12-4-2009

Ex. 277-US-443

Mike Gagner
R2 Resource Consultants

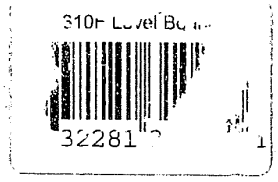
May 10, 2004
survey

1418.01

WM
10

WM-10

WEATHER
LEVEL BOOK
No. 310 F



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PAGE	REFERENCE	DATE

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

ALL-WEATHER
LEVEL BOOK

Name Mike Gagner
R2 Resource Consultants
Address 15250 NE 95 St.
Redmond, WA 98052
Phone 425/556-1288

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
Columnar	Columnar	Item No. 310	Item No. 310F

WM-10 Larkin Co. 04/15/04

Crew: M. Gegner
A. Weybright

	In	Out
Time	2:00	5:30
S.G.	0.87	0.87

Site Setup Only
No Measurements Made

Directions: From Chiloquin, take Sprague R. road NW out of town. After ~ ½ mile turn left onto Pine Ridge Road. Follow for ~ 3 miles to intersection with Pine Cone Rd. stay to the right and follow to bend in road with a large corral on the right. Turn right just past corral and follow to powerline crossing. Turn left at powerline crossing & follow under power-lines to Larkin Co.

WM-10 Photo Log 04/15/04

Photo #	Description
#21	looking d/s from above unit
#20	looking from Lt → Rt across channel
19	" from Rt → Lt " "
~~18~~	" u/s from ~~bot~~ below unit
17	" u/s from bottom of unit
16	TR-1 looking Lt → Rt
15	TR-2 " "
14	TR-3 " "
13	looking d/s from top of unit
12	" u/s from bottom
11	TR-1 & 2 looking Rt → Lt
10	TR-3 Rt → Lt
9	looking d/s from upper end of unit

WM-10 Larkin Cr. 04/15/04

Unit Selection (4, 5, 7)

Pool 1200 x .4 = 480 ft
Riffle 1200 x .5 = 600 ft
Run 1200 x .7 = 840 ft

Transect Selection

Pool Unit (2, 4, 6)

Unit Length = 20.0

20 x .4 = 8'
20 x .2 = 4'
20 x .6 = 12'

> measured u/s from start of unit

Riffle Unit (2, 6, 9)

Unit length = 81'

81 x .2 = 16'
81 x .6 = 48.6'
81 x .9 = 72.9'

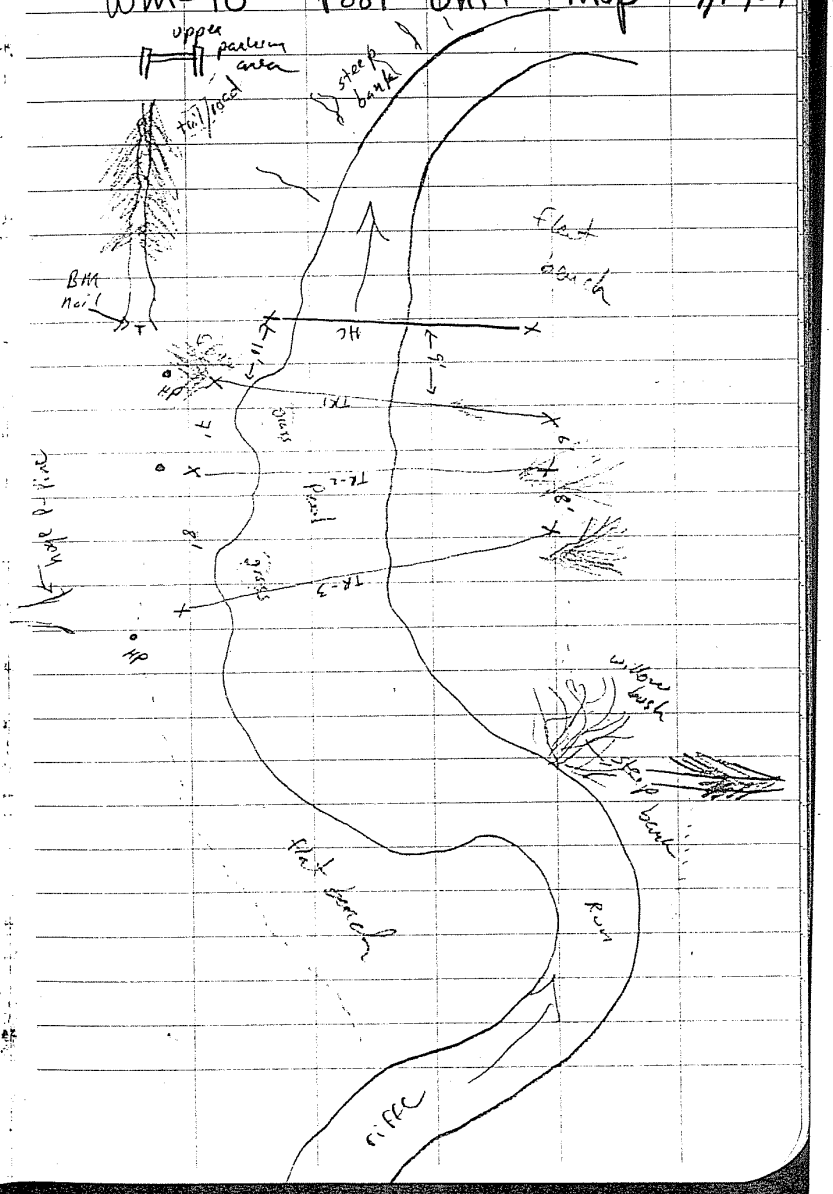
> measured u/s from start of unit

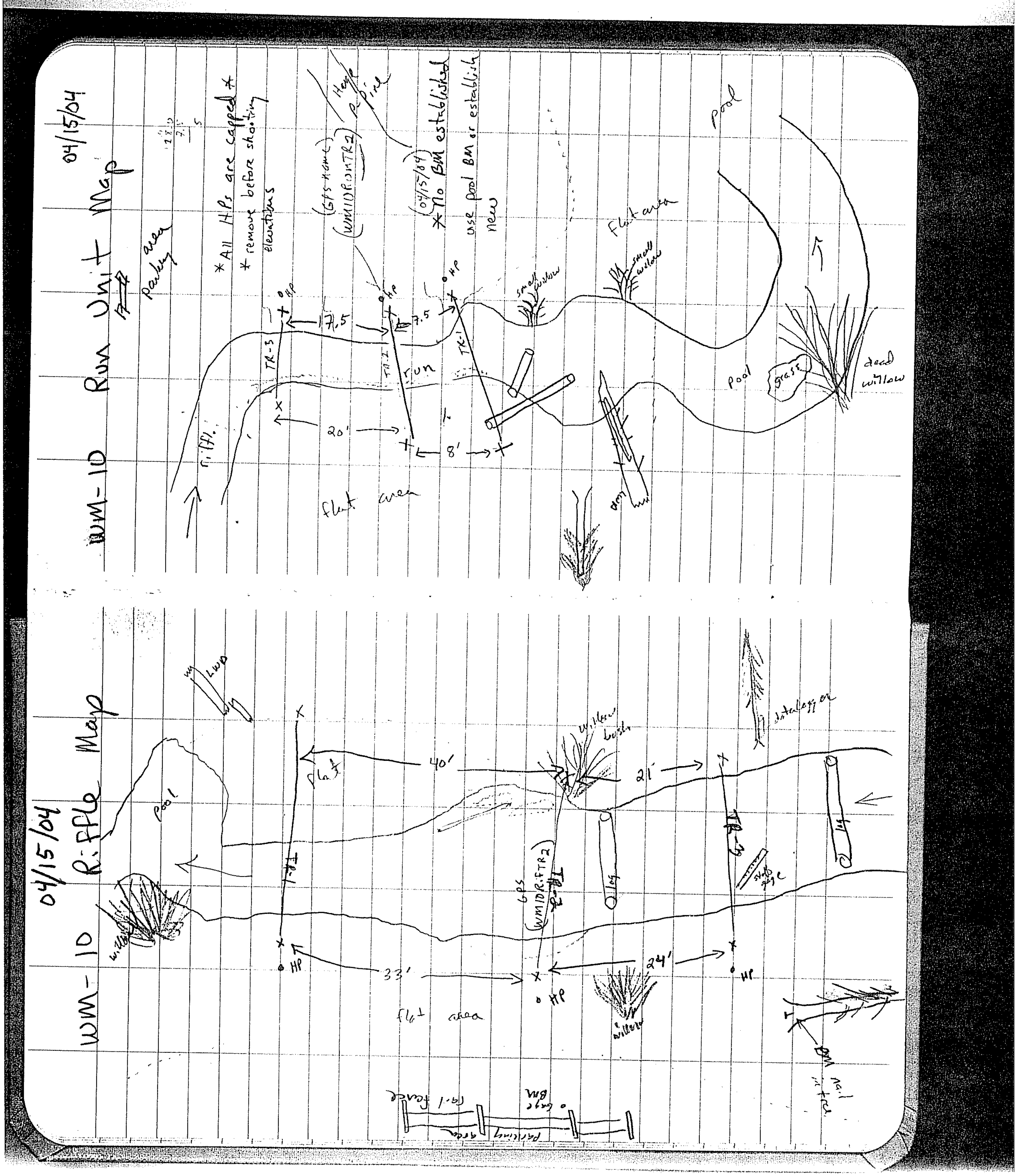
Run Unit unit length 40' (2, 7, 9)

40 x .7 28'
40 x .2 8'
40 x .9 = 36'

> measured d/s from start of unit

WM-10 Pool Unit Map 4/15/04




WM-1D Run Unit Map
04/15/04
* All HPs are capped *
* remove before shooting elevations
(GPS-name) (WM1DRUNTR2)
(04/15/04) * No BM established
use pool BM or establish new
parking area
pool
flat area
small willow
run
riffle
pool
grass
dead willow
TR-1
TR-2
TR-3
HP
17.5
7.5
20'
8'
flat area
WM-1D Riffle Map
04/15/04
pool
LWD
flat
40'
21'
willow bush
datalogger
log
staff gage
GPS (WM1DRIFTR2)
willow
HP
33'
24'
flat area
willow
BM nail in tree
rail fence
gage BM
parking area

5/10/04 Larkin Cr WM10

Cloudy, earlier precip., windy

Crew C. Yoder, A. Weybright

	IN	OUT
TIME	8.45am	2:30pm
S.G.	0.84'	0.84'

Equipment: Swoffer #4087
propellor 1A
Calibration #186

Photo Log

ROLL 1

24. TR3 LB to RB (Riffle)
23. TR2 LB to RB
22. ~~TR1~~ LB to RB WRONG
WRONG LABELING
21. TR1 LB to RB
20. RIFFLE upstream
19. TR1 upstream
18. TR1 downstream
17. TR1 RB to LB
16. TR2 RB to LB
15. TR2 downstream
14. TR2 upstream
13. TR3 RB to LB
12. TR3 downstream
11. TR3 upstream
10. TR3 (Run) RB -> LB
9 TR2 (Run) RB -> LB
8. TR1 (Run) RB -> LB
7. TR1 (Run) Upstream below TR1
~~6. TR3 (Run)~~
6. TR1 (Run) LB -> RB
5. TR2 (Run) LB to RB
4. TR3 (Run) LB to RB
(continued in couple of Pages)

Level Loop Survey 5/10/04

Riffle Unit

STA	BS	HI	FS	ELV
BM	3.11	103.11		100
TR1			4.49	98.62
TR2			4.53	98.58
TR3			4.14	98.97
TP				
TR3	4.00	102.97		9897
TR2			4.40	98.57
TR1			4.37	98.60
BM			2.98	99.99

WSE Survey (RIFFLE)

STA	BS	HI	FS	ELV
		102.97		
TR1-L			5.54	97.43
TR1-R			5.55	97.42
TR2-L			5.23	97.74
TR2-R			5.25	97.72
TR3-L			4.91	98.06
TR3-R			4.87	98.1

Level Loop Survey 5/10/04
WM 10 RUN / POOL

STA	BS	HI	FS	ELV
BM	4.46	104.46		100
TR1-P			7.65	96.81
TR2-P			8.15	96.31
TR3-P			7.44	97.02
TR1-Run			7.35	97.11
TR2-Run			6.15	98.31
TR3-Run			4.01	100.45
(TP)				
TR3-Run	3.90	104.35		100.45
TR2-Run			6.04	98.31
TR1-Run			7.24	97.11

STA	BS	HI	FS	ELV
TR3-P			7.32	97.03
TR2-P			8.04	96.31
TR1-P			7.54	96.81
BM			4.35	100.00

WSE Survey Run/Pool 05/10/04

STA	BS	HI	FS	ELV
		104.35	104.34	
TR1-Run L			10.02	94.33
TR1-Run R			10.03	94.32
TR2-Run L			9.84	94.51
TR2-Run R			9.76	94.59
TR3-Run L			9.55	94.8
TR3-Run R			9.56	94.79
TR1-P L			10.38	93.97
TR1-P R			10.37	93.98
TR2-P L			10.36	93.99
TR2-P R			10.35	94.00

STA	BS	HI	FS	ELV	
TR3-P L			10.34	94.01	
TR3-P R			10.34	94.01	
HC-L		1'	10.38	93.97	1.3
HC-R			10.39	93.96	

Photo Log (continued) 05/10/04

3. Run Looking downstream
2. TR3 Pool LB to RB
1. TR2 Pool LB to RB

ROLL 2 CFU

1.0 TR1 LB to RB (Pool)
2. TR1 LB to RB (Pool)
3. Hydraulic Control, LB to RB
4. Pool looking upstream from TR1
5. Hydraulic Control RB to LB
6. TR1 RB to LB
7. TR2 RB to LB
8. TR3 RB to LB
9. Pool looking downstream from above TR3
10. Staff Gage

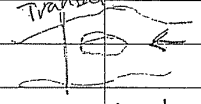
Hydraulic Control

STA	DEPTH	COMMENTS
LB34.8		LWP
26.0		LWE
25.5	0.7	
25.0	0.9	
24.5	1.3	
24.0	1.3	
23.5	1.2	
23.0	1.1	
22.5	1.1	
22.0	1.1	
21.5	1.1	
21.0	1.1	
20.5	1.1	
20.0	1.0	
19.5	0.8	
19.0	0.3	
18.4	0.2	RWE
18.0	0.2	RWP
24.7	1.3	

Discharge Survey 05/10/04

POOL Transect 10

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
17.8	0	0	RWE grassy on edge
18.3	0.3	0	
18.8	0.3	0	
19.3	0.5	0.05	edge of grass
19.8	1.3	0.71	
20.3	1.4	1.40	
20.8	1.4	1.44	
21.3	1.5	1.52	
21.8	1.5	1.74	
22.3	1.4	1.84	from sta 22.8 to 24.8 Sm. grass island in front of transect about 2½' long by about 2' wide
22.8	1.4	0.37	
23.3	1.4	0.09	
22.5	1.4	1.83	NOTE
23.8	1.3	0.05	
~~24.3~~ ~~23.3~~	1.3	0.05	
24.8	1.1	0.05	left edge of island
25.3	1.0	0.48	
25.8	1.0	0.87	
26.3	0.8	0.46	(grass) vegetation
~~26.8~~	0.4	0.1	estimated
27.3	0.1	0	
27.6	0	0	LWE
31.3			LWP



POOL TRANSECT 2

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
12.9	0	0	RWE grassy marsh area
13.4	0.1	0	
13.9	0.1	0	
14.4	0.2	0	
14.9	0.3	0	
15.4	0.4	0	
15.9	0.5	0	
16.4	0.4	0	
16.9	1.3	0	edge of grassy marsh area
17.3	1.5	0.53	
17.8	1.4	0.75	
18.3	1.4	1.14	
18.8	1.5	1.35	
19.3	1.5	1.49	
19.8	1.6	1.59	
20.3	1.6	1.45	
20.8	1.6	1.63	
21.33	1.5	1.09	
21.8	1.5	0.73	
22.3	1.4	0.21	
22.8	1.3	~~0~~ 0.02	
23.3	1.3	0.02	
23.8	1.2	0.02	
24.3	0.9	-.1	
24.8	0.3	0	

STA	Depth	Velocity	
25.2	0	0	RWE
30.9			RWP

Vegetation (grass) Est. velocity grass

POOL TRANSECT 3 05/10/04

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
9.0	0	0	RWE
9.5	0.1	0	grassy marsh area
10.0	0.1	0	
10.5	0.2	0	
11.0	0.2	0	
11.5	0.3	0	
12.0	0.5	0	edge of grassy marsh area
12.5	0.9	0	
13.0	1.0	0	
13.5	1.1	0.23	
14.0	1.1	0.57	
14.5	1.3	1.01	
15.0	1.4	1.23	
15.5	1.4	1.55	
16.0	1.5	1.66	
16.5	1.5	1.27	
17.0	1.5	~~0.96~~ 1.32	
17.5	1.5	1.04	
18.0	1.5	0.64	height 0.2 with grass height of 1'
18.1	1.0	0.1	grass island obstruction
19.6	0	0	
19.8	1.3		
20.3	1.3		
20.7	0	0	LWE
28.4			LWP

RUN TRANSECT 1

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
11.4	0		RWE
11.9	0.1	0	grass
12.4	0.2	0	grass
12.9	0.4	0.34	edge of grass
13.4	0.6	0.19	grass upstream
13.9	0.8	2.03	
14.4	0.8	3.11	
14.9	0.8	4.08	
15.4	0.8	4.76	
15.9	0.8	5.12	
16.4	0.7	4.70	
16.9	0.7	3.34	← in between 16.9 & 17.5
17.5	0.6	0.12	sm. wood (submerged)
17.9	0.5	+0.05	*estimated root
18.4	0.3	-.1	*estimated
18.9	0.2	-.05	
19.4	0.1	0	
19.9	0.1	0	
20.4	0.1	0	
20.9	0.2	0	
21.2	0	0	LWE
25.7			LWP

TRANSECT 2 RUN 05/10/04

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
10.2	0	0	RWE
10.7	0.1	0	grass
11.2	0.3	0.1	grass
11.7	0.4	0.2	*estimated, grass
11.8	...		grass ~~ends~~
12	0.7	1.17	grass ends
12.2	1.2	2.75	
12.7	1.1	3.65	
13.1	1.1	3.90	
13.5	0.8	4.11	
13.9	0.6	4.2	
14.3	0.6	3.93	
14.7	0.5	3.38	
15.1	0.3	0.98	
15.5	0.1	0.09	
15.9	0	0	LWE
21.9			LWP

RUN TRANSECT 3

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
7.0	0	0	RWE grass
7.5	0.4	0	grass
8.0	0.5	0.79	grass
8.5	0.5	~~1.70~~ 1.86	blades of grass touching prop
9.0	0.7	1.38	grass blades from upstream
9.5	0.8	1.26	sta 9.7 is edge of grass holding grass out of way
10.0	1.1	1.86	
10.5	1.2	1.76	
11.0	1.3	1.71	
11.5	1.2	1.67	
12.0	1.0	1.78	
12.5	0.8	1.78	
13.0	0.5	1.53	
13.5	0.4	1.11	
14.0	0.4	0.98	
14.5	0.2	0.35	algae edge
14.7	0	0	LWE undercut bay 0.2
20.45			LWP

RIFFLE TRANSECT 1 05/10/04

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
25.0	0	0	RWE
25.2	0.7	0	grass to sta 26.5
25.7	0.6	1.47	blades of grass interfering w/ prop
26.2	0.6	2.04	
26.7	0.75	2.85	
27.2	0.8*	2.89	
27.7	0.75	3.12	
28.2	0.7	2.94	
28.7	0.6	2.31	
29.2	0.5	2.54	
29.7	0.5	2.81	
30.2	0.6	1.82	
30.0	0.55	2.3	NOTE: out of order
30.6	0.6	0.93	grass blades from upstream
31.2	0.5	0.3	grass, *estimated vel
31.7	0.4	0.1	*estimated, grass
32	0.2	0	
32.1	0	0	LWE
37.1			LWP

RIFFLE TRANSECT 2

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
6.1	0	0	RWE
6.6	0.15	0.05*	back water area
7.1	0.2	0.05*	*est, grass
7.6	0.15	0.05*	
8.1	0.2	0.05*	
8.6	0.15	0.05*	flow going parallel to transect
9.1	0.2	0.05	flow going parallel to transect
9.6	0.3	0.05	flow parallel to transect
10.1	0.35	0.05	aquatic vegetation
10.6	0.4	0	sm. wood in between 10.6 & 11.4
11.4	0.5	0.83	
12.0	0.35	1.06	
12.5	0.35	1.14	
13.0	0.35	1.19	
13.5	0.35	1.31	
14.0	0.4	1.28	
14.5	0.5	1.11	
15.0	0.6	1.26	
15.6	0.7	1.57	grass interfering w/ prop.
16.0	0.8	2.05	
16.5	0.8	2.35	
17.0	0.85	2.01	
17.5	0.8	1.8	

Continued

RIFFLE TR 2 CONTD 05/10/04

STA	DEPTH	velocity	COMMENTS
18.0	0.85	1.57	
18.5	0.8	2.03	
19.0	0.7	1.32	grass
19.5	0.5	0.44	moved grass to take velocity
20	0.3	0	
20.5			LWE
25.4			LWP

RIFFLE TRANSECT 3

STA	DEPTH	VELOCITY	COMMENTS
1.0			RWP
4.4	0	0	RWE
4.9	0.2	0	aquatic veg.
5.4	0.35	0	aquatic veg
5.9	0.3	0.05 *	*estimated
6.4	0.3	0.7* est 0.6 ← velocity taken on surface	
6.9	0.35	0.05	vegetation in front
7.4	0.45	0.72	aquatic veg
7.9	0.55	0.78	
8.4	0.65	1.26	
8.9	0.65	1.72	
9.4	0.65	1.48	
9.9	0.7	1.41	
10.4	0.7	1.43	
10.9	0.7	1.36	
11.4	0.7	1.70	
11.9	0.7	1.41	
12.4	0.65	1.66	
12.9	0.65	1.68	
13.4	0.65	1.9	
13.9	0.7	1.35	eddy behind gage
14.4	0.7	0.74	
14.9	0.7	1.71	

Continued →

RIFFLE TRANSECT 3 (CONT'D) 05/10/04

STA	DEPTH	VELOCITY	COMMENTS
15.4	0.7	1.44	grass (kitting prop)
15.9	0.6	1.18	
16.4	0.35	0	
16.9	0.1	0	
17.0	0	0	LWE
22.45			LWP

WM-10

"Keep in the Race"

ALL-WEATHER

LEVEL BOOK

No. 310 F

6/24/64

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PAGE	REFERENCE	DATE

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

ALL-WEATHER
LEVEL BOOK

Name Mike Gagner
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Address 15250 NE 95 St.
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Phone 425/556-1288

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.

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Columnar	Columnar	Item No. 310	Item No. 310F

WM-10 Larkin Cr. 06/24/04
sunny and warm (high 82°F)
Crew: Adam Weybright
Glen Anderson

	IN	OUT	Mid
S.G. Reading	0.37	0.37	0.37
Time	9am	6pm	2:30pm

Level AP-7 Nikon # 316181

Swofer 3602
Prop. 3A
Cal # 181

24 Riffle R-L
25 Riffle D/S

Photo Log

Photo # (Roll #1)	Description	
1	Pool TR 2	L-R
2		R-L
3	Pool TR 1	R-L
4		L-R
5	Pool HC	L-R
6		R-L
7	Pool U/S	
8	Pool D/S	
9	Pool TR 3	L-R
10		R-L
11	Run TR 1	L-R
12		R-L
13	Run U/S	
14	Run TR 2	L-R
15		R-L
16	Run TR 3	L-R
17		R-L
18	Riffle TR 1	L-R
19		R-L
20	Riffle U/S	
21	TR 2	R-L
22		L-R
23	Riffle TR 3	L-R

Level Loop Survey 6/24/04
POOL / RUN

STA	BS	HI	FS	ELEV.	Notes
BM	5.58	105.58		100.00	Nail in tree
TR1 - P			8.77	96.81	
TR2 - P			9.27	96.31	
TR3 - P			8.56	97.02	
TR1 - Run			8.47	97.11	
TR-2 - Run			7.27	98.31	
TR3 - Run			5.14	100.44	
(TP)					
TR3 - Run	5.18	105.62		100.44	
TR-2 - Run			7.31	96.31	
TR-1 - Run			8.51	97.11	

STA	BS	HI	FS	ELEV
		105.62		
TR-3 P			8.60	97.02
TR-2 P			9.31	96.31
TR-1 P			8.81	96.81
BM			5.62	100.00

Pool X-sec 6/24/04

X-Sec HC Bank Survey

STA	BS	HI	FS	ELEV	Com.
38.1		105.62	8.06		
34.8			9.57		LWP
32.4			10.32		
30.0			10.65		
26.2			11.44		Top of Bank
25.8			12.17		LWE
NA			12.19		WSE center
19.0			12.19		RWE
18.4			11.97		
16.6			11.66		
13.0			11.57		
10.0			11.60		
9.0			11.65		
7.6			11.34		
4.0			10.34		Rotting stump.
2.0			10.73		
1.0			10.52		RWP
-7.4			9.52		

NOTE: Sub on banks all grass in organic soil.

Pool Bank Survey 6/24/04

TR 1

STA	BS	HI	FS	Note
-6.4		105.62	8.88	
1.0			10.77	RWP Base of Slope
1.5			11.14	
6.0			11.59	
10.0			11.60	
13.0			11.77	
17.0			11.82	
17.8			11.82	
19.2			12.24	RWE
NA			12.19	WSE - center
26.6			12.20	LWE
28.6			11.40	
29.6			11.22	
31.3			10.49	LWP
36.3			9.13	Base slope
40.6			7.51	

Sub.	%
Grass/organic	100

[small bush Willow (8'-13')]

[small bush 31' - 36']

Pool TR 1 Discharge 6/24/04

STA	Depth	Vel	Sub. Dom/Sub. %	Comments	Cover
26.3	0.35	0.06	3/2 80	fresh water muscles present	2
25.8	0.42	0.36	3/2 80		
25.3	0.50	0.25	3/2 80		2
24.8	0.55	0.18	3/2 80		2
24.3	0.60	⊖	2/3 60	behind Island	2
23.8	0.70	-0.04	2/3 60	"	2
23.3	0.82	⊖	2/3 60	"	2
22.8	0.85	0.42	3/4 60	"	2
22.5	0.85	0.82	3/4 60		2
22.3	0.90	0.81	3/4 60		2
21.8	0.90	0.80	3/4 60		2
21.3	0.95	0.74	3/4 60		
20.8	0.90	0.71	3/4 60		
20.3	0.83	0.64	3/4 60		
19.8	0.75	0.14	3/2 80		2
19.3	0.15	⊖	1 100		2

Pool TR2 Bank Survey 6/24/04

STA	BS	HI	FS	Elev	Dom/Sub.	Sub. %	
-7		105.62	9.00		3/1	70	grass in Sandy soil - all along bank
11			10.85		3/1	70	RWP
3.5			11.46		1/3	90	small alder [2'-6']
6.0			11.51		tall grass		
9.0			11.40				
11.0			11.79				
14.5			11.97				
15.4			12.25				RWE Grass marsh area
NA			12.19				WSE - center
24.4			12.20				LWE
25.3			11.59				top of bank
28.8			10.75				
31.2			10.28				
32.9			10.01		1/3	70	LWP Small bush [30'-32']
34.9			9.48		1/3	70	
38.9			7.90		3/1	80	

Pool TR2 Discharge 6/24/04

STA	D	V	Sub. Dom/Sub	%	Cover
15.9	0.20	0	1	100	4
16.4	0.10	0	1	100	4
16.9	0.75	0.02	2/1	70	2
17.3	0.85	0.17	2/1	70	2
17.8	0.92	0.29	2/1	60	2
18.3	0.90	0.44	3/4	80	4
18.8	0.90	0.50	3/4	60	4
19.3	0.95	0.59	4/3	60	4
19.8	1.00	0.68	4/3	60	4
20.3	1.00	0.71	4/3	60	4
20.8	1.00	0.58	4/3	60	4
21.3	0.97	0.22	4/3	60	4
21.8	0.90	-0.02	4/3	60	4
22.3	0.85	-0.02	3/4	60	4
22.8	0.80	-0.03	2/3	60	2
23.3	0.80	-0.02	2/3	60	2
23.8	0.70	-0.01	2/3	60	2
24.3	0.90	0.01	2/1	60	2

We have seen many Juvenile salmonids in this pool reach.

6/24/04

Pool TR3 Bank Survey

STA	BS	HI	FS	ELEV	Sub. Dom/sub	%		
-8		105.62	8.80		3/1	70		
1.0			11.19		3/1	60	RWP	Small alder @ [-3'-4']
4.0			11.60		1/3	90	Grass	
6.0			11.49		1	100	Grass	
9.0			11.75		1	100		
11.7			12.03		1	100		
12.0			12.18		1	100	RWE	
NA			12.17				WSE	
18.3			12.16		1/3	80	LWE	Island
18.6			11.86					
19.5			11.74					
19.6			12.17		1/3	80	RWE	Island
20.6			12.16		1/3	80	LWE	
21			11.60		1/3	80		Top of bank
21.6			11.44		1/3	95		
23.5			10.97		1	100		
28.4			10.38		3/1	60	LWP	
31.2			9.89		3/1	80	Inflexion point	
35.2			8.20		3/1	80		

6/24/04

Pool TR 3 Discharge

STA	D	V	Sub. Dom/Sub	%	Cover
13	~~0~~	~~0~~			
13.5	0.3	~~0~~	2/1	60	2
13.0	0.47	0.02	2/1	60	2
13.5	0.55	0.02	2/1	70	2
14.0	0.65	0.05	2/1	60	4
14.5	0.62	0.18	1/2	60	4
15.0	0.80	0.26	1/2	60	4
15.5	0.87	0.32	4/3	60	4
16.0	0.90	0.44	4/3	60	4
16.5	0.90	0.51	4/5	60	4
17.0	0.90	0.56	4/5	60	2
17.5	0.95	0.59	4/5	60	2
18.0	0.95	0.68	3/1	60	2
19.8	0.65	0.03	2/1	70	2
20.3	0.70	~~0~~	2/1	70	2
20.6	~~0~~	~~0~~			

Organic (muscles)

RUN TR 1 Bank Survey.

STA	BS	HI	FS	ELEV.	Sub Dim/Sub	%	Notes
-60*		105.62	9.69		3/1	70	toe of slope
-85*			4.40		3/1	70	on slope
1.0			11.13		1	100	Grass & Small willows
7.5							large woody debris cover
6.0			11.29		1	100	
9.0			11.46		1/3	80	
10.8			11.23		1/3	80	
11.5			11.40		1/3	80	
12.9			11.66		3/1	80	RWE
NA			11.65	93.97			WSE
18.7			11.62		3/4	70	LWE
21.1			11.61		2/3	80	
22.1			10.20		1/3	60	Top of bank
25.7			9.20		1/3	60	LWP
31.7			8.11		1/3	60	

* used on all Run transects as Rt bank

Run TR1 Discharge

12.9

RWE

STA	D	V	Dom/Sub %		CPU
13.4	0.25	-0.17	1/3	60	4
13.9	0.47	0.44	8	100	4
14.4	0.50	3.17	8	100	4
14.9	0.40	2.62	8	100	4
15.4	0.40	3.08	8	100	4
15.9	0.40	2.05	8	100	4
16.4	0.35	2.67	8	100	4
16.9	0.28	0.10	8	100	1
17.5	0.20	-0.06	8/3	70	1
17.9	0.15	-0.03	8/3	70	4
18.4	0.08	-0.01	3/8	60	4
18.7					

LWE

- Large woody debris just d/s of transect 15' - 17'

Root @ 16.9' - 17.5'

RUN TR 2 Bank Survey

STA	BS	HI	FS	ELEV	Dom/Sub.	%	
-60*		105.62	9.69		3/1	70	Large flat grass area w/ some small bushes and trees for ≈ 60' from headpin to sloped bank
-30			9.95		3/1	70	
-85*			4.40		3/1	70	
1			10.64		1	100	RWP
6			11.14		1	100	
8			10.94		1	100	
10			11.13		1	100	
11.2			11.43		1/2	80	RWE
NA			11.44		NA		WSE
15.1			11.45		8	100	LWE
16.1			10.98		8/3	70	[small bush (8'-20']
18.8			9.15		3/1	70	TOP of bank
21.0			8.78		3/1	70	
21.9			8.12		1/3	60	LWP
28			6.51		1/3	70	

RUN TR-2 Discharge

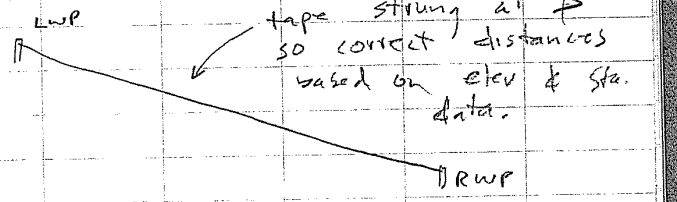
STA	D	V	Dom/Sub	Sub. %	Cover	
11.2	⊖	⊖			4	RWE
11.7	0.22	-0.01	1/2	80	2	
11.8	0.32	0.05	1/2	80	2	
12.0	0.65	0.39	3/4	60	4	
12.2	0.72	0.72	4/3	60	4	
12.7	0.70	2.01	8	100	4	
13.1	0.60	2.32	8	100	4	
13.5	0.40	2.40	8	100	4	
13.9	0.22	2.21	8	100	4	
14.3	0.18	1.38	8	100	4	
14.7	0.10	0.53	8	100	4	
15.1	⊖	⊖				LWE

Grass blocking velocity

⊀ 15° - Velocity measured at angle.
" " "
" " "
Velocity ⊥ again

RUN TR 3 Bank Survey

STA	BS	HI	FS	Elev	Dom/sub : %	
-85*		105.62	4.40		3/1 70	Marsh grass area w/ standing water
-60*			9.69		3/1 70	
-30			9.57		1/3 80	Grass
1.0			10.41		1 100	RWP Grass
4.8			10.42		1 100	
5.5			10.78		1 100	
7.0			10.85		1 100	Top of bank
8.4			11.40		3/1 70	RWE
NA			11.36		NA	WSE
12.8			11.36		8 100	LWE
14.5			10.97		8 100	toe of bank (undercut by .2')
14.6			10.15		3/1 80	top of bank
18.0			7.00		3/1 80	
20.45			5.92		3/1 80	LWP
25.5			3.00		1/3 70	



Run TR3 Discharge

STA	D	V	Sub. D/S	%	cov.	
8.4	~~0~~	~~0~~	—		—	RWE
8.5	0.05	0.05*	3/1	70	3	
9.0	0.18	0.44	3/1	70	3	
9.5	0.40	0.73	3/1	70	3	
10.0	0.57	1.13	3/4	70	3	
10.5	0.70	1.12	5/4	60	4	
11.0	0.73	1.21	8/5	60	4	
11.5	0.60	1.42	8	100	4	
12.0	0.33	1.58	8	100	2	
12.5	0.17	0.73	8	100	2	
12.8	~~0~~	~~0~~	—		—	LWE

* Estimated

6/24/04

Level Loop Riffle WM-10

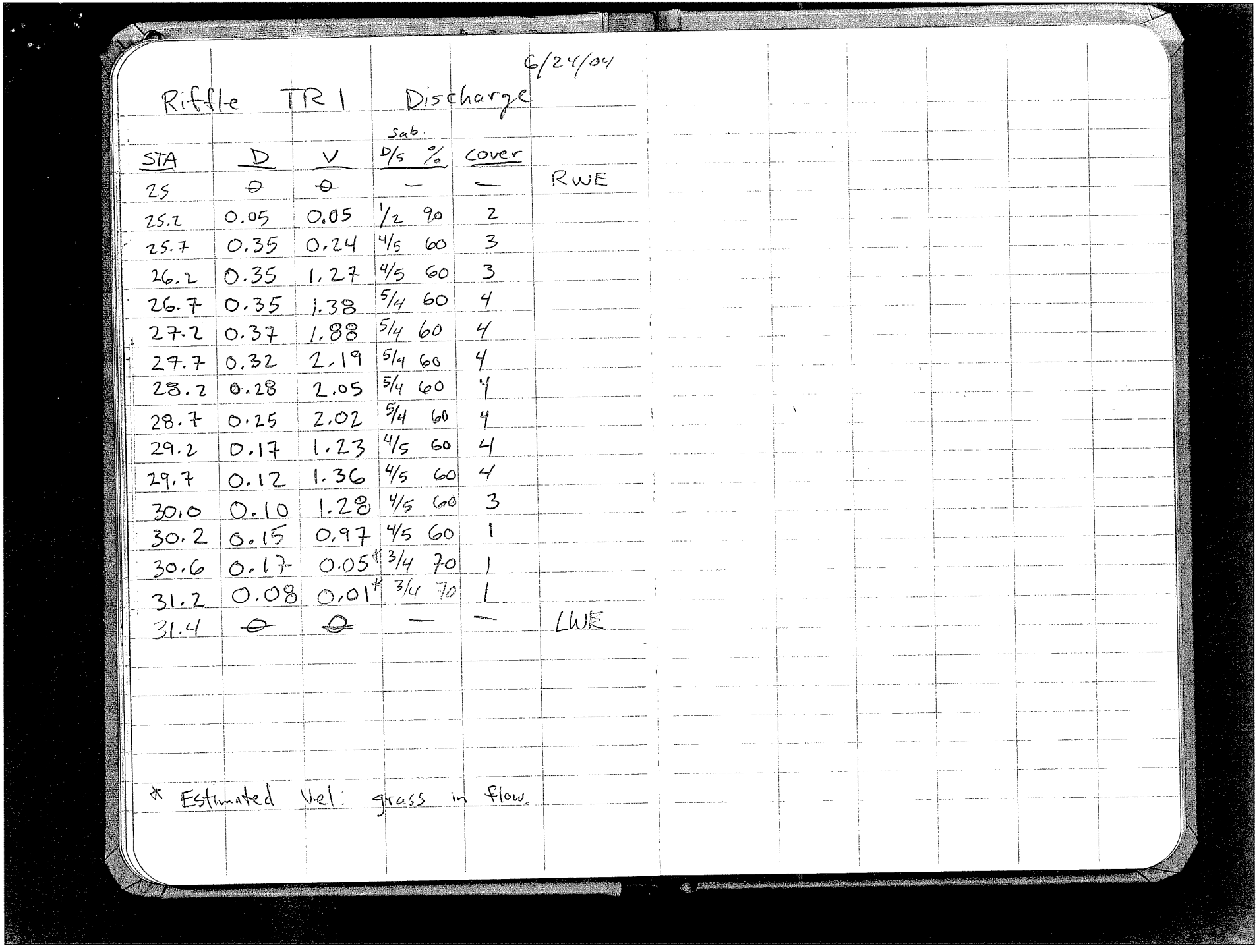
STA	BS	HI	FS	ELEV.	Notes
BM	7.76	107.76		100.00	Nail in root
TR1 - Riffle			9.14	98.62	
TR2			9.17	98.59	
TR3			8.78	98.98	
(TP)					
TR 1	9.32	107.94		98.62	
TR2			9.36	98.58	
TR3			8.96	98.98	
BM			7.94	100.00	

6/24/04

Riffle TR 1 Bank Survey

STA	BS	HI	FS	ELEV	sub. D/S	%	Notes
67		107.94	8.38		3/1	60	
56			9.66		3/1	60	
37.1			9.87		1/3	80	LWP Grass
32.5			10.26		1	100	Top of bank
32.0			10.81		1/4	80	Toe of bank
31.4			10.88		4/1	60	LWE
NA			10.87		NA		WSE
25.0			10.86		1	100	RWE Grass
24.8			10.71		1	100	Grass
20.0			10.63		1/2	80	
15.0			10.43		1	100	
10.0			10.40		1/2	90	
6.5			10.13		1	100	
1.0			7.69		1/3	80	RWP
-6.0			5.04		3/1	60	

30 + 37



6/24/04

Riffle TR1 Discharge

STA	D	V	Sub. D/S	%	cover	
25	~~0~~	~~0~~	—		—	RWE
25.2	0.05	0.05	1/2	90	2	
25.7	0.35	0.24	4/5	60	3	
26.2	0.35	1.27	4/5	60	3	
26.7	0.35	1.38	5/4	60	4	
27.2	0.37	1.88	5/4	60	4	
27.7	0.32	2.19	5/4	60	4	
28.2	0.28	2.05	5/4	60	4	
28.7	0.25	2.02	5/4	60	4	
29.2	0.17	1.23	4/5	60	4	
29.7	0.12	1.36	4/5	60	4	
30.0	0.10	1.28	4/5	60	3	
30.2	0.15	0.97	4/5	60	1	
30.6	0.17	0.05*	3/4	70	1	
31.2	0.08	0.01*	3/4	70	1	
31.4	~~0~~	~~0~~	—		—	LWE

* Estimated Vel: grass in flow.

Riffle TR 2 Bank Survey

STA	BS	HI	FS	Elev	sub. D/S	sub. %		
-2.5		107.94	5.90		1/3	80		Grass
1.0			7.13		1/3	80	RWP	Grass
3.8			9.38		1/3	70		
5.6			9.82		2/1	80		
7.8			10.51		2/1	90		
10.0			10.49		2/1	80		
11.2			10.52		2/1	60	RWE	
NA			10.52		NA		WSE	
19.7			10.51		1/2	80	LWE	"
20.7			10.28		1	100		Grass
25.4			9.87		1	100	LWP	"
42.4			8.74		3/1	80		
52.4			7.10		3/1	80		

6/24/04

Riffle TR 2 Discharge

STA	D	V	Sub. O/S	%	Cover	
11.2	0	0	—		—	RWE
11.4	0.10	0	3/5	60	2	
12.0	0.05	0.03	5/3	55	2	
12.5	0.02	0	5/4	70	4	
13.0	0.02	0	5/4	70	4	
13.5	0.02	0	5/4	70	4	
14.0	0.08	0.05	5/4	70	4	
14.5	0.17	-0.01	3/4	60	4	
15.0	0.28	0.05	3/4	70	4	
15.6	0.40	0.84	3/4	60	4	
16.0	0.45	1.44	4/5	60	4	
16.5	0.50	1.23	5/4	60	4	
17.0	0.52	1.46	5/4	60	4	
17.5	0.52	1.13	5/4	60	4	
18.0	0.50	1.04	5/4	60	4	
18.5	0.40	0.94	5/4	60	4	
19.0	0.35	0.47	3/4	60	4	
19.5	0.12	-0.01	1/2	90	3	
19.7	0	0	—		—	LWE

6/24/04

22.5
20

Riffle TR 3 Bank Survey

STA	BS	HI	FS	ELEV	Sub. D/S	Sub. %	Notes
-4.0		107.94	5.35		1/3	90	
1.0			7.44		1/3	90	RWP
3.5			9.50		2/1	70	
4.5			9.94		2/1	70	
7.6			10.27		1/2	70	RWE
NA			10.26		NA		WSE - Center Stream
16.2			10.35		3/1	60	LWE
17.2			9.96		1/2	80	Grass
18.2			9.61		1	100	Top of bank Grass
22.45			9.39		1	100	LWP
42.5			8.56		1/3	60	
57.5			6.42		3/1	70	

Riffle TR 3 Discharge 6/24/04

STA	D	V	Sub D/s %	Cover	Notes
7.6	~~0~~	~~0~~	—	—	RWE
7.9	0.1	0.1	8/2 60	4	
8.4	0.22	1.38	4/5 60	4	
8.9	0.22	1.89	4/5 60	4	
9.4	0.25	1.79	4/5 60	4	
9.9	0.25	1.81	4/5 60	4	
10.4	0.30	1.30	4/5 60	4	
10.9	0.25	0.89	4/5 60	4	
11.4	0.27	1.53	4/5 60	4	
11.9	0.28	1.62	4/5 60	4	
12.4	0.27	1.56	4/5 60	4	
12.9	0.25	1.49	4/5 60	4	
13.4	0.22	1.81	4/5 60	4	
13.9	0.22	0.82	4/5 60	4	
14.4	0.25	1.00	4/5 70	4	
14.9	0.22	1.00	4/5 70	4	
15.4	0.15	0.05*	4/3 60	2	* Estimated due to grass
15.9	0.10	~~0~~	3/4 70	2	
16.2	~~0~~	~~0~~	—	—	

WM-10

"Rite on the Rain"

ALL-WEATHER

LEVEL BOOK

No. 310 F

8/17/04

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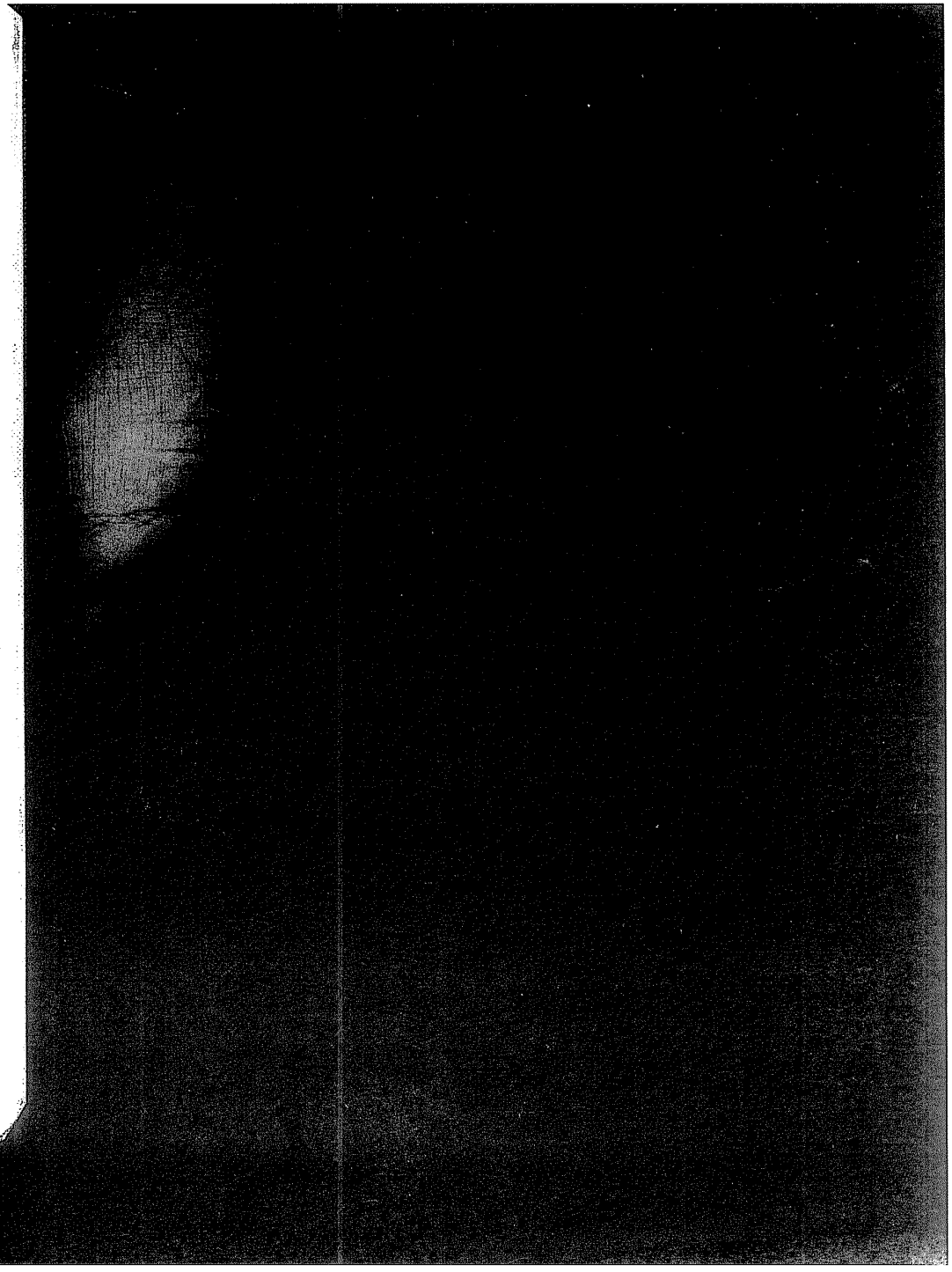


WM-10 LARKIN CREEK 9/17/04

	IN	OUT
TIME	9:30am	4:30
S.G.	0.44	0.44

CREW: A. Weybright
C. Yoder

WEATHER: Sunny, few clouds, no wind

EQUIPMENT:
Swoffer 4099 Prop IA
Cal #136

PHOTO LOG CY ROLL #1

1	25	WM10	POOL	HC	LB to RB
1	24	WM10	POOL	HC	Downstream
2.	23	WM10	POOL	TR1	LB to RB
?.	22	WM10	POOL	TR1	upstream
1	21		POOL	TR2	downstream
1	20		POOL	TR3	LB to RB
1	19		POOL	TR3	upstream
1	18		RUN	TR1	LB → RB
1	17		RUN	TR1	Downstream
1	16		RUN	TR2	UPStream
1	15		RUN	TR2	RB to LB
1	14		RUN	TR3	Downstream
1	13		RUN	TR3	LB to RB
1	12	WM-10	Riffle	TR1	upstream
1	11		Riffle	TR1	RB to LB
1	10		Riffle	TR2	LB to RB
1	9		Riffle	TR2	downstream
1	8		Riffle	TR2	upstream
1	7		Riffle	TR3	LB to RB
1	6		Riffle	TR3	downstream
?.	5		Larkin	Pressure	Transducer
?.	4		Larkin	Staff	Gage

RUN/.
POOL LEVEL LOOP SURVEY

8/17/04

STA	BS	HI	FS	ELV	ROD
BM	5.88	105.88		100.00	
TR1-P			9.06	96.82	
TR2-P			9.57	96.31	
TR3-P			8.85	97.03	
TR1-R			8.78	97.10	
TR2-R			7.57	98.31	
TR3-R			5.44	100.44	
TP					
TR3-R	5.24	105.68		100.44	
TR2-R			7.38	98.30	
TR1-R			8.58	97.10	

STA	BS	HI	FS	ELV	ROD
TR3-P		105.68	8.66	97.02	
TR2-P			9.38	96.30	
TR1-P			8.87	96.81	
BM			5.68	100.00	

POOL/RUN: WATER SURFACE ELV

8/17/04

STA	BS	HI	FS	ELV	ROD
		105.68			
TR1-P(L) (side channel)			12.15	93.53	
TR1-P(R)			12.16	93.52	
TR2-P(L) (side channel)			12.14	93.54	
TR2-P(R)			12.14	93.54	
TR3-P(L)			12.14	93.54	
TR3-P(R)			12.13	93.55	
			~~12.14~~	~~93.54~~	
TR1-R(L)			11.62	94.06	
			~~12.13~~	~~93.55~~	
TR1-R(R)			11.66	94.02	
			~~11.62~~	~~94.06~~	
TR2-R(L)			11.45	94.23	
			~~11.66~~	~~94.02~~	
TR2-R(R)			11.46	94.22	

POOL

RUN

STA	BS	HI	FS	ELV	ROD
		105.68			
TR3-R(L)			11.37	94.31	
TR3-R(R)			11.38	94.30	
HC-L			12.16	93.52	
HC-R			12.16	93.52	
downstream of ~~TR~~ HC ~60'			13.23	93.47	1.02
upstream of TR3-R ~50'			11.60	94.59	0.51

HYDRAULIC CONTROL 8/17/04

STA	DEPTH	COMMENTS
18.4		DRY
18.9	0	RWE
19	~~0.05~~ 0.05	
19.5	0.5	
20	0.5	
20.5	0.6	
21.0	0.53	
21.5	0.62	
22.0	0.7	
22.5	0.7	
23.0	0.75	
23.5	0.8	
24.0	0.82	
24.5	0.82	
25.0	0.8	
25.65	0.2	
~~25.6~~	0	LWE
26.0		DRY

POOL TRI VELOCITIES 8/17/04

18.9 0 0 RWE

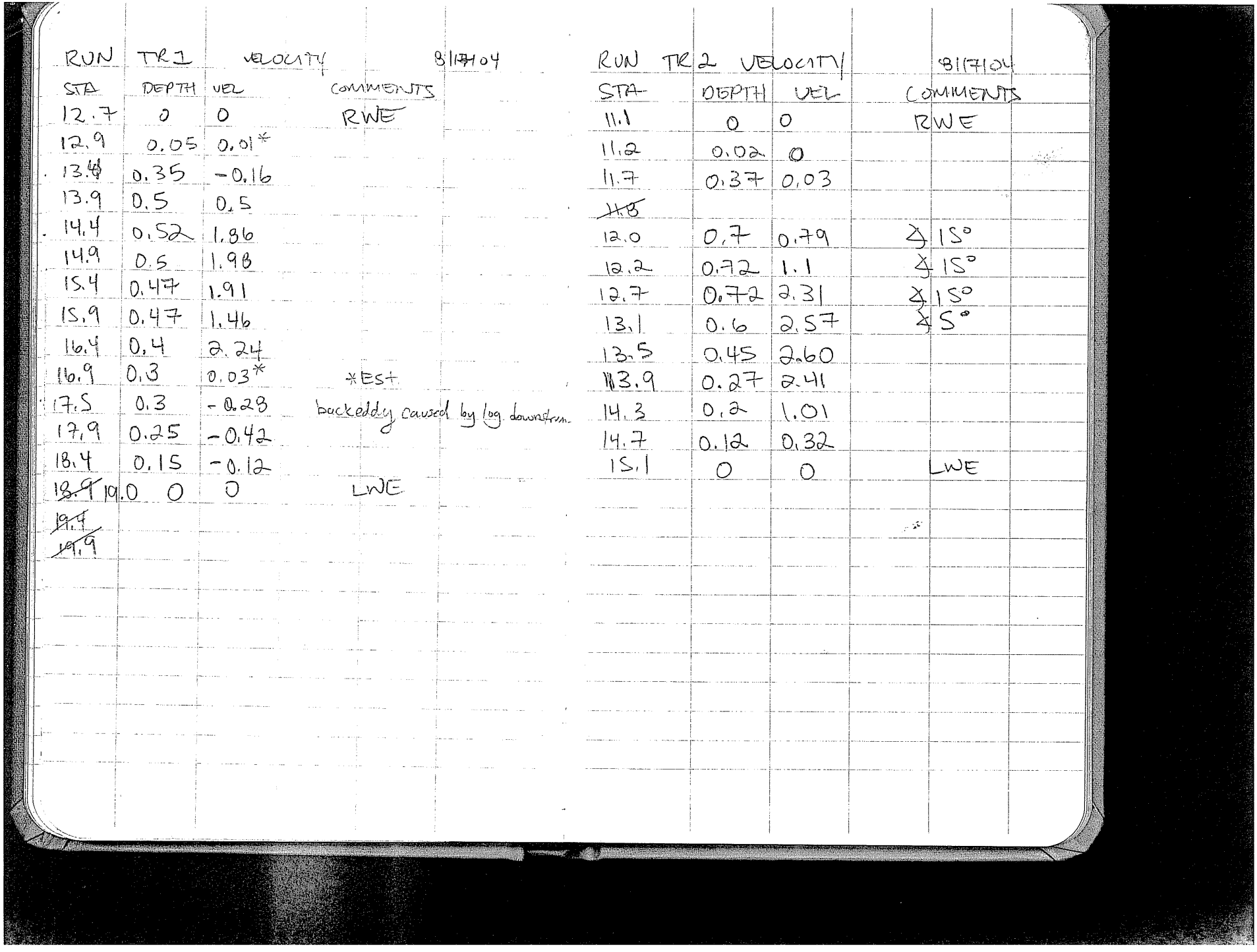
STA	DEPTH	VEL	COMMENTS
19.3	0.43	0.05*	*EST
19.8	0.92	0.76	
20.3	0.95	1.05	
20.8	0.95	1.08	
21.3	0.95	0.88	
21.8	0.95	0.86	
22.3	0.95	0.90	
22.5	0.97	0.92	
22.8	0.93	0.94	
23.3	0.97	0.07	behind grassy island
23.8	0.90	-0.01*	*EST.
24.3	0.73	0.10	
24.8	0.65	0.57	
25.3	0.62	0.51	
25.8	0.55	0.24	
26.3	0.45	0.01*	*EST.
26.5	0	0	LWE

POOL TR 2 VELOCITY 8/17/04

~~STA DEPTH~~	DEPTH	VEL	COMMENTS
15.6	0	0	RWE
15.9	0.3	0.01*	
16.4	0.28	0.01*	Veg
16.9	0.95	0.13	
17.3	1.0	0.28	
17.8	0.95	0.55	
18.3	0.95	0.58	
18.8	0.95	0.68	
19.3	1.02	0.72	
19.8	1.05	0.80	
20.3	1.1	0.79	
20.8	1.05	0.27	
21.3	1.03	0.17	flow not perpendicular <20°c
21.8	0.95	0.08*	< 60° (*Est)
22.3	0.93	0.08*	< 45°
22.8	0.9	0.05*	<20* EST.
23.3	0.82	0.03*	
23.8	0.75	0.03*	
24.3	0.05	0.01	
24.6	0	0	LWE

POOL TR 3 VELOCITY 8/17/04

STA	DEPTH	VEL	COMMENTS
9			
9.5			MUD/VEG
10.0			↓
10.5			
11.0			
11.5			
12.0	0	0	RWE
12.5	0.4	0.01	
13.0	0.6	0.05*	*EST.
13.5	0.65	0.1*	
14.0	0.73	0.25	
14.5	0.85	0.47	
15.0	0.85	0.55	
15.5	0.92	0.59	
16.0	0.98	0.66	
16.5	1.0	0.69	
17.0	1.02	0.69	
17.5	1.05	0.55	
~~18.0~~ 17.9	1.02	0.46	
~~18.1~~ 18.0	0	0	Grass Island edge H=0.4
19.7	0	0	
19.8	0.8	.01*	
20.3	0.75	.01*	
20.5	0	0	LWE



RUN TR1 VELOCITY 8/17/04

STA	DEPTH	VEL	COMMENTS
12.7	0	0	RWE
12.9	0.05	0.01*	
13.4	0.35	-0.16	
13.9	0.5	0.5	
14.4	0.52	1.86	
14.9	0.5	1.98	
15.4	0.47	1.91	
15.9	0.47	1.46	
16.4	0.4	2.24	
16.9	0.3	0.03*	*Est
17.5	0.3	-0.28	backeddy caused by log downstrm.
17.9	0.25	-0.42	
18.4	0.15	-0.12	
~~18.9~~ 19.0	0	0	LWE
~~19.4~~			
~~19.9~~			

RUN TR2 VELOCITY 8/17/04

STA	DEPTH	VEL	COMMENTS
11.1	0	0	RWE
11.2	0.02	0	
11.7	0.37	0.03	
~~11.8~~			
12.0	0.7	0.79	∠ 15°
12.2	0.72	1.1	∠ 15°
12.7	0.72	2.31	∠ 15°
13.1	0.6	2.57	∠ 5°
13.5	0.45	2.60	
13.9	0.27	2.41	
14.3	0.2	1.01	
14.7	0.12	0.32	
15.1	0	0	LWE

RUN TR3 8/17/04

STA	DEPTH	VEL	COMMENTS
8.0	0	0	RWE
8.5	0.12	*0.03	*EST.
9.0	0.25	*0.05	
9.5	0.43	0.19	
10.0	0.60	1.08	
10.5	0.75	1.45	
11.0	0.75	1.34	
11.5	0.7	1.49	
12.0	0.5	1.65	
12.5	0.27	1.16	
13.0			
13.5			
14.0			
13.1	0	0	LWE

RIFFLE LEVEL LOOP 8/17/04

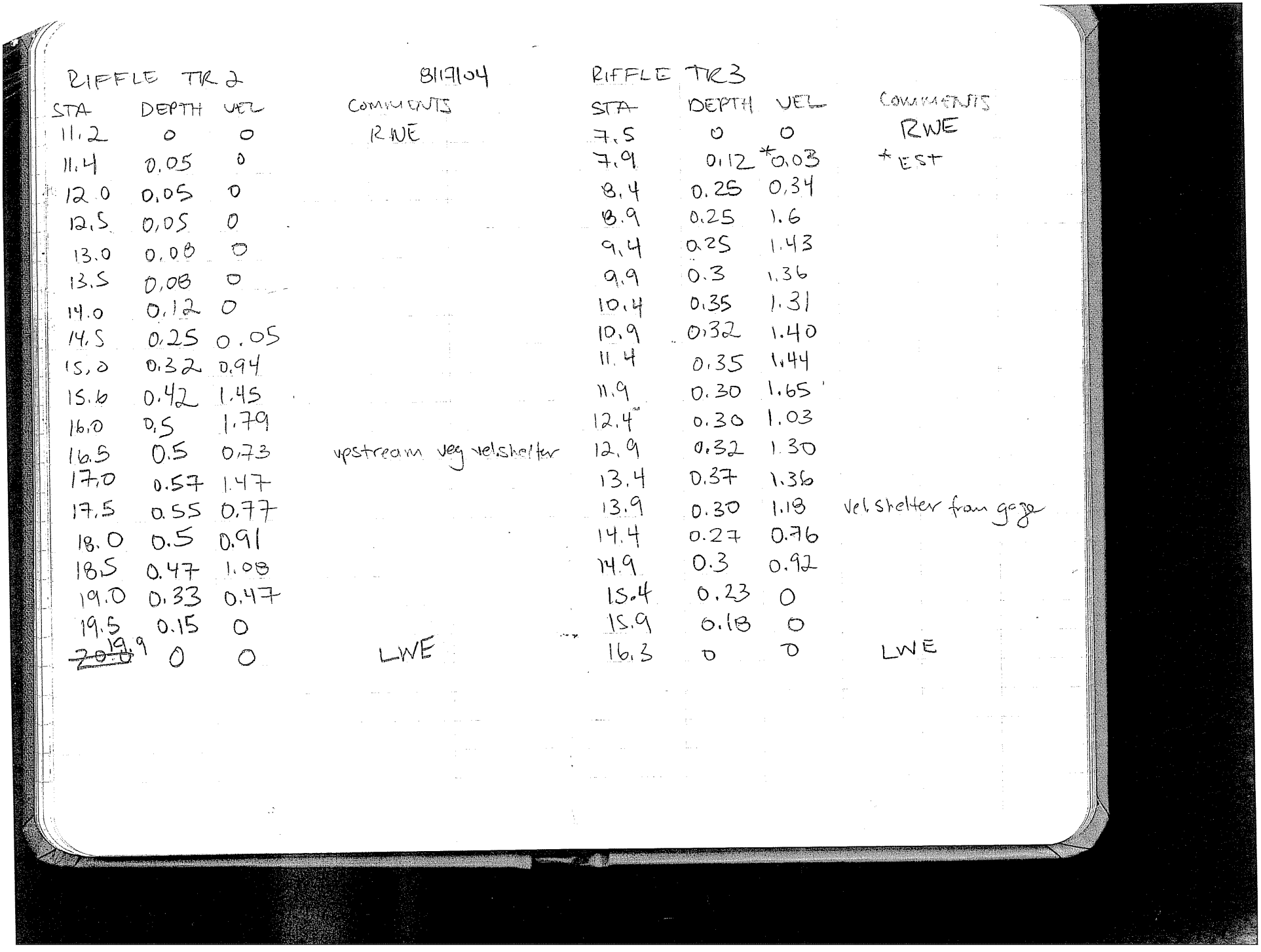
STA	BS	HI	FS	ELV	ROD
BM	7.13	107.13		100.00	
TR1			8.51 ~~8.54~~	98.62	
TR2			8.54	98.59	
TR3 – Not Found suspect someone pulled it out					
TP					
TR3 – Not Found					
TR2	8.37	106.96		98.59	
TR1			8.34	98.62	
BM			6.95	100.01	

RIFFLE WSE SURVEY 8/17/04

STA	BS	HI	FS	ELV	ROD
TR3(L)		106.96	9.27	97.69	
TR3(R)			9.25	97.71	
TR2(L)			9.47	97.49	
TR2(R)			9.50	97.46	
TR1(L)			9.84	97.12 ~~96.62~~	
TR1(R)			9.94	97.12 ~~96.62~~	
downstream of TR1 ~30'			10.61	96.95	0.6
			~~10.58~~	96.98	0.60
upstream of TR3 ~~60'~~ 65'			8.98	98.44	0.46

RIFFLE TR1 VELOCITIES

STA	DEPTH	VEL	COMMENTS
25.1	0	0	RWE
25.2	0.3	*0.03	* EST
25.7	0.3	*0.03	
26.2	0.3	0.25	
26.7	0.4	1.44	
27.2	0.42	1.97	
27.7	0.42	2.31	
28.2	0.38	3.07	
28.7	0.4	2.82	
29.2	0.22	2.18	
29.7	0.18	2.07	
30.0	0.15	0.86	
30.2	0.15	0.3	
30.6	~~0.18~~ 0.2	*0.03	
31.2	0.1	0	
31.4	0	0	LWE



RIFFLE TR 2 — 8/17/04

STA	DEPTH	VEL	COMMENTS
11.2	0	0	RWE
11.4	0.05	0	
12.0	0.05	0	
12.5	0.05	0	
13.0	0.08	0	
13.5	0.08	0	
14.0	0.12	0	
14.5	0.25	0.05	
15.0	0.32	0.94	
15.6	0.42	1.45	
16.0	0.5	1.79	
16.5	0.5	0.73	upstream veg vel shelter
17.0	0.57	1.47	
17.5	0.55	0.77	
18.0	0.5	0.91	
18.5	0.47	1.08	
19.0	0.33	0.47	
19.5	0.15	0	
~~20.0~~ 19.9	0	0	LWE

RIFFLE TR3

STA	DEPTH	VEL	COMMENTS
7.5	0	0	RWE
7.9	0.12	*0.03	*EST
8.4	0.25	0.34	
8.9	0.25	1.6	
9.4	0.25	1.43	
9.9	0.3	1.36	
10.4	0.35	1.31	
10.9	0.32	1.40	
11.4	0.35	1.44	
11.9	0.30	1.65	
12.4	0.30	1.03	
12.9	0.32	1.30	
13.4	0.37	1.36	
13.9	0.30	1.18	vel shelter from gage
14.4	0.27	0.76	
14.9	0.3	0.92	
15.4	0.23	0	
15.9	0.18	0	
16.3	0	0	LWE