

Large Filing Separator Sheet

Case Number: 09-1066-EL-BGN

File Date: 12/21/09

Section: 6

Number of Pages: 200

Description of Document: Application

Prairie Creek

WATERBODY DATA SHEET

WATERBODY ID NO: S014CA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 10/15/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH	ROVER FILE:	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO:		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	4 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 25 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	4 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT: None		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING	

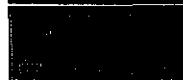
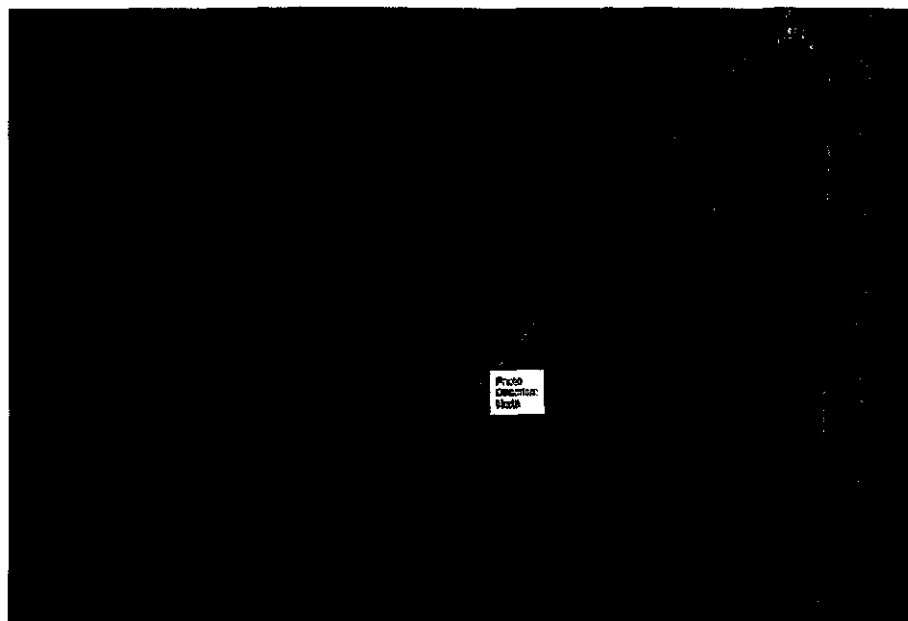
COMMENTS

STREAM QUALITY: Low

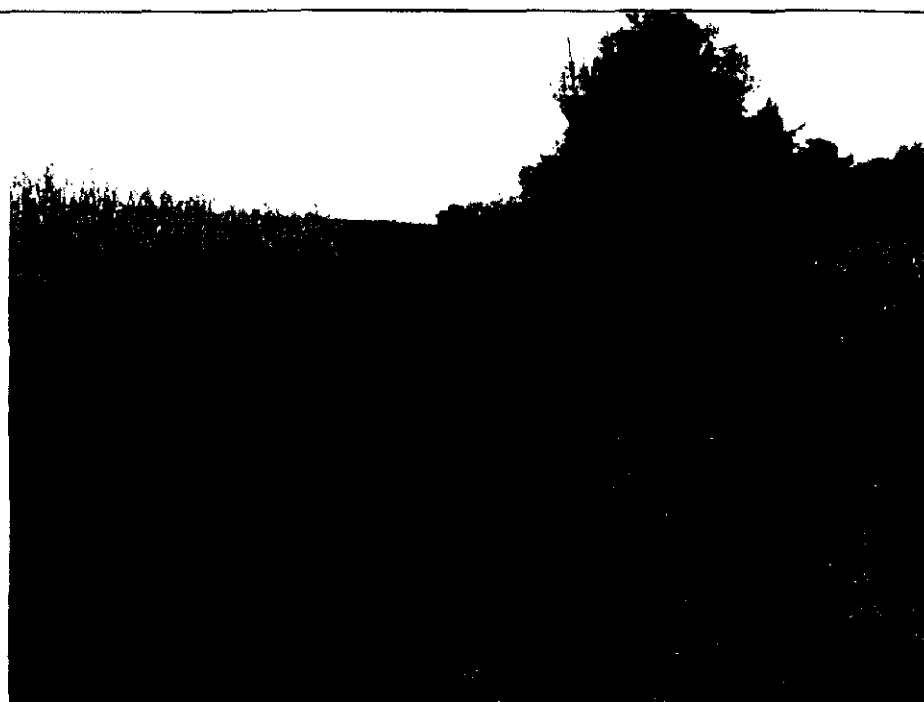
HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levies are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levies restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

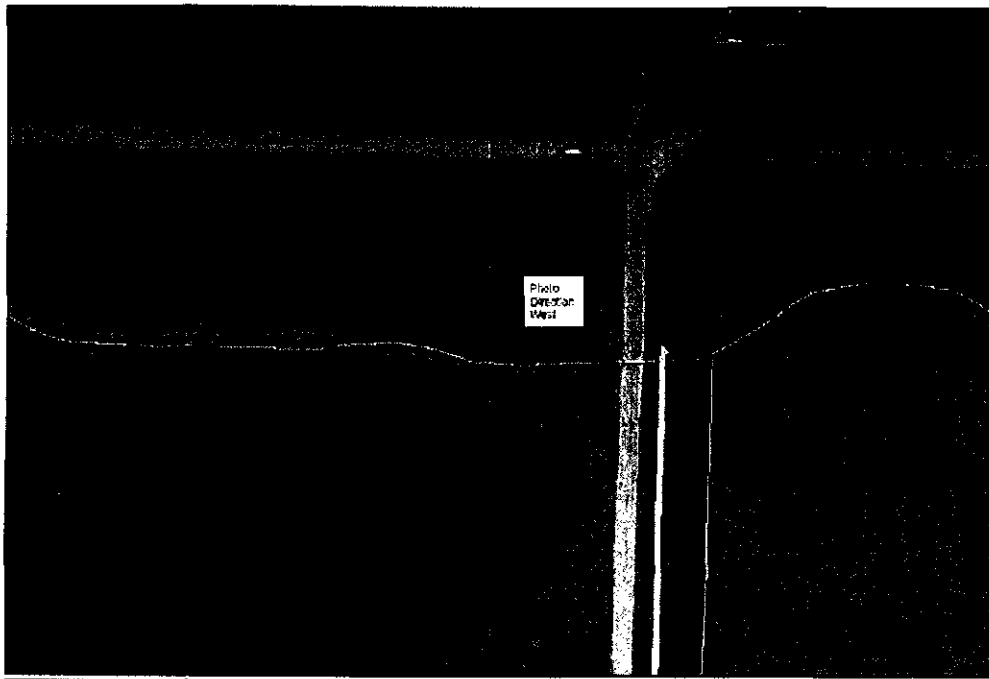
LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levies; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.



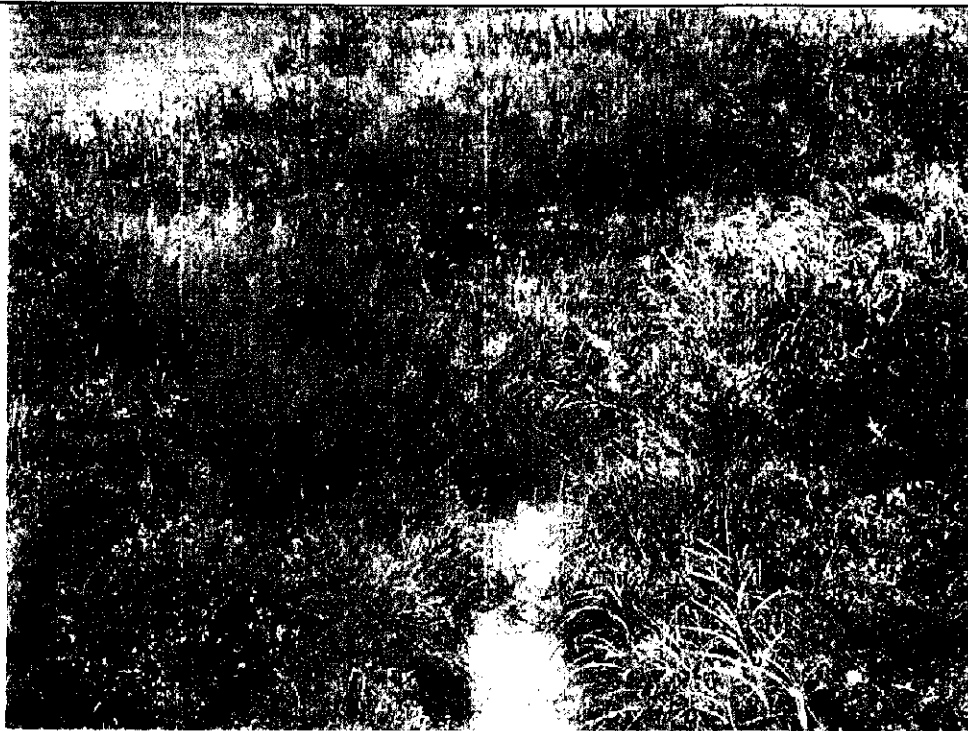
Stream
S014CA



Stream S014CA



Stream
SRICHCA



Stream SRICHCA

WATERBODY DATA SHEET

WATERBODY ID No: SRICHCA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 10/14/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE:	QUAD NAME: Convoy
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO No:	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	2 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	2 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT: None		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: Little Creek

RM: 15.5 Date: 10/14/97

Scorers Full Name & Affiliation:

River Code: -

STORET #: -

Lat./ Long.: 40° 58' 28" N 84° 38' 55" W

Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES <input type="checkbox"/> BLDG/SLABS [10] <input type="checkbox"/> BOULDER [9] <input type="checkbox"/> COBBLE [8] <input type="checkbox"/> GRAVEL [7] <input type="checkbox"/> SAND [6] <input type="checkbox"/> BEDROCK [5]		POOL RIFFLE <input type="checkbox"/> POOL RIFFLE [4] <input type="checkbox"/> DETRITUS [3] <input type="checkbox"/> MUCK [2] <input type="checkbox"/> SILT [2] <input type="checkbox"/> ARTIFICIAL [0]	OTHER TYPES <input type="checkbox"/> HARDPAN [4] <input type="checkbox"/> DETRITUS [3] <input type="checkbox"/> MUCK [2] <input type="checkbox"/> SILT [2] <input type="checkbox"/> ARTIFICIAL [0]	POOL RIFFLE <input type="checkbox"/> POOL RIFFLE [4] <input type="checkbox"/> DETRITUS [3] <input type="checkbox"/> MUCK [2] <input type="checkbox"/> SILT [2] <input type="checkbox"/> ARTIFICIAL [0]	ORIGIN <input type="checkbox"/> LIMESTONE [1] <input type="checkbox"/> TILLS [1] <input type="checkbox"/> WETLANDS [0] <input type="checkbox"/> HARDPAN [0] <input type="checkbox"/> SANDSTONE [0] <input type="checkbox"/> RIP/RAP [0] <input type="checkbox"/> LACUSTURINE [0] <input type="checkbox"/> SHALE [-1] <input type="checkbox"/> COAL FINES [-2]	QUALITY <input type="checkbox"/> HEAVY [-2] <input checked="" type="checkbox"/> MODERATE [-1] <input type="checkbox"/> NORMAL [0] <input type="checkbox"/> FREE [1] <input type="checkbox"/> EXTENSIVE [-2] <input checked="" type="checkbox"/> MODERATE [-1] <input type="checkbox"/> NORMAL [0] <input type="checkbox"/> NONE [1]	SILT <input type="checkbox"/> SILT [1] <input type="checkbox"/> SILT [1] <input type="checkbox"/> SILT [1]	EMBEDDEDNESS <input type="checkbox"/> EMBEDDEDNESS [1] <input type="checkbox"/> EMBEDDEDNESS [1] <input type="checkbox"/> EMBEDDEDNESS [1]	Substrate <div style="border: 1px solid black; padding: 5px; display: inline-block;">14</div> Maximum 20
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NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

<input type="checkbox"/> UNDERCUT BANKS [1] <input checked="" type="checkbox"/> OVERHANGING VEGETATION [1] <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] <input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> POOLS > 70cm [2] <input type="checkbox"/> ROOTWADS [1] <input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> OXBOWS, BACKWATERS [1] <input type="checkbox"/> AQUATIC MACROPHYTES [1] <input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/> EXTENSIVE > 75% [11] <input checked="" type="checkbox"/> MODERATE 25-75% [7] <input type="checkbox"/> SPARSE 5-25% [3] <input type="checkbox"/> NEARLY ABSENT < 5% [1]
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Comments

Cover
Maximum 20

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY <input type="checkbox"/> HIGH [4] <input type="checkbox"/> MODERATE [3] <input checked="" type="checkbox"/> LOW [2] <input type="checkbox"/> NONE [1]	DEVELOPMENT <input type="checkbox"/> EXCELLENT [7] <input type="checkbox"/> GOOD [5] <input checked="" type="checkbox"/> FAIR [3] <input type="checkbox"/> POOR [1]	CHANNELIZATION <input type="checkbox"/> NONE [6] <input type="checkbox"/> RECOVERED [4] <input type="checkbox"/> RECOVERING [3] <input type="checkbox"/> RECENT OR NO RECOVERY [1]	STABILITY <input type="checkbox"/> HIGH [3] <input type="checkbox"/> MODERATE [2] <input checked="" type="checkbox"/> LOW [1]
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Comments

Channel
Maximum 20

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION <input type="checkbox"/> NONE / LITTLE [3] <input type="checkbox"/> MODERATE [2] <input type="checkbox"/> HEAVY / SEVERE [1]	RIPARIAN WIDTH <input type="checkbox"/> WIDE > 50m [4] <input type="checkbox"/> MODERATE 10-50m [3] <input checked="" type="checkbox"/> NARROW 5-10m [2] <input type="checkbox"/> VERY NARROW < 5m [1] <input type="checkbox"/> NONE [0]	FLOOD PLAIN QUALITY <input type="checkbox"/> FOREST, SWAMP [3] <input type="checkbox"/> SHRUB OR OLD FIELD [2] <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] <input checked="" type="checkbox"/> FENCED PASTURE [1] <input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]	CONSERVATION TILLAGE <input type="checkbox"/> CONSERVATION TILLAGE [1] <input type="checkbox"/> URBAN OR INDUSTRIAL [0] <input type="checkbox"/> MINING / CONSTRUCTION [0]
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Comments

Indicate predominant land use(s) past 100m riparian.

Riparian
Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY)

☐ > 1m [6]
☐ 0.7-1m [4]
☐ 0.4-0.7m [2]
☒ 0.2-0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)

☒ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1] ☒ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☒ FAST [1] ☐ INTERMITTENT [-2]
☒ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current
Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH <input checked="" type="checkbox"/> BEST AREAS > 10cm [2] <input type="checkbox"/> BEST AREAS 10cm [1] <input type="checkbox"/> BEST AREAS < 5cm [0]	RUN DEPTH <input type="checkbox"/> MAXIMUM > 50cm [2] <input checked="" type="checkbox"/> MAXIMUM < 50cm [1]	RIFFLE / RUN SUBSTRATE <input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2] <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	RIFFLE / RUN EMBEDDEDNESS <input type="checkbox"/> NONE [2] <input checked="" type="checkbox"/> LOW [1] <input type="checkbox"/> MODERATE [0] <input type="checkbox"/> EXTENSIVE [-1]
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Comments

Riffle / Run
Maximum 8

6] GRADIENT

DRAINAGE AREA

☒ VERY LOW - LOW [2-4]
☐ MODERATE [8-10]
☐ HIGH - VERY HIGH [10-6]

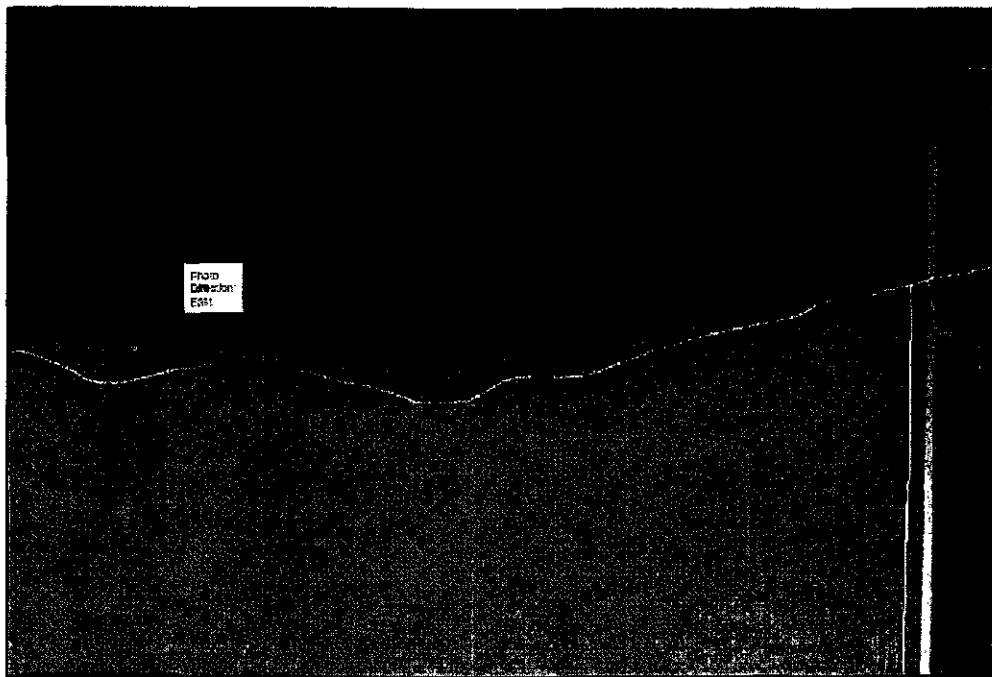
%POOL: 10

%GLIDE: 80%

%RUN: 10%

%RIFFLE: 10%

Gradient
Maximum 10



☐ Photo Location
 USGS NHD Mapped Streams
☒ Stream
☐ Additional Features

Stream
S080AA



Stream S080AA

WATERBODY DATA SHEET

WATERBODY ID NO: S080AA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH	ROVER FILE: RAH091809A.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO: S080cA		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	2 (in)		
AVG. STREAM WIDTH:	3 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Discolored		
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):	12 ft wide to south		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

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Stream & Location: 5080AA (PRAIRIE CREEK)

RM: 14.4 Date: 9/11/91

River Code: - STORET #: -

Scorers Full Name & Affiliation: R. HOOK / CHESA HILL

Lat/Long: 40° 58' 41" N 87° 37' 49" W

Office verified location ☐1] SUBSTRATE Check ONLY Two substrate TYPE BOXES;
estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY	
<input type="checkbox"/>	BLDR/SLABS [10]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>		<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [-2]
<input type="checkbox"/>	BOULDER [9]	<input type="checkbox"/>		<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	TILLS [1]	<input checked="" type="checkbox"/>	MODERATE [-1]
<input type="checkbox"/>	COBBLE [8]	<input type="checkbox"/>		<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input type="checkbox"/>	NORMAL [0]
<input type="checkbox"/>	GRAVEL [7]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	SILT [2]	<input type="checkbox"/>		<input type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [1]
<input type="checkbox"/>	SAND [6]	<input type="checkbox"/>		<input type="checkbox"/>	ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [-2]
<input type="checkbox"/>	BEDROCK [5]	<input type="checkbox"/>		(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	RIPRAP [0]	<input checked="" type="checkbox"/>	MODERATE [-1]
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]								<input type="checkbox"/>	LACUSTURINE [0]	<input type="checkbox"/>	NORMAL [0]
Comments: No riffle/pool - mostly dry channel / intermittent								<input type="checkbox"/>	SHALE [-1]	<input type="checkbox"/>	NONE [1]
								<input type="checkbox"/>	COAL FINES [-2]		

Substrate
Maximum
20
5

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

<input type="checkbox"/>	UNDERCUT BANKS [1]	<input type="checkbox"/>	POOLS > 70cm [2]	<input type="checkbox"/>	OXBOWS, BACKWATERS [1]	<input type="checkbox"/>	EXTENSIVE > 75% [11]
<input type="checkbox"/>	OVERHANGING VEGETATION [1]	<input type="checkbox"/>	ROOTWADS [1]	<input type="checkbox"/>	AQUATIC MACROPHYTES [1]	<input type="checkbox"/>	MODERATE 25-75% [7]
<input type="checkbox"/>	SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	BOULDERS [1]	<input type="checkbox"/>	LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/>	SPARSE 5-25% [3]
<input type="checkbox"/>	ROOTMATS [1]					<input type="checkbox"/>	NEARLY ABSENT < 5% [1]

Cover
Maximum
20
1

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input checked="" type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> NONE [1]	<input checked="" type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Channel
Maximum
20
84] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)
River right looking downstream

EROSION	RIPIARIAN WIDTH	FLOOD PLAIN QUALITY	CONSERVATION TILLAGE
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	
	<input checked="" type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s)
past 100m riparian.Riparian
Maximum
10
3

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)

- ☐ > 1m [6]
☐ 0.7-1m [4]
☐ 0.4-0.7m [2]
☒ 0.2-0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]
☒ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

- ☐ TORRENTIAL [-1] ☒ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ FAST [1] ☒ INTERMITTENT [-2]
☐ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool /
Current
Maximum
12
1

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

RIFFLE DEPTH

RUN DEPTH

RIFFLE / RUN SUBSTRATE

RIFFLE / RUN EMBEDDEDNESS

- ☐ BEST AREAS > 10cm [2] ☐ MAXIMUM > 50cm [2] ☐ STABLE (e.g., Cobble, Boulder) [2]
☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1]
☐ BEST AREAS < 5cm [metric=0] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

- ☐ NONE [2]
☐ LOW [1]
☐ MODERATE [0]
☐ EXTENSIVE [-1]

Riffle /
Run
Maximum
8
-

Comments

6] GRADIENT 0.5 ft/mi ☒ VERY LOW - LOW [2-4]
DRAINAGE AREA 19.3 m² ☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]%POOL: 100% %GLIDE: ☐
%RUN: ☐ %RIFFLE: ☐Gradient
Maximum
10
4

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.

A) SAMPLED REACH

Check ALL that apply

METHOD

☐ POINT

☐ REACH

☐ LINE

☐ OTHER

STAGE

1st sample pass - 2nd

☐ HIGH

☐ UP

☐ NORMAL

☐ LOW

☐ DRY

CLARITY

1st sample pass - 2nd

☐ 4-20 cm

☐ 20-40 cm

☐ 40-70 cm

☐ > 70 cm / OTH

☐ SECCH DEPTH

1st sample pass - 2nd

☐ 1st

☐ 2nd

☐ 3rd

☐ 4th

☐ 5th

☐ 6th

☐ 7th

☐ 8th

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☐ 40th

DISTANCE

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☐ 7th

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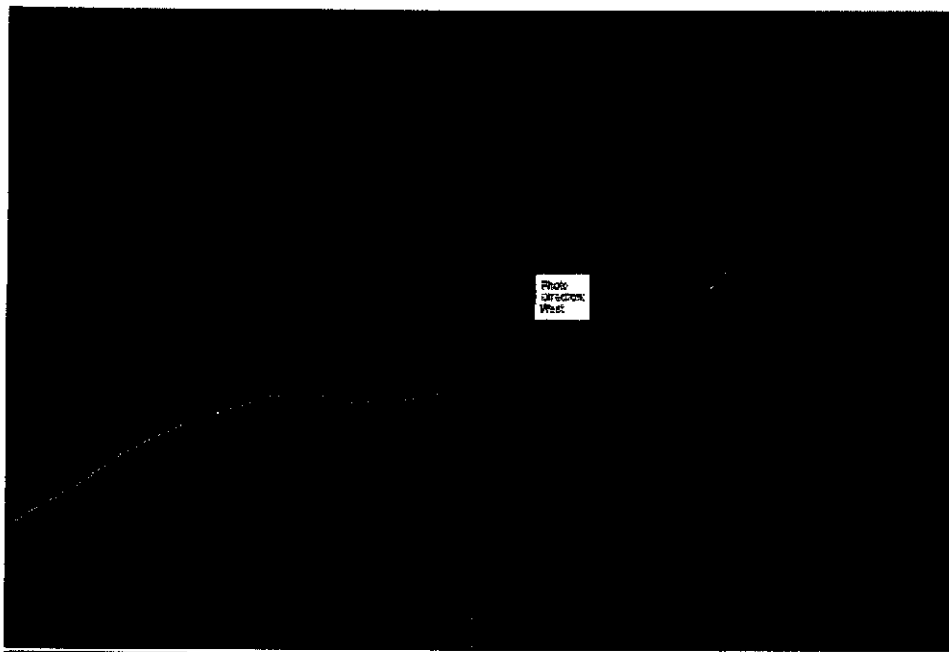
☐ 196th

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Stream
S082CA



Stream S082CA

WATERBODY DATA SHEET

WATERBODY ID NO: S082CA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH	ROVER FILE: RAH091809A.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO: S082CA		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	10 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

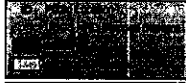
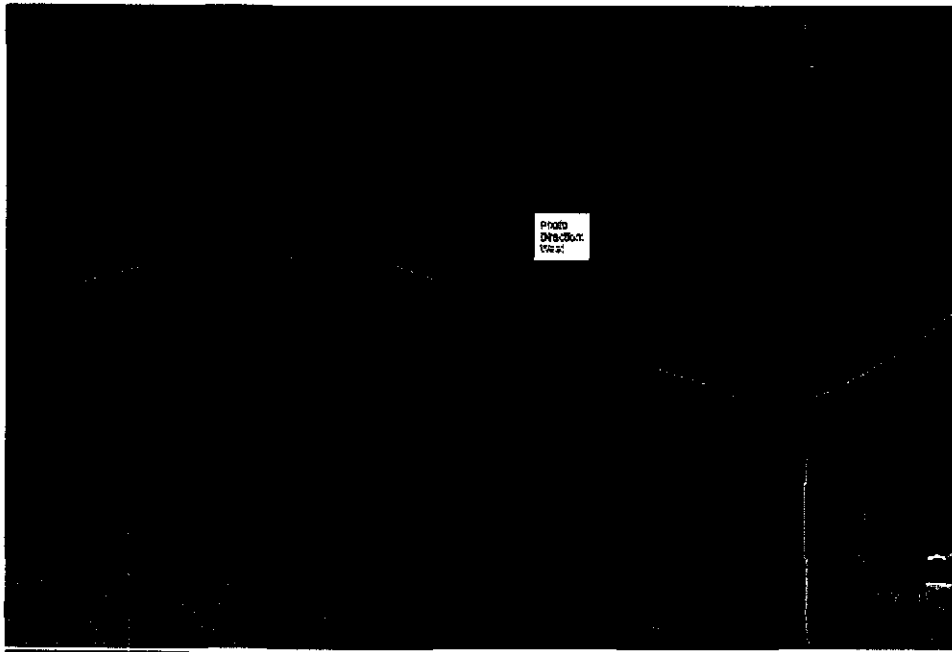
COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; Intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.



Stream
S086CA



Stream S086CA

WATERBODY DATA SHEET

WATERBODY ID NO: S086CA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: S086CA	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 10 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid	
PRIMARY SUBSTRATE:	Sands	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: S 086 CA (PEARIE CREEK) RM: 13.3 Date: 9/17/09Scorers Full Name & Affiliation: R. HOOK / CH2M HILL
River Code: - STORET #: - Lat./ Long.: 40° 58' 54" N 84° 36' 42" W Office verified location ☐1] **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY	
<input type="checkbox"/>	BLDR / SLABS [10]	<input type="checkbox"/>		<input type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>		<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [-2]
<input type="checkbox"/>	BOULDER [9]	<input type="checkbox"/>		<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	TILLS [1]	<input checked="" type="checkbox"/>	MODERATE [-1]
<input checked="" type="checkbox"/>	COBBLE [8]	<input type="checkbox"/>	10%	<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input type="checkbox"/>	NORMAL [0]
<input type="checkbox"/>	GRAVEL [7]	<input type="checkbox"/>		<input type="checkbox"/>	SILT [2]	<input type="checkbox"/>		<input type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [1]
<input checked="" type="checkbox"/>	SAND [6]	<input type="checkbox"/>	90%	<input type="checkbox"/>	ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	SANDSTONE [0]	<input checked="" type="checkbox"/>	EXTENSIVE [-2]
<input type="checkbox"/>	BEDROCK [5]	<input type="checkbox"/>		(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	RIP/RAP [0]	<input type="checkbox"/>	MODERATE [-1]
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more <input checked="" type="checkbox"/> 3 or less <input type="checkbox"/> 0				<input type="checkbox"/>	LACUSTURINE [0]	<input type="checkbox"/>		<input type="checkbox"/>	SHALE [-1]	<input type="checkbox"/>	NORMAL [0]
Comments: <u>Riffle only at ford</u>				<input type="checkbox"/>	COAL FINES [-2]	<input type="checkbox"/>		<input type="checkbox"/>	NONE [1]	Substrate Maximum 12	

2] **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

		AMOUNT	
<input type="checkbox"/>	UNDERCUT BANKS [1]	<input type="checkbox"/>	EXTENSIVE >75% [11]
<input checked="" type="checkbox"/>	OVERHANGING VEGETATION [1]	<input checked="" type="checkbox"/>	MODERATE 25-75% [7]
<input type="checkbox"/>	SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	SPARSE 5-25% [3]
<input type="checkbox"/>	ROOTMATS [1]	<input type="checkbox"/>	NEARLY ABSENT <5% [1]
<input type="checkbox"/>	POOLS > 70cm [2]	<input type="checkbox"/>	
<input type="checkbox"/>	ROOTWADS [1]	<input type="checkbox"/>	
<input type="checkbox"/>	BOULDERS [1]	<input type="checkbox"/>	
<input type="checkbox"/>	LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/>	
Comments: <u>Vegetation largely read canopy grass</u>		Cover Maximum 8	

3] **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input checked="" type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> NONE [1]	<input checked="" type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	
Comments: <u></u>			
Channel Maximum 6			

4] **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)
River right looking downstream

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]
	<input checked="" type="checkbox"/> VERY NARROW < 5m [1]	<input checked="" type="checkbox"/> FENCED PASTURE [1]
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]
		<input type="checkbox"/> CONSERVATION TILLAGE [1]
		<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
		<input type="checkbox"/> MINING / CONSTRUCTION [0]
Comments: <u></u>		Indicate predominant land use(s) past 100m riparian. Riparian Maximum 10

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	(circle one and consent on back)
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input checked="" type="checkbox"/> < 0.2m [0]		<input checked="" type="checkbox"/> MODERATE [1]	
Comments: <u></u>		Indicate for reach - pools and riffles.	Pool / Current Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
Comments: <u></u>			<input checked="" type="checkbox"/> EXTENSIVE [-1]
			Riffle / Run Maximum 8

6] GRADIENT <u>2.5</u> ft/mi	<input checked="" type="checkbox"/> VERY LOW - LOW [2-4]	%POOL: <u>0</u>	%GLIDE: <u>90%</u>	Gradient Maximum 10
DRAINAGE AREA <u>13.1</u> mi ²	<input type="checkbox"/> MODERATE [6-10]	%RUN: <u>0</u>	%RIFFLE: <u>10%</u>	

Comment RE: Reach consistency/ is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

AJ SAMPLED REACH

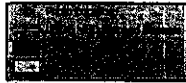
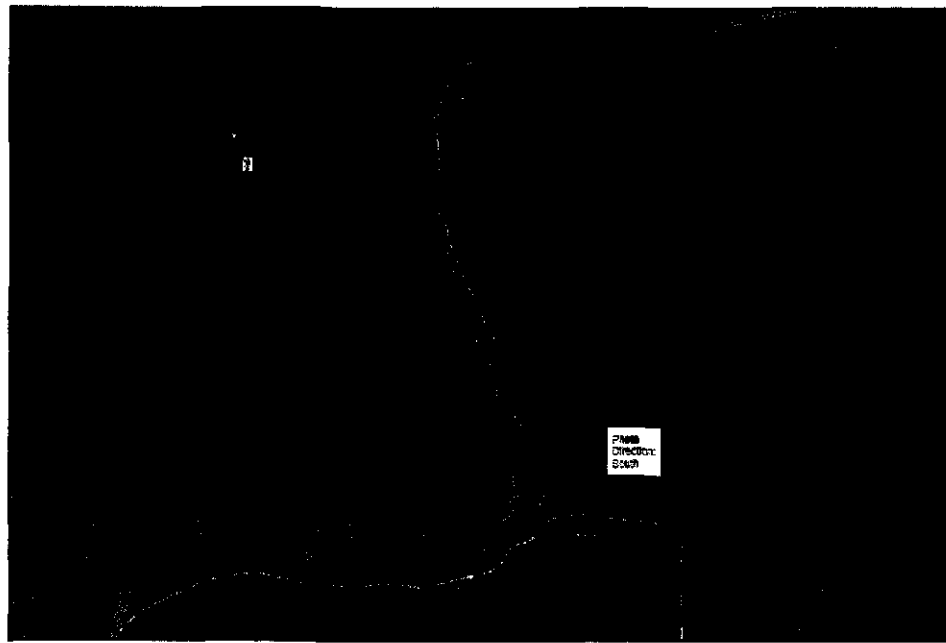
Check ALL that apply

METHOD

STAGE
1st sample point - 2nd
☐ BOAT ☐ HIGH ☐
☐ WALK ☐ UP ☐
☐ L-CLIM ☐ NORMAL ☐
☐ SWIM ☐ LOW ☐
☐ DIVE ☐ DRY ☐

DISTANCE

CLARITY
1st sample point - 2nd
☐ 1-2 ft ☐ 2-3 ft ☐ 3-4 ft ☐ 4-5 ft ☐ 5-6 ft ☐ 6-7 ft ☐ 7-8 ft ☐ 8-9 ft ☐ 9-10 ft ☐ 10-11 ft ☐ 11-12 ft ☐ 12-13 ft ☐ 13-14 ft ☐ 14-15 ft ☐ 15-16 ft ☐ 16-17 ft ☐ 17-18 ft ☐ 18-19 ft ☐ 19-20 ft ☐ 20-21 ft ☐ 21-22 ft ☐ 22-23 ft ☐ 23-24 ft ☐ 24-25 ft ☐ 25-26 ft ☐ 26-27 ft ☐ 27-28 ft ☐ 28-29 ft ☐ 29-30 ft ☐ 30-31 ft ☐ 31-32 ft ☐ 32-33 ft ☐ 33-34 ft ☐ 34-35 ft ☐ 35-36 ft ☐ 36-37 ft ☐ 37-38 ft ☐ 38-39 ft ☐ 39-40 ft ☐ 40-41 ft ☐ 41-42 ft ☐ 42-43 ft ☐ 43-44 ft ☐ 44-45 ft ☐ 45-46 ft ☐ 46-47 ft ☐ 47-48 ft ☐ 48-49 ft ☐ 49-50 ft ☐ 50-51 ft ☐ 51-52 ft ☐ 52-53 ft ☐ 53-54 ft ☐ 54-55 ft ☐ 55-56 ft ☐ 56-57 ft ☐ 57-58 ft ☐ 58-59 ft ☐ 59-60 ft ☐ 60-61 ft ☐ 61-62 ft ☐ 62-63 ft ☐ 63-64 ft ☐ 64-65 ft ☐ 65-66 ft ☐ 66-67 ft ☐ 67-68 ft ☐ 68-69 ft ☐ 69-70 ft ☐ 70-71 ft ☐ 71-72 ft ☐ 72-73 ft ☐ 73-74 ft ☐ 74-75 ft ☐ 75-76 ft ☐ 76-77 ft ☐ 77-78 ft ☐ 78-79 ft ☐ 79-80 ft ☐ 80-81 ft ☐ 81-82 ft ☐ 82-83 ft ☐ 83-84 ft ☐ 84-85 ft ☐ 85-86 ft ☐ 86-87 ft ☐ 87-88 ft ☐ 88-89 ft ☐ 89-90 ft ☐ 90-91 ft ☐ 91-92 ft ☐ 92-93 ft ☐ 93-94 ft ☐ 94-95 ft ☐ 95-96 ft ☐ 96-97 ft ☐ 97-98 ft ☐ 98-99 ft ☐ 99-100 ft ☐ 100-101 ft ☐ 101-102 ft ☐ 102-103 ft ☐ 103-104 ft ☐ 104-105 ft ☐ 105-106 ft ☐ 106-107 ft ☐ 107-108 ft ☐ 108-109 ft ☐ 109-110 ft ☐ 110-111 ft ☐ 111-112 ft ☐ 112-113 ft ☐ 113-114 ft ☐ 114-115 ft ☐ 115-116 ft ☐ 116-117 ft ☐ 117-118 ft ☐ 118-119 ft ☐ 119-120 ft ☐ 120-121 ft ☐ 121-122 ft ☐ 122-123 ft ☐ 123-124 ft ☐ 124-125 ft ☐ 125-126 ft ☐ 126-127 ft ☐ 127-128 ft ☐ 128-129 ft ☐ 129-130 ft ☐ 130-131 ft ☐ 131-132 ft ☐ 132-133 ft ☐ 133-134 ft ☐ 134-135 ft ☐ 135-136 ft ☐ 136-137 ft ☐ 137-138 ft ☐ 138-139 ft ☐ 139-140 ft ☐ 140-141 ft ☐ 141-142 ft ☐ 142-143 ft ☐ 143-144 ft ☐ 144-145 ft ☐ 145-146 ft ☐ 146-147 ft ☐ 147-148 ft ☐ 148-149 ft ☐ 149-150 ft ☐ 150-151 ft ☐ 151-152 ft ☐ 152-153 ft ☐ 153-154 ft ☐ 154-155 ft ☐ 155-156 ft ☐ 156-157 ft ☐ 157-158 ft ☐ 158-159 ft ☐ 159-160 ft ☐ 160-161 ft ☐ 161-162 ft ☐ 162-163 ft ☐ 163-164 ft ☐ 164-165 ft ☐ 165-166 ft ☐ 166-167 ft ☐ 167-168 ft ☐ 168-169 ft ☐ 169-170 ft ☐ 170-171 ft ☐ 171-172 ft ☐ 172-173 ft ☐ 173-174 ft ☐ 174-175 ft ☐ 175-176 ft ☐ 176-177 ft ☐ 177-178 ft ☐ 178-179 ft ☐ 179-180 ft ☐ 180-181 ft ☐ 181-182 ft ☐ 182-183 ft ☐ 183-184 ft ☐ 184-185 ft ☐ 185-186 ft ☐ 186-187 ft ☐ 187-188 ft ☐ 188-189 ft ☐ 189-190 ft ☐ 190-191 ft ☐ 191-192 ft ☐ 192-193 ft ☐ 193-194 ft ☐ 194-195 ft ☐ 195-196 ft ☐ 196-197 ft ☐ 197-198 ft ☐ 198-199 ft ☐ 199-200 ft ☐ 200-201 ft ☐ 201-202 ft ☐ 202-203 ft ☐ 203-204 ft ☐ 204-205 ft ☐ 205-206 ft ☐ 206-207 ft ☐ 207-208 ft ☐ 208-209 ft ☐ 209-210 ft ☐ 210-211 ft ☐ 211-212 ft ☐ 212-213 ft ☐ 213-214 ft ☐ 214-215 ft ☐ 215-216 ft ☐ 216-217 ft ☐ 217-218 ft ☐ 218-219 ft ☐ 219-220 ft ☐ 220-221 ft ☐ 221-222 ft ☐ 222-223 ft ☐ 223-224 ft ☐ 224-225 ft ☐ 225-226 ft ☐ 226-227 ft ☐ 227-228 ft ☐ 228-229 ft ☐ 229-230 ft ☐ 230-231 ft ☐ 231-232 ft ☐ 232-233 ft ☐ 233-234 ft ☐ 234-235 ft ☐ 235-236 ft ☐ 236-237 ft ☐ 237-238 ft ☐ 238-239 ft ☐ 239-240 ft ☐ 240-241 ft ☐ 241-242 ft ☐ 242-243 ft ☐ 243-244 ft ☐ 244-245 ft ☐ 245-246 ft ☐ 246-247 ft ☐ 247-248 ft ☐ 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325-326 ft ☐ 326-327 ft ☐ 327-328 ft ☐ 328-329 ft ☐ 329-330 ft ☐ 330-331 ft ☐ 331-332 ft ☐ 332-333 ft ☐ 333-334 ft ☐ 334-335 ft ☐ 335-336 ft ☐ 336-337 ft ☐ 337-338 ft ☐ 338-339 ft ☐ 339-340 ft ☐ 340-341 ft ☐ 341-342 ft ☐ 342-343 ft ☐ 343-344 ft ☐ 344-345 ft ☐ 345-346 ft ☐ 346-347 ft ☐ 347-348 ft ☐ 348-349 ft ☐ 349-350 ft ☐ 350-351 ft ☐ 351-352 ft ☐ 352-353 ft ☐ 353-354 ft ☐ 354-355 ft ☐ 355-356 ft ☐ 356-357 ft ☐ 357-358 ft ☐ 358-359 ft ☐ 359-360 ft ☐ 360-361 ft ☐ 361-362 ft ☐ 362-363 ft ☐ 363-364 ft ☐ 364-365 ft ☐ 365-366 ft ☐ 366-367 ft ☐ 367-368 ft ☐ 368-369 ft ☐ 369-370 ft ☐ 370-371 ft ☐ 371-372 ft ☐ 372-373 ft ☐ 373-374 ft ☐ 374-375 ft ☐ 375-376 ft ☐ 376-377 ft ☐ 377-378 ft ☐ 378-379 ft ☐ 379-380 ft ☐ 380-381 ft ☐ 381-382 ft ☐ 382-383 ft ☐ 383-384 ft ☐ 384-385 ft ☐ 385-386 ft ☐ 386-387 ft ☐ 387-388 ft ☐ 388-389 ft ☐ 389-390 ft ☐ 390-391 ft ☐ 391-392 ft ☐ 392-393 ft ☐ 393-394 ft ☐ 394-395 ft ☐ 395-396 ft ☐ 396-397 ft ☐ 397-398 ft ☐ 398-399 ft ☐ 399-400 ft ☐ 400-401 ft ☐ 401-402 ft ☐ 402-403 ft ☐ 403-404 ft ☐ 404-405 ft ☐ 405-406 ft ☐ 406-407 ft ☐ 407-408 ft ☐ 408-409 ft ☐ 409-410 ft ☐ 410-411 ft ☐ 411-412 ft ☐ 412-413 ft ☐ 413-414 ft ☐ 414-415 ft ☐ 415-416 ft ☐ 416-417 ft ☐ 417-418 ft ☐ 418-419 ft ☐ 419-420 ft ☐ 420-421 ft ☐ 421-422 ft ☐ 422-423 ft ☐ 423-424 ft ☐ 424-425 ft ☐ 425-426 ft ☐ 426-427 ft ☐ 427-428 ft ☐ 428-429 ft ☐ 429-430 ft ☐ 430-431 ft ☐ 431-432 ft ☐ 432-433 ft ☐ 433-434 ft ☐ 434-435 ft ☐ 435-436 ft ☐ 436-437 ft ☐ 437-438 ft ☐ 438-439 ft ☐ 439-440 ft ☐ 440-441 ft ☐ 441-442 ft ☐ 442-443 ft ☐ 443-444 ft ☐ 444-445 ft ☐ 445-446 ft ☐ 446-447 ft ☐ 447-448 ft ☐ 448-449 ft ☐ 449-450 ft ☐ 450-451 ft ☐ 451-452 ft ☐ 452-453 ft ☐ 453-454 ft ☐ 454-455 ft ☐ 455-456 ft ☐ 456-457 ft ☐ 457-458 ft ☐ 458-459 ft ☐ 459-460 ft ☐ 460-461 ft ☐ 461-462 ft ☐ 462-463 ft ☐ 463-464 ft ☐ 464-465 ft ☐ 465-466 ft ☐ 466-467 ft ☐ 467-468 ft ☐ 468-469 ft ☐ 469-470 ft ☐ 470-471 ft ☐ 471-472 ft ☐ 472-473 ft ☐ 473-474 ft ☐ 474-475 ft ☐ 475-476 ft ☐ 476-477 ft ☐ 477-478 ft ☐ 478-479 ft ☐ 479-480 ft ☐ 480-481 ft ☐ 481-482 ft ☐ 482-483 ft ☐ 483-484 ft ☐ 484-485 ft ☐ 485-486 ft ☐ 486-487 ft ☐ 487-488 ft ☐ 488-489 ft ☐ 489-490 ft ☐ 490-491 ft ☐ 491-492 ft ☐ 492-493 ft ☐ 493-494 ft ☐ 494-495 ft ☐ 495-496 ft ☐ 496-497 ft ☐ 497-498 ft ☐ 498-499 ft ☐ 499-500 ft ☐ 500-501 ft ☐ 501-502 ft ☐ 502-503 ft ☐ 503-504 ft ☐ 504-505 ft ☐ 505-506 ft ☐ 506-507 ft ☐ 507-508 ft ☐ 508-509 ft ☐ 509-510 ft ☐ 510-511 ft ☐ 511-512 ft ☐ 512-513 ft ☐ 513-514 ft ☐ 514-515 ft ☐ 515-516 ft ☐ 516-517 ft ☐ 517-518 ft ☐ 518-519 ft ☐ 519-520 ft ☐ 520-521 ft ☐ 521-522 ft ☐ 522-523 ft ☐ 523-524 ft ☐ 524-525 ft ☐ 525-526 ft ☐ 526-527 ft ☐ 527-528 ft ☐ 528-529 ft ☐ 529-530 ft ☐ 530-531 ft ☐ 531-532 ft ☐ 532-533 ft ☐ 533-534 ft ☐ 534-535 ft ☐ 535-536 ft ☐ 536-537 ft ☐ 537-538 ft ☐ 538-539 ft ☐ 539-540 ft ☐ 540-541 ft ☐ 541-542 ft ☐ 542-543 ft ☐ 543-544 ft ☐ 544-545 ft ☐ 545-546 ft ☐ 546-547 ft ☐ 547-548 ft ☐ 548-549 ft ☐ 549-550 ft ☐ 550-551 ft ☐ 551-552 ft ☐ 552-553 ft ☐ 553-554 ft ☐ 554-555 ft ☐ 555-556 ft ☐ 556-557 ft ☐ 557-558 ft ☐ 558-559 ft ☐ 559-560 ft ☐ 560-561 ft ☐ 561-562 ft ☐ 562-563 ft ☐ 563-564 ft ☐ 564-565 ft ☐ 565-566 ft ☐ 566-567 ft ☐ 567-568 ft ☐ 568-569 ft ☐ 569-570 ft ☐ 570-571 ft ☐ 571-572 ft ☐ 572-573 ft ☐ 573-574 ft ☐ 574-575 ft ☐ 575-576 ft ☐ 576-577 ft ☐ 577-578 ft ☐ 578-579 ft ☐ 579-580 ft ☐ 580-581 ft ☐ 581-582 ft ☐ 582-583 ft ☐ 583-584 ft ☐ 584-585 ft ☐ 585-586 ft ☐ 586-587 ft ☐ 587-588 ft ☐ 588-589 ft ☐ 589-590 ft ☐ 590-591 ft ☐ 591-592 ft ☐ 592-593 ft ☐ 593-594 ft ☐ 594-595 ft ☐ 595-596 ft ☐ 596-597 ft ☐ 597-598 ft ☐ 598-599 ft ☐ 599-600 ft ☐ 600-601 ft ☐ 601-602 ft ☐ 602-603 ft ☐ 603-604 ft ☐ 604-605 ft ☐ 605-606 ft ☐ 606-607 ft ☐ 607-608 ft ☐ 608-609 ft ☐ 609-610 ft ☐ 610-611 ft ☐ 611-612 ft ☐ 612-613 ft ☐ 613-614 ft ☐ 614-615 ft ☐ 615-616 ft ☐ 616-617 ft ☐ 617-618 ft ☐ 618-619 ft ☐ 619-620 ft ☐ 620-621 ft ☐ 621-622 ft ☐ 622-623 ft ☐ 623-624 ft ☐ 624-625 ft ☐ 625-626 ft ☐ 626-627 ft ☐ 627-628 ft ☐ 628-629 ft ☐ 629-630 ft ☐ 630-631 ft ☐ 631-632 ft ☐ 632-633 ft ☐ 633-634 ft ☐ 634-635 ft ☐ 635-636 ft ☐ 636-637 ft ☐ 637-638 ft ☐ 638-639 ft ☐ 639-640 ft ☐ 640-641 ft ☐ 641-642 ft ☐ 642-643 ft ☐ 643-644 ft ☐ 644-645 ft ☐ 645-646 ft ☐ 646-647 ft ☐ 647-648 ft ☐ 648-649 ft ☐ 649-650 ft ☐ 650-651 ft ☐ 651-652 ft ☐ 652-653 ft ☐ 653-654 ft ☐ 654-655 ft ☐ 655-656 ft ☐ 656-657 ft ☐ 657-658 ft ☐ 658-659 ft ☐ 659-660 ft ☐ 660-661 ft ☐ 661-662 ft ☐ 662-663 ft ☐ 663-664 ft ☐ 664-665 ft ☐ 665-666 ft ☐ 666-667 ft ☐ 667-668 ft ☐ 668-669 ft ☐ 669-670 ft ☐ 670-671 ft ☐ 671-672 ft ☐ 672-673 ft ☐ 673-674 ft ☐ 674-675 ft ☐ 675-676 ft ☐ 676-677 ft ☐ 677-678 ft ☐ 678-679 ft ☐ 679-680 ft ☐ 680-681 ft ☐ 681-682 ft ☐ 682-683 ft ☐ 683-684 ft ☐ 684-685 ft ☐ 685-686 ft ☐ 686-687 ft ☐ 687-688 ft ☐ 688-689 ft ☐ 689-690 ft ☐ 690-691 ft ☐ 691-692 ft ☐ 692-693 ft ☐ 693-694 ft ☐ 694-695 ft ☐ 695-696 ft ☐ 696-697 ft ☐ 697-698 ft ☐ 698-699 ft ☐ 699-700 ft ☐ 700-701 ft ☐ 701-702 ft ☐ 702-703 ft ☐ 703-704 ft ☐ 704-705 ft ☐ 705-706 ft ☐ 706-707 ft ☐ 707-708 ft ☐ 708-709 ft ☐ 709-710 ft ☐ 710-711 ft ☐ 711-712 ft ☐ 712-713 ft ☐ 713-714 ft ☐ 714-715 ft ☐ 715-716 ft ☐ 716-717 ft ☐ 717-718 ft ☐ 718-719 ft ☐ 719-720 ft ☐ 720-721 ft ☐ 721-722 ft ☐ 722-723 ft ☐ 723-724 ft ☐ 724-725 ft ☐ 725-726 ft ☐ 726-727 ft ☐ 727-728 ft ☐ 728-729 ft ☐ 729-730 ft ☐ 730-731 ft ☐ 731-732 ft ☐ 732-733 ft ☐ 733-734 ft ☐ 734-735 ft ☐ 735-736 ft ☐ 736-737 ft ☐ 737-738 ft ☐ 738-739 ft ☐ 739-740 ft ☐ 740-741 ft ☐ 741-742 ft ☐ 742-743 ft ☐ 743-744 ft ☐ 744-745 ft ☐ 745-746 ft ☐ 746-747 ft ☐ 747-748 ft ☐ 748-749 ft ☐ 749-750 ft ☐ 750-751 ft ☐ 751-752 ft ☐ 752-753 ft ☐ 753-754 ft ☐ 754-755 ft ☐ 755-756 ft ☐ 756-757 ft ☐ 757-758 ft ☐ 758-759 ft ☐ 759-760 ft ☐ 760-761 ft ☐ 761-762 ft ☐ 762-763 ft ☐ 763-764 ft ☐ 764-765 ft ☐ 765-766 ft ☐ 766-767 ft ☐ 767-768 ft ☐ 768-769 ft ☐ 769-770 ft ☐ 770-771 ft ☐ 771-772 ft ☐ 772-773 ft ☐ 773-774 ft ☐ 774-775 ft ☐ 775-776 ft ☐ 776-777 ft ☐ 777-778 ft ☐ 778-779 ft ☐ 779-780 ft ☐ 780-781 ft ☐ 781-782 ft ☐ 782-783 ft ☐ 783-784 ft ☐ 784-785 ft ☐ 785-786 ft ☐ 786-787 ft ☐ 787-788 ft ☐ 788-789 ft ☐ 789-790 ft ☐ 790-791 ft ☐ 791-792 ft ☐ 792-793 ft ☐ 793-794 ft ☐ 794-795 ft ☐ 795-796 ft ☐ 796-797 ft ☐ 797-798 ft ☐ 798-799 ft ☐ 799-800 ft ☐ 800-801 ft ☐ 801-802 ft ☐ 802-803 ft ☐ 803-804 ft ☐ 804-805 ft ☐ 805-806 ft ☐ 806-807 ft ☐ 807-808 ft ☐ 808-809 ft ☐ 809-810 ft



Stream
S098CA



Stream S098CA

WATERBODY DATA SHEET

WATERBODY ID NO: S098CA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH091709A.cor	QUAD NAME: Scott	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO:		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Stream		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	9 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 30 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Sands	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)	
	TYPE OF VEGETATION PRESENT: Herbaceous	
WETLAND FRINGE (IF PRESENT):	Phalaris arundinacea	
CHANNEL CONDITION:		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

channelized

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: 598 CA (PRAIRIE CREEK) RM: 12.6 Date: 9/17/09

Scorers Full Name & Affiliation: RITONK / CHLM HILL
 River Code: - STORET #: - Lat./ Long.: 40° 59' 16" N 84° 36' 13" W Office verified location ☐

1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL RIFFLE	OTHER TYPES	POOL RIFFLE	ORIGIN	QUALITY
<input type="checkbox"/> BDR/SLABS [10]	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> HEAVY [-2]	SILT BEDDEDNESS Substrate 12 Maximum 20
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> MODERATE [-1]	
<input checked="" type="checkbox"/> COBBLE [8]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> NORMAL [0]	
<input type="checkbox"/> GRAVEL [7]		<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> FREE [1]	
<input type="checkbox"/> SAND [6]		<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> EXTENSIVE [-2]	
<input type="checkbox"/> BEDROCK [5]		<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> MODERATE [-1]	
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]				<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> NORMAL [0]
Comments: <u>14.8 mi</u>					

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.)

<input checked="" type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	AMOUNT
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	Check ONE (Or 2 & average)
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/> EXTENSIVE >75% [11]
<input type="checkbox"/> ROOTMATS [1]			<input checked="" type="checkbox"/> MODERATE 25-75% [7]
			<input type="checkbox"/> SPARSE 5-25% [3]
			<input type="checkbox"/> NEARLY ABSENT <5% [1]
Comments:			Cover Maximum 20 <u>9</u>

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input checked="" type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	
Comments:			Channel Maximum 20 <u>11</u>

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]
	<input checked="" type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]
Comments:		Indicate predominant land use(s) past 100m riparian.
		Riparian Maximum 10 <u>2.5</u>

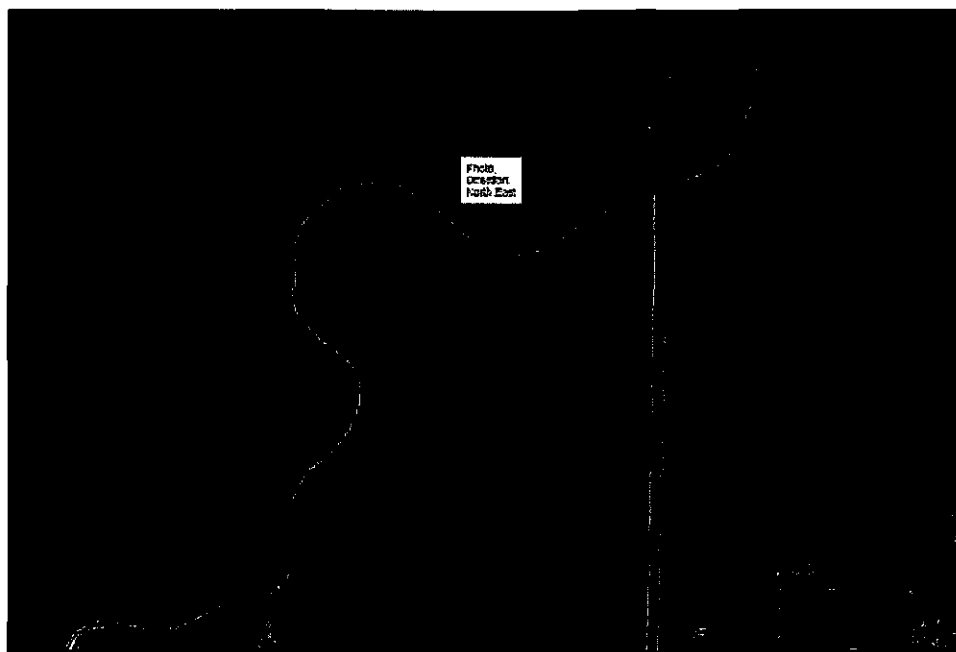
5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)
Check ONE (ONLY)	Check ONE (Or 2 & average)	Check ALL that apply	
<input type="checkbox"/> > 1m [6]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	<input type="checkbox"/> INTERSTITIAL [-1]
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	<input type="checkbox"/> INTERMITTENT [-2]
<input checked="" type="checkbox"/> < 0.2m [0]		<input checked="" type="checkbox"/> MODERATE [1]	<input type="checkbox"/> EDDIES [1]
Comments:			Pool / Current Maximum 12 <u>4</u>

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average).

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 60cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
Comments:			Riffle / Run Maximum 8 <u>-</u>

6) **GRADIENT** 2.5 ft/mi ☒ VERY LOW - LOW [2-4] %POOL: 0 %GLIDE: 100
DRAINAGE AREA 14.8 mi² ☐ MODERATE [8-10] %RUN: 0 %RIFFLE: 0
☐ HIGH - VERY HIGH [10-6] Gradient Maximum 10 4



Stream
S145CA



Stream S145CA

WATERBODY DATA SHEET

WATERBODY ID NO: S145CA-1		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D. West, M. Nechvatal		ROVER FILE: R091709ADW.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Paulding		TOWNSHIP.: Blue Creek	
		PHOTO NO: 094C31n & 094C32SW	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Fairly wide natural channel, likely some manipulation for drainage from ag fields directly adj		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	13 (ft)	TOP OF BANK: 15 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	3 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid		
PRIMARY SUBSTRATE:	Cobbles		
POTENTIAL HABITAT FOR:	Fish/Spawn Areas		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)		
	TYPE OF VEGETATION PRESENT: Scrub Shrub		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Sloughing Banks		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY MEANDERING	

COMMENTS

collector line to turbine 094 crosses S145CA at this point; stream runs between ag fields

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

WATERBODY DATA SHEET

WATERBODY ID NO: S145CA-2		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091709ADW.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Blue Creek	
		PHOTO NO: 095C27nE & 095C28SW	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Fairly wide natural channel, likely some manipulation for drainage from ag fields directly adj		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	15 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	4 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid		
PRIMARY SUBSTRATE:	Cobbles		
POTENTIAL HABITAT FOR:	Fish/Spawn Areas		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD FLAN: 5 (ft)		
	TYPE OF VEGETATION PRESENT: Scrub Shrub		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Highly Erodable		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

collector line to turbine 095 crosses S145CA at this point; stream runs between ag fields

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness; submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

WATERBODY DATA SHEET

WATERBODY ID NO: S145CA-3		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091709ADW.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Paulding		TOWNSHIP.: Blue Creek	
		PHOTO NO: 145C23n & 145C24S	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Fairly wide natural channel, likely some manipulation for drainage from ag fields directly adj		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	15 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	4 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid	
PRIMARY SUBSTRATE:	Cobbles	
POTENTIAL HABITAT FOR:	Fish/Spawn Areas	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)	
	TYPE OF VEGETATION PRESENT: Scrub Shrub	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Highly Erodable	
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

collector line to turbine 145 crosses S145CA; stream runs between ag fields

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; little regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: SLUSCOARM: --- Date: 09/11/09Scorers Full Name & Affiliation: MATT NICHOLSONRiver Code: - STORET #: ---Lat./Long.: 40.99736 184.59231Office verified location: C1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE	
<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SAND	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SAND	<input type="checkbox"/> HARDPAN	<input type="checkbox"/> DETRITUS	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SAND
<input type="checkbox"/> SILT	<input type="checkbox"/> CLAY	<input type="checkbox"/> SILT	<input type="checkbox"/> CLAY	<input type="checkbox"/> SILT	<input type="checkbox"/> CLAY	<input type="checkbox"/> SILT	<input type="checkbox"/> CLAY
<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE
<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL

(Score natural substrates; ignore

NUMBER OF BEST TYPES: ☐ 0 ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Comments

ORIGIN		QUALITY	
<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SAND	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SAND
<input type="checkbox"/> SILT	<input type="checkbox"/> CLAY	<input type="checkbox"/> SILT	<input type="checkbox"/> CLAY
<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE
<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL	<input type="checkbox"/> ARTIFICIAL

SILT

EMBEDDEDNESS

Substrate
Maximum
20
11.52) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

COVER		AMOUNT	
<input type="checkbox"/> NONE	<input type="checkbox"/> NONE	<input type="checkbox"/> EXTENSIVE	<input type="checkbox"/> MODERATE
<input type="checkbox"/> SPARSE	<input type="checkbox"/> NEARLY ABSENT	<input type="checkbox"/> SPARSE	<input type="checkbox"/> NEARLY ABSENT

Comments

Cover
Maximum
20
133) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> NONE	<input type="checkbox"/> EXCELLENT	<input checked="" type="checkbox"/> NONE	<input checked="" type="checkbox"/> HIGH
<input type="checkbox"/> POOR	<input type="checkbox"/> POOR	<input type="checkbox"/> RECOVERING	<input type="checkbox"/> MODERATE
<input type="checkbox"/> NONE	<input type="checkbox"/> POOR	<input type="checkbox"/> RECOVERING	<input type="checkbox"/> LOW

Comments

Channel
Maximum
20
14.54) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> NONE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> FOREST / SWAMP	<input type="checkbox"/> CONSERVATION / WETLAND
<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> SHRUB / OPEN PASTURE	<input type="checkbox"/> URBAN / INDUSTRIAL
<input type="checkbox"/> HEAVY / SEVERE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> RESIDENTIAL / PARK / RECREATION	<input type="checkbox"/> MINING / CONSTRUCTION

Comments

Indicate predominant land use(s) past 100m riparian.

Riparian
Maximum
10
4.755) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH

Check ONE (ONLY!)

<input type="checkbox"/> 0.1-0.2m
<input type="checkbox"/> 0.2-0.3m
<input type="checkbox"/> 0.3-0.4m
<input type="checkbox"/> 0.4-0.5m
<input type="checkbox"/> 0.5-0.6m
<input type="checkbox"/> 0.6-0.7m
<input type="checkbox"/> 0.7-0.8m
<input type="checkbox"/> 0.8-0.9m
<input type="checkbox"/> 0.9-1.0m
<input type="checkbox"/> 1.0-1.1m
<input type="checkbox"/> 1.1-1.2m
<input type="checkbox"/> 1.2-1.3m
<input type="checkbox"/> 1.3-1.4m
<input type="checkbox"/> 1.4-1.5m
<input type="checkbox"/> 1.5-1.6m
<input type="checkbox"/> 1.6-1.7m
<input type="checkbox"/> 1.7-1.8m
<input type="checkbox"/> 1.8-1.9m
<input type="checkbox"/> 1.9-2.0m
<input type="checkbox"/> 2.0-2.1m
<input type="checkbox"/> 2.1-2.2m
<input type="checkbox"/> 2.2-2.3m
<input type="checkbox"/> 2.3-2.4m
<input type="checkbox"/> 2.4-2.5m
<input type="checkbox"/> 2.5-2.6m
<input type="checkbox"/> 2.6-2.7m
<input type="checkbox"/> 2.7-2.8m
<input type="checkbox"/> 2.8-2.9m
<input type="checkbox"/> 2.9-3.0m
<input type="checkbox"/> 3.0-3.1m
<input type="checkbox"/> 3.1-3.2m
<input type="checkbox"/> 3.2-3.3m
<input type="checkbox"/> 3.3-3.4m
<input type="checkbox"/> 3.4-3.5m
<input type="checkbox"/> 3.5-3.6m
<input type="checkbox"/> 3.6-3.7m
<input type="checkbox"/> 3.7-3.8m
<input type="checkbox"/> 3.8-3.9m
<input type="checkbox"/> 3.9-4.0m
<input type="checkbox"/> 4.0-4.1m
<input type="checkbox"/> 4.1-4.2m
<input type="checkbox"/> 4.2-4.3m
<input type="checkbox"/> 4.3-4.4m
<input type="checkbox"/> 4.4-4.5m
<input type="checkbox"/> 4.5-4.6m
<input type="checkbox"/> 4.6-4.7m
<input type="checkbox"/> 4.7-4.8m
<input type="checkbox"/> 4.8-4.9m
<input type="checkbox"/> 4.9-5.0m
<input type="checkbox"/> 5.0-5.1m
<input type="checkbox"/> 5.1-5.2m
<input type="checkbox"/> 5.2-5.3m
<input type="checkbox"/> 5.3-5.4m
<input type="checkbox"/> 5.4-5.5m
<input type="checkbox"/> 5.5-5.6m
<input type="checkbox"/> 5.6-5.7m
<input type="checkbox"/> 5.7-5.8m
<input type="checkbox"/> 5.8-5.9m
<input type="checkbox"/> 5.9-6.0m
<input type="checkbox"/> 6.0-6.1m
<input type="checkbox"/> 6.1-6.2m
<input type="checkbox"/> 6.2-6.3m
<input type="checkbox"/> 6.3-6.4m
<input type="checkbox"/> 6.4-6.5m
<input type="checkbox"/> 6.5-6.6m
<input type="checkbox"/> 6.6-6.7m
<input type="checkbox"/> 6.7-6.8m
<input type="checkbox"/> 6.8-6.9m
<input type="checkbox"/> 6.9-7.0m
<input type="checkbox"/> 7.0-7.1m
<input type="checkbox"/> 7.1-7.2m
<input type="checkbox"/> 7.2-7.3m
<input type="checkbox"/> 7.3-7.4m
<input type="checkbox"/> 7.4-7.5m
<input type="checkbox"/> 7.5-7.6m
<input type="checkbox"/> 7.6-7.7m
<input type="checkbox"/> 7.7-7.8m
<input type="checkbox"/> 7.8-7.9m
<input type="checkbox"/> 7.9-8.0m
<input type="checkbox"/> 8.0-8.1m
<input type="checkbox"/> 8.1-8.2m
<input type="checkbox"/> 8.2-8.3m
<input type="checkbox"/> 8.3-8.4m
<input type="checkbox"/> 8.4-8.5m
<input type="checkbox"/> 8.5-8.6m
<input type="checkbox"/> 8.6-8.7m
<input type="checkbox"/> 8.7-8.8m
<input type="checkbox"/> 8.8-8.9m
<input type="checkbox"/> 8.9-9.0m
<input type="checkbox"/> 9.0-9.1m
<input type="checkbox"/> 9.1-9.2m
<input type="checkbox"/> 9.2-9.3m
<input type="checkbox"/> 9.3-9.4m
<input type="checkbox"/> 9.4-9.5m
<input type="checkbox"/> 9.5-9.6m
<input type="checkbox"/> 9.6-9.7m
<input type="checkbox"/> 9.7-9.8m
<input type="checkbox"/> 9.8-9.9m
<input type="checkbox"/> 9.9-10.0m

Comments

CHANNEL WIDTH

Check ONE (Or 2 & average)

<input checked="" type="checkbox"/> 0.1-0.2m
<input type="checkbox"/> 0.2-0.3m
<input type="checkbox"/> 0.3-0.4m
<input type="checkbox"/> 0.4-0.5m
<input type="checkbox"/> 0.5-0.6m
<input type="checkbox"/> 0.6-0.7m
<input type="checkbox"/> 0.7-0.8m
<input type="checkbox"/> 0.8-0.9m
<input type="checkbox"/> 0.9-1.0m
<input type="checkbox"/> 1.0-1.1m
<input type="checkbox"/> 1.1-1.2m
<input type="checkbox"/> 1.2-1.3m
<input type="checkbox"/> 1.3-1.4m
<input type="checkbox"/> 1.4-1.5m
<input type="checkbox"/> 1.5-1.6m
<input type="checkbox"/> 1.6-1.7m
<input type="checkbox"/> 1.7-1.8m
<input type="checkbox"/> 1.8-1.9m
<input type="checkbox"/> 1.9-2.0m
<input type="checkbox"/> 2.0-2.1m
<input type="checkbox"/> 2.1-2.2m
<input type="checkbox"/> 2.2-2.3m
<input type="checkbox"/> 2.3-2.4m
<input type="checkbox"/> 2.4-2.5m
<input type="checkbox"/> 2.5-2.6m
<input type="checkbox"/> 2.6-2.7m
<input type="checkbox"/> 2.7-2.8m
<input type="checkbox"/> 2.8-2.9m
<input type="checkbox"/> 2.9-3.0m
<input type="checkbox"/> 3.0-3.1m
<input type="checkbox"/> 3.1-3.2m
<input type="checkbox"/> 3.2-3.3m
<input type="checkbox"/> 3.3-3.4m
<input type="checkbox"/> 3.4-3.5m
<input type="checkbox"/> 3.5-3.6m
<input type="checkbox"/> 3.6-3.7m
<input type="checkbox"/> 3.7-3.8m
<input type="checkbox"/> 3.8-3.9m
<input type="checkbox"/> 3.9-4.0m
<input type="checkbox"/> 4.0-4.1m
<input type="checkbox"/> 4.1-4.2m
<input type="checkbox"/> 4.2-4.3m
<input type="checkbox"/> 4.3-4.4m
<input type="checkbox"/> 4.4-4.5m
<input type="checkbox"/> 4.5-4.6m
<input type="checkbox"/> 4.6-4.7m
<input type="checkbox"/> 4.7-4.8m
<input type="checkbox"/> 4.8-4.9m
<input type="checkbox"/> 4.9-5.0m
<input type="checkbox"/> 5.0-5.1m
<input type="checkbox"/> 5.1-5.2m
<input type="checkbox"/> 5.2-5.3m
<input type="checkbox"/> 5.3-5.4m
<input type="checkbox"/> 5.4-5.5m
<input type="checkbox"/> 5.5-5.6m
<input type="checkbox"/> 5.6-5.7m
<input type="checkbox"/> 5.7-5.8m
<input type="checkbox"/> 5.8-5.9m
<input type="checkbox"/> 5.9-6.0m
<input type="checkbox"/> 6.0-6.1m
<input type="checkbox"/> 6.1-6.2m
<input type="checkbox"/> 6.2-6.3m
<input type="checkbox"/> 6.3-6.4m
<input type="checkbox"/> 6.4-6.5m
<input type="checkbox"/> 6.5-6.6m
<input type="checkbox"/> 6.6-6.7m
<input type="checkbox"/> 6.7-6.8m
<input type="checkbox"/> 6.8-6.9m
<input type="checkbox"/> 6.9-7.0m
<input type="checkbox"/> 7.0-7.1m
<input type="checkbox"/> 7.1-7.2m
<input type="checkbox"/> 7.2-7.3m
<input type="checkbox"/> 7.3-7.4m
<input type="checkbox"/> 7.4-7.5m
<input type="checkbox"/> 7.5-7.6m
<input type="checkbox"/> 7.6-7.7m
<input type="checkbox"/> 7.7-7.8m
<input type="checkbox"/> 7.8-7.9m
<input type="checkbox"/> 7.9-8.0m
<input type="checkbox"/> 8.0-8.1m
<input type="checkbox"/> 8.1-8.2m
<input type="checkbox"/> 8.2-8.3m
<input type="checkbox"/> 8.3-8.4m
<input type="checkbox"/> 8.4-8.5m
<input type="checkbox"/> 8.5-8.6m
<input type="checkbox"/> 8.6-8.7m
<input type="checkbox"/> 8.7-8.8m
<input type="checkbox"/> 8.8-8.9m
<input type="checkbox"/> 8.9-9.0m
<input type="checkbox"/> 9.0-9.1m
<input type="checkbox"/> 9.1-9.2m
<input type="checkbox"/> 9.2-9.3m
<input type="checkbox"/> 9.3-9.4m
<input type="checkbox"/> 9.4-9.5m
<input type="checkbox"/> 9.5-9.6m
<input type="checkbox"/> 9.6-9.7m
<input type="checkbox"/> 9.7-9.8m
<input type="checkbox"/> 9.8-9.9m
<input type="checkbox"/> 9.9-10.0m

CURRENT VELOCITY

Check ALL that apply

<input type="checkbox"/> NONE
<input type="checkbox"/> VERY FAST
<input type="checkbox"/> FAST
<input checked="" type="checkbox"/> MODERATE
<input type="checkbox"/> SLOW
<input type="checkbox"/> VERY SLOW
<input type="checkbox"/> STOPPING
<input type="checkbox"/> BACKFLOW
<input type="checkbox"/> REVERSE FLOW
<input type="checkbox"/> FLOODING
<input type="checkbox"/> DRAINAGE
<input type="checkbox"/> EROSION
<input type="checkbox"/> DEPOSITION
<input type="checkbox"/> MINING
<input type="checkbox"/> CONSTRUCTION
<input type="checkbox"/> AGRICULTURE
<input type="checkbox"/> FOREST
<input type="checkbox"/> SWAMP
<input type="checkbox"/> SHRUB
<input type="checkbox"/> OPEN PASTURE
<input type="checkbox"/> FENCED PASTURE
<input type="checkbox"/> OPEN PASTURE / ROW CROP

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool /
Current
Maximum
12
10

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

NO RIFFLE (metric=0)

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST / AVERAGE	<input type="checkbox"/> BEST / AVERAGE	<input type="checkbox"/> STABLE / AVERAGE	<input type="checkbox"/> NONE
<input type="checkbox"/> BEST / AVERAGE	<input type="checkbox"/> BEST / AVERAGE	<input type="checkbox"/> MODERATE / AVERAGE	<input type="checkbox"/> MODERATE
<input type="checkbox"/> BEST / AVERAGE	<input type="checkbox"/> BEST / AVERAGE	<input type="checkbox"/> UNSTABLE / AVERAGE	<input type="checkbox"/> EXTENSIVE

Comments

Riffle /
Run
Maximum
8
4.56) **GRADIENT** (5.5 ft/mi)

DRAINAGE AREA

(17.05 mi²)

<input type="checkbox"/> VERY LOW
<input checked="" type="checkbox"/> MODERATE
<input type="checkbox"/> HIGH

%POOL: 10

%GLIDE: 45

%RUN: 45

%RIFFLE: 5

Gradient
Maximum
10
6

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

AJ SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
☐ WADE
☐ L. LINE
☐ OTHER
- STAGE**
1st sample pass - 2nd
☐ HIGH
☐ UP
☐ NORMAL
☐ LOW
☐ DRY

DISTANCE

- ☐ 0.5 Km
☐ 0.2 Km
☐ 0.15 Km
☐ 0.12 Km
☐ OTHER

CLARITY

- 1st sample pass - 2nd
☐ < 20 cm
☐ 20-40 cm
☐ 40-70 cm
☐ > 70 cm/ GTE
☐ SECCHI DEPTH

meters

CANOPY

- ☐ > 85% - OPEN
☐ 55%-85%
☐ 30%-55%
☐ 10%-30%
☐ < 10% - CLOSED

CJ RECREATION

AREA DEPTH
POOL: ☐ > 100% ☐ > 3R

BJ AESTHETICS

- ☐ NUISANCE ALGAE
☐ INVASIVE MACROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM/SCUM
☐ OIL SHEEN
☐ TRASH/LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSOs/SSOs/OUTFALLS

DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURD / SLUMPS
ISLANDS / SCOURD
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

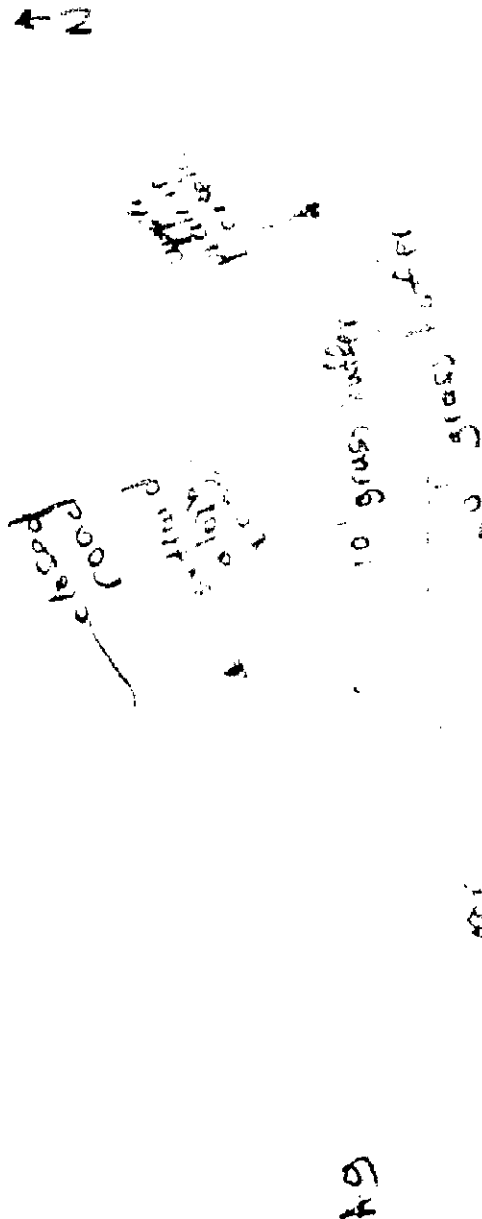
EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT & GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- ☐ width
☐ depth
max. depth
☐ bankfull width
☐ bankfull depth
W/D ratio
bankfull max. depth
floodprone x² width
entrench. ratio
Legacy Tree:

Stream Drawing:



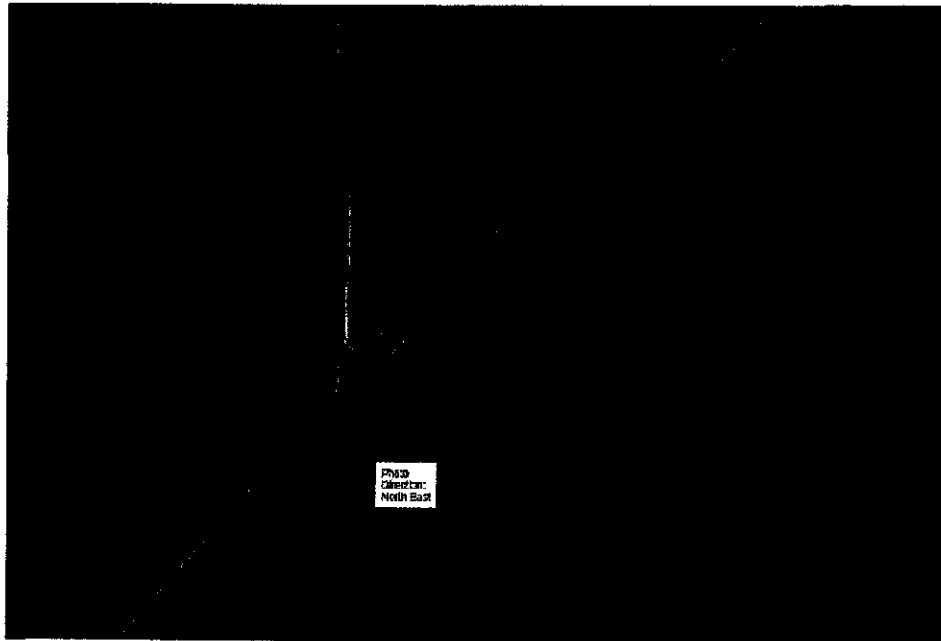
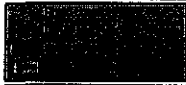


Photo
Direction:
North East



Stream
S143CA



Stream S143CA

WATERBODY DATA SHEET

WATERBODY ID NO: S143CA		WATERBODY NAME: Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091709ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Blue Creek	
		PHOTO NO: 143C10nE & 143C11SW	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Stream, fairly wide natural channel; likely some manipulation due to ag fields directly adj		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	20 (ft)	TOP OF BANK: 25 (ft)	ORDINARY HIGH WATER MARK WIDTH: 20 (ft)
AVG. BANK HEIGHT:	3 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Slightly Turbid		
PRIMARY SUBSTRATE:	Cobbles		
POTENTIAL HABITAT FOR:	Fish/Spawn Areas		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT: None		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Highly Erodable		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

collector line from turbine 146 to 143 crosses stream; stream runs between ag fields

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant macroinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative macroinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no macroinvertebrates present.

Stream & Location: S143 CA

RM: Date: 09/17/09

Scorers Full Name & Affiliation: MATT NEKHURSTIC CH2M

River Code: - - STORET #: Lat./ Long.: 41.00782 / 84.58155

Office verified location

1] **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> GRAVEL (1)	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SAND (2)	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> SILT	<input type="checkbox"/> GRAVEL (1)	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> COBBLES (3)	<u>40</u>	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> BEDROCK (1)	<input checked="" type="checkbox"/> GRAVEL (1)	<input type="checkbox"/> POOL RIFFLE
<input checked="" type="checkbox"/> SAND (2)	<u>10</u>	<input checked="" type="checkbox"/> BEDROCK (1)	<u>70</u>	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> GRAVEL (1)	<input type="checkbox"/> POOL RIFFLE
<input checked="" type="checkbox"/> SAND (2)	<u>30</u>	<input type="checkbox"/> BEDROCK (1)	<u>10</u>	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> GRAVEL (1)	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> BEDROCK (1)		<input type="checkbox"/> BEDROCK (1)		<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> BEDROCK (1)	<input type="checkbox"/> GRAVEL (1)	<input type="checkbox"/> POOL RIFFLE

NUMBER OF BEST TYPES: ☐ 1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Comments: Score natural substrates; ignore sludge from point-sources

2] **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

COVER		AMOUNT	
<input type="checkbox"/> UNDERWATER BARKS (1)	<input type="checkbox"/> ROOTS (1)	<input type="checkbox"/> EXTENSIVE (1)	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> OVERHANGING VEGETATION (1)	<input type="checkbox"/> ROOTWADS (1)	<input checked="" type="checkbox"/> MODERATE (2)	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> SHALLOWS (IN SHALLOW WATER) (1)	<input type="checkbox"/> BOULDERS (1)	<input type="checkbox"/> SPARSE (3)	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> ROOTWADS (1)	<input type="checkbox"/> LOGS OR WOODY DEBRIS (1)	<input type="checkbox"/> NEARLY ABSENT (5)	<input type="checkbox"/> POOL RIFFLE

Comments:

Cover Maximum 20

3] **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY		DEVELOPMENT		CHANNELIZATION		STABILITY	
<input type="checkbox"/> HIGH (1)	<input type="checkbox"/> EXCESSIVE (1)	<input checked="" type="checkbox"/> NONE (0)	<input type="checkbox"/> HIGH (3)				
<input type="checkbox"/> MODERATE (3)	<input checked="" type="checkbox"/> GOOD (3)	<input type="checkbox"/> RECOVERED (4)	<input checked="" type="checkbox"/> MODERATE (2)				
<input checked="" type="checkbox"/> LOW (4)	<input type="checkbox"/> FAIR (3)	<input type="checkbox"/> RECOVERING (5)	<input type="checkbox"/> LOW (1)				
<input type="checkbox"/> NONE (1)	<input type="checkbox"/> POOR (1)	<input type="checkbox"/> REGENT OR NO RECOVERY (1)					

Comments:

Channel Maximum 20

4] **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input checked="" type="checkbox"/> NONE / LITTLE (1)	<input type="checkbox"/> WIDE (30m+)	<input type="checkbox"/> FOREST SWATH (1)			
<input type="checkbox"/> MODERATE (2)	<input type="checkbox"/> MODERATE (10-30m)	<input type="checkbox"/> SHRUB OR GRASS (2)			
<input type="checkbox"/> HEAVY / SEVERE (3)	<input checked="" type="checkbox"/> NARROW (1-10m)	<input type="checkbox"/> RESIDENTIAL / PARK / NEW FIELD (4)			
	<input type="checkbox"/> VERY NARROW (< 5m)	<input type="checkbox"/> FENCED PASTURE (1)			
	<input type="checkbox"/> NONE (0)	<input checked="" type="checkbox"/> OPEN PASTURE / ROW CROP (0)			

Comments:

Riparian Maximum 10

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH		CHANNEL WIDTH		CURRENT VELOCITY		Recreation Potential	
<input checked="" type="checkbox"/> 0-0.3	<input checked="" type="checkbox"/> POOL WITH RIFFLE WIDTH (2)	<input type="checkbox"/> TORRENT (1)	<input checked="" type="checkbox"/> SLOW (1)	Primary Contact Secondary Contact (circle one and comment on back)			
<input type="checkbox"/> 0.3-0.6	<input type="checkbox"/> POOL WITH RIFFLE WIDTH (1)	<input type="checkbox"/> VERY SLOW (1)	<input type="checkbox"/> MODERATE (2)				
<input type="checkbox"/> 0.6-0.9	<input type="checkbox"/> POOL WITH RIFFLE WIDTH (0)	<input type="checkbox"/> FAST (1)	<input type="checkbox"/> RAPID (3)				
<input type="checkbox"/> 0.9-1.2		<input checked="" type="checkbox"/> MODERATE (2)	<input type="checkbox"/> RAPID (3)				

Comments:

Pool / Current Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☐ NO RIFFLE (metric=0)

RIFFLE DEPTH		RUN DEPTH		RIFFLE / RUN SUBSTRATE		RIFFLE / RUN EMBEDDEDNESS	
<input type="checkbox"/> BEST / EXCEL (1)	<input checked="" type="checkbox"/> MAXIMUM 600m (2)	<input checked="" type="checkbox"/> STABLE (1)	<input type="checkbox"/> MODERATE (2)	<input type="checkbox"/> NONE (1)	<input type="checkbox"/> POOL (1)		
<input checked="" type="checkbox"/> BEST / EXCEL (1)	<input type="checkbox"/> MAXIMUM 300m (1)	<input type="checkbox"/> MODERATE (2)	<input type="checkbox"/> MODERATE (2)	<input checked="" type="checkbox"/> MODERATE (2)	<input type="checkbox"/> POOL (1)		
<input type="checkbox"/> BEST / EXCEL (1)		<input type="checkbox"/> UNSTABLE (3)	<input type="checkbox"/> UNSTABLE (3)	<input type="checkbox"/> MODERATE (2)	<input type="checkbox"/> POOL (1)		

Comments:

Riffle / Run Maximum 8

6] **GRADIENT** (2.8 ft/mi) ☒ VERY SLOW (1) ☐ MODERATE (2) ☐ FAST (3) ☐ RAPID (4)

% POOL: 10 % GLIDE: 45
% RUN: 40 % RIFFLE: 5

Gradient Maximum 10

AJ SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
☐ WADE
☐ L. LINE
☐ OTHER
- ☐ DISTANCE
- ☐ 0.5 Km
☐ 0.2 Km
☐ 0.15 Km
☐ 0.12 Km
☐ OTHER

STAGE

- 1st - sample pass - 2nd
- ☐ HIGH
☐ UP
☐ NORMAL
☐ LOW
☐ DRY

CLARITY

- 1st - sample pass - 2nd
- ☐ < 20 cm
☐ 20-40 cm
☐ 40-70 cm
☐ > 70 cm / CTB
☐ SECCHI DEPTH

meters

CANOPY

- ☐ > 85% - OPEN
☐ 55% - 85%
☐ 30% - 55%
☐ 10% - 30%
☐ < 10% - CLOSED

CJ RECREATION

AREA DEPTH
 POOL: ☐ > 100ft ☐ > 3ft

BJ AESTHETICS

- ☐ NUISANCE ALGAE
☐ INVASIVE MICROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM / SCUM
☐ OIL SHEEN
☐ TRASH / LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSOs / SSOs / OUTFALLS

DJ MAINTENANCE

- ☐ PUBLIC / PRIVATE / BOTH / NA
☐ ACTIVE / HISTORIC / BOTH / NA
☐ YOUNG-SUCCESSION-OLD
☐ SPRAY / SNAG / REMOVED
☐ MODIFIED / DIPPED OUT / NA
☐ LEVEED / ONE SIDED
☐ RELOCATED / CUTOFFS
☐ MOVING-BEDLOAD-STABLE
☐ ARMORED / SLUMPS
☐ ISLANDS / SCOURED
☐ IMPOUNDED / DESICCATED
☐ FLOOD CONTROL / DRAINAGE

EJ ISSUES

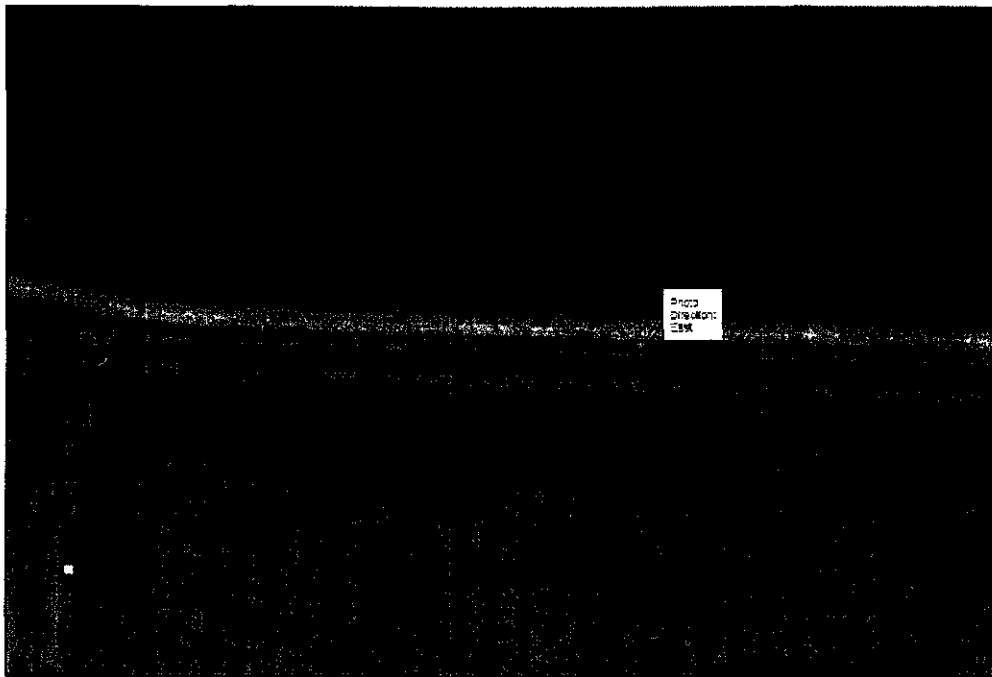
- ☐ WWTP / CSO / NPDES / INDUSTRY
☐ HARDENED / URBAN / DIRT & GRIME
☐ CONTAMINATED / LANDFILL
☐ BMPs - CONSTRUCTION / SEDIMENT
☐ LOGGING / IRRIGATION / COOLING
☐ BANK / EROSION / SURFACE
☐ FALSE BANK / MANURE / LAGOON
☐ WASH H₂O / TILE / H₂O TABLE
☐ ACID / MINE / QUARRY / FLOW
☐ NATURAL / WETLAND / STAGNANT
☐ PARK / GOLF / LAWN / HOME
☐ ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- ☐ \bar{x} width 20'
☐ \bar{x} depth 36"
☐ max. depth 48"
☐ \bar{x} bankfull width 25'
☐ bankfull \bar{x} depth 48"
☐ W/D ratio
☐ bankfull max. depth
☐ floodprone \bar{x} width
☐ entrench. ratio
☐ Legacy Tree:

Stream Drawing:

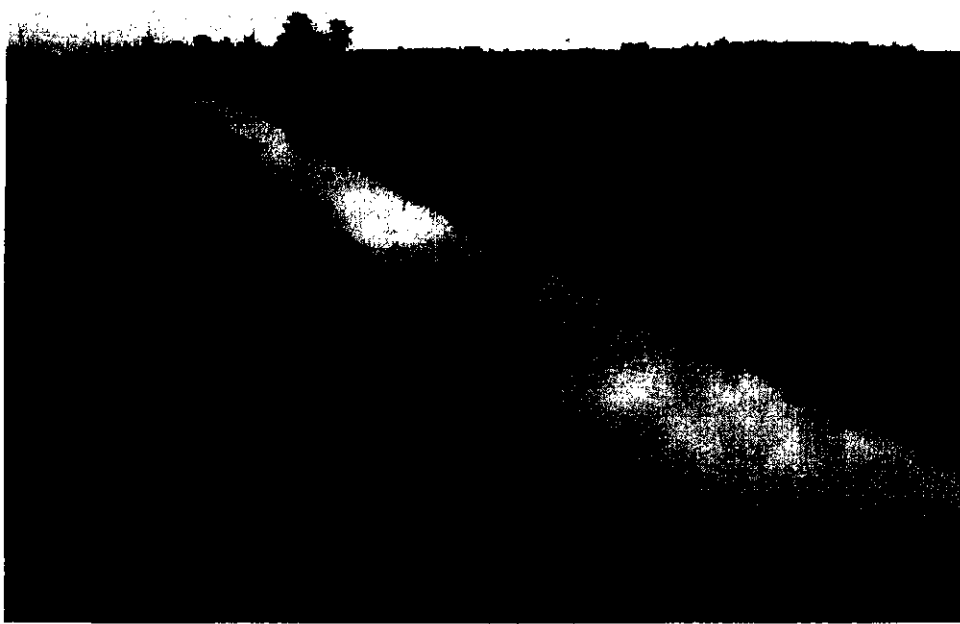
Tributaries to Prairie Creek



☒ Photo Location
 LOGS WHO Mapped Streams
☒ Stream
☐ Additional Features



Stream
S021AA



Stream S021AA

WATERBODY DATA SHEET

WATERBODY ID NO: S021AA		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/21/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090921.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO: s021aa1		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	6 (in)		
AVG. STREAM WIDTH:	7 (ft)	TOP OF BANK: 30 (ft)	ORDINARY HIGH WATER MARK WIDTH: 10 (ft)
AVG. BANK HEIGHT:	7 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid	
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:		
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):	Scirpus ludwigia upstream	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION _____

SITE NUMBER SO21AA

RIVER BASIN _____

DRAINAGE AREA (mi²) 0.2

LENGTH OF STREAM REACH (ft) _____

LAT. 40° 2' 45"LONG. 84° 41' 14"

RIVER CODE _____

RIVER MILE 0DATE 10/15/09SCORER R. Hook

COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL☐ RECOVERED☐ RECOVERING☒ RECENT OR NO RECOVERY

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	PERCENT
<input type="checkbox"/>	BLDR SLABS [16 pts]
<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]
<input type="checkbox"/>	BEDROCK [16 pts]
<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]
<input type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]
<input type="checkbox"/>	SAND (<2 mm) [6 pts]

BLDR SLABS [16 pts]
BOULDER (>256 mm) [16 pts]
BEDROCK [16 pts]
COBBLE (65-256 mm) [12 pts]
GRAVEL (2-64 mm) [9 pts]
SAND (<2 mm) [6 pts]

PERCENT

TYPE	PERCENT
<input checked="" type="checkbox"/>	SILT [3 pt]
<input checked="" type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	ARTIFICIAL [3 pts]

SILT [3 pt]
LEAF PACK/WOODY DEBRIS [3 pts]
FINE DETRITUS [3 pts]
CLAY or HARDPAN [0 pt]
MUCK [0 pts]
ARTIFICIAL [3 pts]

PERCENT

100%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6TOTAL NUMBER OF SUBSTRATE TYPES: 1

HHEI Metric Points

Substrate Max = 40

7

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):

<input type="checkbox"/>	> 30 centimeters [20 pts]
<input checked="" type="checkbox"/>	> 22.5 - 30 cm [30 pts]
<input type="checkbox"/>	> 10 - 22.5 cm [25 pts]

> 30 centimeters [20 pts]
> 22.5 - 30 cm [30 pts]
> 10 - 22.5 cm [25 pts]

<input type="checkbox"/>	> 5 cm - 10 cm [15 pts]
<input type="checkbox"/>	< 5 cm [5 pts]
<input type="checkbox"/>	NO WATER OR MOIST CHANNEL [0 pts]

> 5 cm - 10 cm [15 pts]
< 5 cm [5 pts]
NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters): 12

Pool Depth Max = 30

19

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/>	> 4.0 meters (> 13') [30 pts]
<input checked="" type="checkbox"/>	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
<input type="checkbox"/>	> 1.6 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]

> 4.0 meters (> 13') [30 pts]
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
> 1.6 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]

<input type="checkbox"/>	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/>	≤ 1.0 m (≤ 3' 3") [5 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): 2.5

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(Per Bank)
Wide >10m
Moderate 5-10m
Narrow <5m
None

COMMENTS _____

FLOODPLAIN QUALITY

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(Most Predominant per Bank)
Mature Forest, Wetland
Immature Forest, Shrub or Old Field
Residential, Park, New Field
Fenced Pasture

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Conservation Tillage
Urban or Industrial
Open Pasture, Row Crop
Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/>	Stream Flowing
<input type="checkbox"/>	Subsurface flow with isolated pools (Interstitial)

COMMENTS _____

<input type="checkbox"/>	Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/>	Dry channel, no water (Ephemeral)

Moist Channel, isolated pools, no flow (Intermittent)
Dry channel, no water (Ephemeral)

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/>	None
<input type="checkbox"/>	0.5

0.5

<input type="checkbox"/>	1.0
<input type="checkbox"/>	1.5

1.0
1.5

<input type="checkbox"/>	2.0
<input type="checkbox"/>	2.5

2.0
2.5

<input type="checkbox"/>	3.0
<input type="checkbox"/>	>3

3.0
>3

STREAM GRADIENT ESTIMATE

<input checked="" type="checkbox"/>	Flat (0.5 ft/100 ft)
<input type="checkbox"/>	Flat to Moderate
<input type="checkbox"/>	Moderate (2 ft/100 ft)
<input type="checkbox"/>	Moderate to Severe
<input type="checkbox"/>	Severe (10 ft/100 ft)

Flat (0.5 ft/100 ft)

<input type="checkbox"/>	Flat to Moderate
--------------------------	------------------

Flat to Moderate

<input type="checkbox"/>	Moderate (2 ft/100 ft)
--------------------------	------------------------

Moderate (2 ft/100 ft)

<input type="checkbox"/>	Moderate to Severe
--------------------------	--------------------

Moderate to Severe

<input type="checkbox"/>	Severe (10 ft/100 ft)
--------------------------	-----------------------

Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
EWI Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

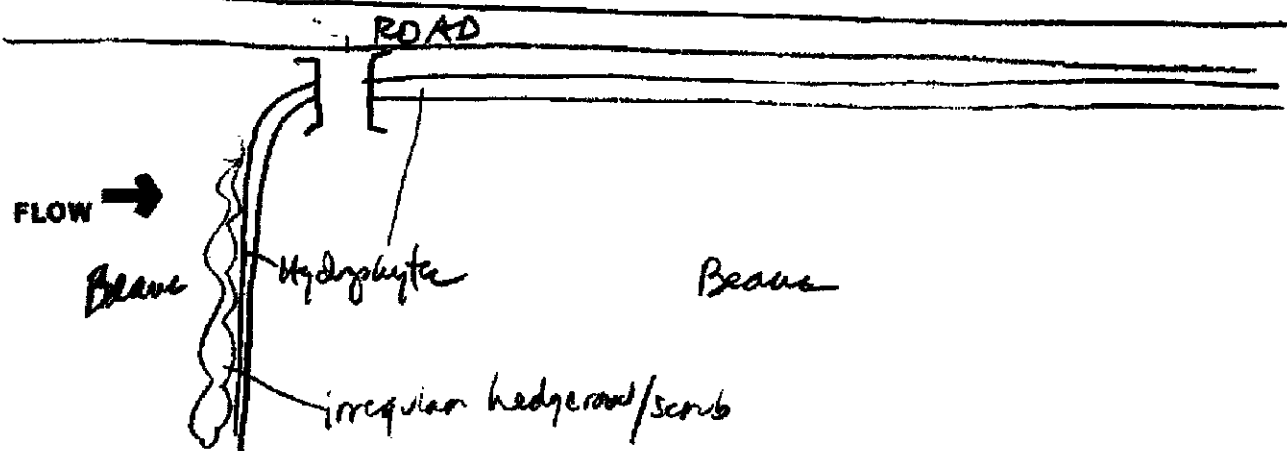
Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: Quantity:
 Photograph Information:
 Elevated Turbidity? (Y/N): Canopy (% open):
 Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
 Field Measures: Temp (°C) Dissolved Oxygen (mg/l) 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): ☒ 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): Aquatic Macroinvertebrates Observed? (Y/N): Voucher? (Y/N):
 Comments Regarding Biology:

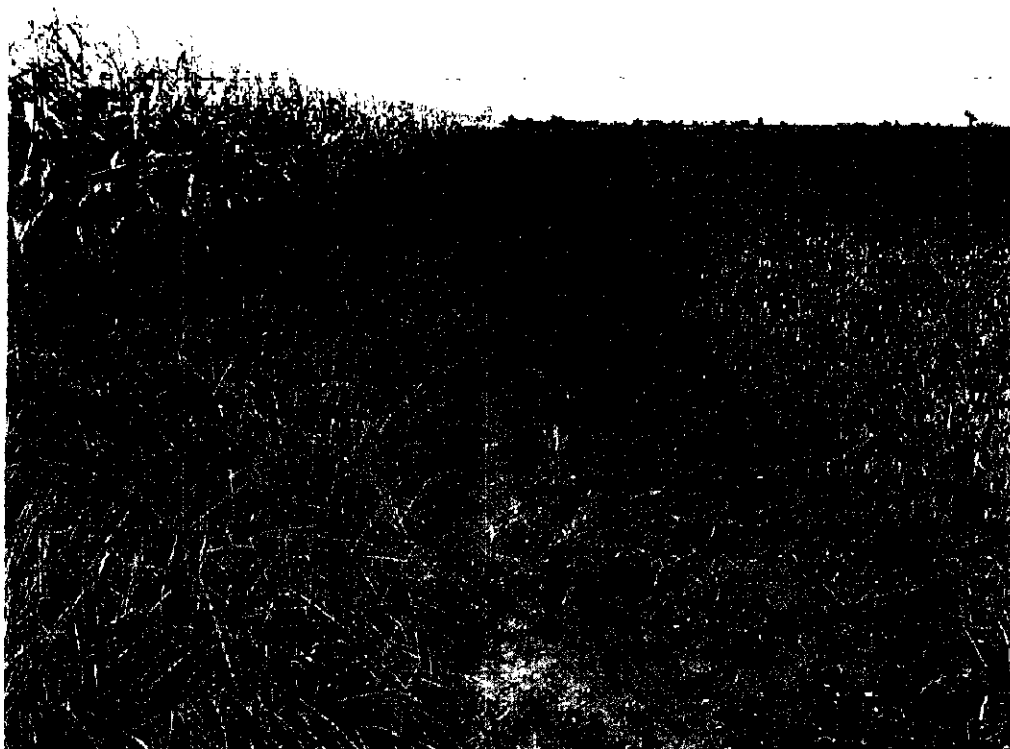
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

—Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Stream
S021CA



Stream S021CA

WATERBODY DATA SHEET

WATERBODY ID NO: S021CA		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 10/15/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH	ROVER FILE:	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO:		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Ephemeral		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 1 (ft)	ORDINARY HIGH WATER MARK WIDTH: 0 (ft)
AVG. BANK HEIGHT:	1 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:	None		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT: None		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside banks actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside banks actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION _____

SITE NUMBER

5021CA

RIVER BASIN _____

DRAINAGE AREA (mi²)

0.1

LENGTH OF STREAM REACH (ft) _____

LAT. 40° 56' 32"

LONG. 84° 40' 40"

RIVER CODE _____

RIVER MILE _____

DATE 10/15/09

SCORER

R2400K

COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL
MODIFICATIONS:☐ NONE / NATURAL CHANNEL☐ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input checked="" type="checkbox"/> SILT [3 pt]	100
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pt]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN [0 pt]	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]		<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

6

TOTAL NUMBER OF SUBSTRATE TYPES:

1

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters):

1

HHEI
Metric
PointsSubstrate
Max = 407
A + BPool Depth
Max = 30

0

Bankfull
Width
Max=30

15

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

NOTE: River Left (L) and Right (R) as looking downstream &

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☐ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name:	<input type="text"/>	Distance from Evaluated Stream:	<input type="text"/>
CWH Name:	<input type="text"/>	Distance from Evaluated Stream:	<input type="text"/>
EVH Name:	<input type="text"/>	Distance from Evaluated Stream:	<input type="text"/>

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: Quantity:
 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 (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) ☐ 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) ☐
 Comments Regarding Biology:

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

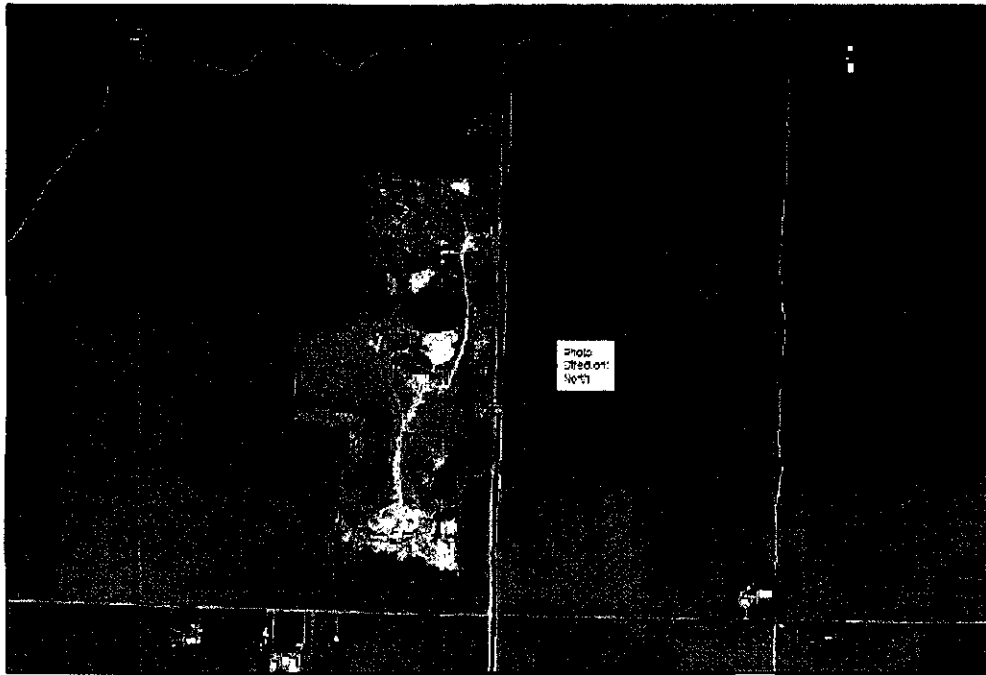
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

BEANS

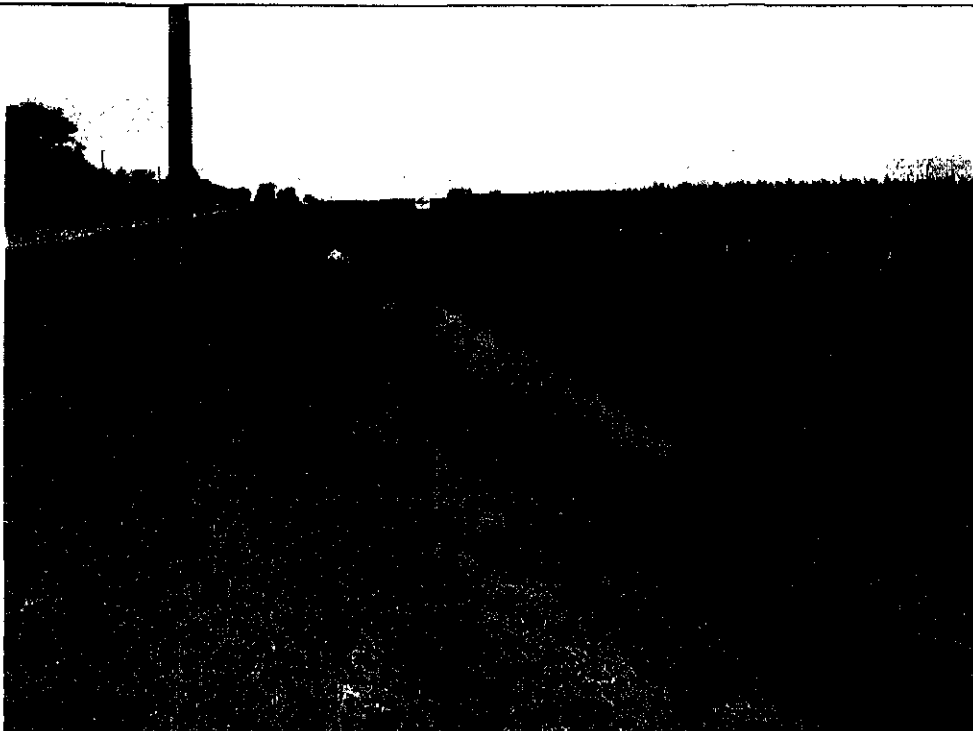
FLOW → Irregular DRY channel, occasional hydrophytes

CORN

grass line crossing
Ditch (W02156)



Stream
S048CA



Stream S048CA

WATERBODY DATA SHEET

WATERBODY ID No: S048CA		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/20/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090920.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO: s048aa1		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	18 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 25 (ft)	ORDINARY HIGH WATER MARK WIDTH: 10 (ft)
AVG. BANK HEIGHT:	6 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:			
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)		
	TYPE OF VEGETATION PRESENT: Herbaceous		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

high flow from gravel pit

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness; submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION

SITE NUMBER 5048AF

RIVER BASIN

DRAINAGE AREA (mi²) 0.5

LENGTH OF STREAM REACH (ft)

LAT. 40° 57' 58"

LONG. 84° 38' 35"

RIVER CODE

RIVER MILE

DATE 9/20/09

SCORER R. B. B. B.

COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL☐ RECOVERED☒ RECOVERING☐ RECENT OR NO RECOVERY

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

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

BLDR SLABS [16 pts]

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pts]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [6 pts]

PERCENT

15%

TYPE

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

SILT [3 pts]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pts]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

22%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock

15%

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

12

TOTAL NUMBER OF SUBSTRATE TYPES:

2

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):

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 30 centimeters [20 pts]

> 22.5 - 30 cm [30 pts]

> 10 - 22.5 cm [25 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 5 cm - 10 cm [15 pts]

< 5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

Gravel pit floor - artificial

MAXIMUM POOL DEPTH (centimeters):

45

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 4.0 meters (> 13') [30 pts]

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

> 1.5 m - 3.0 m (> 8' 7" - 4' 8") [20 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

4

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(Per Bank)

Wide >10m

Moderate 5-10m

Narrow <5m

None

COMMENTS

FLOODPLAIN QUALITY

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(Most Predominant per Bank)

Mature Forest, Wetland

Immature Forest, Shrub or Old Field

Residential, Park, New Field

Fenced Pasture

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

COMMENTS

- FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Stream Flowing

Subsurface flow with isolated pools (Interstitial)

COMMENTS

Gravel pit floor - artificial

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Moist Channel, isolated pools, no flow (Intermittent)

Dry channel, no water (Ephemeral)

- SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

None

0.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

1.0

1.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

2.0

2.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

3.0

>3

STREAM GRADIENT ESTIMATE

☐

Flat (0.5 m/100 ft)

☐

Flat to Moderate

☐

Moderate (2 m/100 ft)

☐

Moderate to Severe

☐

Severe (10 m/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

<input type="checkbox"/> WWH Name: _____	Distance from Evaluated Stream: _____
<input type="checkbox"/> CWH Name: _____	Distance from Evaluated Stream: _____
<input type="checkbox"/> 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: _____ Quantity: _____
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 (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N): _____ If not, please explain: _____
Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

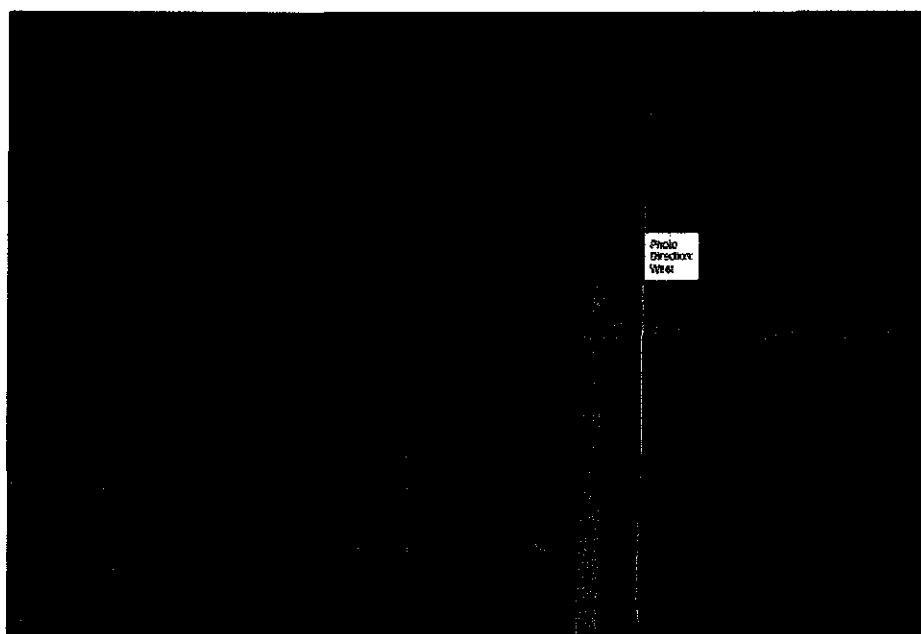
Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) ☐ Voucher? (Y/N) ☐ Salamanders Observed? (Y/N) ☐ Voucher? (Y/N) ☐
Frogs or Tadpoles Observed? (Y/N) ☐ Voucher? (Y/N) ☐ Aquatic Macroinvertebrates Observed? (Y/N) ☐ Voucher? (Y/N) ☐
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

FLOW →

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Stream
SRICHCB



Stream SRICHCB

WATERBODY DATA SHEET

WATERBODY ID No: SRICHCB		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 10/14/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH	ROVER FILE:	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO:		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Ephemeral		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 1 (ft)	ORDINARY HIGH WATER MARK WIDTH: 0 (ft)
AVG. BANK HEIGHT:	1 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION SPRING SITE NUMBER RIVER BASIN DRAINAGE AREA (mi²) 5.4
 LENGTH OF STREAM REACH (ft) LAT. 41°51'11" LONG. 84°26'30" RIVER CODE RIVER MILE 0
 DATE 10/1/09 SCORER COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL
MODIFICATIONS:

☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input checked="" type="checkbox"/> SILT [3 pts]	20
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]		<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [8 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 40 (A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15

TOTAL NUMBER OF SUBSTRATE TYPES: 2

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):
- | | |
|--|---|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):
- | | |
|--|---|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input checked="" type="checkbox"/> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] | |

COMMENTS

AVERAGE BANKFULL WIDTH (meters): 2

HHEI
Metric
Points

Substrate
Max = 40

A + B

Pool Depth
Max = 30

Bankfull
Width
Max=30

20

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	L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/> (Per Bank)	<input type="checkbox"/>	<input type="checkbox"/> (Most Predominant per Bank)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	Narrow <5m	<input type="checkbox"/>	Residential, Park, New Field	<input type="checkbox"/>	Open Pasture, Row Crop
<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	Mining or Construction

COMMENTS

- FLOW REGIME (At Time of Evaluation) (Check ONLY one box):
- | | |
|---|---|
| <input type="checkbox"/> Stream Flowing | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS

- SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
- | | | | |
|--|------------------------------|------------------------------|------------------------------|
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☐ Yes ☒ 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 _____
☐ 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): 1 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. 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

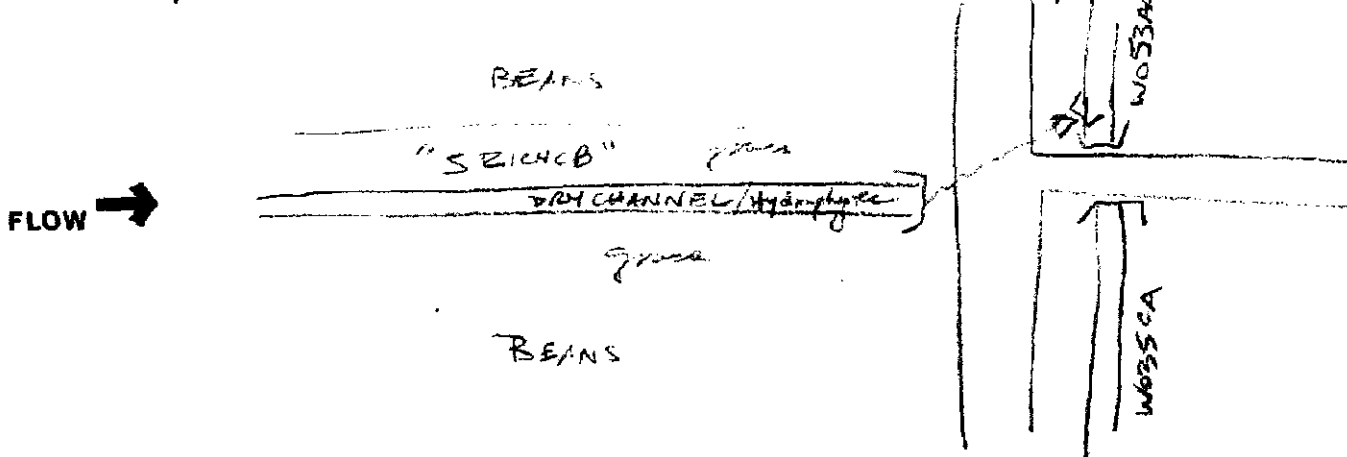
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

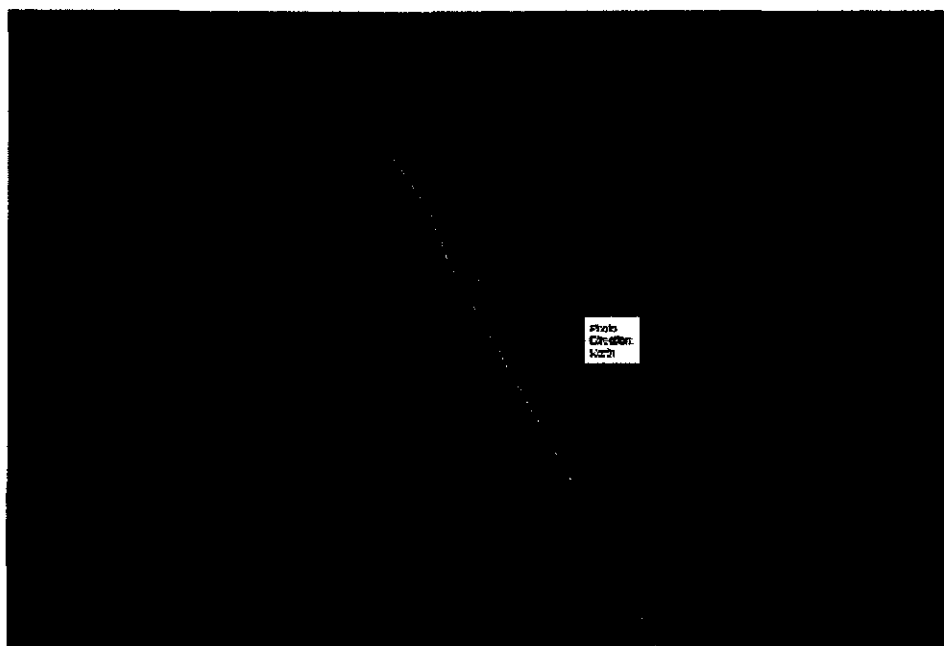
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____

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





Stream
S081CA



Stream S081CA

WATERBODY DATA SHEET

WATERBODY ID NO: S081CA		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO: S082CA	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Ephemeral		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	(ft)	TOP OF BANK: 30 (ft)	ORDINARY HIGH WATER MARK WIDTH: 10 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid	
PRIMARY SUBSTRATE:	Silt	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 15 (ft)	
	TYPE OF VEGETATION PRESENT: Scrub Shrub	
WETLAND FRINGE (IF PRESENT):	Ag in open reaches	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION S 081 CA SITE NUMBER RIVER BASIN DRAINAGE AREA (m²) 0.9
 LENGTH OF STREAM REACH (ft) LAT. 40° 59' 5" LONG. 84° 37' 17" RIVER CODE RIVER MILE
 DATE 9/18/04 SCORER Hook COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL
MODIFICATIONS:

☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input checked="" type="checkbox"/> 100
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<input type="checkbox"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/>
<input type="checkbox"/> SAND (<2 mm) [8 pts]	<input type="checkbox"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 0

TOTAL NUMBER OF SUBSTRATE TYPES: 1

HHEI
Metric
Points

Substrate
Max = 40

7
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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS MAXIMUM POOL DEPTH (centimeters):

Pool Depth
Max = 30

0

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS AVERAGE BANKFULL WIDTH (meters): 2

Bankfull
Width
Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN ZONE WIDTH		FLOODPLAIN QUALITY		FLOODPLAIN QUALITY	
L	R	L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/> (Per Bank)	<input type="checkbox"/>	<input type="checkbox"/> (Most Predominant per Bank)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	Narrow <5m	<input type="checkbox"/>	Residential, Park, New Field	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	None	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	Mining or Construction

COMMENTS:

- FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS:

- SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☐ Yes ☒ 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: _____
☐ 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): Y Date of last precipitation: _____ Quantity: _____
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 75%
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: _____

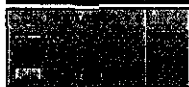
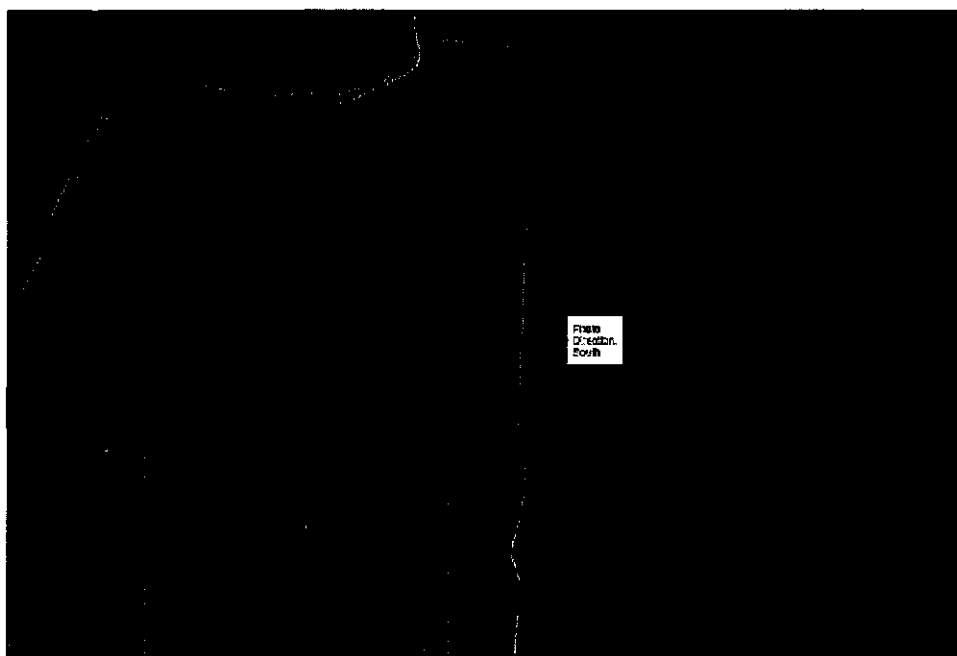
BIOTIC EVALUATION

Performed? (Y/N): 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) ☐ Aquatic Macroinvertebrates Observed? (Y/N) ☐ Voucher? (Y/N) ☐
Comments Regarding Biology: _____

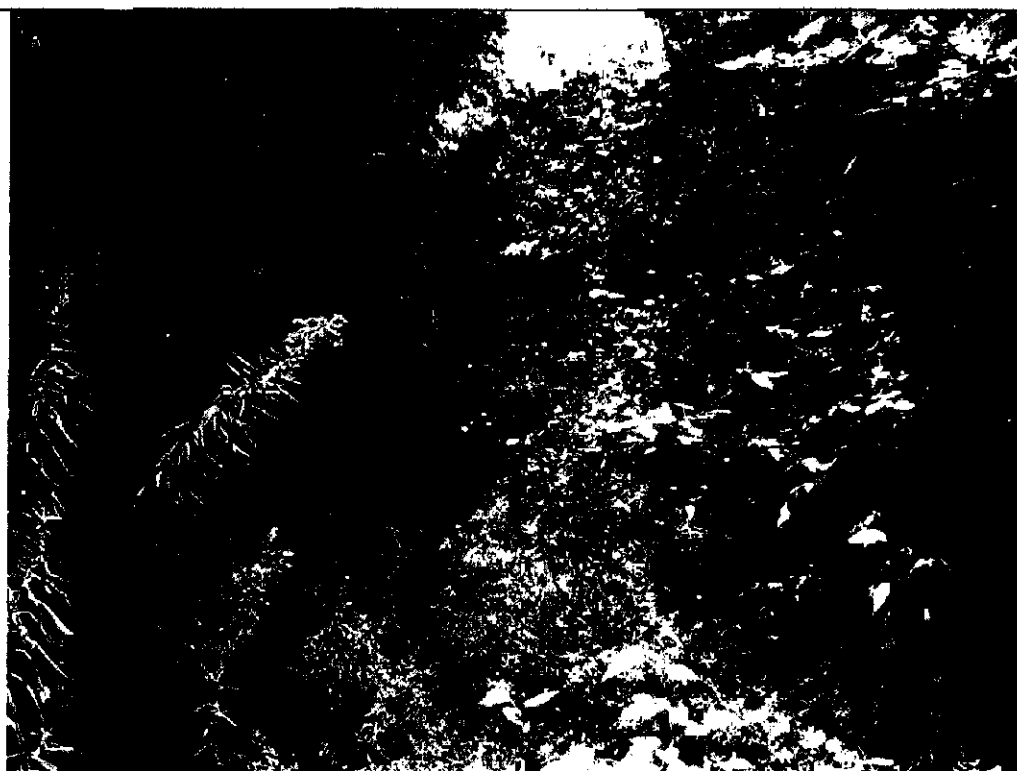
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Stream
S088AA



Stream S098AA

WATERBODY DATA SHEET

WATERBODY ID NO: S098AA		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH091709A.cor	QUAD NAME: Scott	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP.: Union		
	PHOTO NO:		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Ephemeral		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 15 (ft)	ORDINARY HIGH WATER MARK WIDTH: 6 (ft)
AVG. BANK HEIGHT:	5 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silt	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)	
	TYPE OF VEGETATION PRESENT: Scrub Shrub	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

linear ditch

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION

SITE NUMBER

509846

RIVER BASIN

DRAINAGE AREA (mi²)

1.0

LENGTH OF STREAM REACH (ft)

LAT.

40° 59' 10"

LONG.

84° 36' 10"

RIVER CODE

RIVER MILE

DATE

9/18/02

SCORER

D.T. [signature]

COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL
MODIFICATIONS:
☐ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☒ RECOVERING
 ☐ RECENT OR NO RECOVERY

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

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

BLDR SLABS [16 pts]

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pts]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [8 pts]

PERCENT

TYPE

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

100

Total of Percentages of
Blr Slabs, Boulder, Cobble, Bedrock

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

6

TOTAL NUMBER OF SUBSTRATE TYPES:

1

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):

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 30 centimeters [20 pts]

> 22.5 - 30 cm [30 pts]

> 10 - 22.5 cm [25 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 5 cm - 10 cm [15 pts]

< 5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

Channel very shallow

MAXIMUM POOL DEPTH (centimeters):

2

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 4.0 meters (> 13') [30 pts]

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

2

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(Per Bank)

Wide >10m

Moderate 5-10m

Narrow <5m

None

FLOODPLAIN QUALITY

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(Most Predominant per Bank)

Mature Forest, Wetland

Immature Forest, Shrub or Old Field

Residential, Park, New Field

Fenced Pasture

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>

Stream Flowing

Subsurface flow with isolated pools (Interstitial)

COMMENTS

<input type="checkbox"/>
<input checked="" type="checkbox"/>

Moist Channel, isolated pools, no flow (Intermittent)

Dry channel, no water (Ephemeral)

<input checked="" type="checkbox"/>
<input type="checkbox"/>

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None

0.5

<input type="checkbox"/>
<input type="checkbox"/>

1.0

1.5

<input type="checkbox"/>
<input type="checkbox"/>

2.0

2.5

<input type="checkbox"/>
<input type="checkbox"/>

3.0

>3

STREAM GRADIENT ESTIMATE

☐

Flat (0.5 ft/100 ft)

☐

Flat to Moderate

☐

Moderate (2 ft/100 ft)

☐

Moderate to Severe

☐

Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ 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 _____
 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: VAN WERT Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: _____
 Photograph Information: _____
 Elevated Turbidity? (Y/N): _____ Canopy (% open): 25%
 Were samples collected for water chemistry? (Y/N): 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): Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

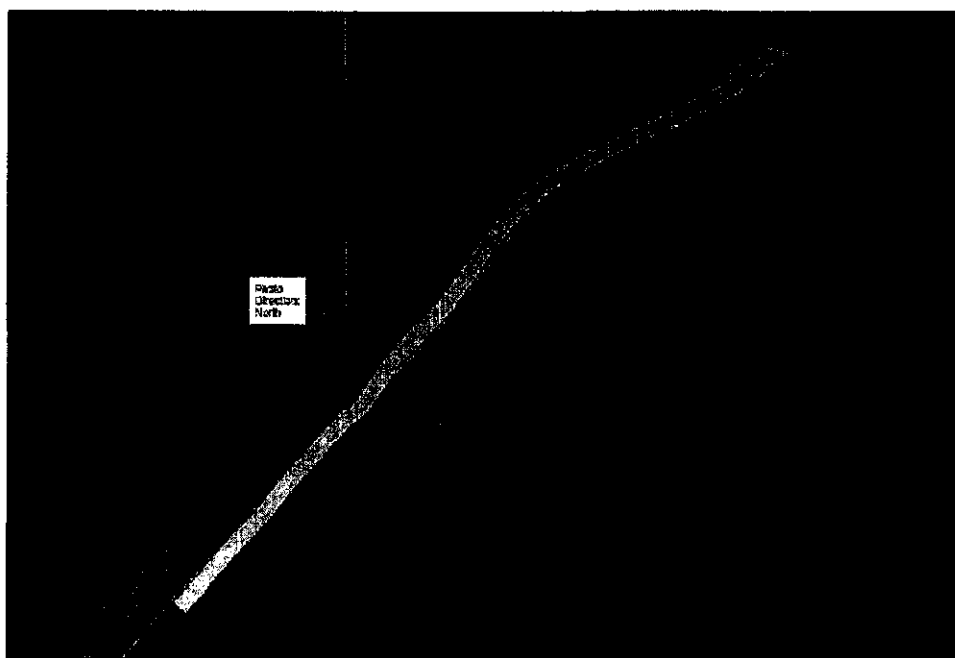
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
 Fish Observed? (Y/N): _____ Voucher? (Y/N): _____ Salamanders Observed? (Y/N): _____ Voucher? (Y/N): _____
 Frogs or Tadpoles Observed? (Y/N): _____ Voucher? (Y/N): _____ Aquatic Macroinvertebrates Observed? (Y/N): _____ Voucher? (Y/N): _____
 Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

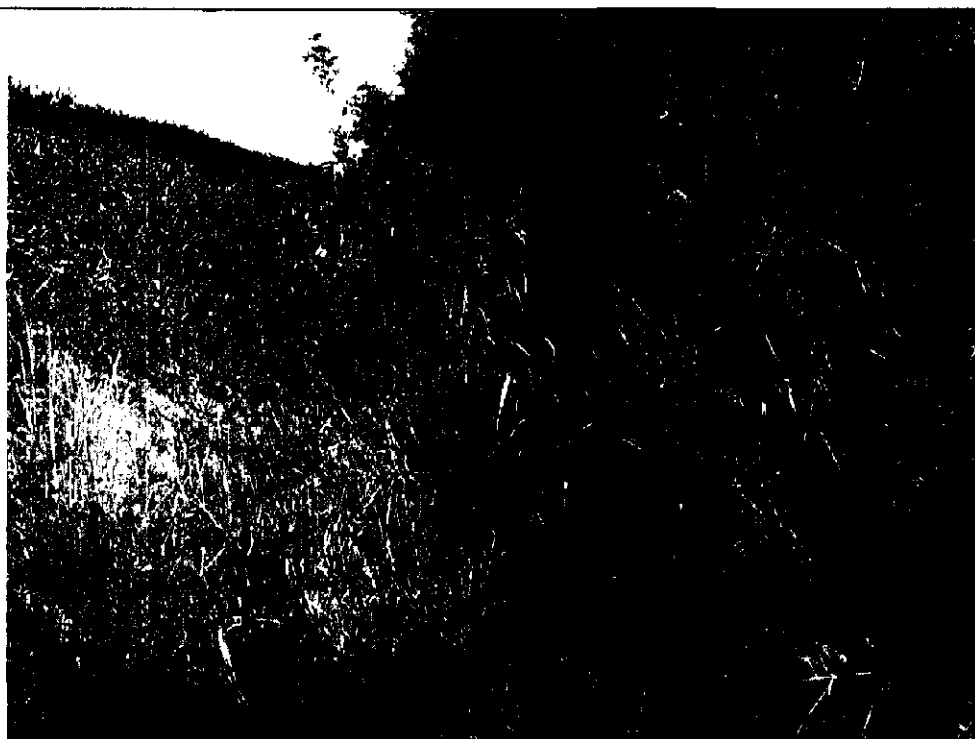
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW →

CORN
 TREES
 DRY DITCH
 TRENCH
 TREES
 CORN



Stream
S143CB



Stream S143CB

WATERBODY DATA SHEET

WATERBODY ID NO: S143CB		WATERBODY NAME: Unnamed Tributary to Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/17/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D. West, M. Nechvatal		ROVER FILE: R091709ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Blue Creek	
		PHOTO NO: 143C12n & 143C13S	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Manipulated channel for drainage from ag fields directly adj to W & E		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 9 (ft)	ORDINARY HIGH WATER MARK WIDTH: 5 (ft)
AVG. BANK HEIGHT:	3 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Vegetation	
POTENTIAL HABITAT FOR:	None	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 10 (ft)	
	TYPE OF VEGETATION PRESENT: Forested	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Highly Erodable	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: SINCE B

RM: --- Date: 2/17/09

Scorers Full Name & Affiliation: MATT NECHES

River Code: --- STORET #: --- Lat/Long: 41.00748 / 84.58236 Office verified location ☐

1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate Maximum 20
<input type="checkbox"/>	BEDROCK (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	HARDPAN (4)	<input type="checkbox"/>	POOL RIFFLE	<input checked="" type="checkbox"/>	LIMESTONE (1)	<input type="checkbox"/>	HEAVY (2)	
<input type="checkbox"/>	BOULDER (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	DETRITUS (3)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	SLATE (1)	<input checked="" type="checkbox"/>	MODERATE (4)	
<input type="checkbox"/>	COBBLE (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	MUCK (2)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	WETLANDS (0)	<input type="checkbox"/>	NORMAL (0)	
<input type="checkbox"/>	GRAVEL (1)	<input type="checkbox"/>	POOL RIFFLE	<input checked="" type="checkbox"/>	SILT (2)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	HARDPAN (0)	<input type="checkbox"/>	FREE (1)	
<input type="checkbox"/>	SAND (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	ARTIFICIAL (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	SANDSTONE (0)	<input type="checkbox"/>	EXTENSIVE (2)	
<input type="checkbox"/>	BEDROCK (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	ARTIFICIAL (0)	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	REPAIR (0)	<input type="checkbox"/>	MODERATE (4)	
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more <input checked="" type="checkbox"/> 3 or less <input type="checkbox"/> 2 or less <input type="checkbox"/> 1 or less <input type="checkbox"/> 0								Check ONE (Or 2 & average)				
Comments: <u>No riffles or pools</u>								SILT				
								EMBEDDEDNESS				
								COALFINES (2)				

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

UNDERCUT BANKS (1)		POOLS > 70cm (2)		OXBOWS / BACKWATERS (1)		AMOUNT	
<u>2</u>	OVERHANGING VEGETATION (1)	<input type="checkbox"/>	ROOTWADS (1)	<input type="checkbox"/>	AQUATIC MACROPHITES (1)	<input type="checkbox"/>	EXTENSIVE (2)
<input type="checkbox"/>	SHALLOWS (IN SLOW WATER) (1)	<input type="checkbox"/>	BOULDERS (1)	<input type="checkbox"/>	LOGS OR WOODY DEBRIS (1)	<input checked="" type="checkbox"/>	MODERATE (4)
<input type="checkbox"/>	ROOTMATS (1)					<input type="checkbox"/>	SPARSE (2-5%) (3)
						<input type="checkbox"/>	NEARLY ABSENT < 5% (1)
Comments:						Cover Maximum 20	

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY		DEVELOPMENT		CHANNELIZATION		STABILITY	
<input type="checkbox"/>	HIGH (2)	<input type="checkbox"/>	EXCELLENT (1)	<input type="checkbox"/>	NONE (0)	<input type="checkbox"/>	HIGH (3)
<input type="checkbox"/>	MODERATE (3)	<input type="checkbox"/>	GOOD (5)	<input type="checkbox"/>	RECOVERED (2)	<input type="checkbox"/>	MODERATE (2)
<input type="checkbox"/>	LOW (2)	<input checked="" type="checkbox"/>	FAIR (3)	<input type="checkbox"/>	RECOVERING (3)	<input type="checkbox"/>	LOW (1)
<input checked="" type="checkbox"/>	NONE (0)	<input type="checkbox"/>	POOR (1)	<input type="checkbox"/>	RECENT OR NO RECOVERY (1)		
Comments:							
Channel Maximum 20							

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input type="checkbox"/>	EROSION	<input type="checkbox"/>	WIDE > 50m (4)	<input type="checkbox"/>	FOREST / SWAMP (1)
<input type="checkbox"/>	NONE / LITTLE (3)	<input checked="" type="checkbox"/>	MODERATE 10-50m (3)	<input type="checkbox"/>	SHRUB OR OLD FIELD (2)
<input checked="" type="checkbox"/>	MODERATE (2)	<input type="checkbox"/>	NARROW < 10m (2)	<input type="checkbox"/>	RESIDENTIAL / PARK / NEW FIELD (1)
<input type="checkbox"/>	HEAVY / SEVERE (1)	<input type="checkbox"/>	VERY NARROW < 5m (1)	<input type="checkbox"/>	FENCED PASTURE (1)
		<input type="checkbox"/>	NONE (0)	<input checked="" type="checkbox"/>	OPEN PASTURE, ROWCROP (0)
Comments:					
Riparian Maximum 10					

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH		CHANNEL WIDTH		CURRENT VELOCITY		Recreation Potential	
Check ONE (ONLY!)		Check ONE (Or 2 & average)		Check ALL that apply		Primary Contact Secondary Contact (circle one and comment on back)	
<input type="checkbox"/>	0-1m (0)	<input type="checkbox"/>	POOL WIDTH > RIFFLE WIDTH (2)	<input type="checkbox"/>	TORRENTIAL (1)	<input type="checkbox"/>	NO RIFFLE (metric=0)
<input type="checkbox"/>	1-2m (1)	<input type="checkbox"/>	POOL WIDTH < RIFFLE WIDTH (1)	<input type="checkbox"/>	VERY FAST (0)	<input type="checkbox"/>	LOW (1)
<input type="checkbox"/>	2-3m (2)	<input type="checkbox"/>	POOL WIDTH < RIFFLE WIDTH (0)	<input type="checkbox"/>	FAST (1)	<input type="checkbox"/>	MODERATE (2)
<input type="checkbox"/>	3-4m (3)			<input type="checkbox"/>	MODERATE (1)	<input type="checkbox"/>	EXTENSIVE (2)
<input checked="" type="checkbox"/>	< 0.2m (0)						
Comments:						Pool / Current Maximum 12	

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

NO RIFFLE (metric=0)

RIFFLE DEPTH		RUN DEPTH		RIFFLE / RUN SUBSTRATE		RIFFLE / RUN EMBEDDEDNESS	
<input type="checkbox"/>	BEST AREAS (10m) (2)	<input type="checkbox"/>	MAXIMUM < 50cm (2)	<input type="checkbox"/>	STABLE (e.g., CORAL, BEDROCK) (2)	<input type="checkbox"/>	NONE (2)
<input type="checkbox"/>	BEST AREAS (5m) (1)	<input type="checkbox"/>	MAXIMUM < 50cm (1)	<input type="checkbox"/>	MOD. STABLE (e.g., SLATE, GRAY) (1)	<input type="checkbox"/>	LOW (1)
<input type="checkbox"/>	BEST AREAS (1m) (0)			<input type="checkbox"/>	UNSTABLE (e.g., FINE SAND, SILT) (0)	<input type="checkbox"/>	MODERATE (2)
						<input type="checkbox"/>	EXTENSIVE (2)
Comments:						Riffle / Run Maximum 8	

6) **GRADIENT** (3.8 ft/m)

DRAINAGE AREA

(1.49 m²)

%POOL: 0

%GLIDE: 50

Gradient

4

%RUN: 50

%RIFFLE: 0

Maximum

10

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

AJ SAMPLED REACH

Check ALL that apply

METHOD STAGE

- ☐ BOAT ☐ HIGH ☐
☐ WADE ☐ UP ☐
☐ L. LINE ☐ NORMAL ☐
☐ OTHER ☐ LOW ☐
DISTANCE ☐ DRY ☐

CLARITY

- 1st sample pass-- 2nd
☐ < 20 cm ☐
☐ 20-40 cm ☐
☐ 40-70 cm ☐
☐ > 70 cm/ CTB ☐
☐ SECCH DEPTH ☐

meters

CANOPY

- ☐ > 85% - OPEN
☐ 65%-85%
☐ 30%-65%
☐ 10%-30%
☐ < 10% - CLOSED

CJ RECREATION

AREA DEPTH
POOL: ☐ > 100% ☐ > 3ft

BJAESTHETICS

- ☐ NUISANCE ALGAE
☐ INVASIVE MACROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM / SCUM
☐ OIL SHEEN
☐ TRASH / LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSOs/SSOs/OUTFALLS

DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMORED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

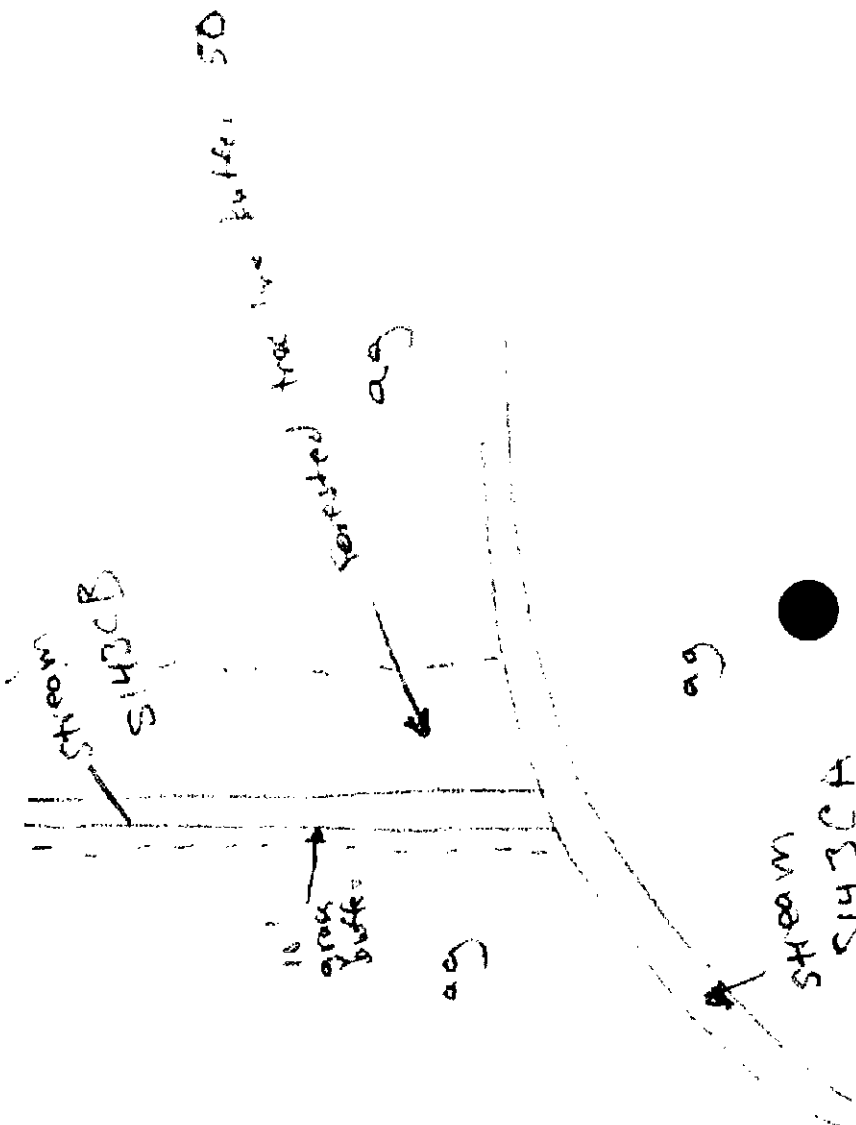
EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT & GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

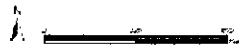
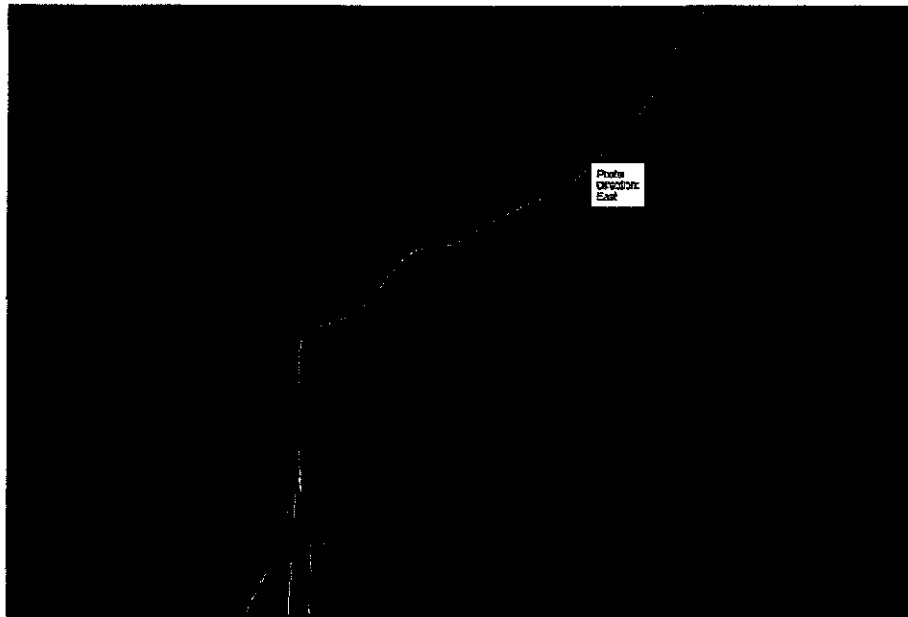
FJ MEASUREMENTS

- \bar{x} width 5'
 \bar{x} depth 2'
max. depth 2'
 \bar{x} bankfull width 3'
bankfull \bar{x} depth 3'
WD ratio
bankfull max. depth
floodprone \bar{x} width
entrench. ratio
Legacy Tree:

Stream Drawing:



Upper Prairie Creek



Stream
S005CA



Stream S005CA

WATERBODY DATA SHEET

WATERBODY ID NO: S005CA-1		WATERBODY NAME: Upper Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/20/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090920.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO: a005aa5 a005aa6		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	8 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 45 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	15 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Cobbles	
POTENTIAL HABITAT FOR:		
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)	
	TYPE OF VEGETATION PRESENT: Herbaceous	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:	Sloughing Banks	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

upper prairie creek

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

WATERBODY DATA SHEET

WATERBODY ID No: S005CA-2		WATERBODY NAME: Upper Prairie Creek	
SITE NAME: Blue Creek			
DATE: 9/20/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090920.cor	QUAD NAME: Convoy
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO No: a005aa1 a005aa2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	18 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	15 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Cobbles	
POTENTIAL HABITAT FOR:		
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 5 (ft)	
	TYPE OF VEGETATION PRESENT: Herbaceous	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:	Highly Erodable	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

upper prairie creek

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location:

S 005 LA (UPPER PRAIRIE CREEK)

RM:

1.0

Date:

9/20/00

River Code:

STORET #:

Scorers Full Name & Affiliation: Z. HOOK / CHM 412

Lat./ Long.: 40° 59' 11" N 84° 40' 42" W

Office ver. location

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES;
estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	Substrate <div style="border: 1px solid black; padding: 5px; display: inline-block;">14</div> Maximum 20
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> 25%	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> 15%	<input type="checkbox"/> HILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> COBBLE [8]		<input type="checkbox"/> MUCK [2]		<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> NORMAL [0]	
<input type="checkbox"/> GRAVEL [7]		<input type="checkbox"/> SILT [2]		<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> FREE [1]	
<input type="checkbox"/> SAND [6]		<input type="checkbox"/> ARTIFICIAL [0]		<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> EXTENSIVE [-2]	
<input type="checkbox"/> BEDROCK [5]				<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> NONE [1]	

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0]

Comments: No riffle / pool

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> EXTENSIVE > 75% [11]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input checked="" type="checkbox"/> SPARSE 5-<25% [3]
<input type="checkbox"/> ROOTMATS [1]			<input type="checkbox"/> NEARLY ABSENT < 5% [1]

Comments:

Cover Maximum 20

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments:

Channel Maximum 20

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY		CONSERVATION TILLAGE	
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> CONSERVATION TILLAGE [1]				
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]				
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]				
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input checked="" type="checkbox"/> FENCED PASTURE [1]					
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]					

Comments:

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [6]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	(circle one and comment on back)
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	
<input checked="" type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input type="checkbox"/> < 0.2m [0]		<input checked="" type="checkbox"/> MODERATE [1]	
		<input type="checkbox"/> INTERMITTENT [-2]	
		<input type="checkbox"/> EDDIES [1]	

Comments:

Indicate for reach - pools and riffles.

Pool / Current Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments:

Riffle / Run Maximum 8

6] GRADIENT (ft/mi) ☐ VERY LOW - LOW [2-4]
DRAINAGE AREA (mi²) ☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 10%

%GLIDE: 90%

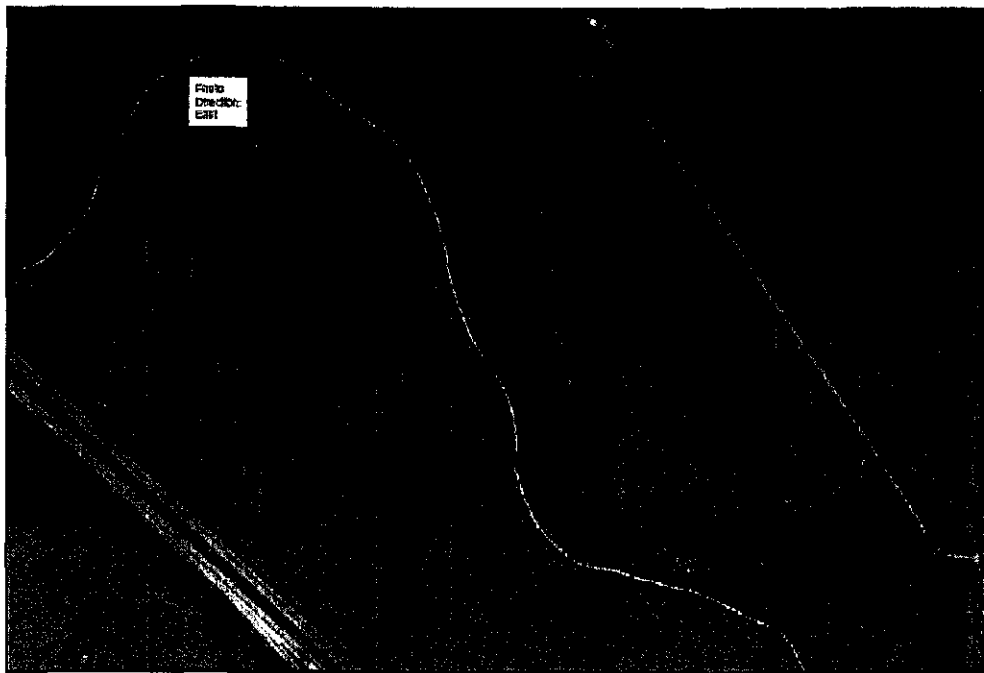
%RUN:

%RIFFLE:

Gradient Maximum 10



Hagerman Creek



Stream
S019AA



Stream S019AA

WATERBODY DATA SHEET

WATERBODY ID NO: S019AA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/21/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090921.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Tully		
	PHOTO NO: a019aa		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Stream		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	10 (in)		
AVG. STREAM WIDTH:	9 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:			
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):	Phalaris arundinacea, Sagittaria sp., Leersia oryzoides		
CHANNEL CONDITION:	Sloughing Banks		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: 3019AA

RM: Date: 07/21/09

River Code: STORET #:

Scorers Full Name & Affiliation: MATTHEW K. KAVATZ CHER

Lat./ Long.: 40.93158 184.68875

Office verified location ☐

1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES	
POOL	RIFFLE	POOL	RIFFLE
<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> SAND [10]	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> BOULDER [10]	<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> MUCK [2]
<input type="checkbox"/> COBBLE [10]	<input type="checkbox"/> SAND [10]	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> ARTIFICIAL [0]
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> BEDROCK [5]	(Score natural substrates; ignore sludge from point-sources)	

ORIGIN

☒ Limestones [10]

☐ Shale [10]

☐ Sandstone [10]

☐ Hardpan [10]

☐ Sandstone [10]

☐ Limestone [10]

☐ Shale [10]

☐ Coal fines [2]

QUALITY

☒ HEAVY [2]

☐ MODERATE [1]

☐ NORMAL [10]

☐ FREE [10]

☐ EXTENSIVE [2]

☐ MODERATE [1]

☐ NORMAL [10]

☐ NONE [1]

Substrate
Maximum
20

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments: No riffles

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

<input checked="" type="checkbox"/> UNDERGROWTH [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS / BACKWATERS [1]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]
<input type="checkbox"/> ROOTMATS [1]		

☐ EXTENSIVE > 75% [11]

☒ MODERATE 25-75% [7]

☐ SPARSE < 25% [3]

☐ NEARLY ABSENT < 5% [1]

Cover
Maximum
20

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Channel
Maximum
20

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY		CONSERVATION / LAND USE	
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> FOREST / SWAMP [1]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> CONSERVATION / LAND USE [1]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> HEAVY / SEVERE [1]	<input checked="" type="checkbox"/> NARROW 5-10m [2]	<input checked="" type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> RESIDENTIAL / PARK / NEW FIELD [1]	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]	
		<input type="checkbox"/> NONE [0]		<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]			

Indicate predominant land use(s) past 100m riparian.

Riparian
Maximum
10

Comments:

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH

Check ONE (ONLY)

☐ 0m [0]

☐ 0-2m [4]

☐ 0-4m [2]

☒ 0-6m [10]

☐ > 6m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)

☐ POOL WIDTH > RIFFLE WIDTH [2]

☒ POOL WIDTH = RIFFLE WIDTH [1]

☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☒ TORRENTIAL [1]

☐ VERY FAST [1]

☐ FAST [1]

☒ MODERATE [1]

☐ INTERMITTENT [1]

☐ INTERMITTENT [2]

☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool /
Current
Maximum
12

Comments:

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST PRACTICE [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., COBBLE, GRAVEL) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST PRACTICE [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., fine Gravel, sand) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST PRACTICE [0]		<input type="checkbox"/> UNSTABLE (e.g., fine Gravel, sand) [0]	<input type="checkbox"/> MODERATE [1]
			<input type="checkbox"/> EXTENSIVE [1]

Riffle /
Run
Maximum
8

Comments:

6) **GRADIENT** (4.2 ft/mi) ☒ VERY LOW (0-2%) ☐ MODERATE (3-10%) ☐ HIGH (> 10%)

DRAINAGE AREA (2.29 m²)

%POOL: 10 %GLIDE: 45

%RUN: 45 %RIFFLE: 0

Gradient
Maximum
10

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

AJ SAMPLED REACH

Check ALL that apply

METHOD STAGE

- 1st sample pass-- 2nd
- ☐ BOAT ☐ HIGH ☐
- ☐ WADE ☐ UP ☐
- ☐ L. LINE ☐ NORMAL ☐
- ☐ OTHER ☐ LOW ☐
- ☐ DISTANCE ☐ DRY ☐

CLARITY

- 1st 2nd
- ☐ < 20 cm ☐
- ☐ 20-40 cm ☐
- ☐ 40-70 cm ☐
- ☐ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

meters

CANOPY

- ☐ > 85% - OPEN
- ☐ 55%-85%
- ☐ 30%-55%
- ☐ 10%-30%
- ☐ < 10% - CLOSED

CJ RECREATION

AREA DEPTH POOL: ☐ > 100m? ☐ > 3ft

BJ AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/ISSOs/OUTFALLS

DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BEDLOAD-STABLE
- ARMOURED / SLUMPS
- ISLANDS / SCoured
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

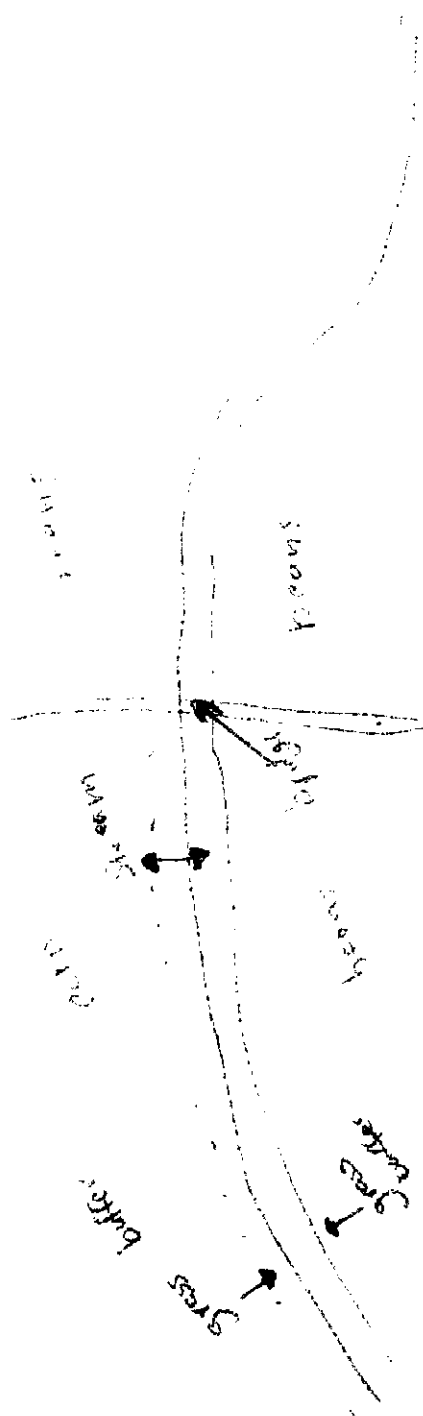
EJ ISSUES

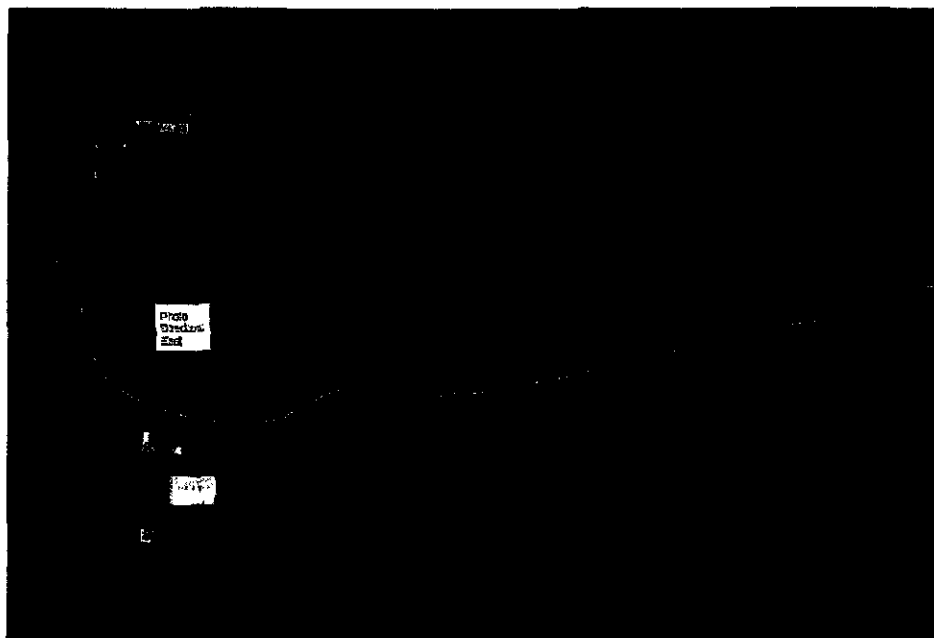
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- HARDENED / URBAN / DIRT&GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H₂O / TILE / H₂O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- \bar{x} width 10
- \bar{x} depth 6.5
- max. depth 10.5
- \bar{x} bankfull width 15.5
- bankfull \bar{x} depth 5.5
- W/D ratio 4
- bankfull max. depth
- floodprone \bar{x}^2 width
- entrrench. ratio
- Legacy Tree:

Stream Drawing:





Stream
S028AA



Stream S028AA

WATERBODY DATA SHEET

WATERBODY ID NO: S028AA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/21/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090921.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Union		
	PHOTO NO: W024aa2		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Stream		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:		
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):	Phalaris arundinacea	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: 028AA

RM: --- Date: 9/2/99

River Code: -

STORET #: ---

Lat./Long.: 40.92583 184.67948

Office verified location ☒

Scorers Full Name & Affiliation: MATTHEW NEWMAN

1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES	POOL RIFFLE	OTHER TYPES	POOL RIFFLE	ORIGIN	QUALITY
<input type="checkbox"/> BED/SUBSTR. (10)	<input type="checkbox"/> <u>100</u>	<input checked="" type="checkbox"/> HARDPAN (4)	<input type="checkbox"/> <u>100</u>	<input type="checkbox"/> LIMESTONE (1)	<input type="checkbox"/> HEAVY (2)
<input type="checkbox"/> BOULDER (10)	<input type="checkbox"/>	<input type="checkbox"/> DETRITUS (3)	<input type="checkbox"/>	<input type="checkbox"/> SILT (1)	<input type="checkbox"/> MODERATE (1)
<input type="checkbox"/> COBBLE (10)	<input type="checkbox"/>	<input type="checkbox"/> MUCK (2)	<input type="checkbox"/>	<input type="checkbox"/> VEGETATION (0)	<input type="checkbox"/> NORMAL (0)
<input type="checkbox"/> GRAVEL (10)	<input type="checkbox"/>	<input type="checkbox"/> SILT (2)	<input type="checkbox"/>	<input type="checkbox"/> FERTILIZER (0)	<input type="checkbox"/> FREE (1)
<input type="checkbox"/> SAND (10)	<input type="checkbox"/>	<input type="checkbox"/> ARTIFICIAL (0)	<input type="checkbox"/>	<input type="checkbox"/> SANDSTONE (0)	<input checked="" type="checkbox"/> EXTENSIVE (2)
<input type="checkbox"/> BEDROCK (5)	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/> RIP/RAPID (0)	<input type="checkbox"/> MODERATE (1)

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more (2) ☒ 3 or less (0)

Comments: ---

Substrate: 3 Maximum 20

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

<input checked="" type="checkbox"/> UNDERGUT BANKS (1)	<input type="checkbox"/> POOLS > 70cm (2)	<input type="checkbox"/> OXBOWS/BACKWATERS (1)	<input checked="" type="checkbox"/> EXTENSIVE > 75% (1)
<input checked="" type="checkbox"/> OVERHANGING VEGETATION (1)	<input type="checkbox"/> ROOTWADS (1)	<input type="checkbox"/> AQUATIC MACROPHYTES (1)	<input checked="" type="checkbox"/> MODERATE 25-75% (1)
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) (1)	<input type="checkbox"/> BOULDERS (1)	<input type="checkbox"/> LOGS OR WOODY DEBRIS (1)	<input type="checkbox"/> SPARSE < 25% (3)
<input type="checkbox"/> ROOTMATS (1)			<input type="checkbox"/> NEARLY ABSENT < 5% (1)

Comments: ---

Cover: 10 Maximum 20

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH (4)	<input type="checkbox"/> EXCELLENT (7)	<input type="checkbox"/> NONE (0)	<input checked="" type="checkbox"/> HIGH (3)
<input type="checkbox"/> MODERATE (3)	<input checked="" type="checkbox"/> GOOD (6)	<input checked="" type="checkbox"/> RECOVERED (4)	<input type="checkbox"/> MODERATE (2)
<input checked="" type="checkbox"/> LOW (2)	<input checked="" type="checkbox"/> FAIR (5)	<input type="checkbox"/> RECOVERING (3)	<input type="checkbox"/> LOW (1)
<input type="checkbox"/> NONE (1)	<input type="checkbox"/> POOR (4)	<input type="checkbox"/> REGENT OR NO RECOVERY (1)	

Comments: ---

Channel: 12.5 Maximum 20

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input checked="" type="checkbox"/> NONE/LITTLE (3)	<input type="checkbox"/> WIDE > 50m (4)	<input type="checkbox"/> FOREST/SWAMP (3)
<input type="checkbox"/> MODERATE (2)	<input type="checkbox"/> MODERATE 10-50m (3)	<input type="checkbox"/> SHRUB OR OLD FIELD (2)
<input type="checkbox"/> HEAVY/SEVERE (1)	<input type="checkbox"/> NARROW 5-10m (2)	<input type="checkbox"/> RESIDENTIAL/PARK/NEW FIELD (1)
	<input checked="" type="checkbox"/> VERY NARROW < 5m (1)	<input type="checkbox"/> FENCED PASTURE (1)
	<input type="checkbox"/> NONE (0)	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP (0)

Indicate predominant land use(s) past 100m riparian.

Comments: ---

Riparian: 4 Maximum 10

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH

CHANNEL WIDTH

CURRENT VELOCITY

Check ONE (ONLY!)

Check ONE (Or 2 & average)

Check ALL that apply

☐ < 0.1m (1)

☐ 0.1-1m (4)

☐ 1-2m (2)

☒ 2-5m (1)

☐ > 5m (0)

☐ POOL WIDTH > RIFFLE WIDTH (2)

☒ POOL WIDTH < RIFFLE WIDTH (1)

☐ POOL WIDTH < RIFFLE WIDTH (0)

☐ TORRENTIAL (1)

☐ VERY FAST (1)

☐ FAST (1)

☒ MODERATE (1)

☐ SLOW (1)

☐ INTERMITTENT (1)

☐ INTERMITTENT (2)

☐ EDDIES (1)

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current
Maximum
12

4

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREA > 10m (2)	<input type="checkbox"/> MAXIMUM > 50cm (2)	<input type="checkbox"/> STABLE (e.g., COBBLE/BOULDER) (2)	<input type="checkbox"/> NONE (2)
<input type="checkbox"/> BEST AREA > 5m (1)	<input type="checkbox"/> MAXIMUM < 50cm (1)	<input type="checkbox"/> MOD. STABLE (e.g., FINE GRAVEL/SAND) (1)	<input type="checkbox"/> MOD. (1)
<input type="checkbox"/> BEST AREA < 5m (0)		<input type="checkbox"/> UNSTABLE (e.g., FINE GRAVEL/SAND) (0)	<input type="checkbox"/> MODERATE (0)
			<input checked="" type="checkbox"/> EXTENSIVE (1)

Comments: ---

Riffle / Run: 0 Maximum 8

6) **GRADIENT** (3.8 ft/mi) ☒ VERY LOW (2)

DRAINAGE AREA (2.90 mi²) ☐ MODERATE (1)

%POOL: 10 %GLIDE: 45

%RUN: 45 %RIFFLE: 0

Gradient
Maximum
10

4

A) SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
☐ WADE
☐ L LINE
☐ OTHER
 DISTANCE
☐ 0.5 Km
☐ 0.2 Km
☐ 0.15 Km
☐ 0.12 Km
☐ OTHER

STAGE

- 1st - sample pass - 2nd
☐ HIGH
☐ UP
☐ NORMAL
☐ LOW
☐ DRY

CLARITY

- ☐ < 20 cm
☐ 20-40 cm
☐ 40-70 cm
☐ > 70 cm / CTB
☐ SECCHI DEPTH

CANOPY

- ☐ > 85% - OPEN
☐ 55% - 85%
☐ 30% - 55%
☐ 10% - 30%
☐ < 10% - CLOSED

B) AESTHETICS

- ☐ NUISANCE ALGAE
☐ INVASIVE MACROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM / SCUM
☐ OIL SHEEN
☐ TRASH / LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSOs / SSOs / OUTFALLS

C) RECREATION

- AREA DEPTH
 POOL: ☐ > 100 R2 ☐ > 3R

D) MAINTENANCE

- ☐ PUBLIC / PRIVATE / BOTH / NA
☐ ACTIVE / HISTORIC / BOTH / NA
☐ YOUNG-SUCCESSION-OLD
☐ SPRAY / SNAG / REMOVED
☐ MODIFIED / DIPPED OUT / NA
☐ LEVEED / ONE SIDED
☐ RELOCATED / CUTOFFS
☐ MOVING-BEDLOAD-STABLE
☐ ARMORED / SLUMPS
☐ ISLANDS / SCOURCED
☐ IMPOUNDED / DESICCATED
☐ FLOOD CONTROL / DRAINAGE

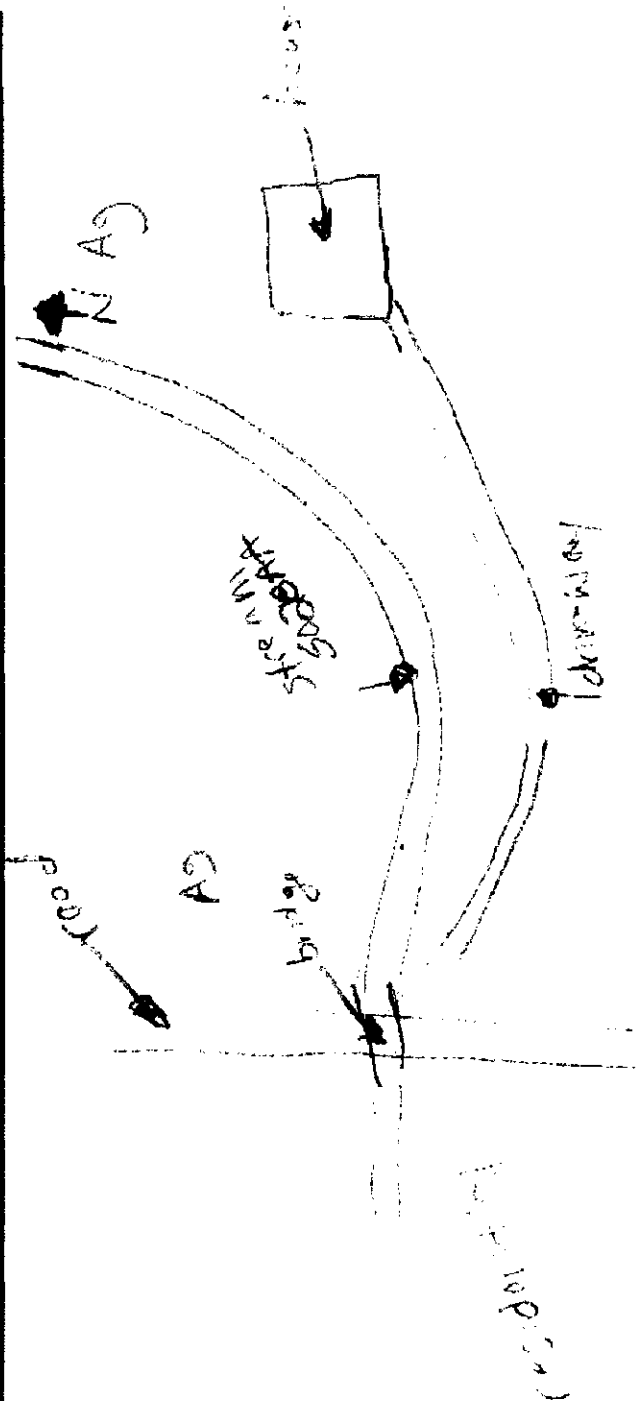
E) ISSUES

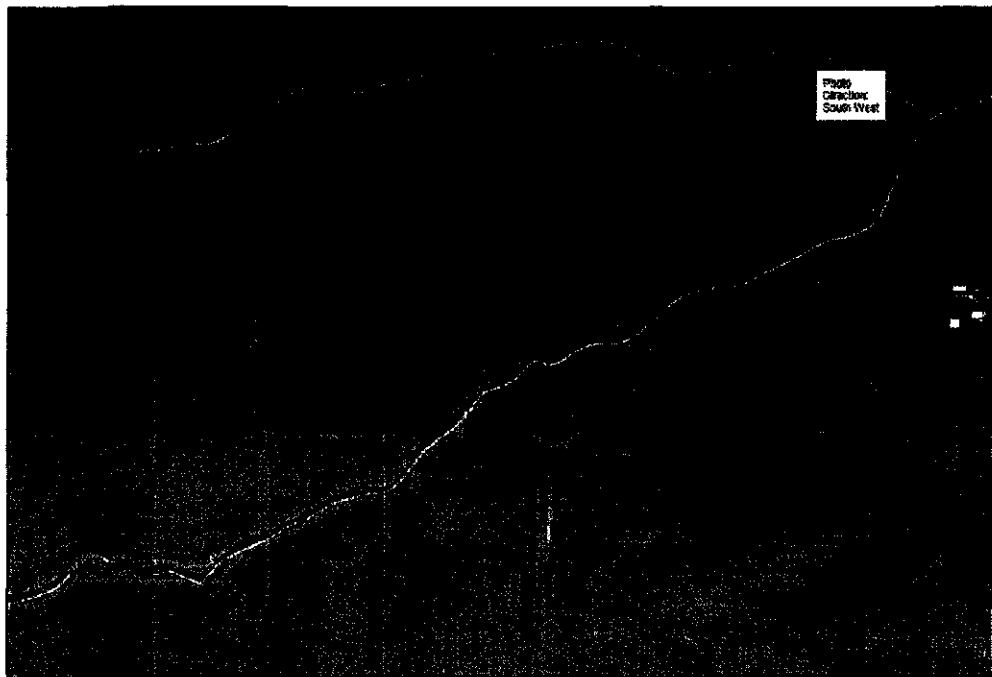
- ☐ WWTP / CSO / NPDES / INDUSTRY
☐ HARDENED / URBAN / DIRT & GRIME
☐ CONTAMINATED / LANDFILL
☐ BMPs - CONSTRUCTION - SEDIMENT
☐ LOGGING / IRRIGATION / COOLING
☐ BANK / EROSION / SURFACE
☐ FALSE BANK / MANURE / LAGOON
☐ WASH H₂O / TILE / H₂O TABLE
☐ ACID / MINE / QUARRY / FLOW
☐ NATURAL / WETLAND / STAGNANT
☐ PARK / GOLF / LAWN / HOME
☐ ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS

- ☐ width
☐ depth
☐ max. depth
☐ bankfull width
☐ bankfull depth
☐ W/D ratio
☐ bankfull max. depth
☐ floodprone x² width
☐ entrench. ratio
☐ Legacy Tree:

Stream Drawing:





Stream
S059CA



Stream S059CA

WATERBODY DATA SHEET

WATERBODY ID NO: S059CA-1		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090919B.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP.: Union		
	PHOTO NO: s59ca3		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	9 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Other	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):	Phalaris arundinacea	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

WATERBODY DATA SHEET

WATERBODY ID NO: S059CA-2		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook	ROVER FILE: RAH090919B.cor	QUAD NAME: Convoy	
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO: s59ca	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):	Phalaris arundinacea		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

<p>STREAM QUALITY: Low</p> <p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside banks actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>

Stream & Location: Hagerman Rd / S 02 E 00 NRM: 11 Date: 9/19/29River Code: - - - - - STORET #: - - - - -Scorers Full Name & Affiliation: R. Hook / CH2M HILLLat./ Long.: 40° 56' 00" 184° 38' 43"Office vol. location ☐1] **SUBSTRATE** Check ONLY Two substrate TYPE BOXES;
estimate % or note every type present

Check ONE (Or 2 & average)

- | | | | |
|--|--------------------------------------|--|--|
| BEST TYPES | POOL RIFFLE | OTHER TYPES | POOL RIFFLE |
| <input type="checkbox"/> BLDR / SLABS [10] | <input type="checkbox"/> <u>POOL</u> | <input checked="" type="checkbox"/> HARDPAN [4] | <input type="checkbox"/> <u>RIFFLE</u> |
| <input type="checkbox"/> BOULDER [9] | <input type="checkbox"/> | <input type="checkbox"/> DETRITUS [3] | <input type="checkbox"/> |
| <input type="checkbox"/> COBBLE [8] | <input type="checkbox"/> | <input type="checkbox"/> MUCK [2] | <input type="checkbox"/> |
| <input type="checkbox"/> GRAVEL [7] | <input type="checkbox"/> | <input type="checkbox"/> SILT [2] | <input type="checkbox"/> |
| <input type="checkbox"/> SAND [6] | <input type="checkbox"/> | <input type="checkbox"/> ARTIFICIAL [0] | <input type="checkbox"/> |
| <input type="checkbox"/> BEDROCK [5] | <input type="checkbox"/> | | |

- ORIGIN**
- ☐ LIMESTONE [1]
- ☐ TILLS [1]
- ☐ WETLANDS [0]
- ☒ **HARDPAN** [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

SILT

- QUALITY**
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☒ **NORMAL** [0]
- ☐ FREE [1]
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☐ **NORMAL** [0]
- ☐ NONE [1]

Substrate

8

Maximum 20

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0] ☐ sludge from point-sources

Comments

2] **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> UNDERCUT BANKS [1] | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1] |
| <input checked="" type="checkbox"/> OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1] | <input type="checkbox"/> AQUATIC MACROPHYTES [1] |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1] | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] |
| <input type="checkbox"/> ROOTMATS [1] | | |

- ☒ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover

Maximum 20

12

3] **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

- | | | | |
|---|--|--|--|
| SINUOSITY | DEVELOPMENT | CHANNELIZATION | STABILITY |
| <input type="checkbox"/> HIGH [4] | <input type="checkbox"/> EXCELLENT [7] | <input type="checkbox"/> NONE [6] | <input checked="" type="checkbox"/> HIGH [3] |
| <input type="checkbox"/> MODERATE [3] | <input type="checkbox"/> GOOD [5] | <input type="checkbox"/> RECOVERED [4] | <input type="checkbox"/> MODERATE [2] |
| <input checked="" type="checkbox"/> LOW [2] | <input checked="" type="checkbox"/> FAIR [3] | <input checked="" type="checkbox"/> RECOVERING [3] | <input type="checkbox"/> LOW [1] |
| <input type="checkbox"/> NONE [1] | <input type="checkbox"/> POOR [1] | <input type="checkbox"/> RECENT OR NO RECOVERY [1] | |

Comments

Channel

Maximum 20

10

4] **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

- | | | |
|---|---|---|
| EROSION | RIPARIAN WIDTH | FLOOD PLAIN QUALITY |
| <input checked="" type="checkbox"/> NONE / LITTLE [3] | <input type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> FOREST, SWAMP [3] |
| <input type="checkbox"/> MODERATE [2] | <input type="checkbox"/> MODERATE 10-50m [3] | <input type="checkbox"/> SHRUB OR OLD FIELD [2] |
| <input type="checkbox"/> HEAVY / SEVERE [1] | <input type="checkbox"/> NARROW 5-10m [2] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] |
| | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> FENCED PASTURE [1] |
| | <input checked="" type="checkbox"/> NONE [0] | <input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0] |

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian

Maximum 10

3

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH

Check ONE (ONLY!)

- ☐ > 1m [8]
- ☐ 0.7-1m [4]
- ☐ 0.4-0.7m [2]
- ☒ 0.2-0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☒ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ☒ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Comments

Pool / Current

Maximum 12

3

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

- | | | | |
|--|---|---|---|
| RIFFLE DEPTH | RUN DEPTH | RIFFLE / RUN SUBSTRATE | RIFFLE / RUN EMBEDDEDNESS |
| <input type="checkbox"/> BEST AREAS > 10cm [2] | <input type="checkbox"/> MAXIMUM > 50cm [2] | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2] | <input type="checkbox"/> NONE [2] |
| <input type="checkbox"/> BEST AREAS 5-10cm [1] | <input type="checkbox"/> MAXIMUM < 50cm [1] | <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] | <input type="checkbox"/> LOW [1] |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0] | | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input type="checkbox"/> MODERATE [0] |
| | | | <input type="checkbox"/> EXTENSIVE [-1] |

Comments

Riffle / Run

Maximum 8

1

6] **GRADIENT** (3.5 ft/mi) ☐ VERY LOW - LOW [2-4]

DRAINAGE AREA (5.5 mi²) ☐ MODERATE [5-10]

☐ HIGH - VERY HIGH [10-6]

%POOL:

%GLIDE:

100%

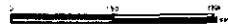
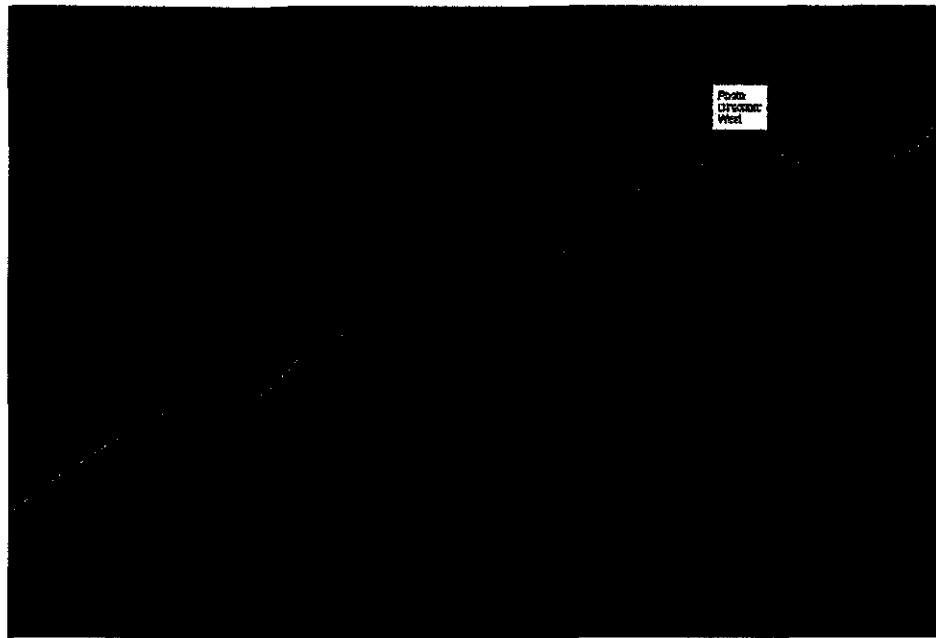
%RUN:

%RIFFLE:

Gradient

Maximum 10

4



Stream
S064CA



Stream S064CA

WATERBODY DATA SHEET

WATERBODY ID No: S064CA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090919B.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO: s64ca	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 35 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear	
PRIMARY SUBSTRATE:	Cobbles	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):	Phalaris arundinacea	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Medium
<p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levies are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>

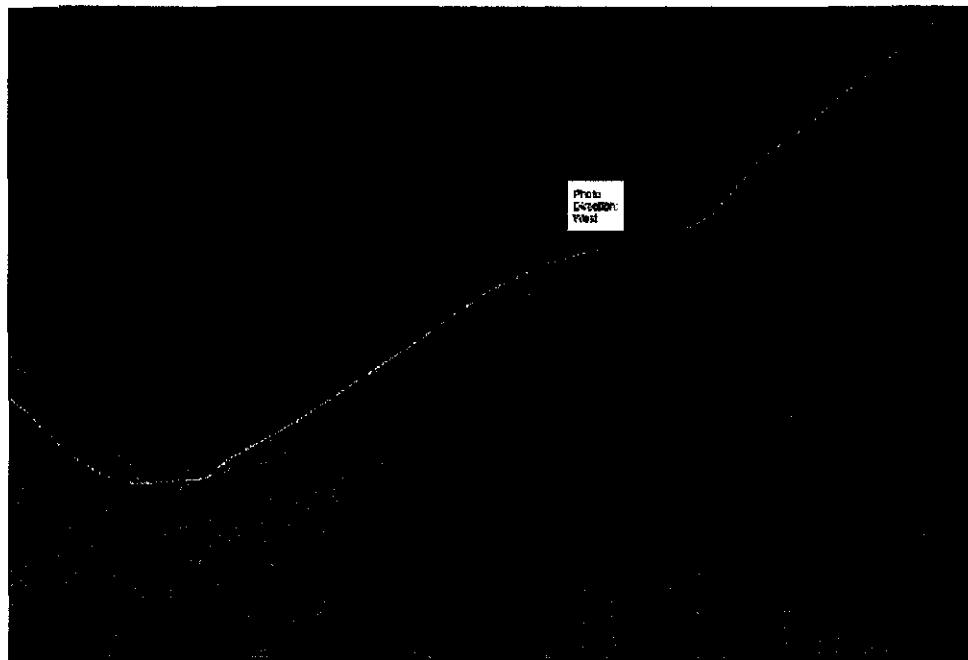


Photo Location
USGS N-10 Mapped Stream
Stream
Aerial Photo



Stream
S115CA



Stream S115CA

WATERBODY DATA SHEET

WATERBODY ID No: S115CA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090919B.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO No: s115ca	

WATERBODY CHARACTERISTICS

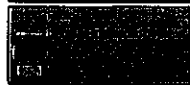
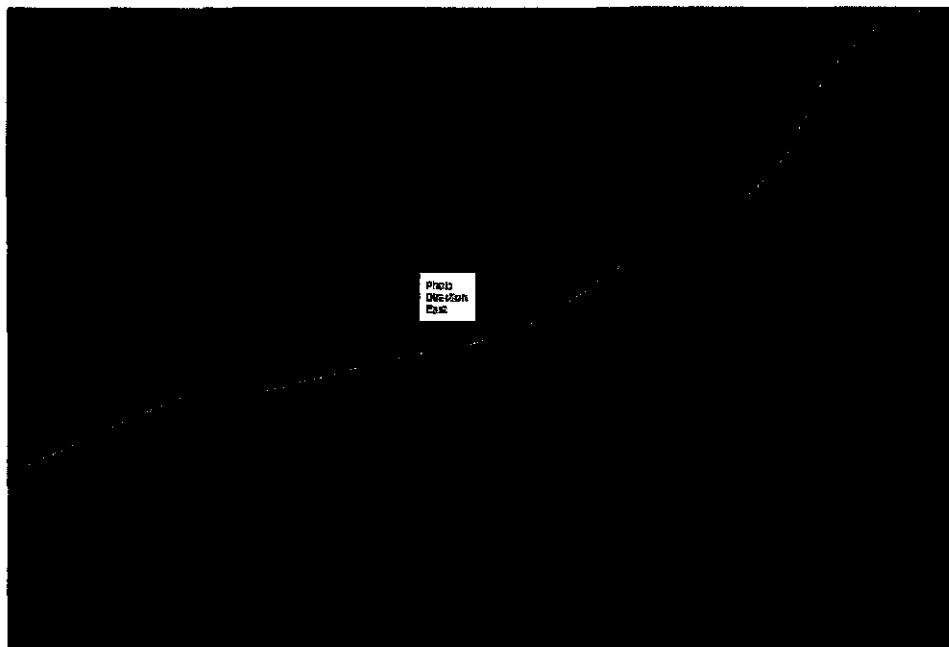
WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	6 (in)		
AVG. STREAM WIDTH:	7 (ft)	TOP OF BANK: 35 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAIN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):	Phalaris arundinace and Scirpus validus		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

<p>STREAM QUALITY: Low</p> <p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>
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Stream
S126CA



Stream S126CA

WATERBODY DATA SHEET

WATERBODY ID No: S126CA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: RH	ROVER FILE: RAH091809A.cor	QUAD NAME: Scott	
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO: s126ca	

WATERBODY CHARACTERISTICS

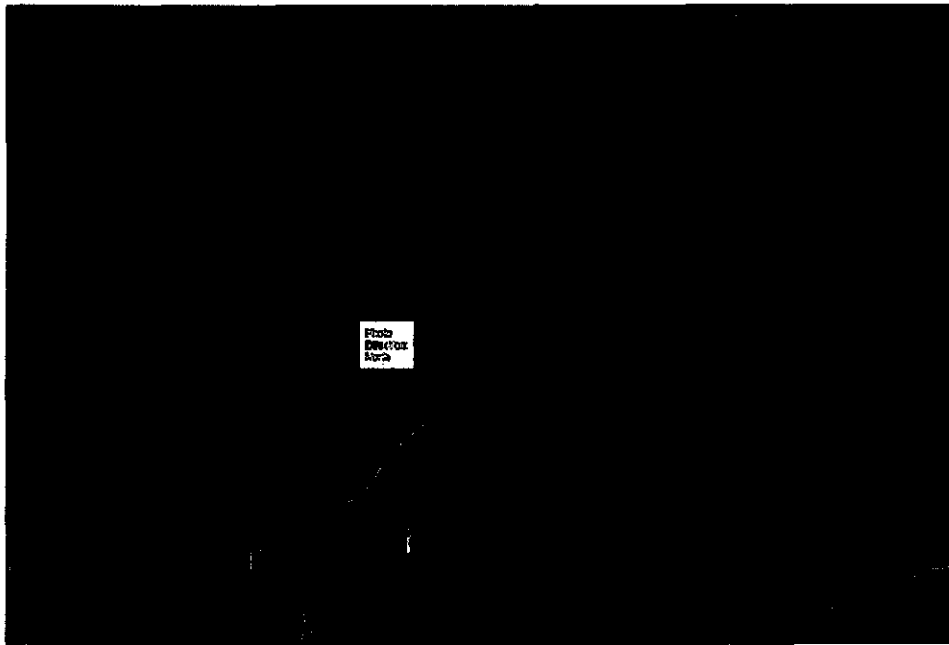
WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	9 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 25 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Sands	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 25 (ft)	
	TYPE OF VEGETATION PRESENT: Forested	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low
<p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>



Stream
SMAINCA



Stream SMAINCA

WATERBODY DATA SHEET

WATERBODY ID NO: SMAINCA-1		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: smainca2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	10 (in)		
AVG. STREAM WIDTH:	10 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 20 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 75 (ft)		
	TYPE OF VEGETATION PRESENT: Forested		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside banks actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside banks actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

WATERBODY DATA SHEET

WATERBODY ID No: SMAINCA-2		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO No: 133c2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	6 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

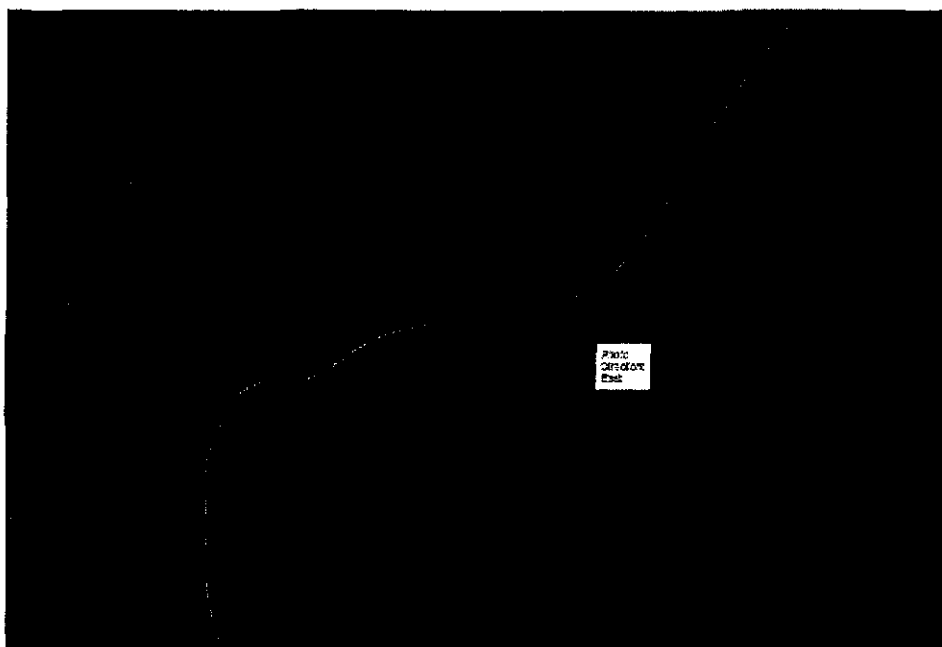
COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; low regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.



Stream
S136CA



Stream S136CA

WATERBODY DATA SHEET

WATERBODY ID NO: S136CA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: s136ca	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	10 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: S 136CA (HAGERMAN CREEK) RM: 11 Date: 9/18/09

River Code: - STORET #: - Scorers Full Name & Affiliation: R. Hook / CH2M HILL
Lat./ Long.: 40° 58' 8" N 84° 34' 30" W (NAD 83 - decimal) Office verified location ☐

1] **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR / SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> HEAVY [-2]						
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> TILLS [1]	<input checked="" type="checkbox"/> MODERATE [-1]						
<input checked="" type="checkbox"/> COBBLE [8]	<u>25%</u> <u>90%</u>	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> NORMAL [0]						
<input type="checkbox"/> GRAVEL [7]	<u>79%</u> <u>10%</u>	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> FREE [1]						
<input checked="" type="checkbox"/> SAND [6]		<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SANDSTONE [0]	<input checked="" type="checkbox"/> EXTENSIVE [-2]						
<input type="checkbox"/> BEDROCK [5]		(Score natural substrates; ignore sludge from point-sources)		<input type="checkbox"/> RIPRAP [0]	<input checked="" type="checkbox"/> MODERATE [-1]						
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]				<input type="checkbox"/> LACUSTURNE [0]	<input type="checkbox"/> NORMAL [0]						
Comments				<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NONE [1]						
				<input type="checkbox"/> COAL FINES [-2]							

2] **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT	
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]
	<input type="checkbox"/> AQUATIC MACROPHYTES [1]
	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]
Check ONE (Or 2 & average)	
<input type="checkbox"/> EXTENSIVE >75% [11]	<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SPARSE 5-25% [3]	<input checked="" type="checkbox"/> NEARLY ABSENT <5% [1]
Cover Maximum 20	
Comments	

3] **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input checked="" type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	
Channel Maximum 20			
Comments			

4] **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> CONSERVATION TILLAGE [1]		
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]		
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]		
	<input checked="" type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]			
	<input type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]			
Indicate predominant land use(s) past 100m riparian.					
Riparian Maximum 10					
Comments					

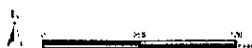
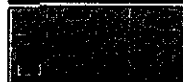
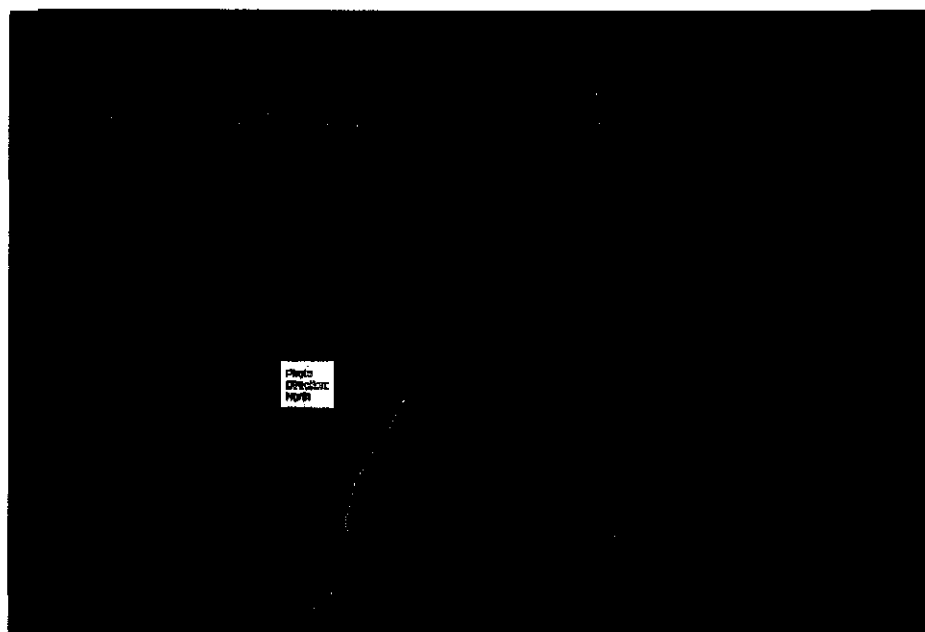
5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [6]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> VERY FAST [1]	(circle one and comment on back)
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> INTERSTITIAL [-1]	
<input checked="" type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input type="checkbox"/> < 0.2m [0]		<input checked="" type="checkbox"/> MODERATE [1]	
Indicate for reach - pools and riffles.			Pool / Current Maximum 12
Comments			

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input checked="" type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input checked="" type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input checked="" type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
Comments			Riffle / Run Maximum 8

6] **GRADIENT** (2.5 ft/m) ☐ VERY LOW - LOW [2-4] %POOL: 0 %GLIDE: 90%
DRAINAGE AREA (9.4 mi²) ☐ MODERATE [6-10] %RUN: 0 %RIFFLE: 10%
☐ HIGH - VERY HIGH [10-6] Gradient Maximum 10



Stream
S160CA



Stream S160CA

WATERBODY DATA SHEET

WATERBODY ID NO: S160CA		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091609ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Latty	
		PHOTO NO: 160CA29S & 160CA30n	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Deep channel, banks may have been widened unnaturally (farmers)		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	12 (in)		
AVG. STREAM WIDTH:	12 (ft)	TOP OF BANK: 15 (ft)	ORDINARY HIGH WATER MARK WIDTH: 10 (ft)
AVG. BANK HEIGHT:	4 (ft)		
AVG. BANK SLOPE (RATIO):	Vertical ($\leq 1:1$)		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Cobbles		
POTENTIAL HABITAT FOR:	Fish/Spawn Areas		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 10 (ft)		
	TYPE OF VEGETATION PRESENT: Forested		
WETLAND FRINGE (IF PRESENT):	S of existing road, W of stream, where stream crosses beneath		
CHANNEL CONDITION:	Highly Erodable		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: 2000RM: --- Date: 9/16/99

Scorers Full Name & Affiliation:

River Code: --- STORET #: --- Lat./Long.: 41.00226 184.54584Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY	
<input type="checkbox"/>	BUD/SNAPS [0]	<input type="checkbox"/>		<input type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>		<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [2]
<input type="checkbox"/>	BOULDER [1]	<input type="checkbox"/>		<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input type="checkbox"/>	MODERATE [1]
<input type="checkbox"/>	COBBLE [1]	<input type="checkbox"/>	15 80	<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	LARDPAN [0]	<input checked="" type="checkbox"/>	NORMALLY [1]
<input type="checkbox"/>	GRAVEL [1]	<input type="checkbox"/>	15 10	<input type="checkbox"/>	SILT [2]	<input type="checkbox"/>	20 5	<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [2]
<input checked="" type="checkbox"/>	SAND [6]	<input type="checkbox"/>	50 5	<input type="checkbox"/>	ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	LAGUSTRINE [0]	<input type="checkbox"/>	MODERATE [1]
<input type="checkbox"/>	PEBBLE [5]	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	SHALE [1]	<input type="checkbox"/>	NORMAL [0]
				(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	COALINES [2]	<input type="checkbox"/>	NONE [1]

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

UNDERGROWTH BANKS [1]		POOLS > 70cm [2]		OXBOWS/BACKWATERS [1]	
<input checked="" type="checkbox"/>	OVERHANGING VEGETATION [1]	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	ROOTWADS [1]	<input type="checkbox"/>	AQUATIC MACROPHYTES [1]
<input type="checkbox"/>	ROOTMATS [1]	<input type="checkbox"/>	BOULDERS [1]	<input type="checkbox"/>	LOGS OR WOODY DEBRIS [1]

Check ONE (Or 2 & average)

Comments

Cover
Maximum
20

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [1]	<input type="checkbox"/> EXCELLENT [7]	<input checked="" type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> REGENT OR NO RECOVERY [1]	

Comments

Channel
Maximum
20

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> WIDE > 50m [1]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> FOREST / WAMP [0]	<input type="checkbox"/> CONSERVATION / TIMBER [1]
<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/> RESIDENTIAL / PARK / NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
		<input type="checkbox"/>		<input type="checkbox"/> FENCED PASTURE [1]	
		<input type="checkbox"/>		<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]	

Comments

Indicate predominant land use(s) past 100m riparian.
Riparian
Maximum
10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

CHANNEL WIDTH

CURRENT VELOCITY

Check ONE (ONLY?)

Check ONE (Or 2 & average)

Check ALL that apply

- ☐ 0-1m [1]
☐ 0.1-1m [4]
☒ 0.4-0.7m [2]
☐ 0.2-0.4m [1]
☐ < 0.2m [0]

- ☒ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

- ☐ TORRENTIAL [1]
☐ VERY FAST [1]
☐ FAST [1]
☐ MODERATE [1]
☐ INTERMITTENT [2]
☐ INTERMITTENT [2]
☐ EDDIES [1]

Indicate for reach - pools and riffles.

Comments

Pool /
Current
Maximum
12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH

RUN DEPTH

RIFFLE / RUN SUBSTRATE

RIFFLE / RUN EMBEDDEDNESS

- ☐ BEST AREAS < 10cm [2]
☒ BEST AREAS < 10cm [1]
☐ BEST AREAS < 10cm [metric=0]
- ☐ MAXIMUM > 50cm [2]
☒ MAXIMUM < 50cm [1]
- ☒ STABLE (e.g., COBBLE/BOULDER) [2]
☒ MOD. STABLE (e.g., GRAVEL/SAND) [1]
☐ UNSTABLE (e.g., MUCK/SLUDGE) [0]

- ☐ NONE [2]
☒ LOW [1]
☐ MODERATE [0]
☐ EXTENSIVE [1]

Comments

Riffle /
Run
Maximum
8

6] GRADIENT (3.3 ft/mi)

DRAINAGE AREA

(13.62 mi²)

- ☐ VERY SHALLOW [2]
☒ MODERATE [1]
☐ HIGH WATER HIGH [0]

%POOL:

10

%GLIDE:

40

%RUN:

40

%RIFFLE:

10

Gradient

Maximum

6

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

AJ SAMPLED REACH

Check ALL that apply

METHOD STAGE

- ☐ BOAT
☐ WADE
☐ L. LINE
☐ OTHER
☐ DISTANCE
☐ 0.6 Km
☐ 0.2 Km
☐ 0.15 Km
☐ 0.12 Km
☐ OTHER
☐ 1st sample past-- 2nd
☐ < 20 cm
☐ 20-40 cm
☐ 40-70 cm
☐ > 70 cm/ CTB
☐ SECCHI DEPTH
☐ HIGH
☐ UP
☐ NORMAL
☐ LOW
☐ DRY

CLARITY

- ☐ 1st sample past-- 2nd
☐ < 20 cm
☐ 20-40 cm
☐ 40-70 cm
☐ > 70 cm/ CTB
☐ SECCHI DEPTH
☐ HIGH
☐ UP
☐ NORMAL
☐ LOW
☐ DRY

meters

CANOPY

- ☐ > 85%-- OPEN
☐ 55%--<85%
☐ 30%--<55%
☐ 10%--<30%
☐ <10%-- CLOSED

CJ RECREATION

POOL: ☐ >1000' ☐ >3R

BJ AESTHETICS

- ☐ NUISANCE ALGAE
☐ INVASIVE MACROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM / SCUM
☐ OIL SHEEN
☐ TRASH / LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSO/ISSUES/OUTFALLS

DJ MAINTENANCE

- ☐ PUBLIC / PRIVATE / BOTH / NA
☐ ACTIVE / HISTORIC / BOTH / NA
☐ YOUNG-SUCCESSION-OLD
☐ SPRAY / SNAG / REMOVED
☐ MODIFIED / DIPPED OUT / NA
☐ LEVEED / ONE SIDED
☐ RELOCATED / CUTOFFS
☐ MOVING-BEDLOAD-STABLE
☐ ARMOURING-SLUMPS
☐ ISLANDS / SCoured
☐ IMPOUNDED / DESICCATED
☐ FLOOD CONTROL / DRAINAGE

EJ ISSUES

- ☐ WWTP / CSO / NPDES / INDUSTRY
☐ HARDENED / URBAN / DIRT&GRIME
☐ CONTAMINATED / LANDFILL
☐ BMPs-CONSTRUCTION-SEDIMENT
☐ LOGGING / IRRIGATION / COOLING
☐ BANK / EROSION / SURFACE
☐ FALSE BANK / MANURE / LAGOON
☐ WASH H₂O / TILE / H₂O TABLE
☐ ACID / MINE / QUARRY / FLOW
☐ NATURAL / WETLAND / STAGNANT
☐ PARK / GOLF / LAWN / HOME
☐ ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- ☐ width
☐ depth
☐ max. depth
☐ bankfull width
☐ bankfull depth
☐ W/D ratio
☐ bankfull max. depth
☐ floodprone x² width
☐ entrench. ratio
☐ Legacy Tree:

Stream Drawing:

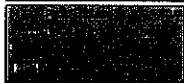
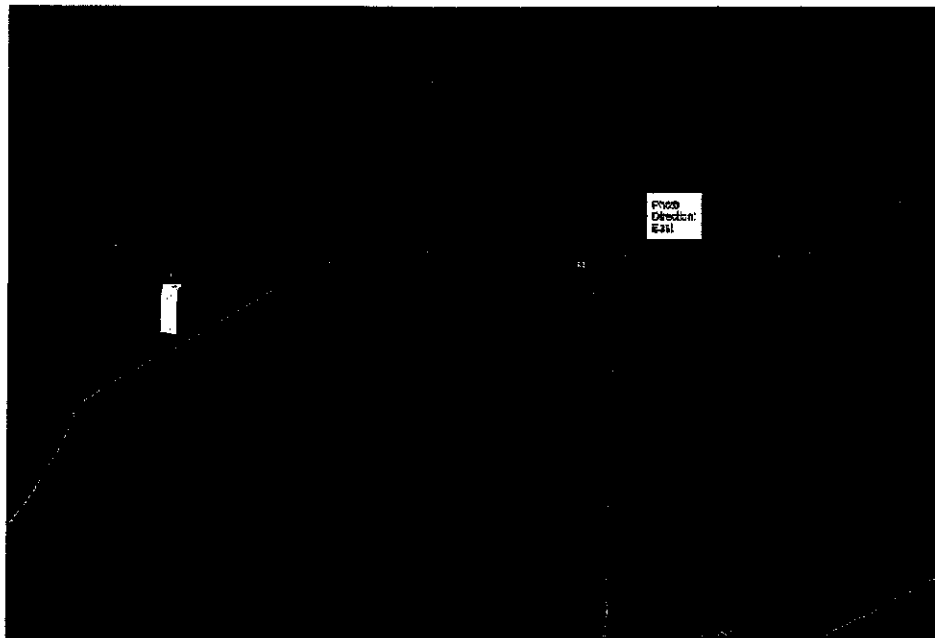
2

road

street

grass
butter
few
trees

Tributaries to Hagerman Creek



Stream
S039CA



Stream S039CA

WATERBODY DATA SHEET

WATERBODY ID NO: S039CA		WATERBODY NAME: Unnamed Tributary to Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090919B.cor	QUAD NAME: Convoy
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: s59ca1	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 30 (ft)	ORDINARY HIGH WATER MARK WIDTH: 8 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAIN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):	Leersia oryzoides	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

<p>STREAM QUALITY: Low</p> <p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; Intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness; submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>
--

SITE NAME/LOCATION

SITE NUMBER 5039CA

RIVER BASIN

DRAINAGE AREA (mi²) 0.50

LENGTH OF STREAM REACH (ft)

LAT. 40° 26' 21" LONG. 84° 32' 32"

RIVER CODE

RIVER MILE

DATE 9/19/09

SCORER

COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL

☐ RECOVERED

☐ RECOVERING

☐ RECENT OR NO RECOVERY

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

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

BLDR SLABS (16 pts)

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pts]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [6 pts]

PERCENT

TYPE

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 0

TOTAL NUMBER OF SUBSTRATE TYPES: 1

HHEI Metric Points

Substrate Max = 40

1

A + B

Pool Depth Max = 30

0

Bankfull Width Max=30

20

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):

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 30 centimeters [20 pts]

> 22.5 - 30 cm [30 pts]

> 10 - 22.5 cm [25 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 5 cm - 10 cm [15 pts]

< 5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 4.0 meters (> 13') [30 pts]

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

> 1.5 m - 3.0 m (> 8' 7" - 4' 8") [20 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

This information must also be completed
RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH

L R

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(Per Bank)

Wide >10m

Moderate 5-10m

Narrow <5m

None

COMMENTS:

FLOODPLAIN QUALITY

L R

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(Most Predominant per Bank)

Mature Forest, Wetland

Immature Forest, Shrub or Old Field

Residential, Park, New Field

Fenced Pasture

L R

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>

Stream Flowing

Subsurface flow with isolated pools (Interstitial)

COMMENTS:

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

Moist Channel, isolated pools, no flow (Intermittent)

Dry channel, no water (Ephemeral)

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None

0.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

1.0

1.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

2.0

2.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

3.0

>3

STREAM GRADIENT ESTIMATE

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Flat (0.5 ft/100 ft)

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Flat to Moderate

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Moderate (2 ft/100 ft)

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Moderate to Severe

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ 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: _____
☐ 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: Van Wert Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: _____
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): 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: _____

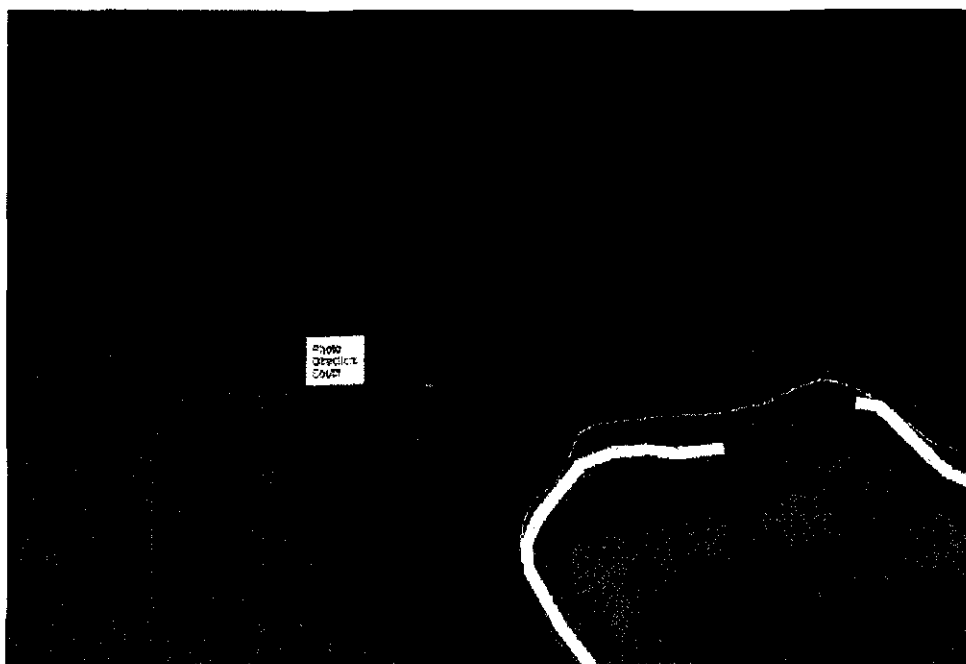
BIOTIC EVALUATION

Performed? (Y/N): 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): Y Voucher? (Y/N): _____ Aquatic Macroinvertebrates Observed? (Y/N): _____ Voucher? (Y/N): _____
Comments Regarding Biology: 2 small (2) mgs. 1 larva

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

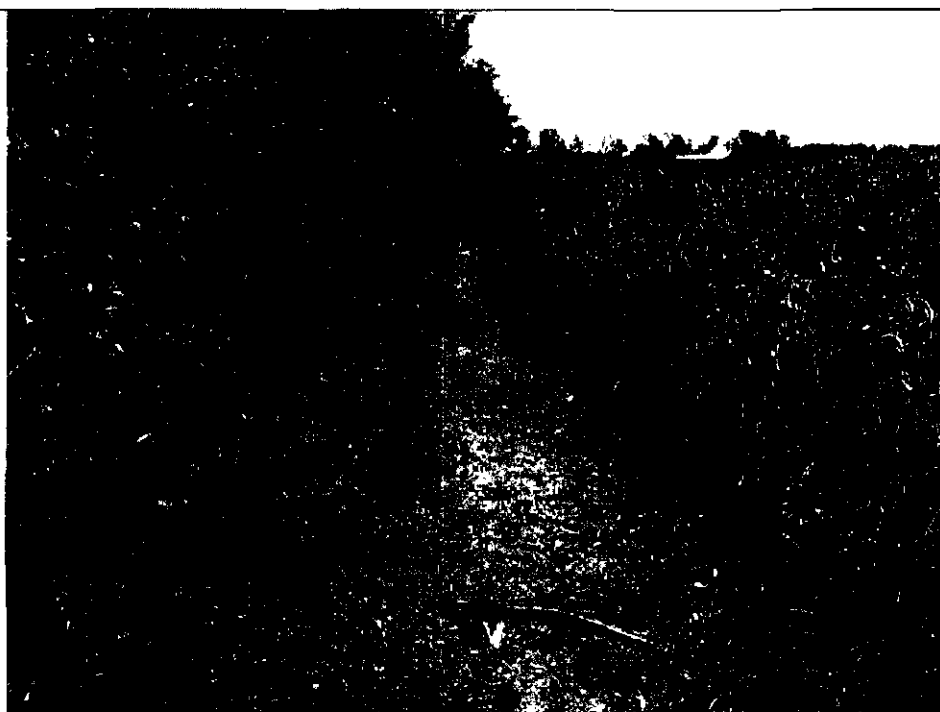
g - 200
Cove
Leena occ. 7/10



○ Photo Location
 L3000 1440 Mapped Stream
 Stream
 Contoured Features



Stream
 SMAINCB



Stream SMAINCB

WATERBODY DATA SHEET

WATERBODY ID NO: SMAINCB		WATERBODY NAME: Unnamed Tributary to Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: smaincb1	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Ephemeral		
AVG. STREAM DEPTH:	(in)		
AVG. STREAM WIDTH:	(ft)	TOP OF BANK: 8 (ft)	ORDINARY HIGH WATER MARK WIDTH: 4 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Sands	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAIN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION _____

SITE NUMBER SMAINCB

RIVER BASIN _____

DRAINAGE AREA (mi²) 0

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 9/18/09 SCORER R. Hook COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	_____
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6

TOTAL NUMBER OF SUBSTRATE TYPES: 1

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): _____

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 8' 7" - 4' 8") [20 pts]	

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 1.5

HHEI Metric Points

Substrate Max = 40

7

A + B

Pool Depth Max = 30

0

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m @ old RR
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None UPPER REACH

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop UPPER REACH
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSIDE DESIGNATED USE(S)

WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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: Quantity:
 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 (µmhos/cm)
 Is the sampling reach representative of the stream (Y/N) ☐ If not, please explain:

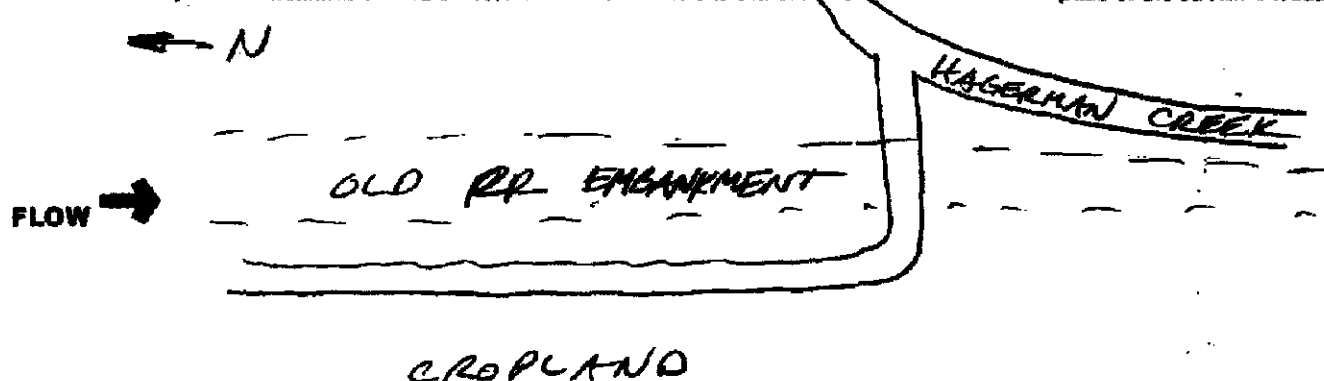
Additional comments/description of pollution impacts:

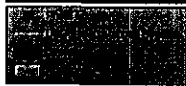
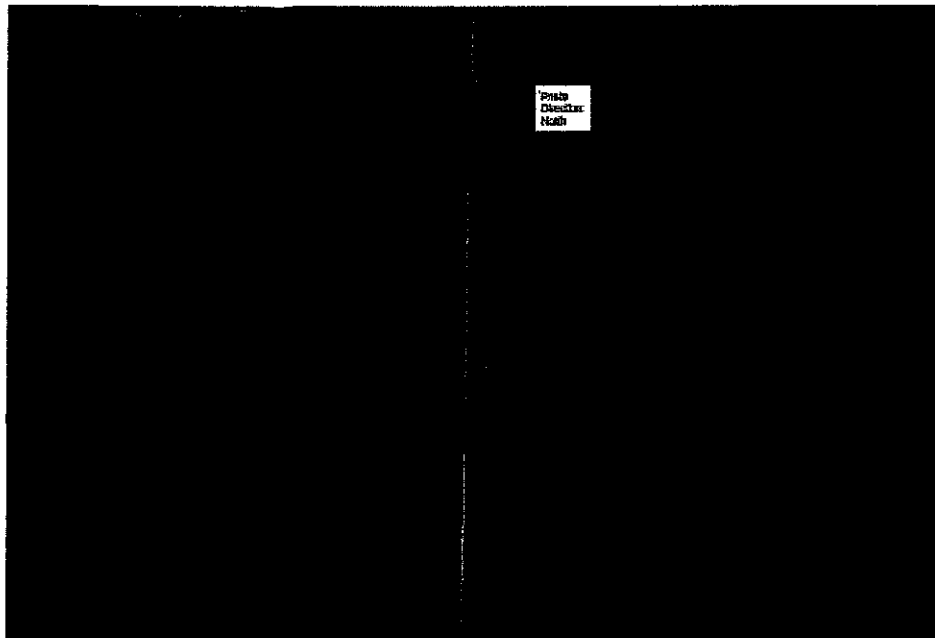
BIOTIC EVALUATION

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) ☐ 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) ☐
 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





Stream
S163AA



Stream S163AA

WATERBODY DATA SHEET

WATERBODY ID NO: S163AA		WATERBODY NAME: Unnamed Tributary to Hagerman Crk (to the N)	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091609ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP.: Latty	
		PHOTO NO: 163C13n & 163C14S	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag drainage, rip-rap along small portion of the E bank; manmade, cobbles and veg in bed		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 8 (ft)
AVG. BANK HEIGHT:	6 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Vegetation	
POTENTIAL HABITAT FOR:	None	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: Other (Specify)	
WETLAND FRINGE (IF PRESENT):	none	
CHANNEL CONDITION:	Other	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.



Primary Headwater Habitat Evaluation Form

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HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION _____

SITE NUMBER **S163AA**

RIVER BASIN _____

DRAINAGE AREA (mi²) **0.19**LENGTH OF STREAM REACH (ft) _____ LAT. **41.00680** LONG. **-84.53430** RIVER CODE _____ RIVER MILE _____DATE **09/16/09** SCORER **Nechvatal** COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL
MODIFICATIONS:☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/>	SILT [3 pt]	70%
<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/>	BEDROCK [16 pt]	0%	<input type="checkbox"/>	FINE DETRITUS [3 pts]	0%
<input checked="" type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	30%	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/>	MUCK [0 pts]	0%
<input type="checkbox"/>	SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/>	ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **30.00%**

(A)

100%

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**TOTAL NUMBER OF SUBSTRATE TYPES: **1**HHEI
Metric
PointsSubstrate
Max = 40**16**

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):

<input type="checkbox"/>	> 30 centimeters [20 pts]	<input type="checkbox"/>	> 5 cm - 10 cm [15 pts]
<input type="checkbox"/>	> 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/>	< 5 cm [5 pts]
<input type="checkbox"/>	> 10 - 22.5 cm [25 pts]	<input type="checkbox"/>	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters): **2**Pool Depth
Max = 30**5**

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/>	> 4.0 meters (> 13') [30 pts]	<input type="checkbox"/>	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/>	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/>	≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/>	> 1.6 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters): **2.00**Bankfull
Width
Max=30**20**This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/>	Stream Flowing	<input checked="" type="checkbox"/>	Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/>	Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/>	Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	1.0	<input type="checkbox"/>	2.0	<input type="checkbox"/>	3.0
<input type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☒ Yes ☐ No QHEI Score 28.0 (If Yes, Attach Completed QHEI 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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Paulding Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: 0.00

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 100%

Were samples collected for water chemistry? (Y/N): 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): Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): 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): N Voucher? (Y/N): N Salamanders Observed? (Y/N): N Voucher? (Y/N): N
Frogs or Tadpoles Observed? (Y/N): N Voucher? (Y/N): N Aquatic Macroinvertebrates Observed? (Y/N): N Voucher? (Y/N): 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

ag ag N →
Hagaman Creek
FLOW →
out to Hagaman Creek ↑
Road ↑ ag

Stream & Location:

RM:

Date: / /

Scorer's Full Name & Affiliation:

River Code:

STORET #:

Lat./ Long.:
(NAD 83 - decimal)

/8

Office verified
location ☐**1) SUBSTRATE** Check ONLY Two substrate TYPE BOXES;
estimate % or note every type present

Check ONE (Or 2 & average)

- | BEST TYPES | POOL RIFFLE | OTHER TYPES | POOL RIFFLE |
|--|-------------|---|-------------|
| <input type="checkbox"/> BLDR/SLABS [10] | _____ | <input type="checkbox"/> HARDPAN [4] | _____ |
| <input type="checkbox"/> BOULDER [9] | _____ | <input type="checkbox"/> DETRITUS [3] | _____ |
| <input type="checkbox"/> COBBLE [8] | _____ | <input type="checkbox"/> MUCK [2] | _____ |
| <input type="checkbox"/> GRAVEL [7] | _____ | <input type="checkbox"/> SILT [2] | _____ |
| <input type="checkbox"/> SAND [6] | _____ | <input type="checkbox"/> ARTIFICIAL [0] | _____ |
| <input type="checkbox"/> BEDROCK [5] | _____ | | |

- ORIGIN
- ☐ LIMESTONE [1]
- ☐ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

SILT

EMBEDDEDNESS

QUALITY

- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate

Maximum
20

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0]

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

- | | | |
|---|---|---|
| <input type="checkbox"/> UNDERCUT BANKS [1] | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1] |
| <input type="checkbox"/> OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1] | <input type="checkbox"/> AQUATIC MACROPHYTES [1] |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1] | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] |
| <input type="checkbox"/> ROOTMATS [1] | | |

- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover
Maximum
20**3) CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

- | SINUOSITY | DEVELOPMENT | CHANNELIZATION | STABILITY |
|---|--|--|---------------------------------------|
| <input type="checkbox"/> HIGH [4] | <input type="checkbox"/> EXCELLENT [7] | <input type="checkbox"/> NONE [0] | <input type="checkbox"/> HIGH [3] |
| <input type="checkbox"/> MODERATE [3] | <input type="checkbox"/> GOOD [5] | <input type="checkbox"/> RECOVERED [4] | <input type="checkbox"/> MODERATE [2] |
| <input checked="" type="checkbox"/> LOW [2] | <input type="checkbox"/> FAIR [3] | <input type="checkbox"/> RECOVERING [3] | <input type="checkbox"/> LOW [1] |
| <input type="checkbox"/> NONE [1] | <input type="checkbox"/> POOR [1] | <input type="checkbox"/> RECENT OR NO RECOVERY [1] | |

Channel
Maximum
20**4) BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

- | River right looking downstream | | RIPARIAN WIDTH | | FLOOD PLAIN QUALITY | | | |
|--|--|---|--|---------------------|--|--|--|
| <input type="checkbox"/> EROSION | <input type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> FOREST, SWAMP [3] | <input type="checkbox"/> CONSERVATION TILLAGE [1] | | | | |
| <input type="checkbox"/> NONE / LITTLE [3] | <input type="checkbox"/> MODERATE 10-50m [3] | <input type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> URBAN OR INDUSTRIAL [0] | | | | |
| <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> NARROW 5-10m [2] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> MINING / CONSTRUCTION [0] | | | | |
| <input type="checkbox"/> HEAVY / SEVERE [1] | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> FENCED PASTURE [1] | | | | | |
| | <input type="checkbox"/> NONE [0] | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0] | | | | | |

Indicate predominant land use(s)
past 100m riparian.Riparian
Maximum
10

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY)

- ☐ > 1m [6]
- ☐ 0.7-1m [4]
- ☐ 0.4-0.7m [2]
- ☐ 0.2-0.4m [1]
- ☒ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

- ☐ TORRENTIAL [-1] ☐ SLOW [1]
- ☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
- ☐ FAST [1] ☐ INTERMITTENT [-2]
- ☐ MODERATE [1] ☐ EDDIES [-1]

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool /
Current
Maximum
12

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

- | RIFFLE DEPTH | RUN DEPTH | RIFFLE / RUN SUBSTRATE | RIFFLE / RUN EMBEDDEDNESS |
|--|---|---|---|
| <input type="checkbox"/> BEST AREAS > 10cm [2] | <input type="checkbox"/> MAXIMUM > 50cm [2] | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2] | <input type="checkbox"/> NONE [2] |
| <input type="checkbox"/> BEST AREAS 5-10cm [1] | <input type="checkbox"/> MAXIMUM < 50cm [1] | <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] | <input type="checkbox"/> LOW [1] |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0] | | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input type="checkbox"/> MODERATE [0] |
| | | | <input type="checkbox"/> EXTENSIVE [-1] |

Riffle /
Run
Maximum
8

Comments

6) GRADIENT

DRAINAGE AREA

(0.19 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

% POOL:

0

% GLIDE:

20

% RUN:

20

% RIFFLE:

30

Gradient
Maximum
10

AJ SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

STAGE

- 1st sample pass--
- ☐ HIGH
- ☐ UP
- ☐ NORMAL
- ☐ LOW
- ☐ DRY

CLARITY

- 1st sample pass--
- ☐ < 20 cm
- ☐ 20-40 cm
- ☐ 40-70 cm
- ☐ > 70 cm/ GTB
- ☐ SECCHI DEPTH

meters

CANOPY

- ☐ > 85% - OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10% - CLOSED

CJ RECREATION

AREA DEPTH

POOL: ☐ >100R2 ☐ >3ft

BJ AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BEDLOAD-STABLE
- ARMOURED / SLUMPS
- ISLANDS / SCoured
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

Choke some & COMMENT

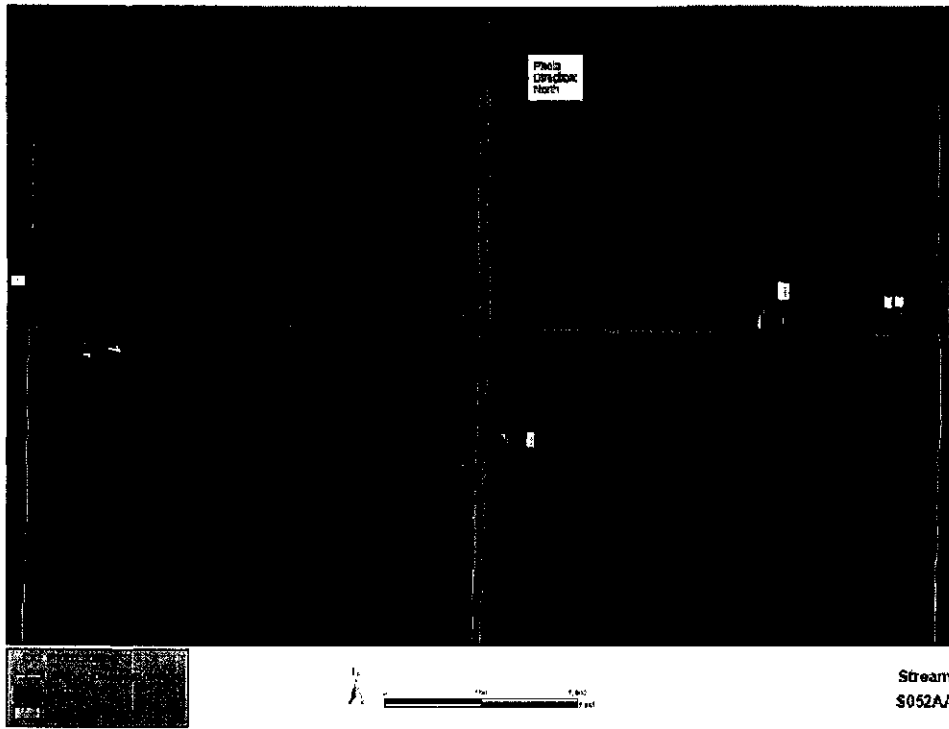
EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT & GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H₂O / TILE / H₂O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- \bar{x} width
- \bar{x} depth
- max. depth
- \bar{x} bankfull width
- bankfull \bar{x} depth
- W/D ratio
- bankfull max. depth
- floodprone \bar{x} width
- entrench. ratio
- Legacy Tree:

Stream Drawing:



Stream S052AA

WATERBODY DATA SHEET

WATERBODY ID NO: S052AA		WATERBODY NAME: Unnamed Tributary to Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/20/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090920.cor	QUAD NAME: Convoy
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: s052aa1	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 5 (ft)
AVG. BANK HEIGHT:	6 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:		
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAIN: 5 (ft)	
	TYPE OF VEGETATION PRESENT: Herbaceous	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside banks actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside banks actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION

SITE NUMBER 5052AA

RIVER BASIN

DRAINAGE AREA (mi²)

0.6

LENGTH OF STREAM REACH (ft)

LAT. 40°57'50"

LONG. 84°37'48"

RIVER CODE

RIVER MILE

DATE 09/20/03

SCORER

COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL☐ RECOVERED☒ RECOVERING☐ RECENT OR NO RECOVERY

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

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

BLDR SLABS [16 pts]

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pts]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [6 pts]

PERCENT

5%

TYPE

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

SILT [3 pts]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pts]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

95%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

0

TOTAL NUMBER OF SUBSTRATE TYPES:

2

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):

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

> 30 centimeters [20 pts]

> 22.5 - 30 cm [30 pts]

> 10 - 22.5 cm [25 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 5 cm - 10 cm [15 pts]

< 5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

-

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 4.0 meters (> 13') [30 pts]

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

> 1.5 m - 3.0 m (> 8' 7" - 4' 8") [20 pts]

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

≤ 1.0 m (<= 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

2

HHEI Metric Points

Substrate Max = 40

2

A + B

Pool Depth Max = 30

0

Bankfull Width Max=30

30

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(Per Bank)

Wide >10m

Moderate 5-10m

Narrow <5m

None

COMMENTS:

FLOODPLAIN QUALITY

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(Most Predominant per Bank)

Mature Forest, Wetland

Immature Forest, Shrub or Old Field

Residential, Park, New Field

Fenced Pasture

L	R
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Stream Flowing

Subsurface flow with isolated pools (Interstitial)

COMMENTS:

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Moist Channel, isolated pools, no flow (Intermittent)

Dry channel, no water (Ephemeral)

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None

0.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

1.0

1.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

2.0

2.5

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

3.0

>3

STREAM GRADIENT ESTIMATE

☒

Flat (0.5 ft/100 ft)

☐

Flat to Moderate

☐

Moderate (2 ft/100 ft)

☐

Moderate to Severe

☐

Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ 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: _____
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): Y 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. 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): 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): _____ Aquatic Macroinvertebrates Observed? (Y/N): _____ Voucher? (Y/N): _____
Comments Regarding Biology: _____

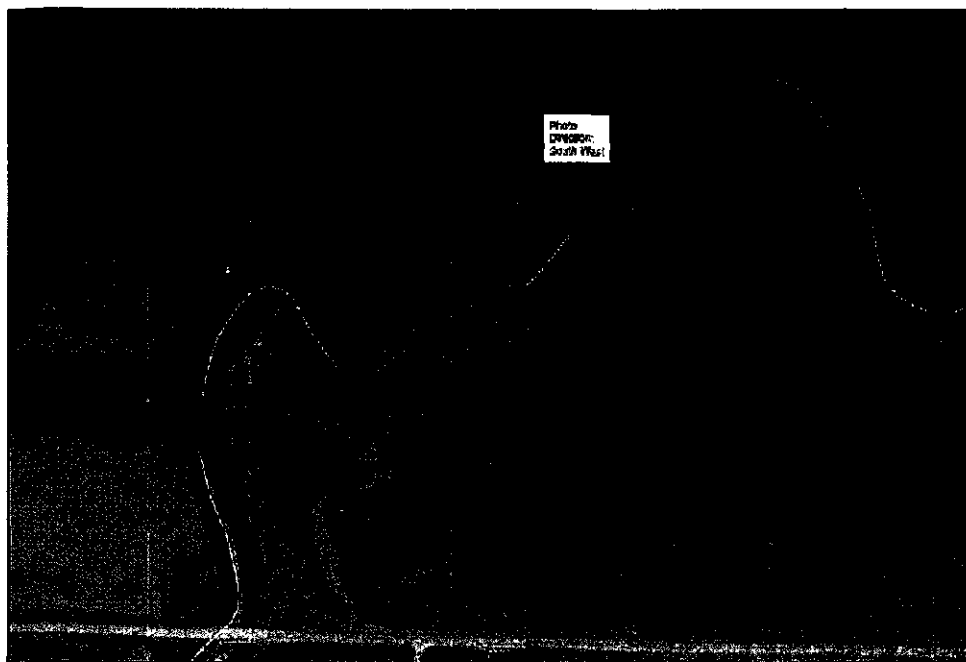
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW →

Handwritten notes and sketch:
Sketch of a stream reach with a meandering path. The stream is labeled "Cottonwood Creek".
Handwritten notes: "Cottonwood Creek", "flowing south", "bank exposed with sandstone above stream", "flow".

Blue Creek



Stream S069CA

WATERBODY DATA SHEET

WATERBODY ID NO: S069CA		WATERBODY NAME: Blue Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M.Nechvatal		ROVER FILE: R091809ADW.cor	QUAD NAME: Payne
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Blue Creek	
		PHOTO NO: 069C5nE & 069C6SW	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Wide, deep natural channel, likely manipulated/cut out due to adj ag fields		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	6 (in)		
AVG. STREAM WIDTH:	15 (ft)	TOP OF BANK: 20 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	2 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Silt		
POTENTIAL HABITAT FOR:	Fish/Spawn Areas		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 100 (ft)		
	TYPE OF VEGETATION PRESENT: Herbaceous		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Sloughing Banks		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY MEANDERING	

COMMENTS

collector line from 070 to 069T crosses stream diagonally at this point, 069T to NW

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

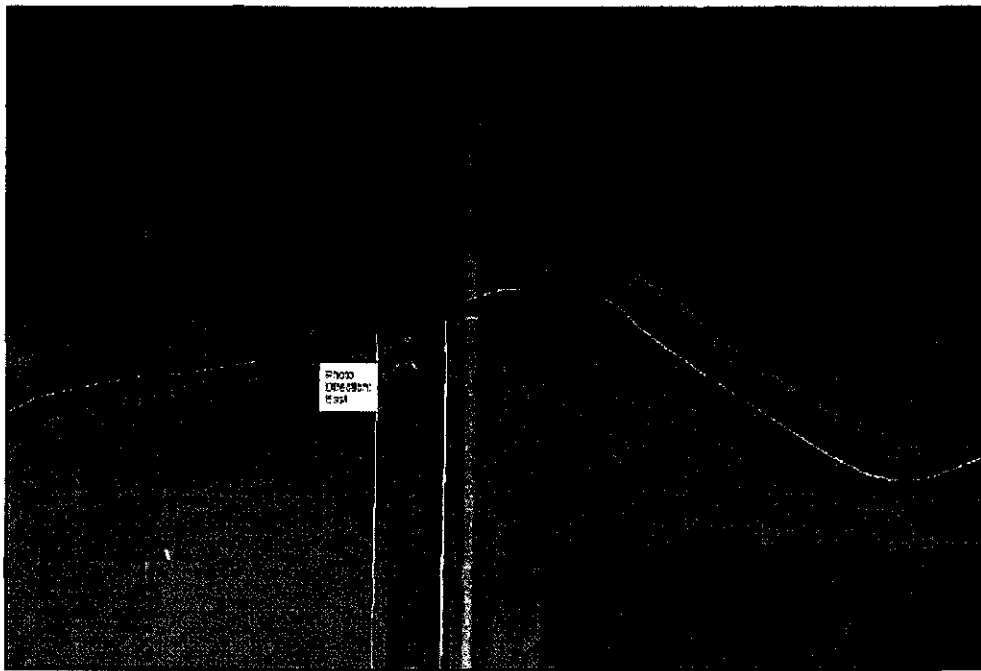
LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

RM: , Date: 09/19/09

Check ONE (Or 2 & average)

452

Pottawatomie Creek.



Stream
S122CA



Stream S122CA

WATERBODY DATA SHEET

WATERBODY ID NO: S122CA		WATERBODY NAME: Pottawatomie Creek	
SITE NAME: Blue Creek			
DATE: 10/14/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE:	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO:	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	2 (in)		
AVG. STREAM WIDTH:	4 (ft)	TOP OF BANK: 25 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	3 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING

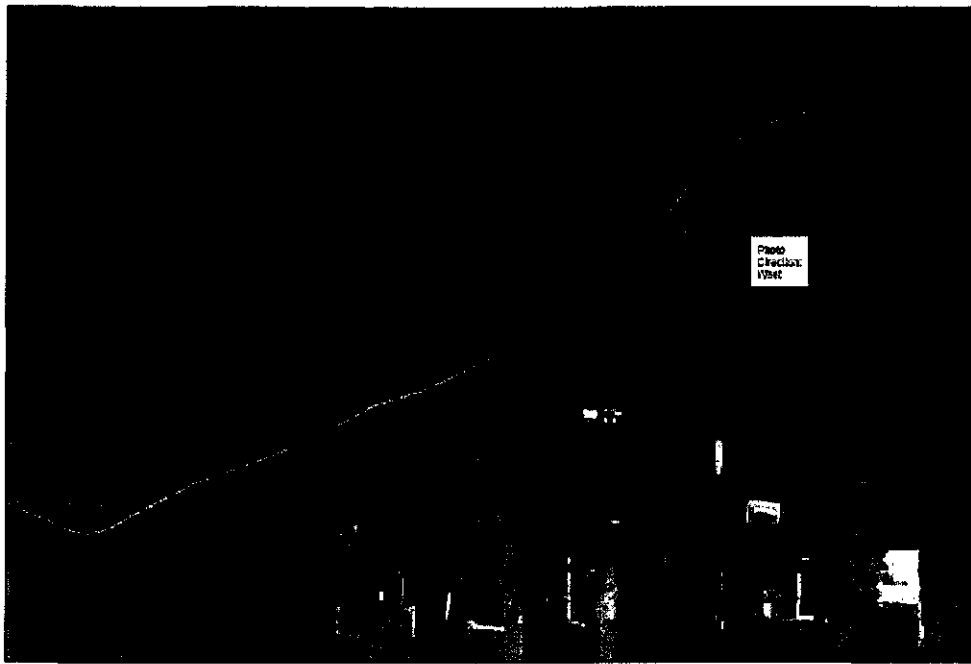
COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

Low QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.



Stream
SMAINCC



Stream SMAINCC

WATERBODY DATA SHEET

WATERBODY ID No: SMAINCC		WATERBODY NAME: Pottawatomie Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090919.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: smaincc1	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	8 (in)		
AVG. STREAM WIDTH:	8 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 15 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid		
PRIMARY SUBSTRATE:	Other		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:			
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: SMAINCC (POTTAWATOMIE CREEK) RM: 2.9 Date: 9/19/09Scorers Full Name & Affiliation:
River Code: - STORET #: - Lat./Long.: 40° 56' 52" N 84° 34' 55" W (NAD 83 - decimal) Office verified location ☐1] **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate Maximum 20
<input type="checkbox"/>	BLDR / SLABS [10]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>		<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [-2]	
<input type="checkbox"/>	BOULDER [9]	<input type="checkbox"/>		<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input type="checkbox"/>	TILLS [1]	<input type="checkbox"/>	MODERATE [-1]	
<input type="checkbox"/>	COBBLE [8]	<input type="checkbox"/>		<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
<input type="checkbox"/>	GRAVEL [7]	<input type="checkbox"/>		<input type="checkbox"/>	SILT [2]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [1]	
<input type="checkbox"/>	SAND [6]	<input type="checkbox"/>		<input type="checkbox"/>	ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [-2]	
<input type="checkbox"/>	BEDROCK [5]	<input type="checkbox"/>		(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	RIP/RAP [0]	<input type="checkbox"/>	MODERATE [-1]	
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]								Check ONE (Or 2 & average) <u>2.7 mi²</u>		<input type="checkbox"/> EXTENSIVE >75% [11] <input type="checkbox"/> MODERATE 25-75% [7] <input checked="" type="checkbox"/> SPARSE 5-25% [3] <input type="checkbox"/> NEARLY ABSENT <5% [1]		
Comments: <u>Comments</u>												

2] **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.)

		AMOUNT	
<input type="checkbox"/>	UNDERCUT BANKS [1]	<input type="checkbox"/>	POOLS > 70cm [2]
<input type="checkbox"/>	OVERHANGING VEGETATION [1]	<input type="checkbox"/>	ROOTWADS [1]
<input type="checkbox"/>	SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	BOULDERS [1]
<input type="checkbox"/>	ROOTMATS [1]	<input type="checkbox"/>	LOGS OR WOODY DEBRIS [1]
Comments: <u>Comments</u>		Check ONE (Or 2 & average) <input type="checkbox"/> EXTENSIVE >75% [11] <input type="checkbox"/> MODERATE 25-75% [7] <input checked="" type="checkbox"/> SPARSE 5-25% [3] <input type="checkbox"/> NEARLY ABSENT <5% [1]	

3] **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input checked="" type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input checked="" type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	
Comments: <u>Comments</u>			

4] **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> FENCED PASTURE [1]
<input type="checkbox"/> NONE [1]		<input checked="" type="checkbox"/> NONE [0]		<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]	
Comments: <u>Comments</u>					

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH		CHANNEL WIDTH		CURRENT VELOCITY	
Check ONE (ONLY!)		Check ONE (Or 2 & average)		Check ALL that apply	
<input type="checkbox"/> > 1m [8]	<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> TORRENTIAL [-1]	<input checked="" type="checkbox"/> SLOW [1]
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> 0.2-0.4m [1]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]		<input type="checkbox"/> VERY FAST [1]	<input type="checkbox"/> INTERSTITIAL [-1]
<input checked="" type="checkbox"/> < 0.2m [0]				<input type="checkbox"/> FAST [1]	<input checked="" type="checkbox"/> INTERMITTENT [-2]
Comments: <u>Comments</u>		Indicate for reach - pools and riffles.		<input type="checkbox"/> MODERATE [1] <input type="checkbox"/> EDDIES [1]	

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
Comments: <u>Comments</u>		<input type="checkbox"/> EXTENSIVE [-1]	

6] **GRADIENT** (2.5 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (2.7 mi²)

%POOL: 100 %GLIDE: 100 %RUN: 100 %RIFFLE: 100

Gradient Maximum 10 **4**

Comment RE: Reach consistency? Is reach typical of stream?, Recreational/Observed - Inferred, Other/Sampling observations, Canals, Access directions, etc.

AJ SAMPLED REACH

Check ALL that apply

METHOD

☐ POINT
☐ TRAP
☐ LAKE
☐ OTHER

STAGE

☐ HIGH
☐ UP
☐ NORMAL
☐ LOW
☐ DRY

DISTANCE

☐ 0-100m
☐ 100-200m
☐ 200-300m
☐ 300-400m
☐ 400-500m
☐ 500-600m
☐ 600-700m
☐ 700-800m
☐ 800-900m
☐ 900-1000m
☐ OTHER

CLARITY

☐ 1st sample pass
☐ 2nd sample pass
☐ 3rd sample pass
☐ 4th sample pass
☐ 5th sample pass
☐ 6th sample pass
☐ 7th sample pass
☐ 8th sample pass
☐ 9th sample pass
☐ 10th sample pass
☐ OTHER

CANOPY

☐ 0-25% OPEN
☐ 25-50% OPEN
☐ 50-75% OPEN
☐ 75-100% OPEN
☐ OTHER

CJ RECREATION

☐ POOL: ☐ 1-100m ☐ 100-200m ☐ 200-300m ☐ 300-400m ☐ 400-500m ☐ 500-600m ☐ 600-700m ☐ 700-800m ☐ 800-900m ☐ 900-1000m ☐ OTHER

EJ AESTHETICS

☐ NEARBY ALGAE
☐ NEARBY MUSHROOMS
☐ NEARBY LICHENS
☐ NEARBY FUNGI
☐ NEARBY BRYOPHYTES
☐ NEARBY ANIMALS
☐ NEARBY PLANTS
☐ NEARBY ROCKS
☐ NEARBY SOIL
☐ NEARBY WATER

DJ MAINTENANCE

☐ PUBLIC / PRIVATE / BOTH / NA
☐ ACTIVE / HISTORIC / BOTH / NA
☐ YOUNG-SUCCESSION-OLD
☐ SPRAY / SNAG / REMOVED
☐ MODIFIED / DRIPPED OUT / NA
☐ LEVEED / ONE SIDED
☐ RELOCATED / CUTOFFS
☐ MOVING-DEAD-LOAD-STABLE
☐ ARMOURD / SLUMPS
☐ ISLANDS / SCOURED
☐ IMPROVED / DEDICATED
☐ FLOOD CONTROL / DRAINAGE

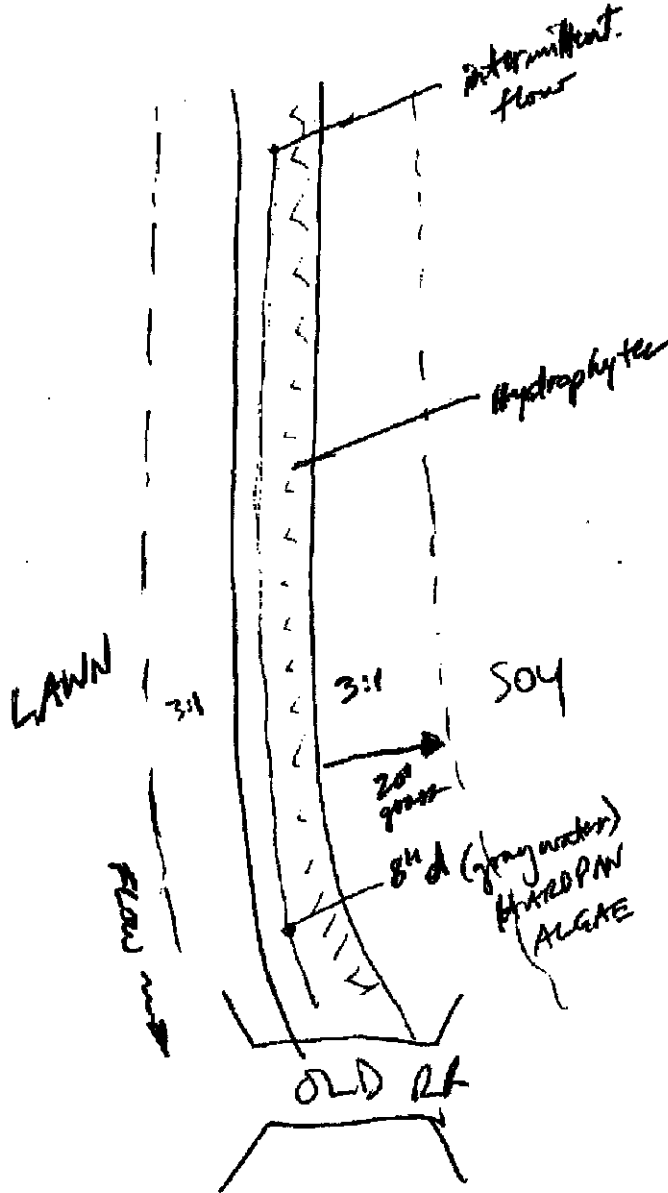
EJ ISSUES

☐ WWT / CSO / NPDES / INDUSTRY
☐ HARDENED / URBAN / DIRT / GRIME
☐ CONTAMINATED / LANDFILL
☐ BMPs-CONSTRUCTION / SEDIMENT
☐ LOGGING / ERIGATION / COOLING
☐ BANK / EROSION / SURFACE
☐ FILL / SAND / MANURE / LAGOON
☐ WASH / H2O / TILE / H2O TABLE
☐ AGED / MINE / QUARRY / FLOW
☐ NATURAL / WETLAND / STAGNANT
☐ PARK / GOLF / LAWN / HOME
☐ ATMOSPHERE / DATA PAUCITY

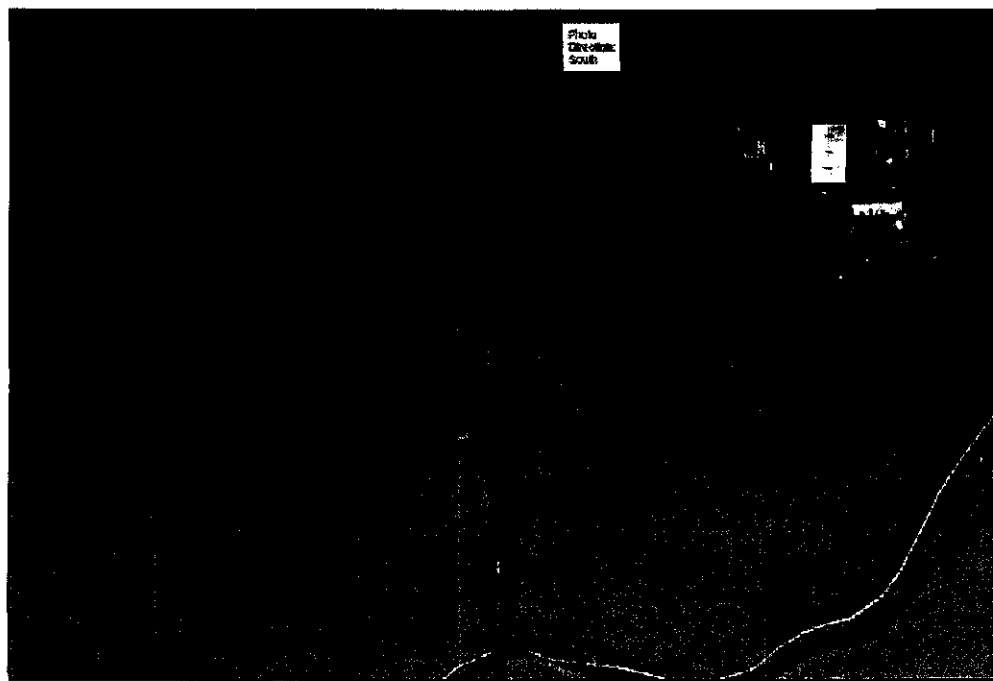
FJ MEASUREMENTS

☐ 1st width
☐ 2nd width
☐ 3rd width
☐ 4th width
☐ 5th width
☐ 6th width
☐ 7th width
☐ 8th width
☐ 9th width
☐ 10th width
☐ OTHER

Stream Drawing:



Tributaries to Pottawatomie Creek



Stream
S120CA



Stream S120CA

WATERBODY DATA SHEET

WATERBODY ID NO: S120CA		WATERBODY NAME: Unnamed Tributary to Pottawatomie Creek	
SITE NAME: Blue Creek			
DATE: 10/14/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE:	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO:	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	2 (in)		
AVG. STREAM WIDTH:	1 (ft)	TOP OF BANK: 10 (ft)	ORDINARY HIGH WATER MARK WIDTH: 6 (ft)
AVG. BANK HEIGHT:	4 (ft)		
AVG. BANK SLOPE (RATIO):	3:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAIN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

High QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

Low QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION S120CA

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi²) <1 mi²

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 09/19/09 SCORER M Nechvatal COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL

☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

MODIFICATIONS:

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS [16 pts]	_____	<input type="checkbox"/> SILT [3 pt]	<u>80</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input checked="" type="checkbox"/> SAND (<2 mm) [8 pts]	<u>20</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 0(A) 9(B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters)

HHEI
Metric
PointsSubstrate
Max = 40

11

A + B

Pool Depth
Max = 30

15

Bankfull
Width
Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☒ 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 _____
☐ 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: **Van Wert** Township / City: **Union**

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): **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) **Y** If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

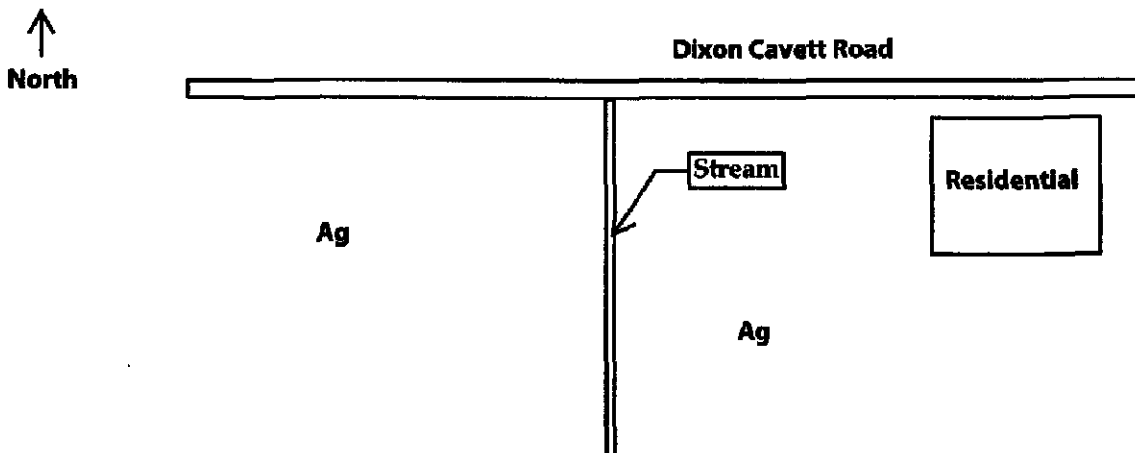
Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

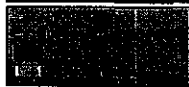
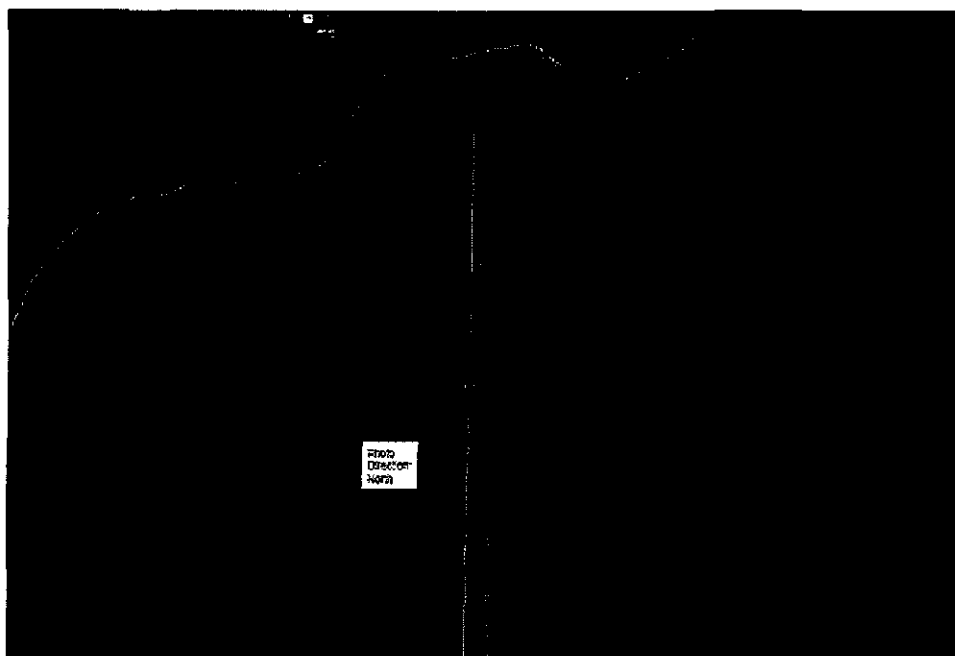
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____

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





Stream
S121CA



Stream S121CA

WATERBODY DATA SHEET

WATERBODY ID NO: S121CA		WATERBODY NAME: Unnamed Tributary to Pottawatomie Creek	
SITE NAME: Blue Creek			
DATE: 9/19/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090919B.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO: s121aa1 a121aa2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag drainage		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 30 (ft)	ORDINARY HIGH WATER MARK WIDTH: 5 (ft)
AVG. BANK HEIGHT:	6 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):	Typha latifolia 30%		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levies are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION _____

SITE NUMBER 5121AA RIVER BASIN _____DRAINAGE AREA (mi²) 0.2LENGTH OF STREAM REACH (ft) _____ LAT. 40° 36' 37" LONG. 84° 35' 33" RIVER CODE _____ RIVER MILE _____DATE 9/19/09 SCORER R. Hook COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☐ RECOVERING
 ☒ RECENT OR NO RECOVERY

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>100</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6TOTAL NUMBER OF SUBSTRATE TYPES: 1

HHEI Metric Points

Substrate Max = 40

7

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30

0

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters): 0

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [26 pts]	<input type="checkbox"/> < 1.0 m (< 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

Bankfull Width Max=30

20

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters): 2

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☐ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
EPH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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: Quantity:
 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 (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) ☐ 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) ☐
 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

CORN

grass slope

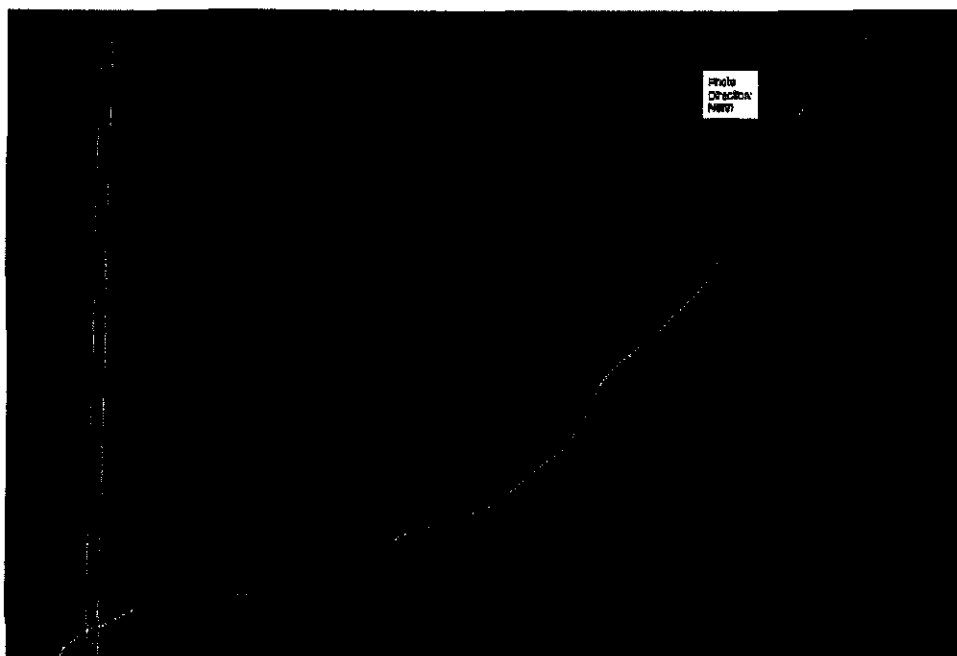
FLOW →

DEM CHANNEL WITH 50% Hydrophytes

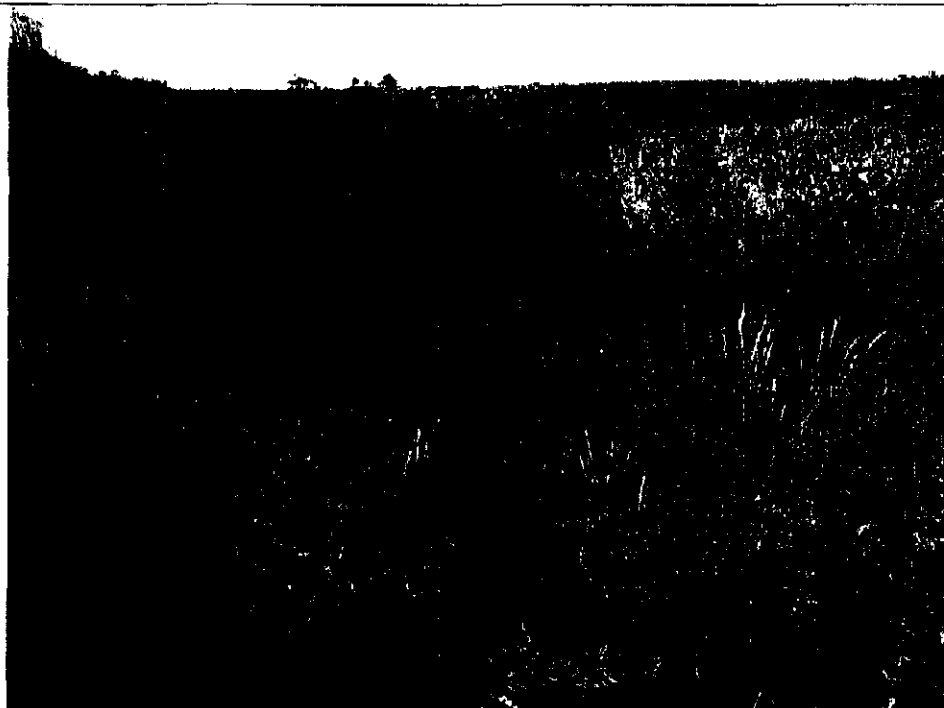
grass slope

ROAD

Dry Creek



Stream
S149CA



Stream S149CA

WATERBODY DATA SHEET

WATERBODY ID NO: SMAINCA-1		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Union	
		PHOTO NO: smainca2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	10 (in)		
AVG. STREAM WIDTH:	10 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 20 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear		
PRIMARY SUBSTRATE:	Sands		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 75 (ft)		
	TYPE OF VEGETATION PRESENT: Forested		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside berms actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside berms actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

WATERBODY DATA SHEET

WATERBODY ID No: SMAINCA-2		WATERBODY NAME: Hagerman Creek	
SITE NAME: Blue Creek			
DATE: 9/18/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE: RAH091809A.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: 133c2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	6 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 12 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Clear	
PRIMARY SUBSTRATE:	Sands	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT:	
WETLAND FRINGE (IF PRESENT):		
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

<p>STREAM QUALITY: Low</p> <p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>

WATERBODY DATA SHEET

WATERBODY ID NO: S149CA-1		WATERBODY NAME: Dry Creek	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE:	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Latty	
		PHOTO NO:	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	2 (in)		
AVG. STREAM WIDTH:	2 (ft)	TOP OF BANK: 10 (ft)	ORDINARY HIGH WATER MARK WIDTH: 6 (ft)
AVG. BANK HEIGHT:	2 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (If PRESENT):	N/A	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

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WATERBODY DATA SHEET

WATERBODY ID No: S149CA-2		WATERBODY NAME: Dry Creek	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE:	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP.: Latty	
		PHOTO No:	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Modified ag ditch		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	6 (in)		
AVG. STREAM WIDTH:	4 (ft)	TOP OF BANK: 10 (ft)	ORDINARY HIGH WATER MARK WIDTH: 8 (ft)
AVG. BANK HEIGHT:	5 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:			
PRIMARY SUBSTRATE:	Silts		
POTENTIAL HABITAT FOR:	Aq/ Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAIN: 0 (ft)		
	TYPE OF VEGETATION PRESENT: None		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING	

COMMENTS

STREAM QUALITY: Low
<p>HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.</p> <p>MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.</p> <p>LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.</p>

Stream & Location: S149CA (DRY CREEK) RM: 2.3 Date: 9/16/09Scorers Full Name & Affiliation: R. Hook / CH2M HILL
River Code: - STORET #: - Lat./Long.: 40° 59' 45" N 84° 34' 1" W (NAD 83 - decimal) Office verified location ☐1) SUBSTRATE Check ONLY Two substrate TYPE BOXES;
estimate % or note every type present

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin-top: 10px;">1</div>
<input type="checkbox"/> BLDG / SLABS [10]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/>	<input checked="" type="checkbox"/> HEAVY [-2]		
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> FILLS [1]	<input type="checkbox"/>	<input type="checkbox"/> MODERATE [-1]		
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/>	<input type="checkbox"/> NORMAL [0]		
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> SILT [2]	<input type="checkbox"/>	<u>100</u>	<input type="checkbox"/>	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/>	<input type="checkbox"/> FREE [1]		
<input type="checkbox"/> SAND [6]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/>	<input checked="" type="checkbox"/> EXTENSIVE [-2]		
<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Score natural substrates; ignore sludge from point-sources)			<input type="checkbox"/>	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/>	<input type="checkbox"/> MODERATE [-1]		
								<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/>	<input type="checkbox"/> NORMAL [0]		
								<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/>	<input type="checkbox"/> NONE [1]		
								<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/>			

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments: dredged channel / deep, tapered

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

		AMOUNT	
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> EXTENSIVE >75% [11]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> SPARSE 5-25% [3]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> NEARLY ABSENT <5% [1]

Comments: Redwood channel / deep, tapered

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [8]	<input checked="" type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input checked="" type="checkbox"/> POOR [1]	<input checked="" type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments: dredged channel / deep, tapered

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)
River right looking downstream

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY	CONSERVATION TILLAGE
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]	

Comments: dredged channel / deep, tapered

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [6]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	(circle one and comment on back)
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	
<input checked="" type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input type="checkbox"/> < 0.2m [0]		<input type="checkbox"/> MODERATE [1]	
		<input type="checkbox"/> INTERSTITIAL [-1]	
		<input type="checkbox"/> INTERMITTENT [-2]	
		<input type="checkbox"/> EDDIES [1]	

Comments: dredged channel / deep, tapered

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: dredged channel / deep, tapered

6) GRADIENT (4 ft/mi) ☒ VERY LOW - LOW [2-4]
DRAINAGE AREA (1.5 mi²) ☐ MODERATE [8-10]
☐ HIGH - VERY HIGH [10-6]%POOL: 0 %GLIDE: 100
%RUN: 0 %RIFFLE: 0

A) SAMPLE EACH
Check ALL and apply

EXAMPLE
Check ALL that apply

STAGE

14	00	00	00	00
15	00	00	00	00
16	00	00	00	00
17	00	00	00	00
18	00	00	00	00
19	00	00	00	00
20	00	00	00	00
21	00	00	00	00
22	00	00	00	00
23	00	00	00	00
24	00	00	00	00
25	00	00	00	00
26	00	00	00	00
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36	00	00	00	00
37	00	00	00	00
38	00	00	00	00
39	00	00	00	00
40	00	00	00	00
41	00	00	00	00
42	00	00	00	00
43	00	00	00	00
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45	00	00	00	00
46	00	00	00	00
47	00	00	00	00
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92	00	00	00	00
93	00	00	00	00
94	00	00	00	00
95	00	00	00	00
96	00	00	00	00
97	00	00	00	00
98	00	00	00	00
99	00	00	00	00
100	00	00	00	00

COLLEGE

SEMI	TRUCK	LONG	TRUCK	DISTANCE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

DISTANCE

CLARITY

141 — sample base — 2nd

人口比例

NEW YORK

GYM RECREATION

天仁堂

Stream Drawing:

QUESTIONS

<input type="checkbox"/>	1. NAME
<input type="checkbox"/>	2. ADDRESS
<input type="checkbox"/>	3. CITY
<input type="checkbox"/>	4. STATE
<input type="checkbox"/>	5. ZIP
<input type="checkbox"/>	6. PHONE
<input type="checkbox"/>	7. GL
<input type="checkbox"/>	8. DATE
<input type="checkbox"/>	9. TIME
<input type="checkbox"/>	10. REMARKS

WELL	AREA	DEPTH
100	100	100

DI MANTENANCE

**PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LIVED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-RELOAD-STABLE
ARMOURD / SLUMPS
ISLANDS / SCOURD
IMPOUNDED / DESICCATED
LOSS CONTROL / DRAINAGE**

Click here to Comment

3071527

FL MEASUREMENTS

WWWTP / GSO / NPDES / INDUSTRY
HARDENED / URBAN / BULKY GRIME
CONTAMINATED / LANDFILL
SEMP / CONSTRUCTION / SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MOUND / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

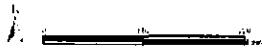
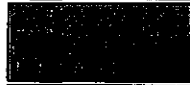
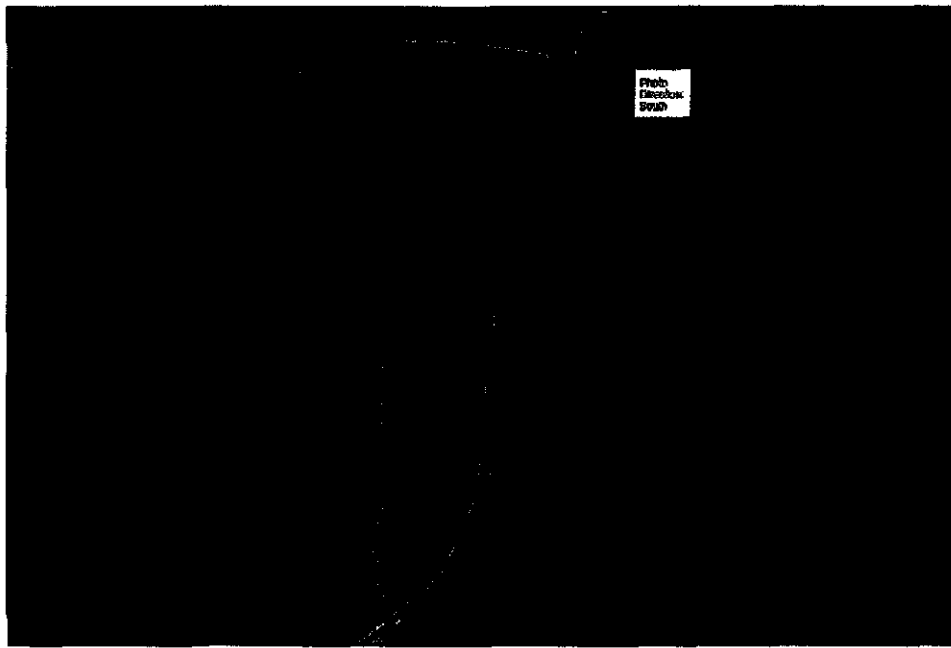
**7 weeks
2 depth
max depth
5 banked
banked
WID radio
banked
5000 ft
5000 ft
Legacy 70**

505

505

AN

[illegible]



Stream
S158CA



Stream S158CA

WATERBODY DATA SHEET

WATERBODY ID NO: S158CA		WATERBODY NAME: Main channel of Dry Creek	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091609ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP.: Latty	
		PHOTO NO: 158CA35S	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Ag Drainage, channel, deep, well cut, with ag fields adj on all sides		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	5 (in)		
AVG. STREAM WIDTH:	6 (ft)	TOP OF BANK: 10 (ft)	ORDINARY HIGH WATER MARK WIDTH: 4 (ft)
AVG. BANK HEIGHT:	4 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid	
PRIMARY SUBSTRATE:	Vegetation	
POTENTIAL HABITAT FOR:	Fish/Spawn Areas	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD FLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: _____ RM: _____ Date: 01/10/11

Scorers Full Name & Affiliation: Matthew Neumann Office: _____
 River Code: - STORET #: _____ Lat./Long.: 41.01060 / 84.55304 (NAD 83 - decimal)

1) SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> GRAVEL	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> NATURAL	<input type="checkbox"/> SILT	<input checked="" type="checkbox"/> GRAVEL	<input checked="" type="checkbox"/> GRAVEL
<input type="checkbox"/> SAND	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SAND	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SILT	<input type="checkbox"/> SAND	<input type="checkbox"/> SAND
<input type="checkbox"/> BEDROCK	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> BEDROCK	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> BEDROCK	<input type="checkbox"/> SILT	<input type="checkbox"/> BEDROCK	<input type="checkbox"/> BEDROCK
<input type="checkbox"/> SLUDGE	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SILT	<input type="checkbox"/> SLUDGE	<input type="checkbox"/> SLUDGE

NUMBER OF BEST TYPES: ☒ 2 (Score natural substrates; ignore sludge from point-sources)

Comments: _____

Substrate: 25 Maximum 20

2) INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT	
<input type="checkbox"/> EXTENSIVE	<input checked="" type="checkbox"/> MODERATE
<input type="checkbox"/> SPARSE	<input type="checkbox"/> NEARLY ABSENT

Comments: _____

Cover: 12 Maximum 20

3) CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH	<input type="checkbox"/> POOL	<input type="checkbox"/> NONE	<input type="checkbox"/> HIGH
<input checked="" type="checkbox"/> MODERATE	<input checked="" type="checkbox"/> POOL	<input checked="" type="checkbox"/> COVERED	<input checked="" type="checkbox"/> MODERATE
<input type="checkbox"/> LOW	<input type="checkbox"/> POOL	<input type="checkbox"/> OPEN	<input type="checkbox"/> LOW

Comments: _____

Channel: 3 Maximum 20

4) BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> NONE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> NONE	<input type="checkbox"/> MODERATE
<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE
<input type="checkbox"/> HEAVY/SEVERE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE

Comments: _____

Riparian: 10 Maximum 10

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
<input checked="" type="checkbox"/> 0-0.2	<input type="checkbox"/> 0-2	<input type="checkbox"/> 0-0.5	<input type="checkbox"/> Primary Contact
<input type="checkbox"/> 0.2-0.5	<input type="checkbox"/> 2-5	<input type="checkbox"/> 0.5-1.0	<input type="checkbox"/> Secondary Contact
<input type="checkbox"/> 0.5-1.0	<input type="checkbox"/> 5-10	<input type="checkbox"/> 1.0-1.5	<input type="checkbox"/> (circle one and comment on back)

Comments: _____

Pool / Current: 12 Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> 0-0.2	<input type="checkbox"/> 0-0.2	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> NONE
<input type="checkbox"/> 0.2-0.5	<input type="checkbox"/> 0.2-0.5	<input type="checkbox"/> SAND	<input type="checkbox"/> MODERATE
<input type="checkbox"/> 0.5-1.0	<input type="checkbox"/> 0.5-1.0	<input type="checkbox"/> BEDROCK	<input type="checkbox"/> EXTENSIVE

Comments: _____

Riffle / Run: 8 Maximum 8

6) GRADIENT

(4.2 ft/mi) ☒ VERY LOW (0.2 ft/mi) ☐ MODERATE (1.0 ft/mi) ☐ HIGH (2.0 ft/mi) ☐ EXTENSIVE

DRAINAGE AREA (3.39 mi²) ☐ MODERATE (1.0 mi²) ☐ HIGH (2.0 mi²) ☐ EXTENSIVE

%POOL: 10 %GLIDE: 45 %RUN: 45 %RIFFLE: 0

Gradient: 4 Maximum 10

AJ SAMPLE REACH

Check that apply

METHOD STAGE

- 1st sample pass-- 2nd
- ☐ BOAT ☐ HIGH ☐
- ☐ WADE ☐ UP ☐
- ☐ L LINE ☐ NORMAL ☐
- ☐ OTHER ☐ LOW ☐
- ☐ DISTANCE ☐ DRY ☐

CLARITY

- 1st sample pass-- 2nd
- ☐ < 20 cm ☐
- ☐ 20-40 cm ☐
- ☐ 40-70 cm ☐
- ☐ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

CANOPY

- ☐ > 80% - OPEN
- ☐ 55% - 85%
- ☐ 30% - 55%
- ☐ 10% - 30%
- ☐ < 10% - CLOSED

CJ RECREATION

AREA DEPTH

POOL: ☐ > 100 ft ☐ > 3 ft

BJAESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOISSOS/OUTFALLS

DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BED LOAD-STABLE
- ARMOURD / SLUMPS
- ISLANDS / SCoured
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT & GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H₂O / TILE / H₂O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- \bar{x} width
- \bar{x} depth
- max. depth
- \bar{x} bankfull width
- bankfull \bar{x} depth
- W/D ratio
- bankfull max. depth
- floodprone \bar{x}^2 width
- entrench. ratio
- Legacy Tree:

Stream Drawing:

road

↑ N

↑ upstream

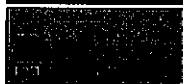
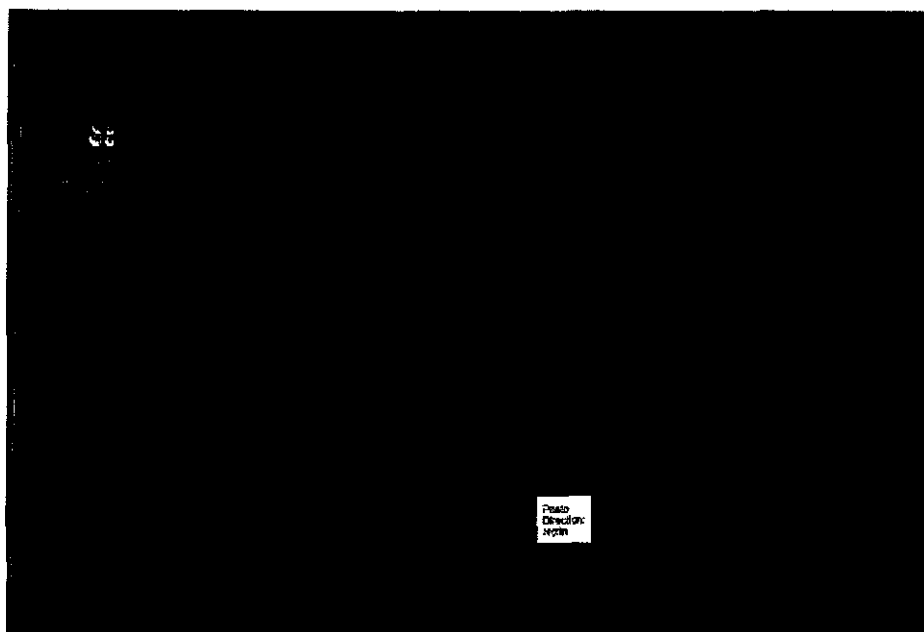
↑

↑

↑

↑ Road

Tributaries to Dry Creek.



Stream
S153AA



Stream S153AA

WATERBODY DATA SHEET

WATERBODY ID NO: S153AA		WATERBODY NAME: Unnamed Tributary to Dry Creek	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D. West, M. Nechvatal		ROVER FILE: R091609ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Latty	
		PHOTO NO: 153AA42n	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Drainage ditch for adj ag fields (soybeans), very linear		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 10 (ft)	ORDINARY HIGH WATER MARK WIDTH: 4 (ft)
AVG. BANK HEIGHT:	5 (ft)		
AVG. BANK SLOPE (RATIO):	Vertical ($\leq 1:1$)		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Vegetation	
POTENTIAL HABITAT FOR:	None	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; little regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION _____

SITE NUMBER **S153AA**

RIVER BASIN _____

DRAINAGE AREA (mi²) **0.09**

LENGTH OF STREAM REACH (ft) _____

LAT. **40.00990**

LONG. **-84.56780**

RIVER CODE _____

RIVER MILE _____

DATE **09/16/09**

SCORER **Nechvatal**

COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☒ RECENT OR NO RECOVERY

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	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	100%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

100%

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**

TOTAL NUMBER OF SUBSTRATE TYPES: **1**

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters): **8**

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters): **1.20**

HHEI Metric Points

Substrate
Max = 40

7

A + B

Pool Depth
Max = 30

15

Bankfull
Width
Max=30

15

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	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS _____

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? ☒ Yes ☐ No QHEI Score 24.5 (If Yes, Attach Completed QHEI 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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Paulding Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: 0.00

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 25%

Were samples collected for water chemistry? (Y/N): 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): Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

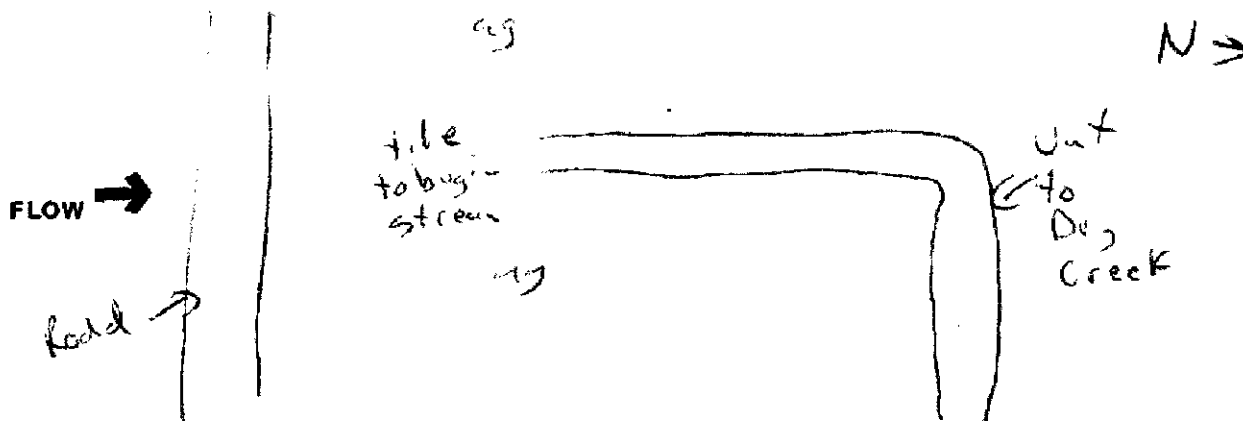
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual!)

Fish Observed? (Y/N): N Voucher? (Y/N): N Salamanders Observed? (Y/N): N Voucher? (Y/N): N
Frogs or Tadpoles Observed? (Y/N): N Voucher? (Y/N): N Aquatic Macroinvertebrates Observed? (Y/N): N Voucher? (Y/N): 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



Stream & Location: _____

RM: _____ Date: 5/12/06

Scorers Full Name & Affiliation: _____

River Code: _____

STORET #: _____

Lat./ Long.: _____

18

Office verified location ☐1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES	
<input type="checkbox"/> BLDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/>	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/>
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/>	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/>
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/>	<input checked="" type="checkbox"/> SILT [2]	<u>100</u> <u>100</u>
<input type="checkbox"/> SAND [6]	<input type="checkbox"/>	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/>
<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/>	(Score natural substrates; ignore sludge from point-sources)	

ORIGIN		QUALITY	
<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	<input type="checkbox"/> MODERATE [-1]
<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> NORMAL [0]	<input type="checkbox"/> FREE [1]
<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> EXTENSIVE [-2]	<input type="checkbox"/> MODERATE [-1]
<input type="checkbox"/> REPAIR [0]	<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> NORMAL [0]	<input type="checkbox"/> NONE [1]
<input type="checkbox"/> SHALE [1]	<input type="checkbox"/> COALFINES [-2]		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments _____

Substrate
2
Maximum
202) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS/BACKWATERS [1]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]
<input type="checkbox"/> ROOTMATS [1]		

<input type="checkbox"/> EXTENSIVE > 75% [11]
<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SPARSE < 25% [3]
<input type="checkbox"/> NEARLY ABSENT < 5% [1]

Comments _____

Cover
Maximum
203) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [8]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments _____

Channel
Maximum
204) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY		CONSERVATION/TILLAGE	
<input type="checkbox"/> NONE/LITTLE [3]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> FOREST SWAMP [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
<input type="checkbox"/> HEAVY / SEVERE [1]		<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> RESIDENTIAL PARK NEW FIELD [1]	<input type="checkbox"/> FENCED PASTURE [1]		
		<input type="checkbox"/> NONE [0]		<input type="checkbox"/> OPEN PASTURE / ROWCROP [0]			

Comments _____

Indicate predominant land use(s)
past 100m riparian.
Riparian
Maximum
105) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH

CHANNEL WIDTH

CURRENT VELOCITY

Check ONE (ONLY)

Check ONE (Or 2 & average)

Check ALL that apply

<input type="checkbox"/> > 1m [6]
<input type="checkbox"/> 0.7-1m [4]
<input type="checkbox"/> 0.4-0.7m [2]
<input type="checkbox"/> 0.2-0.4m [1]
<input checked="" type="checkbox"/> < 0.2m [0]

<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]
<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]
<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]

<input type="checkbox"/> TORRENTIAL [1]	<input type="checkbox"/> SLOW [1]
<input type="checkbox"/> VERY FAST [1]	<input type="checkbox"/> INTERSTITIAL [1]
<input type="checkbox"/> FAST [1]	<input type="checkbox"/> INTERMITTENT [2]
<input type="checkbox"/> MODERATE [1]	<input type="checkbox"/> EDDIES [1]

Indicate for reach - pools and riffles.

Comments _____

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)Pool /
Current
Maximum
12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments _____

Rifle /
Run
Maximum
86) **GRADIENT** 3.3 %

DRAINAGE AREA

609 m²

<input checked="" type="checkbox"/> VERY LOW - LOW [2-4]
<input type="checkbox"/> MODERATE [6-10]
<input type="checkbox"/> HIGH - VERY HIGH [10-6]

%POOL: <u>0</u>	%GLIDE: <u>50</u>
%RUN: <u>50</u>	%RIFFLE: <u>0</u>

Gradient
Maximum
10

AJ SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

- 1st - sample pass - 2nd
- ☐ HIGH
- ☐ UP
- ☐ NORMAL
- ☐ LOW
- ☐ DRY

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

CLARITY

- 1st - sample pass - 2nd
- ☐ < 20 cm
- ☐ 20-40 cm
- ☐ 40-70 cm
- ☐ > 70 cm
- ☐ CTB
- ☐ SECCHI DEPTH

meters

CANOPY

- ☐ > 85% - OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10% - CLOSED

CJ RECREATION

POOL: ☐ >100ft ☐ >3ft

BJ AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSO/SO/SO/OUTFALLS

DJ MAINTENANCE

- ☐ PUBLIC / PRIVATE / BOTH / NA
- ☐ ACTIVE / HISTORIC / BOTH / NA
- ☐ YOUNG-SUCCESSION-OLD
- ☐ SPRAY / SNAG / REMOVED
- ☐ MODIFIED / DIPPED OUT / NA
- ☐ LEVEED / ONE SIDED
- ☐ RELOCATED / CUTOFFS
- ☐ MOVING-BEDLOAD-STABLE
- ☐ ARMoured / SLUMPS
- ☐ ISLANDS / SCoured
- ☐ IMPOUNDED / DESICCATED
- ☐ FLOOD CONTROL / DRAINAGE

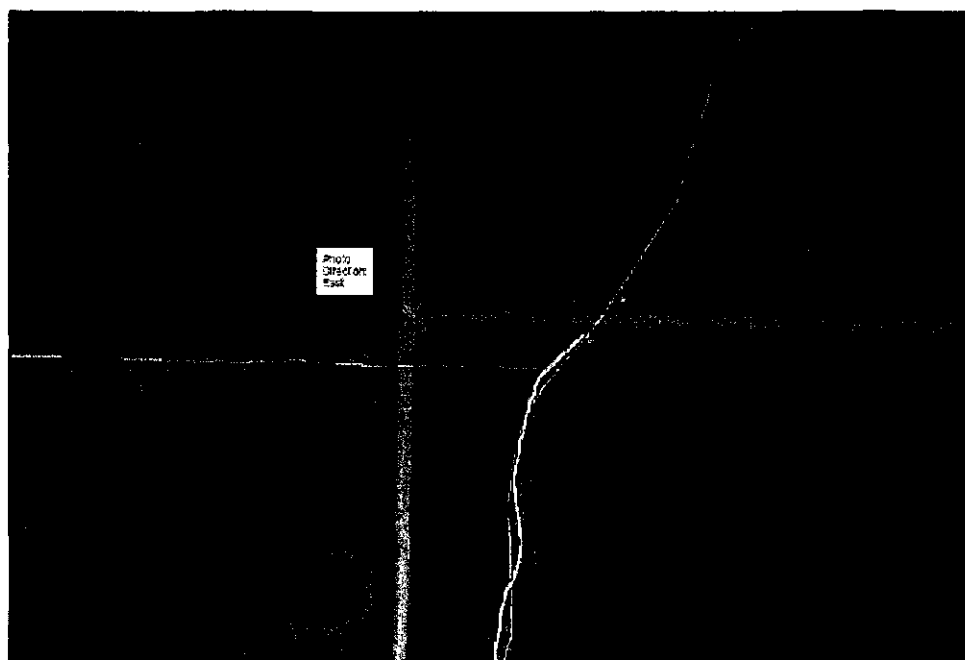
EJ ISSUES

- ☐ WWTP / CSO / NPDES / INDUSTRY
- ☐ HARDENED / URBAN / DIRT&GRIME
- ☐ CONTAMINATED / LANDFILL
- ☐ BMPs-CONSTRUCTION-SEDIMENT
- ☐ LOGGING / IRRIGATION / COOLING
- ☐ BANK / EROSION / SURFACE
- ☐ FALSE BANK / MANURE / LAGOON
- ☐ WASH H₂O / TILE / H₂O TABLE
- ☐ ACID / MINE / QUARRY / FLOW
- ☐ NATURAL / WETLAND / STAGNANT
- ☐ PARK / GOLF / LAWN / HOME
- ☐ ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

- ☐ width
- ☐ depth
- ☐ max. depth
- ☐ bankfull width
- ☐ bankfull x depth
- ☐ W/D ratio
- ☐ bankfull max. depth
- ☐ floodprone x² width
- ☐ entrench. ratio
- ☐ Legacy Tree:

Stream Drawing:



Stream
S158CB



Stream S158CB

WATERBODY DATA SHEET

WATERBODY ID NO: S158CB		WATERBODY NAME: Unnamed Tributary to Dry Creek	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: D.West, M. Nechvatal		ROVER FILE: R091609ADW.cor	QUAD NAME: Latty
STATE/COUNTY: Ohio/Paulding		TOWNSHIP: Latty	
		PHOTO NO: 158CB34E	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Drainage ditch for adj ag fields		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Intermittent		
AVG. STREAM DEPTH:	0 (in)		
AVG. STREAM WIDTH:	0 (ft)	TOP OF BANK: 7 (ft)	ORDINARY HIGH WATER MARK WIDTH: 4 (ft)
AVG. BANK HEIGHT:	3 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:		
PRIMARY SUBSTRATE:	Vegetation	
POTENTIAL HABITAT FOR:	None	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)	
	TYPE OF VEGETATION PRESENT: None	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; no regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

SITE NAME/LOCATION

SITE NUMBER **S158CB**

RIVER BASIN

DRAINAGE AREA (mi²) **0.57**

LENGTH OF STREAM REACH (ft)

LAT. **41.01170**

LONG. **-84.55320**

RIVER CODE

RIVER MILE

DATE **09/16/09**

SCORER **Nechvatal**

COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL

☐ RECOVERED

☐ RECOVERING

☒ RECENT OR NO RECOVERY

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

☐
☐
☐
☐
☐
☐

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pt]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [6 pts]

TYPE

☒
☐
☐
☐
☐
☐

SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

☒
☐
☐
☐
☐
☐

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock

0.00%

(A)

100%

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

6

TOTAL NUMBER OF SUBSTRATE TYPES:

1

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]

☐
☐
☒

> 5 cm - 10 cm [15 pts]

< 5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS **Dry**

MAXIMUM POOL DEPTH (centimeters):

0

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐
☐
☐

> 4.0 meters (> 13') [30 pts]

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

> 1.5 m - 3.0 m (> 4' 7" - 9' 8") [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):

1.20

HHEI Metric Points

Substrate Max = 40

7

A + B

Pool Depth Max = 30

0

Bankfull Width Max=30

15

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) (Per Bank)

Wide >10m

☐
☐

Moderate 5-10m

☒
☐

Narrow <5m

☐
☐

None

COMMENTS

☐
☐

(L) (Most Predominant per Bank)

Mature Forest, Wetland

☐
☐

Immature Forest, Shrub or Old Field

☐
☐

Residential, Park, New Field

☐
☐

Fenced Pasture

☐
☐

(L) (R)

Conservation Tillage

☒
☐

Urban or Industrial

☐
☒

Open Pasture, Row Crop

☐
☐

Mining or Construction

☐
☐

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Stream Flowing

Subsurface flow with isolated pools (Interstitial)

COMMENTS

☐
☒

Moist Channel, isolated pools, no flow (Intermittent)

Dry channel, no water (Ephemeral)

☒
☐

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None

0.5

☐
☐

1.0

1.5

☐
☐

2.0

2.5

☐
☐

3.0

>3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft)

☐ Flat to Moderate

☐ Moderate (2 ft/100 ft)

☐ Moderate to Severe

☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☒ Yes ☐ No QHEI Score 27.0 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

<input type="checkbox"/>	WWH Name:	Distance from Evaluated Stream
<input type="checkbox"/>	CWH Name:	Distance from Evaluated Stream
<input type="checkbox"/>	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: **Faulding**

Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: 0.00

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 100%

Were samples collected for water chemistry? (Y/N): 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) Y If not, please explain: _____

Additional comments/description of pollution impacts:

BIOTIC EVALUATION

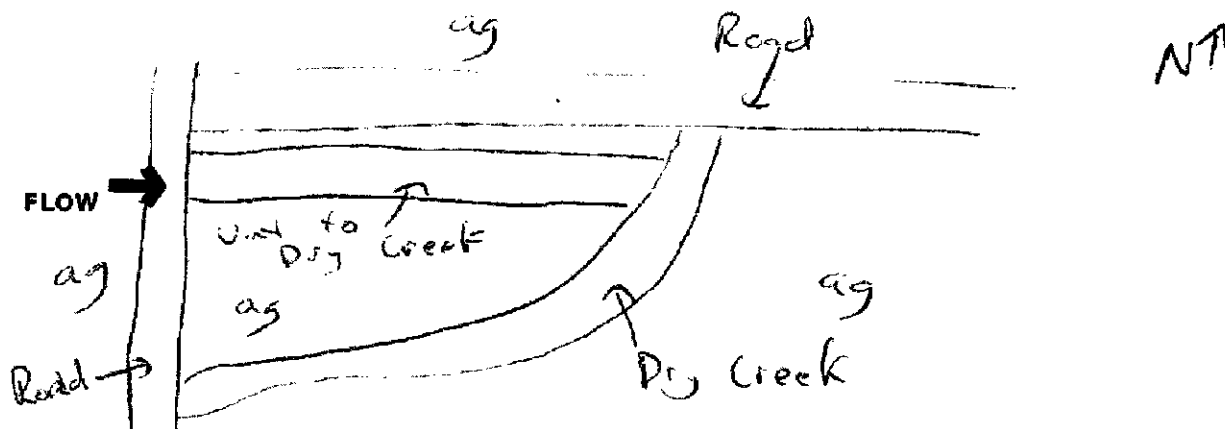
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) 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



Stream & Location: _____

RM: _____ Date: 1 / 1 / 98

Scorers Full Name & Affiliation: _____

River Code: _____

STORET #: _____

Lat./ Long.: _____

18

Office verified location ☐1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES, estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES**POOL RIFFLE****OTHER TYPES****POOL RIFFLE****ORIGIN****QUALITY**

- ☐ BLDR/SLABS [10]
☐ BOULDER [9]
☐ COBBLE [8]
☐ GRAVEL [7]
☐ SAND [6]
☐ BEDROCK [5]

- ☐ POOL RIFFLE
☐ POOL RIFFLE
☐ POOL RIFFLE
☐ POOL RIFFLE
☐ POOL RIFFLE

- ☐ HARDPAN [4]
☐ DETRITUS [3]
☐ MUCK [2]
☒ SILT [2]
☐ ARTIFICIAL [0]

- ☐ POOL RIFFLE
☐ POOL RIFFLE
☐ POOL RIFFLE
☐ POOL RIFFLE
☐ POOL RIFFLE

- ☐ LIMESTONE [1]
☐ TILLS [1]
☐ WETLANDS [1]
☐ HARDPAN [0]
☐ SANDSTONE [0]
☐ RIP RAP [0]
☐ LACUSTURINE [0]
☐ SHALE [1]
☐ COAL FINES [2]

SILT

EMBEDDEDNESS

- ☐ HEAVY [2]
☐ MODERATE [1]
☐ NORMAL [0]
☐ FREE [1]
☐ EXTENSIVE [2]
☐ MODERATE [1]
☐ NORMAL [0]
☐ NONE [1]

Substrate
Maximum
20NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0]

Comments _____

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.**AMOUNT**

Check ONE (Or 2 & average)

- ☐ UNDERCUT BANKS [1]
☐ OVERHANGING VEGETATION [1]
☐ SHALLOWS (IN SLOW WATER) [1]
☐ ROOTMATS [1]

- ☐ POOLS > 70cm [2]
☐ ROOTWADS [1]
☐ BOULDERS [1]

- ☐ OXBOWS/BACKWATERS [1]
☐ AQUATIC MACROPHYTES [1]
☐ LOGS OR WOODY DEBRIS [1]

- ☐ EXTENSIVE > 75% [1]
☐ MODERATE 25-75% [1]
☐ SPARSE < 25% [3]
☐ NEARLY ABSENT < 5% [1]

Cover
Maximum
20

Comments _____

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)**SINUOSITY****DEVELOPMENT****CHANNELIZATION****STABILITY**

- ☐ HIGH [4]
☐ MODERATE [3]
☐ LOW [2]
☒ NONE [1]

- ☐ EXCELLENT [7]
☐ GOOD [6]
☐ FAIR [3]
☒ POOR [1]

- ☐ NONE [6]
☐ RECOVERED [4]
☐ RECOVERING [3]
☒ RECENT OR NO RECOVERY [1]

- ☐ HIGH [3]
☒ MODERATE [2]
☐ LOW [1]

Channel
Maximum
20

Comments _____

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

RIPARIAN WIDTH**FLOOD PLAIN QUALITY****EROSION**

- ☐ NONE/LITTLE [3]
☐ MODERATE [2]
☐ HEAVY/SEVERE [1]

RIPARIAN WIDTH

- ☐ WIDE > 50m [4]
☐ MODERATE 10-50m [3]
☐ NARROW 5-10m [2]
☒ VERY NARROW < 5m [1]
☐ NONE [0]

FLOOD PLAIN QUALITY

- ☐ FOREST SWAMP [3]
☐ SHRUB OR OLD FIELD [2]
☐ RESIDENTIAL PARK/NEW FIELD [1]
☐ FENCED PASTURE [1]
☒ OPEN PASTURE, ROWCROP [0]

FLOOD PLAIN QUALITY

- ☐ CONSERVATION TILLAGE [0]
☐ URBAN OR INDUSTRIAL [0]
☐ MINING/CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian
Maximum
10

Comments _____

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY****MAXIMUM DEPTH****CHANNEL WIDTH****CURRENT VELOCITY**

Check ONE (ONLY)

- ☐ < 1m [5]
☐ 0.7-1m [4]
☐ 0.4-0.7m [2]
☐ 0.2-0.4m [1]
☒ < 0.2m [0]

Check ONE (Or 2 & average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

Check ALL that apply

- ☐ TORRENTIAL [3]
☐ VERY FAST [2]
☐ FAST [1]
☐ MODERATE [1]
☐ SLOW [1]
☐ INTERSTITIAL [1]
☐ INTERMITTENT [2]
☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
 Primary Contact
 Secondary Contact
 (circle one and comment on back)
Pool /
Current
Maximum
12

Comments _____

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]**RIFFLE DEPTH****RUN DEPTH****RIFFLE / RUN SUBSTRATE****RIFFLE / RUN EMBEDDEDNESS**

- ☐ BEST AREAS > 10cm [2]
☐ BEST AREAS 5-10cm [1]
☐ BEST AREAS < 5cm [metric=0]

- ☐ MAXIMUM > 50cm [2]
☐ MAXIMUM < 50cm [1]

- ☐ STABLE (e.g., Cobble/Boulders) [2]
☐ MOD. STABLE (e.g., Large Gravel) [1]
☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

- ☐ NONE [2]
☐ LOW [1]
☐ MODERATE [0]
☐ EXTENSIVE [1]

Riffle /
Run
Maximum
8

Comments _____

6) **GRADIENT** 4 ft/m**DRAINAGE AREA**0.57 mi²

- ☐ VERY LOW - LOW [2-4]
☐ MODERATE [8-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: _____

%GLIDE: _____

%RUN: _____

%RIFFLE: _____

Gradient
Maximum
10

Comment RE: Reach consistency/Is reach typical of stream? Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.

AJ SAMPLED REACH

Check ALL that apply

METHOD STAGE

- 1st - sample pass - 2nd
- ☐ BOAT ☐ HIGH ☐
- ☐ WADE ☐ UP ☐
- ☐ L. LINE ☐ NORMAL ☐
- ☐ OTHER ☐ LOW ☐
- ☐ DRY ☐

DISTANCE

- ☐ 0.6 Km ☐
- ☐ 0.2 Km ☐
- ☐ 0.15 Km ☐
- ☐ 0.12 Km ☐
- ☐ OTHER ☐

CLARITY

- 1st - sample pass - 2nd
- ☐ < 20 cm ☐
- ☐ 20-40 cm ☐
- ☐ 40-70 cm ☐
- ☐ > 70 cm / CTB ☐
- ☐ SECCHI DEPTH ☐

meters

CANOPY

- ☐ > 85% - OPEN ☐
- ☐ 55%-85% ☐
- ☐ 30%-55% ☐
- ☐ 10%-30% ☐
- ☐ < 10% - CLOSED ☐

CJ RECREATION

POOL: ☐ > 100# ☐ > JR

BJ AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSO / SSO / OUTFALLS

DJ MAINTENANCE

- ☐ PUBLIC / PRIVATE / BOTH / NA
- ☐ ACTIVE / HISTORIC / BOTH / NA
- ☐ YOUNG-SUCCESSION-OLD
- ☐ SPRAY / SNAG / REMOVED
- ☐ MODIFIED / DIPPED OUT / NA
- ☐ LEVEED / ONE SIDED
- ☐ RELOCATED / CUTOFFS
- ☐ MOVING-BEDLOAD-STABLE
- ☐ ARMoured / SLUMPS
- ☐ ISLANDS / SCoured
- ☐ IMPOUNDED / DESICCATED
- ☐ FLOOD CONTROL / DRAINAGE

EJ ISSUES

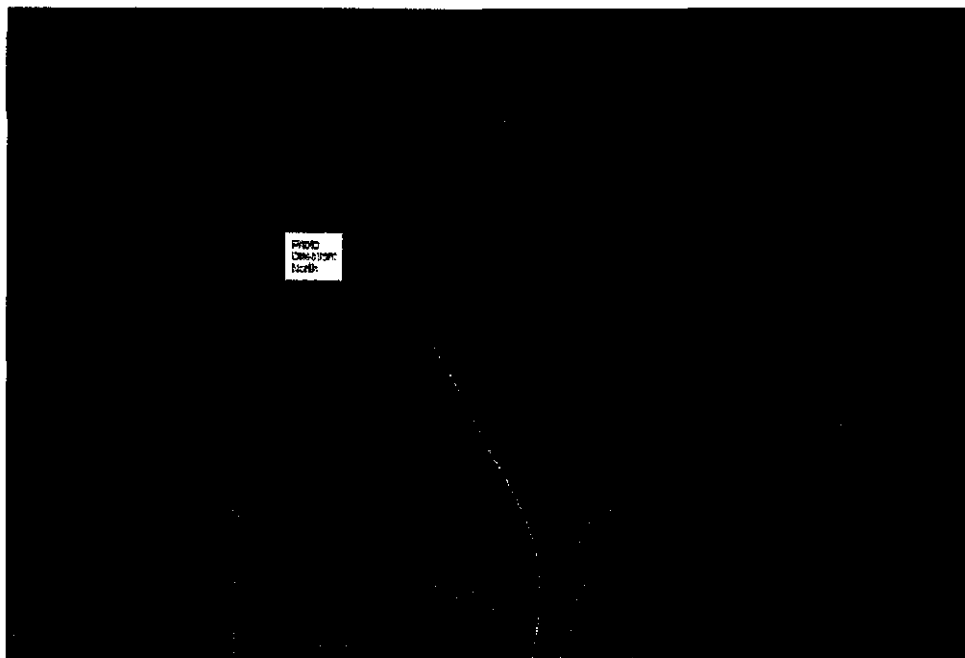
- ☐ WWTP / CSO / NPDES / INDUSTRY
- ☐ HARDENED / URBAN / DIRT & GRIME
- ☐ CONTAMINATED / LANDFILL
- ☐ BMPs-CONSTRUCTION-SEDIMENT
- ☐ LOGGING / IRRIGATION / COOLING
- ☐ BANK / EROSION / SURFACE
- ☐ FALSE BANK / MANURE / LAGOON
- ☐ WASH H₂O / TILE / H₂O TABLE
- ☐ ACID / MINE / QUARRY / FLOW
- ☐ NATURAL / WETLAND / STAGNANT
- ☐ PARK / GOLF / LAWN / HOME
- ☐ ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS

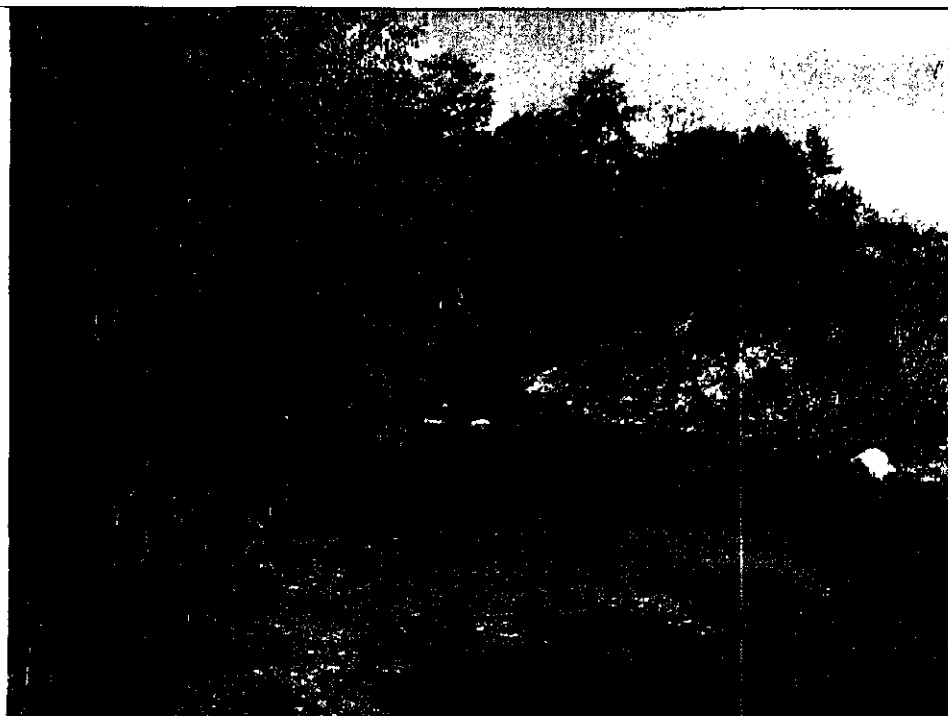
- ☐ \bar{x} width
- ☐ \bar{x} depth
- ☐ max. depth
- ☐ \bar{x} bankfull width
- ☐ bankfull \bar{x} depth
- ☐ W/D ratio
- ☐ bankfull max. depth
- ☐ floodprone \bar{x}^2 width
- ☐ entrench. ratio
- Legacy Tree:

Stream Drawing:

Maddox Creek



Stream
S172TA



Stream S172TA

WATERBODY DATA SHEET

WATERBODY ID NO: S172TA		WATERBODY NAME:	
SITE NAME: Blue Creek			
DATE: 9/16/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH	ROVER FILE: RAH091609A.cor	QUAD NAME: Scott	
STATE/COUNTY: Ohio/Van Wert	TOWNSHIP: Hoaglin		
	PHOTO NO: S172A		

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Stream		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	9 (in)		
AVG. STREAM WIDTH:	20 (ft)	TOP OF BANK: 35 (ft)	ORDINARY HIGH WATER MARK WIDTH: 35 (ft)
AVG. BANK HEIGHT:	10 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Slightly Turbid		
PRIMARY SUBSTRATE:	Cobbles		
POTENTIAL HABITAT FOR:	Aq/Wild Diversity		
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 35 (ft)		
	TYPE OF VEGETATION PRESENT: Forested		
WETLAND FRINGE (IF PRESENT):	N/A		
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Natural	CHANNEL GEOMETRY MEANDERING	

COMMENTS

More notes on QHEI sheet

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: S 172 TA (MADDOX CREEK) RM: 5.0 Date: 9/16/09

Scorers Full Name & Affiliation: 24001 CHM HILL
River Code: - STORET #: - Lat./Long.: 40° 57' 18" N 84° 31' 34" W Office verified location ☐

1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	Substrate <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; text-align: center; line-height: 40px;">13</div> Maximum 20
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> MODERATE [-1]	
<input checked="" type="checkbox"/> COBBLE [8]	<u>50%</u> <u>75%</u>	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> FREE [1]	<input type="checkbox"/> EXTENSIVE [-2]	
<input type="checkbox"/> GRAVEL [7]	<u>25%</u> <u>25%</u>	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> SAND [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> SAND [6]			<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NORMAL [0]	<input type="checkbox"/> NONE [1]	
<input type="checkbox"/> BEDROCK [5]				<input type="checkbox"/> COAL FINES [-2]			

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0] (Score natural substrates; ignore sludge from point-sources)

Comments: _____

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT	
<input checked="" type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> EXTENSIVE >75% [11]
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> MODERATE 25-75% [7]
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input checked="" type="checkbox"/> SPARSE 5-25% [3]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> NEARLY ABSENT <5% [1]

Comments: _____

Cover Maximum 20

5

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input checked="" type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments: _____

Channel Maximum 20

9.5

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]
<input type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input checked="" type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]

Comments: _____

Indicate predominant land use(s) past 100m riparian. Riparian Maximum 10

5

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY):	Check ONE (Or 2 & average):	Check ALL that apply:	Primary Contact
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	(circle one and comment on back)
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	
<input checked="" type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input type="checkbox"/> < 0.2m [0]		<input checked="" type="checkbox"/> MODERATE [1]	
		<input type="checkbox"/> INTERSTITIAL [-1]	
		<input type="checkbox"/> INTERMITTENT [-2]	
		<input type="checkbox"/> EDDIES [1]	

Comments: _____

Indicate for reach - pools and riffles. Pool / Current Maximum 12

4

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: _____

Riffle / Run Maximum 8

0

6) **GRADIENT** (3.5 ft/m) ☒ VERY LOW - LOW [2-4] %POOL: 0 %GLIDE: 100
DRAINAGE AREA (2.8 mi²) ☐ MODERATE [6-10] %RUN: 0 %RIFFLE: 0
☐ HIGH - VERY HIGH [10-6] Gradient Maximum 10

4

Comment RE: Reach consistency/Is reach typical of stream?, Redirection/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.

A) SAMPLED REACH

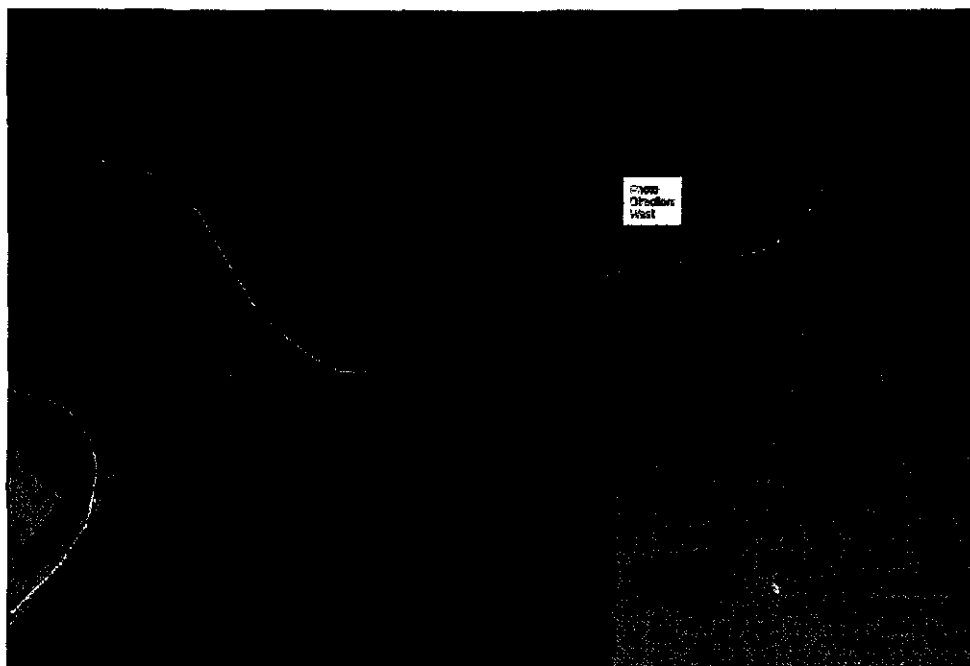
Check ALL that apply

METHOD

STAGE
1st - sample point - 2nd
☐ HIGH ☐ ☐
☐ UP ☐ ☐
☐ INTERMEDIATE ☐ ☐
☐ LOW ☐ ☐
☐ SHOT ☐ ☐

DISTANCE

CLARITY
1st - sample point - 2nd
☐ 10-20 cm ☐ ☐
☐ 20-40 cm ☐ ☐
☐ 40-60 cm ☐ ☐
☐ 60-80 cm ☐ ☐
☐ 80-100 cm ☐ ☐
☐ 100-120 cm ☐ ☐
☐ 120-140 cm ☐ ☐
☐ 140-160 cm ☐ ☐
☐ 160-180 cm ☐ ☐
☐ 180-200 cm ☐ ☐
☐ 200-220 cm ☐ ☐
☐ 220-240 cm ☐ ☐
☐ 240-260 cm ☐ ☐
☐ 260-280 cm ☐ ☐
☐ 280-300 cm ☐ ☐
☐ 300-320 cm ☐ ☐
☐ 320-340 cm ☐ ☐
☐ 340-360 cm ☐ ☐
☐ 360-380 cm ☐ ☐
☐ 380-400 cm ☐ ☐
☐ 400-420 cm ☐ ☐
☐ 420-440 cm ☐ ☐
☐ 440-460 cm ☐ ☐
☐ 460-480 cm ☐ ☐
☐ 480-500 cm ☐ ☐
☐ 500-520 cm ☐ ☐
☐ 520-540 cm ☐ ☐
☐ 540-560 cm ☐ ☐
☐ 560-580 cm ☐ ☐
☐ 580-600 cm ☐ ☐
☐ 600-620 cm ☐ ☐
☐ 620-640 cm ☐ ☐
☐ 640-660 cm ☐ ☐
☐ 660-680 cm ☐ ☐
☐ 680-700 cm ☐ ☐
☐ 700-720 cm ☐ ☐
☐ 720-740 cm ☐ ☐
☐ 740-760 cm ☐ ☐
☐ 760-780 cm ☐ ☐
☐ 780-800 cm ☐ ☐
☐ 800-820 cm ☐ ☐
☐ 820-840 cm ☐ ☐
☐ 840-860 cm ☐ ☐
☐ 860-880 cm ☐ ☐
☐ 880-900 cm ☐ ☐
☐ 900-920 cm ☐ ☐
☐ 920-940 cm ☐ ☐
☐ 940-960 cm ☐ ☐
☐ 960-980 cm ☐ ☐
☐ 980-1000 cm ☐ ☐
☐ 1000-1020 cm ☐ ☐
☐ 1020-1040 cm ☐ ☐
☐ 1040-1060 cm ☐ ☐
☐ 1060-1080 cm ☐ ☐
☐ 1080-1100 cm ☐ ☐
☐ 1100-1120 cm ☐ ☐
☐ 1120-1140 cm ☐ ☐
☐ 1140-1160 cm ☐ ☐
☐ 1160-1180 cm ☐ ☐
☐ 1180-1200 cm ☐ ☐
☐ 1200-1220 cm ☐ ☐
☐ 1220-1240 cm ☐ ☐
☐ 1240-1260 cm ☐ ☐
☐ 1260-1280 cm ☐ ☐
☐ 1280-1300 cm ☐ ☐
☐ 1300-1320 cm ☐ ☐
☐ 1320-1340 cm ☐ ☐
☐ 1340-1360 cm ☐ ☐
☐ 1360-1380 cm ☐ ☐
☐ 1380-1400 cm ☐ ☐
☐ 1400-1420 cm ☐ ☐
☐ 1420-1440 cm ☐ ☐
☐ 1440-1460 cm ☐ ☐
☐ 1460-1480 cm ☐ ☐
☐ 1480-1500 cm ☐ ☐
☐ 1500-1520 cm ☐ ☐
☐ 1520-1540 cm ☐ ☐
☐ 1540-1560 cm ☐ ☐
☐ 1560-1580 cm ☐ ☐
☐ 1580-1600 cm ☐ ☐
☐ 1600-1620 cm ☐ ☐
☐ 1620-1640 cm ☐ ☐
☐ 1640-1660 cm ☐ ☐
☐ 1660-1680 cm ☐ ☐
☐ 1680-1700 cm ☐ ☐
☐ 1700-1720 cm ☐ ☐
☐ 1720-1740 cm ☐ ☐
☐ 1740-1760 cm ☐ ☐
☐ 1760-1780 cm ☐ ☐
☐ 1780-1800 cm ☐ ☐
☐ 1800-1820 cm ☐ ☐
☐ 1820-1840 cm ☐ ☐
☐ 1840-1860 cm ☐ ☐
☐ 1860-1880 cm ☐ ☐
☐ 1880-1900 cm ☐ ☐
☐ 1900-1920 cm ☐ ☐
☐ 1920-1940 cm ☐ ☐
☐ 1940-1960 cm ☐ ☐
☐ 1960-1980 cm ☐ ☐
☐ 1980-2000 cm ☐ ☐
☐ 2000-2020 cm ☐ ☐
☐ 2020-2040 cm ☐ ☐
☐ 2040-2060 cm ☐ ☐
☐ 2060-2080 cm ☐ ☐
☐ 2080-2100 cm ☐ ☐
☐ 2100-2120 cm ☐ ☐
☐ 2120-2140 cm ☐ ☐
☐ 2140-2160 cm ☐ ☐
☐ 2160-2180 cm ☐ ☐
☐ 2180-2200 cm ☐ ☐
☐ 2200-2220 cm ☐ ☐
☐ 2220-2240 cm ☐ ☐
☐ 2240-2260 cm ☐ ☐
☐ 2260-2280 cm ☐ ☐
☐ 2280-2300 cm ☐ ☐
☐ 2300-2320 cm ☐ ☐
☐ 2320-2340 cm ☐ ☐
☐ 2340-2360 cm ☐ ☐
☐ 2360-2380 cm ☐ ☐
☐ 2380-2400 cm ☐ ☐
☐ 2400-2420 cm ☐ ☐
☐ 2420-2440 cm ☐ ☐
☐ 2440-2460 cm ☐ ☐
☐ 2460-2480 cm ☐ ☐
☐ 2480-2500 cm ☐ ☐
☐ 2500-2520 cm ☐ ☐
☐ 2520-2540 cm ☐ ☐
☐ 2540-2560 cm ☐ ☐
☐ 2560-2580 cm ☐ ☐
☐ 2580-2600 cm ☐ ☐
☐ 2600-2620 cm ☐ ☐
☐ 2620-2640 cm ☐ ☐
☐ 2640-2660 cm ☐ ☐
☐ 2660-2680 cm ☐ ☐
☐ 2680-2700 cm ☐ ☐
☐ 2700-2720 cm ☐ ☐
☐ 2720-2740 cm ☐ ☐
☐ 2740-2760 cm ☐ ☐
☐ 2760-2780 cm ☐ ☐
☐ 2780-2800 cm ☐ ☐
☐ 2800-2820 cm ☐ ☐
☐ 2820-2840 cm ☐ ☐
☐ 2840-2860 cm ☐ ☐
☐ 2860-2880 cm ☐ ☐
☐ 2880-2900 cm ☐ ☐
☐ 2900-2920 cm ☐ ☐
☐ 2920-2940 cm ☐ ☐
☐ 2940-2960 cm ☐ ☐
☐ 2960-2980 cm ☐ ☐
☐ 2980-3000 cm ☐ ☐
☐ 3000-3020 cm ☐ ☐
☐ 3020-3040 cm ☐ ☐
☐ 3040-3060 cm ☐ ☐
☐ 3060-3080 cm ☐ ☐
☐ 3080-3100 cm ☐ ☐
☐ 3100-3120 cm ☐ ☐
☐ 3120-3140 cm ☐ ☐
☐ 3140-3160 cm ☐ ☐
☐ 3160-3180 cm ☐ ☐
☐ 3180-3200 cm ☐ ☐
☐ 3200-3220 cm ☐ ☐
☐ 3220-3240 cm ☐ ☐
☐ 3240-3260 cm ☐ ☐
☐ 3260-3280 cm ☐ ☐
☐ 3280-3300 cm ☐ ☐
☐ 3300-3320 cm ☐ ☐
☐ 3320-3340 cm ☐ ☐
☐ 3340-3360 cm ☐ ☐
☐ 3360-3380 cm ☐ ☐
☐ 3380-3400 cm ☐ ☐
☐ 3400-3420 cm ☐ ☐
☐ 3420-3440 cm ☐ ☐
☐ 3440-3460 cm ☐ ☐
☐ 3460-3480 cm ☐ ☐
☐ 3480-3500 cm ☐ ☐
☐ 3500-3520 cm ☐ ☐
☐ 3520-3540 cm ☐ ☐
☐ 3540-3560 cm ☐ ☐
☐ 3560-3580 cm ☐ ☐
☐ 3580-3600 cm ☐ ☐
☐ 3600-3620 cm ☐ ☐
☐ 3620-3640 cm ☐ ☐
☐ 3640-3660 cm ☐ ☐
☐ 3660-3680 cm ☐ ☐
☐ 3680-3700 cm ☐ ☐
☐ 3700-3720 cm ☐ ☐
☐ 3720-3740 cm ☐ ☐
☐ 3740-3760 cm ☐ ☐
☐ 3760-3780 cm ☐ ☐
☐ 3780-3800 cm ☐ ☐
☐ 3800-3820 cm ☐ ☐
☐ 3820-3840 cm ☐ ☐
☐ 3840-3860 cm ☐ ☐
☐ 3860-3880 cm ☐ ☐
☐ 3880-3900 cm ☐ ☐
☐ 3900-3920 cm ☐ ☐
☐ 3920-3940 cm ☐ ☐
☐ 3940-3960 cm ☐ ☐
☐ 3960-3980 cm ☐ ☐
☐ 3980-4000 cm ☐ ☐
☐ 4000-4020 cm ☐ ☐
☐ 4020-4040 cm ☐ ☐
☐ 4040-4060 cm ☐ ☐
☐ 4060-4080 cm ☐ ☐
☐ 4080-4100 cm ☐ ☐
☐ 4100-4120 cm ☐ ☐
☐ 4120-4140 cm ☐ ☐
☐ 4140-4160 cm ☐ ☐
☐ 4160-4180 cm ☐ ☐
☐ 4180-4200 cm ☐ ☐
☐ 4200-4220 cm ☐ ☐
☐ 4220-4240 cm ☐ ☐
☐ 4240-4260 cm ☐ ☐
☐ 4260-4280 cm ☐ ☐
☐ 4280-4300 cm ☐ ☐
☐ 4300-4320 cm ☐ ☐
☐ 4320-4340 cm ☐ ☐
☐ 4340-4360 cm ☐ ☐
☐ 4360-4380 cm ☐ ☐
☐ 4380-4400 cm ☐ ☐
☐ 4400-4420 cm ☐ ☐
☐ 4420-4440 cm ☐ ☐
☐ 4440-4460 cm ☐ ☐
☐ 4460-4480 cm ☐ ☐
☐ 4480-4500 cm ☐ ☐
☐ 4500-4520 cm ☐ ☐
☐ 4520-4540 cm ☐ ☐
☐ 4540-4560 cm ☐ ☐
☐ 4560-4580 cm ☐ ☐
☐ 4580-4600 cm ☐ ☐
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Stream SMAINCD

WATERBODY DATA SHEET

WATERBODY ID NO: SMAINC		WATERBODY NAME: Hoaglin Creek	
SITE NAME: Blue Creek			
DATE: 9/21/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: Hook		ROVER FILE: RAH090921.cor	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Union	
		PHOTO NO: smainc1 2	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Routed under old rr		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	24 (in)		
AVG. STREAM WIDTH:	20 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 25 (ft)
AVG. BANK HEIGHT:	9 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid		
PRIMARY SUBSTRATE:	Cobbles		
POTENTIAL HABITAT FOR:			
DEFINED BED AND BANKS:	PRESENT		
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 0 (ft)		
	TYPE OF VEGETATION PRESENT:		
WETLAND FRINGE (IF PRESENT):			
CHANNEL CONDITION:	Not Significant		
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY RELATIVELY STRAIGHT	

COMMENTS

STREAM QUALITY: Medium

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levees are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levees restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levees; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Stream & Location: SHANNON (HOAGLIN CREEK) RM: 14.0 Date: 9/21/09Scorers Full Name & Affiliation: 12 Hook / CH2M HILLRiver Code: - STORET #: - Lat/Long: 40° 36' 13" N 84° 34' 55" W Office verified location ☐1) **SUBSTRATE** Check ONLY Two substrate TYPE BOXES, estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE	OTHER TYPES		POOL RIFFLE	ORIGIN	QUALITY		Substrate <div style="border: 1px solid black; padding: 5px; display: inline-block;">14</div> Maximum 20
<input type="checkbox"/> BLDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> HEAVY [-2]				
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> MODERATE [-1]				
<input checked="" type="checkbox"/> COBBLE [8]	<u>50%</u>	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> NORMAL [0]				
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> FREE [1]				
<input type="checkbox"/> SAND [6]	<u>50%</u>	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> EXTENSIVE [-2]				
<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> POOL RIFFLE			<input type="checkbox"/> RIP/RAP [0]	<input checked="" type="checkbox"/> MODERATE [-1]				
					<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> NORMAL [0]			
					<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NONE [1]			
					<input type="checkbox"/> COAL FINES [-2]				

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0] (Score natural substrates; ignore sludge from point-sources)

Comments: No riffle/pool

2) **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

				AMOUNT	
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> EXTENSIVE >75% [11]		
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	<input type="checkbox"/> MODERATE 25-75% [7]		
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input checked="" type="checkbox"/> SPARSE 5-<25% [3]		
<input type="checkbox"/> ROOTMATS [1]			<input type="checkbox"/> NEARLY ABSENT <5% [1]		

Comments:

Cover Maximum

4

 20

3) **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		

Comments:

Channel Maximum

10

 20

4) **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream		RIPARIAN WIDTH	FLOOD PLAIN QUALITY	
<input checked="" type="checkbox"/> EROSION	<input checked="" type="checkbox"/> WIDE > 50m [4]	<input checked="" type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> CONSERVATION TILLAGE [1]	
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]	
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]	
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]		
	<input checked="" type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]		

Comments: AVERAGE = 2 AVERAGE = 1.5

Indicate predominant land use(s) past 100m riparian. Riparian Maximum

6.5

 10

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	(circle one and comment on back)
<input checked="" type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input type="checkbox"/> < 0.2m [0]		<input checked="" type="checkbox"/> MODERATE [1]	
		<input type="checkbox"/> INTERSTITIAL [-1]	
		<input type="checkbox"/> INTERMITTENT [-2]	
		<input type="checkbox"/> EDDIES [1]	

Comments:

Indicate for reach - pools and riffles.

Pool / Current Maximum

5

 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

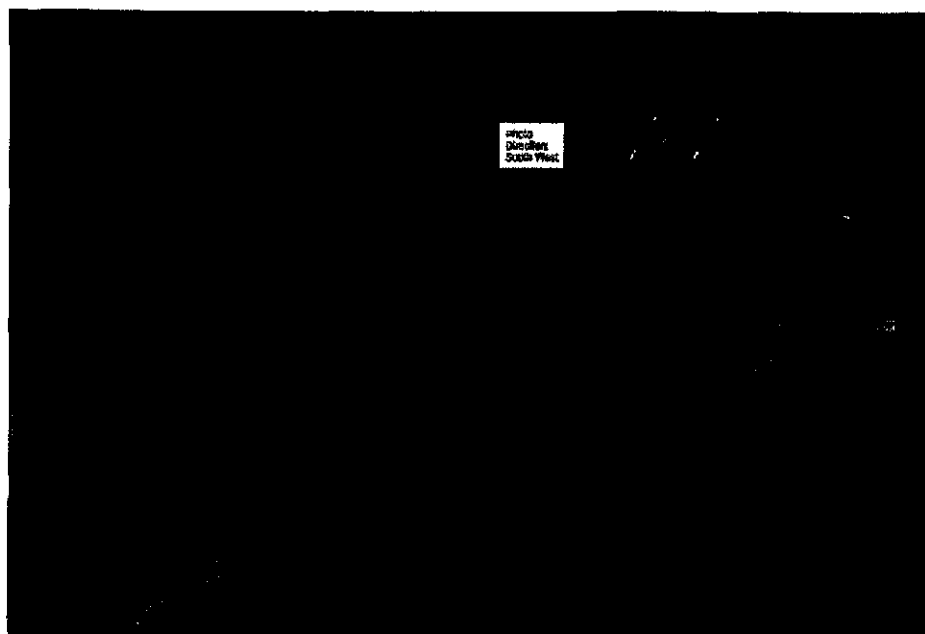
RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS	
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]	
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]	
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]	
			<input type="checkbox"/> EXTENSIVE [-1]	

Comments:

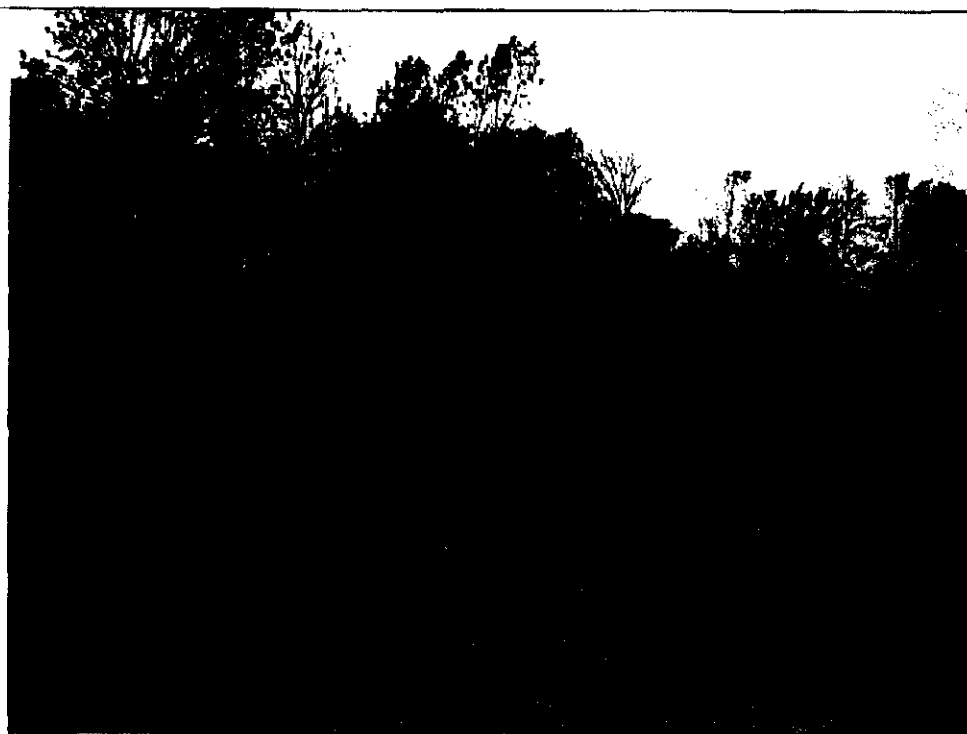
Riffle / Run Maximum

8

6) GRADIENT (<u>3</u> ft/mi)	<input type="checkbox"/> VERY LOW - LOW [2-4]	%POOL: <div style="border: 1px solid black; padding: 2px;">0</div>	%GLIDE: <div style="border: 1px solid black; padding: 2px;">100%</div>	Gradient Maximum <div style="border: 1px solid black; padding: 5px; display: inline-block;">4</div> 10
DRAINAGE AREA (<u>33</u> mi ²)	<input type="checkbox"/> MODERATE [6-10]	%RUN: <div style="border: 1px solid black; padding: 2px;">0</div>	%RIFFLE: <div style="border: 1px solid black; padding: 2px;">0</div>	
	<input type="checkbox"/> HIGH - VERY HIGH [10-6]			



Stream
S139CA



Stream S139CA

WATERBODY DATA SHEET

WATERBODY ID NO: S139CA		WATERBODY NAME: Hoaglin Creek	
SITE NAME: Blue Creek			
DATE: 10/14/2009	CLIENT/PROJECT NAME: Heartland Wind LLC./Blue Creek Wind Farm		
INVESTIGATORS: AF RH		ROVER FILE:	QUAD NAME: Scott
STATE/COUNTY: Ohio/Van Wert		TOWNSHIP: Hoaglin	
		PHOTO NO:	

WATERBODY CHARACTERISTICS

WATERBODY TYPE:	Stream		
FLOW EVENTS/YEAR:			
FLOW TYPE:	Perennial		
AVG. STREAM DEPTH:	36 (in)		
AVG. STREAM WIDTH:	25 (ft)	TOP OF BANK: 40 (ft)	ORDINARY HIGH WATER MARK WIDTH: 30 (ft)
AVG. BANK HEIGHT:	8 (ft)		
AVG. BANK SLOPE (RATIO):	2:1		

QUALITATIVE ATTRIBUTES

AVERAGE WATER APPEARANCE:	Turbid	
PRIMARY SUBSTRATE:	Silts	
POTENTIAL HABITAT FOR:	Aq/Wild Diversity	
DEFINED BED AND BANKS:	PRESENT	
RIPARIAN ZONE:	WIDTH OF NATURAL VEGETATION ZONE FROM EDGE OF ACTIVE CHANNEL OUT ONTO FLOOD PLAN: 15 (ft)	
	TYPE OF VEGETATION PRESENT: Forested	
WETLAND FRINGE (IF PRESENT):	N/A	
CHANNEL CONDITION:	Not Significant	
CHANNEL TYPE:	Manipulated	CHANNEL GEOMETRY MEANDERING

COMMENTS

STREAM QUALITY: Low

HIGH QUALITY: Natural channel (no structures or dikes; no evidence of downcutting or excessive lateral cutting); evidence of past channel alteration with significant recovery; any dikes/levies are set back to provide access to adequate flood plain; natural vegetation extends at least one or two active channel widths on each side; banks stable and protected by roots that extend to the base-flow elevation; water clear to tea-colored; no barriers to fish movement (seasonal water withdrawals prevent movement); many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man; intolerant microinvertebrates present.

MODERATE QUALITY: Altered channel evidenced by rip rap and/or channelization; dikes/levies restrict flood plain width; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function of riparian vegetation only moderately compromised; banks moderately unstable (outside bends actively eroding with few fallen trees); considerable water cloudiness, submerged objects covered with green film; moderate odor; minor barriers to fish movement; 4-3 fish cover types available; fair aquatic habitat; minimum disturbance by livestock or man; Facultative microinvertebrates present.

LOW QUALITY: Channel is actively downcutting or widening; rip rap and channelization excessive; flood plain restricted by dikes/levies; natural vegetation less than 1/3 of the active channel width on each side; low regeneration; filtering function severely compromised; Banks unstable (inside and outside bends actively eroding with numerous fallen trees); water very turbid to muddy; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; green color to water; severe barriers to fish movement; 2-0 fish cover types available; little to no aquatic habitat; severe disturbance by livestock or man; tolerant or no microinvertebrates present.

Blue Creek



IBERDROLA RENEWABLES

6 of January, 2009

Keith Lott
Ohio Department of Natural Resources
Old Woman Creek Research Station
2514 Cleveland Road East
Huron, Ohio 44839

RE: Blue Creek Wind Project, Van Wert and Paulding Counties, Ohio

Dear Keith,

Iberdrola Renewables, Inc. (IBR) is providing this formal correspondence as a summary of the Blue Creek Wind Project introduction conference call on November 14 and agency field review conducted on November 21, 2008 with representatives of the United States Fish and Wildlife Service (FWS) and Ohio Department of Natural Resources Division of Wildlife (ODNR). A review of the site was conducted by vehicle that determined the site was predominantly active agricultural lands with a few sparse woodlot areas. Based on the existing land use conditions of the site, FWS and ODNR representatives indicated that the site would be considered a "minimum risk" for avian and bat impacts and that no records existed for federal or state listed species of concern within the project area.

It was agreed during the field review that the Flat Rock Creek corridor along the northwest border of the project area provided potential habitat conditions for bat species based on the 10 hectare or larger forested areas along this watercourse. ODNR requested that mist net surveys be conducted along this corridor if wind turbines were placed within 500 meters of the 10 hectare or larger forest areas. IBR has prepared the attached drawings in coordination with ODNR depicting the forested areas within the project limits that are 10 hectares or larger. A 500 meter buffer has been placed around each area, at this time IBR does not plan to site wind turbines within forest areas or the adjacent buffers.

According to the *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio (OSMP)*, a minimum risk site would require the completion of the following surveys for avian and bat species:

- **Breeding Bird Survey** – According to the OSMP, if wind turbines are only sited in active agricultural areas then breeding bird surveys would not be required for the project. IBR will not conduct breeding bird surveys based on the current siting of all wind turbines in active agricultural fields, outside of the 500 meter buffers around forest areas that are 10 hectares or larger.

IBERDROLA RENEWABLES, Inc.
201 King of Prussia Road
Radnor, PA 19087
Phone: (810) 230-0333
Fax (866) 648-5913
www.iberdrolarenewables.us



**IBERDROLA
RENEWABLES**

- **Raptor nest Search** – According to the OSMP, one early season (1 February – 31 March) survey should be conducted on and within 1 mile of the proposed site. If nests for protected raptors are observed, then nest monitoring may be required. IBR proposes to conduct a raptor nest search between 1 February – 31 March on and within 1 mile of the proposed project area. If raptor nests are detected, then IBR will coordinate monitoring requirements with ODNR and FWS.
- **Bat Acoustic Monitoring** – According to the OSMP acoustic equipment should be installed on all METs proposed for the project. IBR has three existing METs that do not have apparatus for mounting the acoustic equipment. Based on the existing active agricultural land use comprising the project IBR would install one MET with the appropriate equipment to conduct acoustic monitoring. The proposed location of the MET is provided on the attached figure. IBR proposes to utilize two detectors on this tower to monitor bat activity at the site from 15 March to 15 November, 2009. The detectors will be mounted at 5 meters, and at approximately 48 meters above ground level. We will utilize Analook software to identify ultrasound passes of bats in a high frequency species group (above or equal to 35 kHz), and a low frequency species group (below 35 kHz).

As we move forward in the development of this project under the assumptions addressed in this letter, IBR requests that ODNR provide their approval of the surveys identified for moving forward and a confirmation that no records exist for state listed species of concern or their habitats within the immediate vicinity of the project area.

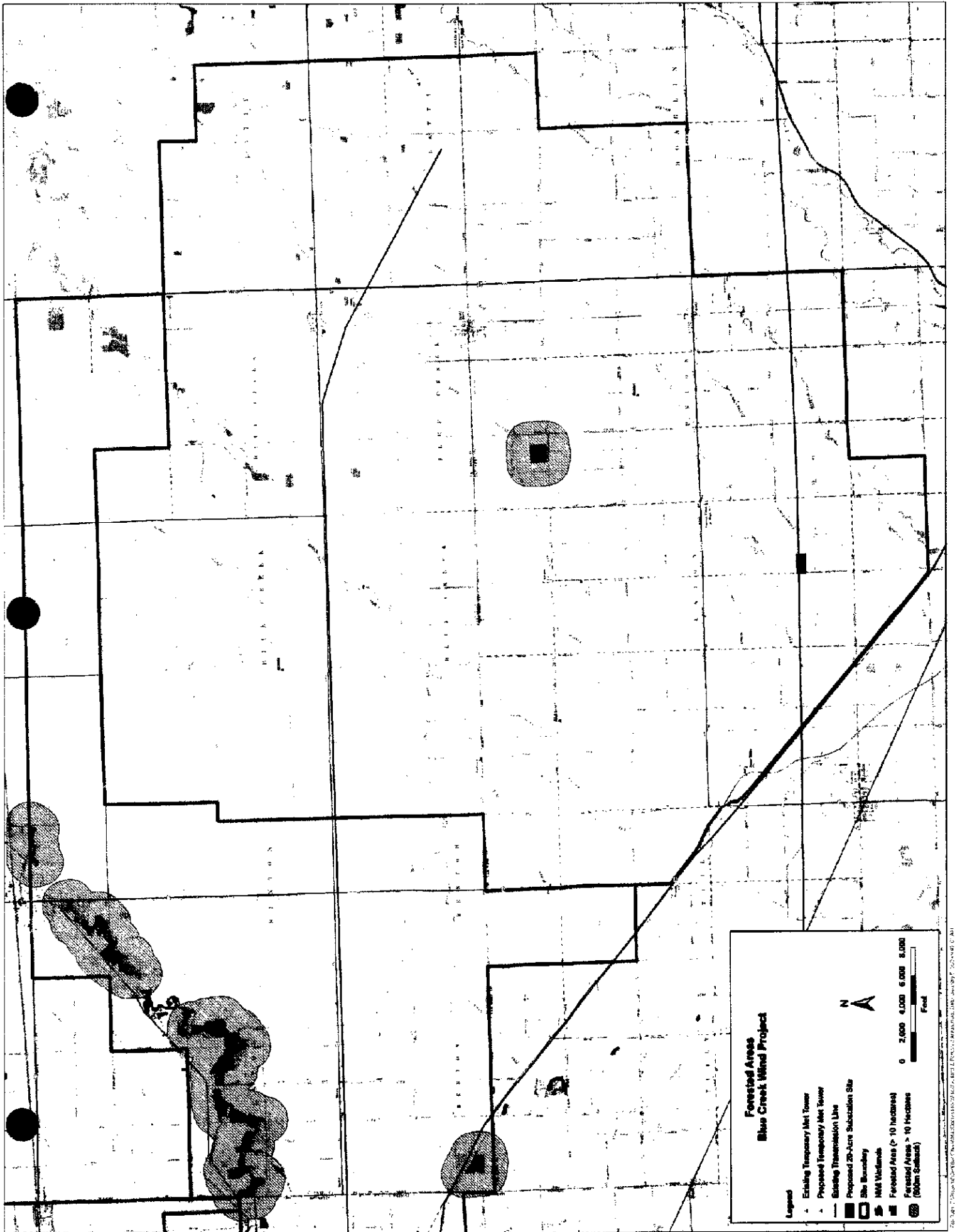
IBR appreciates the time and resources that ODNR has provided to our project and looks forward to our future communications on this project. Please feel free to contact me with questions or comments at (610) 230-0333 or ddecaro@iberdrolausa.com.

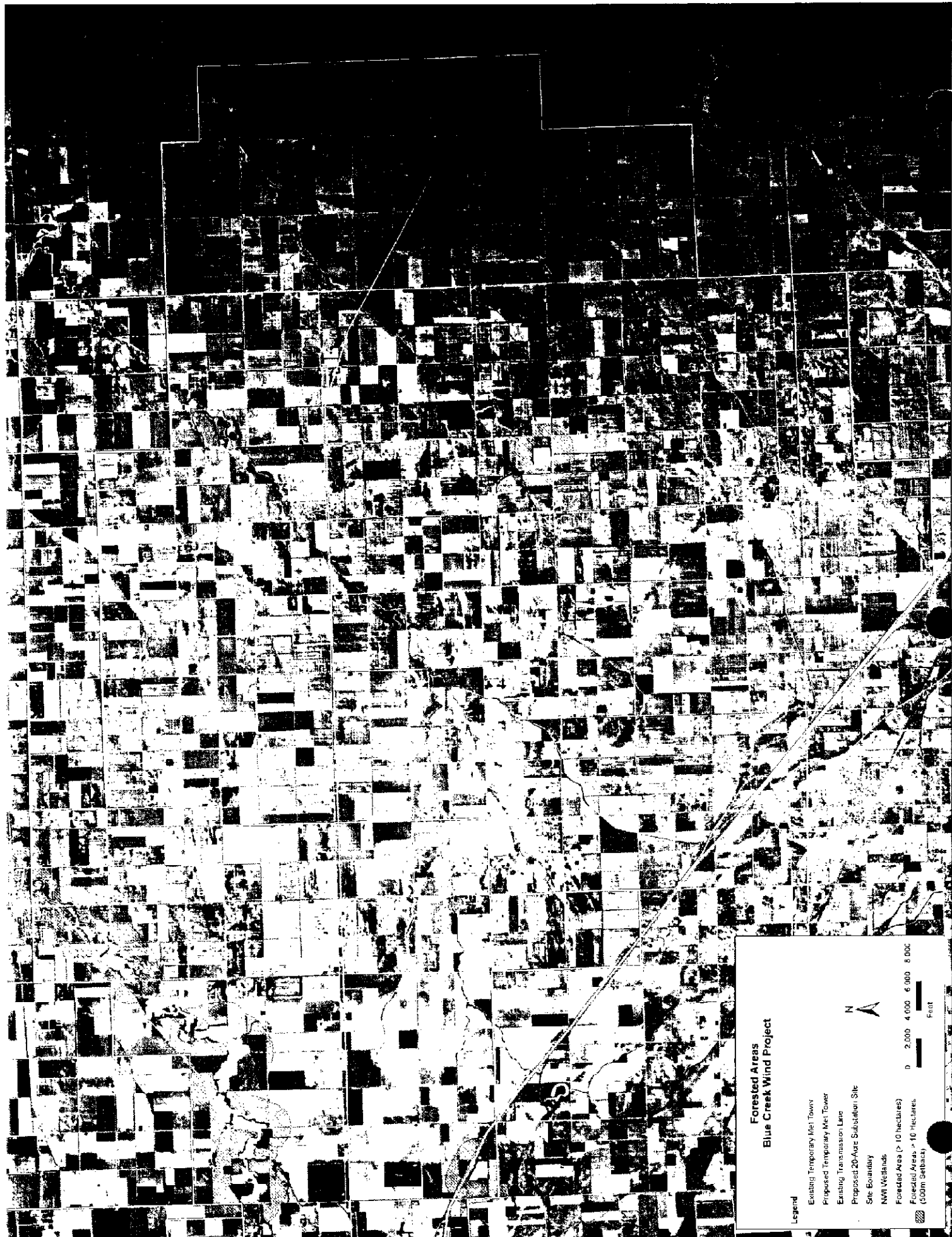
Yours Sincerely,

David De Caro
Senior Permit Manager

CC: D. Litchfield – IBR

Attachment: Blue Creek USGS and Aerial Base Maps – MET Circled for Clarity

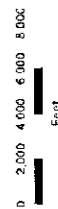




**Forested Areas
Blue Creek Wind Project**

Legend

- Existing Temporary Met Tower
- Proposed Temporary Met Tower
- Existing Transmission Line
- Proposed 20-Acre Substation Site
- Site Boundary
- NWI Wetlands
- Forested Area (> 10 hectares)
- Forested Area (> 10 hectares, 500m Buffer)





IBERDROLA RENEWABLES

6 of January, 2009

Megan Seymour
United States Fish and Wildlife Service
4625 Morse Rd.
Suite 104
Columbus, OH 43230

RE: Blue Creek Wind Project, Van Wert and Paulding Counties, Ohio

Dear Megan,

Iberdrola Renewables, Inc. (IBR) is providing this formal correspondence as a summary of the Blue Creek Wind Project introduction conference call on November 14 and agency field review conducted on November 21, 2008 with representatives of the United States Fish and Wildlife Service (FWS) and Ohio Department of Natural Resources Division of Wildlife (ODNR). A review of the site was conducted by vehicle that determined the site was predominantly active agricultural lands with a few sparse woodlot areas. Based on the existing land use conditions of the site, FWS and ODNR representatives indicated that the site would be considered a "minimum risk" for avian and bat impacts and that no records existed for federal or state listed species of concern within the project area.

It was agreed during the field review that the Flat Rock Creek corridor along the northwest border of the project area provided potential habitat conditions for bat species based on the 10 hectare or larger forested areas along this watercourse. ODNR requested that mist net surveys be conducted along this corridor if wind turbines were placed within 500 meters of the 10 hectare or larger forest areas. IBR has prepared the attached drawings in coordination with ODNR depicting the forested areas within the project limits that are 10 hectares or larger. A 500 meter buffer has been placed around each area, at this time IBR does not plan to site wind turbines within forest areas or the adjacent buffers.

According to the *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio (OSMP)*, a minimum risk site would require the completion of the following surveys for avian and bat species:

- **Breeding Bird Survey** – According to the OSMP, if wind turbines are only sited in active agricultural areas then breeding bird surveys would not be required for the project. IBR will not conduct breeding bird surveys based on the current siting of all wind turbines in active agricultural fields, outside of the 500 meter buffers around forest areas that are 10 hectares or larger.

IBERDROLA RENEWABLES, Inc.
201 King of Prussia Road
Radnor, PA 19087
Phone: (610) 230-0333
Fax: (866) 648-5913
www.iberdrolarenewables.us



**IBERDROLA
RENEWABLES**

- Raptor nest Search – According to the OSMP, one early season (1 February – 31 March) survey should be conducted on and within 1 mile of the proposed site. If nests for protected raptors are observed, then nest monitoring may be required. IBR proposes to conduct a raptor nest search between 1 February – 31 March on and within 1 mile of the proposed project area. If raptor nests are detected, then IBR will coordinate monitoring requirements with ODNR and FWS.
- Bat Acoustic Monitoring – According to the OSMP acoustic equipment should be installed on all METs proposed for the project. IBR has three existing METs that do not have apparatus for mounting the acoustic equipment. Based on the existing active agricultural land use comprising the project IBR would install one MET with the appropriate equipment to conduct acoustic monitoring. The proposed location of the MET is provided on the attached figure. IBR proposes to utilize two detectors on this tower to monitor bat activity at the site from 15 March to 15 November, 2009. The detectors will be mounted at 5 meters, and at approximately 48 meters above ground level. We will utilize Analook software to identify ultrasound passes of bats in a high frequency species group (above or equal to 35 kHz), and a low frequency species group (below 35 kHz).

As we move forward in the development of this project under the assumptions addressed in this letter, IBR requests that FWS provide their approval of the surveys identified for moving forward and a confirmation that no records exist for federal listed species of concern or their habitats within the immediate vicinity of the project area.

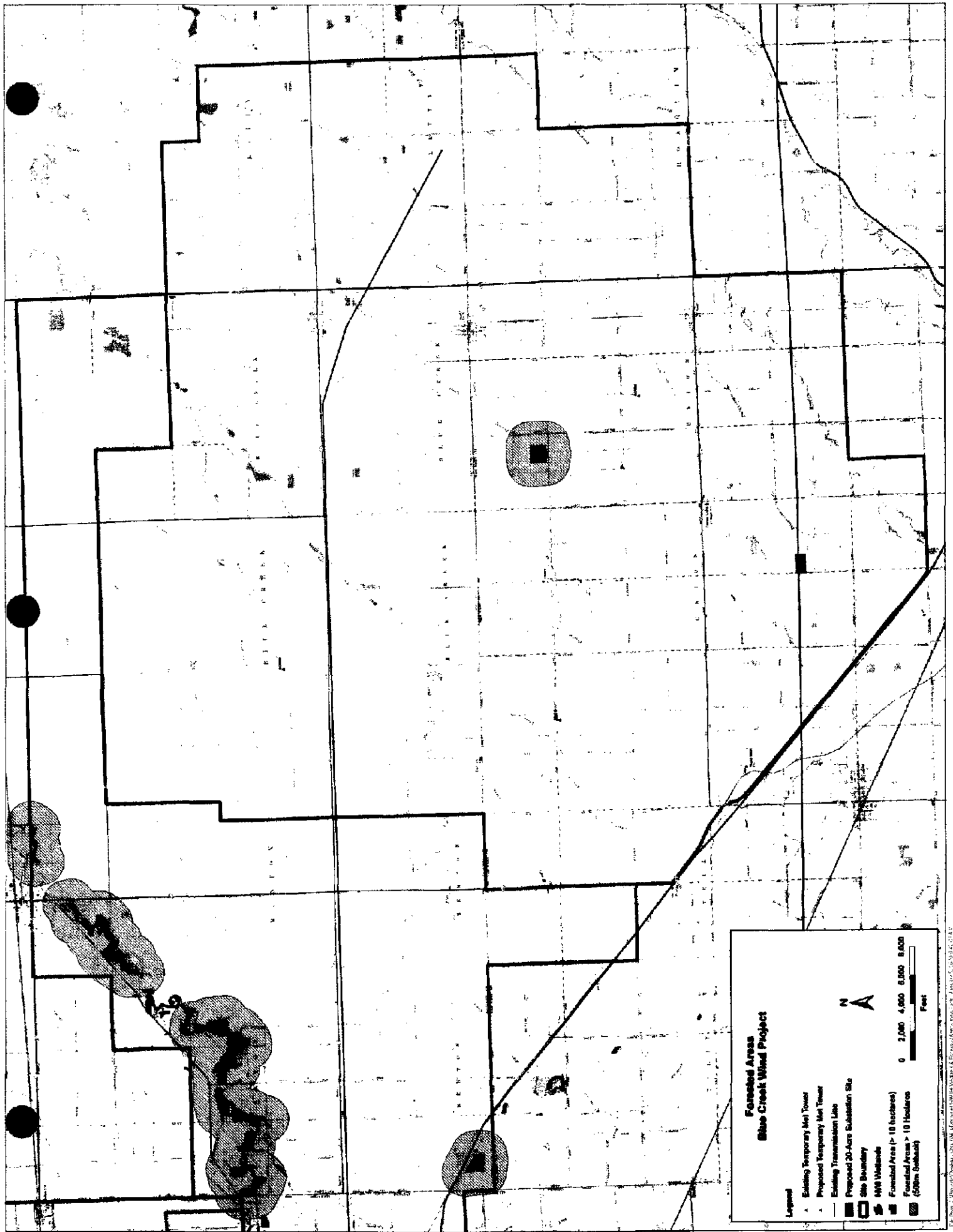
IBR appreciates the time and resources that FWS has provided to our project and looks forward to our future communications on this project. Please feel free to contact me with questions or comments at (610) 230-0333 or ddecaro@iberdrolausa.com.

Yours Sincerely,

David De Caro
Senior Permit Manager

CC: D. Litchfield – IBR

Attachment: Blue Creek USGS and Aerial Base Maps – MET Circled for Clarity





From: Lott, Keith [mailto:Keith.Lott@dnr.state.oh.us]
Sent: Tuesday, January 27, 2009 2:15 PM
To: DeCaro, Dave
Cc: Megan_Seymour@fws.gov; Siegfried, Stuart
Subject: DOW Blue Creek letter response

See attached. <<DOW Blue Creek letter.doc>> <<Blue Creek map.pdf>> <<DNAP Blue Creek.doc>>

Keith Lott, Wind Energy Wildlife Biologist

Old Woman Creek Nat'l Estuarine Research Reserve and State Nature Preserve
Ohio Division of Wildlife
2514 Cleveland Road East
Huron, OH 44839
Office phone: 419-433-4601
Cell: 419-602-3141
Fax: 419-433-2851



Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR

SEAN D. LOGAN, DIRECTOR

Division of Wildlife
David M. Graham, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

26 of January, 2009

To all interested parties,

The following comments have been prepared based upon a review of Iberdrola's proposed Blue Creek Wind Project. The methodologies outlined within the January 6th 2009 letter are consistent with those suggested by the Division of Wildlife (DOW) in the *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocols for Commercial Wind Energy Facilities in Ohio (OSMP)*, with one exception. Typically, the DOW suggests acoustic monitoring of bats at all meteorological towers situated onsite. Due to the extensive agricultural nature of the proposed site, and "minimum" risk classification, the DOW waives that recommendation and does not object to Iberdrola's plan to monitor only 1 meteorological tower. For future projects proposed within the state, it is suggested that all meteorological towers be appropriately equipped for raising and lowering acoustic monitoring devices before they are installed onsite.

As indicated in the accompanying letter, the Division of Natural Areas and Preserves (DNAP) database does not contain any records of rare, threatened, or endangered species within the proposed project area. Records from the DNAP database did indicate the presence of a small (10-15 nest) great blue heron rookery within the project boundaries. Though not specifically addressed within the OSMP due to their uncommon occurrence, heron rookeries are an area of concentrated activity and thus of greater concern. This rookery was last surveyed in 2003; therefore the DOW requests that the number of active nests be assessed. If active nests are found, the DOW requests that the activity patterns of those individuals be determined. Protocols should commence following similar methodologies as the raptor nest monitoring outlined in the OSMP. Monitoring should begin mid-April and continue through June (maximum of 14 visits). The DOW is also suggesting a ½ mile buffer of the rookery in an effort to minimize both direct and indirect impacts to the colony. This region is completely encompassed within the existing 500 meter buffer of 10 hectare forests, so no additional land need be set aside. If this project proceeds, particular effort should be made to avoid staging or operating machinery within this zone during the breeding season (February-July).

Much of the proposed project area is extensively agricultural (>95%). Wind turbine facilities located in similar habitat in other parts of the nation have been

shown to have negligible impacts on wildlife (with a few notable exceptions). The DOW supports the development of green energy in these low impact regions and looks forward to working with Iberdrola on this project.

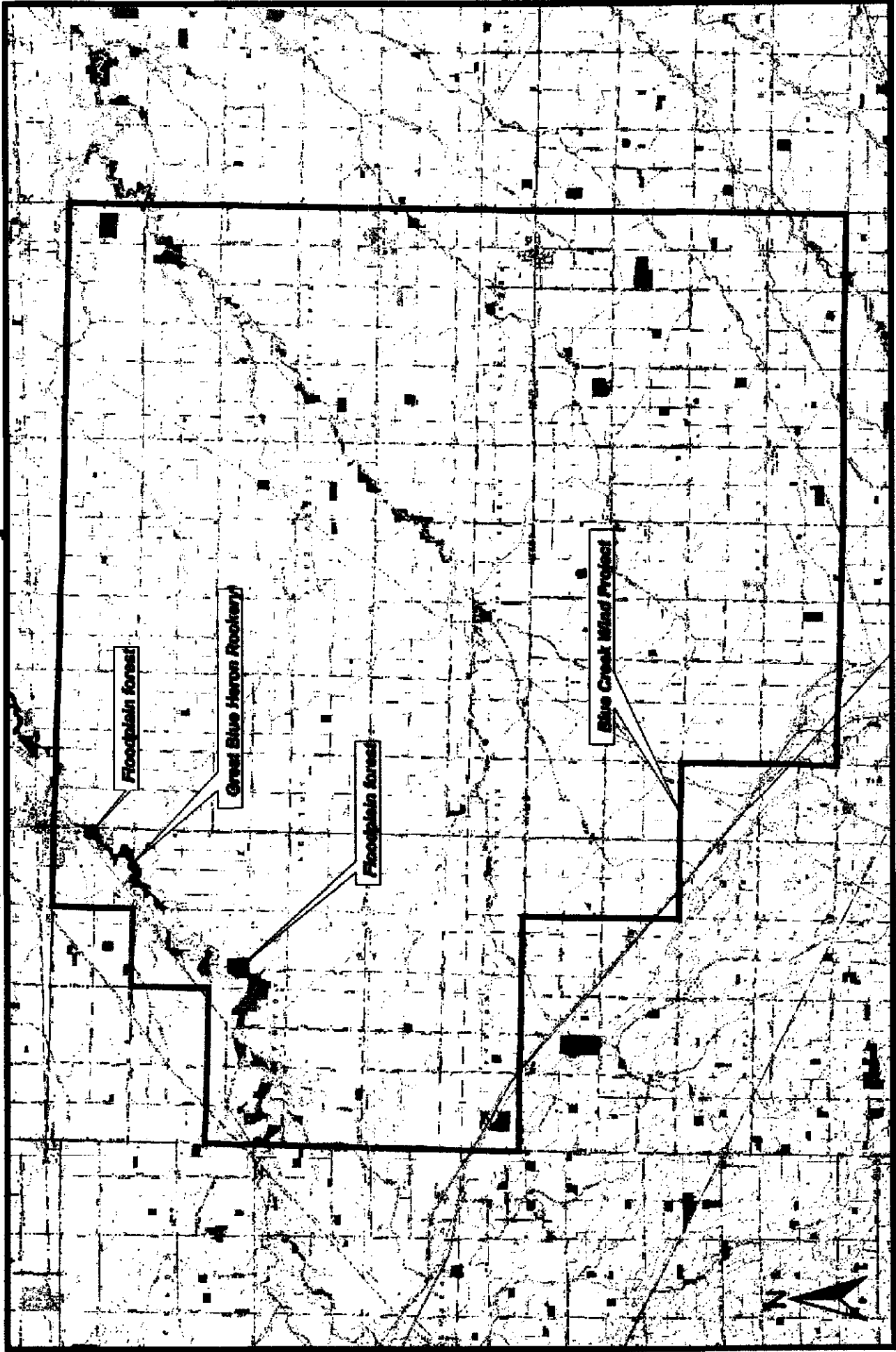
ODNR appreciates the opportunity to provide these comments. Please contact Keith Lott if you have questions about these survey protocols or need additional information.

Keith Lott, Wind Energy Wildlife Biologist

Old Woman Creek Nat'l Estuarine Research Reserve and State Nature Preserve
Ohio Division of Wildlife
2514 Cleveland Road East
Huron, OH 44839
Office: 419-433-4601
Mobile: 419-602-3141
Fax: 419-433-2851

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service

Blue Creek Wind Project



DNAP Natural Heritage Program

Data Services

Butch Quisenberry

January 20, 2007

1 0 1 2 Miles

Division of Natural Areas & Preserves
Steven D. Maurer, Chief
2045 Morse Road, F-1
Columbus, OH 43229-6693
Phone: (614) 265-6453 Fax: (614) 267-3096

January 20, 2009

Keith Lott
ODNR Division of Wildlife
2514 Cleveland Road East
Huron, OH 44839

Dear Mr. Lott:

After reviewing our Natural Heritage maps and files, I find the Division of Natural Areas and Preserves has no records of rare or endangered species near the ODNR Division of Wildlife Blue Creek Wind project. The site is located in Benton and Blue Creek Twps., Paulding Co., and Tully and Union Twps., Van Wert Co., Woodburn South, Payne, Latty, Dixon, Convoy, and Scott Quadrangles. However, the site is near a high quality Floodplain Forest. Best management practices should be employed to avoid impacting these areas. The site is also near a Great Blue Heron Rookery. Becky Jenkins of the Division of Wildlife should be contacted regarding possible impacts to rare animal species. She can be reached at (614) 265-6631.

There are no existing or proposed state nature preserves at the project site. We are also unaware of any unique ecological sites, geologic features, state parks, state forests, scenic rivers, or wildlife areas within the project area.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although we inventory all types of plant communities, we only maintain records on the highest quality areas.

Please contact me at (614) 265-6409 if I can be of further assistance.

Sincerely,

Butch Grieszmer, Data Specialist
Resource Services Group





IBERDROLA RENEWABLES

December 10, 2009

Lynn Army
Maumee Watershed Conservancy District
1464 Pinehurst Drive
Defiance, Ohio 43512

RE: Blue Creek Wind Farm Project

Dear Mr. Army:

Heartland Wind, LLC, a subsidiary of Iberdrola Renewables, (Heartland Wind) is submitting this letter in response to our discussions on November 19, 2009.

It is our understanding that the proposed project collector lines may cross ditches and streams that are under the jurisdiction of the Maumee Watershed Conservancy District (Maumee). In addition the project has requested the opportunity to use access routes adjacent to Maumee riparian areas. The following conditions are agreed to relative to the above activities:

- Underground collectors would be installed no less than 3 feet below the existing bottom of existing ditches and streams;
- All disturbed areas would be restored to pre-existing conditions;
- If access requires disturbance to Maumee constructed berms then all berms would be restored to pre-existing conditions.

We thank your offices for their continued open communication on this project and we look forward to moving forward with the review process. Please do not hesitate to contact me with any questions at 484-467-3345 or ddecaro@iberdrolausa.com.

Yours sincerely,

David R. De Caro
Senior Permit Manager

CC: Dan Litchfield, Heartland, LLC.



Blue Creek Wind Project - Special Hauling and Right-of-Way Permit Requirements

PREPARED FOR: Blue Creek Wind Project, Paulding and Van Wert Counties, Ohio

PREPARED BY: Jeromy Miceli, Iberdrola

DATE: December 16, 2009

Contacts made regarding special hauling and right-of-way permits with:

- Duane Bennett, ODOT Special Hauling Permits Section, (614) 351-2804
- Steve Reichenbach, ODOT District 1, Lima, (419) 222-9055
- Travis McGarvey, Paulding County Engineer, (419) 399-2366
- Kyle Wendel, Van Wert County Engineer, (419) 238-0210

ODOT Special Hauling and Right-of-Way Permits

This morning I spoke with Duane Bennett with ODOT's Special Hauling Permits Section. Based on their specifications, all of the tower sections and the nacelle will need a Special Hauling Permit based on their height, width and weight. In addition, the blades will need a Special Hauling Permit based on length. We can apply for "90 Day Continuing" permits, which will allow for unlimited deliveries of a specified component using a specified type of trailer for a 90 day period. Multiple permits will be required as the 90 day periods expire.

As the permitted loads move from ODOT jurisdictional roads to County and Township roads, the permitting responsibility shifts to those entities. We will need to identify a detailed permitting process in the Roads Agreements that we sign with the Counties and Townships, as opposed to individual permits for each component.

This morning I also spoke with Steve Reichenbach with ODOT's District 1 office in Lima, Ohio regarding permits for right of way use. He indicated that the uses we would require permits for (underground cable crossings, access road entrances, and intersection improvements, all within ODOT jurisdictional rights of way) are all handled using the same permit application. The permit application in these instances will be through the local ODOT District 1 office (Van Wert or Paulding Counties).

Paulding and Van Wert County Hauling and Right-of Way Permits

In meetings held on December 15th, 2009 in the offices of the Paulding County Engineer, Travis McGarvey, representatives from Paulding County, along with Blue Creek, Benton, and Latty Townships, indicated that they were amenable to the idea. As the permitted loads move to County and Township roads, the permitting responsibility shifts to those entities. We will need to identify a detailed permitting process in the Roads Agreements that we sign with the Counties and Townships, as opposed to individual permits for each component. In addition, the representatives of Paulding County, and Blue Creek, Benton,

and Latty Townships indicated that they would be willing to work towards a single Roads Agreement that would cover all roads under those entities' jurisdictions.

In meetings held on December 16th, 2009 in the offices of the Van Wert County Engineer, Kyle Wendel, he also seemed to agree with the approach of having a single Roads Agreement in lieu of individual agreements. The details of the agreements, including sections regarding permit coverage, will be negotiated over the coming months. Mr. Wendel indicated that he would be willing to enter into a single Roads Agreement with the Townships in Van Wert County (Union, Tully, and Hoaglin), however, representatives of those Townships have not yet been contacted regarding the matter.

Right of way use permits for County and Township roads are handled at those levels. In conversations with the Counties and Townships over the past two days, I detailed the typical uses we would need permits for. There was no indication that there would be any problem with granting permits for our uses.



PN: 1848.005

October 2009

**INTERIM SUMMARY
BAT ACOUSTIC MONITORING AT THE
PROPOSED BLUE CREEK WIND FARM,
PAULDING AND VAN WERT COUNTIES, OHIO**

**Prepared for:
Iberdrola Renewables, Inc.
201 King of Prussia Rd., Suite 500
Radnor, Pennsylvania 19087**

**Prepared by:
BHE Environmental, Inc.
11733 Chesterdale Rd.
Cincinnati, Ohio 45246-4131
Phone: 513.326.1500
www.bheenvironmental.com**

Notice: This report has been prepared by BHE Environmental, Inc., solely for the benefit of its client in accordance with an approved scope of work. BHE assumes no liability for the unauthorized use of this report or the information contained in it by a third party. Copyright © 2009 BHE Environmental, Inc.

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2.0 BATS OF OHIO	2
3.0 METHODS	3
4.0 RESULTS AND DISCUSSION	4
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TABLES

Table 1. Land cover types within the Iberdrola Blue Creek project planning area as defined by USGS land use/land cover data (<http://www.mrlc.gov/index.php>).

Table 2. Bats potentially present within the proposed Blue Creek Wind Farm project planning area during summer, winter, and spring/fall migration.

Table 3. Bat passes recorded per month at each height and frequency (<35 kHz or ≥35 kHz).

Table 4. Bat passes recorded per month by height and species group. Species groups include hoary bats (H), big brown/silver-haired bats (BB/SH), red/evening bats (R/E), Myotis (M), and eastern pipistrelles (P).

FIGURES

Figure 1. MET tower location within the proposed Blue Creek Wind Farm project planning area, Paulding and Van Wert counties, Ohio.

Figure 2. Bat hat design.

Figure 3. Total number of bat passes recorded per month.

Figure 4. Number of bat passes recorded at each frequency per month.

Figure 5. Number of bat passes by species group recorded per month. No eastern pipistrelles calls were recorded.

Figure 6. Bat activity recorded at the Blue Creek site relative to the typical bat life cycle.*

EXECUTIVE SUMMARY

Iberdrola Renewables, Inc. proposes to construct the 350-MW Blue Creek Wind Farm near Van Wert in Paulding and Van Wert counties, Ohio. Because bats have been impacted by wind farms, the Ohio Department of Natural Resources requires pre-construction acoustic surveys within the proposed project planning area to assess bat activity. BHE Environmental, Inc. was contracted to install two Anabat units to a meteorological (MET) tower in Van Wert County and assess bat activity based on calls recorded from March 15, 2009 through November 15, 2009. This preliminary report summarizes call sequences recorded from March 5 to August 19, 2009. During 274 detector-nights, 264 calls were recorded, most (78 percent) of which were big brown/silver-haired bats and most (72 percent) were recorded by a detector mounted at 3 meters (m) above the ground rather than by the detector mounted at 45 m above ground level. Other bat species groups recorded were hoary bats (14 percent), red/evening bats (6 percent), and *Myotis* (2 percent). Bat activity increased throughout the season, peaking in late July, a pattern which has been seen at other wind farms. BHE is continuing to monitor bat activity and will submit a report when data collection and analysis is complete.

1.0 INTRODUCTION

The proposed 350 MW Blue Creek Wind Farm Project is located north of the town of Van Wert in Van Wert County and south of Paulding in Paulding County, Ohio. Iberdrola Renewables, Inc. (IBR) has proposed to install 175 Gamesa G90 2.0 MW wind turbines with 100-m hub heights on the approximately 63,919 acre site. Over 95 percent of the project planning area is cropland (Table 1).

Because bats have been impacted by wind energy projects the Ohio Department of Natural Resources (ODNR) has requested preconstruction acoustic surveys to detect ultrasound used to assess bat activity in the project planning area.

The amount of measured bat activity varies from season to season with many bats migrating between summer roosts and winter hibernacula in the spring and fall. During summer, bats rear young and spend nights foraging for insects. In late summer, young bats become volant, joining the adults in foraging bouts. In the fall, migrating bats may travel several hundred kilometers to appropriate winter habitat. Bats return to their summer roosts the following spring. In addition to migration, mating activity occurs during fall (fall swarming). Bats found in Paulding and Van Wert counties, Ohio in the spring and fall may be summer residents or migrants.

BHE Environmental, Inc. was contracted to assess temporal and spatial patterns of bat activity in the proposed project planning area during spring, fall, and summer. BHE coordinated with the ODNR to prepare a study plan for the investigation; the ODNR subsequently approved the study plan.

2.0 BATS OF OHIO

Eleven species of bat inhabit Ohio (Table 2) and may be found in most forested, urban, or rural areas during the summer months. Except for the eastern small-footed bat (*Myotis leibii*), and Rafinesque's big eared bat (*Corynorhinus rafinesquii*), each of these species has potential to occur in the project planning area. The range of the eastern small-footed bat includes the state of Ohio; however, the American Society of Mammalogists lists the species as extirpated from the state (ASM 2009). The Rafinesque's big-eared bat is also rare in Ohio, known only from Adams County, in extreme south central Ohio (ASM 2009). These two species do not have potential to occur in the project planning area. The other nine species of bats in Ohio include year-round residents as well as species present only during certain seasons or during periods of migration. The Indiana bat (*Myotis sodalis*) is federally listed as endangered. The State of Ohio lists both the eastern small-footed bat and Rafinesque's big-eared bat as Species of Concern (Table 2).

Big brown bats (*Eptesicus fuscus*) and little brown bats (*Myotis lucifugus*) are both common, year-round residents that roost in trees, buildings, and other man-made structures during the summer, and winter in buildings, caves, or mines. Big brown bats move short distances between summer and winter habitat; Whitaker and Hamilton (1998) report local migrations of 48 kilometers (km; 30 miles [mi]) or less.

Tree bats, so called because they tend to roost in trees year round, include silver-haired bats (*Lasionycteris noctivivans*), eastern red bats (*Lasiurus borealis*), hoary bats (*Lasiurus cinereus*), and evening bats (*Nycticeius humeralis*). These four species are thought to migrate long distances (>100 km; 62 mi; Cryan 2003) between summer and winter habitat.

Summer ranges of all four species extend into Ohio, but winter sites are typically south of 40 degrees N latitude (Cryan and Veilleux 2007). Migration typically occurs during March-April and late July-October. Hoary bats have been observed traveling in large migratory flocks (Whitaker and Hamilton 1998).

Indiana bats, northern long-eared bats (*Myotis septentrionalis*), and eastern pipistrelles (*Perimyotis [Pipistrellus] subflavus*) roost in trees in forested areas during summer and migrate to caves and mines to hibernate during the winter. Neither northern long-eared bats nor eastern pipistrelles migrate more than about 48 to 64 km (30 to 40 mi) between summer and winter habitat (Whitaker and Hamilton 1998). However, Indiana bats can migrate up to 575 km (357 mi; Winhold and Kurta 2006).

Because the project planning area is mostly agricultural and open land with small patches of trees, the project planning area does not appear to possess unique or otherwise high quality summer or winter habitat for any of the nine species of bats potentially present.

3.0 METHODS

The Ohio Department of Natural Resources (ODNR) On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement (Protocol) was followed (Appendix A).

The Protocol states the following:

"At least 1 full season (15 March - 15 November) of acoustic monitoring should be conducted. This can be accomplished by attaching AnaBat (either SD1 or those equipped with CF ZCAIMS) units to all meteorological towers, with 1 unit positioned at 5 meters of the ground, and 1 unit within or as close as possible to the rotor swept area. In an effort to standardize results among study sites, the AnaBat's sensitivity should be adjusted to detect a calibration tone-3 at 20 meters. AnaBat units must monitor from 0.5 hour before sunset until 0.5 hour after sunrise. A "pass" will be defined as any file with ≥ 2 echolocation pulses. When possible, detections should be identified to species or species group (e.g., big brown/silver-haired) within AnaLook. Copies of original and identified detections should be provided to the ODNR Division of Wildlife. In an effort to assess both potential attractant issues, and to correlate the number of detections with bat mortalities, acoustic monitoring should continue through the conclusion of post-construction monitoring."

Two Anabat II ultrasound recorders and compact flash storage zero-crossings analysis interface modules (Anabat II with CF ZCAIM; Titley Electronics, Ballina NSW, Australia) were attached to one MET tower within the project planning area. The instruments will record ultrasonic calls generated by bats nightly from March 15, 2009 through November 15, 2009. Microphones enclosed in weather-resistant housings (bat hat, EME Systems, Berkley, California) were attached to towers at 3 and 45 m above the ground, and connected to Anabat units on the ground via cables. The lower height of 3 meters was deemed acceptable due to the low growing soy bean crop surrounding the MET tower. Sound reflector plates beneath the microphone housings were positioned 15 degrees below horizontal so that the main acceptance angle was directed upward at 45 degrees (Figure 2). The CF ZCAIM units were programmed to record nightly from approximately 30 min before civil sunset to 30 min

after civil sunrise. Monitoring at the 3-m height began March 5, 2009; monitoring at the 45-m height began March 21, 2009.

Recorded files were scanned with a filter developed by Eric Britzke for the Indiana Bat Survey Guidance for the Commonwealth of Kentucky to identify and eliminate noise. All files not eliminated by the filter were viewed. Each file containing two or more complete bat pulses was tallied as a bat pass. Bat call sequences were sorted into two groups based upon the minimum frequency of the call. Big brown bats, silver-haired bats, and hoary bats typically produce calls with a minimum frequency below 35 kHz, and are therefore identified as the low frequency species group. Red bats, evening bats, Indiana bats, little brown bats, northern long-eared bats, and eastern pipistrelles typically produce calls ≥ 35 kHz and are identified as the high frequency species group. Where recording quality allowed, bat call sequences were also identified to the following species or species groups: hoary bats, big brown/silver-haired bats, red/evening bats, *Myotis*, and eastern pipistrelles.

This interim report summarizes bat calls recorded between March 5 and August 19, 2009. Bat calls recorded throughout the entire 36-week period (March 5 to November 15, 2009) will be presented, analyzed, and discussed in a report prepared after data collection is completed in November 2009.

4.0 RESULTS AND DISCUSSION

Data were recorded during a total of 274 detector-nights between the evening of March 5 and the morning of August 19, 2009. The two Anabat units recorded a total of 264 bat passes (Table 3; Figure 3). Seventy-two percent of calls were recorded at the 3-meter height, while 28 percent of calls were recorded at the 45-meter height (Table 3). Results of similar studies (e.g., Arnett et al. 2006, Redell 2006) have also shown greater activity of bats at lower elevations.

Low frequency calls comprised 90 percent (238) of the passes, while high frequency calls comprised 10 percent (26; Table 3; Figure 4). Approximately 78 percent of bats recorded were big brown/silver-haired bats (198 passes), while 14 percent (35) were hoary bats, 6 percent (15) were red/evening bats, and 2 percent (5) were *Myotis* (Table 4; Figure 5). No eastern pipistrelles were recorded.

The total number of bat passes recorded was greatest in late July (Figure 6). Relatively high levels of activity in July may be associated with young-of-the year becoming volant, the onset of breeding, or an increase in foraging to build up fat reserves for migration and hibernation. For the purposes of this interim report data collected through August 19, 2009 is summarized. Therefore the decline in bat passes recorded in August is, at least in part, a function of data being collected for only part of the month. When data collection is completed, it will allow complete months to be compared throughout the sampling period.