

FLOW DATA SHEET

Mean Velocity¹ = 6/10ths Depth
 Surface Velocity² = 6/10ths Depth x 2
 Bottom Velocity³ = 6/10ths Depth / 2

BANK FULL

STREAM EDGE

STREAM EDGE

BANK FULL

(in) Moly Length

Stream Edge Width (feet)	2 3/4	1 3/4																	
Stream Edge Depth (feet)	1 3/4	1 1/4																	
Flow Rate Width (ft/sec)	1 3/4	3/4 in.																	
Flow Rate Depth (ft/sec)	1 3/4	1 1/2 in.																	
Substrate/ % Vegetation	2 in.	2 in.	1 1/2 in.	1 1/2 in.															
% Plant Coverage	1 3/4	2 1/2	7/16 in.																
Mean Velocity ¹ (ft/sec)	1 1/2	2 1/2																	
Surface Velocity ² (ft/sec)	1 1/2	1 3/4																	
Bottom Velocity ³ (ft/sec)	1 1/2	1 in.																	

DATE	HYDROLAB		
TIME	WIDTH (feet)		
OBSERVER	TEMPERATURE (°C)		
REACH	DISSOLVED OXYGEN (mg/L)		
TRANSECT#	CONDUCTIVITY (mS/cm)		
DAR_CODE	pH		
STREAM	TURBIDITY (NTU)		
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)		

FLOW ↓

Transect Line

FLOW DATA SHEET

Mean Velocity¹ = 6/10ths Depth
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 Bottom Velocity³ = 6/10ths Depth / 2

BANK
FULL

STREAM EDGE

STREAM EDGE

BANK
FULL

Stream Edge Width (feet)	22	20	18	16	14	13	12	11	10	9	8	7	6	5	4	3	1.5	
Stream Edge Depth (feet)	0	0.5	0.8	0.9	1.5	1.7	1.8	2.0	1.9	1.8	1.7	1.5	1.5	1.4	1.2	1.1	0	
Flow Rate Width (ft/sec)																		
Flow Rate Depth (ft/sec)																		
Substrate/ % Vegetation																		
% Plant Coverage																		
Mean Velocity ¹ (ft/sec)	0	-0.07	-0.01	-0.03	0.01	0.12	0.29	0.25	0.41	0.35	0.26	0.27	0.16	0.01	-0.08	-0.11	0	
Surface Velocity ² (ft/sec)																		
Bottom Velocity ³ (ft/sec)																		

DATE	October 7 th , 2004	HYDROLAB			
TIME	3:30 PM	WIDTH (feet)	Pool		Riffle
OBSERVER	Hoopu K.L. C.K. J.L. D.D.	TEMPERATURE (°C)	22.09°		22.00° oc
REACH		DISSOLVED OXYGEN (mg/L)	8.06 mg/L		0.152 mg/L
TRANSECT#		CONDUCTIVITY (mS/cm)	0.152 mS/cm		8.89 mS/cm
DAR_CODE		pH	8.16 units		8.06 units
STREAM	Hirilawe	TURBIDITY (NTU)			
TRIBUTARY		TOTAL SUSPENDED SOLIDS (mg/L)			

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 Bottom Velocity³ = 6/10ths Depth / 2

BANK
FULL

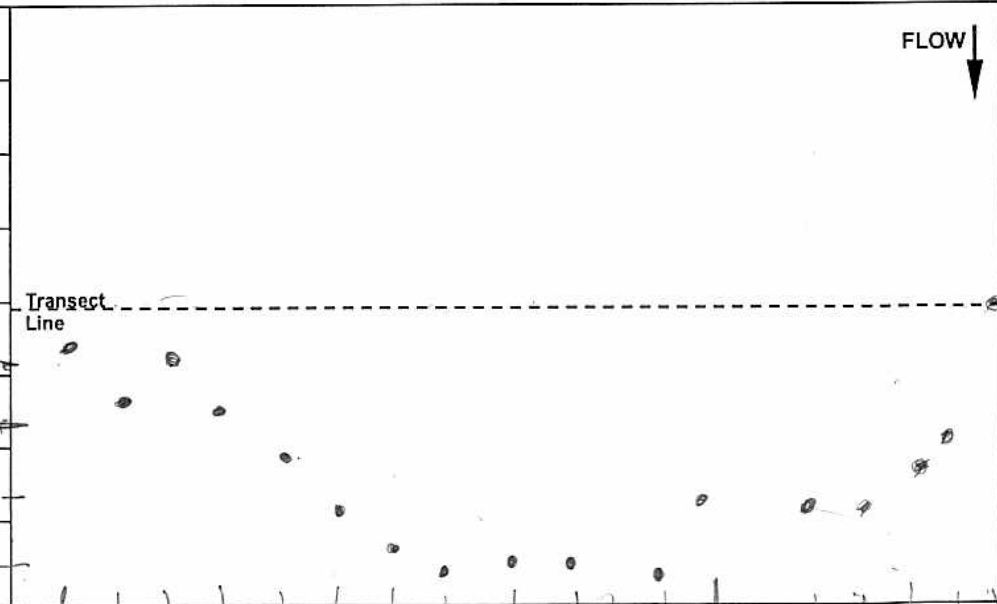
STREAM EDGE

BANK
FULL

STREAM EDGE

Stream Edge Width (feet)	0	1.0 ^{ft}	2.0 ^{ft}	3.0 ^{ft}	4.0 ^{ft}	5.0 ^{ft}	6.0 ^{ft}	7.0 ^{ft}	8.0 ^{ft}	9.0 ^{ft}	10.0 ^{ft}	11.0 ^{ft}	12.0 ^{ft}	13.0 ^{ft}	14 ^{ft}	15 ^{ft}	16 ^{ft}	17.5 ^{ft}
Stream Edge Depth (feet)	0	0.4 ^{ft}	0.7 ^{ft}	0.5 ^{ft}	0.9 ^{ft}	1.3 ^{ft}	1.5 ^{ft}	1.7 ^{ft}	2.0 ^{ft}	1.9 ^{ft}	1.9 ^{ft}	2.0 ^{ft}	1.6 ^{ft}	1.6 ^{ft}	1.4 ^{ft}	1.3 ^{ft}	1.2 ^{ft}	0
Flow Rate Width (ft/sec)	0																	
Flow Rate Depth (ft/sec)		-0.05 ^{ft}	0.02 ^{ft}	-0.04 ^{ft}	-0.04 ^{ft}	0.04 ^{ft}	0.23 ^{ft}	0.19 ^{ft}	0.25 ^{ft}	0.19 ^{ft}	0.34 ^{ft}	0.20 ^{ft}	0.36 ^{ft}	0.28 ^{ft}	0.18 ^{ft}	0.00 ^{ft}	0.04 ^{ft}	0
Substrate/ % Vegetation																		
% Plant Coverage																		
Mean Velocity ¹ (ft/sec)																		
Surface Velocity ² (ft/sec)																		
Bottom Velocity ³ (ft/sec)																		

DATE	Oct-7-2004		
TIME	11:46 a.m.		
	WIDTH (feet)		
OBSERVER	IK	RK	
	opne	AI	NH
REACH	TEMPERATURE (°C)	22.60	
TRANSECT#	DISSOLVED OXYGEN (mg/L)	7.73	
	CONDUCTIVITY (mS/cm)	0.153	0.5
DAR_CODE	pH	8.30	-1.0
STREAM	TURBIDITY (NTU)		1.5
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)		-2.0



SITE PICTURE

FLOW DATA SHEET

Mean Velocity¹ = 6/10ths Depth
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 Bottom Velocity³ = 6/10ths Depth / 2

BANK
FULL

STREAM EDGE

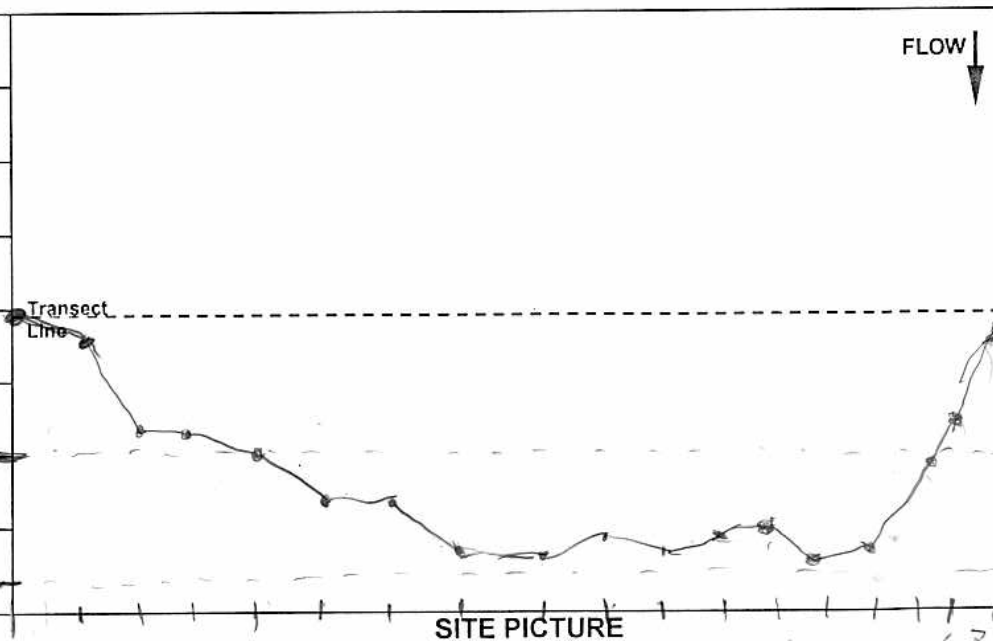
STREAM EDGE

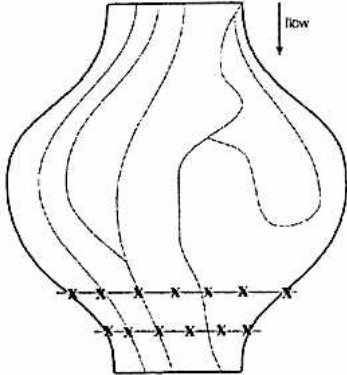
BANK
FULL

Stream Edge Width (feet)	21.9ft	20.0ft	18.0ft	17.0ft	16.0ft	15.0ft	14.0ft	13.0ft	12.0ft	11.0ft	10.0ft	9.8ft	8.0ft	7.0ft	6.0ft	5.0ft	4.0ft	3.5ft
Stream Edge Depth (feet)	0	0.2ft	0.8ft	0.8ft	1.0ft	1.3ft	1.3ft	1.6ft	1.9ft	1.7ft	1.9ft	1.8ft	1.6ft	1.5ft	1.4ft	1.2ft	0.7	0
Flow Rate Width (ft/sec)																		
Flow Rate Depth (ft/sec)																		
Substrate/ % Vegetation																		
% Plant Coverage																		
Mean Velocity ¹ (ft/sec)	0	-0.03 ^{fs}	-0.05 ^{fs}	-0.02 ^{fs}	0.03 ^{fs}	0.20 ^{fs}	0.23 ^{fs}	0.21 ^{fs}	0.25 ^{fs}	0.10 ^{fs}	0.29 ^{fs}	0.29 ^{fs}	0.27 ^{fs}	0.17 ^{fs}	0.08 ^{fs}	0.03 ^{fs}	0.06 ^{fs}	0
Surface Velocity ² (ft/sec)																		
Bottom Velocity ³ (ft/sec)																		

DATE	Oct 7, 2004			
TIME	1:34 p.m.			
OBSERVER	KV, KL, JH, LK Hihiwai			
REACH				
TRANSECT#				
DAR_CODE				
STREAM	Hihiwai			
TRIBUTARY				

HYDROLAB				
WIDTH (feet)				
TEMPERATURE (°C)	22.41°C			
DISSOLVED OXYGEN (mg/L)	7.33 mg/L			
CONDUCTIVITY (mS/cm)	0.153 ^{ms/cm}			
pH	8.18 pH			
TURBIDITY (NTU)				
TOTAL SUSPENDED SOLIDS (mg/L)				



Stream Name	Hi'ilawe	Stream Mapping Data Sheet 
Date	Oct. 7, 2004	
Start Time	3:03 PM	
GPS reading (0 m)		
GPS reading (100 m)	N. 20.10591° W. 155.59575°	
Observers	Hihiwai	
Comments		

Kelsey
Keli'i (David)
Sushi
Imi

Transect # 0	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.1	0.35	0.5	0.8	0.95	1.2	0.75	0.6	0.4	0.35	0.2	0.45	0.35	0.25
Water Speed	S	M	M	S	M	F	F	M	M	S	M	S	S	M
Substrate Size	S	L	S	S	S, M	L	S, M, L	S, M	S, M, L	S	S	M	S	S
Other maj. feat.	S Bank												leaves	S & bank

Transect # 1	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.05	0.35	1.2	1.4	0.5	0	0	0.4	0.0	0.0	0.35	0.3	0	0
Water Speed	S	S	M	M	S	0	0	S	0.0	0.0	S	S	0	0
Substrate Size	S	ML	SML	SM	SL	L	ML	S	S, M, L	Lm	LS	MS	L	M
Other maj. feat.	L					L	BL	L	L	L	L	L	L	L

Transect # 2	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.15	0.3												
Water Speed	S	M												
Substrate Size	SM	SM												
Other maj. feat.	L	Sp												

Transect # 3	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Transect # 4	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Transect # 5	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Water Speed (fast, medium, slow)

Substrate Size (small, medium, large)

1

Stream Name	Hilawe Stream	Stream Mapping Data Sheet
Date	10/11/04	
Start Time		
GPS reading (0 m)	318 N: 20.10671°	
GPS reading (100 m)	319 N: 20.10649° W: 155.59624°	
Observers	no'opu	
Comments		

Dustin
Jacob
Kahena
Chloe

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.1	0.5	0.55	1.2	1.15	.65								
Water Speed	slow	Med.	slow	slow	Med.	Med.								
Substrate Size	small	small	Med.	small	Large	Med.								
Other maj. feat.	Stream Edge					Log								

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0	.8	.5	.4	.4									
Water Speed	0	m.f	med:unslow	slow	fast									
Substrate Size	medium	medium	large	large	large									
Other maj. feat.	stream bank													

Rock

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.7	0.9	1.2	0.6	0.7	0.4								
Water Speed	slow	medium	fast	medium	slow	slow								
Substrate Size	medium	large	medium	SM	small	small								
Other maj. feat.	Bank				small cascade	bank small catch								

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.15	0.34	0.45	0.49	1.1	1.4	.75							
Water Speed	slow	slow	slow	5/m	m	m	m							
Substrate Size	medium	medium	medium	large	large	small	large							
Other maj. feat.	stream bank													

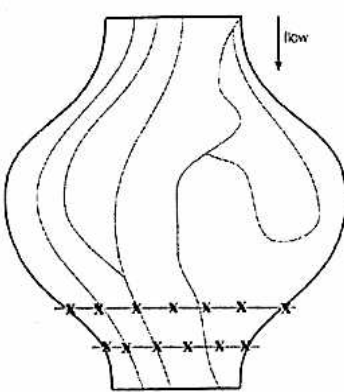
bank

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Water Speed (fast, medium, slow)

Substrate Size (small, medium, large)

Stream Name	Hi'ilawe	
Date	10-7-04	
Start Time	1:35 p.m.	
GPS reading (0 m)	20.10715 N 155.59628 W	
GPS reading (100 m)		
Observers	'Opae	
Comments	Wave point:	

Kaori (ori)
Iwalani (Iwa)
Naiu
Ani
Kawika

Transect # 1	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.2 ft.	0.8 ft.	0.6 ft.	1.1 ft.	0.7 ft.									
Water Speed	slow	med.	med.	med.	slow									
Substrate Size	med.	med.	med.	med.	med.									
Other maj. feat.	S. bank				S. bank									

Transect # 2	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.35 ft.	0	0.5 ft.	0.8 ft.	1.3 ft.	0	0.85 ft.	0.45 ft.	0.45 ft.	0.7 ft.				
Water Speed	S	0	S	SM	M	0	M	S	S	S				
Substrate Size	M	L	S	S	M	L	MS	S	S	S				
Other maj. feat.	S. bank	Boulder	None	None	None	Boulder	None	None	None	Broken pipe				

Transect # 3	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.3 ft.	1.0 ft.	0.6 ft.	1.2 ft.	0	0	0	0	0	0.1	0			
Water Speed	S	m	F	F	0	0	0	0	0	S	0			
Substrate Size	m	S	mL	m	L	M	L	Sm	S	S	m			
Other maj. feat.	none	leaves	none	none	Boulder	rock	rock	Guava	leaves	leaves	rock			

Transect # 4	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.2	0.1	0.4	0.2	0	0.5	0.8	0.5	0.1	0.3	0.3	0.1		
Water Speed	S	S	m	m	0	f	f	f	f	m	f	S		
Substrate Size	S	m	m	L	L	m	L	m	L	S	m	m		
Other maj. feat.	rock	none	none	bolder	bolder	none	none	none	none	none	bolder	leaves		

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Water Speed (fast, medium, slow)

Substrate Size (small, medium, large)

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Kelsey
 ISA CODE: - - - TEMPERATURE: - (°C)
 NAME: Hihiwai ELEVATION: 168 (ft.)
 DATE: 10 / 7 / 04 TIME: 12:12 AM TO - AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):
 SEDIMENT 25% SAND 25% GRAVEL 35%
 COBBLE 10% BOULDERS 5% BEDROCK 0%
 DETRITUS 0%

HABITAT TYPE: SURVEY AREA (l" x w" x h"): -
 POOL SIDE POOL PLUNGE POOL (RUN) RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

N: 20.10629°
 W: 155.59610°

Depth: 11 in.

COMMENTS:

Random No.: 8, 4

Site No.: 2

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Kelsey
 HSA CODE: - - - TEMPERATURE: -
 NAME: Hihiwai ELEVATION: -
 DATE: 10 / 7 / 04 TIME: 11:36 AM TO 12:00 AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):
 SEDIMENT 0% SAND 5% GRAVEL 85%
 COBBLE 5% BOULDERS 5% BEDROCK 0%
 DETRITUS 0%

HABITAT TYPE: SURVEY AREA (l" x w" x h"): -
 POOL SIDE POOL PLUNGE POOL RUN (RIFFLE) CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

N: 20.10471°
 W: 155.59651°
 Depth: 5 in.

COMMENTS:

Random No.: 6, 5

Site No.: 1

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Kahua
 HSA CODE: - - - TEMPERATURE: (°C)
 NAME: Ho'opi ELEVATION: 112 (ft.)
 DATE: 10 / 7 / 2004 TIME: 2:06 AM TO 2:20 AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT SAND 20% GRAVEL 60%
 COBBLE 20% BOULDERS 0% BEDROCK 0%
 DETRITUS

HABITAT TYPE:

SURVEY AREA (l" x w" x h"):

POOL SIDE POOL PLUNGE POOL (RUN) RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

N: 20.10644° WP. 304
 W: 155.59636° 9 inches

COMMENTS:

Random No.: 1, 2

Site No.: 4

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Kahua
 HSA CODE: - - - TEMPERATURE: (°C)
 NAME: Ho'opi ELEVATION: 92^{ft} (ft.)
 DATE: 10 / 07 / 2004 TIME: 12:35 AM TO AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT 0% SAND 14.5% GRAVEL 75%
 COBBLE 14.5% BOULDERS 0% BEDROCK 0%
 DETRITUS

HABITAT TYPE:

SURVEY AREA (l" x w" x h"):

POOL SIDE POOL PLUNGE POOL RUN (RIFFLE) CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

N: 20.10642° 10 in.
 W: 155.59676°

COMMENTS:

Random No.: 3, 5

Site No.: 3

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Ahi Nalin
 HSA CODE: - - - - - TEMPERATURE: - (°C)
 NAME: Opa ELEVATION: 104ft (ft.)
 DATE: 10/17/04 TIME: 3:20 AM TO - AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT 0% SAND 30% GRAVEL 20%
 COBBLE 50% BOULDERS 0% BEDROCK 0%
 DETRITUS 0%

HABITAT TYPE:

SURVEY AREA (l" x w" x h"): Surber

POOL SIDE POOL PLUNGE POOL (RUN) RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

D-1ft
 Np-306
 V-20.10641°
 N-155.59599°

COMMENTS:

Random No.: 4, 5

Site No.: 6

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Ahi
 HSA CODE: - - - - - TEMPERATURE: - (°C)
 NAME: Opa ELEVATION: 105 (ft.)
 DATE: 10/17/04 TIME: 2:30 AM TO - AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT 0% SAND 30% GRAVEL 20%
 COBBLE 50% BOULDERS 0% BEDROCK 0%
 DETRITUS 0%

HABITAT TYPE:

SURVEY AREA (l" x w" x h"): Surber

POOL SIDE POOL PLUNGE POOL (RUN) RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

N 20.10657°
 W 155.59631°

5 inches

wp-305

COMMENTS:

Random No.: - , -

Site No.: 5