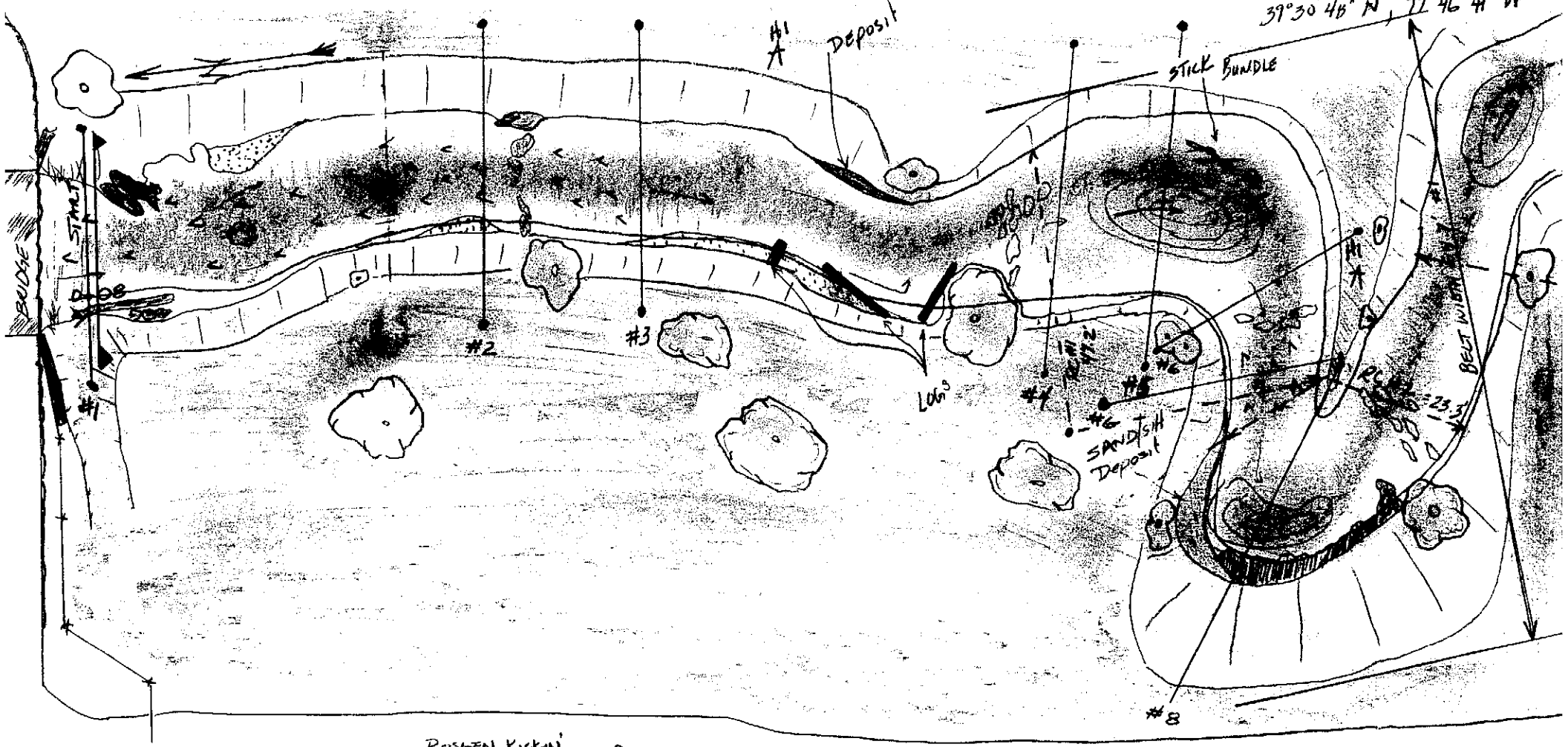
TEAM III

SHARPSBURG, MD

39°30' 48" N, 77°46' 41" W



ROSGEN KICKIN' ASS W/ TRENCH SHOVEL →

PARK ROAD (GRAVEL BASE)

PARK SIGN

STUCK BUS TRACK'S

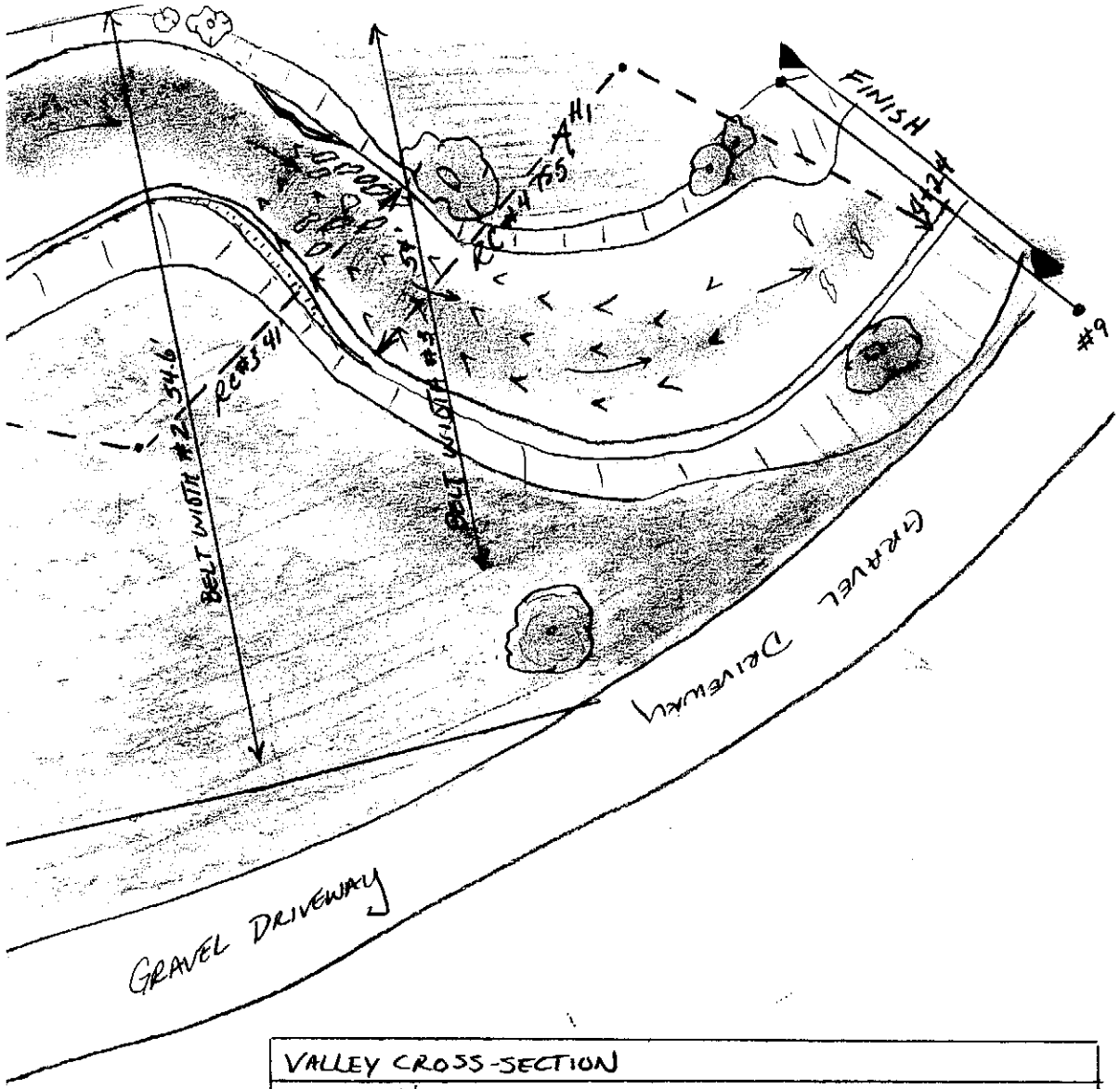
VALLEY LENGTH = 342

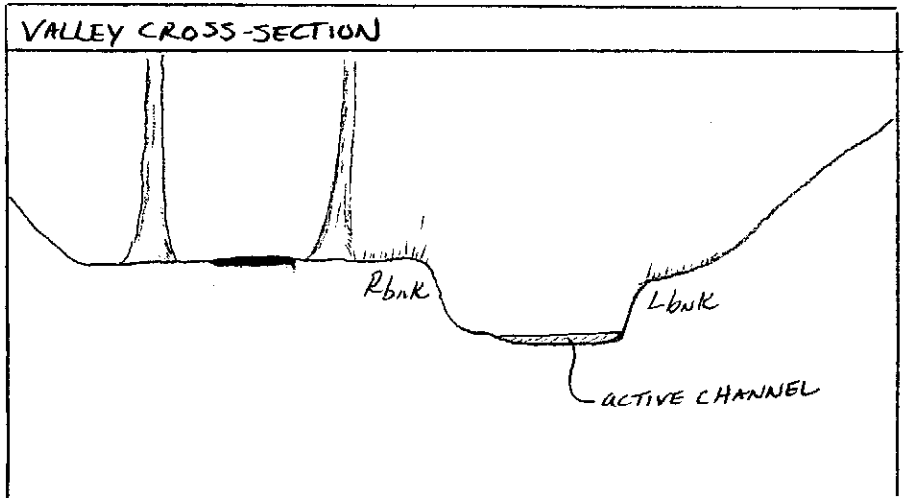
MARSH RUN at GRIMES, MD

BELT WIDTH. #1 = 64.7
#2 = 54.6
= 54.0

NTS

4/17/2014





CROSS SECTIONS 1-9

#1 @ STATION 0+08 Glide

BS

A #2 @ STATION 0+96 Run

#3 @ STATION 1+53 Riffle (Rip)

#4 @ STATION 2+53 Run

#5 @ STATION 2+71 Pool

#6 @ STATION 2+77 Glide

#7 @ STATION 2+90 Riffle

#8 @ STATION 3+41 Pool

#9 @ STATION 4+24 Glide

TOTAL LENGTH OF REACH = 4+24'

Total Valley Length = 357'

Sinuosity = 1.187

BELT WIDTH #1 84.7'
#2 54.6'
#3 54'

Rc = #1 47.2'
Rc = #2 23.3'
Rc = #3 41'
Rc = #4 75.5'

Valley Slope = .0043

19.02 SQmi Drainage Area

Summary....*USGS GAGE STATION* Data / Records for STREAM CHANNEL CLASSIFICATION

Station NAME:	MARSH RUN at GRIMES	Station Number:	01617800
LOCATION:	Washington County, MD		
Period of Record:	42 yrs	Mean Annual DISCHARGE:	cfs
Drainage AREA:	acres / 18.9 mi²	Drainage Area Mn Elev:	ft
Reference REACH SLOPE:	ft/ft	Valley Type:	VIIIc
Stream Type:	F	HUC:	

"BANKFULL" CHARACTERISTICS

Determined from FIELD MEASUREMENT			Determined from GAGE DATA Analysis		
Bankfull WIDTH (W_{bkf})	26.04	ft	Bankfull WIDTH (W_{bkf})	22	ft
Bankfull Mean DEPTH (d_{bkf})	1.14	ft	Bankfull MEAN DEPTH (d_{bkf})	1.71	ft
Bankfull Xsec AREA (A_{bkf})	29.57	ft²	Bankfull Xsec AREA (A_{bkf})	37	ft²
Wetted PERIMETER (W_P)	26.56	ft	Wetted PERIMETER (W_P)	25.42	ft
Bankfull STAGE (Gage Ht)	2.2	ft	Bankfull STAGE (Gage Ht)	2.2	ft
Est. Mean VELOCITY (u)	3.07	ft/sec	Mean VELOCITY (u)	2.4	ft/sec
Est. Bkf. DISCHARGE (Q_{bkf})	90.8	cfs	Bankfull DISCHARGE (Q_{bkf})	95	cfs

Bankfull DISCHARGE associated with **"field-determined"** Bankfull STAGE (From Gage Height reading at Staff Plate and tabular Stage-Discharge curve data) — 87.92 cfs

Recurrence Interval (Log-Pearson) associated with **"field-determined"** Bankfull Discharge — 1.7 yrs

From the *Annual Peak Flow Frequency Analysis* data for the Gage Station, determine:

1.5 Year R.I. Discharge =	71	cfs	10 Year R.I. Discharge =	277	cfs
2.0 Year R.I. Discharge =	104	cfs	25 Year R.I. Discharge =	446	cfs
5.0 Year R.I. Discharge =	189	cfs	50 Year R.I. Discharge =	459	cfs

MEANDER GEOMETRY

Meander Wavelength (L_m)	179.5	ft	Radius of Curvature (R_C)	46.8	ft
Belt Width (W_{blt})	64.4	ft	Meander Width Ratio (W_{blt}/W_{bkf})	2.93	ft/ft

HYDRAULIC GEOMETRY

Based on *USGS Discharge Summary Notes* data (Form 9-207) and regression analyses of measured discharge (Q) with the hydraulic parameters of Width (W), Area (A), Mean Depth (d) & Mean Velocity (u), determine the *intercept coefficient* (a) and the *slope exponent* (b) values for a power function of the form $Y = aX^b$, when Y is one of the selected hydraulic parameters and X is a given discharge value (Q).

	Width (W)	Depth (d)	Area (A)	Velocity (u)
Intercept Coefficient a)	9.227	0.381	3.536	0.281
Slope Exponent b)	0.187	0.334	0.521	0.482

Hydraulic Radius $R = A / W_P$	1.46	ft	Manning's "n" at Bankfull Stage	.0046	Coeff.

$$\text{"n"} = 1.4895\,[(\text{Area})\,(\text{Hydraulic Radius}^{2/3})\,(\text{Slope})^{1/2}]\,/\,Q_{bkf}$$

37 E59 1.29 .00384 / 95

Y = mX + b

Worksheet B-4. Procedure to validate hydraulic relations using gage station data.

1. Obtain the drainage area associated with the gaging station.
2. Obtain the field-determined bankfull discharge at the gaging station (**Figure B-43**).
3. Obtain the bankfull channel dimensions from the gaging station hydraulic geometry relationships (discharge vs. width, depth, area and velocity).
4. Measure the average water surface slope.
5. Perform an active bed pebble count on the riffle to obtain D_{84}.
6. Determine the stream type.
7. Solve for Manning's 'n' at the bankfull stage: $n = (1.49R^{2/3}S^{1/2})/\bar{u}$ (use the bankfull mean velocity from Step 3).
8. Calculate relative roughness: R/D_{84}. Make sure that D_{84} is converted from millimeters to feet. Hydraulic radius (R) and mean depth (d_{bkf}) are often used interchangeably when width/depth ratios are greater than 12.
9. Calculate shear velocity: $u^* = (gRS)^{1/2}$.
10. Calculate friction factor: $\bar{u}/u^*$.
11. Plot bankfull discharge as a function of drainage area on the appropriate regional curve.
12. Plot bankfull channel dimensions as a function of drainage area on the appropriate regional curve (note stream type of plotted values using unique symbols).
13. Plot relative roughness by friction factor (**Figure B-34**) (Example in **Figure B-39**).
14. Plot Manning's 'n' by friction factor (**Figure B-35**) (Example in **Figure B-40**).
15. Plot Manning's 'n' by stream type (**Figure B-36**) (Example in **Figure B-41**). NA

Gaging Station Name: Marsh Run at Grimes **Gaging Station Number:**

Drainage Area (mi^2)	Bankfull Discharge Q_{bkf} (cfs)	Bankfull Width W_{bkf}	Bankfull Mean Depth d_{bkf} (ft)	Bankfull Area A_{bkf} (ft^2)	Bankfull Velocity $\bar{u}_{bkf}$ (ft/s)	Ave. Water Surface Slope S (ft/ft)	D_{84} (mm)	D_{84} (ft)	Stream Type	Manning's 'n'	Relative Roughness R/D_{84} (ft/ft)	Shear Velocity u^* (ft/s)	Friction Factor $\bar{u}/u^*$
18.9	87.92	22.0	1.71	37.0	2.4	0.00584	120.4	0.395	F1	0.038	87.0	2.71	13.75

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influenced by bridge

flow convergence will make it deeper & steeper

SURVEY DATA → **CROSS - SECTION 1**

SITE: Marsh Run - Reach 2 Date: 4/17/14

Location: XS 1 - Glide - station 8

Party / Notes: Team 3 HUC:

Item	Distance, Point, or STATION (ft)	Back-Sight BS (ft)	Height of Instrument HI (ft)	Fore-Sight FS (ft)	Elevation (ft)	REMARKS / COMMENTS / NOTES
1	BM	2.82	102.82		100	Benchmark
2	3.3			3.30		
3	4.0			3.10		
4	5.4			3.46		
5	6.0			3.66		
6	7.1			4.24		
7	7.7			4.75		
8	8.2			5.49		
9	9.0			6.10		LEW
10	10.0			6.42		
11	11.0			6.58		
12	12.0			6.52		
13	13.3			6.78		
14	14.0			6.88		
15	14.5			6.18		
16	15.0			6.10		
17	16.0			6.74		
18	17.1			7.03		
19	18.0			6.93		
20	19.0			6.86		
21	20.0			6.88		
22	21.0			7.03		
23	22.0			6.90		
24	23.0			7.00		
25	24.0			7.04		
26	24.8			7.26		TW
27	25.4			7.20		
28	26.5			7.12		

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voxel

station	foresight	
27.0	7.10	
27.6	6.98	
28.6	6.82	
29.3	6.70	
29.8	6.63	
30.3	6.52	
30.8	6.42	
31.4	6.40	edge of right bank
31.4	6.14	REW
31.5	5.59	
32.6	5.59	
34.0	5.26	- approx. BF
36.0	5.03	
38.0	5.11	
42.0	5.21	
53.3	4.84	
56.0	4.64	
60.0	4.04	
65.0	3.49	

SURVEY DATA ⟹ **CROSS - SECTION 2**

SITE: Run - station 96 - XS 2 **Date:**

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	1.3			3.66		
30	2.4			3.76		
31	3.5			3.78		
32	4.4			3.72		
33	5.7			3.80		
34	6.2			4.00		
35	7.0			4.26		
36	7.6			4.60		
37	8.0			4.76		
38	8.6			5.16		
39	9.1			5.56		
40	9.6			6.08		
41	10.0			6.34		
42	10.4			6.70		
43	10.9			6.92		
44	11.5			7.10		
45	11.8			7.21		LEW
46	12.5			7.44		~~LEW~~
47	13.0			7.66		
48	13.8			7.79		
49	14.6			7.84		
50	15.3			7.74		
51	16.0			7.65		
52	16.3			8.02		
53	16.8			8.13		
54	17.6			8.17		
55	18.4			8.22		
56	19.4			8.35		
57	19.8			8.40		
58	20.4			8.49		
59	21.0			8.49		

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Station	foresight	
21.6	8.44	
22.3	8.41	
23.0	8.38	
23.7	8.49	
24.4	8.51	TW
25.0	8.48	
25.8	8.40	
26.5	8.41	
27.0	8.42	
27.7	8.26	
28.0	8.15	
28.6	7.84	
29.7	7.66	
30.4	7.50	
30.9	7.41	
30.9	7.23	LEW
31.0	7.03	
31.5	6.86	
32.2	6.81	
33.2	6.71	
33.6	6.62	
34.1	6.44	
34.5	6.19	
35.0	5.79	
35.6	5.37	
36.2	4.85	
37.3	4.50	
38.0	4.25	
[illegible]	[illegible]	LED → 208

SURVEY DATA ⟹ CROSS - SECTION 3

SITE: XS 3 - Riffle - station 153 Date: 4/17/14

representative riffle

2.56 · 2x max depth

Wfpa 144.4

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	0			4.19	~~4.7~~	
30	2.0			4.30		
31	7.0			4.81		
32	9.0			4.95		
33	11.0			4.96		
34	13.0			4.99		
35	14.0			5.04		
36	15.0			4.94		
37	15.7			5.43		
38	16.4			5.93		
39	17.2			6.38		
40	17.9			~~5.79~~		6.78
41	18.6			5.26		
42	19.0			7.60		STATION FS.
43	19.0			7.56		LEW 19.0 7.55.
44	19.4			7.80		
45	18.0			~~7.85~~		BF 6.85
46	20.0			7.93		
47	21.0			8.10		
48	22.0			8.15		
49	22.7			8.27		
50	23.2			8.26		
51	23.9			8.29		
52	24.7			8.29		
53	25.7			8.31		TW ?
54	26.5			8.30		
55	27.4			8.27		
56	28.5			8.19		
57	29.5			8.14		
58	30.5			8.17		
59	31.0			8.20		

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station	foresight	
31.7	8.18	
32.6	8.13	
33.5 ~~34.5~~	8.18	
34.4	8.15	
35.2	8.19	
36.0	8.14	
36.9	8.14	
37.7	8.01	
38.7	7.82	
39.9	7.87	
40.9 ~~39.8~~ →	7.65 →	REW
41.3	7.52	
42.4	7.39	
43.0	7.25	
43.5	7.06	
44.0	6.89	
44.5	6.35	
45.3	6.20	
46.6	5.97	
47.6	5.70	
48.7	5.10	
50.0	4.52	
51.3	4.04	
52.4	3.98	
53.5 →	3.88	
54.8	3.83	
56.0	3.91	

SURVEY DATA ⟹ **CROSS - SECTION 4**

SITE: XS 4- Run- Station 253 Date: 4/17/14

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	0				5.34	
30	4.0				5.42	
31	8.0				5.39	
32	11.0				5.38	
33	15.0				5.22	
34	16.0				5.54	
35	16.7				6.04	
36	17.6				6.95	
37	18.0				7.24	
38	20.0				7.86	
39	20.5				8.05	LEW
40	21.0				8.27	
41	22.2				8.46	
42	22.8				8.72	
43	23.1				8.76	
44	23.5				9.44	
45	24.2				9.45	
46	25.2				9.56	
47	26.0				9.76	
48	27.0				9.83	
49	27.8				9.90	
50	28.6				10.00	
51	29.4				10.10	TW
52	30.2				10.09	
53	31.0				10.02	
54	31.5				9.71	
55	32.1				9.27	
56	33.0				9.20	
57	33.8				9.21	
58	34.6				9.32	
59	35.3				9.24	

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station	FS	
36.6	9.21	
37.8	9.10	
38.4	8.66	
39.5	8.29	
40.5	8.05	→ REW
41.2	7.84	
42.2	6.36	
43.0	5.24	
45.0	5.02	
50.0	5.09	

SURVEY DATA ⟹ **CROSS - SECTION 5**

SITE: XS 5 - Pool - Station 271 Date: 4/17/14

Item	STATION ft	B S ft	H I ft	F S ft	Elevation ft	NOTES COMMENTS REMARKS
29	0				5.34	
30	6.0				5.17	
31	8.0				5.19	
32	10.0				5.39	
33	11.0				5.66	
34	11.6				6.32	
35	12.0				6.80	
36	12.6				7.27	
37	13.0				7.70	
38	14.0				8.04	LEW
39	14.5				8.27	
40	15.0				8.45	
41	15.5				8.64	
42	15.6				9.67	
43	16.2				9.81	
44	17.0				9.89	
45	17.5				9.88	
46	18.0				9.90	
47	18.8				10.02	
48	19.3				10.08	
49	20.0				10.09	TW
50	21.0				10.00	
51	21.6				9.99	
52	22.2				9.94	
53	23.0				9.55	
54	23.7				9.60	
55	24.5				9.59	
56	25.3				9.41	
57	26.2				9.45	
58	27.4				9.31	
59	28.7				9.30	

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station	FS	
29.7	9.30	
30.6	9.10	
31.8	8.79	
33.2 →	8.09 →	REW
33.8	7.73	
34.7	7.52	
35.4	7.29	
36.3	6.03	
37.6	5.69	
39.0	5.53	
40.4	5.44	

Marsh Run Team 3

SURVEY DATA ⟹ **CROSS - SECTION 6**

SITE: XS 6 - Glide - Station - 277 **Date:** 4/17/14

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	BM	3.00			100	benchmark
30	0			5.73		
31	2.0			5.76		
32	3.6			5.85		
33	4.2			6.05		
34	5.3			6.51		
35	6.0			7.03		
36	7.0			7.61		
37	7.8			7.95		
38	8.8			8.18		
39	9.0			8.29		LEW
40	9.7			8.52		
41	10.2			8.92		
42	11.1			9.12		
43	12.1			9.20		
44	12.6			9.28		
45	13.2			9.26		
46	14.0			9.27		
47	14.7			9.45		TW
48	15.2			9.37		
49	16.0			9.32		
50	17.0			9.27		
51	17.8			9.32		
52	18.8			9.24		
53	20.0			9.31		
54	20.8			9.16		
55	21.7			9.24		
56	22.5			9.08		
57	23.7			8.88		
58	24.7			8.80		
59	25.5			8.59		

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Station	FS	
26.0	8.29	→ REW
26.6	7.91	
27.4	7.65	
~~82~~ 28.0	7.21	
29.9.	6.66	
30.0	6.15	
31.0	5.96	
32.1	5.87	
34.0	5.65	
35.0	5.54	

Mash Run Team 3

SURVEY DATA ⟹ **CROSS - SECTION 7**

SITE: XS 7 - Riffle - station 290 **Date:** 4/17/14

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	0			5.28		
30	1.0			5.18		
31	3.0			5.05		
32	5.0			5.07		
33	6.0			5.12		
34	6.7			5.29		
35	7.1			5.65		
36	8.0			6.50		
37	8.5			7.74		
38	9.4			8.36		LEW
39	10.3			8.60		
40	11.6			8.80		
41	12.7			9.39		
42	13.3			9.04		
43	14.1			9.32		
44	14.8			9.19		
45	15.7			9.22		
46	16.3			9.24		
47	17.1			9.22		
48	18.0			9.63		
49	18.6			9.89		
50	19.4			9.96		TW
51	20.0			9.95		
52	21.4			9.80		
53	22.8			9.35		
54	24.0			9.02		
55	26.0			8.36		REW
56	27.8			8.08		
57	27.7			7.83		
58	28.3			7.74		
59	29.3			7.69		

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max depth to bankfull - 1.60 (1.53)

Station	FS	BF
30.0	7.54	
30.8	7.10	
31.7	6.50	
33.0	6.28	
35.0	5.92	
39.0	5.68	
44.0	5.52	
48.0	5.50	
52.0	5.44	
54.0	5.424	
58.0	5.76	

SURVEY DATA ⟹ **CROSS - SECTION 8**

SITE: XS 8 - Pool - Station 341 Date: 4/17/14

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	0				5.49	
30	2.0				5.83	
31	4.0				6.03	
32	6.0				6.15	
33	9.0				6.22	
34	11.0				6.28	
35	12.0				6.34	
36	13.5				6.55	
37	14.7				7.04	
38	~~16.1~~				~~7.72~~	
39	~~16.6~~				~~7.94~~	
40	~~17.4~~				~~8.43~~	~~LEW~~
41	~~18.0~~				~~8.89~~	
42	15.0				7.14	
43	15.2				7.36	
44	15.4				7.45	
45	15.6				7.51	
46	15.8				7.59	BF
47	16.0				7.68	
48	16.2				7.74	~~BF~~
49	16.4				7.91	
50	16.6				8.00	
51	16.8				8.11	
52	17.0				8.22	
53	17.3				8.43	LEW
54	17.8				8.80	
55	19.0				9.19	
56	19.6				9.23	
57	20.5				9.32	
58	21.6				9.55	
59	22.1				9.56	

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Station	FS	
22.3	10.61	
22.8	10.78	
23.5	10.90	
24.0	11.00	→ TW
24.8	10.93	
25.6	10.91	
26.6	10.64	
27.4	10.23	
27.8	10.58	
28.8	10.60	
29.7	10.34	
30.9	10.31	
32.0	10.34	
32.5	9.23	
33.0	9.18	
33.9	9.01	
34.8	8.43	→ REW
35.3	8.15	
37.0	6.60	
38.0	5.88	
39.0	5.60	
40.7	5.52	

Marsh Run Team 3

SURVEY DATA ⟹ **CROSS - SECTION 9**

SITE: XS 9- Glide - Station 424 Date: 4/17/04

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	BM	2.23			100	
30	0			4.71		
31	3.0			4.60		
32	5.0			4.59		
33	7.0			4.73		
34	8.0			5.02		
35	9.0			5.72		
36	11.0			7.18		
37	12.0			7.72		
38	12.6			7.90		LEW
39	13.3			8.29		
40	14.5			8.45		
41	15.8			8.39		
42	17.5			8.49		
43	18.6			8.41		
44	19.1			8.54		
45	19.7			8.80		
46	20.3			8.40		
47	22.0			8.42		
48	22.9			8.50		
49	23.7			8.39		
50	25.0			8.38		
51	25.8			8.54		
52	27.0			8.58		~~TW~~
53	27.8			8.75		TW
54	28.6			8.68		
55	30.0			8.68		
56	31.0			8.67		
57	32.0			8.65		
58	33.3			8.48		
59	34.6			7.89		REW

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station	FS	
35.3	7.50	
36.0	7.34	
36.5 →	7.15 →	BF
36.9	6.94	
37.6	6.34	
38.7	5.40	
40.0	4.64	
41.0	4.66	
43.0	4.40	
46.0	4.52	
48.0	4.64	

SURVEY DATA → LONGITUDINAL PROFILE 2

SITE: Marsh Run Date: 4/17/14

Location: Reach 2

Party / Notes: Team 3 HUC:

	Distance, Point, or STATION (ft)	Back-Sight BS (ft)	Height of Instrument HI (ft)	Thalweg Fore-Sight FS (ft)	Thalweg Elevation Elev. (ft)	Water Surface Fore-Sight FS (ft)	Water Surface Elevation Elev. (ft)	Bankfull Fore-Sight FS (ft)	Bankfull Elevation Elev. (ft)	Low Bank HI Fore-Sight FS (ft)	Low Bank HI Elevation Elev. (ft)	NOTES e.g. Riffle Run Pool Glide	
28	262			9.35		7.69						~~Top~~ run	
XS→ 29	270			10.12		8.15		7.36				~~Top~~ Pool	.79
30	2732			9.25		8.12						Top Glide	
31	277			9.23								Glide ~~[illegible]~~	
32	282.4			9.01		8.21						Top Riffle	– Rocks
XS→ 33	289.2			9.87		8.25		7.5				riffle	.75
34	296.			9.63		8.30		7.37				~~Riffle~~	.93
35	307			10.11		8.34		7.52				~~Top~~ Run	.82
36	313			10.3		8.33						Pool Top	
37	334			10.25		8.28						Pool	
38	341			10.73								Pool	
39	357			10.33		8.35		7.6		6.6		Pool	.75
40	362			10.33								Top Glide	} bed rock outcrop
41	365			9.33		8.33						Glide	
42	380			9.00		8.45						Riffle	
43	383			9.95		8.46						Riffle	
44	388			9.85								End Riffle	
45	392			10.28		8.57						Pool	
46	400			11.99								Pool	
47	402			11.42		8.58						Pool	
48	405			10.58								End Pool	
49	407			9.77		8.50						Top Glide	
XS→ 50	4236			9.30		8.75		7.84				Glide	.91
51	4365			9.42								Glide	
52	446			9.45		8.77						End Glide	
53													
54													

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SURVEY DATA ⟶ **LONGITUDINAL PROFILE 1**

SITE: Marsh Run Date: 4/17/14

Location: Reach 2

Party / Notes: Team 3 HUC:

	Distance, Point, or STATION (ft)	Back-Sight BS (ft)	Height of Instrument HI (ft)	Thalweg Fore-Sight FS (ft)	Thalweg Elevation Elev. (ft)	Water Surface Fore-Sight FS (ft)	Water Surface Elevation Elev. (ft)	Bankfull Fore-Sight FS (ft)	Bankfull Elevation Elev. (ft)	Low Bank HI Fore-Sight FS (ft)	Low Bank HI Elevation Elev. (ft)	NOTES e.g. Riffle Run Pool Glide
1	0	2.92	102.92	7.53		6.98 R						Top Glide
XS — 2	8.5			7.24		6.18 R		Bridge ? 7.6		5.19		Mid Glide
3	15.4			7.13		6.24 R						Top Riffle
4	23.4			7.7		6.51 R						Riffle
5	34.0			7.55		6.65 L				3.1		R
6	51.4			7.56		7.17 R						R
7	76.1			8.23		7.20 L				5.76		R
8	79.2			8.43		7.23 R						End Riffle
9	82.6			8.59		7.23 R						Top Run
10	88.5			8.58		7.33 R						Run
XS — 11	95.8			8.45		7.30 L		6.50		[illegible]		End Run .80
12	107			7.86		7.40 L				4.30		top Riffle Bedrock outcrop
13	111			8.44		7.59 R						Riffle
14	120			8.42		7.57 R				4.26		riffle Bedrock
15	134			8.4		7.57 L		7.1				riffle
XS — 16	149.2			8.38		7.64						riffle
XS — 17	153			8.17		7.73		6.94				Rif .79
18	163			8.25		7.77				5.02		Rif
19	181			8.33		7.76		6.98				Rif .78
20	198			8.40		7.92		7.12				Rif .79
21	203			7.96		7.85		6.80		4.46		Rif
22	221.5			8.44		8.00						Riffle 1.05
23	227.5			8.81		8.05	pinch point			5.36		Rif
24	237			9.28		8.15		7.16				End rif 1.00
25	246			8.85								start R
XSec 26	253			9.78		~~7.65~~ → 8.15		6.70		5.30		Run .95
27	260			10.67		~~7.08~~ 8.15						End Run

P1 = Low Pool

262

270 7.

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~~8.15~~ 8.15

8.15

Representative Pebble Ct.

Site: Date:

Location: HUC:

Party:

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	ITEM %	% CUM	POOL (2) TOT #	ITEM %	% CUM	COMPOSITE (3) TOT #	ITEM %	% CUM
							Reach:			Reach:			Reach:		
							Date:			Date:			Date:		
	Silt / Clay	< .062	S/C				6								
	Very Fine	.062 - .125	SAND				2								
	Fine	.125 - .25					2								
	Medium	.25 - .50					1								
	Coarse	.50 - 1.0					4								
.04 - .08	Very Coarse	1.0 - 2													
.08 - .16	Very Fine	2 - 4	GRAVEL				1								
.16 - .22	Fine	4 - 5.7													
.22 - .31	Fine	5.7 - 8													
.31 - .44	Medium	8 - 11.3					1								
.44 - .63	Medium	11.3 - 16					4								
.63 - .89	Coarse	16 - 22.6					5								
.89 - 1.3	Coarse	22.6 - 32					1								
1.3 - 1.8	Very Coarse	32 - 45					2								
1.8 - 2.5	Very Coarse	45 - 64													
2.5 - 3.5	Small	64 - 90	COBBLE				4								
3.5 - 5.0	Small	90 - 128					2								
5.0 - 7.1	Large	128 - 180					3								
7.1 - 10.1	Large	180 - 256					4								
10.1 - 14.3	Small	256 - 362	BOULDER												
14.3 - 20	Small	362 - 512													
20 - 40	Medium	512 - 1024													
40 - 80	Large-Vry Large	1024 - 2048													
	Bedrock		BDRK				38								
Stream Type:			**Valley Type:**			TOTAL→									

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Protrusion Height

Site: ~~Marsh Run~~ 2 Date: 4/17

Location: Marsh Run HUC:

Party: JK J

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	RIFFLE (1) ITEM %	RIFFLE (1) % CUM	POOL (2) TOT #	POOL (2) ITEM %	POOL (2) % CUM	COMPOSITE (3) TOT #	COMPOSITE (3) ITEM %	COMPOSITE (3) % CUM
							Reach:			Reach:			Reach:		
							Date:			Date:			Date:		
	Silt / Clay	< .062	S/C												
	Very Fine	.062 - .125	SAND												
	Fine	.125 - .25													
	Medium	.25 - .50													
	Coarse	.50 - 1.0													
.04 - .08	Very Coarse	1.0 - 2													
.08 - .16	Very Fine	2 - 4	GRAVEL												
.16 - .22	Fine	4 - 5.7													
.22 - .31	Fine	5.7 - 8													
.31 - .44	Medium	8 - 11.3													
.44 - .63	Medium	11.3 - 16													
.63 - .89	Coarse	16 - 22.6													
.89 - 1.3	Coarse	22.6 - 32													
1.3 - 1.8	Very Coarse	32 - 45													
1.8 - 2.5	Very Coarse	45 - 64													
2.5 - 3.5	Small	64 - 90	COBBLE												
3.5 - 5.0	Small	90 - 128													
5.0 - 7.1	Large	128 - 180													
7.1 - 10.1	Large	180 - 256													
10.1 - 14.3	Small	256 - 362	BOULDER												
14.3 - 20	Small	362 - 512													
20 - 40	Medium	512 - 1024													
40 - 80	Large-Vry Large	1024 - 2048													
	Bedrock		BDRK												
						TOTAL→									

Stream Type: **Valley Type:**

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XS 289 Protrusion 2

Site: Date: 4/17/19

Location: Marsh Run HUC:

Party: Team 3

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	ITEM %	% CUM	POOL (2) TOT #	ITEM %	% CUM	COMPOSITE (3) TOT #	ITEM %	% CUM
	Silt / Clay	< .062	S/C												
	Very Fine	.062 - .125	SAND												
	Fine	.125 - .25													
	Medium	.25 - .50													
	Coarse	.50 - 1.0													
.04 - .08	Very Coarse	1.0 - 2													
.08 - .16	Very Fine	2 - 4	GRAVEL												
.16 - .22	Fine	4 - 5.7													
.22 - .31	Fine	5.7 - 8													
.31 - .44	Medium	8 - 11.3					1								
.44 - .63	Medium	11.3 - 16					2								
.63 - .89	Coarse	16 - 22.6													
.89 - 1.3	Coarse	22.6 - 32					10								
1.3 - 1.8	Very Coarse	32 - 45					12								
1.8 - 2.5	Very Coarse	45 - 64					14								
2.5 - 3.5	Small	64 - 90	COBBLE				20								
3.5 - 5.0	Small	90 - 128					22								
5.0 - 7.1	Large	128 - 180					13								
7.1 - 10.1	Large	180 - 256					4								
10.1 - 14.3	Small	256 - 362	BOULDER				2								
14.3 - 20	Small	362 - 512					1								
20 - 40	Medium	512 - 1024													
40 - 80	Large-Vry Large	1024 - 2048													
	Bedrock		BDRK												
Stream Type:			Valley Type:			TOTAL→									

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