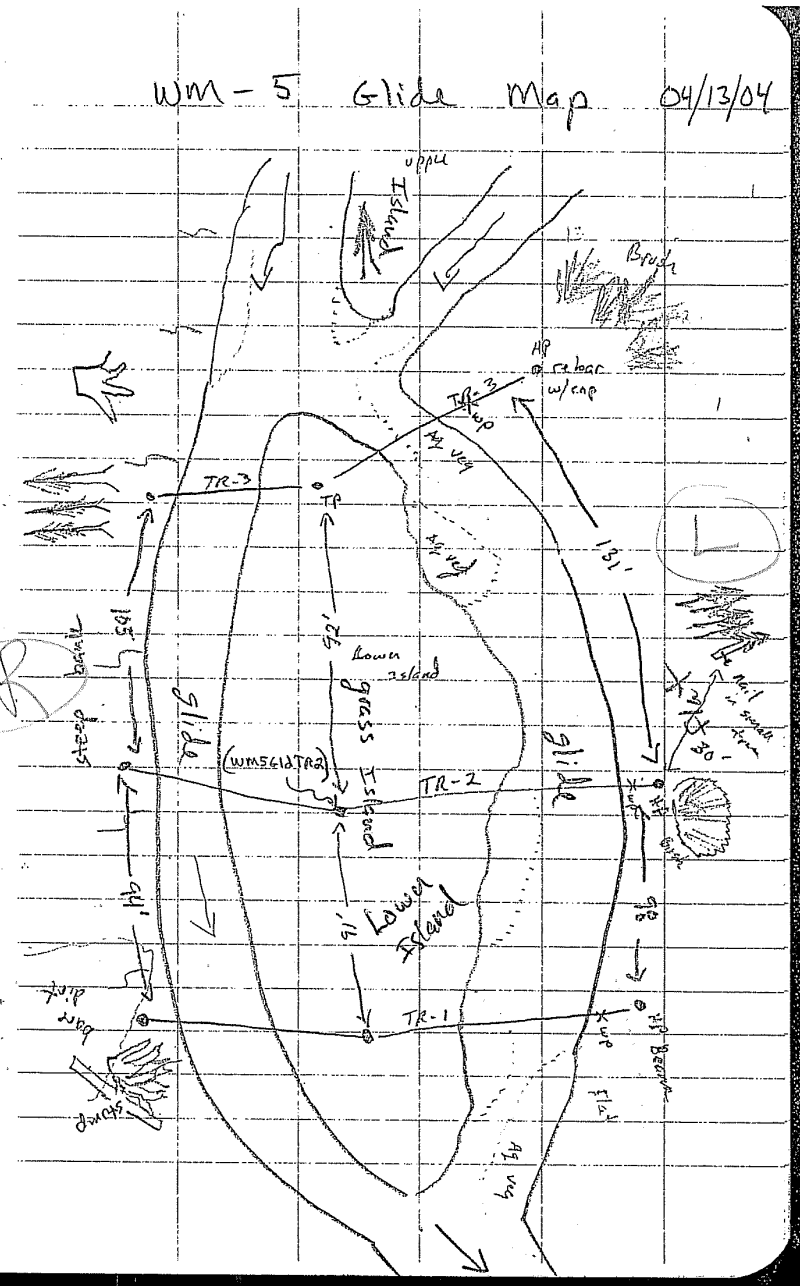
glide Habitat

WM-5 WSE 04/13/04

STA	BS	HI	FS	Elevn
		104.26		
TR-3				
Left channel LWS			8.62	95.64
RWS			8.60	95.66
Right channel middle			8.47	95.79
TR-2				
Left channel middle			8.73	95.53
Right channel middle			8.57	95.69
TR-1				
Left channel LWS			8.74	95.52
RWS			8.74	95.52
Right channel middle			8.64	95.62

Stationing

	Left	Middle	Right
TR-1	98'	91'	105
TR-2	131'	92'	94'
TR-3			



Upper Island Right Channel Discharge

WM-5

04/13/04

STA	Depth	Vel	Notes
18.0	0.0	0.0	edge
19.5	0.5	0.09	Ag. veg/velocity break
22.0	1.50	1.38	
24.5	1.30	0.81	Ag. veg/velocity break
27.0	1.50	1.75	
29.5	1.60	1.73	
32.0	1.60	1.68	
34.5	1.60	1.99	
37.0	1.60	1.64	
39.5	1.60	1.40	
42.0	1.60	2.14	
44.5	2.10	1.85	
47.0	2.40	1.50	
49.5	2.30	2.19	
52.0	2.30	1.50	
54.5	2.20	1.51	
57.0	2.30	0.87	/
59.5	1.90	0.06	Ag. veg/velocity shelter
62.0	1.30	0.05	"
64.5	1.10	0.03	"
67.0	0.30	0.02	"
70.0	0.0	0.0	edge

Upper Island Left Channel Discharge

04/13/04

WM-5

STA	Depth	Vel.	Notes
18.5	0.0	—	edge
19.0	0.30	0.40	edge grass
20.0	1.3	1.38	edge grass
21.0	1.60	1.39	
22.0	1.60	1.40	~~grass vel. break~~
23.0	0.90	.84	grass vel. break
24.0	0.50	.07	" "
25.0	1.0	1.40	
26.0	1.50	1.81	
27.0	1.80	1.93	
28.0	2.0	1.86	
29.0	2.2	1.76	
30.0	2.2	1.72	
31.0	2.3	2.05	
32.0	2.0	2.19	
33.0	1.9	1.56	
34.0	1.5	0.57	
35.0	0.0	—	edge

135.18 17

Discharge — Lower Island Right Channel — 04/13/04

WM-5 (TR-1)

STA	Depth	Vel.	Notes
37.0	0.0	0.0	edge
36.0	0.8	0.0	grass / vel. break
34.5	2.3	0.15	" "
33.0	2.2	.06 —	" "
31.5	2.0	.04 —	" "
30.0	2.5	.57 .06	edge grass
28.5	2.8	.80 .14	
~~28.0~~ 27.0	3.0	.89 .05	some veg. near bottom
25.5	3.1	.89 1.33	
24.0	3.1	1.44 1.60	
22.5	3.3	1.78 1.50	
21.0	3.4	2.10 1.68	
19.5	3.5	2.08 1.61	
18.0	3.4	2.24 1.66	
16.5	3.5	2.06 1.63	
15.0	3.4	1.94 1.78	
13.5	3.3	1.90 1.61	
12.0	3.2	1.58 1.24	
10.5	3.2	1.78 1.42	
9.0	3.1	1.44 ~~1.70~~ 1.54	
7.5	3.0	.96 .42	edge grass
6.0	0.5	0.0	veg. / vel. break
4.~~8~~5	0.2	0.0	
4.0	0.0	0.0	edge

Lower Island Left ~~Right~~ channel — WM-5 — Discharge — ~~Contin.~~ — 04/13/04

STA	Depth	Vel.	Notes
26.0	0.0	0.0	edge
26.5	1.5	1.78	
27.5	1.6	1.46	
28.5	1.9	1.38	
29.5	2.1	1.28	
30.5	2.2	0.96	
31.5	1.8	0.93	veg on bottom
33.5	1.8	0.33	" "
35.5	1.60	0.17	" "
37.5	1.30	0.42	" "
39.5	1.20	0.1	veg / velocity break
41.5	1.1	0.12	veg/ " " (45°)
43.5	1.3	.48	" "
45.5	0.9	.82	" " (45°)
47.5	1.6	1.86	" " "
49.5	0.6	0.0	" "
51.5	0.8	0.12	" "
53.5	0.7	0.03	" "
~~55~~ 54.5	0.0	out	
56.0	0.0	out	
56.5	2.4	.87	
57.5	1.5	.83	
59.0	0.30	.05	

Lower Island Left Channel

Discharge Cont.. 04/13/04

STA	Depth	Vel.	Notes
60	0.0		out
64.5	0.0		out
65.5	.70	.03	very
67.0	.90	.18	very
68.0	0.80		
69.0	0.0		edge

Upper Island Left

MM 5

MM 5

Rite in the Rain®
ALL-WEATHER
LEVEL BOOK
No. 310 F

May 12, 2004
Survey

WM-5 5/12/2004

	IN	OUT
TIME	8:30	6:45
S.G	0.7	0.65

old staff gage from 4/13/04 just out of H2O at 0.0

Crew: C. Yoder, A. Weybright

Equipment: Marsh McBirney Model 2000
sn: 2005068

Weather = nice sunny, few clouds, mid 60's
no precip

CFY ROLL 2

PHOTO LOG: 05/12/04.

29. WM-5 TR3 Riffle LB to RB
30. WM-5 TR3 Riffle RB to LB
31. WM-5 TR3 Riffle upstream
32. WM-5 TR3 Riffle downstream
33. WM-5 TR2 Riffle LB to RB
34. WM-5 TR2 Riffle RB to LB
35. WM-5 TR2 Riffle upstream
36. WM-5 TR2 Riffle downstream

CFY ROLL 2 possibly exposed.

RIFFLE 5/12/04

LEVEL LOOP SURVEY

STA	BS	HI	FS	ELV
BM	2.75	102.75		100
TR1			4.79	97.96
TR2			4.28	98.47
Island control (IC)			5.36	97.39
TR3			4.01	98.74
(fp)				
TR3	3.85	102.59		98.74
IC			5.20	97.39
TR2			4.12	98.47
TR1			4.63	97.96
BM			2.59	100.00

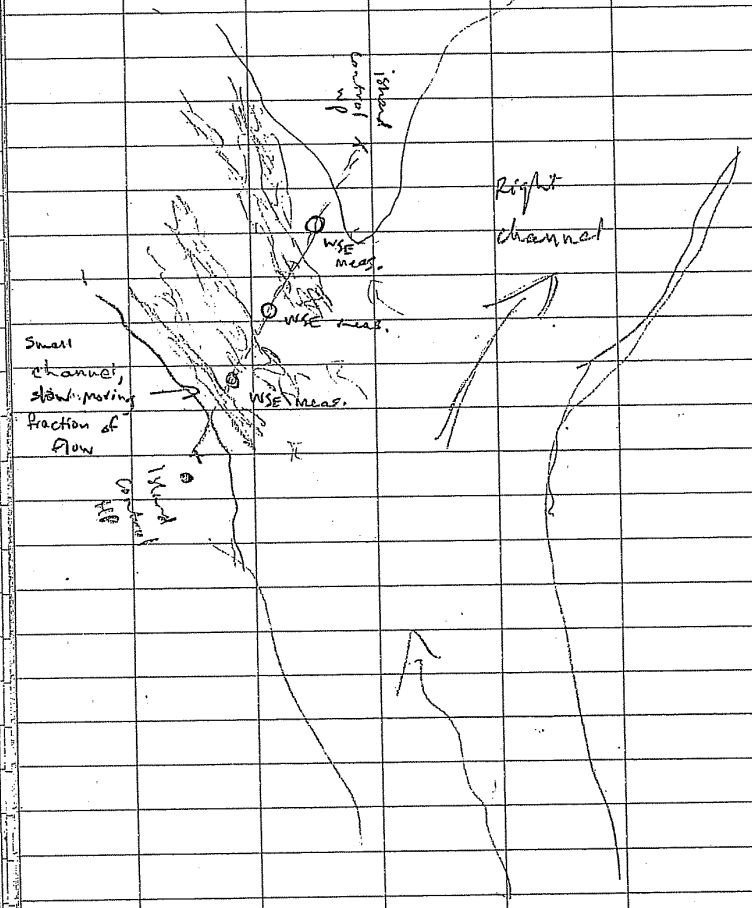
RIFFLE IC - Island control

WSEL SURVEY

STA	BS	HI	FS	ELV
		102.59		
TR3-L			6.39	96.20
TR2-L			6.54	96.05
TR1-L			6.65	95.94
IC-Left left channel			7.17	95.42
IC-Left middle channel			7.41	95.18
IC-Left .rt. channel			7.21	95.38
IC-Rt L. side			7.60	94.99
IC-Rt Rt. side main stem			7.67	94.92
IC-Rt Rt. side channel			8.12	94.47
TR1-R			6.76	95.83
TR2-R			6.61	95.98
TR1-R			6.30	96.29

5/12/04

WSE measurement locations



5/12/04

CASCADE LEVEL LOOP

STA	BS	HI	FS	ELV	
BM	2.07	102.07		100.00	
TR-1			6.56	95.51	
TR-2			4.35	97.72	
TR-3			2.31	~~99.71~~	
FP					
TR-3	2.00	9:01.71		~~99.71~~	
TR-2			4.03	~~97.67~~	97.72
TR-1			6.24	~~95.47~~	95.51
BM		101.75	1.75	99.96	
TR-3			2.00	99.75	

5/12/04

CASCADE WSEL SURVEY

STA	BS	HI	FS	ELV
		101.75		
TR3-L			4.37	97.38
TR2-L			5.65	96.10
TR1-L			8.29	93.46
TR1-M			8.31	93.44
TR1-R			8.39	93.36
TR2-R (channel)			5.53	96.22
			5.51	96.24
TR2-R			5.64	96.11
TR3-R			4.40	97.35

WM5

5/12/04

RIFFLE TR-3 DISCHARGE SURVEY

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWD
17.4	0	0	RWE
18.0	0.45	0.1	
18.8	1.0	-0.06	
19.2	R. edge of rock		rock at of 4.0 by 0.5'
20.5	L. edg of rock		
21.2	1.2	0.60	
22.2	1.0	0.27	
22.2	0.9	0.17	
24.2	2.05	1.25	
25.2	1.5	2.57	
26.2	2.0	2.12	
27.7	2.15	2.72	
29.2	1.75	0.71	
30.7	2.10	0.76	
32.2	2.65	-0.32/0.84	huge boulder just downstream of transect from ~ 29' to 34'
33.7	3.50	-0.55/2.24	
35.2	3.35	-0.2/1.53	
36.7	2.8	0.11/2.58	
37.7	2.2	2.68	
38.7	0.45	4.38	
40.5	1.7'	1.13	

Continued →

(CONTINUED) 5/12/04

RIFFLE TR-3 DISCHARGE SURVEY

(F) STA	(F) DEPTH	(F/S) VELOCITY	COMMENTS
42.0	1.5	0.73	
43.5	1.1	~~0.57~~ 0.85	
45.0	1.25	2.44	
44.1	1.2	2.24	NOTE: OUT OF ORDER
46.5	0.9	1.43	
48.0	1.05	0.48	behind grass
49.5	0.75	0.39	
51.7	0.75	0.36	
53.0	0.35	1.51	
53.8	0	0	edge of main channel
55.6	0	0	obstruction height = 0.5
56.1	0.4	1.06	sm. channel btwn
56.7	0	0	56.1 → 56.7
58.7	0	0	height of 0.5 from RWS & 0.3 from LWS.
59.7	0.55	-0.01	sm. channel from 58.7
60.7	0.55	1.53	to 62.2
61.7	0.45	0.64	
62.2	0	0	grass hump height 0.2'
63.6	0	0	
64.2	0.6	0.53	sm. channel from 63.6 to
64.7	0.3	0.05	
65.2	0	0	LWE
74.5			LWP

RIFFLE TR-2 DISCHARGE SURVEY

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
21.2	0	0	RWE
22.0	0.55	0.06	sm. channel
23.5	0.75	0.28	
24.0	0.6	-0.04	grass
24.6	0	0	grass island
26.0	0	0	height = 0.05'
27.4	0.75	-0.09	grass
29.0	0.7	0.08	grass
30.0	0.45	-0.06	
30.5	0	0	Rock height = 0.2
31.5	0	0	
32.0	0.3	1.02	
33.5	0.55	1.1	
34.0	0.25	0.48	~~Rock~~ edge of Rock
34.4	0	0	Rock height = 0.3'
35.0	0	0	L edge of rock
35.3	0.4	-0.07	
37.0	0.35	1.11	
38.0	0.65	1.69	
39.5	0.45	0.97	
41.5	0.9	1.08	
43.5	1.45	0.33	
	Continued →		

(CONTINUED) 05/12/04

RIFFLE DISCHARGE TR-2

STA	DEPTH	VELOCITY	COMMENTS
45.5	1.7	1.70	
47.0	0.45	1.75	
48.0	1.05	1.25	
50.0	1.4	1.88	
50.8	2.05	1.61	
51.8	2.1	2.63	
52.8	1.75	2.77	
54.0	1.55	2.76	
55.0	1.85	2.28	
56.5	1.3	3.24	
58.0	1.95	2.77	
60.0	1.85	1.20	
61.4	1.35	1.07	
63.0	1.20	0.35	
65.3	0.65	0.22	
66.1	0	0	RWE
75.7			RWP

RIFFLE DISCHARGE TR-1

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
9.3	0	0	RWE
10.0	0.4	1.54	sm. channel
10.6	0.45	-0.13	
10.4	0.4	0.93	NOTE: OUT OF ORDER
11.2			edge height = 0.8
21.0	0	0	channel flows at 45° to rise
21.3	0.3	0.5	
22.6	0.2	1.17	
23.5	0.2	-0.04	
23.8	0	0	edge
32.1	0	0	edge height = 0.4 abv ws
32.5	0.4	0.11	sm. channel
33.0	0.4	0.07	
33.7	0	0	edge
35.0	0	0	height = 0.2'
35.7	0.70	1.01	main channel beg.
37.2	1.0	1.27	
38.7	0.33		
39.7	0.65	0.64	
40.5	0.65	0.09	behind boulder
41.2	0.7	-0.05	
42.5	0.85	0.81	

(CONTINUED) 05/12/04

RIFFLE TR1 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
44.0	0.85	1.9	
46.0	1.1	0.51	
48	1.1	1.58	
50	0.8	1.79	
52	0.7	1.80	
54	1.8	1.62	
55.5	1.35	0.75	
57.5	1.35	1.20	
~~59.5~~	~~1.3~~		
59.5	1.7	1.77	
61.0	0.7	2.60	rock 60-62
62.0	1.85	2.14	
63.5	2.0	0.95	
65.0	1.7	0.63	
66.0	1.55	-0.01	behind rock
65.5	1.7	0.08	NOTE: OUT OF BROOK
67.2	1.4	-0.11	
67.5	1.35	0.16	
68.0	1.7	0	behind rock
68.6	0.7	0.67	
69.4	0.6	1.81	
70.2	1.1	2.39	
71.2	1.1	0.69	

Continued →

CF4 ROLL 3

PHOTO LOG:

1. WM-5 TR1 Riffle RB to LB (may be 2 photos)
2. WM-5 TR2-Riffle RB to LB
3. WM5 TR3-Riffle RB to LB
4. WM5 TR1 Riffle looking upstream
5. WM5 TR1 Riffle looking downstream
6. WM5 TR1 Riffle LB to RB
7. WM5 TR2-Riffle LB to RB
8. WM5 TR3-Riffle LB to RB
9. WM5 Island Control LB to RB Right Channel
10. WM5 Right Channel Island Control looking upstream
11. WM5 Island Control Rt. Channel looking downstream
12. WM5 Island Control Rt. Channel LB to RB
13. WM5 Cascade TR-3 LB to RB
14. WM5 Cascade TR-3 RB to LB
15. WM5 Cascade TR-3 Upstream
16. WM5 Cascade TR-3 Downstream
17. WM5 Cascade TR-2 LB to RB
18. WM5 Cascade TR-2 RB to LB
19. WM5 Cascade TR-2 upstream
20. WM5 Cascade TR-2 downstream

(CONTINUED)

RIFFLE TR1 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
72.7	1.3	1.15	
74.2	1.0	0.80	
75.7	0.95	0.14	
77.2	0.6	-0.02	grass
78.5			RWE
87.5			LWP

TSF 5/12/04

ISLAND CONTROL DISCHARGE

0 RWP

STA	DEPTH	VELOCITY	COMMENTS
7.9	0	0	RWE
9.0	0.8	0.1	aft sm. channel; sm. channel
10.5	0.55	0.42	
11.3	0.7	0.41	
11.4	0	0	Rock
12.4	0		
12.5	0.2	0.25	
12.8	0	0	0.3 height of hump
15.0	0	0	
15.1			edge of hump can't take velocity
16.3	0.5	0.77	
17.7	0.2	0.22	
18.7	~~0.4~~ 0.65	1.85	
19.2	0.5	1.33	
19.4	0	0	
24.6	0	0	grassy hump height = 1.0
25.4	0.25	0.6	
27.0	0.55	-0.05	
28.4	0.2	0.1	channel running parallel to transect
28.8	0	0	grass clump 0.2' abv main channel
30.1	0	0	RWE of main channel
30.6	0.2	1.13	
31.1	0.6	0.82	
31.6	0	0	grass hummock 0.2 abv. water surface

(Continued) 5/12/04

Island Control Discharge

STA	DEPTH	VELOCITY	COMMENTS
32.4	0	0	edge of grass hummock
33.5	0.55	0.6	right behind rock
35.0	0.9	0.57	
36.5	0.95	0.21	
38.5	1.1	0.87	
40.0	1.15	0.73	
41.5	0.5	1.83	
43.0	0.5	1.89	
44.5	1.1	2.18	
46.0	1.5	2.53	
47.5	0.55	2.41	at 48.5' depth = 2.1'
49.0	2.1	2.83	edge of rock 48.2 to 47'
50.5	2.0	2.56	
51.5	2.2	2.35	
52.5	1.65	0.77	
53.5	0.6	2.99	
54.9	1.65	1.42	log at 54.5'
54.2	0.55	1.32	top of rock NOTE: OUT of DEPTH sm. wood from 55' to 56.5'
56.6	1.1	0.51	
58.0	0.8	0.19	
59.5	0.5	0.05	
60.5	0.2	0.13	LWE
60.9	0	0	LWP
74.8			

5/12/04

CASCADE TR3 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
1			RWP
3.5	0	0	RWE
4.5	0.3	0.8	
6.5	1.3	2.04	
7.5	1.45	1.23	rt edge of rock
8.1	0	0	height = 0.2 1.3 max height downstream
9.4	0	0	L. edge of rock
9.6	1.20	1.21	
11.0	1.15	1.34	
13.0	1.20	1.22	
15.0	0.9	1.64	
16.5	1.1	1.08	
18.0	0.95	~~0.66~~ 0.29	behind 2 rocks
19.0	~~1.35~~	~~0.70~~ 1.54	
20.5	1.30	~~2.56~~ 2.77	
21.8	1.3	-0.21	behind rock
23.5	0.2	1.37	on rock
25.0	0.9	0.67	
26.5	1.35	1.21	
28.0	0.9	1.85	
29.5	0.95	2.83	
31.0	0.8	-0.15	behind rock

(CONTINUED) 5/12/04

CASCADE TR-3 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
32.5	0.3	3.07	31.5 & 32.5 cascades over rock
34.0	0.3	0.49	
35.5	0.9	1.21	
36.5	1.1	-0.14	* water definately moving on top underneath cascade
37.5	0.4	2.37	
39.0	0.7	1.27	
40.5	0.25	2.09	
41.1	0	0	aq. veg out of water 0.1 height
42.7	0	0	
42.1	0.25	0.48	
42.3	0	0	LWE
53.6			LWP

5/12/04

CASCADE TR-2 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
4.4	0	0	RWE
6.0	0.9	0.5	
7.5	0.8	1.46	
9.0	0.9	0.37	behind rock
10.0	0.85	0.32	
8.5	0.8	1.01	NOTE: OUT of ORDER
10.7	0.7	0.5	edge
10.9	0	0	} kummock
13.5	0	0	} height = 0.2
14.2	0.45	0.13	
14.7	0.45	1.63	rock channel running 45° from x-section
16.0	0.9	0.44	
16.7	0.75	1.90	
17.7	1.05	0.02	behind grassy island
18.2	1.0	0.9	
19.2	0.5	0.47	
20.2	0.6	1.01	
21.2	0.8	1.97	
21.6	0	0	bottom of island hummock
22.7	0	0	height = 0.3
23.6	0.3	0.16	

Continued →

(CONTINUED) 05/12/04

CASCADE TR-2 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
25	1.55	2.69	
26.5	0.8	0.30	
25.5	1.6	0.75	NOTE: OUT of ORDER
27.5	1.2	3.47	
29.0	1.0	2.56	
30.5	0.25	2.21	top of boulder
32.0	0.15	1.37	top of boulder. edge at 33.2 depth = 0.1
33.7	1.15	1.24	
35.0	1.15	2.08	
36.5	0.85	1.88	
38.0	0.85	2.42	
39.5	1.65	1.99	
40.5	1.45	1.52	
41.5	0.35	0.27	top of rock dog to
43.0	0.3	3.01	drops off at 44.5'
44.16	1.15	0.32	
44.0	0.45	1.58	NOTE: OUT OF ORDER
46.0	1.4	0.48	behind grass (RCG)
47.5	0.7	1.45	
48.5	0.4	0.98	NOTE: OUT OF ORDER
46.5	0.95	1.36	
49.5	0.2	0.36	
50.6	0	0	LWE
67.0			LWP

CASCADE TR-1 DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
5.3			RWE
6.0	1.2	-0.22	
7.0	1.5	-0.1	
8.0	1.5	0.92	
9.5	1.7	1.40	
11.0	1.8	0.22	
12.5	1.5	0.05	behind grass
13.5	0.9	0.11	
14.5	0.55	2.90	
~~15.5~~ 16.0	1.3	0.06	underneath rock
17.0	0	0	Rock height = 0.3
18.0	0	0	
16.7	1.1	0.28	NOTE: OUT OF ORDER
19.0	0.75	1.58	
20.5	0.5	2.65	
22.0	1.35	1.39	
23.5	1.25	1.74	
25.0	1.7	1.94	
~~25.5~~	~~0.7~~		
26.0	1.6	2.19	
28.0	1.5	0.72	
29.5	1.3	-0.03	

continued →

(Continued) 05/12/04

CASCADE TR-1, DISCHARGE

STA	DEPTH	VELOCITY	COMMENTS
29	1.3	0.99	NOTE: OUT OF ORDER
30.5	0.45	0.89	
32.0	0.5	0.35	behind grass
33.0	0.55	1.39	
34.0	0.15		on top of rock
35.	0.5	2.16	on top of rock
36.5	1.1	2.01	
38.0	1.0	1.28	
39.5	0.65	0.62	RCG
41.0	0.8	0.35	
42.	0.4	0.11	
42.8	0	0	R LWE
55.0			LWP

CFY ROLL 3

PHOTO LOG 05/12/04

21. WMS CASCADE, TR-1 LB to RB
22. WMS CASCADE, TR-1 RB to LB
23. WMS CASCADE: TR-1 upstream
24. WMS Cascade TR-1 downstream
25. WMS GLide TR3 looking from island to left bank
26. WMS Glide TR3 looking from island to Rt bank

MG ROLL 2

24. WM-5 Glide Island to LB TR3
23. WM-5 Glide Island to RB TR3
22. WM-5 Glide Island to RB TR2
21. WM-5 Glide Island to RB TR1 (flash)
20. WM-5 Glide TR1 Island to RB (flash)
19. " no flash
18. WM 5 Glide TR1 Island to LB
17. WM 5 Glide TR2 Island to LB

05/12/04

GLIDE LEVEL LOOP SURVEY

STA	BS	HI	FS	ELV
BM	3.96	103.96		100.00
TR1			5.08	98.88
TR2			5.05	98.91
TR3			5.46	98.50
(FP)				
TR3	5.20	103.70		98.50
TR2			4.80	98.53
TR1			4.83	98.87
BM			3.70	100

5/12/04

GLIDE WSE SURVEY

STA	BS	HI	FS	ELV
		103.70		
TR3 Left Side Rt Channel			9.07	94.63
			9.02	
TR3 Left Side Left Channel			9.16	94.54
TR2 Left Side middle			9.24	94.46
TR1 - Left Side middle			9.28	94.42
TR1 - Rt Side middle			9.17	94.53
TR2 - Rt Side middle			9.12	94.58
TR3 - Rt Side Left Channel			9.05	94.65
			9.16	
TR3 - Rt Side Rt. Channel			9.02	94.68

Lower Island Glide D&V 05/12/04

TR-1 Right Channel

STA	Depth	Vel	Notes
RWP= 1.0			Swoffer 3602
RWE= 7.7	0.0	0.0	Prop. 3A
8	.5	0.0	
9	1.95	1.11	
10	2.1	1.18	
11	2.05	1.12	
12	2.10	1.05	
13	2.15	1.26	
14	2.2	1.56	
15	2.25	1.55	
16	2.25	1.54	
17	2.35	1.47	
18	2.35	1.50	
19	2.35	1.46	
20	2.35	1.42	
21	2.35	1.51	
22	2.25	1.16	
23	2.15	1.14	
24	2.0	1.11	
25	2.05	.83	
26	2.00	.47	
27	2.0	.02	
28	1.95	.05	est. aq. veg.
29	1.90	.05	
30	1.65	.05	
31	1.40	0.0	
32	1.0		
33	.9		
34	.6		
35	1.3		
36	.80	0.0	
LWE= 36.8	0.0	0.0	
Mid p.h = 99.3			

Left Channel

RWE= 167.7	0.0	0.0	Marsh McBirney
169	.75	-.01	SW: 2005068
172	.90	.08	
176	0.	0	
177	.4	0	
180	.8	-.01	
183	.8	-.02	
186	1.3	-.01	
189	2.0	.01	
192	2.1	.01	

Glide TR-1 Conti. 05/12/04

Left channel

STA	Depth	Vel.	Notes
195	2.2	0	
198	1.95	-.04	
201	1.75	.06	
204	1.5	-.01	
206.4	.7	-.07	
LWE=207	0.0	0.0	
LWP=219.3			

Marsh McBirney
SN: 2005068

Glide TR-2 D.S.V 05/12/04

Left channel

STA	Depth	Vel.	Notes
LWP=207.4			
LWE=189.8	0.0	0.0	
189	0.9	.10	
187	1.65	.15	
185	2.0	.15	
183	2.0	.14	
181	1.8	.02	
179	1.7	-.02	
176	.85	-.01	
173	.9	-.01	
171	.7	-.03	
RWE=169.9	0.0	0.0	
Mid Pin = 94.4			
	Right channel		
LWE=36.2	0.0	0.0	
36	1.45	-.02	
35	1.8	-.07	
34	1.8	-.06	
33	1.95	-.02	
32	2.2	.06	
31	2.25	.72	
29	2.4	1.06	

Glide TR-2 cont'd 8/31/04

Right Channel

STA	Depth	Vel	Notes
39			
37			
35			
33	2.4	.48	
31	2.4	.78	
29	2.4	1.18	
27	2.4	1.55	
25	2.4	.71	
23	2.4	1.0	
21	2.3	.99	
19	2.2	.95	
17	2.15	.92	
15	1.2	.12	
13	1.25	0.0	
11	0.0	0.0	
RWE = 6.1			
LWE = 1.0			

Glide TR-2 8/31/04

Left Channel

STA	Depth	Vel	Notes
LWE = 187.1			
LWE = 126	0.0	0.0	way in channel
125	.65	.14	
123.3	0.0	0	
120.5	est. 6	—	
120.1	0.0	0.0	
119	.4	-.14	
117.5	0	0	
117	est. 4	0	
116	0	0	
114.5	.4	0	
112	.6	-.02	
110	1.0	-.03	
108	1.35	.17	
106	1.15	.21	
104	.75	.22	
102	.75	.35	
100	.30	-.04	
RWE = 96.2	0.0	0.0	
Mid Pin = 76.1		Right Channel	
LWE = 49.7	0.0	0.0	
49.5	1.25	.28	

W M - 5
"Rite in the Rain"
ALL WEATHER
LEVEL BOOK
No. 310 F

WM-5 May 04/05

	In	Out
Time	9:45	12:20
S.G	3.27	

Crew: M. Cegna
A. Weybright

weather: overcast, some rain, water colored by tannins (coffee/cola)

Equipment:

photo Log: Roll #1

(34) #22. Look u/s from gage
(33) #23: @ gage
(32) #24: Look u/s from top island (e riffle TR's)
(31) #25: Look d/s from top island (e cascade TR's)

Roll #2

(25) #1: Look u/s from cascade TR 3
(24) #2: Look d/s from cascade TR 3
(23) 3: R → L TR 1 cascade
(22) 4: R → L TR 2 Riffle

Photo Log (cont'd)
Roll #2

(21) #5: L → R TR 2 Riffle
(20) #6 u/s from
(19) 7.
(18) 8.
(17) 9:
(16) 10.

WM-5 Riffle Level Loop 05/04/05 KTO ✓ ✓

STA	BS	HI	FS	Elevation
BM	1.50			100.00
		101.50		
TR-3			2.77	98.73
TR-2			3.04	98.46
TR-1			3.54	97.96
Island control (FP)			4.11	97.39
Island control	4.40			97.39
		101.79		
TR-1			3.83	97.96
TR-2			3.34	98.45
TR-3			3.06	98.73
BM			1.79	100.00 ✓

WM-5 Riffle WSE 05/04/05 KTO ✓ ✓

STA	BS	HI	FS	Elevation
		101.79		
TR-3				
L			5.66	96.13
R			5.71	96.08
TR-2				
L			5.90	95.89
R			5.94	95.85
TR-1				
L			6.00	95.79
R			6.05	95.74
Island control				
left channel L			use 6.66	95.13
R			6.48	
right channel L			use 6.95	94.84
R				

05/04/05

WM-5 Cascade Level Loop

STA	BS	HI	FS	Elevn
BM	2.84			100.00
		102.84		
TR-1			7.37	95.51
TR2			5.12	97.72
TR-3			3.08	99.76
(TP)				
TR-3	2.87			99.76
		102.63		
TR-2			4.91	97.72
TR-1			7.12	95.51
BM			2.62	100.01 ✓ OK

WM-5 Cascade WSE 05/04/05

STA	BS	HI	FS	Elevn
		102.63		
TR-3				
L			5.52	97.11
R			5.38	97.25
M			5.46	97.17
TR-2				
L			6.76	95.87
R			6.45	96.18
M			6.71	95.92
TR-1				
L			9.27	93.36
R			9.28	93.35

WM-5 Cascade TR 05/04/05 KTOC

Sta	Depth	Vel	Cover	Comments
5.3	0.9	0.01	veg	RWE
6.0	1.18	-0.15	veg	
7.0	1.60	0.22		Downed pine 3' d/s
8.0	1.50	1.52		" " "
9.5	1.70	0.79	veg	" " "
11.0	1.40	0.14	veg	
12.5	1.40	0.31	veg	
13.5	0.80	-0.04	veg	
14.5	0.60	1.17		
15.5	1.10	2.57		
16.0	1.30	0.56		Flow @ 45° to TR
16.7	0.4		Bldr	
17.0	+0.05	0.0		17.0' WE of bldr — on bldr - out of water
19.7	0.0	0.0		19.7' WE of bldr
~~18.8~~	0.1	-0.01		edge of bldr
19.0	0.7	0.20		
20.5	0.4	2.55		
22.0	1.30	1.15		
23.5	1.70	2.07		
25.0	1.50	2.13		
26.0	1.60	2.16		
28.0	1.50	2.50 / 0.06	Bldr	
29.0	1.50	1.32		
29.5	0.30	2.36		
30.5	0.40	0.95	Bldr/veg	

Sta	Depth	Vel	Cover	Comments
32.0	0.4	0.59	veg	
33.0	0.8	0.60	veg	
34.0	0.0	0.0		top of bldr
35.0	0.4	2.26	veg	
35.1	1.2	2.06 / 0.32	bldr/veg	
36.5	0.9	1.60		" "
38.0	0.8	1.17		
39.5	0.5	0.05	veg	
41.0	0.7	0.45	veg	
42.0	0.4	0.01	veg	
~~42.8~~ 42.7	0.6	0.01	veg	
42.8	0.0	0.0		LEW

Instrument:
Marsh McBirney

WM-5 RIFFLE TR2 05/04/05

Discharge

Sta	Depth	Vel.	Cover	Comments
21.7	0.0	0.0		
22.0	0.4	0.01	veg	
23.5	0.65	0.01	veg	
24.0	0.35	0.01	veg	
24.6	0.0	0.0		grass island
26.0	+0.05	—		dry
27.4	0.6	0.01	veg	
29.0	0.6	0.01	veg	
30.0	0.2	0.01		
30.2	0.0	0.0		NE of rock
30.5	+0.2	—		dry - on rock
31.6	0.0	0.0		WE of rock
32.0	0.15	1.16	veg	
33.5	0.05	1.13		
34.0	0.25	0.24	bldr	edge rock
34.2	0.0	0.0		WE of rock
34.4	dry			
35.0	dry			
35.1	0.6	0.0		WE of rock
35.3	0.25	0.12		
37.0	0.25	0.06	veg/bldr	
38.0	0.50	0.80		
39.5	0.10	0.31	veg	

Sta	Depth	Vel.	Cover	Comments
41.5	0.40	0.56		
43.5	1.25	0.20	bldr	
45.4	1.55	1.22	bldr	between rocks
45.5	0.50	1.59		
47.0	0.20	1.20		
48.0	0.90	0.80		
50.0	1.25	1.26		
50.8	1.80	1.82		
51.8	2.0	2.0		
52.8	0.9	2.39		
54.0	1.40	2.66		
55.0	1.70	2.00		
56.5	1.10	2.37		
58.0	1.60	2.57		
60.0	1.60	0.90	bldr	
61.4	1.10	1.14		
63.0	1.10	0.32		
65.3	0.50	0.08		
66.1	0.0	0.0		

WM-5 Glide Lower Island Level Loop 05/04/05

STA	BS	HI	FS	Elevn
BM	4.35			100.00
		104.35		
TR-3			5.85	98.50
TR-2			5.44	98.91
TR-1			5.47	98.88
TR-1	5.62			98.88
		104.50		
TR-2			5.59	98.91
TR-3			6.00	98.50
BM			4.49	100.01

WM-5 Glide WSE 05/04/05

STA	BS	HI	FS	Elevn
		104.50		
TR-1				
Left channel L			m → 10.13	94.37
Left channel R				
Right channel L			10.03	
Right channel R			10.03	94.47
TR-2				
Left channel L			m → 10.12	94.38
Left channel R				
Right channel L			9.98	94.52
Right channel R			9.98	
TR-3				
Left channel L			10.00	94.50
Left channel R			9.95	
Right channel L			9.92	94.58
Right channel R			9.89	94.61
BM		4.50		100.00

WM-5 RUN TR-2 05/04/05 ✓

Discharge

RIGHT CHANNEL

Sta	Depth	Vel	Cover	Comments
6.2	0.0	0.06		RWE
7.0	0.9	0.01	veg	
9.0	2.0	0.15	veg	
11.0	2.05	0.29		
13.0	2.10	0.62		
15.0	2.20	1.02		
17.0	2.30	0.73		
19.0	2.30	1.10		
21.0	2.35	0.94		
23.0	2.35	0.55		
25.0	2.30	0.82		
27.0	2.30	0.53		
29.0	2.30	0.73		
31.0	2.10	0.01	veg	
32.0	2.00	0.01		
33.0	1.80	0.01		
34.0	1.70	0.01		
35.0	1.70	0.01		
36.0	1.35	0.01		LWE (cutbank) undercut bank 0.7'

LEFT CHANNEL DISCHARGE ✓

Sta	Depth	Vel	Cover	Comments
169.5	0.0	0.0		RWE
171.0	0.6	0.01	Veg	
173.0	0.8	0.01	Veg	
176.0	1.3	0.01	Veg	
179.0	1.6	0.01	Veg	
181.0	1.9	-0.06	Veg	
183.0	1.95	0.08		
185.0	1.90	0.10		
187.0	1.60	0.09		
189.0	0.80	0.05		
189.7	0.0	0.0		LWE

Instrument

Marsh McBirney