Firelands Wind, LLC Case No. 18-1607-EL-BGN

Application Part 17 of 17

Part 17 includes:

- Exhibit Z Ecological Assessment (Part 8 of 8)
- Exhibit AA Frac-Out Contingency Plan

Date Filed: January 31, 2019

Christine M.T. Pirik (0029759) (Counsel of Record) Terrence O'Donnell (0074213) William V. Vorys (0093479) Dickinson Wright PLLC 150 East Gay Street, Suite 2400 Columbus, Ohio 43215 Phone: (614) 591-5461 Email: cpirik@dickinsonwright.com todonnell@dickinsonwright.com

Attorneys for Firelands Wind, LLC

ADDITIONAL STREAM INFORMATION	N (This Information Must Also be Completed):
	es 🖉 No QHEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATE	
WWH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
	OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	NRCS Soil Map Page: NRCS Soil Map Stream Order
	Township / City: NACO Con Map Stream Ofder
MISCELLANEOUS	Township roley
	Date of last precipitation: Quantity:
	Date of last precipitation: Quantity: -168-01E, 51M-168-025UBSTA
Photograph Information:	Canopy (% open): 80 RECENT HEANY RAN
Were samples collected for water chemis	stry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) [Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of th	he stream (Y/N) If not, please explain:
BIOTIC EVALUATION Performed? (Y/N): (If Yes, Re	ecord all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the r. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
ish Observed? (Y/N) Voucher?	? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
	RATIVE DESCRIPTION OF STREAM REACH (This must be completed):
	RATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): other features of interest for site evaluation and a narrative description of the stream's location
	other features of interest for site evaluation and a narrative description of the stream's location $[+ A R] E \leq TE $
	other features of interest for site evaluation and a narrative description of the stream's location $[+ A R] E \leq TE $
	other features of interest for site evaluation and a narrative description of the stream's location $[+ A R] E \leq TE $
	그 사람은 가지 것 같아요. 아님께 가지 않는 것 같아요. 아님께 집에 가지 않는 것 같아요. 아님께 집에서 가지 않는 것 같아요. 이 있는 것 같아요. 이 것 같아요. 이 것 같아요. 이 것 같아요. 이 집 집 같아요. 이 집 집 같아요. 이 집 같아요. 이 집 집 같아요. 이 집 집 같아요. 이 집 집 같아요. 이 집 집 같아요. 이 집 같아요. 이 집 같아요. 이 집 집 같아요. 이 집 같아요. 이 집 집 집 같아요. 이 집 집 같아요. 이 집 집 같아요. 이 집 집 집 집 집 같아요. 이 집 집 집 집 집 집 집 집 집 집 집 집 집 집 집 집 집 집
	other features of interest for site evaluation and a narrative description of the stream's location $[+ A R] E \leq TE $
	CULVERT & DRIVEWAY CULVERT & DRIVEWAY CULVERT & DRIVEWAY

<image/>	SIM-169				· .
		adwater Hab F	itat Evaluation I IHEI Score (sum of r	Form netrics 1, 2, 3):	44
DATE	SITE NUMBER				
NOTE: Complete All items On This Form - Refer to "Field Evaluation Manual for Ohjo's PHWH Streams" for Instructions STREAM CHANNEL INONE / NATURAL CHANNEL RECOVERING Streams" for Instructions MODIFICATIONS SUBSTRATE (Estimate percent of every type of substrate present. Check OWL Yegg pedominant substrate TYPE boxes (Wax of 40). Add total number of significant dubtind bypes chandrade types (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes chandrade types) Image: Status (External dubting bypes) Image: Status (External dubting bypes) Image: Status (External dubting bypes) Image: Status (External	LENGTH OF STREAM REACH (ff) LAT	LONG.	RIVER CODE	RIVER MILE	
MODIFICATIONS 1. SUBSTRATE (Estimate percent of every type of substrate present. Check OMLY lwg predominant substrate 7/7E boxes (Max of 40). Add total number of significant substrate bypes found (Max of 8). Final metric score is sum of boxes A & 8. HEER Image: Substrate (Estimate percent of every type of substrate bypes found (Max of 8). Final metric score is sum of boxes A & 8. HEER Image: Substrate (Section 1) Image: Substrate bypes (Section 2) Image: Section 2) Image: Section 2) Image: Section 2) Image: Section 2) Image: Section 2) Image: Section 2) Image: Section 2) Image: Section 2)					
(Max of 40), Add teal number of significant substrate types found (Max of 8). Final metric score is sum of Dozes A 8. Processes A 8. Proceses A 8. Processe		L CHANNEL 🗍 RECO		RECENT OR NO RECO	OVERY
TPE BLDR SLARS (16 pt) PERCENT YPE SLT [3 pt] PERCENT PERCENT BULLDR (-2266 mm) [16 pts] BULLSR (-2266 mm) [17 pts] BULLSR (-2266 mm) [17 pts] D </td <td>1. SUBSTRATE (Estimate percent of every ty (Max of 40). Add total number of significant su</td> <td>pe of substrate present. Ibstrate types found (Max</td> <td>Check ONLY two predominant of 8). Final metric score is sur</td> <td>t substrate <i>TYPE</i> boxes n of boxes A & B.</td> <td></td>	1. SUBSTRATE (Estimate percent of every ty (Max of 40). Add total number of significant su	pe of substrate present. Ibstrate types found (Max	Check ONLY two predominant of 8). Final metric score is sur	t substrate <i>TYPE</i> boxes n of boxes A & B.	
BEDROCK [16 pt] FINE DETRITUS [3 pts] ID COBLE (65 26 mm) [12 pts] CLAY of HARDPAN [0 pt] ID GRAVEL (24 mm) [6 pts] ID MXX = 4.0 Total of Percentages of Bitt dises, Boulder, Coble, Bedrok ID ID SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: ID 2 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter/200 (0 evaluation reach at the time of evaluation. Avoid plung pools from road culvets or storm water pipes) Check ONLY on box; 2 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter/200 (0 evaluation reach at the time of evaluation. Avoid plung pools from road culvets or storm water pipes) Check ONLY on box; 2 Maximum Pool Depth (Measured as the average of 3-4 measurements) (Check ONLY one box); 2 Stometry 51 [20 pts] Stom (5 fp pts] 3 BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box); 4.00 metry 5-13 [20 pts] Stom (5 fp pts] Stom (5 fp pts] 2.00 metry 5-13 [20 pts] Stom (5 fp pts] Stom (6 fp pts] 3.00 metry 5-13 [20 pts] Stom (5 fp pts] Stom (5 fp pts] 3.00 metry 5-13 [20 pts] Stom (5 fp pts] Stom (5 fp pts] <t< td=""><td>TYPE PERCE</td><td></td><td>T [3 pt]</td><td>PERCENT \$0</td><td></td></t<>	TYPE PERCE		T [3 pt]	PERCENT \$0	
GRAVEL (2-64 mm) [9 pts] Bit Slass, Boulder, Cooble, Bedrock GRAVEL (2-64 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: Maximum Pool Depth (Measure the maximum pool depth within the of meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road cluberts or storm water pipes) Check OVLY one box): >>300 centimeters [20 pts] >5 cm - 10 cm [15 pts] Z co >>40 meters (> 13) (20 pts] S com (25 pts) NO WATER OR MOIST CHANNEL [0 pts] Z co > Dank FULL WIDTH (Measured as the average of 3-4 measurgements) Check OMLY one box): Z co > 4.0 meters (> 13) (20 pts] S 1.0 m (5 a '3 3') [5 pts] S 1.0 m (5 a '3 3') [5 pts] Z co > 4.0 meters (> 13) (20 pts] S 1.0 m (5 a '3 3') [5 pts] Z co Z co > 4.0 meters (> 13) (20 pts] S 1.0 m (5 a '3 '15 pts] Z co Z co > 1.0 m (5 a '2 + 8' 7') [20 pts] S 1.0 m (5 a '10 m (5 m (5 m (5 a '10 m (5 m (IE DETRITUS [3 pts]		
Total of Percentages of Bidr Slabs, Boulder, Coble, Bedrock (A) (B) (B) (B) Score OF TWO MOST PREDOMINATE SUBSTRATE TYPES: Total NUMBER OF SUBSTRATE TYPES: Poil Depth (Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Pool Depth (Max = 3) > 300 centimitiers (20 pts) > 5 cm - 10 cm [15 pts] > 2 cm [25 pts] Z of NOWATER OR MOIST CHANNEL [0 pts] Z of NOWATER OR MOIST CHANNEL [0 pts] . > 40 meters (-13) [20 pts] > 10 m (-15 m (-23) + 42) (15 pts] Z of NOWATER OR MOIST CHANNEL [0 pts] Z of NOWATER OR MOIST CHANNEL [0 pts] Z of . > 40 meters (-13) [20 pts] > 10 m (-15 m (-23) + 42) (15 pts] Z of Bankfull Max = 30 . > 40 meters (-13) [20 pts] > 10 m (-15 m (-23) + 42) (15 pts] Z of Bankfull Max = 30 . > 40 meters (-13) [20 pts] > 10 m (-15 m (-23) + 42) (15 pts] Z of Bankfull Max = 30 . > 40 meters (-13) [20 pts] . AVERAGE BANKFULL WIDTH (meters) If If . This Information must also be completed Ripped Alter Alter Forest, Weiland Conservation Tillage If If If If	GRAVEL (2-64 mm) [9 pts]	ML	JCK [0 pts]		8
Bidr Stabs, Boulder, Coble, Bedrock		171766	TIFICIAL [3 pts]	(B)	
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check OVLY one box): > 300 centimeters [20 pts] > 5 cm. 10 cm [15 pts] > 22.5 - 30 cm [30 pts] > 5 cm. [5 pts] NOWATER OR MOIST CHANNEL [0 pts] Bankt Full. COMM ENTS MAXIMUM POOL DEPTH (centimeters): BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (13) [20 pts] > 1.0 m - 1.5 m (> 3' 3' - 4' 8') [15 pts] > 3.0 m - 4.0 m (> 4' 6' - 9' 7) [20 pts] > 1.0 m (> 3' 3' - 4' 8') [15 pts] > 1.5 m - 3.0 m (> 4' 6' - 9' 7) [20 pts] > 1.0 m (> 3' 3' - 4' 8') [15 pts] COMMENTS	Bldr Slabs, Boulder, Cobble, Bedrock	_ 6	TOTAL NUMBER OF SUBS	3	A. P
So confineters [20 pts] > 22.5 = 30 cm [16 pts] > 22.5 = 30 cm [25 pts] NOWATER OF MOIST CHANNEL [0 pts] COMMENTS BANK FULL WIDTH (Measured as the average of 3-4 measurements) A to meters (> 13) [20 pts] > 4.0 m (> 9' 7' + 13) [25 pts] > 1.0 m - 4.0 m (> 9' 7' + 13) [25 pts] > 1.0 m - 4.0 m (> 9' 7' + 13) [25 pts] > 1.0 m (> 4' 8' = 9' 7) [20 pts] COMMENTS COMMENTS COMMENTS HARRIAN ZONE AND FLOODPLAIN QUALITY This information must also be completed RIPARIAN VIOTH REARIAN ZONE AND FLOODPLAIN QUALITY AVERAGE BANKFULL WIDTH (meters) This information must also be completed RIPARIAN VIOTH REARIAN ZONE AND FLOODPLAIN QUALITY AVERAGE BANKFULL WIDTH (meters) COMMENTS Norde COMMENTS Stream Flows Stream Flowing Stream Flowing S	2. Maximum Pool Depth (Measure the maximu	um pool depth within the	e 61 meter (200 ft) evaluation (Check ON/ Yone box)	reach at the time of	•
>10 - 22.5 cm [25 pts] NOWATER OR MOTER CHANNEL [0 pts] COMMENTS MAXIMUM POOL DEPTH (centimeters): 3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): >4.0 meters(13) [20 pts] >1.0 m -1.5 m (> 3/3' - 4/8') [15 pts] >1.5 m + 3.0 m (> 4/8''-9''') [20 pts] >1.0 m (> 3/3'') [5 pts] COMMENTS	> 30 centimeters [20 pts]		5 cm - 10 cm [15 pts] 5 cm [5 pts]		
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	······································				
> 4.0 meters (> 13) [30 pts] > 1.0 m. + 1.5 m (> 9 3' - 4' 8'') [15 pts] Width > 3.0 m. + 4.0 m (> 9' 7' + 13) [25 pts] > 1.0 m (≤ 3' 3') [5 pts] Image: state sta					Bankfull
COMMENTS AVERAGE BANKFULL WIDTH (meters) This information must also be completed RiPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream? RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Mature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Field Open Pasture, Row Narrow <5m	□ > 4.0 m eters (> 13) [30 pts] □ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]		1.0 m - 1.5 m (> 3' 3" - 4' 8") [15	승규는 방송 이 이 이 것 같은 것 같은 것 같은 것 같은 것 같은 것 같이 있다.	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ARD FLOODPLAIN QUALITY Group of Example in the second of the second			AVERAGE BANKFÜLL W		15
RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH. FLOODPLAIN QUALITY R (Per Bank) L R Mide > 10m Mature Forest, Wetland Conservation Tillage Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Residential, Park, New Field Open Pasture, Row Crop Narrow <5m					
L R (Per Bank) L R (Most Predominant per Bank) L R Image: Stream Flowing Image: Stream Flowing Image: Stream Flowing Image: Stream Flow with isolated pools (Interstitial) Image: Stream Flow mith isolated pools (Interstitial)		QUALITY &NOTE:		looking downstreamな	
Image: Structure of Evaluation in the structure of bends per 61 m (200 ft) of channel) Image: Structure of Evaluation in the structure of the structure of the structure in the structure of the structure in the struc	L R (Per Bank) L	R (Most Predominar		Conservation Tillage	· .
Image: Narrow <5m			Shrub or Öld		
COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS SiNUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0 0.5 1.5 2.5 >3		-		Сгор	
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitiai) Dry channel, no water (Ephemeral) COMMENTS					
None 1.0 2.0 3.0 0.5 1.5 2.5 >3 STREAM GRADIELY ESTIMATE	Stream Flowing Subsurface flow with isolated pools (Inte		Moist Channel, isolated p		
STREAM GRADIENT ESTIMATE I Flat (0.5 ft/100 ft) Flat (0.5 ft/100 ft) I Flat (0.5 ft/100 ft)	None 1.0		2.0		
	STREAM GRADIENT ESTIMATE	Moderate (2 ft/100 ft)	Moderate to Severe	Severe (10.11/100	ft.)

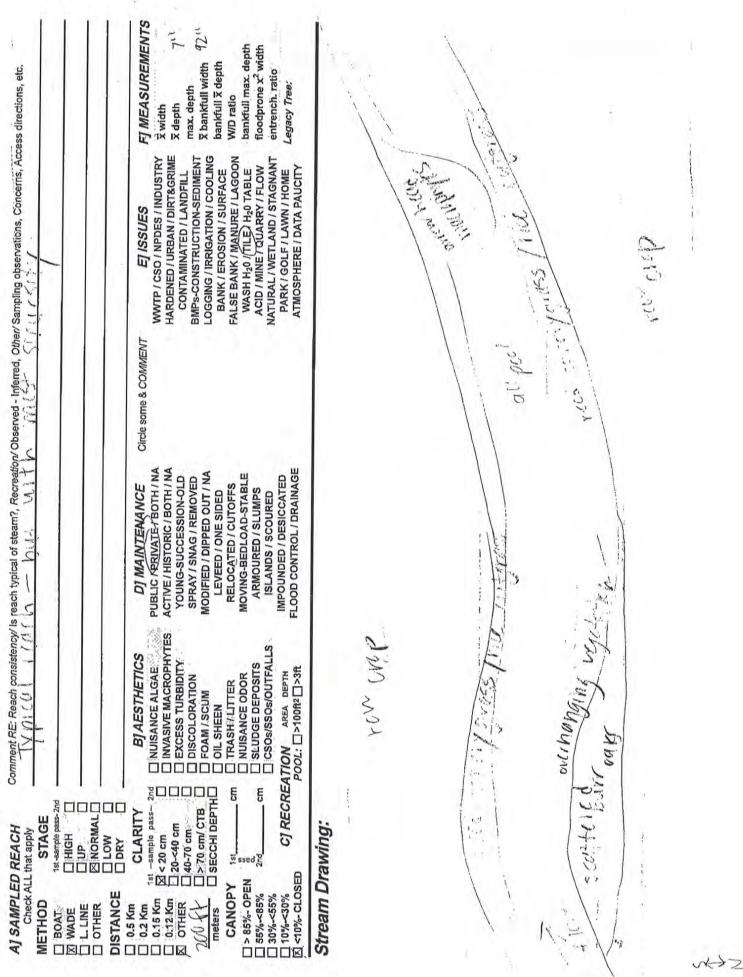
	RMATION (This Information Must /			
and share a start of the start		(If Yes, Attach Completed	QHEI Form)	
DOWNSTREAM DES		Distance fro	m Evaluated Stream	
] CWH Name:] EWH Name:		Distance from Distance from Distance from	n Evaluated Stream	
		ENTIRE WATERSHED AREA. CLEAR		
		NRCS Soil Map Page:		
		wnship / City:		A COLORADO A
MISCELLANEOUS				1.1.1.1.1.1
Base Flow Conditions? (Y/N):	N_ Date of last precipitation:	Quantity:	R	ECENT H
Photograph Information:	SIM-169-0	Quantity: <u>1 E , SIM -16</u>	9-02 50	1BSTRAT
Elevated Turbidity? (Y/N):	Canopy (% opgn):	0		10
		lab sample no. or id. and attach result	s) Lab Number:	
ield Measures: Temp (°C)_	Dissolved Oxygen (mg/l)	pH (S.U.) Conduc	tivity (µmhos/cm)	
		ot, please explain:		
ish Observed? (Y/N) rogs or Tadpoles Observed? (Y	D number. Include appropriate field d Voucher? (Y/N) Salamanders	ther collections optional. NOTE: all vouc ata sheets from the Primary Headwater Observed? (Y/N) Voucher? (Y latic Macroinvertebrates Observed? (Y	Habitat Assessment Mar /N)	ual)
		N OF STREAM REACH (This		· · · · · · · · · · · · · · · · · · ·
DRAWING AND		for site evaluation and a narrative de	scription of the stream	's location
DRAWING AND	arks and other features of interest			's location
DRAWING AND	arks and other features of interest	for site evaluation and a narrative de	scription of the stream	's location
DRAWING AND Include important landma	arks and other features of interest	for site evaluation and a narrative de	scription of the stream	's location
DRAWING AND	arks and other features of interest	for site evaluation and a narrative de	scription of the stream	's location

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June 20, 2008 Revision

OhieEPA	Qualitative Habitat and Use Assessm		QHEI Score:
Stream & Location:	S2M - 0.02	<i>R</i>	<u>m:Date: 911 [1666</u> 18 Katir Sinach MSC1
River Code: -	Scorers STORET #:	Full Name & Affiliation:	4182 . <u>7</u> 4 9 9 Office verified location □
BEST TYPES POOL □ BLDR /SLABS [10] □ BOULDER [9] □ COBBLE [8] □ GRAVEL [7] □ SAND [6] □ BEDROCK [5] □ BEDROCK [5]	Y Two substrate TYPE BOXES; or note every type present RIFFLE OTHER TYPES POOL F Image: Imag		E (Or 2 & average) QUALITY HEAVY [-2] SILT NORMAL [0] FREE [1] DDEO DECO NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [0] NORMAL [1]
qua quality: 3-Highest quality in mode	지수는 것이지, 특히 특히 한 문화가 있는 것이 있는 것이 있는 것이 없다. 이렇게 가지 않는 것이 없는 것이 없는 것이 없는 것이 없다. 이렇게 가지 않는 것이 없는 것이 없는 것이 없는 것이 없다.	boulders in deep or fast water, la	rge Check ONE (<i>Or 2 & average</i>) ols. □ EXTENSIVE >75% [11] [1] □ MODERATE 25-75% [7] [1] □ SPARSE 5-<25% [3]
3] CHANNEL MORPHOLO SINUOSITY DEVELO HIGH [4]	ENT [7] NONE [6] [5] RECOVERED [4] [RECOVERING [3]	STABILITY	Channel Maximum 20
River right looking downstream] MODERATE 10-50m [3] □ □ SHR] NARROW 5-10m [2] □ □ RESI] VERY NARROW < 5m [1] □ □ FENG	FLOOD PLAIN QUALITY EST, SWAMP [3] UB OR OLD FIELD [2] DENTIAL, PARK, NEW FIELD [1]	
│	CHANNEL WIDTH Check ONE (Or 2 & average) OL WIDTH > RIFFLE WIDTH [2] TOI OL WIDTH = RIFFLE WIDTH [1] VEI OL WIDTH > RIFFLE WIDTH [0] FAS	CURRENT VELOCITY Check ALL that apply RRENTIAL [-1] SLOW [1] RY FAST [1] JINTERSTITIAL ST [1] INTERMITTEN DERATE [1] DEDDIES [1] dicate for reach - pools and riffles	NT [-2]
of riffle-obligate speci RIFFLE DEPTH ☐ BESTAREAS > 10cm [2] ☐ M	RUN DEPTH RIFFLE / RU MAXIMUM > 50cm [2] STABLE (e.g., MAXIMUM > 50cm [1] MAXIMUM > 50cm [1] MOD, STABLE	2 & average). JN SUBSTRATE RIFFLE Cobble, Boulder) [2]	E / RUN EMBEDDEDNESS NONE [2] LOW [1] MODERATE [0] Run EXTENSIVE [-1] Maximum 8
6] GRADIENT	VERY LOW - LOW [2-4]	%POOL:(()) %	GLIDE: O Gradient

à,



ζ	52M-005	
OnicEPA Primary H	eadwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	54
DATE <u>9//2//8</u> SCORER <u>ALS</u> NOTE: Complete All Items On This Form	RIVER BASIN DRAINAGE AREA (mi ²) AT. <u>11. 2753</u> LONG. <u></u> RIVER CODE RIVER MILE COMMENTS - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	ructions
STREAM CHANNEL INONE / NATU MODIFICATIONS:	IRAL CHANNEL IRECOVERED IRECOVERING A RECENT OR NO RECO	OVERY
(Max of 40). Add total number of significant	Type of substrate present. Check ONLY two predominant substrate TYPE boxes t substrate types found (Max of 8). Final metric score is sum of boxes A & B. RCENT TYPE I SILT [3 pt] I LEAF PACKWOODY DEBRIS [3 pts] I FINE DETRITUS [3 pts] I CLAY or HARDPAN [0 pt] I MUCK [0 pts] I ARTIFICIAL [3 pts]	HHEI Metric Points Substrate Max = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>2</u> SCORE OF TWO MOST PREDOMINATE SUBSTR 2. Maximum Pool Depth <i>Measure the maxi</i>		A + B Pool Depti
······································	ulverts or storm water pipes) (Check <i>ONLY</i> one box):	Max = 30
COMMENTS	MAXIMUM POOL DEPTH (centimeters):	
3. BANK FULL WIDTH (Measured as the ave > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	rerage of 3-4 measurements) (Check ONLY one box):	Bankfull Width <u>Max=30</u>
COMMENTS	AVERAGE BANKFULL WIDTH (meters)	20
RIPARIAN ZONE AND FLOODPLA <u>RIPARIAN WIDTH</u> L∠R_ (Per Bank)	FLOODPLAIN QUALITY	
Wide >10m	Image: Weight of Conservation Tillage Image: Weight of Conservation Tillage <td< td=""><td></td></td<>	
□ □ Narrow <5m	Field Open Pasture, Row Crop Fenced Pasture Open Pasture, Row Crop	
FLOW REGIME (At Time of Evaluat Stream Flowing Subsurface flow with isolated pools (I COMMENTS	Moist Channel, isolated pools, no flow (Intermittent)	
🔲 None 🛛 🖾	61 m (200 ft) of channel) (Check <i>ONLY</i> one box): 1.0 □ 2.0 □ 3.0 1.5 □ 2.5 □ >3	
STREAM GRADIENT ESTIMATE	Moderate (2 ft/100 ft) Devere Severe Severe Severe (10 ft/100	0 ft)

	ed):
QHEI PERFORMED? - 🗍 Yes 🏳 No QHEI Score (If Yes	, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	Distance from Evaluated Stream
D EWH Name:	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERS	SHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil N	Map Page: NRCS Soil Map Stream Order
County: Township / City:	
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity:
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. o	r id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.I	U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N) If not, please explain	n:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
A DESCRIPTION OF A DESC	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections op ID number. Include appropriate field data sheets from the	
- ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvert	
Comments Regarding Biology	
DRAWING AND NARRATIVE DESCRIPTION OF STRE	AM REACH (This must be completed):
Include important landmarks and other features of interest for site evaluati	지수 물건 것은 안 있는 것 같은 것은 것은 것을 것 같아. 말 것 같아. 돈 같아
	2.1
2nd growth to	ilector
	red con
LOW	- N C
Pool	
ave hanging 2nd granth h	brest

ł

	SZM-014
ChieEPA Primary Hea	adwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 5
SITE NAME/LOCATION	
SITE NUMBERLENGTH OF/ STREAM REACH (ft)LAT.	Hibbon to Moygingon (Alek RIVER BASIN DRAINAGE AREA (mi²) 22.13 41.23017LONG82.8093RRVER CODE RIVER MILE 6 COMMENTS
NOTE: Complete All Items On This Form - Re	efer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL IN NONE / NATURAL MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every typ	be of substrate present. Check ONLY two predominant substrate TYPE boxes
(Max of 40). Add total number of significant su TYPE PERCE BLDR SLABS [16 pts]	Metric
BUDK SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pt]	LEAF PACKWOODY DEBRIS [3 pts]
COBBLE (65-256 mm) [12 pts]	
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts]	MUCK [0 pts] 6
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	(A) 3 A+B
SCORE OF TWO MOST PREDOMINATE SUBSTRAT	
evaluation. Avoid plunge pools from road culve	um pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool Dep erts or storm water pipes) (Check ONLY one box):
→ 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts]	> 5 cm - 10 cm [15 pts] < 5 cm [5 pts] NO WATER OR MOIST CHANNEL [0 pts]
22.5 cm [25 pts]	MAXIMUM POOL DEPTH (centimeters):
3. BANK FULL WIDTH (Measured as the avera	age of 3-4 measurements) (Check ONLY one box): Bankful
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] 	□ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] □ ≤ 1.0 m (≤ 3' 3") [5 pts] □ ↓
COMMENTS	AVERAGE BANKFULL WIDTH (meters)
RIPARIAN ZONE AND FLOODPLAIN	
L R (Per Bank) L	. <u>OODPLAIN QUALITY</u> R (Most Predominant per Bank) L R I Mature Forest, Wetland D Conservation Tillage
	Immature Forest, Shrub or Old Immature Forest, Shrub or Old Field
□ □ Narrow <5m □	Copen Pasture, Row Field
X A None □ COMMENTS	Fenced Pasture III Mining or Construction
FLOW REGIME (At Time of Evaluation Stream Flowing Subsurface flow with isolated pools (International Comments)	Moist Channel, isolated pools, no flow (intermittent)
SINUOSITY (Number of bends per 61	
STREAM GRADIENT ESTIMATE	J Moderate (2 tt/100 tt) □ Moderate to Severe □ Severe (10 tt/100 tt)

~

t,		row	P	
t		(BI)		
				bulsush
				Softstem
		M	s crop	
				tive description of the stream's location
DRAWIN		ESCRIPTION OF	STREAM REACH	(This must be completed):
Frogs or Tadpoles Obser	ved? (Y/N) Voucher? plogy:	(Y/N) Aquatic Ma	croinvertebrates Observ	ved? (Y/N) Voucher? (Y/N)
ish Observed? (Y/N)	Voucher? (Y/N)	Salamanders Observ	ved? (Y/N) Vouch	ner? (Y/N)
^o erformed? (Y/N):	(If Yes, Record all obs	servations. Voucher colle	actions optional. NOTE: a	ll voucher samples must be labeled with the s Iwater Habitat Assessment Manual)
BIOTIC EVAL	UATION			
Additional comments/des	cription of pollution impacts			
is the sampling reach rep	presentative of the stream (Y/N) If not, pleas	se explain:	
				Conductivity (µmhos/cm)
				results) Lab Number:
): Canopy (9			
	Date of last			nuty
MISCELLANE	Y/N): Date of last	precipitation		
		Township /	City:	
				NRCS Soil Map Stream Order
				LEARLY MARK THE SITE LOCATION
				ce from Evaluated Stream
CWH Name:			Distan	ce from Evaluated Stream
	A series to a first starting		Dietor	ce from Evaluated Stream
	M DESIGNATED USE(S)			

ChicEPA Qualitative Habitat E and Use Assessme		HEI Score: 2
Stream & Location: \$2.00-012-	RM:	Date: 1 5106/3
	I Name & Affiliation:	
River Code: STORET # La	1./Long.: /8/8/8/8/8/8/8/	Office verified location
11 SUBSTRATE Check ONLY Two substrate TYPE BOXES;		
estimate % or note every type present	Check ONE (Or) ORIGIN	
BEST TYPES POOL RIFFLE OTHER THE DOOL RIFF		HEAVY [-2]
BOULDER [9] [] DETRITUS [3] [] MUCK [2] []	[] TILLS [1] [] WETLANDS [0] [] SIL	
	HARDPAN [0]	
B SAND [6] BEDROCK [5] Content of the second states in the		MODERATE [-1]
Score natural substrates; gr NUMBER OF BEST TYPES: 4 or more [2] sludge from point-source		NORMAL [0] 20
Comments	☐ SHALE [-1] ☐ COAL FINES [-2]	
	O C	
2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent: 1-Very small guality: 2-Moderate amounts, but not of highest		
quality; 3-Highest quality in moderate or greater amounts (e.g., very large boi diameter log that is stable, well developed rootwad in deep / fast water, or de	ulders in deep or fast water, large	Check ONE (Or 2 & average)
UNDERCUT BANKS [1]	_ OXBOWS, BACKWATERS [1]	TT MODERATE 25-75% [7]
OVERHANGING VEGETATION [1] ROOTWADS [1]	_ AQUATIC MACROPHYTES [1] LOGS OR WOODY DEBRIS [1]	SPARSE 5-25% [3]
_() SHALLOWS (IN SLOW WATER) [1] () BOULDERS [1] ∴		Cover
Comments		Maximum +
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & ex SINUOSITY DEVELOPMENT CHANNELIZATION	/erage) STABILITY	
MODERATE [3] GOOD [5] RECOVERED [4]	MODERATE [2]	·
IOW[2] □ FAIR [3] □ RECOVERING [3] □ NONE [1] √2 POOR [1] ☑ RECENT OR NO RECOVER	Y (1]	Channel
Comments		Maximum 20
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each ca		
4) BANK EROSION AND RIPARIAN ZONE Check ONE in each car River right looking downstream, RIPARIAN WIDTH 1 P. EL	OOD PLAIN QUALITY	in a secologoj
		CONSERVATION TILLAGE [1]
13.12 NONE7LITTLE [3] 〇口 MODERATE 10-50m [3] 〇口 SHRUB	OR OLD FIELD (2)	MINING / CONSTRUCTION 101
HEAVY / SEVERE [1] [] [] VERY NARROW < 5m [1] . FENCED) PASTURE [1]	ete oredominent land use(s)
	ASTURE ROWCROP [0] 🔤 past	100m riparlan. Riparlan Maximum
Comments		
5] POOL / GLIDE AND RIFFLE / RUN QUALITY		[Description Detential]
MAXIMUM DEPTH CHANNEL WIDTH		Recreation Potential Primary Contact
Check ONE (ONLY) Check ONE (Or 2 & average)	chest de la bar su de Single de La Marce de La 1977 de	Secondary Contact
		(circle one and comment on back)
		Pool /
12 <02m 101 M	iș île reșch - poșit and cilles.	Current
Comments D		12
Indicate for functional riffles; Best areas must be large	enough to support a popul	ation NO RIFFLE [metric=0]
of riffle-obligate species: Check ONE (Or 2 & a RIFFLE DEPTH RUN DEPTH RIFFLE / RUN	SUBSTRATE RIFFLE/RU	IN EMBEDDEDNESS
BESTAREAS > 10cm [2] MAXIMUM > 50cm [2] STABLE (e.g. Col		NONE [2]
BESTAREAS 5 10cm [1] MAXIMUM < 50cm [1] MOD STABLE (e. BESTAREAS < 5cm UNSTABLE (e.g.)	ine Gravel Sand) [0]	OW [1] Rifile /
[metric=0]		XTENSIVE LI Maximum
Comments		8
6] GRADIENT (5 ft/ml) X VERY LOW LOW [24]	%POOL:(<u>///0</u>) %GLID	
DRAINAGE AREA D MODERATE (6-10) 4 (4,95 m) ²) D HIGH VERY HIGH (10-8)	%RUN: Ø%RIFFL	
EPA 4520		(. 06/16/06
		,

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F] MEASUREMENTS bankfull max. depth floodprone x² width Z bankfull width bankfull X depth entrench. ratio Comment RE: Reach consistency/ is reach typical of steam?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc. Legacy Tree: max. depth W/D ratio X depth X width 90-20 FALSE BANK/ MANURE / LAGOON LOGGING / IRRIGATION / COOLING NATURAL / WEILAND / STAGNANT BMPs-CONSTRUCTION-SEDIMENT HARDENED / URBAN / DIRT&GRUME WMTP// CSO//NPDES//NDUSTRY ACID / MINE / QUARRY / FLOW ATMOSPHERE/ DATA PAUCITY BANK / EROSION / SURFACE WASH H20 / TILE / H20 TABLE PARK / GOLF / LAWN / HOME CONTAMINATED / LANDFILL いても、と Elissues 302 555 いたまとしていて SPEERMAN うどうとし Citcle some & COMMENT POW CEOP FLOOD CONTROL / DRAINAGE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA MODIFIED / DIPPED OUT / NA MOVING-BEDLOAD-STABLE IMPOUNDED / DESICCATED SPRAY / SNAG / REMOVED YOUNG-SUCCESSION-OLD RELOCATED / CUTOFFS **DI MAINTENANCE** ARMOURED / SLUMPS LEVEED / ONE SIDED ISLANDS / SCOURED 2 BORNINER NUISANCE ALGAE
 ALASIVE MACROPHYTES
 ALAVASIVE MACROPHYTES
 ALAVASIVE MACROPHYTES
 IEXCESS TURBIDITY
 DISCOLORATION
 DISCOLORATION
 OIL SHEEN
 TRASH / LITTER ×.3.3. NUISANCE ODUR
 SUUDGE DEPOSITS
 CSOSISSOSIOUTFALLS BIAESTHETICS POOL: []>100h2[]>3h AREA DEPTH TRASH / LITTER CHANNER C] RECREATION dog Ë E THIM BUILD 1st eamble puer-2nd -70 cm/ CTB كالمع CLARITY STAGE Stream Drawing: A] SAMPLED REACH Check ALL that apply Ē ned □ 55%~65% □ 30%~65% □ 10%~55% □ <10%-CDSED ■ 55%-69EN CANOPY DISTANCE C LINE 0.15 Km METHOD 0.5 Km 0.2 Km OTHER meters Z

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ChicEPA Primary Headwater Habitat Evaluation HHEI Score (sum	
SITE NAMELOCATION HUMANIAL DITTLE (52 M-017)	DRAINAGE AREA (mi²)
LENGTH OF STREAM REACH (R) LAT LONG RIVER C	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Onic STREAM CHANNEL IN NONE (NATURAL CHANNEL RECOVERED RECOVER MODIFICATIONS: CHANNEL 29417V	RING RECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predo (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score (Max of 9) final metric score ($\begin{array}{c c} & \underline{PERCENT} \\ \hline & \underline{41} \\ \hline & \underline{51} \\ \hline \\ \hline & \underline{51} \hline \\ \hline & \underline{51} \hline \hline \\ \hline & 51$
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF	SUBSTRATE TYPES:
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check OWLY one of 30 centimeters [20 pts] 22.5 \sigma 30 cm [30 pts] 30 cm [25 pts	
COMMENTS MAXIMUM POOL D 3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONL > 4.0 meters (< 13) [30 pts]	Y one box): \mathfrak{G}^{1} [15 pts] \mathfrak{G}^{1} \mathfrak{G}^{1} \mathfrak{G}^{1} \mathfrak{G}^{1}
COMMENTSAVERAGE BANKFL	JLL WIDTH (meters)
This Information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\$NOTE: River Left (L) and Right (RIPARIAN WIDTH FLOODPLAIN QUALITY	- 1 e
Immature Forest, Shrub or Old	· R D D Conservation Tillage D Urban or Industriał
Narrow <5m Sm Signature Sig	Open Pasture, Row Crop Mining or Construction
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isol Subsurface flow with isolated pools (Interstitial) Dry channel, no wa COMMENTS 4	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): Image: Sinu constraints 1.0 2.0 Image: Sinu constraints 1.5 2.5	
STREAM GRADIENT ESTIMATE	re 🔲 Severa (10 n/100 n)
PHWH Form Page - 1 October 24, 2002 Revision	

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	ATION (This information Must Also	n be Completed):			
			oIslad OHEI Form		
OHEI PERFORMED? -	Yes TNo OHEl Score	(If Yes, Allach	Completed Oncir offic	1	
DOWNSTREAM DESK	GNATED USE(S)	1. 25	Distance from Evaluate	d Stream	-
WWH Name:			Distance from Evaluate	d Stream	
			Distance from Evaluate	d Stream	
		-		영상 것 : .	TION
	OPIES OF MAPS, INCLUDING THE EN				
USGS Quadrangle Name:		NRCS Soll Map Pag	e: NRCS Soll	Map Stream Or	nder
County:	Towns	ship / City:			
MISCELLANEOUS					
	J		Overtibe		
Base Flow Conditions? (Y/N): /	Date of last precipitation:	. <u> </u>			
Photograph Information:				·	
Elevated Turbidily? (Y/N):	Canopy (% open):				
Were samples collected for water	chemistry? (YRN): (Note lab	sample no or ld and	attach results) Lab Nut	nber:	
	Dissolved Oxygen (mg/l)				
is the sampling reach representati	ive of the stream (Y/N) If not,	please explain:	<u> </u>		
			·		
Additional comments/description o					
BIOTIC EVALUATION	- <u></u>	<u> </u>	······		
BIOTIC EVALUATION Performed? (V/N): (II'	Yes, Record all observations. Voucher number. Include appropriate field data				
BIGTIC EVALUATION Performed? (Y/N): (If ID Fish Observed? (Y/N) Voi	number. Include appropriate field data ucher? (Y/N) Salamanders Ot I) Voucher? (Y/N) Aquali	sheets from the Primar oserved? (YIN)	y Headwater Habitat Ass Voucher? (Y/N) bbserved? (Y/N)	eäsment Manua	1)
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BIOTIC EVALUATION Performed? (Y/N): (II ID Fish Observed? (Y/N) Voi Frogs or Tadpoles Observed? (Y/N)	number. Include appropriate field data ucher? (Y/N) Salamanders Ot I) Voucher? (Y/N) Aquali	sheets from the Primar oserved? (YIN) c MacroInvertebrates (y Headwater Habitat Ass Voucher? (Y/N) bbserved? (Y/N)	eäsment Manua	1)
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BIOTIC EVALUATION Performed? (Y/N):	number. Include appropriate field data ucher? (Y/N) Salamanders Ot I) Voucher? (Y/N) Aqualle VARRATIVE DESCRIPTION	sheets from the Primar oserved? (Y/N) c MacroInvertebrates (OF STREAM RE/ site evaluation and a	y Headwater Habitat Ass Voucher? (Y/N) observed? (Y/N) observed? (Y/N) observed? (Y/N) observed? (Y/N)	essment Manue Voucher? (Y/N) e completed	ı) i):
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BIOTIC EVALUATION Performed? (Y/N): (If '	number. Include appropriate field data ucher? (Y/N) Salamanders Ob) Voucher? (Y/N) Aqually NARRATIVE DESCRIPTION ta and other features of Interest for Y (SULCh 1) d+Y Ch (Ann.c) Y CM U	sheets from the Primar oserved? (YRN) c Macroinvertebrates (OF STREAM RE/ site evaluation and a) (1	y Headwater Habitat Ass Voucher? (Y/N) observed? (Y/N) observed? (Y/N) observed? (Y/N) observed? (Y/N)	essment Manue Voucher? (Y/N) e completed	ı) i):

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ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	$\dot{\zeta}$
SITE NAME/LOCATION DI +LLA (SZ-MA ~) SITE NUMBER A 2020000 RIVER BASIN DRAINAGE AREA (mi²) LENGTH OF STREAM REACH (ft) LATLONG RIVER CODE RIVER MILE DATE A SCORER Fract M COMMENTS	
DATE 14/18 SCORER 6.1 M COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru STREAM CHANNEL ONONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERING CHANNEL CHANNEL CHANNEL CHANNEL CHANNEL CHANNEL CHANNEL OF CHANNEL CHANNEL	
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] PERCENT TYPE BOULDER (>256 mm) [16 pts] SILT [3 pt] PERCENT BEDROCK [16 pt] BEDROCK [16 pt] FINE DETRITUS [3 pts] TOTAL NUMBER OF SUBSTRATE TYPES: COBBLE (65-256 mm) [12 pts] ARTIFICIAL [3 pts] SUCK [0 pts] GRAVEL (2-64 mm) [9 pts] ARTIFICIAL [3 pts] SUCK [0 pts] Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock (A) SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:	HHEI Metric Points Substrate Max = 40 A + B
 2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts] COMMENTS	Pool Depth Max = 30
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] $2 \times 1.0 \text{ m} - 1.5 \text{ m} (> 3' 3" - 4' 8") [15 pts]$ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] $2 \times 1.0 \text{ m} (< 3' 3") [5 pts]$ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] $3 \times 1.0 \text{ m} (< 3' 3") [5 pts]$ COMMENTS AVERAGE BANKFULL WIDTH (meters)	Bankfull Width Max=30
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ŵNOTE: River Left (L) and Right (R) as looking downstream ŵ RIPARIAN WIDTH FLOODPLAIN QUALITY Conservation Tillage L R (Per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Narrow <5m	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) Of a construction Of a construction	
Image: Stream Gradient Estimate Image: Stream Estimates	0

PHWH Form Page - 1

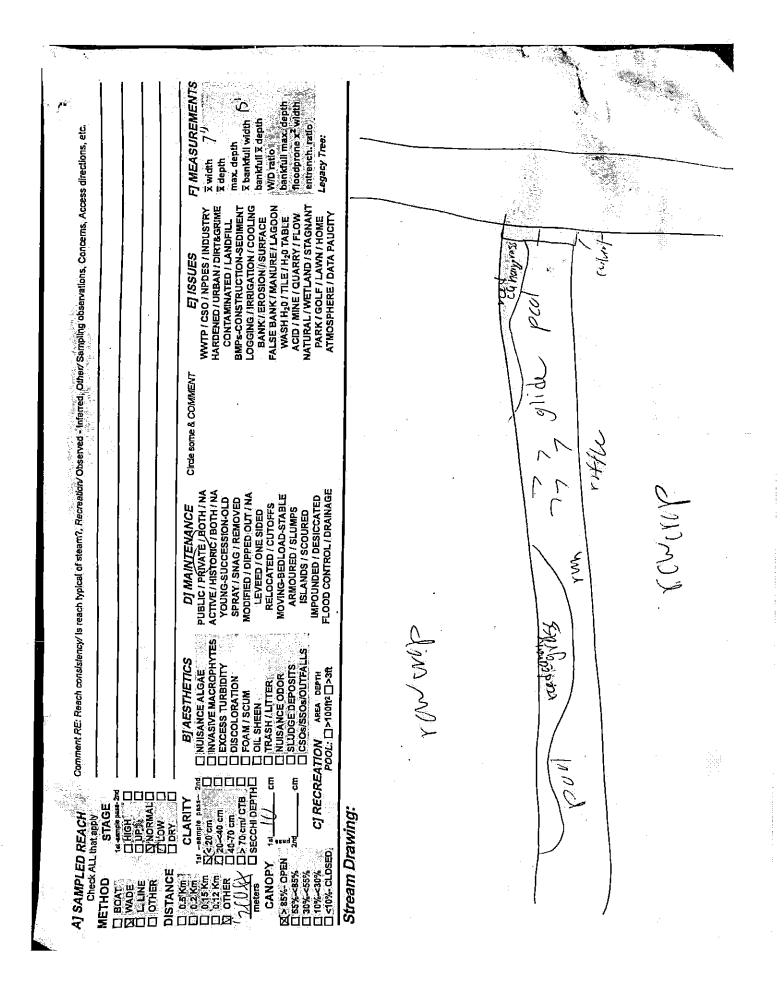
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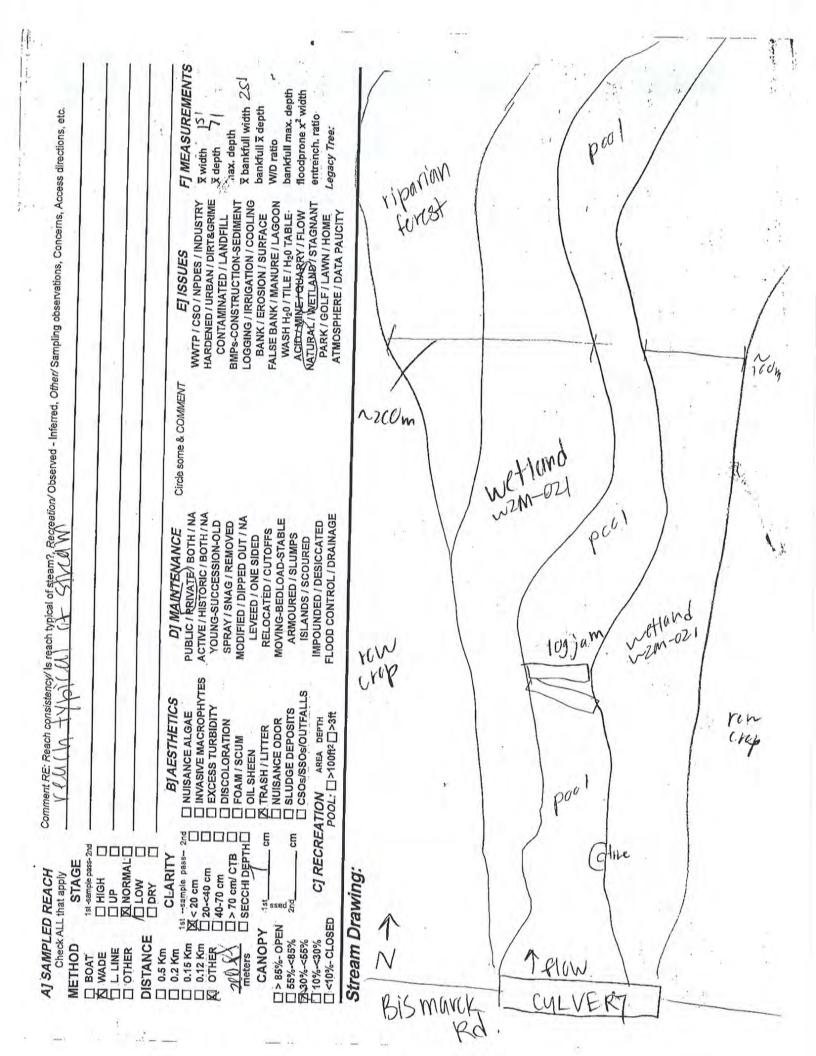
		· ·		
	RMATION (This Information Must Also be			
QHEI PERFORMED	0? - 🗋 Yes 🕅 No 🛛 QHEI Score	(If Yes, Attach Completed QHEI	Form)	
DOWNSTREAM DE	SIGNATED ÚSE(S)			
J WWH Name:		Distance from Ev	aluated Stream	
-	I COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u>			
	NR			
ounty:	Township /	/ Cily:		
MISCELLANEOUS	1		• •	
ase Flow Conditions? (Y/N):_	Date of last precipitation:	Quantity:	· .	-
notograph Information:		— <u>».</u>		
evated Turbidity? (Y/N):	Canopy (% open):	/		
ere samples collected for wa	iter chemistry? (Y/N): (Note lab sam	nple no. or id. and attach results) La	b Number:	,
eld Measures; Temp (°C)	Dissolved Oxygen (mg/l)	_ pH (S.U.) Conductivity	(µmhos/cm)	
Ihe sampling reach represer	ntative of the stream (Y/N) If not, pleas	se explain:		
dditional comments/description	on of pollution impacts:			-
erformed? (Y/N):	(If Yes, Record all observations. Voucher colle ID number. Include appropriate field data she			•
ish Observed? (Y/N) rogs or Tadpoles Observed? omments Regarding Biology;	Voucher? (Y/N) Salamanders Obser (Y/N) Voucher? (Y/N) Aquatic Ma		Voucher? (Y/N)	
	ID NARRATIVE DESCRIPTION OF marks and other features of interest for site $\mathcal{H}(\mathcal{AS}(1/\mathcal{G}^{(i)}) \mathcal{A}(\mathcal{W}^{(i)}) \to \mathcal{W} \to \mathcal{U} \to \mathcal{U}$	e evaluation and a narrative descr		
	allp	00		$\overline{\lambda}$
\sim	1 / guldin			7`(m) 4
	ALASCITIT YUCK IN	2012	1	
	fcasci/0 rua vi 4.SW	on wep	N/	

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.	Chiefpa	Qualitative Habita and Use Assessn	t Evaluation Index nent Field Sheet	QHEI Score: (43	
	Stream & Location:	KRMh (52M	-() q	E-IM, MSG	3 18
, 907 	River Code:	STORET #:	Lat./ Long.: (NAD 83-decimal*)		
	BEST TYPES POOL R	FFLE OTHER TYPES			
-	BOULDER [9] GOBBLE [8] GOBBLE [8] GRAVEL [7] SAND [6] SAND [6]	70 DETRITUS (3)*5 70 DOMUCK (2)* 30 DOSILT (2) 0 DARTIFICIAL (0)	UWETLANDS [0]	DEO MORMAL [0] DEO MODERATE [-1] MODERATE [-1] Maxh S 2 NORMAL [0] 2	3)
	Comments /	March 100 to 1			
	quality: 3-Highest quality in modera diameter log that is stable, well dev UNDERCUT BANKS [1] OVERHANGING VEGETATIO SHALLOWS (IN SLOW WAT	e or greater amounts (e.g., very large eloped rootwad in deep / fast water, o POOLS > 70cm [2] POOLS > 70cm [2] ROOTWADS [1] BOULDERS [1]	boulders in deep or fast water, lan r deep, well-defined, functional poo C) OXBOWS, BACKWATERS AQUATIC MACROPHYTES	theck One (0/2 & average) s. □ EXTENSIVE >75% [11] [1] □ MODERATE 25-75% [7] [1] □ SPARSE 5-25% [3]	
	SINUOSITY DEVELOP	IENT CHANNELIZATION	STABILITY		
	☐ HIGH [4] ☐ MODERATE [3] ☐ COOD [5] ☐ LOW [2] ☐ NONE [1] Comments	RECOVERED [4]	MODERATE [2]	Channel Maximum 20).
	River right looking downstream	RIPARIAN WIDTH	FLOOD PLAIN QUALITY	L R	-
		/IODERATE 10-50m [3] , □ □ SHF /ARROW 5-10m [2] , □ □ RES /ERY NARROW < 5m [1] □ □ FEN	UB OR OLD FIELD [2] IDENTIAL: PARK, NEW FIELD [1] CED PASTURE [1]		1
				Maximum 10	Ľ
	MAXIMUM DEPTH Check ONE (O/LV) Ch □ ≤ 1m (6) D POOI □ 0.7 < 1m (4) D POOI □ 0.4 < 0.7m (4) D POOI □ 0.4 < 0.7m (7) C POOI □ 0.2 < 0.4m (1) □ 0.2 < 0.4m (1)	CHANNEL WIDTH eck ONE (Or 2 & average) WIDTH SRIFFLE WIDTH [2] WIDTH SRIFFLE WIDTH [1] WIDTH SRIFFLE WIDTH [0]		Recreation Potential Primary Contact Secondary Contact Late one and comment on back Late Pool / Current Maximum	
	Indicate for functional ri	ffles; Best areas must be lar	ge enough to support a pe	12 Spulation	;=0]
	RIFFLE DEPTH R DESTAREAS 10cm [2] DMA DESTAREAS 5.10cm [1] DMA DESTAREAS 5.00cm [1] DMA UBESTAREAS 5.00cm [1] DMA DESTAREAS 5.00cm [1] DMA DESTAREAS 5.00cm [1] DMA DMA DMA DMA DMA DMA DMA DMA DMA DMA	UN DEPTH RIFFLE / R XIMUM > 50cm [2] STABLE (6.g. XIMUM < 50cm [1] Ø MOD: STABL	UN SUBSTRATE RIFFLE Cobble, Boulder) [2] E (e.g., Large Gravel) [1]		
•		(MODERATE [6-10]		FFLE: 5 Maximum D	
	EPA 4520	And		06/16/08	
		River Code: 1] SUBSTRATE Check OWLYT BEST TYPES D BLOR ISLASS [10] D BEOROCK [5] RID BEOROCK [5] NUMBER OF BEST TYPES: Comments VUMBER OF BEST TYPES: Comments D VOERTANGING VEGETATIC D SHALLOWS [IN SLOW WAT D NODERATE [3] GOOD SINUOSITY DEVELOPM HIGH [4] D MODERATE [3] BANK EROSION AND RIM NONE [1] Comments 4] BANK EROSION AND RIM RENSION MODERATE [3] D NONE [1] D HEAVY / SEVERE [1] MAXIMUM DEPTH Check ONE (ONLY) D HEAVY / SEVERE [1] <td< td=""><td>Stream & Location: 1(1A) Mys. Scorers Stream & Location: 1(1A) Mys. Scorers River Code: Stream & Location: 1(1A) Mys. Scorers River Code: Stream & Location: Stream & Scorers Scorers 11 SUBSTRATE Schedows on one every type present BEST TYPES POOL ARFLE HARDPAN [0] BEDULDER[9] DOTT BEST TYPES POOL ARFLE HARDPAN [0] BEDROOK [9] DOTT BOULDER[9] DOTT BOULDER[9] BESAND [9] DOTT BEDROOK [9] Stream Strea</td><td>Stream & Location: 11AL Scorers Full Name & Attiliation: River Code: STORET #: Lat/Long: 1) SUBSTRATE Check ONLY Two substrate TYPE SOL RIFLE Check ONE BEST TYPES CODOL RIFLE Check ONE BEST TYPES CODE RIFLE Check ONE BEST TYPES Code Line: Check ONE Code Line: Code Line: Check ONE Check ONE Code Line: Code Line: Code Line: Check ONE Co</td><td>CHERCHAR and Use Assessment Field Sheet Chercel Control Stream & Location: 1114 CM Control Date: 1114 CM Stream & Location: 1114 CM Stream & Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present of the control water by the control water by the control water by the</td></td<>	Stream & Location: 1(1A) Mys. Scorers Stream & Location: 1(1A) Mys. Scorers River Code: Stream & Location: 1(1A) Mys. Scorers River Code: Stream & Location: Stream & Scorers Scorers 11 SUBSTRATE Schedows on one every type present BEST TYPES POOL ARFLE HARDPAN [0] BEDULDER[9] DOTT BEST TYPES POOL ARFLE HARDPAN [0] BEDROOK [9] DOTT BOULDER[9] DOTT BOULDER[9] BESAND [9] DOTT BEDROOK [9] Stream Strea	Stream & Location: 11AL Scorers Full Name & Attiliation: River Code: STORET #: Lat/Long: 1) SUBSTRATE Check ONLY Two substrate TYPE SOL RIFLE Check ONE BEST TYPES CODOL RIFLE Check ONE BEST TYPES CODE RIFLE Check ONE BEST TYPES Code Line: Check ONE Code Line: Code Line: Check ONE Check ONE Code Line: Code Line: Code Line: Check ONE Co	CHERCHAR and Use Assessment Field Sheet Chercel Control Stream & Location: 1114 CM Control Date: 1114 CM Stream & Location: 1114 CM Stream & Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present Control Market Atministration of the control water by the present of the control water by the control water by the control water by the

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ChieEPA	Qualitative Habita and Use Assessn	t Evaluation Index nent Field Sheet	QHEI Score:
Stream & Location: S	2M-020	RI	n: Date: 9_1 <u>17</u> 1
River Code:	Scorers STORET #:	Full Name & Affiliation:	182.80258 Office vi
11 SUBSTRATE Check ONLY	Two substrate TYPE BOXES;		(Qr 2 & average)
estimate % of BEST TYPES POOL F □ BULDR/SLABS [10] □ BOULDER [9] □ COBBLE [8] <u>10</u> □ GRAVEL [7] <u>50</u> □ SAND [6]		RIFFLE ORIGIN LIMESTONE [1] TILLS [1] WETLANDS [0] HARDPAN [0] Signore CRIP/RAP [0]	QUALITY HEAVY [-2] SILT MODERATE [-1] S MODERATE [-1] S POE DEC MODERATE [-1] MODERATE [-1] MODERATE [-1] NONE [1]
quality of the second sec		e houlders in deep or fast water, lar	Ge Check ONE (0/ 2 & avera Is. □ EXTENSIVE >75% [11] [1] □ MODERATE 25-75% [7] [1] □ SPARSE 5-<25% [3]
SINUOSITY DEVELOP HIGH [4] EXCELL MODERATE [3] GOOD [8 LOW [2] X FAIR [3] NONE [1] POOR [1] Comments Comments	ENT [7] INONE [6] 5] IRECOVERED [4] [2] RECOVERING [3]] IRECENT OR NO RECO	N STABILITT HIGH [3] MODERATE [2] LOW [1] VERY [1]	Channel Maximum 20
	MODERATE 10-50m [3] □ □ SH NARROW 5-10m [2] □ □ □ RE VERY NARROW < 5m [1]	FLOOD PLAIN QUALITY REST, SWAMP [3] RUB OR OLD FIELD [2] SIDENTIAL, PARK, NEW FIELD [1] NCED PASTURE [1]	R CONSERVATION TILLAGE URBAN OR INDUSTRIAL URBAN OR INDUSTRIAL Imining / CONSTRUCTION Indicate predominant land use(s) past 100m riparian. Riparian Maximum
Comments			10
□ > 1m [6] □ POO □ 0.7<1m [4] ■ POO	CHANNEL WIDTH Check ONE (Or 2 & average) OL WIDTH > RIFFLE WIDTH [2] U T(OL WIDTH = RIFFLE WIDTH [1] VI OL WIDTH > RIFFLE WIDTH [0] FA	CURRENT VELOCITY Check ALL that apply DRRENTIAL [-1] X SLOW [1] ERY FAST [1] INTERSTITIAL AST [1] INTERMITTEN ODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.	Pool/
Indicate for functional of riffle-obligate specie RIFFLE DEPTH □ BESTAREAS > 10cm [2]	RUN DEPTH RIFFLE / F IAXIMUM > 50cm [2] □ STABLE (e.g. IAXIMUM < 50cm [1]	RUN SUBSTRATE RIFFLE	opulation INO RIFFLE [mu] I NONE [2] INONE [2] I LOW [1] Riffle / Run I MODERATE [0] Riffle / Run I EXTENSIVE [-1] Maximum
□ BEST AREAS 5-10cm [1] □ W □ BEST AREAS < 5cm [metric=0] Comments			8`



SITE NAME/LOCATION	524 -	012		· · · · · ·			
	SITE NUMBER		RIVER BASIN		DF	RAINAGE AREA (mi²)	
ENGTH OF STREAM REA	асн (ft) _ ZeD	_LAT	LONG.	R	IVER CODE	RIVER MILE	_
DATE 9-17-18 S	CORER _ EAM	C	OMMENTS	·			
NOTE: Complete All I			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				
STREAM CHANNEL		TURAL CH	ANNEL 🗍 RECO	VERED 🗍 RE	COVERING	RECENT OR NO RECO	OVEF
MODIFICATIONS:				а. 1			
, SUBSTRATE (Est	timate percent of ev	erv type of	substrate present.	Check ONLY tw	o predominant	substrate TYPE boxes	1
(Max of 32). Add to	otal number of signifi	cant substra	ite types found (Max	of 8). Final metr	ric score is sum	of boxes A & B.	M
TYPE BLDR SLABS		PERCENT	TYPE	T [3 pt]		PERCENT	Ρ
BOULDER (>2	256 mm) [16 pts]			AF PACK/WOOL		its] <u>20</u>	Su
	• -			IE DETRITUS [AY or HARDPAN	• -		Ma
GRAVEL (2-64	(mm) [9 nfe]			JCK [0 pts]			
SAND (<2 mm) [6 pts]	30		TIFICIAL [3 pts]	Ī	·	
Total of Perc Bldr Slabs, Boulde	centages of r, Cobble, Bedrock _		(A)			^(B)	Ā
CORE OF TWO MOST PI			PES;	TOTAL NUMB	ER OF SUBST	RATE TYPES:	
Maximum Pool De	epth <i>(Measure the n</i>	naximum p	ool depth within th	e 61 meter (200	ft) evaluation re	each at the time of	Poo
evaluation. Avoid p	olunge pools from roa	id culverts o	or storm wat <u>er</u> pipes)	(Check ONL)	Y one box):		Ma
 > 30 centimeters [2 > 22.5 - 30 cm [30 		an ta An ta		5 cm - 10 cm [1 5 cm [5 pts]			•(
> 10 - 22.5 cm [25	pts]	· ·	<u> </u>	O WATER OR M	IOIST CHANNE	L lo ptsi	
COMMENTS						— 10 II	
COMMENTS	FH (Measured as the	_	f 3-4 measurement	s) (Ché	POOL DEPTH (centimeters):	
COMMENTS BANK FULL WID > 4.0 meters (> 13')] > 3.0 m - 4.0 m (> 5	[30 pts] 9' 7" - 13') [25 pts]	_	f 3-4 measurement		POOL DEPTH (eck <i>ONLY</i> one 3' 3'' - 4' 8'') [15	centimeters):	V
COMMENTS BANK FULL WID > 4.0 meters (> 13')] > 3.0 m - 4.0 m (> 5	[30 pts]	_	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (>	POOL DEPTH (eck <i>ONLY</i> one 3' 3'' - 4' 8'') [15	centimeters):	V
COMMENTS BANK FULL WID → 4.0 meters (> 13 ³)] → 3.0 m - 4.0 m (> 5 → 4.5 m - 4.0 m (> 5	[30 pts] 9' 7" - 13') [25 pts]	_	f 3-4 measurement	s) (Che 1.0 m - 1.5 m (> 1.0 m (≤ 3'3")[5	POOL DEPTH (eck <i>ONLY</i> one 3' 3'' - 4' 8'') [15	centimeters):	Ba V M;
COMMENTS BANK FULL WIDT > 4.0 meters (> 13') > 3.0 m - 4.0 m (> 5 > 1.5 m - 3.0 m (> 5	[30 pts] 9' 7" - 13') [25 pts]	e average o	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE	POOL DEPTH (ack <i>ONLY</i> one 3' 3" - 4' 8") [15 5 pts] BANKFULL WI	centimeters):	V
COMMENTS BANK FULL WID > 4.0 meters (> 13')] > 3.0 m - 4.0 m (> 9 > 1.5 m - 3.0 m (> 9 COMMENTS	[30 pts] 9' 7" - 13') [25 pts]	e average o	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE also be comple	POOL DEPTH (ack <i>ONLY</i> one 3' 3" - 4' 8") [15 5 pts] BANKFULL WI	centimeters):	V
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COMMENTS BANK FULL WIDT > 4.0 meters (> 13')] > 3.0 m - 4.0 m (> 5 > 1.5 m - 3.0 m (> 5 COMMENTS RIPARIAN	[30 pts] 9' 7" - 13') [25 pts] 9' 7" - 4' 8") [20 pts] 2' ONE AND FLOOD <u>N WIDTH</u> nk)	e average o This PLAIN QUA	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE also be comple River Left (L) an nt per Bank)	POOL DEPTH (ack <i>ONLY</i> one 3' 3" - 4' 8") [15 5 pts] BANKFULL WI	DTH (meters)	V
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COMMENTS BANK FULL WID > 4.0 meters (> 13')] > 3.0 m - 4.0 m (> S > 1.5 m - 3.0 m (> S COMMENTS COMMENTS L R (Per Baa Wide > 1 Nore COMMENT Nore COMMENT	[30 pts] 9' 7" - 13') [25 pts] 9' 7" - 4' 8") [20 pts] 2' 7" - 4' 8"] [20 pts] 2' 7" [2	This PLAIN QUA FLOOD L R D D C D C D C D C D C D C D C D C D C D	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE also be comple River Left (L) an nt per Bank) /etland Shrub or Old , New Field , New Field <u>x</u>):	POOL DEPTH (ack ONLY one 3' 3" - 4' 8") [15 5 pts] BANKFULL WI ted d Right (R) as I L R D D D D D D	centimeters):	
COMMENTS BANK FULL WID > 4.0 meters (> 13') > 3.0 m - 4.0 m (> S > 1.5 m - 3.0 m (> S COMMENTS COMMENTS L R (Per Bar Wide >1 Nore COMMENT D Narrow D None COMMENT FLOW REC Stream Flov	[30 pts] 9' 7" - 13') [25 pts] 9' 7" - 4' 8") [20 pts] 9' 7" - 4' 8") [20 pts] 2' 7" - 4' 8") [20 pts] 7' 7" - 4' 8" [20 pts] 7' 7' 7' 7' - 4' 8" [20 pts] 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7	This PLAIN QUA FLOOD L R D D D D D D D D D D D D D D D D D D D	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE also be comple River Left (L) an nt per Bank) /etland Shrub or Old , New Field x): Moist Char	POOL DEPTH (ack ONLY one 3' 3" - 4' 8") [15 5 pts] BANKFULL WI ted d Right (R) as I L R D D D D D D	centimeters):	
COMMENTS BANK FULL WID > 4.0 meters (> 13') > 3.0 m - 4.0 m (> S > 1.5 m - 3.0 m (> S COMMENTS COMMENTS RIPARIAN RIPARIAN RIPARIAN RIPARIAN OPER BAI Wide >1 None COMMENT COMMENT COMMENT COMMENT COMMENT	[30 pts] 9' 7" - 13') [25 pts] 9' 7" - 4' 8") [20 pts] 9' 7" - 4' 8") [20 pts] 2' 7" - 4' 8") [20 pts] 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7	This PLAIN QUA FLOOD L R D D D D D D D D D D D D D D D D D D D	f 3-4 measurement	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE also be comple River Left (L) an nt per Bank) /etland Shrub or Old , New Field x): Moist Char	POOL DEPTH (ack ONLY one a' 3'' - 4' 8'') [15 i pts] BANKFULL WI ted d Right (R) as I L R 0 0 0 0 0 0 0 0 0 0 0 0 0	centimeters):	
COMMENTS	[30 pts] 9' 7" - 13') [25 pts] 9' 7" - 4' 8") [20 pts] 9' 7" - 4' 8") [20 pts] 2' 7" - 4' 8") [20 pts] 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7' 7	This PLAIN QUA FLOOD L R D D D D D D D D D D D D D D D D D D D	f 3-4 measurement a information must LITY ☆NOTE: PLAIN QUALITY (Most Predomina Mature Forest, W Immature Forest, W Immature Forest, Field Residential, Park Fenced Pasture Check ONLY one bo al)	s) (Ché 1.0 m - 1.5 m (> 1.0 m (≤ 3' 3") [5 AVERAGE also be comple River Left (L) an nt per Bank) /etland Shrub or Old , New Field x): Moist Char	POOL DEPTH (a' 3'' - 4' 8'') [15 b pts] BANKFULL WI ted d Right (R) as I L R 0 0 0 0 0 0 0 0 0 0 0 0 0	centimeters):	

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PHWH Form Page - 1

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DDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	1
QHEI PERFORMED? - 🗍 Yes 🕅 No QHEI Score (If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Distance from Evaluated Stream	ı
D CWH Name: Distance from Evaluated Stream	<u> </u>
Distance from Evaluated Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE	LOCATION
SGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stre	am Order
ounty: Township / City:	<i></i>
MISCELLANEOUS	
ase Flow Conditions? (Y/N): Date of last precipitation: Quantity:	
hotograph Information:	
evated Turbidity? (Y/N): Canopy (% open): 50	
lere samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and atlach results) Lab Number:	
eld Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) _	
the sampling reach representative of the stream (Y/N) If not, please explain:	
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment sh Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) ogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher?	Manual)
priments Regarding Biology:	
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be comp Include important landmarks and other features of interest for site evaluation and a narrative description of the str rcm(rcp)	
tratime s-ium	
ow -> dry chunnel	
tralin S-10m) /52.W
	201- 02
Cron crap	02
PHWH Form Page - 2	

Let in Street

	OhicEPA	Qualitative Hab and Use Asses	itat Evaluation Index sment Field Sheet)
	Stream & Location: 52.	M- 023		RM: Date: <u>9</u> 1 <u>7</u> 1 06	18
	River Code:	Scor STORET #:	ors Full Name & Affiliation: Lat./ Long.: NADS: desimal	18 Office verifies	; 0
	1) SUBSTRATE Check ONLY TW estimate % or no BEST TYPES POOL RIF BLDR /SLABS [10] BOULDER [9] COBBLE [9] GRAVEL [7] BEDROCK [9] BEDROCK [9] NUMBER OF BEST TYPES:	All every type present FLE OTHER TYPES present Image: Image of the present Image of the present	Check O ORIGIN DOL RIFFLE LIMESTONE [1]	NE (Or 2 & average) QUALITY HEAVY [-2] SILT MODERATE (-1) FREE [1] MODERATE [-1] MODERATE [-1] MAXIM SE NORMAL [0] NONE [1]	
	quality; 3-Highest quality in moderate diameter log that is stable, well dave	or greater amounts, but no o or greater amounts (e.g., very loped rootwad in deep / last wa (Iarge boulders in deep or fast water, iter, or deep, well-defined, functional [[2] OXBOWS, BACKWATE AQUATIC MACROPHYT	large Check UNE (0.2 strong) pools. □ EXTENSIVE >75% [11] RS [1] ☑ MODERATE 25-75% [7] ES [1] □ SPARSE 5-425% [3]	J
	3] CHANNEL MORPHOLOGY SINUOSITY DEVELOPM HIGH [4] EXCELLEN MODERATE [3] GOOD [3] LOW [2] SINU [3] NONE [1] POOR [1] Comments	ENT CHANNELIZA	TION STABILITY 	Channel Maximum 20	Ð
15	EROSION	IPARIAN WIDTH DE > 55m [4] DERATE 10-55m [3] URROW 5-10m [2] DERATE 10-55m [1] DERATE 10-55m [1] DERA	FLOOD PLAIN QUALI FOREST, SWAMP (3) SHRUB OR OLD FIELD (2) RESIDENTIAL PARK, NEW FIELD (CONSERVATION TILLAGE [1] URBAN OR INDUSTRIAL[0] URBAN OR INDUSTRIAL[0] MINING / CONSTRUCTION [0] Indicale predominent land use(s) past 100m ripenion. Riperian	A
	Comments			Maximum D. S 10	J
	Check ONE (ONLY) Che 2 Im [6] POOL 0.7 < Im [4] DOOL 0.4 < 0.7 m [2] POOL 0.4 < 0.7 m [2] POOL 0.2 < 0.4 m [1] 0.5 < 0.2 m [0] Comments	HANNEL WIDTH ck ONE (072& sverage) MDTH > RIFFLE WIDTH [7] [MDTH > RIFFLE WIDTH [7] [MDTH > RIFFLE WIDTH [0] [[CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] [2] SLOW [1] VERY FAST [1] [2] INTERSITE FAST [1] [2] INTERMIT NODERATE [1] [2] EDDIES [1] Indicate for reach - pools and rith	est (2) Pool / Current Maximum 12	D
्म स्व स्व स्व स्व स्व स्व स्व	of fiffie-obligate species: RIFFLE DEPTH RU	Check ONI IN DEPTH RIFFLE MUM > 50cm [2] □ STABLE MUM < 50cm [1] □ MOD. ST	e large enough to support a E (Or 2 & average) E / RUN SUBSTRATE RIFFI (e.g., Cobble, Boulder) (2) ABLE (e.g., Large Gravel) [1] LE (e.g., Fine Gravel, Sand) (0]	POPULATION INO RIFFLE Invetrice LE / RUN EMBEDDEDNESS DNONE [2] LOW [1] MODERATE [0] Run DEXTENSIVE [-1] Maximum 8	9)
		VERY LOW & LOW (2-4) MODERATE (0-10) HIGH VERY HIGH (10-6)		KGLIDE: Gradient Gradient 6)
	EPA 4520			06/16/06	

cess directions, etc.		F] MEASUREMENTS Zwidth (T depth (T depth (max. depth (max. depth (bankfull mitth bankfull max. depth (bankfull max. depth bankfull max. depth (bankfull m		l	
Comment RE: Reach consistency is reach typical of steam?, Recreation/Observed - Inferred, <i>Other/</i> Sampling observations, Concerns, Access directions, etc.		EJ ISSUES WWTP / CSO / NPDES / INDUSTRY HARDENED / URBAN / DIRT&GRUME CONTAMINATED / LANDFILL BROSTRUCTION-SEDIMENT LOGGING / IRRIGATION / COOLING BANK./ EROSTON / SURFACE FALSE BANK./ MANURE / LAGOON WASH.H_D / TILE / H_D TABLE FALSE BANK./ MANURE / LAGOON WASH.H_D / TILE / H_D TABLE ALSE BANK./ MANURE / LAGOON WASH.H_D / TILE / H_D TABLE ALSE BANK./ EROSTON / SURFACE FALSE BANK./ MANURE / LAGOON WASH.H_D / TILE / H_D TABLE ALSE BANK./ FOLL MANURE / LAGOON MASH.H_D / TILE / H_D TABLE MASH.H_D / TILE / H_D TABLE MASH.H_D / TABLE / H_D RAVE ATMOSPHERE / DATA PAUCITY		znd Jawith	
n' Observed - Inferred, <i>Other</i>		Circle some & COMMENT	· · ·		John Maria
reach typical of steam?, Recreatio		DJ MAINTENANCE PUBLIC I RRIVATEJ BOTH / NA ACTURE / HISTORIC / BOTH / NA ACTURE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD SPRAY / SNAG / REMOVED SPRAY / SNAG / REMOVED MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED MODIFIED / SLUMPS ISLANDS / SCOURED MPOUNDED / DESICCATED MPOUNDED / DESICCATED MPOUNDED / DESICCATED MPOUNDED / DESICCATED			weilland W2M-021
mment RE: Reach consistency is		BJAESTHETICS DNUISANCEALGAE DNUISANCEALGAE DINVASIVE MACROPHYTES DISCOLORATION DESCOLORATION DISCOLO			And the party
			Stream Drawing;		A A Z

4

	SZM-OTT		
ChieEPA Primary Headw	vater Habitat Evalu HHEI Score	ation Form (sum of metrics 1, 2, 3) :	1
SITE NAME/LOCATION			
<u>A3920001</u> SITE NUMBER LENGTH OF STREAM REACH (#) LAT. <u>41-1</u> DATE SCORER LS CO	RIVER BASIN		56
LENGTH OF STREAM REACH (ft) LAT. $41-1$	LONG. <u></u> _RIV 0MMENTS	/ER CODE RIVER MILE	
NOTE: Complete All Items On This Form - Refer t	o "Field Evaluation Manual for	Ohio's PHWH Streams" for Instruct	tions
			ERY
MODIFICATIONS:	/ /	T.	
1. SUBSTRATE (Estimate percent of every type of s (Max of 40). Add total number of significant substrat	substrate present. Check ONLY two	predominant substrate TYPE boxes	HHEI
TYPE PERCENT	TYPE	PERCENT	Metric Points
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]	SILT [3 pt]	/ DEBRIS [3 pts]	Substrate
BEDROCK [16 pt] D COBBLE (65-256 mm) [12 pts]	FINE DETRITUS [3 CLAY or HARDPAN	pts]	Max = 40
GRAVEL (2-64 mm) [9 pts]		50	71
□ □ □ SAND (<2 mm) [6 pts]() Total of Percentages of //)	(A) ARTIFICIAL [3 pts]	(B)	 A + B
Bldr Slabs, Boulder, Cobble, Bedrock	3	R OF SUBSTRATE TYPES:	ATD
2. Maximum Pool Depth (Measure the maximum po evaluation. Avoid plunge pools from road culverts or	ol depth within the 61 meter (200 ft	t) evaluation reach at the time of Property (Construction)	ool Depti Max = 30
> 30 centimeters [20 pts]	>5 cm - 10 cm [15]		10-
□ > 22.5 - 30 cm [30 pts] □ > 10 - 22.5 cm [25 pts]		DIST CHANNEL [0 pts]	/5
COMMENTS	MAXIMUM P	OOL DEPTH (centimeters):	
3. BANK FULL WIDTH (Measured as the average of > 4.0 meters (> 13') [30 pts]	□ > 1.0 m - 1.5 m (> 3'	'3" - 4' 8") [15 pts]	Bankfull Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	(≤ 3' 3") [5 p	ots]	<u>Max=30</u>
COMMENTS	AVERAGE B	ANKFULL WIDTH (meters)	5
This RIPARIAN ZONE AND FLOODPLAIN QUA	information <u>must</u> also be complete LITY ☆NOTE: River Left (L) and	ad Right (R) as looking downstream☆	
<u>RIPARIAN WIDTH</u> FLOODIL R, (Per Bank)L R,	PLAIN QUALITY (Most Predominant per Bank)	LR	
□ 🕅 Wide >10m □ 🕅	Mature Forest, Wetland Immature Forest, Shrub or Old	Conservation Tillage	
□ □ Moderate 5-10m □ □	Field	U Urban or Industrial	
KQ □ Narrow <5m □ □ □ □ None □ □	Residential, Park, New Field Fenced Pasture	Crop	
COMMENTS			
FLOW REGIME (At Time of Evaluation) (C	Moist Chanr	nel, isolated pools, no flow (Intermittent) , no water (Ephemeral)	
Subsurface flow with isolated pools (Interstitia COMMENTS			
SINUOSITY (Number of bends, per 61 m (20	0 ft) of channel) (Check ONLY one 2.0	box):	
□ None /2 1.0 □ 0.5 □ 1.5	$\square 2.0$ $\square 2.5$	\square >3	
STREAM GRADIENT ESTIMATE	erate (2 ft/100 ft) Oderate (to Severe (10 ft/100 ft)	1
Flat (0.5 ft/100 ft) Flat to Moderate U Mode			,

Red	
ADDITIONAL STREAM INFORMATION (This Informa	ation Must Also be Completed):
QHEI PERFORMED? - 🗌 Yes 🗍 No QH	HEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: CWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCL	LUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County:	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last pre	ecipitation:Quantity:
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% o	men): 30-55
	(Note lab sample no. or id. and attach results) Lab Number:
	gen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N	I) If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observ	vations. Voucher collections optional. NOTE: all voucher samples must be labeled with the s opriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Performed? (Y/N): (If Yes, Record all observ ID number. Include appro	opriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N)
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ChieFA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	56
SITE NAME/LOCATION SZAC 2007	
$\frac{52M-030}{2}$ site NUMBER <u>A3820001</u> RIVER BASIN DRAINAGE AREA (ml ³)_	0.39
LENGTH OF STREAM REACH (II) _ 200 LAT LONG RIVER CODE RIVER MILE	<u></u>
DATE 9/10/18 SCORER ELM, MSG COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	structions
STREAM CHANNEL IN ONE / NATURAL CHANNEL IN RECOVERED RECOVERING RECENTOR NO RECENT OF NO RECENT	GOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate lypes found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
<u>TYPE</u> <u>PERCENT</u> <u>TYPE</u> <u>PERCENT</u>	Metric Points
	Substrate
D BEDROCK. [1]5 pt] D	Max = 40
□□ COBBLE (65-256 mm) [12.pls]	
Total of Decembrance of (A)	A+B
Bidr Slabs, Boulder, Cobble, Bedrock	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the lime of	Pool Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box).	<u>Max = 30</u>
□ > 30 centimeters [20 pts] □ > 22.5 ⊂ 30 cm [30 pts]	25
> 30 centimeters [20 pts] > 5 cm = 10 cm [14 pts] > 522 5 = 30 cm [30 pts] < 5 cm [5 pts]	
COMMENTSMAXIMUM POOL DEPTH (contineters);	
3. BANK FULL WDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13) [30 pts] > 10 m 1.5 m (> 9.3 · 4.8) (95 pts) > 3.0 m 4.0 m (> 9.7 · 43) [25 pts] > 10 m (< 3 3") [5 pts]	Bankfull Width Max=30
COMMENTSAVERAGE BANKFULL WIDTH (meters)	- <u>30</u> -
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY #NOTE: River Left (L) and Right (R) as looking downstream	
RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Most Prodominant per Bank) L	
☐ ☐ Wide >10m	
☐ ☐ Moderate 5-10m ☐ ☐ Immature Forest, Shrub or Old ☐ ☐ Urban or Industrial Field	
K Notroy 25m Residential Park New Field X Open Pasture, Row	
Image: Solution of the second state of the second	l
COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Image: Comparison of the state o)
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
STREAM GRADIENT ESTIMATE	00 n)

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CHEI PERPORMED7 - [] Yes] CHEI Bacce	ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
DWH Name:	GHEI PERFORMED? - DYes DAte QHEI Score (If Yes, Attach Com	pleted QHEI Form)
Digmet Home:		nce from Eveluated Stream
Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>BATTRE WATERAHED AREA. CLEARLY MARK THE STEL COCATION</u> USGE Quadrangle Name: NRCG Soil Map Page: NRCG Soil Map Stream Order		
USGS Quadrangle Name:	EWH Name: Distance Distanc	nce from Evaluated Stream
County:	MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA.	CLEARLY MARK THE SITE LOCATION
BisSELLANEOUS Base Flow Conditions? (YM): Date of last precipitation: Quantity	USGS Quadrangle Name: NRCS Soil Map Page:	NRCS Soil Map Stream Order
Base Flow Conditions? (YM): Date of test precipitation: Quantity: Photograph Information: Elevided Turbidity? (YM): Cenopy (% open):Q Were samples collected for water chemistry? (YM): (Note isb sample no. or id. and effach results) Lab Number: Pield Measures: Tomp (*C) Dissolved Oxygen (mg/t) pH (S.U.) Conductivity (umhos/arm) is the sampling reach representative of the stream (YM) If not, please explain: stational comments/description of pollution Impacts: EloTIC EVALUATION Performed? (YM): (If Yes, Record all observations: Voucher collections optional. NOTE: all voucher samples must be labeled with the elle ID number. Include appropriate field data sheets from the Primary Headwader Habitat Assessment Manual) Performed? (YM): (Ut Yes, Record all observations: Voucher collections optional. NOTE: all voucher samples must be labeled with the elle ID number. Include appropriate field data sheets from the Primary Headwader Habitat Assessment Manual) Performed? (YM): Voucher? (YM) Salamanders Observed? (YM) Voucher? (YM) Prime Observed? (YM) Voucher? (YM) Aquelic Macroinvetebrates Observed? (YM) Voucher? (YM) Comments Regarding Biology DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include Important landmarks and other features of Inferest for site avaluation and a marrative description of the stream's location TEACCUPT FEETURE OF STREAM REACH (This must be completed): Include Important landmarks and other features of Inferest for site avaluation and a marrative description of the stream's location TEACCUPT FEETURE OF STREAM REACH (This must be completed): Include Important landmarks and other features of Inferest for site avaluation and a marrative description of the stream's location Include Important landmarks and other features of Inferest for site avaluation and a marrative description to the stre	County: Township / City:	
thelograph Information:	MISCELLANEOUS	
Bevated Turblidly? (YA):Canopy (% open):OO	Base Flow Conditions? (Y/N): Date of last precipitation; Qu	iantity:
Nere samples collected for water chemistry? (Y/N): (Note fab sample no. or ki. and attach results) Lab Number; ited Measures: Tomp (*C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (umhos/om) is the sampling reach representative of the stream (Y/N) If not, please explain:	Photograph Information:	
Were samples collected for water chemistry? (Y/N):	Elevated Turbidity? (Y/N): Canopy (% open):	
s the sampling reach representative of the stream (Y/N) If not, please explain:		ch results) Lab Number:
Additional comments/description of pollution impacts: BIOTIC EVALUATION terformed? (Y/N): (if Yes, Record all observations, Voucher collections optional, NOTE; all voucher samples must be labeled with the site ID number, include appropriate field data sheeks from the Primary Headwater Habital Assessment Manual Ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) orgs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) omments Regarding Biology;	leid Measures: Temp (°C) Dissolved Oxygen (mg/i) pH (S.U.)	Conductivity (µmhos/cm)
BIOTIC EVALUATION Verformed? (Y/N):	s the sampling reach representative of the stream (Y/N) If not; please explain:	<u> </u>
BIOTIC EVALUATION Performed? (Y/N):		
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DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location Rowcear Con BVFFE TEASCLIPHOWED/TRATIL	<u>BIOTIC EVALUATION</u> Performed? (Y/N): (if Yes, Record all observations. Voucher collections optional, NOTE ID number. Include appropriate field data sheets from the Primary He Ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Vou rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic MacroInvertebrates Observed	all voucher samples must be labeled with the site adwater Habitat Assessment Manual) cher? (Y/N) srved? (Y/N) Voucher? (Y/N)
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SITE NAME/LOCATION			HHEI Scor	<u> </u>		
			ER BASIN			
LENGTH OF STREAM REAC DATE	H(n) - LAT	COMMEN	LONG I	RIVER CODE		
NOTE: Complete All Ite	ms On This Form - F	Refer to "Fiel	d Evaluation Manual f	or Ohla's Pl	fWH Streams" for Inst	
STREAM CHANNEL		L CHANNEL		ECOVERING	RECENT OR NO REC	OVERY
MODIFICATIONS:	n Ala			- - -		
. SUBSTRATE (Eatim	ate percent of every ty	në of subëtrai	e present. Check ONLY to	vo predominar	t substrate TYPE boxes	
(Max of 32). Add tola	I number of significant si	ubstrate types	found (Max of 8). Final me		m of boxes A & B.	HHE Metr
	i pts)				PERCENT	Poin
	mm) [16 pts] pt]			DY DEBRIS [3	pts]	Substra
COBBLE (65-256	mm) [12 pts]		CLAY or HARDPA		93	
GRAVEL (2-64 m		— <u> </u>	MUCK [0 pts]		1200	19
~	5 pts] 🔆 🦾			No. of States	1997	
Total of Percen Bidr Slabs, Boulder, C		^(A)	6		⁽ⁱⁱ⁾ 3	A+B
	DOMINATE SUBSTRAT	TE TYPES:	TOTAL NUMB	ER OF SUBS	TRATE TYPES:	
			within the 61 meter (200 rater pipes) (Check ONL)		reach at the time of	Pool Dep Max = 3
30 centimeters [20 p	ots]	ens or storm w	🗍 🔁 5 cm - 10 cm (10			20
22.5 - 30 cm [30 pt 5 - 10 - 22.5 cm [25 pt	al de Slatin de la companya	1999 1997 1997		OIST CHANN	EL (0 pts)	
COMMENTS			MAXMUM I	POOL DEPTH	(centimeters):	
BANK FULL WIDTH	(Measured as the avera	ige of 3-4 mer	su <u>re</u> ments) (Che	ck ONLY one	box):	Bankful
□ (> 1.0 meters (> 13) [30 □ +> 3.0 m - 4.0 m (> 9' 7	pts] - 13') [25 pts]		□ > 1.0 m ≤ 1.5 m (> □ ≤ 1.0 m (≤ 3' 3] [5	3' 3" - 4' 8") [15 pts]	(atq	Width <u>Max=30</u>
X > 1.5 m = 3.0 m (> 8 7	-4'.8") [20 pts]				81	70
COMMENTS			AVERAGE E	ANKFULL W	DTH (maters)	
· · · · · · · · · · · · · · · · · · ·	<u></u>	This Informat	ion must also be complet	edi		
		QUALITY OODPLAIN QU	PRIVATE: River Left (L) and	l Right (R) as l	ooking downstream 🗘	
<u>RIPARIAN W</u> L_R/ (Per Bank)	<u>师</u> 正	R (Most F	redominant per Bank)	LR		
2 2 Wide >10m		A .	Forest, Wetland re Forest, Shrub or Old		Conservation Tillage	
Moderate 5-	-10m 📙	Field			Urban or Industrial	
🗍 🗍 🛛 Naπow <5m			nilal, Park, New Fleid	00	Open Pasture, Row Crop	
		Fenced	Pasture		Mining or Construction	
) (Check ON!	Yone box):			
COMMENTS	E (At Time of Evaluation.		Moist Chan	nel, isolated po , no water (Ep	ols, no flow (Intermittent) hemeral)	
COMMENTS_	E (At Time of Evaluation) with isolated pools (inte	rstiliah	Dry channel	a second darks	· -·	
COMMENTS_	•	rstilial)	Dry channel	•••••••••••••••••••••••••••••••••••••••		
COMMENTS_ FLOW REGIM Stream Flowing Subsurface flow COMMENTS_ SINUOSITY (N	with isolated pools (inte	n (200 N) of cha	annel) (Chack ONLY one			
COMMENTS FLOW REGIM Stream Flowing Subsurface flow COMMENTS	with isolated pools (inte	n (200 N) of cha		box): D	3.0 >3	
COMMENTS_ FLOW REGIM Stream Flowing Subsurface flow COMMENTS_ SINUOSITY (N None	with isolated pools (inter- lumber of bends per 61 n 1,0 1,5 ES11MATE	n (200 N) of cha	annel) (Chack ONLY one 2.0 2.5	ď		

and the second second

	QHEI PERFORMED	7 - 🛛 Yes 🏹 No QHEI S	core (if Yes, Attach	Completed QHEI Form)
	DOWNSTREAM DE	CIONATED USE(S)		
	Name:			Distance from Evaluated Stream
				Distance from Evaluated Stream
		COPIES OF MAPS, INCLUDIN	NG THE <u>ENTIRE</u> WATERSHED AF	REA. CLEARLY MARK THE SITE LOCATION
USGS Qu				e: NRCS Soll Map Stream Order
County:				
	MISCELLANEOUS	1		
Base Flow	Conditions? (Y/N):	Date of last precipits	allon:	Quantity:
Photograp	h Information:			<u></u>
Elevated T	iurbidiity? (Y/N): <u> </u>	Canopy (% open):		
Were samp	bles collected for wat	er chemistry? (Y/N):	(Note lab sample no. or id. and	attach results) Lab Number:
Field Meas	unes: Temp ("C)_	Diasolved Oxygen (r	mg/l)pH (S.U.)	Conductivity (µmhos/cm)
s the sam	oling reach represent	ative of the stream (Y/N)	If not, please explain:	· · · · · · · · · · · · · · · · · · ·
			··	
Additional o	comments/description	of pollution impacts:		
·	comments/description			
		N If Yes. Record all observations	s. Voucher collections optional. No	DTE: all voucher samples must be labeled with the
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LENGTH OF STREAM REACH (ft)LATLONGRIVER CODERIVER MILE DATE2118 SCORERS1MON _ COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruct STREAM CHANNEL 0 NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVER MODIFICATIONS:	tions
TYPE BLDR SLABS [16 pts] PERCENT TYPE SILT [3 pt] PERCENT BOULDER (>256 mm) [16 pts] D D LEAF PACK/WOODY DEBRIS [3 pts] PERCENT BEDROCK [16 pt] D D D CLAY or HARDPAN [0 pt] D GRAVEL (2-64 mm) [9 pts] D D MUCK [0 pts] D D SAND (<2 mm) [6 pts]	HHEI Metric Points Substrate Max = 40
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	ool Depth Max = 30 () Bankfull Width Max=30 25
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY L. R. (Per Bank) L R Wide >10m Immature Forest, Wetland Immature Forest, Shrub or Old Immature Forest, Shrub or Old Immature Forest, Shrub or Old Immature, Row Crop Immature Some Immature Forest, New Field Open Pasture, Row Crop Immature None Immature Forest Pasture Immature Mining or Construction FLOW REGIME (At Time of Evaluation) (Check ONLY one Devi: Moist Channel, isolated pools, no flow (Intermittent) Stream Flowing Subsurface flow with isolated pools (Interstitial) Immature Some Immature Some SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): 3.0 None 1.0 2.0 3.0 0.5 1.5 2.5 3	

8

October 24, 2002 Revision

ADDITIONAL STREAM INFORMATION (This Information Must A	Also be Completed):
QHEI PERFORMED? - DYes No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
□ CWH Name: □ EWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: To	winship / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity:
Photograph Information:	
Elevated Turbidity? (Y/N):/ Canopy (% open):	
	ab sample no. or id. and atlach results) Lab Number:
	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) <u>N</u> If n	not, please explain: OUTSIDE OF WOODLOT
THE STREAM IS SURROUN	VDED BE AGRICULTURAL FIELD
Additional comments/description of pollution impacts:	
ID number. Include appropriate field (Fish Observed? (Y/N) N Voucher? (Y/N)	uatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
	····
DRAWING AND NARRATIVE DESCRIPTION	ON OF STREAM REACH (This <u>must</u> be completed):
Include important landmarks and other features of interest	t for site evaluation and a narrative description of the stream's location
FLAND	UPLAND FORIST
FLOW	
POSTAL FLOODPLAIN FLOODPLAIN	
· · ·	
PHW	/H Form Page - 2

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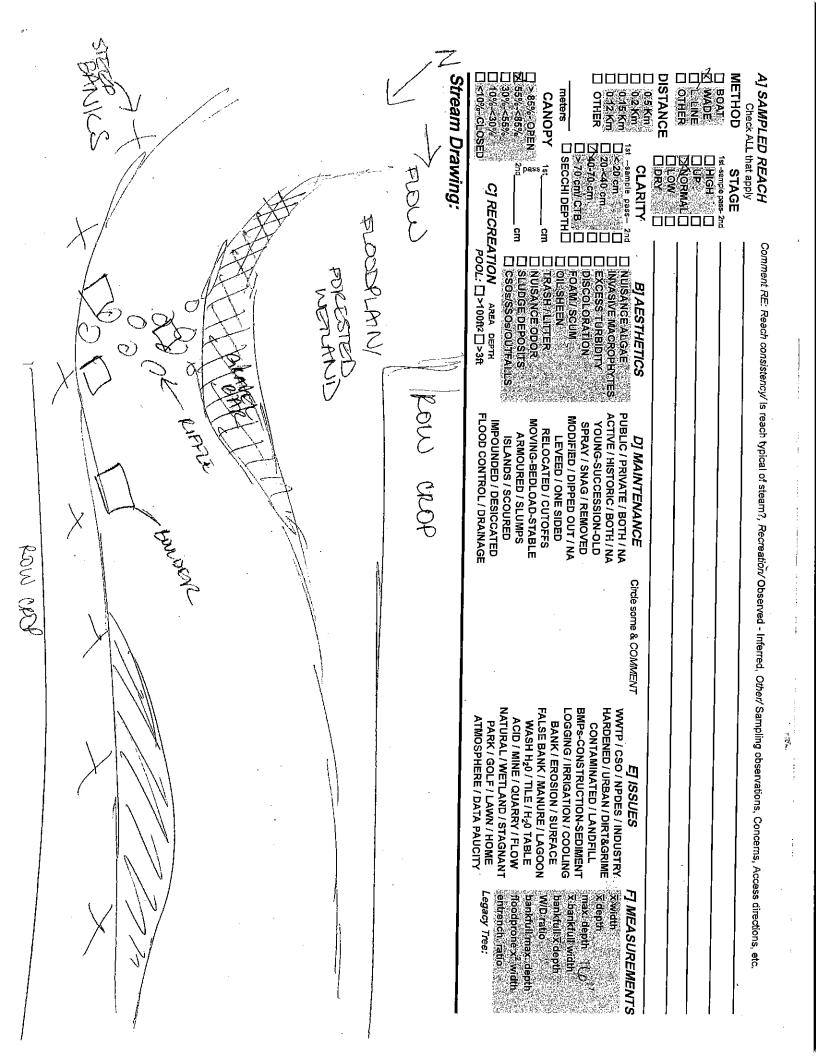
October 24, 2002 Revision

Stream & Location: SQ	M-037		RM: Date: 0
<u>k</u>		rs Full Name & Affiliation:	<u> SIMON, IVA</u>
River Code:	STORET #:	Lat./Long.:41 125	1 182 1815
	r note everv type dresent		IE (Or 2 & average) QUALITY
	// HARDPAN [4]		HEAVY [-2]
	70		SILT DI MODERATE [-1]
$\Box \underline{C} COBBLE [8] \qquad \underline{/} (\underline{C}) \\ \Box \underline{C} GRAVEL [7] \qquad \underline{ZL} $		L Z HARDPAN [0]	DEXTENSIVE [-2]
□ □ SAND [6]. □ □ BEDROCK [6]	ARTIFICIAL [0] (Score natural substr	ates; ignore RIP/RAP [0]	
	3: [Z] 4 or more [2] sludge from por □ 3 or less [0]	nt-sources) A LACUSTURINE [0]	DEONE D EXTENSIVE [2] MODERATE [-1] S □ NORMAL [0] ⊠ NONE [1]
Comments			
2] INSTREAM COVER Indic	ate presence 0 to 3: 0-Absent; 1-Ve	ry small amounts or if more common highest quality or in small amounts o	of marginal AMOUNT
wunlihr 9 Ulabort quality in mode	rate or greater amounts (e.g., very la weloned rootwad in deen / last wate	arge boulders in deep of fast water, i er, or deep, well-defined, functional p	
UNDERCUT BANKS [1]		2] <u>2</u> OXBOWS, BACKWATER 2 AQUATIC MACROPHYTI	S [1] MODERATE 25-75%
OVERHANGING VEGETAT			
<u>2</u> ROOTMATS III - The Comments	1944-1944		Cove Maximu
	·		
	GY Check ONE in each category (C PMENT CHANNELIZAT	or 2 & average)	
	ENT [7] X NONE [6]	(Х нісн (з)	
☐ MODERATE [3]		☐ MODERATE [2]	
	이야 않는 것은 것은 것은 것은 것을 알았는 것을 받았다.	COVERY [1]	Chann Maximu
Comments			
4] BANK EROSION AND R River right looking downstream	IPARIAN ZONE Check ONE in RIPARIAN WIDTH	each category for EACH BANK (Or 2 FLOOD PLAIN QUALIT	2 per bank & average) Y
	WIDE > 50m [4] 公 公 区 区	FOREST, SWAMP [3]	
		SHRUB OR OLD FIELD [2] RESIDENTIAL, PARK, NEW FIELD [1	
HEAVY/SEVERE [1]	VERY NARROW < 5m [1]	ENCED PASTURE [1] OPEN PASTURE, ROWCROP [0]	Indicate predominant land use(
Comments		JEEN EMOLUMENTONOMUNI	Maximur 1
		<u> </u>	······
5] <i>POOL / GLIDE AND RIFI</i> MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Poter
	Check ONE (Or 2 & average)	Check ALL that apply TORRENTIAL [1] SLOW [1]	Primary Conta
07-<1m [4] DPOC	ol width = Riffle width [1] 🛛	VERY FAST (1)	Circle one and comment on
図 0·2-<0.4m[1]		MODERATE [1] DEDDIES [1]	Pool
[□]<0.2m [0] Comments		Indicale for reach - pools and riffle	Maximur 1
-	riffloo: Roet areas must be	large enough to support a	nonulation
of riffle-obligate specie	Check ONE	(Or 2 & average).	
	RUN DEPTH RIFFLE		E / RUN EMBEDDEDNES
Jeestanias in the M	AXIMUM < 50cm [1] (MOD+STA	BLE (e.g., Large Gravel) [1]	
Janaraknasi sen /~		E (e.g., Fine Gravel, Sand) [0]	
	<u> </u>		
	U VERY LOW -LOW [2-4]	%POOL:() %	GLIDE: Gradier
3] GRADIENT (, , (Υ ft/mi)	NZI MODERATE IS 10		
	MODERATE (6:10)	%RUN:%	

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ChieFA Primary Headwater Habitat Evaluation Form	Ĩ
HHEI Score (sum of metrics 1, 2, 3) : SITE NAMEA.OCATION SITE NUMBERA3820007 RIVER BASIN DRAINAGE AREA (m ²) SITE NUMBERA3820007 RIVER BASIN DRAINAGE AREA (m ²) LENGTH OF STREAM REACH (ft) DOT LAT 41.14.30 LONG. 82.700 DATE	lons
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY Iwo predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] PERCENT BOULDER (>256 mm) [16 pts] D LEAF PACKWOODY DEBRIS [3 pts] BEDROCK [16 pt] D FINE DETRITUS [3 pts] BEDROCK [16 pts] D FINE DETRITUS [3 pts] BEDROCK [16 pts] D ARTIFICIAL [3 pts]	HHEI Aetric Points Iax = 40 A + B
2 Maximum Pool Depth (Measure the maximum pool depth within the 51 meter (200 ft) evaluation reach at the time of Po	ool Depth (ax = 30
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (circen of 2 of 6 period	Bankfull Width 1ax=30
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream \$\$\$\$ RIPARIAN WIDTH RIPARIAN WIDTH FLOODPLAIN QUALITY Short : River Left (L) and Right (R) as looking downstream \$\$\$\$ RIPARIAN WIDTH I R L R (Per Bank) L R (Most Predominant per Bank) L R I Wide >10m I Mature Forest, Welland I Conservation Tillage I Moderate 5-10m I Immature Forest, Shrub or Old I Urban or Industrial I Narrow <5m	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS Sinuo Sitry (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0	
0.5 1.5 2.5 STREAM GRADIENT ESTIMATE Flat (0.5 #/100 m) Flat (0.5 #/100 m) Flat (0.5 #/100 m) PHWH Form Page - 1	

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	ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed): QHEI PERFORMED? - I Yes IN 0 QHEI Score (If Yes, Attach Completed QHEI Form) DOWNSTREAM DESIGNATED USE(S) WWH Name:
	DOWNSTREAM DESIGNATED USE(S)
	WWH Name: Distance from Evaluated Stream
	CWH Name: Distance from Evaluated Stream
	EWH Name: Distance from Evaluated Stream
	MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	USGS Quadrangle Name: NRCS Soll Map Page: NRCS Soll Map Stream Order
	County: Township / City:
	MISCELLANEOUS
	Base Flow Conditions? (Y/N): N Date of last precipitation: <u>9/25/18</u> Quantity:
	Photograph Information:
	Elevated Turbidily? (Y/N): Canopy (% open):
	Were samples collected for water chemistry? (Y/N): <u>N</u> (Note lab sample no. or id. and attach results) Lab Number:
	Field Measures; Temp (°C) Dissolved Oxygen (mg/t)pH (S.U.) Conductivity (µmhos/cm)
	Is the sampling reach representative of the stream (Y/N) If not, please explain:
	Additional comments/description of pollution impacts:
	BIOTIC EVALUATION
	Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE; all voucher samples must be labeled with the site
•	ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Fish Observed? (Y/N) <u>N</u> Voucher? (Y/N) Salamanders Observed? (Y/N) <u>N</u> Voucher? (Y/N)
	Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
,	Comments Regarding Biology.
-	
	DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):
-	Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location
RECED CALANKY	Row/CROP///////////////////////////////////
VERET	
CK4402	$= Low \rightarrow \qquad $
	A VY MAG
	LOW - KING MANNAN CO BUFFER TO POOL WEET
	I pucture
	POW AND CORS
\mathbf{X}	
\rightarrow	(RDP) (ALMED ENTRY (DUTPAL GUILD) K
-	ROW MANNED BUFFLER (POXTALL GRASS) WIDUCIFUR
	HOP THE BUFFLER (POXTML) ALL ALL ALL ALL ALL ALL ALL ALL ALL A
	PHWH Form Page - 2
	PHWH Form Page - 2

SITE NAME/LOCATION SITE NUMBER A STREAM REACH (ft) 200 LAT. 4 1454 LONG 82.7844 RIVER CODE DRAINAGE AREA (mi ²) LENGTH OF STREAM REACH (ft) 200 LAT. 4 1454 LONG 82.7844 RIVER CODE RIVER MILE DATE 2 25/18 SCORER L SWOOL COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Oh!o's PHWH Streams" for Instruct STREAM CHANNEL SO NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVER	ctions
MODIFICATIONS: 1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pis] BOULDER (>256 mm) [16 pis] PERCENT BOULDER (>256 mm) [16 pis] D BOULDER (>256 mm) [16 pis] D	HHEI Metric Points Substrate Max = 40
 SAND (<2 mm) [6 pts]	A + B Pool Depth Max = 30 20
COMMENTS MAXIMUM POOL DEPTH (centimeters): 3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4,0 meters (> 13') [30 pts] > 1.0 in - 1.5 m (> 3'3' - 4'3'') [15 pts] > 3,0 m - 4,0 m (> 9'7' - 13') [25 pts] > 1.0 m (≤ 3'3'') [5 pts] > 1,5 m - 3.0 m (> 4'8'' - 9'7') [20 pts] < 1.0 m (≤ 3'3'') [5 pts]	Bankfull Width Max=30 20
This Information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream fr RIPARIAN WIDTH FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream fr Network L R (Most Predominant per Bank) L R Vide >10m D Mature Forest, Wetland D Conservation Tillage Moderate 5-10m D Residential, Park, New Field Open Pasture, Row Crop Narrow <5m D Fenced Pasture Mining or Construction	
COMMENTS	

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June 20, 2008 Revision

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PHWH Form Page - 1

QHE! PERFORMED	7 - 🗇 Yes 🖄 No 🛛 QHEI Score	(If Yes, Atlach Complete	d QHEI Form)
DOWNSTREAM DE	-	-	
		Dislance	from Evaluated Stream
D EWH Name:	·	Distance 1	rom Evaluated Stream
MAPPING: ATTACH	COPIES OF MAPS, INCLUDING THE <u>EI</u>	NTIRE WATERSHED AREA. CLE	ARLY MÁRK THE SITE LOCATION
USGS Quadrangle Name:		NRCS Sofi Map Page:	_ NRCS Soil Map Stream Order _
County:	Town	iship / City:	
MISCELLANEOUS		-	
Base Flow Conditions? (Y/N):	Date of last precipitation:	. <u>1255/18</u> Quantit	۶ <u></u>
Photograph Information:			
Elevated Turbidity? (Y/N):	Сапору (% open):) 	
Were samples collected for wal	er chemistry? (Y/N): <u>N</u> (Note lat	b sample no. or id. and attach re	sults) Lab Number:
Fleid Measures: Temp (°C)_	Dissolved Oxygen (mg/l)	pH (S.U.) Con	ductivity (µmhos/cm)
Is the sampling reach represent	lalive of the stream (Y/N) 1 If not,	, please explain:	
-			
Additional comments/description	n of pollution impacts:		
	— (If Yes, Record all observations. Vouche ID number. Include appropriate field dat Voucher? (Y/N) <u>//</u> Salamanders O Y/N)_/_ Voucher? (Y/N)_/_ Aquat	a sheets from the Primary Headwa	ter Habitat Assessment Manual)
,	<i></i>		· ·····
	· ·		
DRAWING ANI	D NARRATIVE DESCRIPTION	OF STREAM REACH (T	is <u>must</u> be completed):
include Important landm	arks and other features of Interest for	r site evaluation and a narrative	
include Important landm	arks and other features of Interest for THE STATES AND A	r site evaluation and a narrative \mathcal{A}	
include important landm		QL.	X attractionsh

June 20, 2008 Revision

ChigEPA Primary He	eadwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	,0
DATE 12511B SCORER K.S.IMC NOTE: Complete All Items On This Form - STREAM CHANNEL	32000 River Basin	uctions
1. SUBSTRATE (Estimate percent of every to (Max of 40). Add total number of significant structures of 40). Add total number of significant structures of 40). Add total number of significant structures of 8001. DER SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Der SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Der SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16 pts] Image: Dep SLABS [16	ype of substrate present. Check ONLY two predominant substrate TYPE boxes substrate lypes found (Max of 8). Final metric score is sum of boxes A & B. CENT TYPE PERCENT D SILT [3 pt] PERCENT D FINE DETRITUS [3 pts] PERCENT CLAY or HARDPAN [0 pt] CLAY or HARDPAN [0 pt] (B) ARTIFICIAL [3 pts] (B) (A) (B) (5)	HHEI Metric Points Substrate Max = 40 20 A + B Pool Depth Max = 30 15
COMMENTS 3. BANK FULL WIDTH (Measured as the aver > 4.0 meters (> 13) [30 pts] > 3.0 m + 4.0 m (> 9' 7' = 13') [25 pts] > 1.5 m - 3.0 m (> 4' 8" - 9' 7') [20 pts]	MAXIMUM POOL DEPTH (centimeters): rage of 3-4 measurements) (Check ONLY one box): □ > 1.0 m = 1.5 m (≥ 3 3". 4"8") [15 pts] ; □ < 1.0 m (≤ 3 3") [5 pts]	Bankfull Width Max=30
L R (Per Bank) L M Wide >10m M Oderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Evaluation Stream Flowing Subsurface flow with isolated pools (Int COMMENTS	LOODPLAIN QUALITY R (Most Predominant per Bank) L R Mature Forest, Wetland Immalure Forest, Wetland Immalure Forest, Shrub or Old Immalure Forest, Shrub or Old Residential, Park, New Field Open Pasture, Row Crop Fenced Pasture Immalure Forest, Shrub or Old Mining or Construction Moist Channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral) m (200 ft) of channel) (Check ONLY one box):	
0.5 0.1 1.3		n)

June 20, 2008 Revision

	QHEI Score (If Yes, Atlach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
1 WWH Name:	Distance from Evaluated Stream
O CWH Name:	Distance from Evaluated Stream
	Distance from Evaluated Stream
	ICLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County:	Township / City
MISCELLANEOUS	· · · · · · · · · · · · · · · · · · ·
Base Flow Conditions? (Y/N): Date of last	precipitation: <u>\$125/18</u> Quantity:
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (%	6 open):
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or Id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissofved O	xygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
is the sampling reach representative of the stream Ω	//N) If not, please explain:
Performed? (Y/N): (If Yes, Record all obs ID number. Include a	servations. Voucher collections optional. NOTE; all voucher samples must be labeled with the site ppropriate field data sheels from the Primary Headwater Habital Assessment Manual)
Frogs or Tadpoles Observed? (Y/N) 1 Voucher?	Salamanders Observed? (Y/N) <u>Voucher</u> ? (Y/N) <u>V</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) <u>V</u> Voucher? (Y/N)</u>
Frogs or Tadpoles Observed? (Y/N) 1 Voucher?	Salamanders Observed? (V/AILN) Vousher? (Y/AILN)
Frogs or Tadpoles Observed? (Y/N) Y Voucher?	Salamanders Observed? (Y/N) <u>Voucher</u> ? (Y/N) <u>V</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) <u>V</u> Voucher? (Y/N)</u>
Frogs or Tadpoles Observed? (Y/N) 1 Voucher?	Salamanders Observed? (Y/N) <u>Voucher</u> ? (Y/N) <u>V</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) <u>V</u> Voucher? (Y/N)</u>
Frogs or Tadpoles Observed? (Y/N) Y Voucher? Comments Regarding Biology.	Salamanders Observed? (Y/N). (Y/N). Aquatic Macroinvertebrates Observed? (Y/N). Voucher? (Y/N).
Frogs or Tadpoles Observed? (Y/N) Y Voucher? Comments Regarding Biology DRAWING AND NARRATIVE I	Salamanders Observed? (Y/N) <u>N</u> Voucher? (Y/N) <u>N</u> (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) <u>N</u> Voucher? (Y/N) <u>N</u>
Frogs or Tadpoles Observed? (Y/N) Y Voucher? Comments Regarding Biology DRAWING AND NARRATIVE I	Salamanders Observed? (Y/N) <u>N</u> Voucher? (Y/N) <u>N</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) </u> Voucher? (Y/N) <u>N</u> OESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
Frogs or Tadpoles Observed? (Y/N) Y Voucher? Comments Regarding Biology DRAWING AND NARRATIVE I	Salamanders Observed? (Y/N) <u>N</u> Voucher? (Y/N) <u>N</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) </u> Voucher? (Y/N) <u>N</u> OESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
Frogs or Tadpoles Observed? (Y/N) Y Voucher? Comments Regarding Biology DRAWING AND NARRATIVE I	Salamanders Observed? (Y/N) <u>N</u> Voucher? (Y/N) <u>N</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) </u> Voucher? (Y/N) <u>N</u> OESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
Frogs or Tadpoles Observed? (Y/N) Y Voucher? Comments Regarding Biology	Salamanders Observed? (Y/N) <u>N</u> Voucher? (Y/N) <u>N</u> (Y/N) <u>Aquatic Macroinvertebrates Observed? (Y/N) </u> Voucher? (Y/N) <u>N</u> OESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
Frogs or Tadpoles Observed? (Y/N) Voucher? Comments Regarding Biology DRAWING AND NARRATIVE I Include important landmarks and other featu	Salamanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): ares of interest for site evaluation and a narrative description of the stream's location

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ChigEFA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : SITE NAME/LOCATION	1610
STREAM CHANNEL ANNEL	tructions
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] PERCENT TYPE BOULDER (>256 mm) [16 pts] DI EAF PACKAWOODY DEBRIS [3 pts] PERCENT BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pt] DI EAF PACKAWOODY DEBRIS [3 pts] DI EAF PACKAWOODY DEBRIS [3 pts] BEDROCK [16 pts] DI EAF PACKAWOODY [10 pt] DI EAF PACKAWOODY [10 pt] BEDROCK [16 pts] DI EAF PACKAWOODY [10 pt] DI EAF PACKAWOODY [10 pt] BEDROCK [16 pts] DI EAF PACKAWOO	HHEI Metric Points Substrate Max = 40
Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts]	Pool Depth Max = 30 30 Bankfull Width Max=30
02 >3.0m - 4.9m (> 9'7'- 13') [25 pts] □ > 1.5m - 3.0m (> 4'8'- 9'7') [20 pts] COMMENTSAVERAGE BANKFULL WIDTH (meters)	25
This Information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY স্থা প্রসাতTE: River Left (L) and Right (R) as looking downstream জ	
RIPARIAN 20NL AND TECODI EAIN decision FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank)	n
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Image: Comparison of the solution of t	it)
SINUO SITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Check ONLY one box): Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Check ONLY one box): Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sinuo Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of channel) Image: Sity (Number of bends per 61 m (200 ft) of	
STREAM GRADIENT ESTIMATE	/100 fl)

	ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):
	QHEI PERFORMED? - I Yes K. No QHEI Score (If Yes, Attach Completed QHEI Form)
	DOWNSTREAM DESIGNATED USE(S)
	WWH Name: Distance from Evaluated Stream CWH Name: Distance from Evaluated Stream Distance from Evaluated Stream
	EWH Name: Distance from Evaluated Stream
-	MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	USGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
-	County: Township / City:
	MISCELLANEOUS
	Base Flow Conditions? (Y/N): Date of last precipitation: <u>9/210/18</u> Quantity:
	Photograph Information:
	Elevated Turbidity? (Y/N): Canopy (% open): 15
	Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
	Field Measures: Temp (°C) Dissolved Oxygen (mg/) pH (S.U.) Conductivity (µmhos/cm)
	Is the sampling reach representative of the stream (Y/N) N If not, please explain: SAMPUNG ACACH IS
	REPRESENTATIVE OF THE STREAM WITHIN THE WOODLOT, NOT WITHIN THE AS. FIELDS.
	NOT WITHN THE AS. FIELDS.
	BIOTIC EVALUATION
-	Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
	ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
	Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
	Comments Regarding Biology.
	· · · · · · · · · · · · · · · · · · ·
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DOLLOG .	DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):
PERINS	Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location
	FORESTED FUNCTIONS (VERDERUS
γ (L)	FORESTED FUNCTIONS GUIDENUS
1 Bat	
DEE)	FLOW - I LA FLOW
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)	Att
Ę	CWOODTUS FORESTED DEPORTS FORESTED WETLAND
\longrightarrow	WETLAND
NI	June 20, 2008 Revision
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Chieffa Primary Head	Water Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :
DATE 9/177/18 SCORER KSIMON	201 RIVER BASIN DRAINAGE AREA (mi ²) 1.1550 Long82.1015 RIVER CODE RIVER MILE COMMENTS
	er to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions PHANNEL: 🖸 RECOVERED: 🗇 RECOVERING: 👰 RECENT OR NO RECOVERY.
(Max of 40). Add total number of significant subslutery of signif	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
evolucition. Avoid physics people from road culverts	pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool Depth
3. BANK FULL WIDTH (Measured as the average	of 3-4 measurements) (Check ONLY one box): 1 Bankfull > 1.0 m - 1.5 m (> 3' 3'' - 4''8'') [15 pts]; Width
RIPARIAN ZONE AND FLOODPLAIN QU	DDPLAIN QUALITY (Most Predominant per Bank) Mature Forest, Welland Immature Forest, Shrub or Old Field Residential, Park, New Field
FLOW REGIME (At Time of Evaluation) Stream Flowing Subsurface flow with Isolated pools (Interstic COMMENTS	Moist Channel, isolated pools, no ilow (intermittent) Dry channel, no water (Ephemeral) 200 ft) of channel) (Check ONLY one box): 2.0 3.0
0.5 0.5 1.5	□ 2.5 □ >3 oderale (2 #/100 R) □ Moderate to Severe □ Severe (10 ft/100 R)

June 20, 2008 Revision

- 42

PHWH Form Page - 1

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	EAM INFORMATION (This in				
QHEI PE	RFORMED? - 🗍 Yes 🕅 N	o QHEI Score	(If Yes, Atlac	h Completed QHEI Form)	
DOWNS	TREAM DESIGNATED USE(8	S)	2	<u>.</u>	2
WWH Name:			· · ·	Distance from Evaluated	Stream
	······································			Distance from Evaluated	Stream Stream
MAPPIN	G: ATTACH COPIES OF MAPS	, INCLUDING THE <u>EN</u>	TIRE WATERSHED	REA. CLEARLY MARK TH	E SITE LOCATION
	Name:				
County:		Towns	hlp / City:	. <u> </u>	
MISCELL	ANEOUS				
	ns? (Y/N); N Date of le				_
	tion:				
Elevated Turbidity?	(Y/N): Canopy	/ (% open):			
Were samples colle	cted for water chemistry? (Y/N	l): (Note lab	sample no. or id. an	d allach results) Lab Numb	er:
Field Measures:	Temp (°C) Dissolved	l Oxygen (mg/l)	pH (S.U.)	Conductivity (µmho	s/cm)
is the sampling read	h representative of the stream	n (Y/N)lf not, p	blease explain:		
	<u>VALUATION</u> 				
Fish Observed? (Y/N	ID number. Include			ary Headwaler Habilat Asse Voucher? (Y/N)	sment Manual)
Frogs or Tadpoles O	bserved? (Y/N) Vouche	er? (Y/N) Aquatio	Macroinvertebrates	Observed? (Y/N) V	pucher? (Y/N)
Comments Regardin	g Blology:				<u>. </u>
	VING AND NARRATIVE			• • —	
nicique impor	tant landmarks and other fea	atures of interest for	and andination sug	а нананче сезсприон от	ule suezin's location
	ROU	O CRI	$\mathcal{P} = \prec \mathcal{I}$	TBEANS	
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	XXIIIA		ANITER	21 X 2 8	
-Low →	XVederA		ANNEZ	2727	Z
-Low →	XXegerA	PAC DE	ANNEZ	2 X 7 X	250
Low →	NegerA	BB COG	ARIGEZ	2727	2 D
-Low	XVEGETA	CORD	ANNES		wwer
-Low	NegerA	CORD	AKINEZ		WWERT

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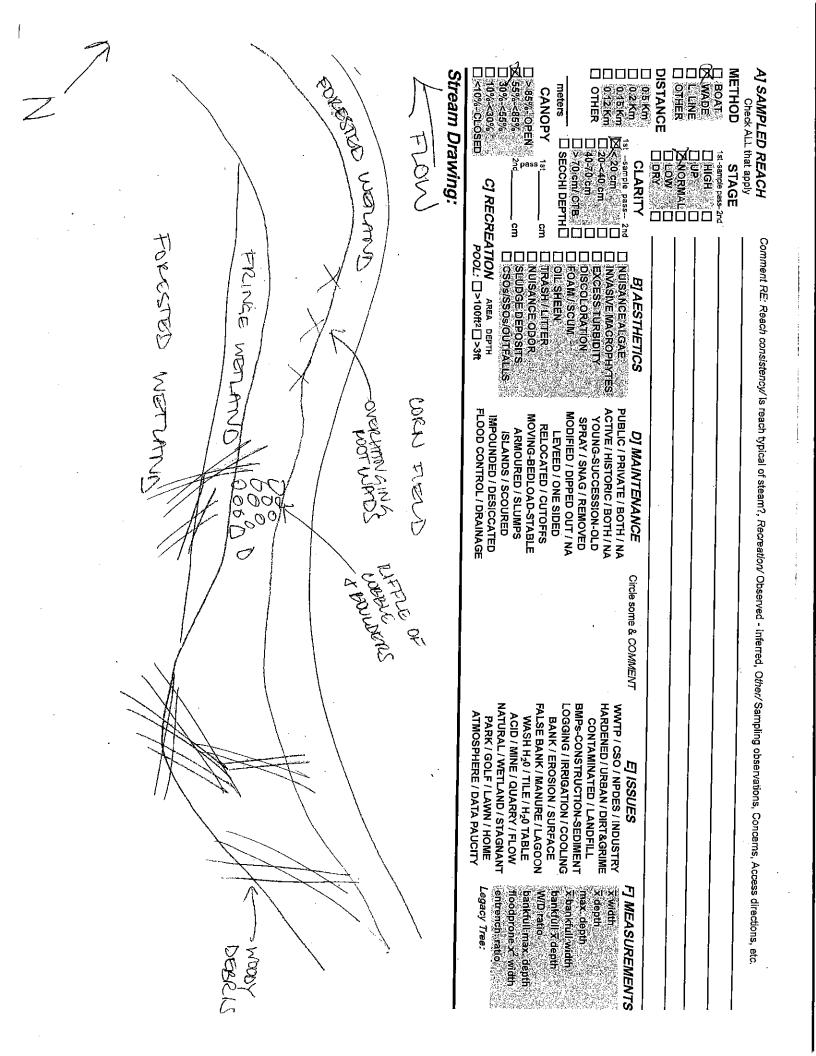
ing in the

Stream & Location: A	and Use Assessm		Date: 0
	Scorers	Full Name & Affiliation: K.E	STOMON
River Code:	<i>STORET #:</i>	Lat./Long.: 41 1279 18	327691 Office
1] SUBSTRATE Check Of estimate	NLY Two substrate TYPE BOXES; % or note every type present	Check ONE (C	
BEST TYPES POO	OF RIFFLE OTHER TYPES POOL F		
		□ WETLANDS [0]	
	Score natural substrates		
NUMBER OF BEST TY	PES: 14 or more [2] sludge from point-s	ources) ☐ LACUSTURINE [0] 교 □ SHALE [-1]	Contraction (1) Contraction (1) Contra
Comments	[•] □ 3 or less [0]	COAL FINES [-2]	ಹಿತಿಕೊಡುತ್ತುಕೊಂಡುತ್ತಿದ್ದಾರೆ. ಕನ್ನಡಚಿತ್ರಗಳು
21 INSTREAM COVER	ndicate presence 0 to 3: 0-Absent; 1-Very si	mall amounts or if more common of ma	
musliku 2 Llichool guoliku in m	puality, z-inouerate amounts, but not of high	boulders in deep or fast water, large	Check ONE (Or 2 & ave EXTENSIVE ≥75% [1]
diameter log that is stable, we UNDERCUT BANKS [1	ell developed rootwad in deep / tast water, o	OXBOWS; BACKWATERS [1]	MODERATE 25-75%
2 OVERHANGING VEGE		2 AQUATIC MAGROPHYTES [1 3 LOGS OR WOODY DEBRIS [] □ SPARSE 5-<25% [3]] □ NEARLY ABSENT <5
ROOTMATS [1]		in the second s	Cover Maximum
Comments			20
	OGY Check ONE in each category (Or 2	& average)	
		I STABILITY	
MODERATE [3] A GOO	D [5] CARECOVERED [4]	☐ MODERATE [2] □ LOW [1]	
LOW [2] FAIR NONE [1] POO			Channel Maximum
Comments			20
4] BANK EROSION AN	D RIPARIAN ZONE Check ONE in eac	h category for EACH BANK (Or 2 per FLOOD PLAIN QUALITY	bank & average)
		EST. SWAMP [3]	
] 口 MODERATE 10-50in [3] / (口 口 SHR] 口 NARROW 5-10m [2] // (口 RES	UB OR OLD FIELD [2] UB OR OLD FIELD [1]	URBAN OR INDUSTRIAL MINING / CONSTRUCTION
] 🕅 VERY NARROW < 5m [1] 🖾 🖾 FEN	CED PASTURE [1]	licate predominant land use(s) st 100m riparian. Riparia n
 Comments		N PASTURE/ROWCROP [0] pa	Maximum 10
5] POOL / GLIDE AND F			
MAXIMUM DEPTH			Recreation Potent
Check ONE (ONLY!) □ ≥ 1m [6]		Check ALL that apply RRENTIAL[-1] SLOW [1]	🕅 🛛 Secondary Conta
□ 0.7 ≤ 1m [4] 5 D	POOL WIDTH < RIFFLE WIDTH [0]	RY FAST [1]	
□ 0.2-<0.4m [1]	/DAMC	DERATE [1] DEDDIES [1]	Pool / Current
	light V M	ndicate for reach - pools and riffles.	
□ <0.2m [0] Comments	i na virna Antika Antika	ndicate for reach - pools and riffles.	
□ < 0.2m [0] Comments Indicate for function	ر مر nal riffles; Best areas must be lar	ndicate for reach - pools and riffies. ge enough to support a pop	12 Julation
□ < 0.2m [0] Comments Indicate for function of riffle-obligate spo	nal riffles; Best areas must be lar ecies: Check ONE (Or	ndicate for reach - pools and riffies. ge enough to support a pop 2 & average).	12 ulation <u>□NO RIFFLE [r</u>
☐ ≤ 0.2m [0] Comments Indicate for function of riffle-obligate spo RIFFLE DEPTH ∑BESTAREAS > 10cm [2]	nal riffles; Best areas must be lar ecies: Check ONE (Or RUN DEPTH RIFFLE / R □MAXIMUM≫50cm 121 M STABLE 16.0	dicate for reach - pools and riffles. ge enough to support a pop 2 & average). UN SUBSTRATE RIFFLE / Cobble: Boulder) [2]	ulation <u>NO RIFFLE [n</u> RUN EMBEDDEDNESS NONE [2]
□ < 0.2m [0] Comments Indicate for function of riffle-obligate spo RIFFLE DEPTH XBESTAREAS > 10cm [2] □ BESTAREAS > 50cm [1]	nal riffles; Best areas must be lar ecies: Check ONE (Or RUN DEPTH RIFFLE / R MAXIMUM > 50cm [2] \STABLE (e.g. MAXIMUM < 50cm [1] MOD: STABLE	dicate for reach - pools and riffies. ge enough to support a pop 2 & average). UN SUBSTRATE RIFFLE / Cobble, Boulden [2] [6.6. Large Grave]) [1] 5 (e.6. Large Grave]) [1]	12 ulation □ <u>NO RIFFLE [n</u> RUN EMBEDDEDNESS □ NONE [2] 3LOW [1] □ MODERATE [0] <i>Riffle /</i>
□ ≤ 0.2m [0] Comments Indicate for function of riffle-obligate spo RIFFLE DEPTH MEESTAREAS ≤ 10cm[2] □ BESTAREAS 5 10cm[1]	nal riffles; Best areas must be lar ecies: Check ONE (Or RUN DEPTH RIFFLE / R MAXIMUM > 50cm [2] \STABLE (e.g. MAXIMUM < 50cm [1] MOD: STABLE	dicate for reach - pools and riffies. ge enough to support a pop 2 & average). UN SUBSTRATE RIFFLE / Cobble, Boulden [2] [6.6. Large Grave]) [1] 5 (e.6. Large Grave]) [1]	12 ulation □ <u>NO RIFFLE [n</u> RUN EMBEDDEDNESS □ NONE [2] 3LOW [1] □ MODERATE [0] <i>Riffle /</i>
□ ≤ 0.2m [0] Comments Indicate for function of riffle-obligate spe RIFFLE DEPTH VBESTAREAS > 10cm [2] □ BESTAREAS > 50cm [1] □ BESTAREAS > 5cm ([metric=0] Comments	nal riffles; Best areas must be lar ecies: Check ONE (Or RUN DEPTH RIFFLE / R MAXIMUM > 50cm [2] \STABLE (e.g. MAXIMUM < 50cm [1] MOD: STABLE	dicate for reach - pools and riffies. ge enough to support a pop 2 & average). UN SUBSTRATE RIFFLE / Cobble, Boulden [2] [6.6. Large Grave]) [1] 5 (e.6. Large Grave]) [1]	12 ulation □NO RIFFLE [n RUN EMBEDDEDNESS □NONE [2] ALOW [1] □ MODERATE [0] Riffle / Run □EXTENSIVE [-1] Maximum 8

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L	ChieFPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):
	SITE NAMELOCATION 4 \$210-053 SITE NUMBER 382000 RIVER BASIN 'DRAINAGE AREA' (ml ²) LENGTH OF STREAM REACH (1) 200 LAT LONG RIVER CODE RIVER MILE DATE 28/18 scorer 4.51000 comments NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
	STREAM CHANNEL IN NONE / NATURAL CHANNEL IN RECOVERED RECOVERING IN RECENT OF NO RECOVERY
	1. SUBSTRATE (Estimate percent of every type of substrate present. Check OWLY (wo predominant substrate TYPE boxes (Mex of 40). Add lotal number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. HHEI Metric Points TYPE ED R SLABS (16 pts) PERCENT PYPE SLT(3 pt) PERCENT PERCENT Points BOULDER (x286 mm) [18 pts] D LEAP PACKWOODY DEBRIS [3 pts] Bustrate Max = 40 Max = 40 D COBBLE (es 256 mm) [12 pts] D CLAY of MARDPAN [0 pt] Muck (0 pts] Max = 40 D CRAVEL (2.01 mm) [9 pts] D ARTIFICIAL [3 pts] Muck (0 pts] Muck (0 pts] Artificial (10 pts) Artificial
	2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from read culverts or storm water pipes) (Check: OVLY one box): >> 30 centimeters [20 pts] >> 30 centimeters [20 pts]
	3. BANK, FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): - Stümdere (* 19) [30 pts] - Stümdere (* 19) [30 p
. / •	This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY (Per Bank) L. R (Most Predominant per Bank) L. R Wide >10m Image: Conservation Trilege Conservation Trilege Moderate 5-10m Image: Conservation Trilege Urban or Industrial Narrow ≤5m Image: Conservation Trilege Conservation Trilege None Image: Conservation Trilege Conservation Trilege None Fenced Pasture Mining or Construction
س	COMMENTS FLOW REGIME (A! Time of Evaluation) (Check ONLY one box): Stream Flowing Image: Comment of Evaluation Substitute flow with isolated pools (interstillei) Image: Comment of Evaluation Comment of Evaluation (Check ONLY one box): Substitute flow with isolated pools (interstillei) Image: Comment of Evaluation Comment of Evaluation
-	SINUO SI TY (Number of bends per 51 m (200 lt) of channel) (Check ONLY one box): □ None □ 1.0 □ 2.0 □ 3.0 □ 0.5 □ 1.5 □ 2.5 □ >3

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PHWH Form Page - 1

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ļ	ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):
	GHEI PERFORMED? - C Yes K No QHEI Score (If Yes, Atlach Completed QHEI Form)
	DOWNSTREAM DESIGNATED USE(S)
	CWH Name: Distance from Evaluated Stream
	Distance from Evaluated Stream
	MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	USGS Quadrangle Name: NRCS Soll Map Page: NRCS Soll Map Stream Order
	County: Township / City:
	MISCELLANEOUS
	Base Flow Conditions? (Y/N): Date of last precipitation:2_2_2 (12) Quantity:
	Pholograph Information:
	Elevated Turbldity? (Y/N): Canopy (% open):
•	Were samples collected for water chemistry? (Y/N): 🔼 (Note lab sample no. or id, and allach results) Lab Number:
	Field Measures: Temp ("C) Dissolved Oxygen (mg/) pH (S.U.) Conductivity (umhos/cm)
	Is the sampling reach representative of the stream (Y/N) If not, please explain:
,	
	Additional comments/description of pollution impacts:
	t .
•	BIOTIC EVALUATION
	Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE; all voucher samples must be labeled with the site
	ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
	Fish Observed? (Y/N) Voucher? (Y/N) Selamanders Observed? (Y/N) Voucher? (Y/N)
· · ·	Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology
	DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location
	POW CROPS
	A WODY
	CH PEBRUS over Mini
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ONCEPA Primary Headwater Habitat Evaluation Form	Ă
SITE NAMELOCATION	·
NOTE: Complete All items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruct STREAM CHANNEL IN ONE (NATURAL CHANNEL IN RECOVERING) TRECOVERING TO RECOVER MODIFICATIONS:	tions
TYPE PERCENT TYPE PERCENT Image: Display Strates (15 pts) Image: Display Strates (15 pts) Image: Display Strates (15 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts) Image: Display Strates (16 pts)	HHEI Metric Points Substrate Max = 40
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) Chieck ONLY one box): Storm - 10 cm [15 pts] Storm - 10 cm [15 pts] No WATER OR MOIST CHANNEL [0 pts]	A = B bool Depith Max = 30 5
COMMENTS	Bankfuli Widih Maxi=30 20
This information <u>must</u> also be completed	• -
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream from the intermediate structure intermedia	
FLOW REGIME (At Time of Evaluation) (Check ONLY one hox): Stream Rowing Moist Channel, isolated pools, no flow (intermittent) Substitutes flow with isolated pools (interstitiat) Dry channel, no water (Ephemeral) COMMENTS	
SINUOSITY (Number of bends por 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 1 0.5 1.5 2.5 3.0	
STREAM GRADIENT ESTIMATE Flat (0.5 n/100 n) Flat to Moderate O Moderate O Moderate (2 n/100 n) O Moderate Io Severe (10 n/100 n) PHWH Form Page - 1	

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	AHEI Score (If Yes, Allach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Namo:	Distance from Evaluated Stream
U CWH Name;	Distance from Evaluated Stream
	Distance from Evaluated Stream
·	CLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soll Map Page: NRCS Soil Map Stream Order
County:	Township / City
MISCELLANEOUS	~ Int NO
Base Flow Conditions? (Y/N): Date of last p	recipitation: 120 0 Quantity:
Photograph Information:	I
Eleveled Turbidily? (Y/N): Cahopy (%	open):
Nere samples collected for water chemistry? (Y/N):	
Field Measures: Temp (*C) Dissolved Ox	ygan (mg4) pH (S.U.) Conductivity (umhos/cm)
1 I	N) If not, please explain:
· · · · · · ·	
BIOTIC EVALUATION	· · · · · · · · · · · · · · · · · · ·
erformed? (Y/N); (If Yes, Record all obser ID number, Include app	vations. Voucher collections optional. NOTE: all voucher samples must be labeled with the s ropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
ID number, include opp ish Observed? (Y/N) Voucher? (Y/N)	ropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Ohservad? (Y/N) //cucher? (Y/N)
ID number, Include epp Ish Observed? (Y/N) Voucher? (Y/N) rogs or Tadpolas Observed? (Y/N) Voucher? (Y	-
ID number, include opp Ish Observed? (Y/N) Voucher? (Y/N)	ropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Vroucher? (Y/N)
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ID number, Include epp ish Observed? (Y/N) Voucher? (Y/N) rogs or Tadpolas Observed? (Y/N) Voucher? (Y omments Regarding Biology:	ropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) (N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ID number, Include epp sh Observed? (Y/N) Voucher? (Y/N) ogs or Tadpolas Observed? (Y/N) Voucher? (Y omments Regarding Biology: Omments Regarding Biology: DRAWING AND NARRATIVE DE	ropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) /N) Aquelle Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) SCRIPTION OF STREAM REACH (This must be completed):
ID number, Include epp ish Observed? (Y/N) Voucher? (Y/N) fogs or Tadpoles Observed? (Y/N) Voucher? (Y omments Regarding Biology: DRAWING AND NARRATIVE DE Include Important landmarks and other feeture	Salamanders Observed? (Y/N) YN) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Scription OF STREAM REACH (This must be completed): as of Inforest for site evaluation and a narrative description of the stream's location VOUCHER VOUCHER
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June 20, 2008 Rovision

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Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : SITE NAME/LOCATION SITE NUMBER ASKLOOD IRIVER BASIN DRAINAGE AREA (ml²) 211-0-1 RIVER MILE RIVER CODE _ LONG. LENGTH OF STREAM REACH (R) DATE 9/28/18 SCORER SIMON COMMENTS NOTE: Complete All items On This Form - Refer to "Fleid Evaluation Manual for Ohio's PHWH Streams" for Instructions NONE/NATURAL CHANNEL O RECOVERED ETRECOVERING CARECENT OF NO RECOVERY STREAM CHANNEL MODIFICATIONS SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes HHE (Max of 40). Add total number of significant substrate types found (Max of 6). Final majric score is sum of boxes A & B. Metric PERCENT PERCENT Points TYPE SILT [3 pt] BLDR SLABS (16 pts) LEAF PACKWOODY DEBRIS [3 pts] Ōΰ BOULDER (>256 mm) [16 pts] 00 Substrate FINE DETRITUS [3 pts] /⊠.⊡ Max = 4000 BEDROOK [16 pt] OLAY or HARDPAN [0 pt] 00 COBBLE (65-256 mm) [12 pts] 00 00 MUCK [0 pts] ٥D GRAVEL (2-64 mm) [9 ms] 00 ARTIFICIAL [] pts] 口図 SAND (2 mm) [8 pts] (B) A + B (A)Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock TOTAL NUMBER OF SUBSTRATE TYPES: SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: Pool Depth Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 fi) evaluation reach at the time of Ż Max ¥ 30 evaluation. Avoid plunge pools from road cuiverts or storm water pipes) (Check ONLY one box): >6 cm - 10 cm [15 pls] \square п 30 centrolers [20 pis] < 5 cm [5 pts] NO WATER OR MOIST 22.5 - 30 cin (30 pts)* {0 - 22.5 cm [25 pts] Ø CHANNEL [0 pts] ñ Г MAXIMUM POOL DEPTH (centimeters): COMMENTS Bankfuli (Check ONLY one box): BANK FULL WIDTH (Measured as the average of 3-4 measurements) O >10m > 1.5m (> 3 8*= 4*8') [15 pls]
O ≤ 1.0m (≤ 3 8) [5 pls] Width > 40 melete (* 13) [30 přej > 9,0 m = 4,0 m (* 9 7 * 16) [25 přej Max=30 >1 0 m 58.0 m (2 4 8 - 0 7 / [20 pts] AVERAGE BANKFULL WIDTH (meters) COMMENTS. This information <u>must</u> also be completed GNOTE: River Left (L) and Right (R) as looking downstream & RIPARIAN ZONE AND FLOODPLAIN QUALITY FLOODPLAIN QUALITY RIPARIAN WIDTH (Most Predominant per Bank) R (Per Bank) E. 00 Conservation Tillage Mature Forest, Wetland ΟŰ Wide >10m 00 Ξ. Immalure Forest, Shrub or Old Urban of Industrial QΟ пс 00 Moderate 5-10m Field Open Paslure, Row 00 Residential, Park, New Field Crop Narrow <5m Mining or Construction 00 Fenced Pasture **XIX** None COMMENTS FLOW REGIME (AI Time of Evaluation) (Check ONLY one box) Moist Channel, Isolated pools, no flow (Intermittent) Stream Flowing Dry channel, no water (Ephemeral) Subsurface flow with isolated pools (interstillal) COMMENTS_ SINUQ SITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): FT 3,0 8 2.0 Ð None Ē >3 2:5 \Box 0.5 STREAM GRADIENT ESTIMATE Severe (10 8/100 0) Moderale to Severe Moderale (2 1/100 #) Fiel to Moderate Fini (0.5 N/108 A) PHWH Form Page - 1 June 20, 2008 Revision

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NOTE: Complete All I	ems On This Form - Refe	r to "Field Evaluation Mar	ual for Ohio's PHW	H Streams" for Instru	ction
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	56 mm)[[16 pts]		WOODY DEBRIS (3 pts TUS (3 pts)	·]	Subsi
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			្រ pts]		
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🛛 💭 🔹 > 30 centimeters [2i		or storm water pipes) (Chec	cm [15 pts]	1	max
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	Distance from Evaluated Stream
	IG THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Nama:	NRCS Soil Map Page HRCS Gol Map Stream Order
County HURON	Township / City
MISCELLANEOUS	
Base Flow Conditions? (Y/N) Date of last procipita	illon: Quentity
Photograph Information	
Elevated Turbidity? (Y/N):	<u> </u>
Were samples collected for water chemistry? (Y/N): 1-1	, (Note lab sample no or id and attach results) Lab Number
	mg/l) pH (S U.) Conductivity (µmhos/cm)
Additional comments/description of pollution impacts:	
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Performed? (Y/N):	S. Voucher collections options). NOTE: all yourcher samples must be labeled with the site of black and a site of the option of the site
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لیکلات LENG DATE	<u>ы і </u>	STREAM REACH (N)	200		LO	NG	F	RIVER CODE	RIVER MI	E
NO	TE: Co	omplete All Items O	n This For	m - Refer	to "Field Ev	aluatio	on Manual fe	or Ohio's PH	WH Streams" for i	instructions
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ā	Ξ,	GRAVEL (2-84 mm) [9]		··	σð	MUC	K [D pts]		5	
	₹	SAND (<2 mm) [6 pts]	<i>‡</i>	\mathcal{L}	00	ART	FICIAL [3 pts]	1		L'_ '
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C.106-K162 ADDITIONAL STREAM INFORMATION (This information Must Also be Completed): CHELPERFORMED7 - 17 Yes DNo CHELScore _____ (If Yes, Allach Completed OHELForm) DOWNSTREAM DESIGNATED USE(S) 🗍 WWH Name Distance from Evaluated Stream _____ 🗇 CWH Nema 🔄 Distance from Evaluated Stream 🗇 EWH Name 🔔 Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION USGS Quadrangle Name: _____NRCS Soil Mop Page:_____ NRCS Soil Map Stream Order _____ County ____ Township / City_____ MISCELLANEOUS Base Flow Condition's? (Y/N). () Dete of last precipitation. _____ Outentity. _____ Photograph Information Elevated Turbidity? (Y/N): _____ Canopy (% open): _____ Ware samples collected for water chemistry? (Y/N): ______ (Note lab sample no, or Id. and attach results) Lab Number _____ Field Measures Temp (*C)_____ Dissolved Oxygen (mg/t) ____ pH (S.U.) _____ Conductivity (µmhos/cm) ___ Is the sampling reach representative of the stream (Y/N)______ If not, please explain;_____ Additional comments/description of pollution impacts: BIOTIC EVALUATION Performed? (Y/N). ______ (If Yes, Record all observations. Volicher collections optional, NOTE; all voucher samples must be labeled with the site IO number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrales Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology. DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location LORESTED WETVETUD CROPS Poul RIPPAR VLGLA MITO LTRAL HATL FLOW KAM+PROPS KOW CHUNG WH Form Page - 2 THEE UNE June 20 2008 Reviews

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	DIFICAT			7			-	
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	(Max	of 40). Add total nutriber of sign	ifficient substr	ate types found	(Max of 8), Final mot	INC BOOKE IS SUIT	of boates A & B <u>PERCENT</u>	HI Me
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<u> </u>	_	OULDER (>256 mm) [16 pts]		22	LEAF PACKWOOI	• •	fs)	هد
ר כ		EDROCK [16 p(] OBBLE (65-256 mm) [12 pts]	75	<u>ה</u> ה מגב			<u></u>	18.00
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Л		nion Avoid plange pools source nimeters [20 pits]		<u>]</u>	>5 cm - 10 cm [1:			1
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		whens (> 13") [34] pts] - 4.0 m (> 9" 7" - 13") [25 pts]			> 10 m • 15 m (>3 > 10 m (= 3 5) (5	than] 2.2 4.9 if 49 bi		
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E2M-DE ADDITIONAL STREAM INFORMATION (This information Must Also be Completed): QHEI PERFORMED? . D Yes X No. QHEI Score _____ (II Yes, Attach Completed OHEI Form) DOWNSTREAM DESIGNATED USE(S) 🗇 www. Name, 🔛 ___ Distance from Evaluated Stream _ CWH Name: _____ Distance from Evaluated Stream __ _____ ____ Distance from Evaluated Stream EWH Name: MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION ___ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____ USGS Ouedrangle Name._ County HURON _____ Township / City:_____ MISCELLANEOUS Base Flow Conditions? (Y/N): Date of lest precipitation: Quantity: Photograph Information: _ 20 Elevaled Turbidity? (Y/N): _____ Canopy (% open); ____ Were samples collected for water chemistry? (Y/N): 1 (Note leb sample no. or ki. and attach results) Lab Number:____ Field Measures: Temp (*C)____ ___ Dissolved Oxygen (mg/) ______ pH (S.U.) ______ Conductivity (µmhos/cm) ______ Is the sampling reach representative of the stream (Y/N)______ If not, please explain:______ Additional comments/description of pollution impacts: BIOTIC EVALUATION Performed? (Y/N): ____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habital Assessment Manual) Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y Comments Regarding Biology:____ DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location FORESTED WETLAND FLOOPPLINT 5235 m D HUNEL abble NPURT れらわじと PHWH Form Page 🗸 June 20, 2008 Revision

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LENGTH	
NOTE:	Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruction
	M CHANNEL ONONE / NATURAL CHANNEL OR RECOVERED RECOVERING OR RECENT OR NO RECOVER
MODIF	ICATIONS:
1. 8	BUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes
(TYPE	Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. <u>PERCENT</u> <u>TYPE</u> <u>PERCENT</u> PC
	BLDR SLABS [16 pts]
ōō	
00	$\begin{array}{c} \text{COBBLE} (65-256 \text{ num}) [12 \text{ pts}] \\ \text{GRAVEL} (2-64 \text{ num}) [9 \text{ pts}] \\ \end{array} \begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $
۵ġ	SAND (<2 mm) [6 pts]
-	Total of Percentages of (B)
	DF TWO MOST PREDOMINATE SUBSTRATE TYPES:
2. M	AxImum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool
	svaluation, Avoid plunge pools from road culverts or storm water pipes) (Check OWLY one box): 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]
_ D >	22.5 - 30 cm [30 pts] pd < 5 cm [5 pts] 10 - 22.5 cm [25 pts] 11 -
	COMMENTS MAXIMUM POOL DEPTH (centimeters):
<u> </u>	BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Ba
<u> </u>	4.0 meters (> 13) [30 pts] [W 3.0 m + 4.0 m (> 6' T - 13) [25 pts] [W 3.0 m - 4.0 m (> 6' T - 13) [25 pts] [W
_	1.5m - 3.0m (>4'8'-6'7')[20 pts]
c	COMMENTSAVERAGE BANKFULL WIDTH (motors)
	This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY אלאסדוב: River Left (L) and Right (R) as looking downstream אל
	RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R
	Image: Mode > 10m Image: Meture Forest, Wetland Image: Image Office of the second sec
-6	The contract of the contract o
	Display Open Pasture, Row Comparison Compasture, Row Compasture, Row Crop
-	COMMENTS
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-	FLOW REGIME (Al Time of Evaluation) (Check ONLY one boy);
C	C Stream Flowing C Moist Channel, isolated pools, no flow (Infermittent)
C	C Stream Flowing C Moist Channel, isolated pools, no flow (Informittent)
C	Stream Flowing Zi Moist Channel, isolated pools, no flow (Infermittent) Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel), (Check ONLY one box):

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ADDITIONAL STREAM INFORMATION (This information Musi, A	
CHEI PERFORMED? - O Yes XNo OHEI Scare	(if Yes, Allach Completed QHEI Form)
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CWH Name: EWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	NRCS Soli Map Page: NRCS Soil Mep Stream Order
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MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity:
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	<u></u>
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Field Measures: Temp (*C) Dissolved Oxygen (mg/)	pH (S.U.) Conductivity (µmhos/cm)
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BIOTIC EVALUATION	- · · · · · · · · · · · · · · · · · · ·
	er collections optional. NOTE: all voucher samples must be tabeled with the site
eriormed/((1/N): (r tes, kecord all coservations, vouch ID number, include appropriate field da	te concerns optional, non-e, an voicier samples most be ableta with the same ta sheets from the Primary Headwater Habitat Assessment Manual)
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June 20, 2005 Reestin

PHWH Form Page - 2

STE AUMGER ASSUGD RIVER PASIN DRAWAGE AREA (m) LEINGTH OF STREAM REACH (m) LAT. LONG RIVER CODE ANCE: MALE DATE [D] 4[1], SCORER [S, CUIDON COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions STREAM CHANNEL INONE / NATURAL CHANNEL RECOVERED RECOVERED RECOVERED MODIFICATIONS: INONE / NATURAL CHANNEL RECOVERED RECOVERING MARCH (MA OF), Find medif score is sun of bases A & B. MEDIFICATIONS: INONE / NATURAL CHANNEL RECOVERED RECEIVE (MALE SCORE IS UNIT Status / YVE David (Max Of), Find medif score is sun of bases A & B. MEDIFICATIONS: INONE / NATURAL CHANNEL RECEIVE (MARCH ALL VIEW DAVID (MARCH ALL VIEW) DAVID (MARCH ALL VIEW DAVID (MARCH ALL VIEW) DAVID (MARCH ALL V		eadwater Habitat Evaluation HHEI Score (sum of	metrics 1, 2, 3) :
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ADDITIONAL STREAM INFORMATION (Th	is information Must Also be Completed	D:	
	ZINO QHEI Score (Il Yes, /		
		Distance from Evaluated Stream	
CWH Name;		Distance (rom Evaluated Stream)	
EWH Name:		Distance from Evaluated Stream	
MAPPING; ATTACH COPIES OF N	APS, INCLUDING THE <u>ENTIRE</u> WATERSH	IED AREA, CLEARLY MARK THE SITE I	LOCATION
USGS Quedrangle Name:	NRCS Soli Ma	p Page: NRCS Soll Map Stree	am Order
county: HURON	Township / City:		
MISCELLANEOUS		<u> </u>	
Base Flow Conditions? (Y/N): Date			
Photograph Information:			<u> </u>
Elevated Turbidity? (Y/N): Ca	nopy (% open): 100		
Were samples collected for water chemistry?	(Y/N): (Note tab sample no. or in	l. and attach results) Lab Númber;	·
Is the sampling reach representative of the st	olved Oxygen (mg/t) pH (S.U.)		
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BIOTIC EVALUATION			
ID number. In	all observations. Voucher collections option dude appropriate field data sheets from the F	Primary Headwater Habital Assessment M	fanual)
Fish Observed? (Y/N) Voucher? (Y/N Frogs or Tadpoles Observed? (Y/N) Vo	I) Salamanders Observed? (Y/N)	Voucher? (Y/N)	
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Comments Regarding Biology.			
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FLOW	/ ytatemies	CHANNEL	······································
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STE NAMEROCATION S2M-OFO SITE NUMBER A	Headwater Habitat Evaluation HHEI Score (sum of 382.000 IRIVER BASIN	of metrics 1, 2, 3) :
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(Max of 40). Add total number of signification TYPE Pi BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pt] COBBLE (65-256 mm) [12 pts]		sum of boxes A & B, <u>PERCENT</u> S [3 pis] <u>40</u> <u>50</u> (B) (B) A + B
evaluation. Avoid plunge pools from road 30 centimeters [20 pts] 22.5 - 30 cm [30 pts] 21.5 - 22.5 cm [25 pts] COMMENTS	MAXIMUM POOL DEP	NNEL [0 pls] TH (centimeters):
J. BANK FULL WIDTH (Measured as the a □ > 4.0 meters (> 13) [30 pts] □ > 3.0 m - 4.0 m (> 9' 7' - 13') [25 pts] □ > 1.5 m - 3.0 m (> 4' 6' - 9' 7') [20 pts] COMMENTS	verage of 3-4 measurements) (Check ONLY o > 1.0 m - 1.5 m (> 3 3 *- 4' 8") ≤ 1.0 m (≤ 3' 3") (5 pts] AVERAGE BANKFULL	[16 pts] Width Max=30 26
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STREAM GRADIENT ESTIMATE		_

S7M-(ADDITIONAL STREAM INFORMATION (This information Must Also be Completed): CHEI PERFORMED7 - 7 Yes No QHEI Score _____ (If Yes, Atlach Completed QHEI Form) DOWNSTREAM DESIGNATED USE(S) WWH Name: Distance from Evaluated Streem CWH Náme: ___ Distance from Evaluated Stream 🖸 EWH Name: ____ _____ Distance from Evaluated Stream _____ MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION _____ NRCS Soli Map Page:_____ NRCS Soil Map Stream Order _____ USGS Quedrangie Name: County: URON _____ Township / City._____ MISCELLANEOUS Base Flow Conditions? (Y/N):_____ Date of last precipitation:__O/_4 / 178______ Ouenility.______ Photograph Information: Elevated Turbidity? (Y/N); _____ Canopy (% open): ______ Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:______ Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) ______ Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_______ Additional comments/description of poliution impacts: BIOTIC EVALUATION Performed? (Y/N); (If Yes, Record all observations. Voucher collections optional; NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data shaels from the Primary Headwater Habitat Assessment Manual) Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology._ DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location Į, ROW CROPS CONTINCO

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ROW CROPS

PHWH Form Page - 2

June 20 2008 Reation

LENGTH OF STREAM REACH (I) 200 LAT LONG RVER CODE RIVER MILE COMMENTS CORRECT LIMIT COMMENTS RECENT OF INSTRUCTIONS RECENT OF THE POINT	SITE NAME	DF2SITE NUMBERA	3821100 RIVER BA		Um of metrics 1, 2, 3	
STREAM CHANNEL INONE / NATURAL CHANNEL RECOVERING RECEIVERING RECEIVERY MODIFICATIONS: INONE / NATURAL CHANNEL RECEIVERY RECEIVERY RECEIVERY INONE / Add total number of significant substrate types found (Max of b). Final metric score is sum of baces A & B. HHE INONE / Add total number of significant substrate types found (Max of b). Final metric score is sum of baces A & B. HHE INONE / Add total number of significant substrate types found (Max of b). Final metric score is sum of baces A & B. HHE INONE / Add total number of significant substrate types found (Max of b). Final metric score is sum of baces A & B. HHE INONE / COBBLE (62526 mm) [16 pts] INONE / PREDETITUS [3 pts] INONE / PREDETITUS [3 pts] INONE / CobBLE (62526 mm) [12 pts] INONE / PREDETITUS [3 pts] INONE / PREDETITUS [3 pts] INONE / Subst. Bedrock (16 pt) INONE / PREDETITUS [20 pts] INONE / PREDETITUS [20 pts] INONE / PREDETITUS [20 pts] Score of TWO MOST PREDOMINATE SUBSTRATE TYPES: INONE / PREDETITUS [20 pts] INDE / Subst. Boulder, CobBLE, Bedrock (IC Diptel) INONE / PREDETITUS [20 pts] INONE / PREDETITUS	LENGTH OF	STREAM REACH (11) 200	LATLO	Ng River	RIVER	R MILE
(Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. HTFE Image: State of the	STREAM					
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 10 - 22.5 cm [25 pts]		x of 40). Add total number of signific BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pt] COBBLE (85-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] Total of Percentages of Slabs, Boulder, Cobble, Bedrock	PERCENT TYPE 9 0 9 0 9 0 9 0 10 0	(Max of 8). Final metric sc SILT [3 pt] LEAF PACKWOODY DI FINE DETRITUS [3 pts CLAY & HARDPAN [0 MUCK [0 pts] ARTIFICIAL [3 pts]	ore is sum of boxes A & B. <u>PERCEN</u> EBRIS [3 pts]] pt] (B)	HTEI Metric Points - Substrate - Max = 40
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfull > 4.0 meters (> 13) [30 pts] > 1.0 m (> 3' 3" - 4' 8") [15 pts] Bankfull > 3.0m (> 6' 7" - 13) [25 pts] > 1.0 m (> 3' 3" - 4' 8") [15 pts] Bankfull > 1.5m - 3.0m (> 4' 8" - 9' 7") [20 pts] > 1.0 m (< 3' 3") [5 pts]	evel > 30 > 22: > 10	ualion. Avoid plunge pools from roe centimeters [20 pts] 5 - 30 cm [30 pts] - 22.5 cm [25 pts]	d culverts or storm water p	ipes) (Check ONLY one > 5 cm - 10 cm [15 pts] < 5 cm [5 pts] NO WATER OR MOIST	i box):] f CHANNEL [0 pts]	Max = 30
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Image: State of the state o	a c	<u>RIPARIAN WIDTH</u> R (Per Bank) J Wide >10m	DAIN QUALITY ANC <u>FLOODPLAIN QUALIT</u> L R (Most Predor □ □ Mature Fores □ □ Immature Fores	DTE: River Left (L) and Rig Y minant per Bank) st, Welland	L R Conservation 1	Nage
		J Narrow <5m	Residential, I		Crop	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Image: Channel, Isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstilial) Image: Comments isolated pools (Interstilial) COMMENTS Image: Comments isolated pools	閤	Stream Flowing Subsurface flow with Isolated pool		🗾 Moist Channel, l		miltent)
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ADDITIONAL STREAM INFORMATION (This information Must Also be Completed);	
QHELPERFORMED? - DYes No QHELScore(If Yes, Atlach Completed QHELForm)	
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Distance from Evaluated Stream	
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MAPPING: ATTACH COFIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: HURON Township/City.	
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation: 10/4/18 Quantity:	
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and allach results) Lab Number:	
Field Measures: Temp (*C) Dissolved Oxygen (mg/) pH (S.U.) Conductivity (µmhos/cm)	
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
BIOTIC EVALUATION Performed? (Y/N):	
Frogs or Tadpoles Observed? (Y/N) Y Voucher? (Y/N) N Aquitic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) Comments Regarding Biology	-
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DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):	
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location	
Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location ROW ROPS LOW	
Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location WDIATN ARABS LOW NOTATI ARABS INDIAN ILLEASE	 C#
Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location HD/ATN ARABS LOW NDIAN GRASS	 CF

COMPERA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : SITE NAMELOCATION	ons
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This Information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY	
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June 20, 2003 Revision

PHWH Form Page 1

ADDITIONAL STREAM INFORMATION (This intermation Must Also be Completed): QHEI PERFORMED? - C Yes XNo QHEI Score _____ (II Yes, Allach Completed QHEI Form) **DOWNSTREAM DESIGNATED USE(S)** 🖸 wwłi Name: _ Distance from Evaluated Stream, _ Distance from Evaluated Stream _ CWH Name: EWH Name: Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION NRCS Soll Map Page:_____ NRCS Soll Map Stream Order ____ USGS Quadrangle Name: county LURON (D) _____ Township / City:__ MISCELLANEOUS Date of last precipitation: 10/4/18 quantity:_____ Base Flow Conditions? (Y/N): Photograph Information: Canopy (% open): 100 Elevated Turblaity? (Y/N): _ Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:____ Field Measures: Temp ("C)____ Dissolved Oxygen (mg/l) ____ pH (S.U.) ____ Conductivity (umhos/cm) ____ Is the sampling reach representative of the stream (Y/N)______ If not, please explain:_____ Additional comments/description of pollution impacts: BIOTIC EVALUATION Performed? (Y/N): _ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number, Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Fish Observed? (Y/N) Youcher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology._ DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): notiscient in many and in a second and the second interval and the second of the second of the second in a second in a second of the second of t ROW URDPS GIRASSED FLOW ROW CROPS PHWH Form Page - 2 una 20 2009 Revision

LENGTH OF STREAM REACH (1) 200 DATE 1015/18 SCORER K.SLW NOTE: Complete All items On This For	HHEI Score	
MODIFICATIONS: 1. SUBSTRATE (Estimate percent of eve (Max of 40). Add total number of significa TYPE P BLDR SLABS [16 pts] BEDROCK [16 pt] COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts]	TY type of substrate present. Check ONLY two ant substrate types found (Max of 8). Final metri ERCENT TYPE SILT [3 pt]	predominant substrate TYPE boxes c score is sum of boxes A & B. <u>PERCENT</u> Y DEBRIS [3 pts] pts] 7277 Max = 40
 Maximum Pool Depth (Measure the many evaluation. Avoid plunge pools from road > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 10 - 22 5 cm [25 pts] 	aximum pool depth within the 61 meter (200 f culverts or storm water pipes) (Check ONLY > 5 cm - 10 cm (15 < 5 cm [5 pts] NO WATER OR MA MAXIMUM P average of 3-4 measurements) (Chec > 1.0 m (< 3 37) [5]	pts] DIST CHANNEL [0 pts] OOL DEPTH (centimeters): (A ONLY one box): (37-4'87) [15 pts] Bankfull Wedth Wedth Waters
RIPARIAN ZONE AND FLOODPI <u>RIPARIAN WIDTH</u> L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Evalue Stream Flowing Subsurface flow with isolated pools COMMENTS SUBJUSTY (Number of bends peels	This Information must also be complete LAIN QUALITY SHOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u> L/R (Most Predominant per Bank) Mature Forest, Weitend Immature Forest, Weitend Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture (Interstitial) Immature forest, Shrub or Old Field Moist Channel (Interstitial) For channel (Check ONLY one box): Noist Channel Immature for state of the formation of the channel (Check ONLY one box):	
SINGUSH (INITIALISION OF A CONTRACT OF A CON	1.0 2.0 1.5 2.5 Moderate (2 1/100 2) I Moderate 1 PHWH Form Page - 1	

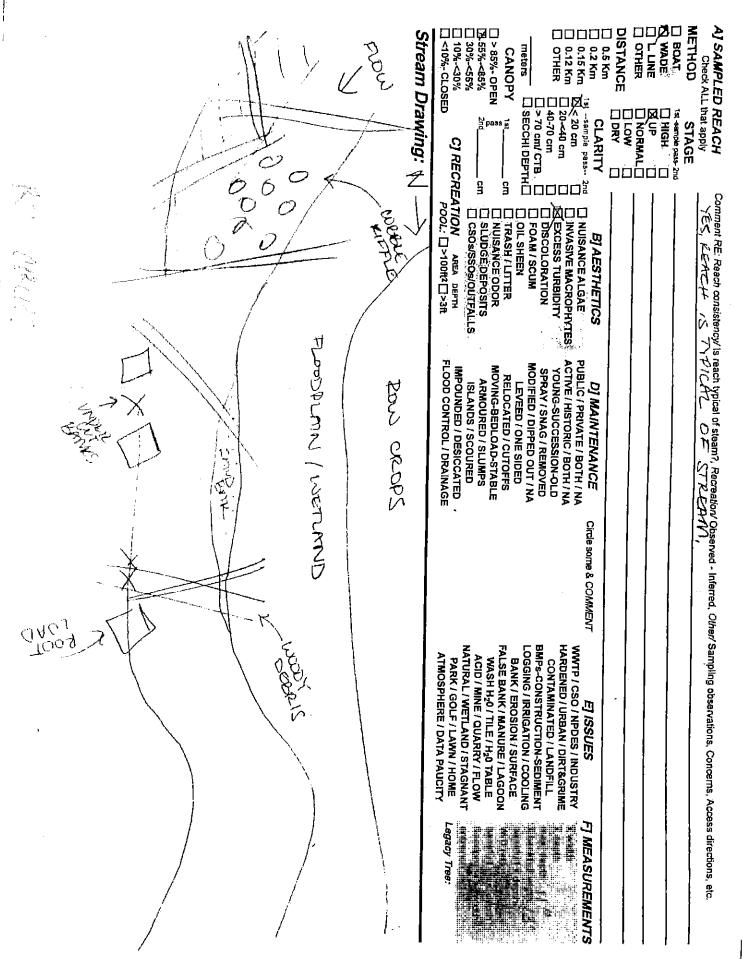
NM-D ADDITIONAL STREAM INFORMATION (This information Must Also be Completed); QHEI PERFORMED? - 2 Yes Xo OHEI Score _____ (If Yes, Allach Completed QHEI Form) DOWNSTREAM DESIGNATED USE(S) 🗍 WWH Name; _____ _ Distance from Evaluated Streem _ CWH Name: _____ Distance from Evaluated Stream 🗍 EWH Name; ___ Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION USGS Quadrangle Name; NRCS Soll Map Page: _____ NRCS Soil Map Stream Order ____ county: HURDKI Township / City:____ MISCELLANEOUS Base Flow Conditions? (Y/N): ____ Date of last precipitation: 10/5/18 Ouantity:_____ Photograph Information: _ Elevated Turbidity? (Y/N): _____ Canopy (% open): 100 Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id, and attach results) Lab Number:____ Field Measures: Temp (*C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) ______ Is the sampling reach representative of the stream (Y/N)______ If not, please explain:______ Additional comments/description of pollution impacts: BIOTIC EVALUATION Performed? (Y/N): ____ (If Yes, Record all observations. Voucher collections optional, NOTE; all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habital Assessment Manual) Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrales Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology.__ DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location CABURFRY DOPHINATES FLOW CHEMNEL FIRD DL_ PHWH Form Page - 2 Line 20, 2008 Reveluen

	ACCATION				HHE		um of me	etrics 1, 2, 3):	74
DATE 10	12/18_ sco	RERKSIM	QV co	MMENTS	G,		R CODE	AINAGE AREA (ml²) _ RIVER MILE //H Streams'' for Ins	
	CHANNEL							Frecent or no re	
	BLDR SLABS [11 BOULDER (>256 BEDROCK [16 COBBLE (65-256 GRAVEL (2-64 m SAND (<2 mm) [1 Total of Percent Slabs, Boulder, 1	introductor signin ip (s] mm) [16 pts] at] mm) [12 pts] mm) [9 pts] coble, Bedrock	PERCENT <u>PERCENT</u> <u>40</u> <u>40</u> <u>10</u>		Max of & SILT (3 LEAF { FINE [CLAY MUCK	i). Final metric s	core is sum DEBRIS [3 p ts]	PERCENT	HHE Metr Poin Substr Max =
2. Ma: eva , → 30 × > 22 □ > 10	TWO MOST PRE XImum Pool Dep Juation . Avoid plu Los to cont [30 pt - 22.5 cm [25 pt MMENTS	h (Measura the r nge pools from ro 15] 5] 5]	naximum po ad culvents or	ol depth with storm water p 0 0	in the 61 ipes) > 5 ci < 5 ci NO V	(Check ONLY o n - 10 cm [15 p n [5 pls] /ATER OR MOI	evaluation range box): ts] ST CHANNE	each at the time of	Pool De Max = : 30
$\bigcup_{i=1}^{i} > 4.0$	NK FULL WIDTH) meters (> 13) [30) m - 4.0 m (> 9' 7 5 m - 3.0 m (> 4' 8 MMENTS	pts] - 13') [25 pts] - 9' 7'') [20 pts]			> 1.0 s 1.0	m 1.5 m (> 3' 3 m (≤ 3' 3")[5 pi	5]	pts) ZZ	Bankti Widih Max=3 26
	RIPARIAN V		PLAIN QUAL FLOOD	LITY ☆NO PLAIN QUALIT	ΣΤĒ: RIV <u>Υ</u>			ooking downstreams ² r	
0	Moderate (ı		(Most Predo Mature Fore: Immature Fo Field	st, Wetje	nd	00 00	Conservation Tillage Urban or Industrial	
0	25-		00 00	Residential, i Fenced Past		w Fleid		Open Pasture, Row Crop Mining or Construction	n
Å	Stream Flowing	IE (At Time of Eve) w with isolated poo			e box);	Moist Channe Dry channel, r	i, iscinited po to water (Epi	ols, no llow (intermitter hemeral)	it)
	SINUOSITY (I None 0.5	Number of bands p 0 0	0er 61 m (200 1.0 1.5	ft) of channel;) (Che	ck ONLY one bo 2.0 2.5	^{xx):}	3.0 >3	

F

	M INFORMATION (This Information Must Also be Completed):	
QHEI PERFC	ORMED? - [] Yes XNo QHEI Score(If Yes, Attach Completed QHEI Form)	
	EAM DESIGNATED USE(S) Distance from Evaluated Stream	
C CWFI Nome:	Distance from Evaluated Stream	
	Distance from Evaluated Stream	
MAPPING: A	ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOC/	ATION
	Inne: NRCS Soll Map Page: NRCS Soll Map Page: NRCS Soll Map Stream O	
County	(24) Township / City:	
MISCELLAN		
Base Flow Conditions?	7 (Y/N): Date of last precipitation: Quantity:	
Photograph Information	xn:	
Elevated Turbidity? (Y/		
Were samples collecte	ed for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number	<u> </u>
Field Measures Te	emp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)	
is the sampling reach (representative of the stream (Y/N) If not, please explain:	
		d with the site
	ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manua	il)
Fish Observed? (Y/N)_ Frogs of Tadpoles Obs	Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) served? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N))
	Biology	
<u> </u>		
OD 4 MAR	NG AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed	
	ant landmarks and other features of interest for site evaluation and a narrative description of the stream's 0	iocallon
	わやまとく じたいしく	
	ROW CROPS	1 1
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include Importar	twoodermin thanks	HE
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include Importar		AL.
include Importar		AL
include Importar	+WOODPLANN WETLANNY	AT S

	Qualitative Habitat Ev Ind Use Assessment		HEI Score: 58
Stream & Location: 138200	101	RM:	Date:/0/8//8
S2M-UP		Vame & Affiliation: K.Sl	MON
	(NAD 83	/Long.: /8	
1] SUBSTRATE Check ONLY Two sub estimate % or note ev	erv type present.	41° Check ONE (Or	$32^{\circ}50'41''W$
		E ORIGIN	QUALITY
		TILLS [1] SIL	T DNORMAL [0]
$\Box \mathbf{K} \operatorname{GRAVEL} [7] \qquad \overline{20} \overline{12}$			
	(Score natural substrates; ignor	$ = \begin{array}{c} \Box \text{ SANDSTONE [0]} \\ e \end{array} \qquad \qquad$	EXTENSIVE [-2] Moderate [-1] Maximum Moderate [-1] Maximum 20 None [1]
	or more [2] sludge from point-sources or less [0]	i) □ LACUSTURINE [0] 适 □ SHALE [-1]	⁰ SELNORMAL [0] 20
Comments	51 1055 [0]	COAL FINES [-2]	
2] INSTREAM COVER Indicate prese	ence 0 to 3: 0-Absent; 1-Very small ar	nounts or if more common of mar	
quality; 2-Mo quality; 3-Highest quality in moderate or g diameter log that is stable, well developed	derate amounts, but not of highest qu reater amounts (e.g., very large bouid	ers in deep or fast water, large	Check ONE (Dr 2 & average)
UNDERCUT BANKS [1]		OXBOWS, BACKWATERS [1]	☐ EXTENSIVE >75% [11] ☑ MODERATE 25-75% [7]
OVERHANGING VEGETATION [1]		AQUATIC MACROPHYTES [1] LOGS OR WOODY DEBRIS [1]	[] SPARSE 5-<25% [3] [] NEARLY ABSENT <5% [1]
ROOTMATS [1]	A		7 Cover
Comments	Ø		Maximum 20
3] CHANNEL MORPHOLOGY Chec			
SINUOSITY DEVELOPMENT		STABILITY	
MODERATE [3] GOOD [5]	RECOVERED [4]	MODERATE [2]	
☐ LOW [2]	RECOVERING [3] RECENT OR NO RECOVERY	[1] [1]	Channel
Comments	Ų	2	Maximum 20
4] BANK EROSION AND RIPARIA			nnk & average)
			CONSERVATION TILLAGE [1]
	RATE 10-50m [3] 🛛 🖓 SHRUB (0)		URBAN OR INDUSTRIAL (0)
ODERATE [2] ODERATE [2] ODERATE [1] ODERATE [DW 5-10m [2] □ □ □ RESIDENT IARROW < 5m [1] □ □ FENCED F	AL, PARK, NEW FIELD [1] LAL ASTURE [1]	
		TURE, ROWCROP [0] , past	100m riparian. Riparian Maximum
Comments		·	
5) POOL / GLIDE AND RIFFLE / R			Recreation Potential
Check ONE (ONLY!) Check ON	NE (Or 2 & everage) C	heck ALL that apply	Primary Contact
	H > RIFFLE WIDTH [2] 🛛 TORREN H = RIFFLE WIDTH [1] 🗌 VERY FA	NAL [4] 🖾 SLOW [1] 💥	Secondary Contact
	H < RIFFLE WIDTH [0] 🛛 FAST [1]		
□ < 0.2m [0]	2 Indicate	for reach -, pools and rifles.	Current
Comments	-	<u> </u>	12
Indicate for functional riffles; of riffle-obligate species:	Best areas must be large en Check ONE (Or 2 & av	nough to support a popul erage).	ation
RIFFLE DEPTH RUN D	EPTH RIFFLE / RUN S	UBSTRATE RIFFLE/R	
BEST AREAS > 10cm [2] MAXIMUM	≥ 50cm [2], [X] STABLE (e.g., Cobb ≤ 50cm [1] □ MOD, STABLE (e.g.,	Large Gravel) [1] 🔀	NONE [2]
BEST AREAS < 5cm [metric=0]	UNSTABLE (e.g., Fin	e Gravel Sand IVI	MODERATE 10, Riffle / Bun EXTENSIVE 141 Maximum
Comments		هـ	Maximum
	RY LOW - LOW [2-4]	%POOL: %GLI	DE: Gradient
DRAINAGE AREA X MOI (2.25 mi ²) Hig	DERATE [6-10] H - VERY HIGH [10-6]	%RUN: 0%RIFFL	.E: Maximum V
EPA 4520	······································		06/16/06



SITE NAMER OCATIONSITE NUMBER $1 \le 2000$ SITE NUMBER $1 \le 2000$ LENGTH OF STREAM REACH (R)2000 DATE $1 \ge 2000$ SITE NUMBERSI NOTE: Complete All Items On This For	AND COMMENTS	e (sum of metrics 1, 2, 3) :
1. SUBSTRATE (Estimate percent of ev (Max of 40). Add total number of signifi- TYPE Image: Description of the signifi- TYPE Image: Description of the signifi- BLDR SLABS [16 pts] Image: Description of the signification of the significati	Percent TYPE Clark of substrate present. Check ONLY h cant substrate types found (Max of 8). Final met PERCENT TYPE SILT [3 pt] Clark packwood FINE DETRITUS (CLAY or HARDPA MUCK [0 pts] ARTIFICIAL [3 pts	Percent Metric Percent Metric Points Substrate Spts] Substrate (B) Max = 40 (B) A + B (B) A + B (B) A + B (B) Pool Depth (B) Max = 30 (B) Pool Depth (B) Max = 30 (B) Pool Depth
COMMENTS 3. BANK FULL WIDTH (Measured as the □ > 4.0 meters (> 13) [30 pts] 3.0 m - 4.0 m (> 9' 7' - 13') [25 pts] □ > 1.5 m - 3.0 m (> 4' 8" - 9' 7') [20 pts] COMMENTS	MAXIMUM I average of 3-4 measurements) (Che) > 1.0 m - 1.5 m (> 1) < 1.0 m (< 3' 3') [5 	POOL DEPTH (centimeters): ck ONLY one box): 5 3*-4*87 [15 pts] pte] DANKFULL WIDTH (meters) B.Y
RIPARIAN ZONE AND FLOODP <u>RIPARIAN WIDTH</u> L. R. (Per Bank) Wide >10m Moderale 5-10m 	FLOODPLAIN QUALITY L R (Most Predominent per Benk) Mature Forest, Welland Immature Forest, Welland Mature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Jational (Check ONLY one box): Moist Chang	I Right (R) as looking downstream L R Conservalion Tillage Urban or Industrial Copen Pasture, Row Crop Mining or Construction Mining or Construction Mining or Construction
COMMENTS	r 61 m (200 ft) of channel) (Check ONLY one 1.0 2.0 1.5 2.5 Moderate (2 t/100 n) Moderate 1 PHWH Form Page - 1	□ 3.0 □ >3

ADDITIONAL STREAM INFORMATION (This informatic	
OHEI PERFORMED? - 🗍 Yes 🎘 No OHEI	Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	Distance from Evaluated Stream
	Distance from Evaluated Stream Distance from Evaluated Stream
	Distance from Evaluated Stream
	DING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrengle Name:	NRCS Soll Map Page: NRCS Soll Map Stream Order
County:	Township / City
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of lest preci	pilation: 10 (8 / 18 Quantity:
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% ope	
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id, and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxyge	n (mg/l)pH (S.U.)Conductivity (µmhos/cm)
	If not, please explain:
Additional comments/description of pollution impacts:	
ID number. Include approp	ons. Voucher collections optional. NOTE: all voucher samples must be labeled with the nate field data sheets from the Primary Headwater Habitat Assessment Manual) amanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
DRAWING AND NARRATIVE DESC	CRIPTION OF STREAM REACH (This must be completed):
Include Important landmarks and other features o	f interest for site evaluation and a narrative description of the stream's location
Include Important landmarks and other features o	CRIPTION OF STREAM REACH (This <u>must</u> be completed); finterest for site evaluation and a narrative description of the stream's location USTED WETLAND
Include Important landmarks and other features o	f interest for site evaluation and a narrative description of the stream's location
Include Important landmarks and other features o	af interest for site evaluation and a narrative description of the stream's location
Include Important landmarks and other features o	f interest for site evaluation and a narrative description of the stream's location
Include Important landmarks and other features of FDR LOW + Pcol	finierest for site evaluation and a narrative description of the stream's location ISTED WETAND

SITE NAMELOCATION S211-085 site NUMB			(
LENGTH OF STREAM REACH (1)		LONG.	RIVER CODE	RIVER MILE	
NOTE: Complete All Items On This	s Form • Refer	to "Fleid Evaluation Manual	for Ohio's PH	WH Streams" for Inst	uction
MODIFICATIONS:			,		
1. SUBSTRATE (Estimate percent		wheterte grocont. Check ON/ V	wo predominani	subsidie TYPE boxes	
(Max of 40). Add total number of :	significant substra	te types found (Max of 8). Final m	etric score is sur	n of boxes A & B.	HH Met
TYPE BLDR SLABS [16 pts]	PERCENT	түре. []]⊠ sillт [3 pi]			Poi
BOULDER (>256 mm) [16 pt:	s]			pts]	Subs
COBBLE (65-256 mm) [12 pts	s]	CLAY or HARDF		ĨQ.	Max
() [] GRAVEL (2-84 mm) [9 pts] [] [] SAND (<2 mm) [6 pts]		□ 🖾 MUCK (0 pis) □ □ □ ARTIFICIAL [3 p	tel	40_	17
		······································		(B)	A+
Totel of Percentages of Bidr Slebs, Boulder, Cobble, Bedr	ock	(A) 3	BER OF SUBS		
SCORE OF TWO MOST PREDOMINATE					Pool D
2. Maximum Pool Depth (Measure evaluation. Avoid plunge pools fro	the maximum po Im road cuiverts or	• storm wat <u>er</u> pipes) (Check O <i>l</i>	VLY one box):	reach al ine time of	Max
> 30 centimeters [20 pts]		[_] > 5 cm - 10 cm	[15 pts]		F
> 10 - 22.5 cm [25 pts]					10
COMMENTS	<u> </u>	MAXIMU	N POOL DEPTH	(cenilmeters):	
3. BANK FULL WIDTH (Measured a	is the average of	3-4 measurements) (C	heck ONLY one		Bank Wid
→ 4.0 meters (> 13') [30 pts] → 3.0 m + 4.0 m (> 9' 7' - 13') [25 pts	e]	s1.0 m (≤ 3° 3")	(233-48)[13 [5 pts]		- Max≡
□				35	25
COMMENTS		AVERAG	E BANKFULL W	10'TH (metars)	
	This	information <u>must</u> also be comp	le(ed and Right (R) as:	looking downstream fr	
RIPARIAN ZONE AND FLO <u>RI</u> PARIAN <u>WIDTH</u>	DODPLAIN QUAL	ITY &NOTE: River Left (L)		looking control currys	
L R (Per Bank)		Mature Forest, Wetland		Conservation Tillage	
Moderale 5-10m	00	Immature Forest, Shrub or Old	00	Urban or Industrial	
	00	Residential, Park, New Field	00	Open Pasture, Row	
XIX None	<u>a</u> a	Fenced Paslure		Crop Mining or Construction	
COMMENTS	<u> </u>		_	•	
FLOW REGIME (At Time o	f Evaluation) (Cl	eck ONLY one box) Moist Ch	annol, isolated o	ools, no flow (intermillent)	
	d pools (Interstillei		nel, no waler (E	phemeral)	
Subsurface flow with isofate		· · · · · · · · · · · ·			
Subsurface flow with isofele COMMENTS			00.0001	_	
Subsurface flow with isofele COMMENTS	[] 1.0	Ift) of channel) (Check ONLY o ☐ 2.0	μα box). Σ	3.0	
Subsurface flow with isotate COMMENTS SINUOSITY (Number of be		Ift) of channel) (Check ONLY o ☐ 2.0 ☐ 2.5] 3.0] >3	

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QHEI PERFORMED2 . (Tyes No OHEI Score (If Yes, Allach Completed OHEI Form)
DOWNSTREAM DESIGN,	ATEO USE(S) Distance from Evaluated Stream
GWH Nome:	Distance from Evaluated Stream Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
	IES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	NRCS Soil Map Page: NRCS Soil Map Stream Order
	Texnship / City hites control con
MISCELLANEOUS	
	Date of last precipitation: Quantity:
	Date of lest precipitation: Quantity:
	Свлору (% open):) ОО
	emistry7 (Y/N); (Note leb sample no. or ld. and attach results) Lab Number;
Field Measures: Temp (°C)	Dissolved Oxygen (mg/) pH (S.U.) Canductivity (µmhas/cm)
is the sampling reach representative	of the stream (Y/N) If not, please explain:
Additional comments/description of p	pollution Impácts:
· · · · · · · · · · · · · · · · · · ·	
ال الله ID hui Ish Observed? (۲/۱۱) Rogs or Tadpoles Observed? (۲/۱۱)	s; Record all observations. Voucher collections optional, NOTE; all youther samples must be labeled with th mber: Include appropriate field data sheels from the Primary Headwater Habiliat Assessment Manual) hgr? (Y/N) Selemanders Observed? (Y/N)_N Voucher? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
i ال الله ish Observed? (۲/۱۱) N rogs of Tadpoles Observed? (۲/۱۱)	inder: Include appropriate field data sheels from the Primary Headwater Habitat Assessment Manual) hg?? (Y/N) Salamanders Observed? (Y/N)_N Voucher? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ال الله Sh Observed? (۲/N) <u>N</u> Voud Togs or Tadpoles Observed? (۲/N)	inder: Include appropriate field data sheels from the Primary Headwater Habitat Assessment Manual) hg?? (Y/N) Salamanders Observed? (Y/N)_N Voucher? (Y/N) Voucher? (Y/N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ID nui Fish Observed? (Y/N) N Voug rogs of Tadpoles Observed? (Y/N) Comments Regarding Biology: DRAWING AND NA Include Important landmarks a	Index: Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) hpr? (Y/N)
ID nui Ish Observed? (Y/N) N Voug irogs or Tadpoles Observed? (Y/N) comments Regarding Biology: DRAWING AND NA Include Important landmarks a MAUNTAUNED 1 SRASS	Index: Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) hpr? (Y/N)
ID nuit Tesh Observed? (Y/N) N Voug Trogs or Tadpoles Observed? (Y/N) Comments Regarding Biology: DRAWING AND NA Include Important landmarks a MALINT TALINED I SRASS LOW VLGETAT	Inder: Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) http:// Statamanders Observed? (Y/N) Voucher? (Y/N) Vouc
ID nui Fish Observed? (Y/N) N Voug Trogs of Tadpoles Observed? (Y/N) Comments Regarding Biology: DRAWING AND NA Include Important landmarks a MAUNTAUNED 1 SRASS	Inder: Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) http://www.salamanders.observed?(Y/N)

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ChieFFA Primary	Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	-8
SITE NAME LOCATION	7875001	
	222000 RIVER BASIN DRAINAGE AREA (ml ²)	
LENGTH OF STREAM REACH (ft) 200		
DATE 12 1 1 X SCORER 6-12VI	MON COMMENTS	
NOTE: Complete All Items On This For	rm - Refer to "Fleid Evaluation Manual for Ohio's PHWH Streams" for Instru-	a Persona Periona
	ATURAL CHANNEL TRECOVERED TRECOVERING RECENT OR NO RECO	VERY
MODIFICATIONS:		186712-CV
1. SUBSTRATE (Estimate percent of ev	very type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 40). Add total number of signific	icant substrate types found (Max of 6), Final metric score is sum of boxes A & B.	HHEI Metric
ELDR SLABS [16 pts]		Points
[] [] BOULDER (>256 mm) [16 pts] [] [] BEDROCK [16 pt]		Substrate
COBBLE (65-256 mm) [12 pts]		$\frac{Max = 40}{L}$
GRAVEL (2-84 mm) [9 pts]		2
Total of Percentages of Blotr Slabs, Boulder, Cobble, Bedrock	(A) 3 (B) 2	A + B
SCORE OF TWO MOST PREDOMINATE SUBS		
2. Maximum Pool Depth (Measure the m	maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Depth
evaluation, Avoid plunge pools from roa	ad culverts or storm water pipes) (Check O/LY one box):	Max = 30
> 30 conlimeters [20 pts] > 22.5 : 30 cm [30 pts] > 10 - 22.6 cm [25 pts]	Som [6 pts]	10
	52.5	
COMMENTS	MAXIMUM POOL DEPTH (centimeters):	
	MAXIMUM POOL DEPTH (cantimeters):	Bankfull Width
	MAXIMUM POOL DEPTH (cantimeters):	Bankfull Widih Max⊨30
3. BANK FULL WIDTH (Measured as the 3.4.0 meters (> 13) [30 pts] 3.0 m (> 4.0 m (> 9.77 + 13) [25 pts] 3.1.5 m + 3.0 m (> 4.6" + 9"7) [20 pts]	MAXIMUM POOL DEPTH (centimeters): e average of 3-4 measurements} (Check ONLY one box): ☐ 3-10m = 1.5 m (> 3-31, 4-87) (15 pts) ☐ 3-10m (< 3-37, [5 pts] 1-1] 3-10m (< 3-37, [5 pts] 1-10m (< 3-37, [5 pts] 1-10m (Width
3. BANK FULL WIDTH (Measured as the 3.4.0 meters (> 13) [30 pts] 3.0 m (> 4.0 m (> 9.77 + 13) [25 pts] 3.1.5 m + 3.0 m (> 4.6" + 9"7) [20 pts]	MAXIMUM POOL DEPTH (cantimeters): e average of 3-4 measurements) (Check ONLY one box): □ >> 1.0 m = 1.5 m (> 3 3); 4 8) [15 pts] □ ≤ 1.0 m (≤ 3' 3) [5 pts]	Width
3. BANK FULL WIDTH (Measured as the 3.4.0 meters (> 13) [30 pts] 3.0 m (> 4.0 m (> 9.77 + 13) [25 pts] 3.1.5 m + 3.0 m (> 4.6" + 9"7) [20 pts]	MAXIMUM POOL DEPTH (centimeters):	Width
3. BANK FULL WIDTH (Measured as the 3.4.0 meters (> 13) [30 pts] 3.0 m (> 4.0 m (> 9.77 + 13) [25 pts] 3.1.5 m + 3.0 m (> 4.6" + 9"7) [20 pts]	MAXIMUM POOL DEPTH (centimeters): e average of 3-4 measurements) (Check ONLY one box): ↓>10 m = 1.5 m (> 3 3" [4 8") [15 pts] ↓>10 m (< 3' 3") [5 pts] ↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pis] > 3.0 m - 4.0 m (> 9'.77 + 13) [25 pts] > 1.5 m + 3.0 m (> 4'.8" - 9'.7') [20 pts] COMMENTS	MAXIMUM POOL DEPTH (centimeters): e average of 3-4 measurements) (Check ONLY one box): 	Width
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3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m (> 4.0 m (> 9.77 + 13) [25 pts] > 1.5 m (> 3.0 m (> 4.6 + 6 + 9 7 *) [20 pts] COMMENTS RIPARIAN ZONE AND FLOODF <u>RIPARIAN WIDTH</u> L R (Per Bank)	MAXIMUM POOL DEPTH (cantimeters): # average of 3.4 measurements) (Check ONLY one box): > 1.0 m 1.5 m (< 3.3]	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m - 4.0 m (> 9'.77 + 13) [25 pts] > 1.5 m + 3.0 m (> 4'.6" - 9'.7') [20 pts] COMMENTS	MAXIMUM POOL DEPTH (cantimeters): # average of 3-4 measurements) (Check ONLY one box): > 1.0 m 1.5 m (< 3'3') [5 pts]	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m (> 4.0 m (> 9'77 + 13) [25 pts] > 1.5 m + 3.0 m (> 4' 5" + 9'7') [20 pts] COMMENTS RIPARIAN ZONE AND FLOODF <u>RIPARIAN WIDTH</u> L R (Per Bank) U Wide >10m Moderate 5-10m Nerrow <5m None	MAXIMUM POOL DEPTH (cantimeters): e average of 3.4 measurements) (Check ONLY one box): 2.0 m 1.5 m (< 3.3 (4.8)) [15 pts]	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m (> 4.0 m (> 9',77 + 13) [25 pts] > 1.5 m ÷ 3.0 m (> 4*6"=9'7') [20 pts] COMMENTS RIPARIAN ZONE AND FLOODF <u>RIPARIAN WIDTH</u> L R (Per Bank) U Wide > 10m Moderate 5-10m Nerrow <5m	MAXIMUM POOL DEPTH (cantimeters): e average of 3-4 measurements) (Check ONLY one box):	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m < 4.0 m (> 9'.77 < 13) [25 pts] > 1.5 m ÷ 3.0 m (> 4*6"=9'7') [20 pts] COMMENTS	MAXIMUM POOL DEPTH (cantimeters): a average of 3-4 measurements) (Check ONLY one box): 3 10 m (5 3' 3') [5 pts] AVERAGE BANKFULL WIDTH (meters) This information must also be completed PLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream Ar FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R Mature Forest, Welland Immature Forest, Shrub or Old Immature Forest, Shrub or Old Immature Forest, Shrub or Old Immature Forest, Shrub or Old Field Conservation Titlage Mature Forest, Shrub or Old Field Conservation Titlage Mature Forest, Shrub or Old Mature Forest, Shrub or Old M	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m (> 4.0 m (> 9',77 + 13) [25 pts] > 1.5 m + 3.0 m (> 4' 5" + 9' 7') [20 pts] COMMENTS RIPARIAN ZONE AND FLOODF <u>RIPARIAN WIDTH</u> L R (Per Bank) U Wide >10m Moderate 5-10m Moderate 5-10m Nerrow <5m None COMMENTS FLOW REGIME (At Time of Evel Stream Flowing Subsurface flow will isolated poo	MAXIMUM POOL DEPTH (cantimeters): a average of 3-4 measurements) (Check ONLY one box): a average of 3-4 measurements) (Check ONLY one box): AVERAGE BANKFULL WIDTH (meters) AVERAGE BANKFULL WIDTH (meters) AVERAGE BANKFULL WIDTH (meters) This information must also be completed AVERAGE BANKFULL WIDTH (meters) L R (Most Predominant per Bank) (Most Channel, isolated pools, no flow (Intermittent)	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pis] > 3.0 m < 4.0 m (> 9'.77 + 13) [25 pts] > 1.5 m ÷ 3.0 m (> 4*8 = 9'.7) [20 pts] COMMENTS RIPARIAN ZONE AND FLOODF <u>RIPARIAN WIDTH</u> L R (Per Bank) U Wide>10m Moderate 5-10m Nerrow <5m None COMMENTS FLOW REGIME (At Time of Evel Stream Flowing Subsurface flow with Isolated poo COMMENTS	MAXIMUM POOL DEPTH (cantimeters): a average of 3.4 measurements) (Check ONLY one box): 3.0 m = 1.5 m (< 3.3] 4 87 [15 pts]	Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m < 4.0 m (> 9'.77 + 13) [25 pts] > 1.5 m ÷ 3.0 m (> 4*8 = 9' 7') [20 pts] COMMENTS	MAXIMUM POOL DEPTH (cantimeters): a average of 3.4 measurements) (Check ONLY one box):	Width
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3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m (> 4.0 m (> 9'.77 (= 13) [25 pts] > 1.5 m (= 3.0 m (> 4'.6" = 9'.7") [20 pts] COMMENTS	MAXIMUM POOL DEPTH (cantimeters): a average of 3.4 measurements) (Check ONLY one box): 3.0 m = 1.5 m (< 3.3] * 8.7] [15 pts]	Width Maxin 30 25
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13) [30 pts] > 3.0 m (+ 4 0 m (> 9'77 + 13) [25 pts] > 1.5 m + 3.0 m (> 4 * 6* - 9'7') [20 pts] COMMENTS RIPARIAN ZONE AND FLOODF RIPARIAN WIDTH L R (Per Bank) U Wide > 10m Moderate 5-10m None COMMENTS FLOW REGIME (At Time of Evel Stream Flowing Subsurface flow with Isolated poo COMMENTS SINUOSITY (Number of bends p None 0.5	MAXIMUM POOL DEPTH (cantimeters): a average of 3.4 measurements) (Check ONLY one box): 3.0 a average of 3.4 measurements) (Check ONLY one box): 3.0 MAXIMUM POOL DEPTH (cantimeters): a average of 3.4 measurements) (Check ONLY one box): 3.0 Maximum Pool Depth (cantimeters): Average box (S 3.3, 3.5, 3.5, 3.5, 3.5, 3.5, 3.5, 3.5,	Width Maxin 30 25

June 20, 2008 Revision

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S2M-04 ADDITIONAL STREAM INFORMATION (This information Must Also be Completed); QHEI PERFORMED? - DYes No OHEI Score _____ (If Yes, Allach Completed OHEI Form) DOWNSTREAM DESIGNATED USE(S) 🗍 WWH Name: _ Distance from Evaluated Stream CWH Name: Distance from Evaluated Stream EWH Name; _ Distance from Evaluated Stream MAPPING; ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION _ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order ___ USGS Quadrangle Name:__ County: _ Township / City:__ MISCELLANEOUS ____ Base Flow Conditions? (Y/N); Date of last precipitation: Quantity: Photograph Information: 90 Carlopy (% open): ____ Elevated Turbidity? (Y/N): Were samples collected for water chamistry? (Y/N): _____ (Note tab sample no. or id. and attach results) Lab Number:____ _ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _ Field Measures: Temp (°C)_ Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:____ Additional comments/description of pollution impacts:___ BIOTIC EVALUATION Performed? (Y/N): __ (If Yes, Record all observations. Voucher collections optional. NOTE: all youcher samples must be labeled with the site (D number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqualla Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology:_ CHANNEL DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): WHARE RELEASE And a narrative description of the stream's location ton G にちや ٧o י

June 20, 2008 Revision

ChicEPA Primary I	Headwater Habitat Evaluat HHEI Score (si	tion Form Im of metrics 1, 2, 3) : 54
SITE NAMELOCATION	082.000 kiver basin Lat Long River ON_comments	CODE RIVER MILE
NOTE: Complete All Items On This Form	n - Refer to "Field Evaluation Manual for Of URAL CHANNEL (RECOVERED) RECOV	Io's PHWH Streams" for Instructions
. (Max of 40). Add total number of significa	ry type of substrate present. Check OWLY two pre ant substrate types found (Max of 6). Final metric sc ERCENT TYPE ' SILT [3 pt] CLEAF PACKWOODY DI FINE DETRITUS [3 pts CLAY or HARDPAN [0]	PERCENT Points
GRAVEL (264 mm) [9 pts] GRAVEL (264 mm) [9 pts] SAND (2 mm) [6 pts] Total of Percentages of Bidr Stabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBST		総合語 <u>―</u> Q
evaluation. Avoid plunge pools from road	C <6 on [5 pts]	
3. BANK FULL WIDTH (Measured as the :	□ > 1.0 m > 1.5 m (> 3'3') □ > 1.0 m (< 3'3') 15 btel	NLY one box): 4'8') (15 pts) (FULL WIDTH (meters) ALY one box): Bankfull Width Max=30 2.5
RIPARIAN ZONE AND FLOODPI <u>RIPARIAN WIDTH</u>	FLOODPLAIN QUALITY	ht (R) as looking downstream &
L R (Per Bank)	L R (Most Predominant per Bank)	L R Conservation Tillage Urban or Industrial
口 Narrow <5m 凤凰 None COMMENTS	Residential, Park, New Fleid Fenced Pesture	Image: Comp description Image: Comp description Image: Comp description Image: Comp description
FLOW REGIME (At Time of Evalue Stream Flowing Subsurface flow with isolated pools COMMENTS		solated pools, no flow (intermittent) water (Ephemeral)
SINUOSITY (Number of bends pe None 29 0.5	r 61 m (200 ft) of channel) (Check ONLY one box) 1.0	□ 3.0 □ >3
STREAM GRADIENT ESTIMATE	Moderate (2 4/100 h) OModerate to Se	evere Severe (10 M100 A)
June 20, 2008 Revision	PHWH Form Page - 1	

S2M-093

] Yes XNO QHEI Score	(if tes, Allach Comple	(Ga QHEI FORM)	
			- Anicia Frankrada d Obraham	
·			e from Evaluated Stream _ e from Evaluated Stream _	_
EWH Name:			from Evaluated Stream _	
MAPPING: ATTACH COP	IES OF MAPS, INCLUDING THE <u>ENTIRE</u> V	ATERSHED AREA. CL	EARLY MARK THE SITE L	CATION
county: HURON	Township / C			
		W. Arthone Marthal		·
	1- 17	110		
Base Flow Conditions? (Y/N):	Date of last precipitation: $\frac{10}{2}$	Ulan Quan	iity:	
Photograph Information:			_	
Elevated Turbidity? (Y/N):	Canopy (% open);/OO			
Were samples collected for water ch	emistry? (Y/N): 📐 (Note lab sample	e no. or id, and attach r	esuits) Leb Nümber;	<u> </u>
Field Measures: Temp (°C)	Dissolved Oxygen (mg/i)	oH (S.U.) Co	nductivity (µmhos/cm)	
	of the stream (Y/N) / If not, please			
	,, <u>,</u>			
Additional comments/description of	ollution impacts:			
10 n	s, Record all observations, Voucher collecti mber, include appropriate field data sheets her? (Y/N) Salamanders Observed	from the Primery Headw	rater Habitat Ássessmeni Mi	unual)
Performed? (Y/N): (If Ya ID nu ish Observed? (Y/N) M/ Vou rogs or Tadpoles Observed? (Y/N) comments Regarding Biology:	mber. Include appropriate field däta sheets her? (Y/N) Salamanders Observed Voucher? (Y/N) Aqualic Macro	from the Primery Headw 7 (Y/N) Vouche Invertebrates Observe	rater Habitat Assessment Mi ir? (YAN) d? (Y/N) Voucher? (anual) Y/N)
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25 μ. – **	ChieEPA Primary Headwater Habitat Evaluation Form HHEl Score (sum of metrics 1, 2, 3) :
	SITE NAME/LOCATION
	STREAM CHANNEL: INONE / NATURAL CHANNEL: IRECOVERED RECOVERING RECENT OR NO RECOVERY MODIFICATIONS:
: :	(Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. HHE! TYPE PERCENT TYPE BLDR SLABS [16 pts] Image: Silt [3 pt] Image: Silt [3 pt] BOULDER (>256 mm) [16 pts] Image: Silt [3 pt] Image: Silt [3 pt] BEDROCK [16 pt] Image: Silt [3 pt] Image: Silt [3 pt] BEDROCK [16 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt [3 pt] Image: Silt
	Construction Construction <td< th=""></td<>
. 1,2"	evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Social continueters (20 pts) Social continueters (20 pts) Social continueters) Social continueters Social continters Social continueters Social continueters Social
11 '	3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfull > 4.0 mdem (> 13) [30 pte] > 1.0 m - 1.5 m (> 3' 3'; 4 8") [15 pte] Width > 3.0 m + 4.0 m (> 2',7; 113') [25 pte] > 1.0 m (≤ 3' 3'; 15 pte] Bankfull > 1.5 m + 3.0 m (> 4' 8'; -9'77) [20 pte] > 4.0 m (≤ 3' 3'; 15 pte] Bankfull COMMENTS
	This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY INTOTE: River Left (L) and Right (R) as looking downstream in Another Another Loodplain QUALITY L R (Per Bank) L R Conservation Tillage Image: Image of the state of
·	FLOW REGIME (Al Time of Evaluation) (Check ONLY one box): Stream Flowing Image: Commentation of Evaluation Subsurface flow with isolated pools (Interstillal) Image: Commentation of Evaluation COMMENTS Image: Commentation of Evaluation
	SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0 0.5 1.5 2.5 >3
	STREAM GRADIENT ESTIMATE Fial (0 5 #/100 m) Fial (
ł	June 20, 2008 Revision

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QHI	EI PERFORMED? - 🗖 Yes 🖄 No 🛛 QHEI 800	xe (If Yes, Attach Completed QHEI Form)
DO	NNSTREAM DESIGNATED USE(S)	
		Distance from Evaluated Stream
		Distance from Evaluated Stream Distance from Evaluated Stream
MAR	PING: ATTACH COPIES OF MAPS, INCLUDING	THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadra	ngle Nama;	NRCS Soil Map Page: NRCS Soil Map Stream Order
County:		Township / City
MIS	CELLANEOUS	
Base Flow Cor	idillons? (Y/N); Y Date of last precipitation	ion: <u>11/11/18</u> Quentity:
Photograph inf	ormation:	
Elevated Turbl	(lity? (Y/N): Canopy (% open);	<u> </u>
Were samples	collected for water chemistry? (Y/N): (Note lab sample no, or id, and attach results) Lab Number
Fleid Measures	; Temp (°C) Dissolved Oxygen (mg	pH (S.U.) Conductivity (umhos/cm)
is the sampling	reach representative of the stream (Y/N)	if nol, please explain;
Additional com	nents/description of pollution impacts:	
<u>BiOT</u> Performed? (Y/	IC EVAL UATION N): (If Yes, Record all observations. iD number. Include appropriate f	Voucher collections optional. NOTE: all voucher samples must be labeled with field data sheets from the Primary Headwater Habitat Assessment Manual)
<u>BIOT</u> Performed? (Y/ Fish Observed? Frogs or Tadpol	IC EVAL UATION N): (If Yes, Record all observations. iD number. Include appropriate f	Voucher collections optional. NOTE: all youcher samples must be labeled with
<u>BIOT</u> Performed? (Y/ Fish Observed? Frogs or Tadpol	IC EVALUATION N): (If Yes, Record all observations, iD number, include appropriate f (Y/N) Voucher? (Y/N) Salamar es Observed? (Y/N) Voucher? (Y/N)	Voucher collections optional. NOTE: all voucher samples must be labeled with field data sheets from the Primary Headwater Habitat Assessment Manual) nders Observed? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
<u>BIOT</u> Performed? (Y/ Fish Observed? Frogs or Tadpol	IC EVALUATION N): (If Yes, Record all observations, iD number, include appropriate f (Y/N) Voucher? (Y/N) Salamar es Observed? (Y/N) Voucher? (Y/N)	Voucher collections optional. NOTE: all voucher samples must be labeled with field data sheets from the Primary Headwater Habitat Assessment Manual) nders Observed? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
<u>BiOT</u> Performed? (Y/ Fish Observed? Frogs or Tadpol Comments Reg DF	IC EVALUATION N): (If Yes, Record all observations, ID number. Include appropriate f (Y/N) Voucher? (Y/N) Salamar es Observed? (Y/N) Voucher? (Y/N) arding Biology: RAWING AND NARRATIVE DESCRIF	Voucher collections optional. NOTE: all voucher samples must be labeled with field data sheets from the Primary Headwater Habitat Assessment Manual) nders Observed? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
<u>BiOT</u> Performed? (Y/ Fish Observed? Frogs or Tadpol Comments Reg DF	IC EVALUATION N): (If Yes, Record all observations, ID number. Include appropriate f (Y/N) Voucher? (Y/N) Salamar es Observed? (Y/N) Voucher? (Y/N) arding Biology: RAWING AND NARRATIVE DESCRIF	Voucher collections optional. NOTE: all voucher samples must be labeled with field data sheets from the Primary Headwater Habitat Assessment Manual) nders Observed? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) PTION OF STREAM REACH (This must be completed): prest for site evaluation and a narrative description of the stream's location
<u>BiOT</u> Performed? (Y/ Fish Observed? Frogs or Tadpol Comments Reg DF	IC EVALUATION N): (If Yes, Record all observations. ID number. Include appropriate f (Y/N) Voucher? (Y/N) Salamar es Observed? (Y/N) Voucher? (Y/N) arding Biology: RAWING AND NARRATIVE DESCRIF mportant landmarks and other features of inte ROW UP	Voucher collections optional. NOTE: all voucher samples must be labeled with field data sheets from the Primary Headwater Habitat Assessment Manual) nders Observed? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) PTION OF STREAM REACH (This must be completed): prest for site evaluation and a narrative description of the stream's location

June 20; 2008 Revision

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OnicEPA Prima	y Headwater Habitat Evaluation Form HHEI Score (sum of metrics	
	1291/M/	
<u>S2M-0977</u> SITE NUMBE	RA382000 (RIVER BASIN DRAINAG	E AREA (ml²)
LENGTH OF STREAM REACH (ft)		
	(MOA) COMMENTS	
NOTE: Complete All Items On This	Form - Refer to "Field Evaluation Manual for Ohio's PHWH Stru	
STREAM CHANNEL MODIFICATIONS		NT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of state)	if every type of substrate present. Check ONLY <u>two</u> predominant subsirat gnificant substrate types found (Max of 6). Final metric score is sum of boxe	A&B. (<u>DDE</u> L
TYPE	PERCENT TYPE	ERCENT Metric Points
BLOR SLABS [16 pts]		5
		Substrate Max = 40
COBBLE (65-256 mm) [12 pts]		
GRAVEL (2-64 mm) [9 pts]	AN AGAIN MARKED AND AN	— III I
Total of Percentages of		(B) (A+B
Bldr Stabs, Boulder, Cobble, Bedro		
SCORE OF TWO MOST PREDOMINATE S	UBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE T	/PES;
2. Maximum Pool Depth (Measure t	he meximum pool depth within the 61 meter (200 ft) evaluation reach at t	e time of Pool Depth Max ≈ 30
evaluation. Avoid plunge pools from	1 road culverts or storm water pipes) (Check ONLY one box): S gm = 10 cm (15 pts)	
valuana. Avai plange pois inter- 30 centimeters [20 pis] ↓ 22.5 - 30 cm [30 pis] ↓ > 40 - 22.5 cm [25 pis]	< 6 cm (5 pts)	
		20
BANK FULL WIDTH (Measured a: 4.0 meters (> 13) [30 pts] 3.0 m - 4.0 m (> 9' 7': 13) [26 pts] 1.5 m - 3.0 m (> 4' 8': 9' 7') [20 pt]	: the average of 3-4 measurements) (Check Over 7 one Dox):	
	AVERAGE BANKFULL, WIDTH (m	(ers)
	This information <u>must</u> also be completed ODPLAIN QUALITY	wastream 🏠
<u>RIPARIAN WIDTH</u> L R (Per Benk)	L R (Most Predominant per Bank) L R	
X 2 Wide > 10m	🗋 🗋 Mature Forest, Welland 🛛 🗍 Conse	vation Tiliage
🗇 🖸 Moderate 5-10m	Field	or Industrial
🗇 🗇 — Narrow <5m	🗆 🗖 Residential, Park, New Field 🛛 🕅 Crop	Pesture, Row
O One COMMENTS		or Construction
	Evaluation) (Check ONLY one box): Mölst Channel, Isolated pools, no (pools (Interstilial) Dry channel, no water (Ephemera	
SINUO SITY (Number of ber None 0 0.5	ds per 61 m (200 ft) of channel), (Check ONLY one box); □ 1.0 □ 2.0 □ 3.0 □ 1.5 □ 2.5 □ >3	
		-
Flat (0.5 n/100 n) Flat to Moderate	Moderate (2 1/100 #)	Severe (10 A/100 m)

June 20, 2008 Revision

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dim i ma anni an i ta china anni	Score (II Yes, Atlach Co	mpleted QHEI Form)
DOWNSTREAM DESIGNATED USE(S)		
WWH Name; CWH Name:		
		lance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLU		
USGS Quadrangle Name:		
COUNTY AURON	Township / City	,
MISCELLANEOUS		
Base Flow Conditions? (Y/N): Date of last precip	lation; C	Quantity:
Photograph Information:		
Elevated Turbidity? (Y/N): Canopy (% open	<u>. 30 </u>	
Were samples collected for water chemistry? (Y/N):		ach results) Lab Number:
Fleid Measures: Temp (°C) Dissolved Oxygen	(mg/i) pH (S.U.)	_ Conductivity (µmhos/cm)
ts the sampling reach representative of the stream (Y/N)		
		· · · · · · · · · · · · · · · · · · ·
	le field data sheets from the Primary H	E: all voucher samples must be labeled with the site eadwater Habilat Assessment Manual) ucher? (Y/N) erved? (Y/N)
Comments Regarding Biology:		
· · · · · · · · · · · · · · · · · · ·	·····	
DRAWING AND NARRATIVE DESC	RIPTION OF STREAM REAC	H (This <u>must</u> be completed):
include important landmarks and other features of	nterest for site evaluation and a na	rative description of the stream's location
		UNU
Ţ	BECH FORES	
	W 2 GRAN	the same the
	X XX	XX
NOUDY	BEACH FORES	T

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ChigEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	9
SITE NAME LOCATION	<u></u>
LENGTH OF STREAM REACH (1) 200 LAT. LONG, RIVER CODE RIVER MILE RIVER MILE	<u>_</u>
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instri	uctions
STREAM CHANNEL	読み 感染 法がほう かいていし
1 SUBSTRATE (Estimate percent of every type of substrate present, Check ONLY two predominant substrate TYPE boxes	HHEI
(Max of 40). Add iolal number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts]	Metric Points
BLOR SLABS (16 pts) BOULDER (>256 mm) [16 pts] BOULDER (>256 mm) [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK (18 pt]	Substrate
Clay or HARDPAN [0 pt] G GRAVEL (2:64 mm) [9 pts]	
Total of Percentages of (A) Bidr Slabs, Boulder, Cobble, Bedrock (A) BIDR Slabs, Boulder, Cobble, Bedrock (B) BIDR TOTAL NUMBER OF SUBSTRATE TYPES:	A + B
2. Maximum Pool Depth (Meesure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Depth
evaluation. Avoid physics pools from road culvaris or storm water pipes) (Check ONLY 018 box);	Max = 30
30 continuetors (20 pts) >22.5. 30 cm (30 pts) >10 - 22.5 cm (25 pts)	40
COMMENTSMAXIMUM POOL DEPTH (centimeters):	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): □ > 4.0 meters (> 13) [30 pte] □ > 1.0 m - 1.5 m (> 3' 3'', 4' 8'') (15 pte) □ > 3.0 m - 4.0 in (> 9'7; - 13') [25 pte] □ > 1.0 m (≤ 3'.3'') [5 pte] □ > 1.5 m + 3.0 m (> 4' 8'; = 9'7') [20 pte] □ ≤ 1.0 m (≤ 3'.3'') [5 pte]	Bankfull Width <u>Max=30</u>
Comments	20
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream fr RIPARIAN MIDTH FLOODPLAIN QUALITY	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream fr RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank)	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream and RipARIAN WIDTH RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Mide >10m Immature Forest, Weiland Moderate 5-10m Immature Forest, Shrub or Old	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream from the second downstream from the second downstream from from the second downstream from the second downstrea	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream and read	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream from the read of the	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream from the second construction for	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream from the second construction for) #}

June 20, 2008 Revision

PHWH Form Page - 1

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	o QHEI Score (If Yes, Atlach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S	S) Distance from Evaluated Stream
	Distance from Evaluated Stream
	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS,	, INCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	NRCS Soll Map Page: NRCS Soll Map Stream Order
ounty: HURON	Township / Clly:
MISCELLANEOUS	
ase Flow Conditions? (Y/N): Date of la	ast precipitation; Quantity:
hotograph Information:	· · · · · · · · · · · · · · · · · · ·
eveted Turbidity? (Y/N): Canopy	/ (% open): <u>80</u>
ere samples collected for water chemistry? (Y/N	I): N
eld Measures: Temp (°C) Dissolved	i Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
the sampling reach representative of the stream	
1	appropriate field data sheets from the Primary Headwater Habilat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) r? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
mments Regarding Blology	
mments Regarding Blology:	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
mments Regarding Blology DRAWING AND NARRATIVE Include (mportant landmarks and other feat	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
mments Regarding Blology DRAWING AND NARRATIVE Include (mportant landmarks and other feat	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	EDESCRIPTION OF STREAM REACH (This <u>must</u> be completed): tures of Interest for site evaluation and a narralive description of the stream's location ECH FOFUST ANALY ANALY ANALY
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	EDESCRIPTION OF STREAM REACH (This <u>must</u> be completed): tures of Interest for site evaluation and a narralive description of the stream's location ECH FOFUST ANALY ANALY ANALY
mments Regarding Blology DRAWING AND NARRATIVE Include (mportant landmarks and other feat BC	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	EDESCRIPTION OF STREAM REACH (This <u>must</u> be completed): tures of Interest for site evaluation and a narralive description of the stream's location ECH FOFUST ANALY ANALY ANALY
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): atures of interest for site evaluation and a narralive description of the stream's location ECH FOFUST X X K K HORDER WITH HAMPEN H FDRECT
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): atures of interest for site evaluation and a narralive description of the stream's location ECH FOFUST X X K K HORDER WITH HAMPEN H FDRECT
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): tures of interest for sile evaluation and a narralive description of the stream's location ECH FOFUST X X K HABBERN
mments Regarding Blology: DRAWING AND NARRATIVE Include Important landmarks and other feat BC	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): atures of interest for site evaluation and a narralive description of the stream's location ECH FOFUST X X K K HORDER WITH HAMPEN H FDRECT

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ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	2
SITE NAME/LOCATION	
STREAM CHANNEL	/FRY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY <u>two</u> predominant substrate TYPE boxas (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] PERCENT TYPE PERCENT BLDR SLABS [16 pts] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROCK, [16 pt] BEDROK, [16 pt] BEDROK, [16 pt]	HHEI Metric Points Substrate Max = 40
Avoid buildinge pools from read culverts or storm water pipes) (Check ONLY one box): So centimeters [20 pts] So centimeters [20 pts] So centimeters [20 pts] So centimeters [20 pts] No water or moist channel (0 pts) No water or moist channel (0 pts)	A + B Paol Depth Max = 30 25
COMMENTS MAXIMUM POOL DEPTH (centimeters): 3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check OMLY one box): 3. Commers (> 13) [30 pte] > 1.0 m - 1.5 m (> 3' 3' - 4'8') [16 pte] > 3.0 m - 4.0 m (> 9' 7: -13) [25 pts] > 1.0 m (< 3' 3') [5 pte]	Bankfull Width Max=30
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream Ar RIPARIAN WIDTH FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream Ar L R (Per Bank) L R Image: Display the state of th	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Image: Stream Flowing Subsurface flow with located pools (Interstitial) Image: Dry channel, no water (Ephameral) COMMENTS SINUOSITY (Number of bends per 61 m (200 it) of channel)	
SINUOSITY (Number of beinds per of the (200 h) of chainer) (Check One.) of the box). 3.0 None 1.0 2.0 3.0 0.5 1.5 2.5 >3 STREAM GRADIENT ESTIMATE Fiel (0.5 n/100 h) Fiel to Moderate Moderate (2 t/100 h) Moderate to Severe Severe (10 n/100 f)	u)

June 20, 2008 Revision

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ADDITIONAL STREAM INFORMATION (This information Must		
GHEI PERFORMED? - 🗍 Yes 🕅 No QHEI Score _	(If Yes, Allach Completed QHE! Form)	
	Distance from Englished Ninger	
	Distance from Evaluated Stream	
	Distance from Evaluated Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	E ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name	NRCS Soil Map Page:NRCS Soil Map Stream Order	
lawon	ownship / Cily	
MISCELLANEOUS		
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity:	
Photograph information:	· · · · · · · · · · · · · · · · · · ·	
Elevated Turbidity? (Y/N): Canopy (% oppn):	00	
Were samples collected for water chemistry? (Y/N); ///////////////////////////////////	a lab sample no, or ld, and atlach results) Lab Nümber:	
Fleid Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)	
Is the sampling reach representative of the stream (Y/N) If r	not, please explain;	
Additional comments/description of poliution impacts:		_
		_
BIOTIC EVALUATION		
	cher collections optional. NOTE: all voucher samples must be labeled with the sit	e
	data sheels from the Primary Headwater Habilal Assessment Manual)	
Fish Observed? (Y/N) /V. Voucher? (Y/N) Salaman der: Frans or Tadholes Observed? (Y/N) /Voucher? (Y/N) Ag	s Observed? (Y/N) Voucher? (Y/N) juelic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)	
Comments Regarding Biology		_
		_
		_
		-
	ON OF STREAM REACH (This <u>must</u> be completed): t for sile evaluation and a narrative description of the stream's location	
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		DOWNINATE
X SCHARD/SHEUBS		- BJ
- TI WEARDANES	S CHATTARE /	CANNER
		america a ser e la la
ROW	CROPS	-
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June 20, 2008 Revision

X_Y-W-WADSITE NUM	HERA382.000 / RIVER BASIN	DRAINAGE AREA (ml²)	
	LATLONG	RIVER CODE RIVER MILE	
NOTE: Complete All Items On Th	us Form - Refer to "Field Evaluation Manual	l for Ohio's PHWH Streams" for Inst	ructions
			OVERY
VODIFICATIONS:			
SUBSTRATE (Estimate percen	nt of every type of substrate present. Check ONLY f significant substrate types found (Max of 8). Final m	<u>/ two</u> predominant substrate TYPE boxes netric score is sum of boxes A & B.	HHEI
TYPE DD BLOR SLABS [16 pts]		PERCENT 55	Metric Points
BOULDER (>256 mm) [18 p			Substrate
COBBLE (65-256 mm) [12 p	IS] UX CLAY or HARDE	5 [3 pts] PAN [0 pt] <u>20</u>	Max = 40
□ □ GRAVEL (2-64 mm) [9 pts] □ ☑ SAND (<2 mm) [6 pts]		<u>10</u>	
Total of Percentages of	(A) 77	(B)	A+6
Bidr Stebs, Boulder, Cobbie, Bea CORE OF TWO MOST PREDOMINATE		MBER OF SUBSTRATE TYPES:	
Maximum Pool Depih (Measur	e the maximum pool depth within the 61 meter (2	200 ft) evaluation reach at the time of	Pool Depth Max = 30
evaluation. Avoid plunge pools n > 30 centimeters [20 pts]	rom road cutverts or storm water pipes) (Check O/	115 of site of the second s	25
↓ > 22.5 - 30 cm [30 pts] ▲ 10 - 22.5 cm [25 pts]	□ >5 cm 10 cm □ <5 cm [6 pis] □ NO.WATER OF	R MOIST CHANNEL [0 pts]	
COMMENTS	MAXIMU	M POOL DEPTH (centimeters):	I
BANK FULL WIDTH (Measured	as the average of 3-4 measurements) (C	Check ONLY one box): (> 3'3"-4'8") [15 pts]	Bankfull Width
 → 4.0 meters (> 13) [30 pte] → 3.0 m ÷ 4.0 m (> 8*7* 13) [26 pte] > 1.5 m ÷ 3.0 m (> 4*8* 9*7*) [20 	nta] 🗍 🕹 fi0m (< 3'9"	(> 3 3' - 4' 8') [15 pts]) [5 pts]	Max=30
	AVERAG	BE BANKFULL WIDTH (meters)	' <i>Ш</i>
RIPARIAN ZONE AND F		pleted and Right (R) as looking downstream \$	
<u>RIPARIAN WIDTH</u> L.R. (Per Bank)	FLOODPLAIN QUALITY L R / (Most Predominant per Bank)		
Moderate 5-10m	immature Forest, Shrub or Old	Conservation Tillage	
	Field 🗍 🗍 Field	Open Pasture, Row	
🗐 💭 None	G G Fenced Pasture	Crop	
COMMENTS		· · · · · · · · · · · · · · · · ·	-
I FLOW REGIME (At Time)		hannel, isolatad pools, no flow (intermittent) nnel, no water (Ephemeral)	i -
Stream Flowing		Intel ⁴ Ito water (chitettician)	
			-
Stream Flowing Subsurface flow with isola COMMENTS	bends per 61 m (200 ft) of channel) ((Check ONLY of 2.0	one box):	-

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June 20, 2008 Revision

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QHEI PERFORMED? - 🗍 Yes 🕅 No QHEI Score	(if Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	
_	Distance from Evaluated Stream
[.] EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENT</u>	IRE WATERSHED AREA. CLEARLY MARK THE SITE LOCA
USGS Quadrangle Name;	NRCS Soil Map Page: NRCS Soil Map Stream O
County: Townsh	lp / Clty
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity:
Photograph Information:	
Elevated Turbldity? (Y/N): Canopy (% open):	
Were samples collected for water chemistry? (Y/N): Note lab s	
Field Measures: Temp (°C) Dissolved Oxygen (mgA)	pH (S.U.) Conductivity (umhos/cm)
is the sampling reach representative of the stream (Y/N) If not, pl	
is the sampling reach representative of the sroam (TNA) If not, pr	ease explain
-[sh Observed? (Y/N) Voucher? (Y/N) Selamanders Obs Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic i	erved? (Y/N) N Voucher? (Y/N)
Frogs or Tadpolas Observed? (Y/N) <u>N</u> Voucher? (Y/N) Aquatte l Commants Regarding Biology:	
Comments Regarding Biology.	
Comments Regarding Biology DRAWING AND NARRATIVE DESCRIPTION O	F STREAM REACH (This <u>must</u> be completed
Comments Regarding Biology DRAWING AND NARRATIVE DESCRIPTION O Include important landmarks and other features of interest for si	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's
DRAWING AND NARRATIVE DESCRIPTION O	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's FD (CES) T
Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION O Include Important landmarks and other features of Interest for st Butter	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's FD (CES) T
Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION O Include Important landmarks and other features of Interest for st Butter	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's
Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION O Include Important landmarks and other features of Interest for st Butter	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's FD (CES) T
DRAWING AND NARRATIVE DESCRIPTION O Include Important landmarks and other features of Interest for st BETCH	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's FD (CES) T
DRAWING AND NARRATIVE DESCRIPTION O Include Important landmarks and other features of Interest for st BETCH	F STREAM REACH (This <u>must</u> be completed to evaluation and a narrative description of the stream's FD (CES) T
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June 20, 2008 Revision

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PHWH Form Page - 2

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	47
SITE NAME/LOCATION SITE NUMBER AS 2006 RIVER BASIN DRAINAGE AREA (ml ²) SITE NUMBER AS 2006 RIVER BASIN DRAINAGE AREA (ml ²) LENGTH OF STREAM REACH (ft) LATLONG RIVER CODE RIVER MILE DATE RIVER CODE RIVER MILE DATE SCORER SIMON COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Ins	tructions
SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 40). Add total number of significant substrate types found (Max of 6). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE BLDR'SLABS [16 pts]	HHEI Metric Points
Image: Description of the product o	Substrate Max = 40
Total of Percentages of (B) Bidr Slabs, Boulder, Cobble, Bedrock (A) SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:	A+B
Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): S 30 continueters [20 pis] S 22.5.30 cm [30 pis] S 50 m [30 pis] No WATER OR MOIST CHANNEL [0 pis]	Pool Depth Max = 30 15
COMMENTSMAXIMUM POOL DEPTH (centimeters):	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check OWLY one box): > 4.0 m Hers (> 13) [30 pts] > 1.0 m - 1.5 m (> 3/3" - 4/8") [15 pts] > 3.0 m - 4.0 m (> 8'.7" - 13') [25 pts] > 1.0 m (≤ 3'3") [5 pts] > 1.6 m - 3.0 m (> 4'.6" - 8'.7" - 13') [20 pts] > 1.0 m (≤ 3'3") [5 pts] COMMENTS	Bankfull Width Max=30 25
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June 20, 2008 Revision

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June 20, 2008 Revision

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Firelands Wind, LLC Case No. 18-1607-EL-BGN

Exhibit AA Frac-Out Contingency Plan

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Attorneys for Firelands Wind, LLC

INADVERTENT RELEASE OF DRILLING FLUID CONTINGENCY PLAN

For Horizontal Directional Drilling Under Certain Sensitive Streams and Wetlands Emerson Creek Wind Farm Huron and Erie Counties, Ohio

I. Introduction

Construction of the Emerson Creek Wind Farm in Erie and Huron Counties, Ohio, will include the use of trenchless excavation methods known as horizontal directional drilling ("HDD"). This widely used technique accomplishes the installation of buried utilities with minimal impact, by routing the utility under a sensitive feature (such as a stream, river or wetland). The HDD procedure uses a bentonite slurry, a fine clay material as a drilling lubricant ("drilling mud"). Although bentonite is non-toxic and non-hazardous, a potential environmental risk associated with conducting HDD under sensitive features occurs when bentonite is released to the surface during construction (sometimes referred to as an inadvertent release or "frac-out").

Seepage of drilling fluid is most likely to occur near the bore entry and exit points where the drill head is shallow. Frac-outs can occur, however, in any location along a directional bore. This plan establishes operational procedures and responsibilities for HDD near sensitive environmental features such as streams, rivers, or wetlands for the prevention, containment, and remediation of any of frac-outs that may occur in connection with the proposed HDD as part of the construction of the Emerson Creek Wind in Erie and Huron Counties, Ohio.

The objectives of this Plan are to:

- 1. Minimize the potential for an inadvertent release associated with HDD activities;
- 2. Provide for the timely detection of an inadvertent release;
- 3. Protect sensitive water courses and associated riparian vegetation;
- 4. Ensure an organized, timely, and minimum-impact response in the event an inadvertent release occurs; and
- 5. Ensure that all appropriate notifications are made immediately to management and environmental personnel.

Measures to be deployed as part of the contingency plan include site inspection, proper training of the contractor and construction personnel, development of response procedures, provision of containment materials, and implementation of appropriate clean up procedures. These measures are described in detail below:

II. <u>Description of Work</u>

Drilling operations will be carefully monitored to determine if and when a frac-out may be occurring. Operations will be halted immediately upon detection of a significant decline in drilling pressure or other evidence that a frac-out may be occurring. The clean-up of all spills shall begin immediately. Management and environmental personnel shall be notified

immediately of any spills and shall be consulted regarding remediation procedures. Spill response kits shall be maintained on-site and used if a frac-out occurs. A vacuum truck and containment materials, such as straw bales, shall also be readily available. In the event of a frac-out, the on-site supervisor of construction activities ("Site Supervisor") will conduct an evaluation of the situation and direct recommended mitigation actions, based on the following guidelines:

- 1. If the frac-out is minor, easily contained, has not reached the surface, and is not threatening sensitive resources, then drilling operations may resume after use of a leak-stopping compound or redirection of the bore; and
- 2. If the frac-out has reached the surface, any hazardous materials within the bentonite shall be removed, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite either is properly disposed of at an approved disposal facility or properly recycled in an approved manner. The Site Supervisor shall notify and take any necessary follow-up response actions in coordination with the relevant regulatory agency representatives. The Site Supervisor shall coordinate the mobilization of equipment stored at off-site locations (e.g., vacuum trucks) on an as needed basis.

III. <u>Site Supervisor Responsibilities</u>

The Site Supervisor has ultimate responsibility for implementing this plan. The Site Supervisor shall ensure that all relevant employees are trained prior to drilling. The Site Supervisor shall be notified immediately when a frac-out is detected. The Site Supervisor shall be responsible for ensuring that environmental personnel are aware of the frac-out, and coordinate personnel, response, remediation, and regulatory agency notification. The Site Supervisor shall ensure all waste materials are properly containerized, labeled, and removed from the site to an approved disposal facility by personnel experienced in the removal, transport and disposal of drilling mud.

The Site Supervisor shall be familiar with all aspects of the drilling activity, the contents of this plan and the conditions of approval under which the HDD is authorized to take place. The Site Supervisor shall have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The Site Supervisor shall ensure that a copy of this plan is available (at the project work site) and accessible to all construction personnel. The Site Supervisor shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of drilling operations.

IV. Equipment

The Site Supervisor shall ensure that:

1. Spill responses kit and spill containment materials are available on-site at all times, and that the equipment is in good working order;

- 2. Equipment required to contain and remediate a frac-out release either will either be available at the work site or readily available at an offsite location within 15- minutes of the bore site; and
- 3. If equipment is required to be operated adjacent to a water course, absorbent pads and plastic sheeting for placement beneath motorized equipment shall be used to protect sensitive areas from engine fluids.

V. <u>Training</u>

Prior to the start of construction, the Site Supervisor shall ensure that relevant workers receive training in the following areas:

- 1. The provisions of this plan, equipment maintenance and site-specific permit and monitoring requirements;
- 2. Inspection procedures for release prevention and containment equipment and materials;
- Contractor/employee obligations to immediately stop the drilling operation upon first evidence of the occurrence of a frac-out and to immediately report any frac-out releases;
- 4. Contractor/employee responsibilities in the event of a release;
- 5. Operation of release prevention and control equipment and the location of release control materials, as necessary and appropriate; and
- 6. Protocols for communication with relevant regulatory agency representatives who might be on-site during the remediation effort.

VI. <u>Procedures</u>

The following procedures shall be followed each day, prior to the start of work. This plan shall be available on-site during all construction. The Site Supervisor shall be on-site at any time that HDD is occurring or is planned to occur. The Site Supervisor shall ensure that a briefing is held at the start of each day of HDD to review the appropriate procedures to be followed in case of a frac-out. Questions shall be answered, and clarification given on any point over which the HDD operating crew or other employees or contractors have concerns.

A. Drilling

Drilling pressures shall be closely monitored so they do not exceed those needed to penetrate the target formation. Pressure levels shall be monitored randomly by the operator. Pressure levels shall be set at a minimum level to prevent frac-outs. During the pilot bore,

the drilled annulus shall be maintained. Cutters and reamers shall be pulled back into previously-drilled sections after each new joint of pipe is added.

Exit and entry pits shall be enclosed by silt fences and straw or similar material. A spill kit shall be on-site and used if a frac-out occurs. A vacuum truck shall be readily available prior to and during all HDD operations. Containment materials (straw, silt fencing, sand bags, frac-out spill kits, etc.) shall be staged on-site at locations where they are readily available and easily mobilized for immediate use in the event of a frac-out. If necessary, barriers (straw bales or sedimentation fences) between the bore site and the edge of the water source, shall be constructed, prior to drilling, to prevent released bentonite material from reaching the water.

Once the drill rig is in place, and drilling begins, the drill operator shall stop work whenever the pressure in the drill rig significantly drops or there is a lack of returns in the entrance pit. If either of these occur, the Site Supervisor shall be informed that a possible frac-out has occurred. The Site Supervisor and the drill rig operator(s) shall work to coordinate the likely location of the frac-out.

The location of the frac-out shall be recorded and notes made on the location and measures taken to address the concern. The following subsections shall be adhered to when addressing a frac-out situation.

Water containing mud, silt, bentonite, or other pollutants from equipment washing or other activities, shall not be allowed to enter any water course. The bentonite used in the drilling process shall be either disposed of at an approved disposal facility or recycled in an approved manner. Other construction materials and wastes shall be recycled, or disposed of, as appropriate.

B. Vacuum Truck

A vacuum truck shall be staged at a location from which it can be mobilized and relocated so that any place along the drill shot, can be reached by the apparatus, within thirty (30) minutes of information indicating a possible frac-out.

C. Field Response

The response of the field crew to a frac-out release shall be immediate and in accordance with procedures set forth in this plan. All appropriate emergency actions that do not pose additional threats to sensitive resources will be taken, as follows:

- 1. Boring shall stop immediately;
- 2. The bore stem shall be pulled back to relieve pressure on the frac-out;

- 3. The Site Supervisor shall be notified to ensure that management and environmental personnel are notified, adequate response actions are taken and required notifications are made;
- 4. The Site Supervisor shall evaluate the situation and recommend the type and level of response warranted, including the level of notification required;
- 5. If the frac-out is minor, easily contained, has not reached the surface and is not threatening any sensitive resources, then a leak-stopping compound shall be employed to block the frac-out. If the use of leak-stopping compound is not fully successful, then the bore stem shall be redirected to a new location along the desired drill path (i.e., where a frac-out has not occurred);
- 6. If the frac-out has reached the surface, any hazardous materials within the bentonite shall be removed to a depth of 48 inches, contained and properly disposed of, as required by law. A dike or berm may be constructed around the frac-out to entrap released drilling fluid, if necessary. Clean sand shall be deployed and the area returned to pre-project contours; and
- 7. If a frac-out occurs, reaches the surface and becomes widespread, the Site

Supervisor shall authorize a vacuum truck and bulldozer stored off-site to be mobilized. The vacuum truck may be either positioned at either end of the line of the drill so that the fracout can be reached by crews on foot, or may be pulled by a bulldozer, so that contaminated soils can be vacuumed up.

D. Response Close-out Procedures

1. When the release has been contained and remediated, response close-out activities shall be conducted at the direction of the Site Supervisor. These activities shall include those below.

2. The recovered drilling fluid shall either be recycled or transported to an approved facility for disposal. No recovered drilling fluids may be discharged into streams, storm drains or any other water source;

3. All frac-out excavation and remediation sites shall be returned to pre-project contours using clean fill, as necessary; and

4. All containment measures (fiber rolls, straw bale, etc.) shall be removed, unless otherwise specified by the Site Supervisor.

E. Resumption of HDD

For minor releases not necessitating external notification, HDD may continue, if full containment is achieved through the use of a leak-stopping compound or redirection of the

bore and the cleanup crew remains at the frac-out location throughout the HDD activity. For releases necessitating external notification, HDD activities shall not restart without prior approval from the Site Supervisor.

F. Bore Abandonment

Abandonment of the bore will only be required when all efforts to control the frac-out within the existing directional bore have failed.

VII. Notification

In the event of a frac-out that reaches a water source, the Site Supervisor shall notify safety personnel so they can notify the appropriate regulatory agencies. All agency notifications will occur within 24 hours and proper documentation will be created in a timely and complete manner.

The following information will be provided:

- 1. Name and telephone number of person reporting;
- 2. Location of the release;
- 3. Date and time of release;
- 4. Type and quantity, estimated size of release;
- 5. How the release occurred;
- 6. The type of activity that was occurring around the area of the frac-out;
- 7. Description of any sensitive areas, and their location in relation to the frac-out; and
- 8. Description of the methods used to remediate the site.

A. Communicating with Regulatory Agency Personnel

All employees and subcontractors shall adhere to the following protocols when regulatory agency personnel arrive on site. Regulatory agency personnel shall be required to comply with appropriate safety rules. Only the Site Supervisor, safety personnel and environmental should coordinate communication with regulatory agency personnel.

B. Documentation

The Site Supervisor shall record the frac-out event in his or her daily log. The log will include the following:

1. Details on the release event, including an estimate of the amount of bentonite released;

- 2. The location and time of release;
- 3. The size of the area impacted, and the success of the remediation action;
- 4. Name and telephone number of person reporting;
- 5. Date;
- 6. How the release occurred;
- 7. The type of activity that was occurring around the area of the frac-out:
- 8. Description of any sensitive areas, and their location in relation to the frac-out;
- 9. Description of the methods used to remediate the site; and
- 10. Listing of the water-related permits for the project.

VIII. Project Completion and Clean-up

1. All materials and any rubbish-construction debris shall be removed from the construction zone at the end of each work day;

2. Sump pits at bore entry and exits will be filled and returned to natural grade; and

3. All protective measures (fiber rolls, straw bale, silt fence, etc.) will be removed unless otherwise specified by the Site Supervisor.

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1/31/2019 2:59:25 PM

in

Case No(s). 18-1607-EL-BGN

Summary: Application - Part 17 of 17 electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC