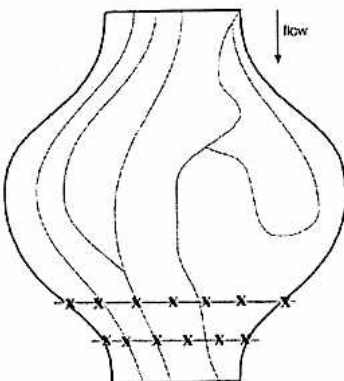


Stream Name	Hilawe	
Date	5/18/2004	
Start Time	1:59	
GPS reading (0 m)		
GPS reading (100 m)		
Observers	Session 3	
Comments		

Transect # <u>2</u>	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	5	0.35	0	0.45	0.9	1.6	1.55	1.4	1.2	1			
Water Speed	0	S	S	0	S	M	F	F	F	M	S			
Substrate Size	M/L	S	S	L	S	S	L	L	M	M	S/M			
Other maj. feat.														

Transect # <u>1</u>	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	0	0.4	0.85	0.9	0.4	1	0.55	0	0.55	0.85	0.85	0.95	
Water Speed	0	0	F	F	F	F	F	F	0	M	F	F	F	
Substrate Size	M/L	L	L	S	M	L	M/L	M/L	L	M/L	M	M/L	M	
Other maj. feat.		Bolder							Bolder					

Transect # <u>2</u>	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.														

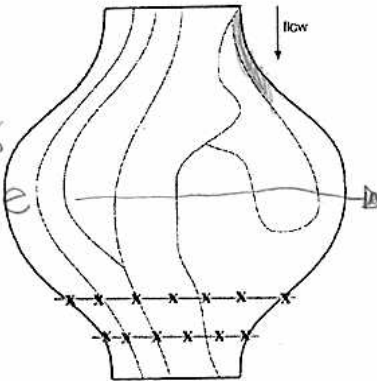
Transect # <u>3</u>	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth														
Water Speed														
Substrate Size														
Other maj. feat.														

Transect # <u>4</u>	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 # <u>5</u>	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	Hilawe	
Date	May 18, 2004	
Start Time		
GPS reading (0 m)	N20.10647°/W155.59618°	
GPS reading (100 m)	N20.10636°/W155.59648°	
Observers	Leināla, Mike, Brooke, Kahale	
Comments	begin wpt 214 end wpt 215	keola, kai

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	0.4	1.5	2.2	1.45	0.7	1.15	0.6							
Water Speed	S	M	M	M	M	S	M							
Substrate Size	M	M/L	M/L	M	M/L	M/L	S/M							
Other maj. feat.														

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	.35	.9	.7	.85	.55	.9	.9	.45						
Water Speed	S	M	M	M	M	M	M/L	M/S						
Substrate Size	S/M	L	L	M/S	S	M/L	M	M/S						
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	.05	.65	1.5	1.25	1.35	1.45	1.35	.75	.2					
Water Speed	S	S	M/S	M	M	M	S/M	S	S					
Substrate Size	S	M	S/M	M	M/L	S/L	S/M	S/M	S					
Other maj. feat.						boulder								

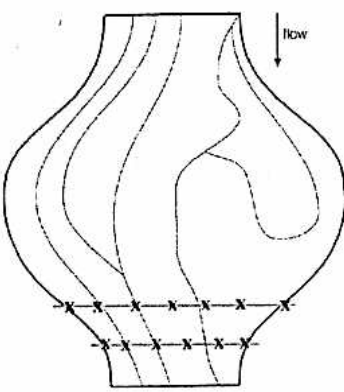
Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	.1	.7	.6	.85	1.0	1.65	1.35	1.0	0.0	.9				
Water Speed	S	M	F	F	F	F	M	M	S	S				
Substrate Size	M	M	M	M/L	L	S/L	S/L	M	L	S/M				
Other maj. feat.														

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.														

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	Hilawe	Stream Mapping Data Sheet 
Date	8 March May 18, 2004	
Start Time	N 20.1063 W 155.5990	
GPS reading (0 m)	N 20.1063 W 155.5990	
GPS reading (100 m)	N 20.10607 W 155.59602	
Observers	Ikaika (Tues)	
Comments	wpt 217 end begin wpt 216	

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	.75	7.5	1.5	1.3A	1.2	1.74	.3	.7					
Water Speed	slow	slow	medium	S	M	M	L	LS	M					
Substrate Size	small	small	medium	M	M	ML	ML	LM	M					
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	0	.6	.5	.8	1.45	.8	1.34	0	0					
Water Speed	S	S	S	M	F	F	F	VS	0					
Substrate Size	S	L/M	M/S	S	L	LM	M	M	L					
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	0.1m	.65	.3	.7	1.1m	2	.65	.45	.49					
Water Speed	S	S	S	m	F	F	m	S	m					
Substrate Size	sm	sm	sm	m	m	m	L	m	S					
Other maj. feat.														

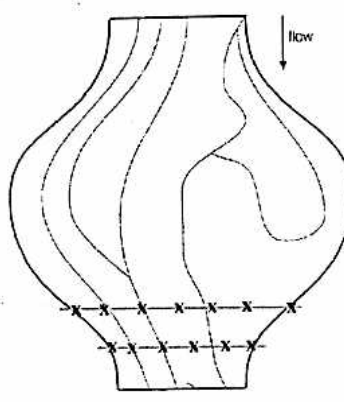
Transect #	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	.0	0	.3	.7	1.0	.5	1.74	.7	1.3A	.4				
Water Speed	S	0	S	S	0	M	F	M	M	S				
Substrate Size	S	S/M	M/S	M/S	LM	L/M	L	L	L/M	M/S				
Other maj. feat.														

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.														

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	May 20, 2004	
Start Time	10:03 am	
GPS reading (0 m)	N20.10646°/W 155.59593	
GPS reading (100 m)	N20.10669°/W 155.59627	
Observers	O'opus	
Comments	West 155.59593 BB = Big Boulder N 20.10669 W 155.59627	

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	0m	1.9 ft	1.5 ft	1.5 ft	1.5 ft	1.9 ft	1.5 ft							
Water Speed	M	M	M	M	S	M	M							
Substrate Size	S	M	M	L	M/S	M/L	M							
Other maj. feat.														

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	1.1 ft	1.5 ft	0.7 ft	1.8 ft	1 ft	0.6 ft								
Water Speed	M	F	M	M	M	M								
Substrate Size	M	M	L/M	M/L	L	S								
Other maj. feat.														

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	0.4 ft	0.8 ft	0.7 ft	1.6 ft	1.6 ft	1.3 ft	0.7 ft	0.6 ft						
Water Speed	S	M	F	M	M	M	S	S						
Substrate Size	L	M	M	M	M	M	S	M						
Other maj. feat.	BB													

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	0.4 ft	0.6 ft	0.5 ft	0.4 ft	0.5 ft	0	0.26 ft	0.7 ft						
Water Speed	M	M	M	M	M	S	M	S						
Substrate Size	S	S	M/S	L	L/M	S	L/M	M/S						
Other maj. feat.						BB								

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	Stream Mapping Data Sheet
Date	5/20/04	
Start Time	11:24	
GPS reading (0 m)	N 20.10645/W 155.59642	
GPS reading (100 m)	N 20.10623/W 155.59616	
Observers	Pua'a i Ka Wai	
Comments	N 20.10623 W 155.59616	

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	0.3	0.35	0.7	1.3	0.75	0.7	1.1							
Water Speed	S	S/M	M	M	M	M	M							
Substrate Size	S	S/m	S/m	M/S	L/M	L/M	M/S							
Other maj. feat.														

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	0.4	0.7	0.8	0.5	1.45	1.6	1.4	0.1	0.4	0.35	0.2			
Water Speed	S	M	M/F	M	F/M	M/F	S	F	S	F	M/F			
Substrate Size	G/S	1/m/s	M/S	S/m	M/S/L	M/L	S/m	Pipe	Cobble	L/M/S	S/M/S			
Other maj. feat.								Pipe						

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	0.2	0.4	0.5	0.8	1.4	0.95	0.6	0.3					
Water Speed	F	M/F	M/S	S	M	M/F	M	S	S					
Substrate Size	M/S	M/S	M/S	S/M	S/M	L/M	M/S	M/S	L/M/S					
Other maj. feat.														

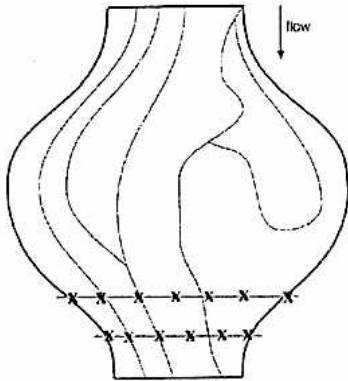
Transect # 3	0 m	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m
Est. Depth	0.1	0.3	0.8	1.15	0.6	0.7	0.05	0.05						
Water Speed	S	F	F	F	m/s	F	S	S						
Substrate Size	m/s	m/s	m/s/L	S/m	m/s	m/L	m/s	S/m						
Other maj. feat.														

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	0.05	0.1	0	0.1	0.4	0.3	1.3	0.3	1.3					
Water Speed	S	S	0	M/F	S/m	F	F	M/F	M					
Substrate Size	m/s	S/m	S/m	S/m	m/s	m/s	L/m	L/m	m/L					
Other maj. feat.			dry											

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	0.3	0.7	1.0	0.3	0	0.2	1.4	1.3	1.65	0				
Water Speed	S	S	S	S	0	m/s	F	M	S	0				
Substrate Size	m	S/m	m/L	S/m	S	m/s	L/S	m/L	S/m	m/s				
Other maj. feat.					dry					dry				

Water Speed (fast, medium, slow)

Substrate Size (small, medium, large)

Stream Name	Hirilawe	Stream Mapping Data Sheet 
Date	5/20/04	
Start Time	Begin	
GPS reading (0 m)	N 20.10618°	
GPS reading (100 m)	W 155.59607°	
Observers	BIG BOARZ	
Comments	er = edge a vch N 20.10606° W 155.59579° up + 227 end	

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	.6	.7	.9	.6	.6	.8	.8	.4	.5	.7	.2	.2	
Water Speed	S	M	m	m	m	m	m	m	S	S	S	m	m	
Substrate Size	S	L	m	L	S	m	m	S	L	L	L	L	L	
Other maj. feat.														

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	.6	.6	.5	.5	.5	.5	.5	.5	.5	.35	.6	.5	.8
Water Speed	S	M	M	S	F	M	S	M	M	M	M	M	F	M
Substrate Size	M	S	M	S	M	L	S	M	S	S	L	L	L	M
Other maj. feat.														

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	.2	.0	.1	.3	.1	.3	.2	.1	0	.5	0	0	.8	1.75
Water Speed	S	m	m	S	S	S	S	S	0	S	0	0	S	m
Substrate Size	ML	L	Sm	S	m	S	M	m	L	S	L	L	L	S
Other maj. feat.		er							dry		dry	dry		

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	.2	.9												
Water Speed	F	m												
Substrate Size	L	L												
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.														

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)

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

Stream Edge Width (feet)	24.7	23	21	19	17	15	14	13	12	11	10	9	8	7	6	4	2.0	1
Stream Edge Depth (feet)	0	0.4	0.6	1.1	0.8	1.0	2.1	2.2	2.4	2.2	2.2	2.1	1.9	1.8	1.5	0.8		
Flow Rate Width (ft/sec)																		
Flow Rate Depth (ft/sec)																		
Substrate/ % Vegetation																		
% Plant Coverage																		
Mean Velocity ¹ (ft/sec)	0	-0.06	-0.25	-0.11	0.1	0.12	0.28	0.38	0.31	0.83	0.97	0.9	1.0	0.95	0.65	0.13	0	
Surface Velocity ² (ft/sec)																		
Bottom Velocity ³ (ft/sec)																		

DATE 5/18/01	HYDROLAB			gage = 1.0 ft FLOW ↓ Transect Line Kawai - Kahale, Kai, Keola, Nahe, Lema'ala, Brooke
TIME 2.48 pm	WIDTH (feet)			
OBSERVER K. A. Nolan	TEMPERATURE (°C)	21.4		
REACH	DISSOLVED OXYGEN (mg/L)	12.12		
TRANSECT#	CONDUCTIVITY (mS/cm)	96.7		
DAR_CODE	pH	Not working		
STREAM Hiihawe	TURBIDITY (NTU)			
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)			

SITE PICTURE

FLOW DATA SHEET

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

STREAM EDGE

BANK FULL

BANK FULL

STREAM EDGE

Stream Edge Width (feet)	24.7	19 ft	18 ft	17 ft	16 ft	15 ft	14 ft	13 ft	12 ft	11 ft	10 ft	9 ft	8 ft	7 ft	6 ft	5 ft	4 ft	3 ft	2.6
Stream Edge Depth (feet)	0	0.5	0.6	1.1	1.1 ft	0.7 ft	1.04 ft	1.7 ft	1.8 ft	1.5 ft	1.7 ft	1.6 ft	2.1 ft	1.9 ft	1.9 ft	1.8 ft	1.6 ft	1.7 ft	0
Flow Rate Width (ft/sec)	0																		
Flow Rate Depth (ft/sec)	0																		
Substrate/ % Vegetation	00																		
% Plant Coverage	0																		
Mean Velocity ¹ (ft/sec)	0	-0.13	0.29	0.53	0.66	0.54	0.61	0.45	0.45	0.74	0.63	1.28	1.11	0.58	0.67	0.50	0.32	0.03	0
Surface Velocity ² (ft/sec)	0																		
Bottom Velocity ³ (ft/sec)	0																		

DATE 5-18-04	HYDROLAB				Transect Line Ikaika Iliana Iokepa R.J. Keau Wena Ha'o Staff Gage = 1.01 ft
TIME 11:21 Am	WIDTH (feet)				
OBSERVER R.J.	TEMPERATURE (°C)	21.2°C			
REACH	DISSOLVED OXYGEN (mg/L)	12.26 mg/L			
TRANSECT#	CONDUCTIVITY (mS/cm)	102.9 mS/cm			
DAR_CODE	pH	8.05 pH			
STREAM hiliawe	TURBIDITY (NTU)				
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)				

SITE PICTURE

FLOW DATA SHEET

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

STREAM EDGE

BANK FULL

BANK FULL

	22.3	21	20	19	18	17	16	15	14	13	11	10	8	7	6	5	4	3	1.3
Stream Edge Width (feet)																			
Stream Edge Depth (feet)	0	0.6	0.5	0.5	0.7	0.7	1.3	1.4	1.5	1.6	1.9	1.8	1.7	1.6	1.6	1.6	1.5	1.5	0
Flow Rate Width (ft/sec)																			
Flow Rate Depth (ft/sec)																			
Substrate/ % Vegetation																			
% Plant Coverage																			
Mean Velocity ¹ (ft/sec)	0	-0.09	-0.02	+0.05	0.11	0.33	0.32	0.30	0.41	0.63	0.36	0.91	0.95	0.98	0.50	0.53	0.25	0.05	0
Surface Velocity ² (ft/sec)																			
Bottom Velocity ³ (ft/sec)																			

DATE 5/18/2004	HYDROLAB			STAFF gage = 1.0 feet FLOW ↓ Transect Line Kaili Kapua Taked' I'i Ni Kaleo An A
TIME 1:27	WIDTH (feet)	7		
OBSERVER Kapua	TEMPERATURE (°C)	21.3°C		
REACH	DISSOLVED OXYGEN (mg/L)	12.25mg/L		
TRANSECT#	CONDUCTIVITY (mS/cm)	94.6		
DAR_CODE	pH	8.35		
STREAM Hiihawe	TURBIDITY (NTU)			
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)			

SITE PICTURE

FLOW DATA SHEET

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

STREAM EDGE

STREAM EDGE

BANK
FULL

BANK
FULL

Stream Edge Width (feet)	22.6 ^{ft}	21 ^{ft}	19 ^{ft}	17 ^{ft}	16 ^{ft}	15 ^{ft}	14 ^{ft}	13 ^{ft}	12 ^{ft}	11 ^{ft}	10 ^{ft}	9 ^{ft}	8 ^{ft}	7 ^{ft}	6 ^{ft}	5 ^{ft}	4 ^{ft}	2.4 ^{ft}
Stream Edge Depth (feet)	0	0.8	1.6	1.0	1.0	1.7	1.8	2.0	2.1	2.0	2.1	2.0	2.0 ^{ft}	1.8 ^{ft}	1.7 ^{ft}	1.5 ^{ft}	1.5 ^{ft}	0
Flow Rate Width (ft/sec)																		
Flow Rate Depth (ft/sec)																		
Substrate/ % Vegetation																		
% Plant Coverage																		
Mean Velocity ¹ (ft/sec)	0	0.04	0.03	0.01	0.03	0.11	0.12	0.12	0.16	0.23	0.22	0.21	0.22	0.25	0.30	0.10	0.01	0
Surface Velocity ² (ft/sec)																		
Bottom Velocity ³ (ft/sec)																		

DATE 5/20/04	HYDROLAB			Ikwa, Kaeo FLOW ↓ Kili, Kaeo J.D. gage reading 0.92
TIME 1:00 PM	WIDTH (feet)			
OBSERVER	TEMPERATURE (°C)	23.2 ^{°C}		
REACH	DISSOLVED OXYGEN (mg/L)	9.1		
TRANSECT#	CONDUCTIVITY (mS/cm)	107.0		
DAR_CODE	pH			
STREAM Hiliawe	TURBIDITY (NTU)	0.6		
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)			

SITE PICTURE

FLOW DATA SHEET

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

STREAM EDGE

BANK FULL

STREAM EDGE

BANK FULL

Stream Edge Width (feet)	23.3	22	21 ft	20 ft	19 ft	18 ft	17 ft	16 ft	15 ft	14 ft	13 ft	12 ft	11 ft	10 ft	9 ft	8 ft	7 ft	6 ft	5 ft	2.3 ft
Stream Edge Depth (feet)	0	0.6 ft	0.8 ft	1.1 ft	1.1 ft	1.1 ft	1.1 ft	1.6 ft	2.0	1.8 ft	2.2 ft	2.2 ft	2 ft	1.8 ft	1.7 ft	1.5 ft	1.5 ft	0		
Flow Rate Width (ft/sec)																				
Flow Rate Depth (ft/sec)																				
Substrate/ % Vegetation																				
% Plant Coverage																				
Mean Velocity ¹ (ft/sec)	0	0.01	0.03	0.04	0.03	0.05	0.07	0.11	0.16	0.22	0.17	0.27	0.33	0.33	0.29	0.29	0.23			
Surface Velocity ² (ft/sec)																				
Bottom Velocity ³ (ft/sec)																				

DATE 5/20/07	HYDROLAB			Flow ↓ Kahea, Alisha, Jacob, Kawika, Pono, Keroa, Kela Transect Line Staff Gauge = 0.94 ft
TIME 11:31 am	WIDTH (feet)			
OBSERVER	TEMPERATURE (°C)	22.6 (t)		
REACH	DISSOLVED OXYGEN (mg/L)	9.16		
TRANSECT#	CONDUCTIVITY (mS/cm)	105.7		
DAR_CODE	pH			
STREAM Hiiwane	TURBIDITY (NTU)	0.85		
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)			

SITE PICTURE

10/04 Kūniipo, Hīlei, Isaiak,
Hirano, Gimo, Kawaiakapu,
Ron, Leon, Kāinulani
Pua'a o Kawai

FLOW DATA SHEET

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

lessor conductivity (minerals) the fresher the water
7 (1-14) avg. acidity for distilled/pure water
[1 most acidic]

BANK FULL	STREAM EDGE												STREAM EDGE	BANK FULL
Stream Edge Width (feet)	22.3ft	21.8ft	20ft	19ft	18ft	17ft	16ft	14ft	12ft	10ft	8ft	6ft	4ft	2ft
Stream Edge Depth (feet)	0	0.4ft	0.9ft	1.1ft	1.2ft	1.0ft	1.1ft	1.8ft	1.0ft	2.1ft	2.1ft	1.6ft	1.5ft	0
Flow Rate Width (ft/sec)														
Flow Rate Depth (ft/sec)														
Substrate/ % Vegetation														
% Plant Coverage														
Mean Velocity ¹ (ft/sec)	0	0.08	0.02	0.01	0.01	0.01	0.08	0.10	0.12	0.21	0.28	0.31	0.02	0
Surface Velocity ² (ft/sec)														
Bottom Velocity ³ (ft/sec)														

DATE 20 May 2007	HYDROLAB			FLOW ↓
TIME 1020	WIDTH (feet)			
OBSERVER Kainulani	TEMPERATURE (°C)	21.9°C		
REACH	DISSOLVED OXYGEN (mg/L) 9-12 avg	9.31 mg/L		higher oxygen # the better low 2-3 nothing will survive
TRANSECT#	CONDUCTIVITY (mS/cm) minerals	105.2 mS/cm		Transect Line
DAR_CODE	pH	acidic		
STREAM Kūniipo	TURBIDITY (NTU) how "dirty" water is	0.8 NTU		calibrate / standardize your equipment (unit)
TRIBUTARY	TOTAL SUSPENDED SOLIDS (mg/L)			

SITE PICTURE

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: 10
 HSA CODE: - TEMPERATURE: - (°C)
 NAME: Hihilawe ELEVATION: 34^{ft} (ft.)
 DATE: 5/18/2004 TIME: 11:24 AM TO 11:50 AM
Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):
 SEDIMENT 0% SAND 10% GRAVEL 20%
 COBBLE 20% BOULDERS 50% BEDROCK 0%
 DETRITUS -

HABITAT TYPE: SURVEY AREA (l" x w" x h"): 12" x 12" x 8" deep
 POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

0.19 W. 155.51618°
 at N. 20.10025°

COMMENTS:

Random No.: 5, 1

Site No.: 2

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: 10
 HSA CODE: - TEMPERATURE: - (°C)
 NAME: Hihilawe ELEVATION: 37 (ft.)
 DATE: May 18 2004 TIME: 10:45 AM TO - AM
Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):
 SEDIMENT 20% SAND 50% GRAVEL 20%
 COBBLE 5% BOULDERS 20% BEDROCK 20%
 DETRITUS surver

HABITAT TYPE: SURVEY AREA (l" x w" x h"): 12 x 12
 POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

16" deep, clear water

Wp

N 20.10652°

W 155.59622°

COMMENTS:

Random No.: 3, 3

Site No.: 1

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: KAWAI

WATER CODE: _____ TEMPERATURE: _____ (°C)

NAME: Huilawe ELEVATION: 75' (Feet) (ft.)

DATE: May 13 / 2004 TIME: 1:18 PM AM TO _____ AM
Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT 0 SAND 10% GRAVEL 10%

COBBLE 35% BOULDERS 45% BEDROCK 0

DETRITUS _____

HABITAT TYPE: Riffle SURVEY AREA (l" x w" x h"): _____

POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE

NO WATER DIRTY WATER

SIZE: _____ ♂ _____ ♀ _____ ?

NOTES:

Depth 5" (inches)

N: 20.10622°

W: 155.59618°

COMMENTS:

Random No.: 1, 9

Site No.: 2

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: KAWAI

HSA CODE: _____ TEMPERATURE: _____ (°C)

NAME: Huilawe Str ELEVATION: 62' (ft.)

DATE: May 18 / 2004 TIME: 12:40 AM TO 1:17 AM
Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT _____ SAND 70% GRAVEL 5%

COBBLE 5% BOULDERS 20% BEDROCK _____

DETRITUS _____

HABITAT TYPE: SURVEY AREA (l" x w" x h"): 1m sq

POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE

NO WATER DIRTY WATER

SPP: _____ SIZE _____ ♂ _____ ♀ _____ ?

1' deep. Surber Sample.

No GPS -

20.10629°

155.59589°

COMMENTS:

Random No.: 1, 1

Site No.: 1

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Team Ikaika
 HSA CODE: _____ TEMPERATURE: _____ (°C)
 NAME: Hiliawe stream ELEVATION: 86 (ft.)
 DATE: 5/18/2004 TIME: 2:27 AM TO _____ AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT _____ SAND _____ GRAVEL _____
 COBBLE 60% BOULDERS 40% BEDROCK _____
 DETRITUS _____

HABITAT TYPE:

SURVEY AREA (l" x w" x h"): Super 21m²
 POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE
 NO WATER DIRTY WATER

SIZE ♂ ♀ ?
8 in

N 20.10578°
 W. 155.59578°

COMMENTS:

Random No.: 1, 5

Site No.: 2

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Team Ikaika
 HSA CODE: _____ TEMPERATURE: _____ (°C)
 NAME: Hiliawe ELEVATION: 85 ft. (ft.)
 DATE: 5/18/2004 TIME: 2:00 AM TO 2:25 AM
 Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT _____ SAND _____ GRAVEL 0-2%
 COBBLE 30% BOULDERS 15% BEDROCK 0%
 DETRITUS _____

HABITAT TYPE:

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

SIZE ♂ ♀ ?
7 1/2 inches deep

N. 20.10596°
 W. 155.59586°

COMMENTS:

Random No.: 1, 2

Site No.: 1

Team
 Ikaika
 Iliana
 Keana
 Wena
 Ha'o
 RJ
 Iokapa

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Big Bear
 HSA CODE: _____ TEMPERATURE: _____ (°C)
 NAME: Hillside stream ELEVATION: ~40 ft (ft.)
 DATE: May 11 2012 TIME: 11:30 AM TO _____ AM
 Mo. Day Yr. (START) PM (STOP) PM
 SUBSTRATE TYPE (%):
 SEDIMENT 0% SAND 0% GRAVEL 10%
 COBBLE 20% BOULDERS 70% BEDROCK 0%
 DETRITUS 0%
 HABITAT TYPE: pool SURVEY AREA (l" x w" x h"): 16 inch sq
 POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE
 NO WATER DIRTY WATER

P: SIZE ♂ ♀ ?

N 20.10620°
 W 155.59616°

COMMENTS:

Random No.: 6, 0

DIVISION OF AQUATIC RESOURCES
 GRH 2/02

Site No.: 2

J. L. DARLING CORP.

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Big Bear
 HSA CODE: _____ TEMPERATURE: _____ (°C)
 NAME: Hillside str. ELEVATION: 32.5 (ft.)
 DATE: 5 120 12004 TIME: 10:00 AM TO _____ AM
 Mo. Day Yr. (START) PM (STOP) PM
 SUBSTRATE TYPE (%):
 SEDIMENT _____ SAND 30% GRAVEL 30%
 COBBLE 0% BOULDERS 40% BEDROCK 0%
 DETRITUS _____
 HABITAT TYPE: SURVEY AREA (l" x w" x h"): 13" deep
 POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?

o'opu 3mm
 spp undef.

N GPS
 N 20.10621°
 W 155.59634°

COMMENTS:

Random No.: 1, 3

DIVISION OF AQUATIC RESOURCES
 GRH 2/02

Site No.: 1

J. L. DARLING CORP.
 www.RiteintheRain.com

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Big Bear
 HSA CODE: _____ TEMPERATURE: _____ (°C)
 NAME: Hillane Str. ELEVATION: _____ (ft.)
 DATE: 5/20/2004 TIME: _____ AM TO _____ AM
 (Mo. Day Yr. (START) PM (STOP) PM)

SUBSTRATE TYPE (%):
 SEDIMENT 0% SAND 0% GRAVEL 36%
 COBBLE 10% BOULDERS 60% BEDROCK 0%
 DETRITUS 0%

HABITAT TYPE: SURVEY AREA (l" x w" x h"): 18 Dept
 POOL SIDE POOL PLUNGE POOL RUN RIFFLE CASCADE
 NO WATER DIRTY WATER

SPP: SIZE ♂ ♀ ?
18'

No Catch

COMMENTS:

Random No.: 1, 61

DIVISION OF AQUATIC RESOURCES
 GRH 2/02

J. L. DARLING CORP.

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: O'opu
 HSA CODE: _____ TEMPERATURE: _____ (°C)
 NAME: Pihitani ELEVATION: 242 (ft.)
 DATE: ✓ 12012004 TIME: 11:20 AM TO _____ AM
 (Mo. Day Yr. (START) PM (STOP) PM)

SUBSTRATE TYPE (%):
 SEDIMENT 0 SAND 35% GRAVEL 30%
 COBBLE 30% BOULDERS 15% 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 ♂ ♀ ?

6m deep (riffle)

N 20.10584°
 W 155.59598

COMMENTS:

Random No.: 3, 3

DIVISION OF AQUATIC RESOURCES
 GRH 2/02

J. L. DARLING CORP.

Site No.: 1

J. L. DARLING CORP.
 www.BitaintheRain.com

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM

OBSERVER: Pua'a i Ka

A CODE: - - - TEMPERATURE: 2 (°C)

NAME: Hihilawe ELEVATION: 50 (ft.)

DATE: 5/20/04 TIME: 1:35 PM AM TO PM AM

Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT 80% SAND 5% GRAVEL 10%

COBBLE 80% 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 ♂ ♀ ?

9 in deep

N: 20.10615°
W: 155.59589°

COMMENTS:

Random No.: 3, 2

Site No.: 2

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM

OBSERVER: O'opo

HSA CODE: - - - TEMPERATURE: (°C)

NAME: Hihilawe ELEVATION: 81 (ft.)

DATE: 5/20/2004 TIME: 11:50 AM TO AM

Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):

SEDIMENT 0% SAND 30% GRAVEL 25%

COBBLE 15% BOULDERS 25% BEDROCK 5%

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 ♂ ♀ ?

bin

N 20.10585°
W 155.59619°

COMMENTS:

Random No.: 3, 6

Site No.:

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Pua'i ika wai
 HSA CODE: - - - TEMPERATURE: - (°C)
 NAME: Hilawae ELEVATION: - (ft.)
 DATE: 5 120 104 TIME: 1:40 pm AM TO 2:15 pm AM
Mo. Day Yr. (START) PM (STOP) PM

SUBSTRATE TYPE (%):
 SEDIMENT - SAND 10% GRAVEL 20%
 COBBLE 50% BOULDERS 20% BEDROCK -
 DETRITUS -

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

SPP: SIZE ♂ ♀ ?

9in deep
 N 20.10591°
 W 155.59586°

COMMENTS:

Random No.: 4, 11

Site No.: 3

STREAM SURVEY FORM

SURVEY TYPE: RANDOM NONRANDOM OBSERVER: Pua'i ika wai
 HSA CODE: - - - TEMPERATURE: - (°C)
 NAME: Hilawae ELEVATION: - (ft.)
 DATE: 5 120 104 TIME: 1:15 pm AM TO - - - AM
Mo. Day Yr. (START) PM (STOP) A P

SUBSTRATE TYPE (%):
 SEDIMENT 0% SAND 15% GRAVEL 5%
 COBBLE 50% BOULDERS 50% 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 ♂ ♀ ?

9in deep
 N 20.10631°
 W 155.59602°

COMMENTS:

Random No.: 3, 4

Site No.: 1