

## **ATTACHMENT B**

### **STREAM FORMS**



# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3):** 20 **Stream 3, Class 1**

SITE NAME/LOCATION: South Ridge - Housley SITE NUMBER: 011-0146-2 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_

LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_

DATE: 3/24/2016 SCORER: PSR COMMENTS: Channel Shallow

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 40). 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"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>12</u>	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) [8 pts]		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Big Slabs, Boulder, Cobble, Bedrock: 12 (A) 6 (B) 18 A+B

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** \_\_\_\_\_ **TOTAL NUMBER OF SUBSTRATE TYPES:** 4

**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 (10 pts)

☐ > 10 - 22.5 cm (5 pts)

☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: \_\_\_\_\_ **MAXIMUM POOL DEPTH (centimeters):** 1

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

☐ > 4 meters (> 13') [20 pts]

☐ > 3.0 m - 4.0 m (> 9'7" - 13') [15 pts]

☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") [10 pts]

☐ < 1.0 m (< 3'3") [5 pts]

COMMENTS: \_\_\_\_\_ **AVERAGE BANKFULL WIDTH (meters):** 2.0

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

**RIPARIAN WIDTH** (Per Bank)

☒ Wide >10m

☐ Moderate 5-10m

☐ Narrow <5m

☐ None

**FLOODPLAIN QUALITY** (Most Predominant per Bank)

☒ Mature Forest, Wetland

☐ Immature Forest, Shrub or Old Field

☐ Residential, Park, New Field

☐ Fenced Pasture

**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 (intermittent)

☐ Dry channel, no water (ephemeral)

**SHRUGGITY** (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 (<5 m/mi)

☐ Flat to Moderate

☐ Moderate (>5 m/mi)

☐ Moderate to Severe

☒ Severe (>10 m/mi)

# 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: \_\_\_\_\_

☐ CWN Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

☐ EAH 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): 40

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)

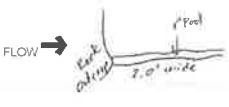
Fish Observed? (Y/N): \_\_\_\_\_ Voucher? (Y/N): \_\_\_\_\_ Salamanders Observed? (Y/N): \_\_\_\_\_ Voucher? (Y/N): \_\_\_\_\_

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 → 

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# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3):** 37 **Stream 4, Modified Class 2**

SITE NAME/LOCATION: South Ridge - Housley SITE NUMBER: 011-0146-7 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_

LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_

DATE: 3/24/2016 SCORER: PSR 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 40). 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"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>4</u>	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) [8 pts]		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Big Slabs, Boulder, Cobble, Bedrock: 40 (A) 11 (B) 51 A+B

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** \_\_\_\_\_ **TOTAL NUMBER OF SUBSTRATE TYPES:** 6

**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 (10 pts)

☐ > 10 - 22.5 cm (5 pts)

☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: \_\_\_\_\_ **MAXIMUM POOL DEPTH (centimeters):** 1

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

☐ > 4 meters (> 13') [20 pts]

☐ > 3.0 m - 4.0 m (> 9'7" - 13') [15 pts]

☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") [10 pts]

☐ < 1.0 m (< 3'3") [5 pts]

COMMENTS: \_\_\_\_\_ **AVERAGE BANKFULL WIDTH (meters):** 2.5

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

**RIPARIAN WIDTH** (Per Bank)

☒ Wide >10m

☐ Moderate 5-10m

☐ Narrow <5m

☐ None

**FLOODPLAIN QUALITY** (Most Predominant per Bank)

☒ Mature Forest, Wetland

☐ Immature Forest, Shrub or Old Field

☐ Residential, Park, New Field

☐ Fenced Pasture

**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 (intermittent)

☐ Dry channel, no water (ephemeral)

**SHRUGGITY** (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 (<5 m/mi)

☐ Flat to Moderate

☐ Moderate (>5 m/mi)

☐ Moderate to Severe

☒ Severe (>10 m/mi)

# 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: \_\_\_\_\_

☐ CWN Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

☐ EAH 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): 70

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 → 

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**OhioEPA Primary Headwater Habitat Evaluation Form**  
**HHEI Score (sum of metrics 1, 2, 3):** 19

**Stream 5, Modified Class 1**

SITE NAME/LOCATION: Good Hope - Harris  
 SITE NUMBER: HH-312/16-1 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/22/16 SCORER: PSR COMMENTS: Ephemeral stream

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 top predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS [16 pts]		<input type="checkbox"/> SILT [3 pt]	<u>12</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>6</u>
<input type="checkbox"/> BEDROCK [16 pt]		<input type="checkbox"/> FINE DETRITUS [3 pts]	<u>5</u>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN [0 pt]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]		<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [5 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: 12 (A) 6 (B) 18  
**SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES:** \_\_\_\_\_ **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

**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] ☐ > 5 cm - 10 cm [15 pts] ☐ < 5 cm [5 pts] ☐ NO WATER OR MOST CHANNEL [0 pts]  
 COMMENTS: \_\_\_\_\_ **MAXIMUM POOL DEPTH (centimeters):** 1

**3. BANK FULL WIDTH** (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (> 13') [20 pts] ☐ > 1.0 m - 1.5 m (> 3' - 4' 8") [15 pts] ☐ < 1.0 m (< 3' 3") [5 pts]  
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]  
 COMMENTS: \_\_\_\_\_ **AVERAGE BANKFULL WIDTH (meters):** 1.5

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input type="checkbox"/> (Per Bank)	<input type="checkbox"/> (Per Bank)	<input type="checkbox"/> (Most Predominant per Bank)	<input type="checkbox"/> (Most Predominant per Bank)
<input type="checkbox"/> Wide >10m	<input type="checkbox"/> Wide >10m	<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Immature Forest, Shrub or Old Field	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/> Narrow <5m	<input type="checkbox"/> Narrow <5m	<input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/> None	<input type="checkbox"/> None	<input type="checkbox"/> Fenced Pasture	<input type="checkbox"/> Fenced Pasture

COMMENTS: \_\_\_\_\_

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing  
☐ Subsurface flow with isolated pools (intermittent)  
☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)  
 COMMENTS: \_\_\_\_\_

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ > 3.0

**STREAM GRADIENT ESTIMATE**  
☐ Flat (< 1:100 ft) ☐ Flat to Moderate ☐ Moderate (> 1:100 ft) ☐ Moderate to Severe ☒ Severe (> 10 ft/100 ft)

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June 20, 2002 Revision

**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): \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
 CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
 BWH 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): N Date of last precipitation: 3/24/2016 Quantity: \_\_\_\_\_  
 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: \_\_\_\_\_

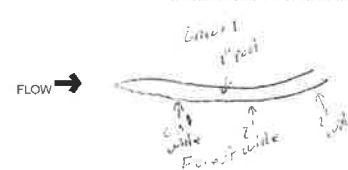
Stream 5, Modified Class 1

**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 Toads 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



June 20, 2002 Revision

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**OhioEPA Primary Headwater Habitat Evaluation Form**  
**HHEI Score (sum of metrics 1, 2, 3):** 53

**Stream 6, Class 2**

SITE NAME/LOCATION: Good Hope - Harris  
 SITE NUMBER: HH-312/16-2 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/22/2016 SCORER: PSR 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 top predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS [16 pts]		<input type="checkbox"/> SILT [3 pt]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>12</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input checked="" type="checkbox"/> BEDROCK [16 pt]	<u>40</u>	<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>12</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>5</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [5 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: 40 (A) 12 (B) 52  
**SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES:** \_\_\_\_\_ **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

**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] ☐ > 5 cm - 10 cm [15 pts] ☐ < 5 cm [5 pts] ☐ NO WATER OR MOST CHANNEL [0 pts]  
 COMMENTS: \_\_\_\_\_ **MAXIMUM POOL DEPTH (centimeters):** 2

**3. BANK FULL WIDTH** (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (> 13') [20 pts] ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ☐ < 1.0 m (< 3' 3") [5 pts]  
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]  
 COMMENTS: \_\_\_\_\_ **AVERAGE BANKFULL WIDTH (meters):** 1.5

This information must also be completed

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

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

COMMENTS: \_\_\_\_\_

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing  
☐ Subsurface flow with isolated pools (intermittent)  
☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)  
 COMMENTS: \_\_\_\_\_

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ > 3.0

**STREAM GRADIENT ESTIMATE**  
☐ Flat (< 1:100 ft) ☐ Flat to Moderate ☐ Moderate (> 1:100 ft) ☐ Moderate to Severe ☒ Severe (> 10 ft/100 ft)

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June 20, 2002 Revision

**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): \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
 CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
 BWH 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): N Date of last precipitation: 3/24/2016 Quantity: \_\_\_\_\_  
 Photograph Information: \_\_\_\_\_  
 Elevated Turbidity? (Y/N): Y Canopy (% open): 15  
 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: \_\_\_\_\_

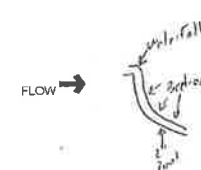
Stream 6, Class 2

**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 Toads 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



June 20, 2002 Revision

PHWH Form Page - 2

# OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **66**

Stream 7,  
Modified  
Class 2

SITE NAME/LOCATION: Good Hope - Revere  
 SITE NUMBER: HH-0101-3 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/28/2016 SCORER: PSR COMMENTS: Pre-run stream  
 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 40). 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 checked="" type="checkbox"/> BLDG SLABS [16 pts]	_____	<input type="checkbox"/> SILT [3 pts]	_____
<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 type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [8 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 Box Slabs, Boulder, Cobble, Bedrock: **6** (A) **15** (B) **21**  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: \_\_\_\_\_ TOTAL NUMBER OF SUBSTRATE TYPES: \_\_\_\_\_  
**2. MAXIMUM POOL DEPTH** (Measure the maximum pool depth within the 81 meter (260 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] ☐ 5 cm - 10 cm [15 pts] ☐ 5 cm [5 pts] ☐ NO WATER OR MOIST CHANNEL [0 pts]  
 COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): **7**  
**3. BANK FULL WIDTH** (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (> 131 [30 pts]) ☐ > 1.0 m - 1.5 m (> 3'3" - 4'8") [15 pts] ☐ > 3.0 m - 4.0 m (> 9'7" - 13') [10 pts] ☐ < 1.0 m (< 3'3") [5 pts]  
☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") [10 pts] ☐ < 1.5 m (< 4'8") [5 pts]  
 COMMENTS: \_\_\_\_\_ AVERAGE BANK FULL WIDTH (meters): **2.0**

This information must also be completed  
**RIPARIAN ZONE AND FLOODPLAIN QUALITY** (NOTE: River Left (L) and Right (R) as looking downstream)  
**RIPARIAN WIDTH** (Per Bank) **FLOODPLAIN QUALITY** (Most Predominant per Bank)  

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

 COMMENTS: \_\_\_\_\_  
**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing ☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (interstitial) ☐ Dry channel, no water (ephemeral)  
 COMMENTS: \_\_\_\_\_  
**SHRUBSITY** (Number of bands per 81 m (260 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3  
**STREAM GRADIENT ESTIMATE**  
☐ Flat (< 0.1%) ☐ Flat to Moderate ☐ Moderate (> 0.1%) ☐ Moderate to Severe ☐ Severe (> 1% to 4%)

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## 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: \_\_\_\_\_  
 BWH 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) **N** Date of last precipitation: 3/24/2016 Quantity: \_\_\_\_\_  
 Photograph Information: \_\_\_\_\_  
 Elevated Turbidity? (Y/N) **N** Canopy (% open): **75**  
 Were samples collected for water chemistry? (Y/N) **N** (Note lab sample no. or xi, 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 →  
 PHWH Form Page - 2

# OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **14**

Stream 8,  
Class 1

SITE NAME/LOCATION: Good Hope - Revere  
 SITE NUMBER: HH-0101-4 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/28/2016 SCORER: PSR COMMENTS: Pre-run stream  
 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 40). 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 pts]	_____
<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 type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [8 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 Box Slabs, Boulder, Cobble, Bedrock: **0** (A) **6** (B) **3**  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: \_\_\_\_\_ TOTAL NUMBER OF SUBSTRATE TYPES: \_\_\_\_\_  
**2. MAXIMUM POOL DEPTH** (Measure the maximum pool depth within the 81 meter (260 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] ☐ 5 cm - 10 cm [15 pts] ☐ 5 cm [5 pts] ☐ NO WATER OR MOIST CHANNEL [0 pts]  
 COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): **0**  
**3. BANK FULL WIDTH** (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (> 131 [30 pts]) ☐ > 1.0 m - 1.5 m (> 3'3" - 4'8") [15 pts] ☐ > 3.0 m - 4.0 m (> 9'7" - 13') [10 pts] ☐ < 1.0 m (< 3'3") [5 pts]  
☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") [10 pts] ☐ < 1.5 m (< 4'8") [5 pts]  
 COMMENTS: \_\_\_\_\_ AVERAGE BANK FULL WIDTH (meters): **2.0**

This information must also be completed  
**RIPARIAN ZONE AND FLOODPLAIN QUALITY** (NOTE: River Left (L) and Right (R) as looking downstream)  
**RIPARIAN WIDTH** (Per Bank) **FLOODPLAIN QUALITY** (Most Predominant per Bank)  

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

 COMMENTS: \_\_\_\_\_  
**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing ☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (interstitial) ☐ Dry channel, no water (ephemeral)  
 COMMENTS: \_\_\_\_\_  
**SHRUBSITY** (Number of bands per 81 m (260 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3  
**STREAM GRADIENT ESTIMATE**  
☐ Flat (< 0.1%) ☐ Flat to Moderate ☐ Moderate (> 0.1%) ☐ Moderate to Severe ☐ Severe (> 1% to 4%)

PHWH Form Page - 1

## 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: \_\_\_\_\_  
 BWH 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) **N** Date of last precipitation: 3/24/2016 Quantity: \_\_\_\_\_  
 Photograph Information: \_\_\_\_\_  
 Elevated Turbidity? (Y/N) **N** Canopy (% open): **50**  
 Were samples collected for water chemistry? (Y/N) **N** (Note lab sample no. or xi, 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 →  
 PHWH Form Page - 2



Ohio EPA Primary Headwater Habitat Evaluation Form  
HHEI Score (sum of metrics 1, 2, 3): **39**  
Stream 11, Modified Class 2  
SITE NAME/LOCATION: Red Shale Creek  
SITE NUMBER: 001 RIVER BASIN: 001 DRAINAGE AREA (mi<sup>2</sup>): 0.1  
LENGTH OF STREAM REACH (ft): 100 LAT: 40.0 LONG: 82.0 RIVER CODE: 001 RIVER MILE: 0.1  
DATE: 3/12/06 SCORER: 032 COMMENTS: Stream 11  
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 40). 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"/> SILT (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BLDR SLASS (16 pts)		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pts)	
<input type="checkbox"/> BOULDER (>256 mm) (16 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)	
<input type="checkbox"/> BEDROCK (16 pts)		<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> COBBLE (63-256 mm) (12 pts)		<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)		<input type="checkbox"/> ARTIFICIAL (3 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)			

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A) 6 (B) 3  
SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: 6 TOTAL NUMBER OF SUBSTRATE TYPES: 3

2. Maximum Pool Depth (Measure the maximum pool depth within the 51 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 (30 pts)  
☐ > 22.5 - 30 cm (20 pts)  
☐ > 10 - 22.5 cm (15 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)  
COMMENTS: 7 MAXIMUM POOL DEPTH (centimeters): 7  
Pool Depth: 7

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 (> 4'8" - 9'7") (20 pts)  
COMMENTS: 2.1 AVERAGE BANKFULL WIDTH (meters): 2.1  
Bankfull Width: 2.1

RIPIARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)  
RIPIARIAN WIDTH (Per Bank): ☐ Wide >10m ☐ Moderate 5-10m ☐ Narrow <5m ☐ None  
FLOODPLAIN QUALITY (Most Predominant per Bank):  
L: ☐ Mature Forest, Wetland ☐ Immature Forest, Shrub or Old Field ☐ Residential, Park, New Field ☐ Fenced Pasture  
R: ☐ Conservation Tillage ☐ Urban or Industrial ☐ Open Pasture, Row Crop ☐ Mining or Construction  
COMMENTS: None  
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing ☐ Subsurface flow with isolated pools (intermittent) ☐ Moist Channel, isolated pools, no flow (intermittent) ☐ Dry channel, no water (ephemeral)  
COMMENTS: None  
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 to Moderate ☐ Moderate to Severe ☐ Severe  
PHWH Form Page - 1

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed)  
QHEI PERFORMED? ☐ Yes ☒ No QHEI Score: 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: Township / City  
MISCELLANEOUS  
Base Flow Conditions? (Y/N) N Date of last precipitation: 3/12/06 Quantity: 0  
Photograph Information: 0  
Elevated Turbidity? (Y/N) N Canopy (% open): 0  
Wet samples collected for water chemistry? (Y/N) N (Note lab sample no. or id and attach results) Lab Number: 0  
Field Measures: Temp (°C) 0 Dissolved Oxygen (mg/l) 0 pH (5 U) 0 Conductivity (µmhos/cm) 0  
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: 0  
Additional comments/description of pollution impacts: 0  
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) 0 Voucher? (Y/N) 0 Salamanders Observed? (Y/N) 0 Voucher? (Y/N) 0  
Frogs or Tadpoles Observed? (Y/N) 0 Voucher? (Y/N) 0 Aquatic Macroinvertebrates Observed? (Y/N) 0 Voucher? (Y/N) 0  
Comments Regarding Biology: 0  
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 →  
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  
PHWH Form Page - 2

Report Name: Stream 12 Modified Class II

Report Name: Stream 12 Modified Class II

Ohio EPA Primary Headwater Habitat Evaluation Form  
HHEI Score (sum of metrics 1, 2, 3): **61**  
SITE NAME/LOCATION: Rocky Creek  
HH-MDT-033016-09 SITE NUMBER: 001 RIVER BASIN: 001 DRAINAGE AREA (mi<sup>2</sup>): 0.1  
LENGTH OF STREAM REACH (ft): 100 LAT: 40.0 LONG: 82.0 RIVER CODE: 001 RIVER MILE: 0.1  
DATE: 3/12/06 SCORER: 032 COMMENTS: Stream 12  
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: Repaired/Trans. Row

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> SILT (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BLDR SLASS (16 pts)		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pts)	
<input type="checkbox"/> BOULDER (>256 mm) (16 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)	
<input type="checkbox"/> BEDROCK (16 pts)		<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> COBBLE (63-256 mm) (12 pts)		<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)		<input type="checkbox"/> ARTIFICIAL (3 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)			

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 15 (A) 15 (B) 6  
SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 6

2. Maximum Pool Depth (Measure the maximum pool depth within the 51 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 (30 pts)  
☐ > 22.5 - 30 cm (20 pts)  
☐ > 10 - 22.5 cm (15 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)  
COMMENTS: 2.5 MAXIMUM POOL DEPTH (centimeters): 2.5  
Pool Depth: 2.5

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 (> 4'8" - 9'7") (20 pts)  
COMMENTS: 3.5 AVERAGE BANKFULL WIDTH (meters): 3.5  
Bankfull Width: 3.5

RIPIARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)  
RIPIARIAN WIDTH (Per Bank): ☐ Wide >10m ☐ Moderate 5-10m ☐ Narrow <5m ☐ None  
FLOODPLAIN QUALITY (Most Predominant per Bank):  
L: ☐ Mature Forest, Wetland ☐ Immature Forest, Shrub or Old Field ☐ Residential, Park, New Field ☐ Fenced Pasture  
R: ☐ Conservation Tillage ☐ Urban or Industrial ☐ Open Pasture, Row Crop ☐ Mining or Construction  
COMMENTS: None  
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing ☐ Subsurface flow with isolated pools (intermittent) ☐ Moist Channel, isolated pools, no flow (intermittent) ☐ Dry channel, no water (ephemeral)  
COMMENTS: None  
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 to Moderate ☐ Moderate to Severe ☐ Severe  
PHWH Form Page - 1

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed)  
QHEI PERFORMED? ☐ Yes ☒ No QHEI Score: 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: Township / City  
MISCELLANEOUS  
Base Flow Conditions? (Y/N) N Date of last precipitation: 3/12/06 Quantity: 0  
Photograph Information: 0  
Elevated Turbidity? (Y/N) N Canopy (% open): 0  
Wet samples collected for water chemistry? (Y/N) N (Note lab sample no. or id and attach results) Lab Number: 0  
Field Measures: Temp (°C) 0 Dissolved Oxygen (mg/l) 0 pH (5 U) 0 Conductivity (µmhos/cm) 0  
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: 0  
Additional comments/description of pollution impacts: 0  
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) 0 Voucher? (Y/N) 0 Salamanders Observed? (Y/N) 0 Voucher? (Y/N) 0  
Frogs or Tadpoles Observed? (Y/N) 0 Voucher? (Y/N) 0 Aquatic Macroinvertebrates Observed? (Y/N) 0 Voucher? (Y/N) 0  
Comments Regarding Biology: 0  
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 →  
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  
PHWH Form Page - 2



## Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 49

SITE NAME/LOCATION: 11-1011 3/10/16 SITE NUMBER: 08 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 10/16/16 SCORER: HU, B.C. COMMENTS: suburban

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: some disturbance for pipeline

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 6). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN [3 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>30</u>	<input type="checkbox"/> MUCK [3 pts]	
<input type="checkbox"/> SAND (<2 mm) [8 pts]	<u>30</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock, Gravel, Sand = 10 (A) 15 (B) 4 (C) 19 (D) 19 (E) 19 (F) 19 (G) 19 (H) 19 (I) 19 (J) 19 (K) 19 (L) 19 (M) 19 (N) 19 (O) 19 (P) 19 (Q) 19 (R) 19 (S) 19 (T) 19 (U) 19 (V) 19 (W) 19 (X) 19 (Y) 19 (Z) 19 (AA) 19 (AB) 19 (AC) 19 (AD) 19 (AE) 19 (AF) 19 (AG) 19 (AH) 19 (AI) 19 (AJ) 19 (AK) 19 (AL) 19 (AM) 19 (AN) 19 (AO) 19 (AP) 19 (AQ) 19 (AR) 19 (AS) 19 (AT) 19 (AU) 19 (AV) 19 (AW) 19 (AX) 19 (AY) 19 (AZ) 19 (BA) 19 (BB) 19 (BC) 19 (BD) 19 (BE) 19 (BF) 19 (BG) 19 (BH) 19 (BI) 19 (BJ) 19 (BK) 19 (BL) 19 (BM) 19 (BN) 19 (BO) 19 (BP) 19 (BQ) 19 (BR) 19 (BS) 19 (BT) 19 (BU) 19 (BV) 19 (BW) 19 (BX) 19 (BY) 19 (BZ) 19 (CA) 19 (CB) 19 (CC) 19 (CD) 19 (CE) 19 (CF) 19 (CG) 19 (CH) 19 (CI) 19 (CJ) 19 (CK) 19 (CL) 19 (CM) 19 (CN) 19 (CO) 19 (CP) 19 (CQ) 19 (CR) 19 (CS) 19 (CT) 19 (CU) 19 (CV) 19 (CW) 19 (CX) 19 (CY) 19 (CZ) 19 (DA) 19 (DB) 19 (DC) 19 (DD) 19 (DE) 19 (DF) 19 (DG) 19 (DH) 19 (DI) 19 (DJ) 19 (DK) 19 (DL) 19 (DM) 19 (DN) 19 (DO) 19 (DP) 19 (DQ) 19 (DR) 19 (DS) 19 (DT) 19 (DU) 19 (DV) 19 (DW) 19 (DX) 19 (DY) 19 (DZ) 19 (EA) 19 (EB) 19 (EC) 19 (ED) 19 (EE) 19 (EF) 19 (EG) 19 (EH) 19 (EI) 19 (EJ) 19 (EK) 19 (EL) 19 (EM) 19 (EN) 19 (EO) 19 (EP) 19 (EQ) 19 (ER) 19 (ES) 19 (ET) 19 (EU) 19 (EV) 19 (EW) 19 (EX) 19 (EY) 19 (EZ) 19 (FA) 19 (FB) 19 (FC) 19 (FD) 19 (FE) 19 (FF) 19 (FG) 19 (FH) 19 (FI) 19 (FJ) 19 (FK) 19 (FL) 19 (FM) 19 (FN) 19 (FO) 19 (FP) 19 (FQ) 19 (FR) 19 (FS) 19 (FT) 19 (FU) 19 (FV) 19 (FW) 19 (FX) 19 (FY) 19 (FZ) 19 (GA) 19 (GB) 19 (GC) 19 (GD) 19 (GE) 19 (GF) 19 (GG) 19 (GH) 19 (GI) 19 (GJ) 19 (GK) 19 (GL) 19 (GM) 19 (GN) 19 (GO) 19 (GP) 19 (GQ) 19 (GR) 19 (GS) 19 (GT) 19 (GU) 19 (GV) 19 (GW) 19 (GX) 19 (GY) 19 (GZ) 19 (HA) 19 (HB) 19 (HC) 19 (HD) 19 (HE) 19 (HF) 19 (HG) 19 (HH) 19 (HI) 19 (HJ) 19 (HK) 19 (HL) 19 (HM) 19 (HN) 19 (HO) 19 (HP) 19 (HQ) 19 (HR) 19 (HS) 19 (HT) 19 (HU) 19 (HV) 19 (HW) 19 (HX) 19 (HY) 19 (HZ) 19 (IA) 19 (IB) 19 (IC) 19 (ID) 19 (IE) 19 (IF) 19 (IG) 19 (IH) 19 (II) 19 (IJ) 19 (IK) 19 (IL) 19 (IM) 19 (IN) 19 (IO) 19 (IP) 19 (IQ) 19 (IR) 19 (IS) 19 (IT) 19 (IU) 19 (IV) 19 (IW) 19 (IX) 19 (IY) 19 (IZ) 19 (JA) 19 (JB) 19 (JC) 19 (JD) 19 (JE) 19 (JF) 19 (JG) 19 (JH) 19 (JI) 19 (JJ) 19 (JK) 19 (JL) 19 (JM) 19 (JN) 19 (JO) 19 (JP) 19 (JQ) 19 (JR) 19 (JS) 19 (JT) 19 (JU) 19 (JV) 19 (JW) 19 (JX) 19 (JY) 19 (JZ) 19 (KA) 19 (KB) 19 (KC) 19 (KD) 19 (KE) 19 (KF) 19 (KG) 19 (KH) 19 (KI) 19 (KJ) 19 (KL) 19 (KM) 19 (KN) 19 (KO) 19 (KP) 19 (KQ) 19 (KR) 19 (KS) 19 (KT) 19 (KU) 19 (KV) 19 (KW) 19 (KX) 19 (KY) 19 (KZ) 19 (LA) 19 (LB) 19 (LC) 19 (LD) 19 (LE) 19 (LF) 19 (LG) 19 (LH) 19 (LI) 19 (LJ) 19 (LK) 19 (LL) 19 (LM) 19 (LN) 19 (LO) 19 (LP) 19 (LQ) 19 (LR) 19 (LS) 19 (LT) 19 (LU) 19 (LV) 19 (LW) 19 (LX) 19 (LY) 19 (LZ) 19 (MA) 19 (MB) 19 (MC) 19 (MD) 19 (ME) 19 (MF) 19 (MG) 19 (MH) 19 (MI) 19 (MJ) 19 (MK) 19 (ML) 19 (MN) 19 (MO) 19 (MP) 19 (MQ) 19 (MR) 19 (MS) 19 (MT) 19 (MU) 19 (MV) 19 (MW) 19 (MX) 19 (MY) 19 (MZ) 19 (NA) 19 (NB) 19 (NC) 19 (ND) 19 (NE) 19 (NF) 19 (NG) 19 (NH) 19 (NI) 19 (NJ) 19 (NK) 19 (NL) 19 (NM) 19 (NO) 19 (NP) 19 (NQ) 19 (NR) 19 (NS) 19 (NT) 19 (NU) 19 (NV) 19 (NW) 19 (NX) 19 (NY) 19 (NZ) 19 (OA) 19 (OB) 19 (OC) 19 (OD) 19 (OE) 19 (OF) 19 (OG) 19 (OH) 19 (OI) 19 (OJ) 19 (OK) 19 (OL) 19 (OM) 19 (ON) 19 (OO) 19 (OP) 19 (OQ) 19 (OR) 19 (OS) 19 (OT) 19 (OU) 19 (OV) 19 (OW) 19 (OX) 19 (OY) 19 (OZ) 19 (PA) 19 (PB) 19 (PC) 19 (PD) 19 (PE) 19 (PF) 19 (PG) 19 (PH) 19 (PI) 19 (PJ) 19 (PK) 19 (PL) 19 (PM) 19 (PN) 19 (PO) 19 (PP) 19 (PQ) 19 (PR) 19 (PS) 19 (PT) 19 (PU) 19 (PV) 19 (PW) 19 (PX) 19 (PY) 19 (PZ) 19 (QA) 19 (QB) 19 (QC) 19 (QD) 19 (QE) 19 (QF) 19 (QG) 19 (QH) 19 (QI) 19 (QJ) 19 (QK) 19 (QL) 19 (QM) 19 (QN) 19 (QO) 19 (QP) 19 (QQ) 19 (QR) 19 (QS) 19 (QT) 19 (QU) 19 (QV) 19 (QW) 19 (QX) 19 (QY) 19 (QZ) 19 (RA) 19 (RB) 19 (RC) 19 (RD) 19 (RE) 19 (RF) 19 (RG) 19 (RH) 19 (RI) 19 (RJ) 19 (RK) 19 (RL) 19 (RM) 19 (RN) 19 (RO) 19 (RP) 19 (RQ) 19 (RR) 19 (RS) 19 (RT) 19 (RU) 19 (RV) 19 (RW) 19 (RX) 19 (RY) 19 (RZ) 19 (SA) 19 (SB) 19 (SC) 19 (SD) 19 (SE) 19 (SF) 19 (SG) 19 (SH) 19 (SI) 19 (SJ) 19 (SK) 19 (SL) 19 (SM) 19 (SN) 19 (SO) 19 (SP) 19 (SQ) 19 (SR) 19 (SS) 19 (ST) 19 (SU) 19 (SV) 19 (SW) 19 (SX) 19 (SY) 19 (SZ) 19 (TA) 19 (TB) 19 (TC) 19 (TD) 19 (TE) 19 (TF) 19 (TG) 19 (TH) 19 (TI) 19 (TJ) 19 (TK) 19 (TL) 19 (TM) 19 (TN) 19 (TO) 19 (TP) 19 (TQ) 19 (TR) 19 (TS) 19 (TT) 19 (TU) 19 (TV) 19 (TW) 19 (TX) 19 (TY) 19 (TZ) 19 (UA) 19 (UB) 19 (UC) 19 (UD) 19 (UE) 19 (UF) 19 (UG) 19 (UH) 19 (UI) 19 (UJ) 19 (UK) 19 (UL) 19 (UM) 19 (UN) 19 (UO) 19 (UP) 19 (UQ) 19 (UR) 19 (US) 19 (UT) 19 (UU) 19 (UV) 19 (UW) 19 (UX) 19 (UY) 19 (UZ) 19 (VA) 19 (VB) 19 (VC) 19 (VD) 19 (VE) 19 (VF) 19 (VG) 19 (VH) 19 (VI) 19 (VJ) 19 (VK) 19 (VL) 19 (VM) 19 (VN) 19 (VO) 19 (VP) 19 (VQ) 19 (VR) 19 (VS) 19 (VT) 19 (VU) 19 (VV) 19 (VW) 19 (VX) 19 (VY) 19 (VZ) 19 (WA) 19 (WB) 19 (WC) 19 (WD) 19 (WE) 19 (WF) 19 (WG) 19 (WH) 19 (WI) 19 (WJ) 19 (WK) 19 (WL) 19 (WM) 19 (WN) 19 (WO) 19 (WP) 19 (WQ) 19 (WR) 19 (WS) 19 (WT) 19 (WU) 19 (WV) 19 (WW) 19 (WX) 19 (WY) 19 (WZ) 19 (XA) 19 (XB) 19 (XC) 19 (XD) 19 (XE) 19 (XF) 19 (XG) 19 (XH) 19 (XI) 19 (XJ) 19 (XK) 19 (XL) 19 (XM) 19 (XN) 19 (XO) 19 (XP) 19 (XQ) 19 (XR) 19 (XS) 19 (XT) 19 (XU) 19 (XV) 19 (XW) 19 (XX) 19 (XY) 19 (XZ) 19 (YA) 19 (YB) 19 (YC) 19 (YD) 19 (YE) 19 (YF) 19 (YG) 19 (YH) 19 (YI) 19 (YJ) 19 (YK) 19 (YL) 19 (YM) 19 (YN) 19 (YO) 19 (YP) 19 (YQ) 19 (YR) 19 (YS) 19 (YT) 19 (YU) 19 (YV) 19 (YW) 19 (YX) 19 (YY) 19 (YZ) 19 (ZA) 19 (ZB) 19 (ZC) 19 (ZD) 19 (ZE) 19 (ZF) 19 (ZG) 19 (ZH) 19 (ZI) 19 (ZJ) 19 (ZK) 19 (ZL) 19 (ZM) 19 (ZN) 19 (ZO) 19 (ZP) 19 (ZQ) 19 (ZR) 19 (ZS) 19 (ZT) 19 (ZU) 19 (ZV) 19 (ZW) 19 (ZX) 19 (ZY) 19 (ZZ)

2. Maximum Pool Depth (Measure the maximum pool depth within the 81 meter (260 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] ☐ > 5 cm (< 10 cm) [15 pts] ☐ NO WATER OR MOST CHANNEL [10 pts]

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

☐ > 4.0 meters (> 13') [20 pts] ☐ > 3.0 m - 4.0 m (> 9'7" - 13') [15 pts] ☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") [10 pts]

COMMENTS: suburban

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

RIPARIAN WIDTH: ☒ Wide > 10m ☐ Moderate 5-10m ☐ Narrow < 5m ☐ None

FLOODPLAIN QUALITY: ☒ Mature Forest, Wetland ☐ Urban or Industrial ☐ Open Pasture, Row Crop ☐ Mining or Construction

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

☒ Stream Flowing ☐ Subsurface flow with isolated pools (intermittent) ☐ Most Channel, isolated pools, no flow (intermittent) ☐ Dry channel, no water (ephemeral)

6. 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 ☐ > 3.0

7. STREAM GRADIENT ESTIMATE

☐ Flat (< 5%) ☐ Flat to Moderate ☒ Moderate (> 5%) ☐ Moderate to Severe ☐ Severe (> 10%)

PHWH Form Page - 1

## 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: Adams Township/City: \_\_\_\_\_

## MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 7/7/16 Quantity: 100 mm  
 Photograph Information: 2  
 Elevated Turbidity? (Y/N) N Canopy (% open) 20  
 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 (SU) \_\_\_\_\_ 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) \_\_\_\_\_ Salamanders Observed? (Y/N) N Voucher? (Y/N) \_\_\_\_\_  
 Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) Y 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



PHWH Form Page - 2

## Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 51

SITE NAME/LOCATION: 11-1011 3/10/16 SITE NUMBER: 07 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/20/16 SCORER: not/16 COMMENTS: suburban

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: Pipeline 10 ft

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 6). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5</u>	<input type="checkbox"/> CLAY or HARDPAN [3 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>20</u>	<input type="checkbox"/> MUCK [3 pts]	
<input type="checkbox"/> SAND (<2 mm) [8 pts]	<u>25</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock, Gravel, Sand = 25 (A) 15 (B) 6 (C) 21 (D) 21 (E) 21 (F) 21 (G) 21 (H) 21 (I) 21 (J) 21 (K) 21 (L) 21 (M) 21 (N) 21 (O) 21 (P) 21 (Q) 21 (R) 21 (S) 21 (T) 21 (U) 21 (V) 21 (W) 21 (X) 21 (Y) 21 (Z) 21 (AA) 21 (AB) 21 (AC) 21 (AD) 21 (AE) 21 (AF) 21 (AG) 21 (AH) 21 (AI) 21 (AJ) 21 (AK) 21 (AL) 21 (AM) 21 (AN) 21 (AO) 21 (AP) 21 (



## Ohio EPA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION: 100 ft. stream reach  
 SITE NUMBER: 06 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 10/10/16 SCORER: MDT, BCL COMMENTS: stream bank

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 ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: stream channel loses definition through riparian ROW

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) (12 pts)	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	<u>40</u>	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bld Slabs, Boulder, Cobble, Bedrock: 10 (A) 10 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 2

2. Maximum Pool Depth (Measure the maximum pool depth within the 51 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 (10 pts)	<input type="checkbox"/> < 5 cm (5 pts)
<input type="checkbox"/> > 10 - 22.5 cm (25 pts)	<input type="checkbox"/> NO WATER OR MOST CHANNEL (0 pts)

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): 3

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

<input type="checkbox"/> > 4.0 meters (> 13) (10 pts)	<input type="checkbox"/> > 1.0 m - 1.5 m (> 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 (> 4' 8" - 9' 7") (20 pts)	

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): 3

HHEI Metric Points  
Substrate Max = 40  
Pool Depth Max = 30  
Bankfull Width Max = 30

A + B

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

## 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: \_\_\_\_\_  
☐ BWH 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: DeWitt Township/City: \_\_\_\_\_

## MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 3/24/16 County: DeWitt  
 Photograph Information: \_\_\_\_\_  
 Elevation Turbidity? (Y/N): N Canopy (% open): 30  
 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 (3 U): \_\_\_\_\_ Conductivity (umhos/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): Y (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): Y Voucher? (Y/N): \_\_\_\_\_ Salamanders Observed? (Y/N): Y Voucher? (Y/N): \_\_\_\_\_  
 Frogs or Toads Observed? (Y/N): Y Voucher? (Y/N): \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N): Y Voucher? (Y/N): \_\_\_\_\_  
 Comments Regarding Bioty: \_\_\_\_\_

## 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



## Ohio EPA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION: 100 ft. stream reach  
 SITE NUMBER: 06 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 10/10/16 SCORER: MDT, BCL COMMENTS: stream bank

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 ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: \_\_\_\_\_

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) (12 pts)	<u>70</u>	<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	<u>20</u>	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bld Slabs, Boulder, Cobble, Bedrock: 20 (A) 20 (B) 4  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 2

2. Maximum Pool Depth (Measure the maximum pool depth within the 51 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 (10 pts)	<input type="checkbox"/> < 5 cm (5 pts)
<input type="checkbox"/> > 10 - 22.5 cm (25 pts)	<input type="checkbox"/> NO WATER OR MOST CHANNEL (0 pts)

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): 3

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

<input type="checkbox"/> > 4.0 meters (> 13) (10 pts)	<input type="checkbox"/> > 1.0 m - 1.5 m (> 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 (> 4' 8" - 9' 7") (20 pts)	

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): 3

HHEI Metric Points  
Substrate Max = 40  
Pool Depth Max = 30  
Bankfull Width Max = 30

A + B

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

Pool Depth

Max = 30

Bankfull Width

Max = 30

Total

Final

Score

Metric

Points

Substrate

Max = 40

## 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: \_\_\_\_\_  
☐ BWH 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: DeWitt Township/City: \_\_\_\_\_

## MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 3/24/16 County: DeWitt  
 Photograph Information: \_\_\_\_\_  
 Elevation Turbidity? (Y/N): N Canopy (% open): 5  
 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 (3 U): \_\_\_\_\_ Conductivity (umhos/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): Y (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): Y Voucher? (Y/N): \_\_\_\_\_ Salamanders Observed? (Y/N): Y Voucher? (Y/N): \_\_\_\_\_  
 Frogs or Toads Observed? (Y/N): Y Voucher? (Y/N): \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N): Y Voucher? (Y/N): \_\_\_\_\_  
 Comments Regarding Bioty: \_\_\_\_\_

## 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



## Ohio EPA Primary Headwater Habitat Evaluation Form

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

23

SITE NAME/LOCATION: 11000-11000-11000 SITE NUMBER: 04 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/20/16 SCORER: 11000-11000 COMMENTS: 11000-11000  
 NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions  
 STREAM CHANNEL: ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: 11000-11000

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY top predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	20	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	10	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bdr Slabs, Boulder, Cobble, Bedrock: (A) 9 (B) 1  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 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 line of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box):  
☐ > 30 centimeters (12 pts) ☐ > 5 cm - 10 cm (15 pts) ☒ < 5 cm (5 pts) ☐ NO WATER OR MOIST CHANNEL (0 pts)  
 COMMENTS: 11000-11000 MAXIMUM POOL DEPTH (centimeters): 1

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (12) (20 pts) ☐ > 1.0 m - 1.5 m (3' 3" - 4' 8") (15 pts) ☒ > 0.5 m - 1.0 m (4' 8" - 12') (10 pts) ☐ > 1.5 m - 3.0 m (4' 8" - 9' 7") (20 pts)  
 COMMENTS: 11000-11000 AVERAGE BANKFULL WIDTH (meters): 1

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input type="checkbox"/> Wide > 10m	<input type="checkbox"/> (Per Bank)	<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Conservation Tillage
<input checked="" type="checkbox"/> Moderate 5-10m	<input checked="" type="checkbox"/> (Most Predominant per Bank)	<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 type="checkbox"/> Mining or Construction
<input type="checkbox"/> None	<input type="checkbox"/> Fenced Pasture		

COMMENTS: 11000-11000

FLOW REGIME (All Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing  
☐ Subsurface flow with isolated pools (intermittent)  
☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)  
 COMMENTS: 11000-11000

BIOTICITY (Number of bands per 61 m (200 ft) of channel). (Check ONLY one box):  
☒ None  
☐ 0.5  
☐ 1.0  
☐ 1.5  
☐ 2.0  
☐ 2.5  
☐ 3.0  
☐ > 3.0

STREAM GRADIENT ESTIMATE  
☐ Flat to Slight (1:1000) ☒ Flat to Moderate ☐ Moderate to Stevere ☐ Stevere (1:1000)

PWH Form Page - 1

## 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 Quad sheet Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
 County: Madison Township / City: \_\_\_\_\_

MISCELLANEOUS  
 Base Flow Conditions? (Y/N) N Date of last precipitation: 3/20/16 Quantity: 11000-11000  
 Photograph information: 11000-11000  
 Elevated Turbidity? (Y/N) N Canopy (% open): 11000-11000  
 Were samples collected for water chemistry? (Y/N) N (Check box 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) N If not, please explain: \_\_\_\_\_  
 Additional comment(s) description of pollution impacts: 11000-11000

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: 11000-11000

## 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 → 11000-11000

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HH-MDT-033016-03

## Ohio EPA Primary Headwater Habitat Evaluation Form

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

34

SITE NAME/LOCATION: 11000-11000-11000 SITE NUMBER: 03 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/20/16 SCORER: 11000-11000 COMMENTS: 11000-11000  
 NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions  
 STREAM CHANNEL: ☐ NONE/NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: 11000-11000

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY top predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	15	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	10	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bdr Slabs, Boulder, Cobble, Bedrock: (A) 9 (B) 1  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 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 line of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box):  
☐ > 30 centimeters (12 pts) ☐ > 5 cm - 10 cm (15 pts) ☒ < 5 cm (5 pts) ☐ NO WATER OR MOIST CHANNEL (0 pts)  
 COMMENTS: 11000-11000 MAXIMUM POOL DEPTH (centimeters): 1

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (12) (20 pts) ☐ > 1.0 m - 1.5 m (3' 3" - 4' 8") (15 pts) ☒ > 0.5 m - 1.0 m (4' 8" - 12') (10 pts) ☐ > 1.5 m - 3.0 m (4' 8" - 9' 7") (20 pts)  
 COMMENTS: 11000-11000 AVERAGE BANKFULL WIDTH (meters): 1

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/> Wide > 10m	<input type="checkbox"/> (Per Bank)	<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Conservation Tillage
<input type="checkbox"/> Moderate 5-10m	<input checked="" type="checkbox"/> (Most Predominant per Bank)	<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 type="checkbox"/> Mining or Construction
<input type="checkbox"/> None	<input type="checkbox"/> Fenced Pasture		

COMMENTS: 11000-11000

FLOW REGIME (All Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing  
☐ Subsurface flow with isolated pools (intermittent)  
☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)  
 COMMENTS: 11000-11000

BIOTICITY (Number of bands per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None  
☒ 0.5  
☐ 1.0  
☐ 1.5  
☐ 2.0  
☐ 2.5  
☐ 3.0  
☐ > 3.0

STREAM GRADIENT ESTIMATE  
☐ Flat to Slight (1:1000) ☐ Flat to Moderate ☒ Moderate to Stevere ☐ Stevere (1:1000)

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## 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 Quad sheet Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
 County: \_\_\_\_\_ Township / City: \_\_\_\_\_

MISCELLANEOUS  
 Base Flow Conditions? (Y/N) N Date of last precipitation: 3/20/16 Quantity: 11000-11000  
 Photograph information: 11000-11000  
 Elevated Turbidity? (Y/N) N Canopy (% open): 11000-11000  
 Were samples collected for water chemistry? (Y/N) N (Check box 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) N If not, please explain: \_\_\_\_\_  
 Additional comment(s) description of pollution impacts: 11000-11000

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: 11000-11000

## 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 → 11000-11000

PWH Form Page - 2

# Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **30**

SITE NAME/LOCATION: Rocky Ridge - Pleasant  
 HH-MDT-033016-02 SITE NUMBER: 02 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 150 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/04/16 SCORER: MDT/MLR COMMENTS: Aggravated

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B)				HHEI Metric Points	
TYPE	PERCENT	TYPE	PERCENT	Substrate Max = 40	A + B
<input type="checkbox"/> BLR SLABS [16 pts]		<input 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 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]			
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>15</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]			
<input type="checkbox"/> GRAVEL (2-64 mm) [16 pts]	<u>25</u>	<input type="checkbox"/> MUCK [0 pts]			
<input type="checkbox"/> SAND (<2 mm) [8 pts]	<u>40</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]			
Total of Percentages of Bld Slabs, Boulder, Cobble, Bedrock				(A) <u>15</u>	(B) <u>5</u>
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:				TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u>	

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):				HHEI Metric Points	
<input type="checkbox"/> > 30 centimeters [20 pts]		<input type="checkbox"/> > 5 cm - 10 cm [15 pts]		Pool Depth Max = 30	A + B
<input type="checkbox"/> > 22.5 - 30 cm [10 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): <u>2.5</u>	

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):				HHEI Metric Points	
<input type="checkbox"/> > 4.0 meters (> 13') [10 pts]		<input type="checkbox"/> > 1.0 m - 1.5 m (> 3'3" - 4'8") [15 pts]		Bankfull Width Max=30	A + B
<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 (< 4'8" - 9'7") [20 pts]					
COMMENTS: _____				AVERAGE BANKFULL WIDTH (meters): <u>1.5</u>	

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/> Wide >10m	<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Conservation Tillage	
<input type="checkbox"/> Moderate 5-10m	<input checked="" 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 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)

☒ Stream Flowing

☐ Subsurface flow with isolated pools (intermittent)

☐ Moist Channel, isolated pools, no flow (intermittent)

☐ Dry channel, no water (ephemeral)

COMMENTS: \_\_\_\_\_

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

☐ None
 ☒ 1.0 | ☐ 2.0 | ☐ 3.0 || ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☐ >3 |

STREAM GRADIENT ESTIMATE

☐ Flat (< 0.5%)
 ☐ Flat to Moderate | ☐ Moderate to Severe | ☒ Severe (> 0.5%) |

PWH Form Page - 1

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

OHEI PERFORMED? ☐ Yes ☒ No OHEI Score \_\_\_\_\_ (If Yes, Attach Completed OHEI Form)

DOWNSIDE DESIGNATED USE(S): \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

WVH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

CVH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

EVH 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): N Date of last precipitation: 02/20/16 Quantity: 2

Photograph Information: 2 Photos, Upstream & Downstream

Elevated Turbidity? (Y/N): N Canopy (% open): 50

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 (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: N/A

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 sheet 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 →

PWH Form Page - 2

# Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **33**

SITE NAME/LOCATION: Rocky Ridge - Pleasant  
 HH-MDT-033016-01 SITE NUMBER: 01 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 150 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/04/16 SCORER: MDT/MLR COMMENTS: Aggravated

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B)				HHEI Metric Points	
TYPE	PERCENT	TYPE	PERCENT	Substrate Max = 40	A + B
<input type="checkbox"/> BLR SLABS [16 pts]		<input 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 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]			
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>30</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]			
<input type="checkbox"/> GRAVEL (2-64 mm) [16 pts]	<u>10</u>	<input type="checkbox"/> MUCK [0 pts]			
<input type="checkbox"/> SAND (<2 mm) [8 pts]	<u>25</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]			
Total of Percentages of Bld Slabs, Boulder, Cobble, Bedrock				(A) <u>18</u>	(B) <u>5</u>
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:				TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u>	

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):				HHEI Metric Points	
<input type="checkbox"/> > 30 centimeters [20 pts]		<input type="checkbox"/> > 5 cm - 10 cm [15 pts]		Pool Depth Max = 30	A + B
<input type="checkbox"/> > 22.5 - 30 cm [10 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): <u>1.5</u>	

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):				HHEI Metric Points	
<input type="checkbox"/> > 4.0 meters (> 13') [10 pts]		<input type="checkbox"/> > 1.0 m - 1.5 m (> 3'3" - 4'8") [15 pts]		Bankfull Width Max=30	A + B
<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 (< 4'8" - 9'7") [20 pts]					
COMMENTS: _____				AVERAGE BANKFULL WIDTH (meters): <u>1.5</u>	

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/> Wide >10m	<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Conservation Tillage	
<input type="checkbox"/> Moderate 5-10m	<input checked="" 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 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)

☒ Stream Flowing

☐ Subsurface flow with isolated pools (intermittent)

☐ Moist Channel, isolated pools, no flow (intermittent)

☐ Dry channel, no water (ephemeral)

COMMENTS: \_\_\_\_\_

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

☐ None
 ☒ 1.0 | ☐ 2.0 | ☐ 3.0 || ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☐ >3 |

STREAM GRADIENT ESTIMATE

☐ Flat (< 0.5%)
 ☐ Flat to Moderate | ☐ Moderate to Severe | ☒ Severe (> 0.5%) |

PWH Form Page - 1

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

OHEI PERFORMED? ☐ Yes ☒ No OHEI Score \_\_\_\_\_ (If Yes, Attach Completed OHEI Form)

DOWNSIDE DESIGNATED USE(S): \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

WVH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

CVH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

EVH 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): N Date of last precipitation: 03/01/16 Quantity: 2

Photograph Information: 2 Photos, Upstream & Downstream

Elevated Turbidity? (Y/N): N Canopy (% open): 60

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 (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: N/A

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 sheet 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 →

PWH Form Page - 2

# **OHNEPA** Primary Headwater Habitat Evaluation Form

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

15

SITE NAME/LOCATION: HH-MOT-32516-3 SITE NUMBER: 3 RIVER BASIN: HOUSTON DRAINAGE AREA (mi<sup>2</sup>): 1.0

LENGTH OF STREAM REACH (ft): 100 LAT: 40.00 LONG: 82.00 RIVER CODE: 1 RIVER MILE: 1.0

DATE: 3/25/16 SCORER: MDT/KMS COMMENTS: Converted

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: Converted

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input checked="" type="checkbox"/> BLDG SLABS [18 pts]		<input checked="" type="checkbox"/> SILT [3 pts]	
<input checked="" type="checkbox"/> BOULDER (>256 mm) [18 pts]		<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input checked="" type="checkbox"/> BEDROCK [18 pts]		<input checked="" type="checkbox"/> FINE DETRITUS [3 pts]	
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input checked="" type="checkbox"/> CLAY or HARDPAN [3 pts]	
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [8 pts]		<input checked="" type="checkbox"/> MUCK [3 pts]	
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]		<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: (A) 3

SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: (B) 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):

☒ > 35 centimeters [20 pts] ☐ > 5 cm - 10 cm [15 pts] ☐ > 2.5 - 30 cm [10 pts] ☐ < 5 cm [5 pts] ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: 2" MAXIMUM POOL DEPTH (centimeters): 2"

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

☒ > 4.0 meters (> 12) [20 pts] ☐ > 1.0 m - 1.5 m (> 3' - 4' 8") [15 pts] ☐ > 3.0 m - 4.0 m (> 9' - 12') [10 pts] ☐ < 1.0 m (< 3' 3") [5 pts]

COMMENTS: 25' AVERAGE BANK FULL WIDTH (meters): 25'

HHEI Metric Points

Substrate Max = 40

A + B

Pool Depth Max = 30

Bankfull Width Max = 20

S

This information must also be completed

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

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

## RIPARIAN WIDTH

(Per Bank)

Wide &gt; 10m

Moderate 5-10m

Narrow &lt; 5m

None

COMMENTS:

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

Stream Flowing

Subsurface flow with isolated pools (intermittent)

COMMENTS:

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

3.5

STREAM GRADIENT ESTIMATE

Flat (&lt; 5 ft/mi)

Flat to Moderate

Moderate to Steep

Severe (&gt; 10 ft/mi)

PHWH Form Page - 1

Date: 3/25/16

## 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)

WVH Name

CWN Name

EVH Name

Distance from Evaluated Stream

Distance from Evaluated Stream

Distance from Evaluated Stream

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

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

County: Township/City:

## MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 3/25/16 Quantity:Photograph Information: 2Elevated Turbidity? (Y/N) N Canopy (% open): 70%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 (SU) Conductivity (µmhos/cm)

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

Additional comments/Description of pollution impacts:

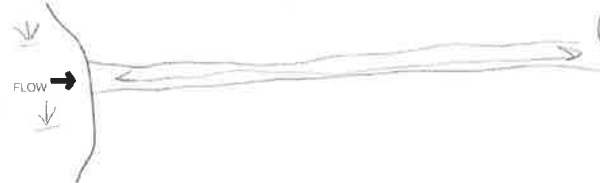
## BIOTIC EVALUATION

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) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) NFrogs 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



PHWH Form Page - 2

# **OHNEPA** Primary Headwater Habitat Evaluation Form

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

16

SITE NAME/LOCATION: HH-MOT-32516-2 SITE NUMBER: 2 RIVER BASIN: HOUSTON DRAINAGE AREA (mi<sup>2</sup>): 1.0

LENGTH OF STREAM REACH (ft): 100 LAT: 40.00 LONG: 82.00 RIVER CODE: 1 RIVER MILE: 1.0

DATE: 3/25/16 SCORER: MDT/KMS COMMENTS: Converted

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: Converted

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input checked="" type="checkbox"/> BLDG SLABS [18 pts]		<input checked="" type="checkbox"/> SILT [3 pts]	
<input checked="" type="checkbox"/> BOULDER (>256 mm) [18 pts]		<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input checked="" type="checkbox"/> BEDROCK [18 pts]		<input checked="" type="checkbox"/> FINE DETRITUS [3 pts]	
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input checked="" type="checkbox"/> CLAY or HARDPAN [3 pts]	
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [8 pts]		<input checked="" type="checkbox"/> MUCK [3 pts]	
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]		<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	

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

SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: (B) 3

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):

☒ > 35 centimeters [20 pts] ☐ > 5 cm - 10 cm [15 pts] ☐ > 2.5 - 30 cm [10 pts] ☐ < 5 cm [5 pts] ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: 2" MAXIMUM POOL DEPTH (centimeters): 2"

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

☒ > 4.0 meters (> 12) [20 pts] ☐ > 1.0 m - 1.5 m (> 3' - 4' 8") [15 pts] ☐ > 3.0 m - 4.0 m (> 9' - 12') [10 pts] ☐ < 1.0 m (< 3' 3") [5 pts]

COMMENTS: 25' AVERAGE BANK FULL WIDTH (meters): 25'

HHEI Metric Points

Substrate Max = 40

A + B

Pool Depth Max = 30

Bankfull Width Max = 20

S

This information must also be completed

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

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

## RIPARIAN WIDTH

(Per Bank)

Wide &gt; 10m

Moderate 5-10m

Narrow &lt; 5m

None

COMMENTS:

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

Stream Flowing

Subsurface flow with isolated pools (intermittent)

COMMENTS:

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

3.5

STREAM GRADIENT ESTIMATE

Flat (&lt; 5 ft/mi)

Flat to Moderate

Moderate to Steep

Severe (&gt; 10 ft/mi)

PHWH Form Page - 1

Date: 3/25/16

## 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)

WVH Name

CWN Name

EVH Name

Distance from Evaluated Stream

Distance from Evaluated Stream

Distance from Evaluated Stream

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

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

County: Township/City:

## MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 3/25/16 Quantity:Photograph Information: 2Elevated Turbidity? (Y/N) N Canopy (% open): 80%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 (SU) Conductivity (µmhos/cm)

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

Additional comments/Description of pollution impacts:

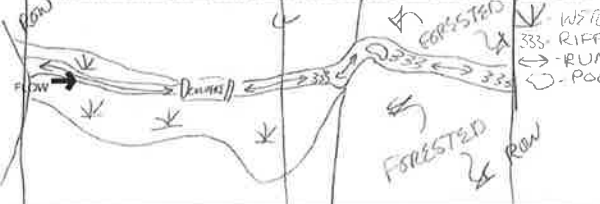
## BIOTIC EVALUATION

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) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) NFrogs 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



PHWH Form Page - 2

# **Ohio EPA** Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3): **32**

SITE NAME/LOCATION: HH-MDT-032516-01  
 HH-MDT-032516-01 SITE NUMBER: 01 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 3/26/16 SCORER: CMS, MDT COMMENTS: Final report  
 NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for instructions  
 STREAM CHANNEL: ☐ NONE/NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☒ RECENT OR NO RECOVERY  
 MODIFICATIONS: \_\_\_\_\_

SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B)		HHEI Metric Points	
TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (63-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	10	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (5 pts)	30	<input type="checkbox"/> ARTIFICIAL (3 pts)	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: <u>0</u>		Substrate Max = 40	
SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: (A) <u>9</u> (B) <u>3</u>		A + B = <u>12</u>	
<b>2. Maximum Pool Depth</b> (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 (30 pts) <input type="checkbox"/> > 22.5 - 30 cm (10 pts) <input type="checkbox"/> > 10 - 22.5 cm (5 pts) <input checked="" type="checkbox"/> NO WATER OR MOST CHANNEL (0 pts)			
<b>3. BANK FULL WIDTH</b> (Measured as the average of 3-4 measurements). (Check ONLY one box): <input type="checkbox"/> > 4.0 meters (> 13') (30 pts) <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' - 13') (25 pts) <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' - 9') (10 pts) <input checked="" type="checkbox"/> < 1.0 m (< 3' 3") (5 pts)			
<b>COMMENTS:</b> _____ <b>MAXIMUM POOL DEPTH (centimeters):</b> <u>4"</u> <b>Bankfull Width (meters):</b> <u>1.5'</u> <b>AVERAGE BANKFULL WIDTH (meters):</b> <u>1.5'</u>			

This information must also be completed

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

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
<input checked="" type="checkbox"/> L	Wide >10m	<input checked="" type="checkbox"/> L	Mature Forest, Wetland
<input type="checkbox"/> R	Moderate 5-10m	<input type="checkbox"/> R	Urban or Industrial
<input type="checkbox"/> L	Narrow <5m	<input type="checkbox"/> R	Open Pasture, Row Crop
<input type="checkbox"/> R	None	<input type="checkbox"/> R	Mining or Construction
<b>COMMENTS:</b> _____			
<b>FLOW REGIME</b> (At Time of Evaluation) (Check ONLY one box): <input checked="" type="checkbox"/> Stream Flowing <input type="checkbox"/> Subsurface flow with isolated pools (intermittent) <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) <input type="checkbox"/> Dry channel, no water (ephemeral)			
<b>COMMENTS:</b> _____			
<b>SINUOSITY</b> (Number of bends per 81 m (260 ft) of channel). (Check ONLY one box): <input type="checkbox"/> None <input type="checkbox"/> 0.5 <input type="checkbox"/> 1.0 <input type="checkbox"/> 1.5 <input type="checkbox"/> 2.0 <input type="checkbox"/> 2.5 <input type="checkbox"/> 3.0 <input type="checkbox"/> >3			
<b>STREAM GRADIENT ESTIMATE</b> <input type="checkbox"/> Flat (< 0.01%) <input checked="" type="checkbox"/> Flat to Moderate <input type="checkbox"/> Moderate to Steep <input type="checkbox"/> Steep (> 10%)			

PWH Form Page - 1

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

GHEI PERFORMED? ☐ Yes ☒ No GHEI Score: \_\_\_\_\_ (If Yes, Attach Completed GHEI Form)

**DOWNSTREAM DESIGNATED USES:**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ BWH 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: 3/24/16 Quantity: \_\_\_\_\_  
 Photograph Information: 2 Photos Upstream + Downstream  
 Elevated Turbidity? (Y/N): N Canopy (% open): 70%  
 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 (3 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 Toads 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

Flow direction indicated by an arrow pointing right.

PWH Form Page - 2

# **Ohio EPA** Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3): **23**

SITE NAME/LOCATION: 30 cent Upper + Mainstem  
 HH-MDT-032816-02 SITE NUMBER: 02 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 300 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/28/16 SCORER: MDT/MDT COMMENTS: 30 cent  
 NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for instructions  
 STREAM CHANNEL: ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: Pipeline Construction within Trans. ROW

SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B)		HHEI Metric Points	
TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (63-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	10	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (5 pts)	10	<input type="checkbox"/> ARTIFICIAL (3 pts)	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: <u>0</u>		Substrate Max = 40	
SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: (A) <u>9</u> (B) <u>4</u>		A + B = <u>13</u>	
<b>2. Maximum Pool Depth</b> (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 (30 pts) <input type="checkbox"/> > 22.5 - 30 cm (10 pts) <input type="checkbox"/> > 10 - 22.5 cm (5 pts) <input checked="" type="checkbox"/> NO WATER OR MOST CHANNEL (0 pts)			
<b>3. BANK FULL WIDTH</b> (Measured as the average of 3-4 measurements). (Check ONLY one box): <input type="checkbox"/> > 4.0 meters (> 13') (30 pts) <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' - 13') (25 pts) <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' - 9') (10 pts) <input checked="" type="checkbox"/> < 1.0 m (< 3' 3") (5 pts)			
<b>COMMENTS:</b> _____ <b>MAXIMUM POOL DEPTH (centimeters):</b> <u>1"</u> <b>Bankfull Width (meters):</b> <u>1.5'</u> <b>AVERAGE BANKFULL WIDTH (meters):</b> <u>1.5'</u>			

This information must also be completed

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

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
<input checked="" type="checkbox"/> L	Wide >10m	<input type="checkbox"/> L	Mature Forest, Wetland
<input type="checkbox"/> R	Moderate 5-10m	<input type="checkbox"/> R	Urban or Industrial
<input type="checkbox"/> L	Narrow <5m	<input type="checkbox"/> R	Open Pasture, Row Crop
<input type="checkbox"/> R	None	<input type="checkbox"/> R	Mining or Construction
<b>COMMENTS:</b> <u>Pipeline Construction within Trans. ROW</u>			
<b>FLOW REGIME</b> (At Time of Evaluation) (Check ONLY one box): <input checked="" type="checkbox"/> Stream Flowing <input type="checkbox"/> Subsurface flow with isolated pools (intermittent) <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) <input type="checkbox"/> Dry channel, no water (ephemeral)			
<b>COMMENTS:</b> _____			
<b>SINUOSITY</b> (Number of bends per 81 m (260 ft) of channel). (Check ONLY one box): <input type="checkbox"/> None <input type="checkbox"/> 0.5 <input type="checkbox"/> 1.0 <input type="checkbox"/> 1.5 <input type="checkbox"/> 2.0 <input type="checkbox"/> 2.5 <input type="checkbox"/> 3.0 <input type="checkbox"/> >3			
<b>STREAM GRADIENT ESTIMATE</b> <input type="checkbox"/> Flat (< 0.01%) <input type="checkbox"/> Flat to Moderate <input checked="" type="checkbox"/> Moderate to Steep <input type="checkbox"/> Steep (> 10%)			

PWH Form Page - 1

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

GHEI PERFORMED? ☐ Yes ☒ No GHEI Score: \_\_\_\_\_ (If Yes, Attach Completed GHEI Form)

**DOWNSTREAM DESIGNATED USES:**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ BWH 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): N Date of last precipitation: 03/24/16 (Early AM) Quantity: ?  
 Photograph Information: 2 Photos Upstream + Downstream  
 Elevated Turbidity? (Y/N): N Canopy (% open): 50  
 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 (3 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: NA

**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 Toads 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

Flow direction indicated by an arrow pointing right.

PWH Form Page - 2

**Ohio EPA Primary Headwater Habitat Evaluation Form**  
HHEI Score (sum of metrics 1, 2, 3): **23**

SITE NAME/LOCATION: Grand Ridge Run SITE NUMBER: 01 RIVER BASIN: 01 DRAINAGE AREA (mi<sup>2</sup>): 0.1  
LENGTH OF STREAM REACH (ft): 100 LAT: 40° 15' N LONG: 82° 15' W RIVER CODE: 01 RIVER MILE: 0.1  
DATE: 03/16/10 SCORER: W. B. B. COMMENTS: Stream  
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: Trans/Pipeline ROW construction

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>25 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 type="checkbox"/> COBBLE (65-250 mm) [12 pts]	<u>2</u>	<input type="checkbox"/> CLAY or HARDPAN [9 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>18</u>	<input type="checkbox"/> MUCK [9 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>40</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 2 (A) 4 (B) 4  
TOTAL NUMBER OF SUBSTRATE TYPES: 4

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 (16 pts)  
☐ < 5 cm (5 pts)  
☒ NO WATER OR MOST CHANNEL (0 pts)  
 COMMENTS: NO WATER 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' - 13' [25 pts])  
☒ 1.5 m - 3.0 m (> 4' - 9' [10 pts])  
 COMMENTS: Bank full AVERAGE BANKFULL WIDTH (meters): 1.5

PHWH Form Page - 1

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

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score: 0 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S):  
☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ BWH 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) N Date of last precipitation: 3/16/10 Quantity: ?  
 Photograph Information: 2 Photos, Upstream + Downstream  
 Elevated Turbidity? (Y/N) N Canopy (% open): 3.5%  
 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 (5.0-14): \_\_\_\_\_ Conductivity (µmhos/cm): \_\_\_\_\_  
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: N/A

BOTIC EVALUATION  
 Performed? (Y/N) Y (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) Y Voucher? (Y/N) Y Salamanders Observed? (Y/N) Y Voucher? (Y/N) Y  
 Frogs or Tadpoles Observed? (Y/N) Y Voucher? (Y/N) Y Aquatic Macroinvertebrates Observed? (Y/N) Y Voucher? (Y/N) Y  
 Comments Regarding Biology: \_\_\_\_\_

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

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location.  
Trans ROW edge Pipeline ROW edge  
ATV Trail  
  
 PHWH Form Page - 2

**Ohio EPA Primary Headwater Habitat Evaluation Form**  
HHEI Score (sum of metrics 1, 2, 3): **27**

SITE NAME/LOCATION: Grand Ridge Run SITE NUMBER: 02 RIVER BASIN: 01 DRAINAGE AREA (mi<sup>2</sup>): 0.1  
LENGTH OF STREAM REACH (ft): 100 LAT: 40° 15' N LONG: 82° 15' W RIVER CODE: 01 RIVER MILE: 0.1  
DATE: 03/16/10 SCORER: W. B. B. COMMENTS: Stream  
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: Trans/Pipeline ROW construction

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>25 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 type="checkbox"/> COBBLE (65-250 mm) [12 pts]	<u>5</u>	<input type="checkbox"/> CLAY or HARDPAN [9 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>25</u>	<input type="checkbox"/> MUCK [9 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>30</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 12 (B) 17  
TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 (16 pts)  
☐ < 5 cm (5 pts)  
☒ NO WATER OR MOST CHANNEL (0 pts)  
 COMMENTS: NO WATER 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' - 13' [25 pts])  
☒ 1.5 m - 3.0 m (> 4' - 9' [10 pts])  
 COMMENTS: Bank full AVERAGE BANKFULL WIDTH (meters): 1.5

PHWH Form Page - 1

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

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score: 0 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S):  
☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ BWH 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) N Date of last precipitation: 3/16/10 Quantity: ?  
 Photograph Information: 2 Photos, Upstream + Downstream  
 Elevated Turbidity? (Y/N) N Canopy (% open): 3.5%  
 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 (5.0-14): \_\_\_\_\_ Conductivity (µmhos/cm): \_\_\_\_\_  
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

BOTIC EVALUATION  
 Performed? (Y/N) Y (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) Y Voucher? (Y/N) Y Salamanders Observed? (Y/N) Y Voucher? (Y/N) Y  
 Frogs or Tadpoles Observed? (Y/N) Y Voucher? (Y/N) Y Aquatic Macroinvertebrates Observed? (Y/N) Y Voucher? (Y/N) Y  
 Comments Regarding Biology: \_\_\_\_\_

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

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location.  
Trans ROW edge Pipeline ROW edge  
ATV Trail  
  
 PHWH Form Page - 2



# **Ohio EPA** Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **24**

SITE NAME/LOCATION: 22nd Street - Road Right  
 HHEI SITE NUMBER: 017 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 08/16/16 SCORER: MB/B COMMENTS: epheral

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

STREAM CHANNEL ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: post disturbance from pipeline construction

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points			
<input type="checkbox"/> TYPE	PERCENT	<input type="checkbox"/> TYPE	PERCENT	Substrate Max = 40	A + B		
<input type="checkbox"/> BLDR SLABS (16 pts)		<input 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 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)					
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN (0 pt)					
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	<u>15</u>	<input type="checkbox"/> MUCK (0 pts)					
<input type="checkbox"/> SAND (<2 mm) (8 pts)	<u>10</u>	<input type="checkbox"/> ARTIFICIAL (3 pts)					
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock						(A)	(B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:						TOTAL NUMBER OF SUBSTRATE TYPES:	
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 (Per Bank)

L	R
<input checked="" type="checkbox"/> Wide >10m	<input type="checkbox"/> Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/> Narrow <5m	<input type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/> None	<input type="checkbox"/> Fenced Pasture

COMMENTS:

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

Stream Flowing ☒ Substrate flow with isolated pools (intermittent) ☐ Most Channel, isolated pools, no flow (intermittent) ☐ Dry channel, no water (ephemeral) ☐

COMMENTS:

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

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

STREAM GRADIENT ESTIMATE

☐ Flat to 5% ☐ Flat to Moderate ☒ Moderate to Severe ☐ Severe to 10% or greater

PHHW Form Page - 1

## 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):

☐ WQI 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) N Date of last precipitation: 08/16/16 Quantity: HeavyPhotograph Information: 2 Photos 11/20/16 - DownstreamElevated Turbidity? (Y/N) N Turbidity (NTU): 10Water 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 (5-11) \_\_\_\_\_ 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) NFrogs or Toads 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



PHHW Form Page - 2

# **Ohio EPA** Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **24**

SITE NAME/LOCATION: 22nd Street - Road Right  
 HHEI SITE NUMBER: 016 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 08/16/16 SCORER: MB/B COMMENTS: epheral

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

STREAM CHANNEL ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: Pipeline ROW at tail

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points			
<input type="checkbox"/> TYPE	PERCENT	<input type="checkbox"/> TYPE	PERCENT	Substrate Max = 40	A + B		
<input type="checkbox"/> BLDR SLABS (16 pts)		<input 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 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)					
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)	<u>5</u>	<input type="checkbox"/> CLAY or HARDPAN (0 pt)					
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	<u>10</u>	<input type="checkbox"/> MUCK (0 pts)					
<input type="checkbox"/> SAND (<2 mm) (8 pts)	<u>10</u>	<input type="checkbox"/> ARTIFICIAL (3 pts)					
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock						(A)	(B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:						TOTAL NUMBER OF SUBSTRATE TYPES:	
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 (Per Bank)

L	R
<input checked="" type="checkbox"/> Wide >10m	<input type="checkbox"/> Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/> Narrow <5m	<input type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/> None	<input type="checkbox"/> Fenced Pasture

COMMENTS:

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

Stream Flowing ☒ Substrate flow with isolated pools (intermittent) ☐ Most Channel, isolated pools, no flow (intermittent) ☐ Dry channel, no water (ephemeral) ☐

COMMENTS:

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

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

STREAM GRADIENT ESTIMATE

☐ Flat to 5% ☐ Flat to Moderate ☒ Moderate to Severe ☐ Severe to 10% or greater

PHHW Form Page - 1

## 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):

☐ WQI 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) N Date of last precipitation: 08/16/16 Quantity: HeavyPhotograph Information: 2 Photos 11/20/16 - DownstreamElevated Turbidity? (Y/N) N Turbidity (NTU): 10Water 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 (5-11) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_Additional comments/description of pollution impacts: N/A

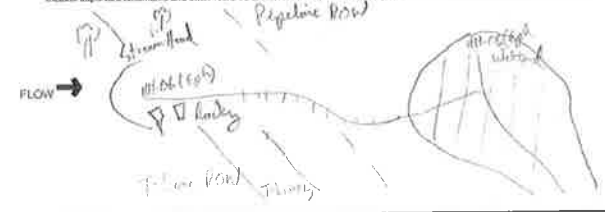
## BIOTIC EVALUATION

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) NFrogs or Toads 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



PHHW Form Page - 2





## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **34**

SITE NAME/LOCATION: Cross Lake - Harrison HH-MDT-032816-05 SITE NUMBER: 04 RIVER BASIN: 04 DRAINAGE AREA (sq mi): 0.04  
 LENGTH OF STREAM REACH (ft): 1000 LAT: 40°07' LONG: 82°07' RIVER CODE: 04 RIVER MILE: 0.04  
 DATE: 03/28/16 SCORER: John R. Bice COMMENTS: Ephemeral  
 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: Pipeline ROW

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 6). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (85-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	15	<input type="checkbox"/> MUCK (0 pts)	
<input checked="" type="checkbox"/> SAND (<2 mm) (8 pts)	40	<input type="checkbox"/> ARTIFICIAL (0 pts)	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 1 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 5 TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters (20 pts) ☐ > 5 cm - 10 cm (15 pts) ☐ < 5 cm (5 pts) ☐ NO WATER OR MOST CHANNEL (0 pts)  
 COMMENTS: MAXIMUM POOL DEPTH (centimeters): 4"

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 m (> 13') (25 pts) ☐ > 1.0 m - 1.9 m (3' 3" - 6' 3") (15 pts) ☐ > 3.0 m - 4.0 m (9' 8" - 13') (25 pts) ☐ > 1.0 m - 1.9 m (3' 3" - 6' 3") (15 pts)  
 COMMENTS: AVERAGE BANKFULL WIDTH (meters): 2'

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

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

5. FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing ☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (Ephemeral)  
 COMMENTS: Flowing, very slow

6. SINUOSITY (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ 3.5

7. STREAM GRADIENT ESTIMATE  
☐ Flat or Slight ☐ Flat to Moderate ☐ Moderate to Severe ☐ Severe to Extreme

PHWH Form Page - 1

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

GHEI PERFORMED? ☐ Yes ☒ No GHEI Score: \_\_\_\_\_ (If Yes, Attach Completed GHEI Form)  
 DOWNSTREAM DESIGNATED USE(S):  
☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ EVH 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) N Date of last precipitation: 03/28/16 Quantity: 1 inch AM?  
 Photograph information: 4 Photos, Upstream (2) + Downstream (2)  
 Elevated Turbidity? (Y/N) N Canopy (% open): 35  
 Were samples collected for water chemistry? (Y/N) N (Include 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: NA

BIOTIC EVALUATION  
 Performed? (Y/N) Y (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):



PHWH Form Page - 2



## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): **24**

SITE NAME/LOCATION: Cross Lake - Harrison HH-MDT-032816-04 SITE NUMBER: 04 RIVER BASIN: 04 DRAINAGE AREA (sq mi): 0.04  
 LENGTH OF STREAM REACH (ft): 1500 LAT: 40°07' LONG: 82°07' RIVER CODE: 04 RIVER MILE: 0.04  
 DATE: 03/28/16 SCORER: John R. Bice COMMENTS: Ephemeral  
 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: Pipeline ROW

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 6). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (85-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	15	<input type="checkbox"/> MUCK (0 pts)	
<input checked="" type="checkbox"/> SAND (<2 mm) (8 pts)	40	<input type="checkbox"/> ARTIFICIAL (0 pts)	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 1 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 5 TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters (20 pts) ☐ > 5 cm - 10 cm (15 pts) ☐ < 5 cm (5 pts) ☐ NO WATER OR MOST CHANNEL (0 pts)  
 COMMENTS: MAXIMUM POOL DEPTH (centimeters): 2"

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 m (> 13') (25 pts) ☐ > 1.0 m - 1.9 m (3' 3" - 6' 3") (15 pts) ☐ > 3.0 m - 4.0 m (9' 8" - 13') (25 pts) ☐ > 1.0 m - 1.9 m (3' 3" - 6' 3") (15 pts)  
 COMMENTS: AVERAGE BANKFULL WIDTH (meters): 2'

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

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

5. FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing ☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (Ephemeral)  
 COMMENTS: Flowing, very slow

6. SINUOSITY (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ 3.5

7. STREAM GRADIENT ESTIMATE  
☐ Flat or Slight ☐ Flat to Moderate ☐ Moderate to Severe ☐ Severe to Extreme

PHWH Form Page - 1

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

GHEI PERFORMED? ☐ Yes ☒ No GHEI Score: \_\_\_\_\_ (If Yes, Attach Completed GHEI Form)  
 DOWNSTREAM DESIGNATED USE(S):  
☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ EVH 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) N Date of last precipitation: 03/28/16 Quantity: 1 inch AM?  
 Photograph information: 4 Photos, Upstream (2) + Downstream (2)  
 Elevated Turbidity? (Y/N) N Canopy (% open): 35  
 Were samples collected for water chemistry? (Y/N) N (Include 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: NA

BIOTIC EVALUATION  
 Performed? (Y/N) Y (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):



PHWH Form Page - 2

# **OhioEPA** Primary Headwater Habitat Evaluation Form

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

42

SITE NAME/LOCATION: Acacia Creek DATE: 10/16/16 RIVER BASIN: Wabash DRAINAGE AREA (mi<sup>2</sup>): 1.2  
 LENGTH OF STREAM REACH (ft): 100 LAT: 40° 16' N LONG: 84° 16' W RIVER CODE: 100 RIVER MILE: 1.2  
 DATE: 10/16/16 SCORER: MD, BCR COMMENTS: Salmon Creek

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

STREAM CHANNEL: ☒ NONE/NATURAL CHANNEL ☒ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: changes of channeling along hill side

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (64-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	30	<input type="checkbox"/> MUCK (0 pts)	
<input checked="" type="checkbox"/> SAND (<2 mm) (6 pts)	70	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bld Slabs, Boulder, Cobble, Bedrock, Gravel, Sand = 100% (A) 7 (B) 4  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: 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 line of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box):  
☐ > 22.5 - 30 cm (9 pts)  
☐ > 30 - 40 cm (10 pts)  
☒ > 40 - 50 cm (11 pts)  
☐ > 50 - 60 cm (12 pts)  
☐ > 60 - 70 cm (13 pts)  
☐ > 70 - 80 cm (14 pts)  
☐ > 80 - 90 cm (15 pts)  
☐ > 90 - 100 cm (16 pts)  
☐ > 100 - 110 cm (17 pts)  
☐ > 110 - 120 cm (18 pts)  
☐ > 120 - 130 cm (19 pts)  
☐ > 130 - 140 cm (20 pts)  
☐ > 140 - 150 cm (21 pts)  
☐ > 150 - 160 cm (22 pts)  
☐ > 160 - 170 cm (23 pts)  
☐ > 170 - 180 cm (24 pts)  
☐ > 180 - 190 cm (25 pts)  
☐ > 190 - 200 cm (26 pts)  
☐ > 200 - 210 cm (27 pts)  
☐ > 210 - 220 cm (28 pts)  
☐ > 220 - 230 cm (29 pts)  
☐ > 230 - 240 cm (30 pts)  
☐ > 240 - 250 cm (31 pts)  
☐ > 250 - 260 cm (32 pts)  
☐ > 260 - 270 cm (33 pts)  
☐ > 270 - 280 cm (34 pts)  
☐ > 280 - 290 cm (35 pts)  
☐ > 290 - 300 cm (36 pts)  
☐ > 300 - 310 cm (37 pts)  
☐ > 310 - 320 cm (38 pts)  
☐ > 320 - 330 cm (39 pts)  
☐ > 330 - 340 cm (40 pts)  
☐ > 340 - 350 cm (41 pts)  
☐ > 350 - 360 cm (42 pts)  
☐ > 360 - 370 cm (43 pts)  
☐ > 370 - 380 cm (44 pts)  
☐ > 380 - 390 cm (45 pts)  
☐ > 390 - 400 cm (46 pts)  
☐ > 400 - 410 cm (47 pts)  
☐ > 410 - 420 cm (48 pts)  
☐ > 420 - 430 cm (49 pts)  
☐ > 430 - 440 cm (50 pts)  
☐ > 440 - 450 cm (51 pts)  
☐ > 450 - 460 cm (52 pts)  
☐ > 460 - 470 cm (53 pts)  
☐ > 470 - 480 cm (54 pts)  
☐ > 480 - 490 cm (55 pts)  
☐ > 490 - 500 cm (56 pts)  
☐ > 500 - 510 cm (57 pts)  
☐ > 510 - 520 cm (58 pts)  
☐ > 520 - 530 cm (59 pts)  
☐ > 530 - 540 cm (60 pts)  
☐ > 540 - 550 cm (61 pts)  
☐ > 550 - 560 cm (62 pts)  
☐ > 560 - 570 cm (63 pts)  
☐ > 570 - 580 cm (64 pts)  
☐ > 580 - 590 cm (65 pts)  
☐ > 590 - 600 cm (66 pts)  
☐ > 600 - 610 cm (67 pts)  
☐ > 610 - 620 cm (68 pts)  
☐ > 620 - 630 cm (69 pts)  
☐ > 630 - 640 cm (70 pts)  
☐ > 640 - 650 cm (71 pts)  
☐ > 650 - 660 cm (72 pts)  
☐ > 660 - 670 cm (73 pts)  
☐ > 670 - 680 cm (74 pts)  
☐ > 680 - 690 cm (75 pts)  
☐ > 690 - 700 cm (76 pts)  
☐ > 700 - 710 cm (77 pts)  
☐ > 710 - 720 cm (78 pts)  
☐ > 720 - 730 cm (79 pts)  
☐ > 730 - 740 cm (80 pts)  
☐ > 740 - 750 cm (81 pts)  
☐ > 750 - 760 cm (82 pts)  
☐ > 760 - 770 cm (83 pts)  
☐ > 770 - 780 cm (84 pts)  
☐ > 780 - 790 cm (85 pts)  
☐ > 790 - 800 cm (86 pts)  
☐ > 800 - 810 cm (87 pts)  
☐ > 810 - 820 cm (88 pts)  
☐ > 820 - 830 cm (89 pts)  
☐ > 830 - 840 cm (90 pts)  
☐ > 840 - 850 cm (91 pts)  
☐ > 850 - 860 cm (92 pts)  
☐ > 860 - 870 cm (93 pts)  
☐ > 870 - 880 cm (94 pts)  
☐ > 880 - 890 cm (95 pts)  
☐ > 890 - 900 cm (96 pts)  
☐ > 900 - 910 cm (97 pts)  
☐ > 910 - 920 cm (98 pts)  
☐ > 920 - 930 cm (99 pts)  
☐ > 930 - 940 cm (100 pts)  
☐ > 940 - 950 cm (101 pts)  
☐ > 950 - 960 cm (102 pts)  
☐ > 960 - 970 cm (103 pts)  
☐ > 970 - 980 cm (104 pts)  
☐ > 980 - 990 cm (105 pts)  
☐ > 990 - 1000 cm (106 pts)  
☐ > 1000 - 1010 cm (107 pts)  
☐ > 1010 - 1020 cm (108 pts)  
☐ > 1020 - 1030 cm (109 pts)  
☐ > 1030 - 1040 cm (110 pts)  
☐ > 1040 - 1050 cm (111 pts)  
☐ > 1050 - 1060 cm (112 pts)  
☐ > 1060 - 1070 cm (113 pts)  
☐ > 1070 - 1080 cm (114 pts)  
☐ > 1080 - 1090 cm (115 pts)  
☐ > 1090 - 1100 cm (116 pts)  
☐ > 1100 - 1110 cm (117 pts)  
☐ > 1110 - 1120 cm (118 pts)  
☐ > 1120 - 1130 cm (119 pts)  
☐ > 1130 - 1140 cm (120 pts)  
☐ > 1140 - 1150 cm (121 pts)  
☐ > 1150 - 1160 cm (122 pts)  
☐ > 1160 - 1170 cm (123 pts)  
☐ > 1170 - 1180 cm (124 pts)  
☐ > 1180 - 1190 cm (125 pts)  
☐ > 1190 - 1200 cm (126 pts)  
☐ > 1200 - 1210 cm (127 pts)  
☐ > 1210 - 1220 cm (128 pts)  
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☐ > 1260 - 1270 cm (133 pts)  
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☐ > 1360 - 1370 cm (143 pts)  
☐ > 1370 - 1380 cm (144 pts)  
☐ > 1380 - 1390 cm (145 pts)  
☐ > 1390 - 1400 cm (146 pts)  
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☐ > 1460 - 1470 cm (153 pts)  
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☐ > 1480 - 1490 cm (155 pts)  
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☐ > 1570 - 1580 cm (164 pts)  
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☐ > 1660 - 1670 cm (173 pts)  
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☐ > 1770 - 1780 cm (184 pts)  
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☐ > 2220 - 2230 cm (229 pts)  
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☐ > 2250 - 2260 cm (232 pts)  
☐ > 2260 - 2270 cm (233 pts)  
☐ > 2270 - 2280 cm (234 pts)  
☐ > 2280 - 2290 cm (235 pts)  
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☐ > 2360 - 2370 cm (243 pts)  
☐ > 2370 - 2380 cm (244 pts)  
☐ > 2380 - 2390 cm (245 pts)  
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☐ > 2470 - 2480 cm (254 pts)  
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☐ > 2570 - 2580 cm (264 pts)  
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☐ > 2620 - 2630 cm (269 pts)  
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☐ > 2650 - 2660 cm (272 pts)  
☐ > 2660 - 2670 cm (273 pts)  
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☐ > 2680 - 2690 cm (275 pts)  
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☐ > 3060 - 3070 cm (313 pts)  
☐ > 3070 - 3080 cm (314 pts)  
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☐ > 3250 - 3260 cm (332 pts)  
☐ > 3260 - 3270 cm (333 pts)  
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☐ > 3560 - 3570 cm (363 pts)  
☐ > 3570 - 3580 cm (364 pts)  
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☐ > 3650 - 3660 cm (372 pts)  
☐ > 3660 - 3670 cm (373 pts)  
☐ > 3670 - 3680 cm (374 pts)  
☐ > 3680 - 3690 cm (375 pts)  
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☐ > 3760 - 3770 cm (383 pts)  
☐ > 3770 - 3780 cm (384 pts)  
☐ > 3780 - 3790 cm (385 pts)  
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☐ > 3860 - 3870 cm (393 pts)  
☐ > 3870 - 3880 cm (394 pts)  
☐ > 3880 - 3890 cm (395 pts)  
☐ > 3890 - 3900 cm (396 pts)  
☐ > 3900 - 3910 cm (397 pts)  
☐ > 3910 - 3920 cm (398 pts)  
☐ > 3920 - 3930 cm (399 pts)  
☐ > 3930 - 3940 cm (400 pts)  
☐ > 3940 - 3950 cm (401 pts)  
☐ > 3950 - 3960 cm (402 pts)  
☐ > 3960 - 3970 cm (403 pts)

**Ohio EPA Primary Headwater Habitat Evaluation Form**  
**HHEI Score (sum of metrics 1, 2, 3):** 41

**SITE NAME/LOCATION:** Good Hope - 11/20/16  
**HH-MDT-032816-15** **SITE NUMBER:** 15 **RIVER BASIN:** 15 **DRAINAGE AREA (mi<sup>2</sup>):** 15  
**LENGTH OF STREAM REACH (ft):** 100 ft **LAT:** 40° 41' N **LONG:** 81° 16' W **RIVER CODE:** 15 **RIVER MILE:** 15  
**DATE:** 03/28/16 **SCORER:** WAT/ACK **COMMENTS:** ephemeral  
**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:** Within T-Line ROW/Residential lot.

**1. SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	<u>20</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>5</u>
<input type="checkbox"/> BEDROCK [16 pts]	<u>5</u>	<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN [9 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>30</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>30</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 15 (A) 15 (B) 6  
**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15 6 **TOTAL NUMBER OF SUBSTRATE TYPES:** 6

**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) ☐ > 5 cm - 10 cm (15 pts) ☐ < 5 cm (5 pts) ☐ NO WATER OR MOIST CHANNEL (0 pts)  
**COMMENTS:** NO WATER OR MOIST CHANNEL (0 pts) **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' [20 pts]) ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [15 pts] ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [10 pts] ☐ < 1.0 m (< 3' 3") [5 pts]  
**COMMENTS:** Bank Full Width (meters): 2.7 5

**RIPIARIAN ZONE AND FLOODPLAIN QUALITY** (This information must also be completed. NOTE: Row Left (L) and Right (R) as looking downstream.)

**RIPIARIAN WIDTH** **FLOODPLAIN QUALITY**

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

**COMMENTS:** None

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing ☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (ephemeral)  
**COMMENTS:** None

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☒ 2.5 ☐ 3.5

**STREAM GRADIENT ESTIMATE**  
☐ Flat to Slight (0.1%) ☐ Flat to Moderate ☒ Moderate to Severe ☐ Severe to Steep (10%)

PHWH Form Page - 1

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

**QHEI PERFORMED?** ☐ Yes ☒ No **QHEI Score:** 15 (If Yes, Attach Completed QHEI Form)

**DOWNSIDE DESIGNATED USE(S)**  
☐ VWH Name: 15 Distance from Evaluated Stream: 15  
☐ CWH Name: 15 Distance from Evaluated Stream: 15  
☐ EWH Name: 15 Distance from Evaluated Stream: 15

**MAPPING:** ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION


**USGS Quadrangle Name:** 15 **NRCS Soil Map Page:** 15 **NRCS Soil Map Stream Order:** 15  
**County:** 15 **Township / City:** 15

**MISCELLANEOUS**  
**Base Flow Conditions?** (Y/N) N **Date of last precipitation:** 03/28/16 **Quantity:** 15  
**Photograph information:** 2 Photos, Upstream & Downstream  
**Elevated Turbidity?** (Y/N) N **Canopy (% open):** 40  
**Were samples collected for water chemistry?** (Y/N) N (Note lab sample no. or id, and attach results) **Lab Number:** 15  
**Field Measures:** **Temp (°C):** 15 **Dissolved Oxygen (mg/l):** 15 **pH (5 U):** 15 **Conductivity (µmhos/cm):** 15  
**Is the sampling reach representative of the stream?** (Y/N) Y If not, please explain: 15

**Additional comments/description of pollution impacts:** 15

**BIOTIC EVALUATION**  
**Performed?** (Y/N) N (If Yes, Record all observations. Voucher collection 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:** 15

**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** → 

PHWH Form Page - 2

**Ohio EPA Primary Headwater Habitat Evaluation Form**  
**HHEI Score (sum of metrics 1, 2, 3):** 30

**SITE NAME/LOCATION:** Good Hope - 11/20/16  
**HH-MDT-032816-14** **SITE NUMBER:** 14 **RIVER BASIN:** 14 **DRAINAGE AREA (mi<sup>2</sup>):** 14  
**LENGTH OF STREAM REACH (ft):** 100 ft **LAT:** 40° 41' N **LONG:** 81° 16' W **RIVER CODE:** 14 **RIVER MILE:** 14  
**DATE:** 03/28/16 **SCORER:** WAT/ACK **COMMENTS:** ephemeral  
**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:** Within Transition Line ROW

**1. SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	<u>15</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>10</u>
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5</u>	<input type="checkbox"/> CLAY or HARDPAN [9 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>30</u>	<input type="checkbox"/> MUCK [0 pts]	
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<u>40</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 5 (A) 15 (B) 5  
**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15 5 **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

**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) ☐ > 5 cm - 10 cm (15 pts) ☐ < 5 cm (5 pts) ☐ NO WATER OR MOIST CHANNEL (0 pts)  
**COMMENTS:** NO WATER OR MOIST CHANNEL (0 pts) **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' [20 pts]) ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [15 pts] ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [10 pts] ☐ < 1.0 m (< 3' 3") [5 pts]  
**COMMENTS:** Bank Full Width (meters): 1.9 5

**RIPIARIAN ZONE AND FLOODPLAIN QUALITY** (This information must also be completed. NOTE: Row Left (L) and Right (R) as looking downstream.)

**RIPIARIAN WIDTH** **FLOODPLAIN QUALITY**

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

**COMMENTS:** None

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing ☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (ephemeral)  
**COMMENTS:** Recent Heavy rain

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☒ 1.5 ☐ 2.5 ☐ 3.5

**STREAM GRADIENT ESTIMATE**  
☐ Flat to Slight (0.1%) ☐ Flat to Moderate ☒ Moderate to Severe ☐ Severe to Steep (10%)

PHWH Form Page - 1

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

**QHEI PERFORMED?** ☐ Yes ☒ No **QHEI Score:** 14 (If Yes, Attach Completed QHEI Form)

**DOWNSIDE DESIGNATED USE(S)**  
☐ VWH Name: 14 Distance from Evaluated Stream: 14  
☐ CWH Name: 14 Distance from Evaluated Stream: 14  
☐ EWH Name: 14 Distance from Evaluated Stream: 14

**MAPPING:** ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

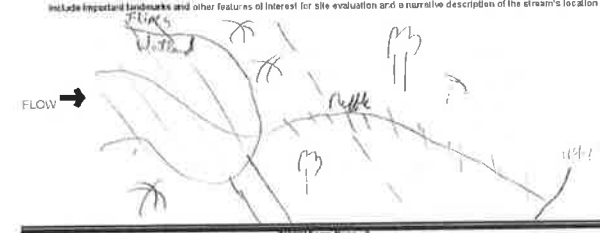
**USGS Quadrangle Name:** 14 **NRCS Soil Map Page:** 14 **NRCS Soil Map Stream Order:** 14  
**County:** 14 **Township / City:** 14

**MISCELLANEOUS**  
**Base Flow Conditions?** (Y/N) N **Date of last precipitation:** 03/28/16 **Quantity:** 14  
**Photograph information:** 2 Photos, Upstream & Downstream  
**Elevated Turbidity?** (Y/N) N **Canopy (% open):** 20  
**Were samples collected for water chemistry?** (Y/N) N (Note lab sample no. or id, and attach results) **Lab Number:** 14  
**Field Measures:** **Temp (°C):** 14 **Dissolved Oxygen (mg/l):** 14 **pH (5 U):** 14 **Conductivity (µmhos/cm):** 14  
**Is the sampling reach representative of the stream?** (Y/N) Y If not, please explain: 14

**Additional comments/description of pollution impacts:** 14

**BIOTIC EVALUATION**  
**Performed?** (Y/N) N (If Yes, Record all observations. Voucher collection 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:** 14

**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** → 

PHWH Form Page - 2

**ADDITIONAL STREAM INFORMATION** [This information must also be completed.]

OHEI PERFORMED? ☐ Yes ☒ No OHEI Score \_\_\_\_\_ (If Yes, Attach Completed OHEI Form)

DOWNSIDE FARM DESIGNATED USE(S) \_\_\_\_\_

☐ WWH Name \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ CWH Name \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ BWH 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 Section Order \_\_\_\_\_

County \_\_\_\_\_ Township \_\_\_\_\_ City \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) N Date of last precipitation 03/19/16 Quantity ?

Pictograph Information: 2 Pools, Upstream + Downstream

Elevated Turbidity? (Y/N) N Conspicuous open? NO

Water samples collected by water user(s)? (Y/N) N Note (sk sample no or id, and attach results) Lab Number \_\_\_\_\_

Field Measures Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (SU) \_\_\_\_\_ Conductivity (umhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) X If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: n/a

**BIOLOGICAL EVALUATION**

Performs? (Y/N) N (If yes, file all observations "Voucher collections optional". NOTE: In all water samples must be labeled with site ID number, include appropriate full date/time from the Primary Headwater Label Assessment Manual.)

Fish Observed? (Y/N) \_\_\_\_\_ Vouches? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Vouches? (Y/N) \_\_\_\_\_  
Frogs or Toads Observed? (Y/N) \_\_\_\_\_ Vouches? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Vouches? (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

To Lewis Young Smith Creek

FLOW →

(Pool Edge)

Hand-drawn sketch of a stream reach showing flow direction, pool edge, and various features like rocks and vegetation.

PHOTO FORM Page # 2

**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): \_\_\_\_\_

☐ WWF Name \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ Civil Name \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ EWI Name \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

**MAPPING: LOCATING 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) N Date of last precipitation 8/10/06 Quantity Heavy

Photograph information: 2 Photos Upstream + Downstream

Elevated Turbidity? (Y/N) N Category (if none) 15

Were samples collected for water chemistry? (Y/N) N (If lab sample no. or id. and all other results) Lab Number: \_\_\_\_\_

Field measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/L) \_\_\_\_\_ pH (5 U) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream? (Y/N) Y If not, please describe: \_\_\_\_\_

Additional comments/description of pollution impacts: N/A

**BIOTIC EVALUATION**

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

Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Toads Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aqueatic 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 narrative description of the stream's location

HH-13 Spring gutter upstream downstream HH-12 (Iron)

FLOW →

PHOTO Form Page 2



## Primary Headwater Habitat Evaluation Form

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

23

SITE NAME/LOCATION: East Hope - Harrison  
 HH-MDT-032816-11 SITE NUMBER: 11 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 150 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/29/16 SCORER: Robert COMMENTS: Submerged  
 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: T-Line Row (within)

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN [0 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	10	<input type="checkbox"/> MUCK [0 pts]	
<input checked="" type="checkbox"/> SAND (<2 mm) [8 pts]	40	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: (A) 9 (B) 4  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 4

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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters [20 pts]  
☐ > 22.5 - 30 cm [10 pts]  
☒ > 10 - 22.5 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):  
☐ > 4.0 meters (> 13') [20 pts]  
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [15 pts]  
☒ > 1.5 m - 3.0 m (> 4' 9" - 9' 7") [10 pts]  
☐ < 1.5 m (< 4' 9" - 9' 7") [5 pts]

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): 1'

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

RIPIARIAN WIDTH	FLOODPLAIN QUALITY
<input checked="" type="checkbox"/> L (Per Bank) Wide >10m	<input type="checkbox"/> L (Most Predominant per Bank) Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input checked="" type="checkbox"/> R Urban or Industrial
<input type="checkbox"/> Narrow <5m	<input type="checkbox"/> Open Pasture, Row Crop
<input type="checkbox"/> None	<input type="checkbox"/> Mining or Construction

COMMENTS: \_\_\_\_\_

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing  
☐ Subsurface flow with isolated pools (intermittent)  
☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)

COMMENTS: \_\_\_\_\_

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%)  
☐ Flat to Moderate  
☐ Moderate (2-10%)  
☐ Moderate to Severe  
☒ Severe (>10%)

PHWH Form Page - 1

## 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): N Date of last precipitation: 03/29/16 Quantity: 2 inches  
 Photograph Information: 2 Photos, Upstream & Downstream  
 Elevated Turbidity? (Y/N): N Canopy (% open): 10  
 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or lot 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: N/A

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

PHWH Form Page - 2



## Primary Headwater Habitat Evaluation Form

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

24

SITE NAME/LOCATION: East Hope - Harrison  
 HH-MDT-032816-10 SITE NUMBER: 10 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 150 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/29/16 SCORER: Robert COMMENTS: Submerged  
 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: Within tree ROW

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	5	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	15	<input type="checkbox"/> MUCK [0 pts]	
<input checked="" type="checkbox"/> SAND (<2 mm) [8 pts]	40	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: (A) 9 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters [20 pts]  
☐ > 22.5 - 30 cm [10 pts]  
☒ > 10 - 22.5 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):  
☐ > 4.0 meters (> 13') [20 pts]  
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [15 pts]  
☒ > 1.5 m - 3.0 m (> 4' 9" - 9' 7") [10 pts]  
☐ < 1.5 m (< 4' 9" - 9' 7") [5 pts]

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): 2'

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

RIPIARIAN WIDTH	FLOODPLAIN QUALITY
<input checked="" type="checkbox"/> L (Per Bank) Wide >10m	<input type="checkbox"/> L (Most Predominant per Bank) Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input checked="" type="checkbox"/> R Urban or Industrial
<input type="checkbox"/> Narrow <5m	<input type="checkbox"/> Open Pasture, Row Crop
<input type="checkbox"/> None	<input type="checkbox"/> Mining or Construction

COMMENTS: \_\_\_\_\_

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing  
☐ Subsurface flow with isolated pools (intermittent)  
☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)

COMMENTS: Recent Runoff

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%)  
☐ Flat to Moderate  
☐ Moderate (2-10%)  
☒ Moderate to Severe  
☐ Severe (>10%)

PHWH Form Page - 1

## 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): N Date of last precipitation: 03/29/16 Quantity: 2 inches  
 Photograph Information: 2 Photos, Upstream & Downstream  
 Elevated Turbidity? (Y/N): N Canopy (% open): 20  
 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or lot 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: N/A

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

PHWH Form Page - 2

## OhioEPA Primary Headwater Habitat Evaluation Form

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

24

SITE NAME/LOCATION: Grass Lake - Mason  
 HH-MDT-032916-09 SITE NUMBER: 09 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 20 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/29/16 SCORER: not field COMMENTS: ephemeral

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

STREAM CHANNEL ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: T-Line ROW (within)

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>250 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 type="checkbox"/> COBBLE (65-250 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	10	<input type="checkbox"/> MUCK (3 pts)	
<input checked="" type="checkbox"/> SAND (<2 mm) (8 pts)	40	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: 5 (A) 1 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 5

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) ☐ > 5 cm - 10 cm (15 pts)  
☐ > 22.5 - 30 cm (10 pts) ☐ < 5 cm (5 pts)  
☒ > 10 - 22.5 cm (25 pts) ☐ NO WATER OR MOST CHANNEL (0 pts)

COMMENTS: none MAXIMUM POOL DEPTH (centimeters): 14

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (> 13) (20 pts) ☐ > 1.0 m - 1.5 m (> 3'3" - 4'8") (15 pts)  
☐ > 3.0 m - 4.0 m (> 9'7" - 13') (25 pts) ☐ < 1.0 m (< 3'3") (5 pts)  
☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") (20 pts)

COMMENTS: none AVERAGE BANKFULL WIDTH (meters): 2

This information must also be completed

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

RIPIARIAN WIDTH	FLOODPLAIN QUALITY
<input checked="" type="checkbox"/> L (Per Bank) Wide >10m	<input type="checkbox"/> L (Most Predominant per Bank) Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/> Narrow <5m	<input checked="" type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/> None	<input type="checkbox"/> Open Pasture, Row Crop
COMMENTS: <u>none</u>	<input type="checkbox"/> Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing Subsurface flow with isolated pools (intermittent)  
☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)  
 COMMENTS: stream flowing

SINUOSITY (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None 0.5 ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3

STREAM GRADIENT ESTIMATE  
☐ Flat to Slightly ☐ Flat to Moderate ☐ Moderate to Slightly ☒ Moderate to Severe ☐ Severe to Steep

PWH Form Page - 1

## 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: \_\_\_\_\_  
☐ DWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quad Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
 County: \_\_\_\_\_ Township / City: \_\_\_\_\_

## MISCELLANEOUS

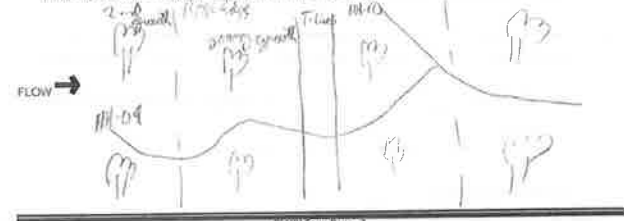
Base Flow Conditions? (Y/N) N Date of last precipitation: 03/29/16 Quantity: Heavy  
 Photograph Information: 2 Photos, Upstream & Downstream  
 Elevated Turbidity? (Y/N) N Canopy (% open): 25  
 Were samples collected for water chemistry? (Y/N) N (Note: lab sample no. and attach results) Lab Number: \_\_\_\_\_  
 Field Measures: Temp (°C): \_\_\_\_\_ Dissolved Oxygen (mg/l): \_\_\_\_\_ pH (8.1): \_\_\_\_\_ Conductivity (µmhos/cm): \_\_\_\_\_  
 Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: \_\_\_\_\_  
 Additional comments/description of pollution impacts: none

## BIOTIC EVALUATION

Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the 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 Toads 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



PWH Form Page - 2

## OhioEPA Primary Headwater Habitat Evaluation Form

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

19

SITE NAME/LOCATION: Grass Lake - Mason  
 HH-MDT-032916-01 SITE NUMBER: 01 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 20 ft LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/29/16 SCORER: not field COMMENTS: ephemeral

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

STREAM CHANNEL ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: Old road over head

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>250 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 type="checkbox"/> COBBLE (65-250 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	15	<input type="checkbox"/> MUCK (3 pts)	
<input checked="" type="checkbox"/> SAND (<2 mm) (8 pts)	40	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: 5 (A) 1 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 5

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) ☐ > 5 cm - 10 cm (15 pts)  
☐ > 22.5 - 30 cm (10 pts) ☐ < 5 cm (5 pts)  
☒ > 10 - 22.5 cm (25 pts) ☐ NO WATER OR MOST CHANNEL (0 pts)

COMMENTS: none MAXIMUM POOL DEPTH (centimeters): 10

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.0 meters (> 13) (20 pts) ☐ > 1.0 m - 1.5 m (> 3'3" - 4'8") (15 pts)  
☐ > 3.0 m - 4.0 m (> 9'7" - 13') (25 pts) ☐ < 1.0 m (< 3'3") (5 pts)  
☐ > 1.5 m - 3.0 m (> 4'8" - 9'7") (20 pts)

COMMENTS: none AVERAGE BANKFULL WIDTH (meters): 1.5

This information must also be completed

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

RIPIARIAN WIDTH	FLOODPLAIN QUALITY
<input checked="" type="checkbox"/> L (Per Bank) Wide >10m	<input type="checkbox"/> L (Most Predominant per Bank) Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/> Narrow <5m	<input checked="" type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/> None	<input type="checkbox"/> Open Pasture, Row Crop
COMMENTS: <u>Pipeline transmission line</u>	<input type="checkbox"/> Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing Subsurface flow with isolated pools (intermittent)  
☐ Most Channel, isolated pools, no flow (intermittent)  
☐ Dry channel, no water (Ephemeral)  
 COMMENTS: none

SINUOSITY (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None 0.5 ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3

STREAM GRADIENT ESTIMATE  
☐ Flat to Slightly ☐ Flat to Moderate ☐ Moderate to Slightly ☒ Moderate to Severe ☐ Severe to Steep

PWH Form Page - 1

## 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: \_\_\_\_\_  
☐ DWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quad Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
 County: \_\_\_\_\_ Township / City: \_\_\_\_\_

## MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation: 03/29/16 Quantity: 7  
 Photograph Information: 2 Photos, Upstream & Downstream  
 Elevated Turbidity? (Y/N) N Canopy (% open): 10  
 Were samples collected for water chemistry? (Y/N) N (Note: lab sample no. and attach results) Lab Number: \_\_\_\_\_  
 Field Measures: Temp (°C): \_\_\_\_\_ Dissolved Oxygen (mg/l): \_\_\_\_\_ pH (8.1): \_\_\_\_\_ Conductivity (µmhos/cm): \_\_\_\_\_  
 Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: \_\_\_\_\_  
 Additional comments/description of pollution impacts: none

## 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 Toads 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



PWH Form Page - 2



# **Ohio EPA** Primary Headwater Habitat Evaluation Form

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

19

SITE NAME/LOCATION: Good Hope - 032916-02 SITE NUMBER: 62 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (m<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (R): 100 ft LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/29/16 SCORER: NOT/BLR COMMENTS: Agreement

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

STREAM CHANNEL ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: T-Line ROW

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>250 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 type="checkbox"/> COBBLE (65-250 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	10	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	40	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 4 (B) 5  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 (30 pts)  
☐ > 22.5 - 30 cm (20 pts)  
☒ > 10 - 22.5 cm (15 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: Very shallow

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ < 4.0 meters (< 13') (20 pts)  
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') (25 pts)  
☒ > 4.0 m - 3.0 m (> 4' 8" - 9' 7") (20 pts)

COMMENTS: best

AVERAGE BANKFULL WIDTH (meters): 11

HHEI Metric Points  
 Substrate Max = 40  
 14  
 A + B

Pool Depth  
 Max = 30  
 0

Bankfull Width  
 Max = 30  
 5

This information must also be completed

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

RIPARIAN WIDTH: (Per Bank) L R (Most Predominant per Bank) L R

☒ Wide > 10m ☐ Mature Forest, Wetland ☐ Conservation Tillage

☐ Moderate 5-10m ☒ Immature Forest, Shrub or Old Field ☐ Urban or Industrial

☐ Narrow < 5m ☒ Residential, Park, New Field ☐ Open Pasture, Row Crop

☐ None ☐ Fenced Pasture ☐ Mining or Construction

COMMENTS: \_\_\_\_\_

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☐ Stream Flowing ☒ Moist Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (Ephemeral)

COMMENTS: \_\_\_\_\_

BIQUANTITY (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☒ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5

STREAM GRADIENT ESTIMATE  
☐ Flat (< 5 ft/mi) ☐ Flat to Moderate ☐ Moderate to Severe ☒ Severe (> 10 ft/mi)

PWH Form Page - 1

## 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):

☐ WWF Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ DWH 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 Quad single Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
 County: \_\_\_\_\_ Township / City: \_\_\_\_\_

### MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation: 03/28/16 Quantity: ?  
 Photograph Information: 2 Photos; Upstream + Downstream  
 Elevated Turbidity? (Y/N) N Canopy (% open): 15  
 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 (± 0.1): \_\_\_\_\_ Conductivity (µmhos/cm): \_\_\_\_\_  
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: N/A

### BIOTIC EVALUATION

Performed? (Y/N) N (If Yes, Record all observations. Voucher collection 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



ANALYST Initials: \_\_\_\_\_

PWH Form Page - 2

# **Ohio EPA** Primary Headwater Habitat Evaluation Form

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

55

SITE NAME/LOCATION: Good Hope - 032916-03 SITE NUMBER: 03 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (m<sup>2</sup>): \_\_\_\_\_  
 LENGTH OF STREAM REACH (R): 600 ft LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 03/29/16 SCORER: NOT/BLR COMMENTS: Permanent

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

STREAM CHANNEL ☐ NONE/NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: Pipeline/Trench ROW + Stream Ford

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>250 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 type="checkbox"/> COBBLE (65-250 mm) (12 pts)	15	<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	20	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	20	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 15 (A) 15 (B) 5  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 (30 pts)  
☐ > 22.5 - 30 cm (20 pts)  
☐ > 10 - 22.5 cm (15 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: Very shallow

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ < 4.0 meters (< 13') (20 pts)  
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') (25 pts)  
☒ > 4.0 m - 3.0 m (> 4' 8" - 9' 7") (20 pts)

COMMENTS: best

AVERAGE BANKFULL WIDTH (meters): 4

HHEI Metric Points  
 Substrate Max = 40  
 20  
 A + B

Pool Depth  
 Max = 30  
 20

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: (Per Bank) L R (Most Predominant per Bank) L R

☐ Wide > 10m ☐ Mature Forest, Wetland ☐ Conservation Tillage

☐ Moderate 5-10m ☐ Immature Forest, Shrub or Old Field ☐ Urban or Industrial

☒ Narrow < 5m ☒ Residential, Park, New Field ☐ Open Pasture, Row Crop

☐ None ☐ Fenced Pasture ☐ Mining or Construction

COMMENTS: Agriculture surrounding, but some wooded areas

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  
☒ Stream Flowing ☐ Moist Channel, isolated pools, no flow (intermittent)  
☐ Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (Ephemeral)

COMMENTS: \_\_\_\_\_

BIQUANTITY (Number of bends per 61 m (200 ft) of channel). (Check ONLY one box):  
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0  
☐ 0.5 ☐ 1.5 ☐ 2.5

STREAM GRADIENT ESTIMATE  
☒ Flat (< 5 ft/mi) ☐ Flat to Moderate ☐ Moderate to Severe ☐ Severe (> 10 ft/mi)

PWH Form Page - 1

## 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):

☐ WWF Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
☐ DWH 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 Quad single Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
 County: \_\_\_\_\_ Township / City: \_\_\_\_\_

### MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation: 03/28/16 Quantity: ?  
 Photograph Information: 4 Photos; Upstream + Downstream  
 Elevated Turbidity? (Y/N) N Canopy (% open): 35%  
 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 (± 0.1): \_\_\_\_\_ Conductivity (µmhos/cm): \_\_\_\_\_  
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: N/A

### BIOTIC EVALUATION

Performed? (Y/N) N (If Yes, Record all observations. Voucher collection 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



ANALYST Initials: \_\_\_\_\_

PWH Form Page - 2



[illegible][illegible]

**ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):**

OHEI PERFORMED? - ☐ Yes ☒ No OHEI Score \_\_\_\_\_ (If Yes, Attach Completed OHEI Form)

DOWNTHEAM DESIGNATED USE(S): \_\_\_\_\_

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

☐ CWRI Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

☐ BWH Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadmap 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) 90

Were samples collected for water chemistry? (Y/N) N (note lab sample no. or kit and attach results) Lab Name(s): \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (SU.3) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) Y. If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOIC 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 Priority 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) \_\_\_\_\_ Aqueatic 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 →

4 ft deep

5 ft deep

10 ft wide

4.0 ft wide

DEM

10 ft

PERM

4.0 ft wide

[illegible]

**Ohio EPA Primary Headwater Habitat Evaluation Form**

HHEI Score (sum of metrics 1, 2, 3): **51**

Stream 47, Modified Class 2

SITE NAME/LOCATION: Good Hope - Harrison

SITE NUMBER: 111-3046-1 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_

LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_

DATE: 3/24/2016 SCORER: PJR COMMENTS: Intermittent stream

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PFWH 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 40). 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"/> BLK SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>25 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 type="checkbox"/> COBBLE (5-25 mm) [12 pts]	5	<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	25	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) [8 pts]		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Blk Slabs, Boulder, Cobble, Bedrock: **5** (A) **12** (B) **4**

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):

☐ > 30 centimeters [20 pts]

☐ > 22.5 - 30 cm [10 pts]

☒ > 10 - 22.5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): **10**

**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 (> 4'8" - 9'7") [20 pts]

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

☐ < 1.0 m (< 3'3") [5 pts]

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): **2.5**

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)

☐ Wide >10m

☐ Moderate 5-10m

☒ Narrow <5m

☐ None

COMMENTS: \_\_\_\_\_

**FLOODPLAIN QUALITY**

L R (Most Predominant per Bank)

☐ Mature Forest, Wetland

☐ Immature Forest, Shrub or Old Field

☐ Residential, Park, New Field

☐ Fenced Pasture

☐ Conservation Tillage

☐ Urban or Industrial

☒ Open Pasture, Row Crop

☐ Mining or Construction

COMMENTS: \_\_\_\_\_

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

☐ Stream Flowing

☐ Subsurface flow with isolated pools (intermittent)

☐ Moist Channel, isolated pools, no flow (intermittent)

☐ Dry channel, no water (ephemeral)

COMMENTS: \_\_\_\_\_

**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

COMMENTS: \_\_\_\_\_

**STREAM GRADIENT ESTIMATE**

☐ Flat (<5%)

☐ Flat to Moderate

☒ Moderate (5-10%)

☐ Moderate to Severe

☐ Severe (>10%)

April 2016 Edition

PFWH Form Page - 1

**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): 95

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 Toads 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 →

Row Crop

4' wide

10' wide

10' wide

Row Crop

PFWH Form Page - 2

**Ohio EPA Primary Headwater Habitat Evaluation Form**

HHEI Score (sum of metrics 1, 2, 3): **47**

Stream 48, Modified Class 2

SITE NAME/LOCATION: Good Hope - Harrison

SITE NUMBER: 111-3046-2 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_

LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_

DATE: 5/19/2016 SCORER: PJR COMMENTS: Intermittent stream

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PFWH 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 40). 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"/> BLK SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>25 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 type="checkbox"/> COBBLE (5-25 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN (3 pts)	
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	15	<input type="checkbox"/> MUCK (3 pts)	
<input type="checkbox"/> SAND (<2 mm) [8 pts]		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Blk Slabs, Boulder, Cobble, Bedrock: **0** (A) **12** (B) **3**

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):

☐ > 30 centimeters [20 pts]

☐ > 22.5 - 30 cm [10 pts]

☒ > 10 - 22.5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): **5**

**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 (> 4'8" - 9'7") [20 pts]

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

☐ < 1.0 m (< 3'3") [5 pts]

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): **2.1**

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)

☐ Wide >10m

☐ Moderate 5-10m

☒ Narrow <5m

☐ None

COMMENTS: \_\_\_\_\_

**FLOODPLAIN QUALITY**

L R (Most Predominant per Bank)

☐ Mature Forest, Wetland

☐ Immature Forest, Shrub or Old Field

☐ Residential, Park, New Field

☐ Fenced Pasture

☐ Conservation Tillage

☐ Urban or Industrial

☒ Open Pasture, Row Crop

☐ Mining or Construction

COMMENTS: \_\_\_\_\_

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

☐ Stream Flowing

☐ Subsurface flow with isolated pools (intermittent)

☐ Moist Channel, isolated pools, no flow (intermittent)

☐ Dry channel, no water (ephemeral)

COMMENTS: \_\_\_\_\_

**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

COMMENTS: \_\_\_\_\_

**STREAM GRADIENT ESTIMATE**

☐ Flat (<5%)

☐ Flat to Moderate

☒ Moderate (5-10%)

☐ Moderate to Severe

☐ Severe (>10%)

April 2016 Edition

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**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): 95

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 Toads 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 →

Row Crop

10' wide

10' wide

10' wide

Row Crop

PFWH Form Page - 2

**OhioEPA Primary Headwater Habitat Evaluation Form**  
HHEI Score (sum of metrics 1, 2, 3): **53** Stream 49, Modified Class 2

SITE NAME/LOCATION: Good Hope - Mainstem  
SITE NUMBER: 04-010416-2 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
DATE: 3/24/16 SCORER: PSR COMMENTS: Intermittent stream

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWHH 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 40). 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"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>2</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>40</u>
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	<u>5</u>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>8</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>51</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>2</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bdr Slabs, Boulder, Cobble, Bedrock: 10 (A) 12 (B) 10 A + B

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: \_\_\_\_\_ TOTAL NUMBER OF SUBSTRATE TYPES: 6

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

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): 10

**3. BANK FULL WIDTH** (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.6 meters (> 15') [30 pts] ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [10 pts] ☐ < 1.0 m (< 3' 3") [5 pts]

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): 1.5

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input type="checkbox"/> Wide >10m	<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"/> 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 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"/> None	<input type="checkbox"/> Fenced Pasture	<input type="checkbox"/> Mining or Construction

COMMENTS: \_\_\_\_\_

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☐ Stream flowing  
☐ Subsurface flow with isolated pools (Intermittent) ☒ Moist Channel, isolated pools, no flow (Intermittent)  
☐ Dry channel, no water (Ephemeral)

COMMENTS: \_\_\_\_\_

**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 (< 1%) ☐ Rel to Moderate ☒ Moderate (> 1% to < 2%) ☐ Moderate to Severe ☐ Severe (> 2% to < 4%)

PWHH Form Page - 1

**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): \_\_\_\_\_

WWM Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
CWM Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
EWM 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): 85

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: \_\_\_\_\_

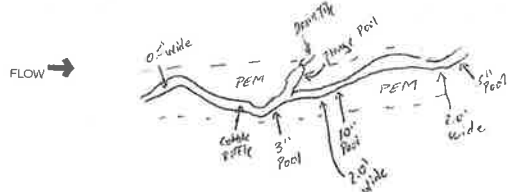
**BIOTIC EVALUATION**

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



APR 27, 2017 Revision

PWHH Form Page - 2

**OhioEPA Primary Headwater Habitat Evaluation Form**  
HHEI Score (sum of metrics 1, 2, 3): **29** Stream 50, Modified Class 1

SITE NAME/LOCATION: Good Hope - Mainstem  
SITE NUMBER: 04-010416-4 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>): \_\_\_\_\_  
LENGTH OF STREAM REACH (ft): \_\_\_\_\_ LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
DATE: 3/14/2016 SCORER: PSR COMMENTS: Intermittent stream

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWHH 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 40). 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"/> SILT [3 pts]	<u>50</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>8</u>
<input type="checkbox"/> BEDROCK [16 pts]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<input type="checkbox"/> CLAY or HARDPAN [0 pts]	
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	<u>5</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bdr Slabs, Boulder, Cobble, Bedrock: 0 (A) 6 (B) 3 A + B

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: \_\_\_\_\_ TOTAL NUMBER OF SUBSTRATE TYPES: 3

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

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): 3

**3. BANK FULL WIDTH** (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4.6 meters (> 15') [30 pts] ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [10 pts] ☐ < 1.0 m (< 3' 3") [5 pts]

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): 1.2

This information must also be completed

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

RIPARIAN ZONE		FLOODPLAIN QUALITY	
L	R	L	R
<input type="checkbox"/> Wide >10m	<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"/> 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 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"/> None	<input type="checkbox"/> Fenced Pasture	<input type="checkbox"/> Mining or Construction

COMMENTS: \_\_\_\_\_

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):  
☐ Stream flowing  
☐ Subsurface flow with isolated pools (Intermittent) ☒ Moist Channel, isolated pools, no flow (Intermittent)  
☐ Dry channel, no water (Ephemeral)

COMMENTS: \_\_\_\_\_

**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 (< 1%) ☒ Rel to Moderate ☐ Moderate (> 1% to < 2%) ☐ Moderate to Severe ☐ Severe (> 2% to < 4%)

PWHH Form Page - 1

**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): \_\_\_\_\_

WWM Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
CWM Name: \_\_\_\_\_ Distance from Evaluated Stream: \_\_\_\_\_  
EWM 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): 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: \_\_\_\_\_

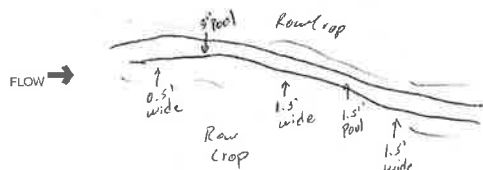
**BIOTIC EVALUATION**

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): \_\_\_\_\_ 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



APR 27, 2017 Revision

PWHH Form Page - 2





IMPLED REACH		STAGE		CLARITY		BI/ AESTHETIC		DI/ MAINTENANCE		E/ ISSUES		F/ MEASUREMENTS	
check ALL	near apply	100	2nd	100	2nd	100	2nd	100	2nd	100	2nd	100	2nd
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> </											

**Team Drawing:**

**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)

WQH Name	Distance From Evaluated Stream
CWH Name	Distance From Evaluated Stream
AWH 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: 28941 2736  
 Elevated Turbidity? (Y/N) N Ceruzzi (W open) 100  
 Were samples collected for water chemistry? (Y/N) N (Node lake sample no. 0 and attach results) Lab Number: \_\_\_\_\_  
 Field Notes: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/L) \_\_\_\_\_ pH (SU) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_  
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: All voucher samples must be labeled with the ID number. Indicate appropriate field data sheets from the Primary/Secondary 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.



## Primary Headwater Habitat Evaluation Form

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

29

SITE NAME/LOCATION: HH-BAE-032416-03 SITE NUMBER: 03 RIVER BASIN: OHIO DRAINAGE AREA (mi<sup>2</sup>): 1.0  
 LENGTH OF STREAM REACH (ft): 100 LAT: 40° 15' N LONG: 83° 24' W RIVER CODE: 1 RIVER MILE: 1.0  
 DATE: 3/14/16 SCORER: W. J. C. / J. C. / J. C. COMMENTS: late evaluation

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 RECOVERYMODIFICATIONS: 1/10/16 / 1/10/16 / 1/10/16

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>256 mm) (16 pts)		<input type="checkbox"/> LEAF PACKWOODY DEBRIS (3 pts)	
<input type="checkbox"/> BEDROCK (16 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)	
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)	10	<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	40	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	40	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bar Slabs, Boulder, Cobble, Bedrock: (A) 15 (B) 4  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 19 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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters (20 pts)  
☐ > 22.5 - 30 cm (10 pts)  
☒ > 10 - 22.5 cm (5 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: max pool depth 15 cm MAXIMUM POOL DEPTH (centimeters): 15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4 meters (> 12 ft) (20 pts)  
☐ > 3.0 m - 4.0 m (> 9'7" - 13') (15 pts)  
☒ > 1.5 m - 3.0 m (> 4'8" - 9'7") (10 pts)  
☐ < 1.0 m (< 3'3" - 4'8") (5 pts)

COMMENTS: avg bank full width 1.5 m AVERAGE BANK FULL WIDTH (meters): 1.5

HHEI Metric Points

Substrate  
Max = 40

19

A + B

Pool Depth

Max = 30

15

Bankfull Width

Max=20

10

5

This information must also be completed

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

RIPARIAN WIDTH (Per Bank)

FLOODPLAIN QUALITY (Most Predominant per Bank)

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

COMMENTS: max pool depth 15 cm

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

Stream Flowing

Subsurface flow with isolated pools (intermittent)

COMMENTS: max pool depth 15 cm

SHRUBBINESS (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

&gt;3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/m or less)

Flat to Moderate

Moderate (0.5 to 1 ft/m)

Moderate to Severe

Severe (1.0 ft/m or more)

PHWH Form Page - 1



## Primary Headwater Habitat Evaluation Form

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

45

SITE NAME/LOCATION: HH-BAE-032416-01 SITE NUMBER: 01 RIVER BASIN: OHIO DRAINAGE AREA (mi<sup>2</sup>): 1.0  
 LENGTH OF STREAM REACH (ft): 100 LAT: 40° 15' N LONG: 83° 24' W RIVER CODE: 1 RIVER MILE: 1.0  
 DATE: 3/14/16 SCORER: W. J. C. / J. C. / J. C. COMMENTS: late evaluation

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 RECOVERYMODIFICATIONS: 1/10/16 / 1/10/16 / 1/10/16

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>256 mm) (16 pts)		<input type="checkbox"/> LEAF PACKWOODY DEBRIS (3 pts)	
<input type="checkbox"/> BEDROCK (16 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)	
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	10	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	10	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bar Slabs, Boulder, Cobble, Bedrock: (A) 5 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 10 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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters (20 pts)  
☐ > 22.5 - 30 cm (10 pts)  
☒ > 10 - 22.5 cm (5 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: max pool depth 15 cm MAXIMUM POOL DEPTH (centimeters): 15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4 meters (> 12 ft) (20 pts)  
☐ > 3.0 m - 4.0 m (> 9'7" - 13') (15 pts)  
☒ > 1.5 m - 3.0 m (> 4'8" - 9'7") (10 pts)  
☐ < 1.0 m (< 3'3" - 4'8") (5 pts)

COMMENTS: avg bank full width 1.5 m AVERAGE BANK FULL WIDTH (meters): 1.5

HHEI Metric Points

Substrate  
Max = 40

20

A + B

Pool Depth

Max = 30

15

Bankfull Width

Max=20

10

5

This information must also be completed

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

RIPARIAN WIDTH (Per Bank)

FLOODPLAIN QUALITY (Most Predominant per Bank)

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

COMMENTS: max pool depth 15 cm

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

Stream Flowing

Subsurface flow with isolated pools (intermittent)

COMMENTS: max pool depth 15 cm

SHRUBBINESS (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

&gt;3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/m or less)

Flat to Moderate

Moderate (0.5 to 1 ft/m)

Moderate to Severe

Severe (1.0 ft/m or more)

PHWH Form Page - 1

## 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)

WVH 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: 3/14/16 Quantity: \_\_\_\_\_Photograph information: 2872Elevated Turbidity? (Y/N) N Canopy (% open): 10Were samples collected for water chemistry? (Y/N) N (Hide lab sample no. 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



PHWH Form Page - 2



## Primary Headwater Habitat Evaluation Form

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

45

SITE NAME/LOCATION: HH-BAE-032416-01 SITE NUMBER: 01 RIVER BASIN: OHIO DRAINAGE AREA (mi<sup>2</sup>): 1.0  
 LENGTH OF STREAM REACH (ft): 100 LAT: 40° 15' N LONG: 83° 24' W RIVER CODE: 1 RIVER MILE: 1.0  
 DATE: 3/14/16 SCORER: W. J. C. / J. C. / J. C. COMMENTS: late evaluation

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 RECOVERYMODIFICATIONS: 1/10/16 / 1/10/16 / 1/10/16

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<input type="checkbox"/> BOULDER (>256 mm) (16 pts)		<input type="checkbox"/> LEAF PACKWOODY DEBRIS (3 pts)	
<input type="checkbox"/> BEDROCK (16 pts)		<input type="checkbox"/> FINE DETRITUS (3 pts)	
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (0 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	10	<input type="checkbox"/> MUCK (0 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	10	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Bar Slabs, Boulder, Cobble, Bedrock: (A) 5 (B) 5  
 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 10 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 stormwater pipes). (Check ONLY one box):  
☐ > 30 centimeters (20 pts)  
☐ > 22.5 - 30 cm (10 pts)  
☒ > 10 - 22.5 cm (5 pts)  
☐ NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS: max pool depth 15 cm MAXIMUM POOL DEPTH (centimeters): 15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements). (Check ONLY one box):  
☐ > 4 meters (> 12 ft) (20 pts)  
☐ > 3.0 m - 4.0 m (> 9'7" - 13') (15 pts)  
☒ > 1.5 m - 3.0 m (> 4'8" - 9'7") (10 pts)  
☐ < 1.0 m (< 3'3" - 4'8") (5 pts)

COMMENTS: avg bank full width 1.5 m AVERAGE BANK FULL WIDTH (meters): 1.5

HHEI Metric Points

Substrate  
Max = 40

20

A + B

Pool Depth

Max = 30

15

Bankfull Width

Max=20

10

5

This information must also be completed

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

RIPARIAN WIDTH (Per Bank)

FLOODPLAIN QUALITY (Most Predominant per Bank)

Conservation Tillage

Urban or Industrial

Open Pasture, Row Crop

Mining or Construction

COMMENTS: max pool depth 15 cm

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

Stream Flowing

Subsurface flow with isolated pools (intermittent)

COMMENTS: max pool depth 15 cm

SHRUBBINESS (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

&gt;3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/m or less)

Flat to Moderate

Moderate (0.5 to 1 ft/m)

Moderate to Severe

Severe (1.0 ft/m or more)

PHWH Form Page - 1

## 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)

WVH 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) N Date of last precipitation: 3/14/16 Quantity: \_\_\_\_\_Photograph information: 2879 upElevated Turbidity? (Y/N) N Canopy (% open): 10Were samples collected for water chemistry? (Y/N) N (Hide lab sample no. 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



PHWH Form Page - 2





# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

 QHEI Score: **63.5**

 Stream & Location: Harrison, OH

OH-BAE-032416-01

 Date: 3/21/16

 Scorers Full Name & Affiliation: BAE/CMS

 Lat/Long: 18

 River Code: STORET #:

1) SUBSTRATE Check ONLY 1-2 substrate TYPE BOXES.

BEST TYPES	POOL RIFFLE	OTHER TYPES	POOL RIFFLE	ORIGIN	QUALITY
<input type="checkbox"/> BLDG SLABS (10)	<input type="checkbox"/> HARDPAN (4)	<input type="checkbox"/> LIMESTONE (1)	<input type="checkbox"/> HEAVY (2)	<input type="checkbox"/> SILT	<input type="checkbox"/> MODERATE (-1)
<input type="checkbox"/> BOULDER (8)	<input type="checkbox"/> DETRITUS (3)	<input type="checkbox"/> TILLS (1)	<input type="checkbox"/> MODERATE (-1)	<input type="checkbox"/> MUCK (2)	<input type="checkbox"/> NORMAL (0)
<input type="checkbox"/> COBBLE (6)	<input type="checkbox"/> MUCK (2)	<input type="checkbox"/> WETLANDS (0)	<input type="checkbox"/> FREE (1)	<input type="checkbox"/> SAND (5)	<input type="checkbox"/> EXTENSIVE (-2)
<input type="checkbox"/> GRAVEL (7)	<input type="checkbox"/> SILT (2)	<input type="checkbox"/> HARDPAN (0)	<input type="checkbox"/> MODERATE (-1)	<input type="checkbox"/> BEDROCK (6)	<input type="checkbox"/> NONE (1)
<input type="checkbox"/> SAND (5)	<input type="checkbox"/> ARTIFICIAL (0)	<input type="checkbox"/> RIPRAP (0)	<input type="checkbox"/> NONE (1)		
<input type="checkbox"/> BEDROCK (6)		<input type="checkbox"/> LACUSTURINE (0)			

 NUMBER OF BEST TYPES: 2 4 or more (2) sludge from point-source)
 

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 rootwads in deep or fast water, or deep, well-defined, functional pools).

COVER	AMOUNT
<input type="checkbox"/> UNDERCUT BANKS (1)	<input type="checkbox"/> EXTENSIVE >75% (1)
<input type="checkbox"/> OVERHANGING VEGETATION (1)	<input type="checkbox"/> MODERATE 25-75% (7)
<input type="checkbox"/> SHALLOW IN LOW WATER (1)	<input type="checkbox"/> SPARSE 5-25% (3)
<input type="checkbox"/> ROOTWADS (1)	<input type="checkbox"/> NEARLY ABSENT <5% (1)

Comments:

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; 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 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:

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

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input 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 type="checkbox"/> NONE (0)	<input type="checkbox"/> OPEN PASTURE, ROWCROP (0)

Comments:

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
<input type="checkbox"/> > 1m (8)	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH (2)	<input type="checkbox"/> TORRENTIAL (-1) 2) SLOW (1)
<input type="checkbox"/> 0.7-1m (4)	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH (1)	<input type="checkbox"/> VERY FAST (1)
<input type="checkbox"/> 0.4-0.7m (2)	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH (0)	<input type="checkbox"/> FAST (1)
<input type="checkbox"/> 0.2-0.4m (1)		<input type="checkbox"/> MODERATE (1)
<input type="checkbox"/> < 0.2m (0)		<input type="checkbox"/> EDDIES (-1)

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 type="checkbox"/> BEST AREAS > 10cm (2)	<input type="checkbox"/> MAXIMUM > 50cm (2)	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) (1)	<input type="checkbox"/> NONE (3)
<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-d)		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) (0)	<input type="checkbox"/> MODERATE (0)
			<input type="checkbox"/> EXTENSIVE (-1)

Comments:

6) GRADIENT / DRAINAGE AREA

GRADIENT	DRAINAGE AREA
<input type="checkbox"/> VERY LOW - LOW (2-4)	<input type="checkbox"/> POOL: <u>2.0</u>
<input type="checkbox"/> MODERATE (5-10)	<input type="checkbox"/> GLIDE: <u>6.0</u>
<input type="checkbox"/> HIGH - VERY HIGH (10-6)	<input type="checkbox"/> RUN: <u>0</u>

Comments:



## Primary Headwater Habitat Evaluation Form

 HHEI Score (sum of metrics 1, 2, 3): **27**

 SITE NAME/LOCATION: 18 m 200 ft 120

 HHEI Score: 032416-02 SITE NUMBER: 12 RIVER BASIN: 18 DRAINAGE AREA (mi<sup>2</sup>): 1.0

 LENGTH OF STREAM REACH (ft): 100 LAT: 18 LONG: 18 RIVER CODE: 18 RIVER MILE: 18

 DATE: 3/21/16 SCORER: BAE/CMS COMMENTS: Intermittent

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

 STREAM CHANNEL: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY
 
 MODIFICATIONS: by broken 04 file

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY 1-2 predominant substrate TYPE boxes (Max of 4). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A &amp; B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	
<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 type="checkbox"/> COBBLE (65-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)		<input type="checkbox"/> MUCK (2 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)		<input type="checkbox"/> ARTIFICIAL (2 pts)	

 Total Percentages of: (A) 15 (B) 4

 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 4

2. Maximum Pool Depth (Measure the maximum pool depth within the 81 meter (260 ft) evaluation reach at the time of evaluation. Round plunge pools from road culverts or storm water pipes). (Check ONLY one box):

POOL DEPTH	SCORE
<input type="checkbox"/> > 30 centimeters (20 pts)	<u>2</u>
<input type="checkbox"/> 22.5 - 30 cm (10 pts)	
<input type="checkbox"/> > 10 - 22.5 cm (5 pts)	

 COMMENTS: MAXIMUM POOL DEPTH (centimeters):

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

BANK FULL WIDTH	SCORE
<input type="checkbox"/> > 4.0 meters (> 13') (10 pts)	<u>5</u>
<input type="checkbox"/> 3.0 m - 4.0 m (> 9' - 13') (5 pts)	
<input type="checkbox"/> 1.5 m - 3.0 m (> 4' - 9') (20 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 ZONE	FLOODPLAIN QUALITY
<input type="checkbox"/> R (Per Bank)	<input type="checkbox"/> (Most Predominant per Bank)
<input type="checkbox"/> Wide > 10m	<input type="checkbox"/> Mature Forest, Wetland
<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/> Narrow < 5m	<input type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/> None	<input type="checkbox"/> Fenced Pasture

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

FLOW REGIME	SCORE
<input type="checkbox"/> Stream Flowing	<u>3</u>
<input type="checkbox"/> Subsurface flow with isolated pools (intermittent)	
<input type="checkbox"/> Dry channel, no water (ephemeral)	

COMMENTS:

SINUOSITY (Number of bends per 81 m (260 ft) of channel). (Check ONLY one box):

SINUOSITY	SCORE
<input type="checkbox"/> > 4.0	<u>3</u>
<input type="checkbox"/> 1.0 - 4.0	
<input type="checkbox"/> 0.5	

STREAM GRADIENT ESTIMATE

GRADIENT	SCORE
<input type="checkbox"/> Flat to Moderate	<u>3</u>
<input type="checkbox"/> Moderate to Severe	
<input type="checkbox"/> Severe	

PWH Form Page - 1

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

 QHEI PERFORMED? ☐ Yes ☒ No QHEI Score: 63.5 (If Yes, Attach Completed QHEI Form)
 

DOWNSTREAM DESIGNATED USE(S):

USE	NAME	DISTANCE FROM EVALUATED STREAM
<input type="checkbox"/> WWH Name		
<input type="checkbox"/> CWH Name		
<input type="checkbox"/> EVH Name		

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

 USGS Catalog Name: 18 m 200 ft 120 NRCS Soil Map Page: 18 NRCS Soil Map Stream Order: 18

 County: 18 Township/City: 18

MISCELLANEOUS

 Base Flow Conditions? (Y/N) N Date of last precipitation: 18 Quantity: 18

Photograph Information

 Elevated Turbidity? (Y/N) N Canopy (% open) 50

 Were samples collected for water chemistry? (Y/N) N (Note: no sample no or id and attach results) Lab Number: 18

 Field Measures: Temp (C) 18 Dissolved Oxygen (mg/L) 18 pH (S U) 18 Conductivity (µmhos/cm) 18

 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: w/ voucher samples must be shared with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessments 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 Bioty:

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

PWH Form Page - 2

# **OhioEPA** Qualitative Habitat Evaluation Index and Use Assessment Field Sheet **QHEI Score: 60**

 Stream & Location: Good Warmwater AEP Harrison-Good Hope, RM: 0122416-01 Date: 01/11/06

 River Code: 0122416-01 STORET #: 18

1) SUBSTRATE Check ONLY two substrate TYPE boxes estimate % of total every type present. Check ONE (Or 2 &amp; average) ORIGIN QUALITY

<input type="checkbox"/> BLDG SLABS (10)	<input type="checkbox"/> POOL RIFLE	<input type="checkbox"/> OTHER TYPES	<input type="checkbox"/> POOL RIFLE	<input type="checkbox"/> LIMESTONE (1)	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY (1)	<input type="checkbox"/> MODERATE (1)	<input type="checkbox"/> NORMAL (1)	<input type="checkbox"/> SUBSTRATE
<input type="checkbox"/> BOULDER (9)	<input type="checkbox"/> GRAVEL (8)	<input type="checkbox"/> SAND (7)	<input type="checkbox"/> BEDROCK (6)	<input type="checkbox"/> HARDPAN (1)	<input type="checkbox"/> SILT (2)	<input type="checkbox"/> EXTENSIVE (1)	<input type="checkbox"/> MODERATE (1)	<input type="checkbox"/> NORMAL (1)	<input type="checkbox"/> NONE (1)
<input type="checkbox"/> GRAVEL (8)	<input type="checkbox"/> SAND (7)	<input type="checkbox"/> BEDROCK (6)	<input type="checkbox"/> HARDPAN (1)	<input type="checkbox"/> SILT (2)	<input type="checkbox"/> EXTENSIVE (1)	<input type="checkbox"/> MODERATE (1)	<input type="checkbox"/> NORMAL (1)	<input type="checkbox"/> NONE (1)	<input type="checkbox"/> SUBSTRATE
<input type="checkbox"/> GRAVEL (8)	<input type="checkbox"/> SAND (7)	<input type="checkbox"/> BEDROCK (6)	<input type="checkbox"/> HARDPAN (1)	<input type="checkbox"/> SILT (2)	<input type="checkbox"/> EXTENSIVE (1)	<input type="checkbox"/> MODERATE (1)	<input type="checkbox"/> NORMAL (1)	<input type="checkbox"/> NONE (1)	<input type="checkbox"/> SUBSTRATE

 NUMBER OF BEST TYPES: 3

 Comments: 3

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 or fast water, or deep, well-defined, functional pools)

<input type="checkbox"/> UNDERCUT BANKS (1)	<input type="checkbox"/> OVERHANGING VEGETATION (1)	<input type="checkbox"/> SHALLOWS (IN SLOW WATER) (1)	<input type="checkbox"/> ROOTWADS (1)	<input type="checkbox"/> BOULDERS (1)	<input type="checkbox"/> AQUATIC MACROPHYTES (1)	<input type="checkbox"/> LOGS OR WOODY DEBRIS (1)
---	---	---	---------------------------------------	---------------------------------------	--	---

 Comments: 1

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

<input type="checkbox"/> HIGH (4)	<input type="checkbox"/> EXCELLENT (7)	<input type="checkbox"/> NONE (9)	<input type="checkbox"/> HIGH (3)
<input type="checkbox"/> MODERATE (3)	<input type="checkbox"/> GOOD (6)	<input type="checkbox"/> RECOVERED (4)	<input type="checkbox"/> MODERATE (2)
<input type="checkbox"/> LOW (2)	<input type="checkbox"/> FAIR (5)	<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)	<input type="checkbox"/> NONE (1)

 Comments: 1

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

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

 Comments: 1.5

5) POOL / GUIDE AND RIFLE / RUN QUALITY

<input type="checkbox"/> MAXIMUM DEPTH	<input type="checkbox"/> CHANNEL WIDTH	<input type="checkbox"/> CURRENT VELOCITY
<input type="checkbox"/> > 1m (4)	<input type="checkbox"/> POOL WIDTH > RIFLE WIDTH (2)	<input type="checkbox"/> TORRENTIAL (1)
<input type="checkbox"/> 0.7-1m (4)	<input type="checkbox"/> POOL WIDTH = RIFLE WIDTH (1)	<input type="checkbox"/> SLOW (1)
<input type="checkbox"/> 0.4-0.7m (2)	<input type="checkbox"/> POOL WIDTH < RIFLE WIDTH (0)	<input type="checkbox"/> VERY FAST (1)
<input type="checkbox"/> 0.2-0.4m (1)		<input type="checkbox"/> INTERSTITIAL (1)
<input type="checkbox"/> < 0.2m (0)		<input type="checkbox"/> FAST (1)
		<input type="checkbox"/> MODERATE (1)
		<input type="checkbox"/> EDGES (1)

 Comments: 2

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

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

 Comments: 1

6) GRADIENT / DRAINAGE AREA

<input type="checkbox"/> GRADIENT	<input type="checkbox"/> DRAINAGE AREA
<input type="checkbox"/> VERY LOW - LOW (2-4)	<input type="checkbox"/> MODERATE (10-100)
<input type="checkbox"/> MODERATE (10-100)	<input type="checkbox"/> HIGH - VERY HIGH (100-4)

 Comments: 1.5

EPA 4520

## **OhioEPA** Primary Headwater Habitat Evaluation Form **33**

 HHEI Score (sum of metrics 1, 2, 3): 33

 SITE NAME/LOCATION: AEP Good Hope-Harrison

 SITE NUMBER: 0122416-01 RIVER BASIN: 0122416-01 DRAINAGE AREA (mi<sup>2</sup>): 1.5

 LENGTH OF STREAM REACH (ft): 100 LAT: 40° 15' N LONG: 80° 45' W RIVER CODE: 0122416-01 RIVER MI F: 0.1

 DATE: 03/24/16 SCORER: BAOJBL COMMENTS: Intermittent; hh-bao-032416-04

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

riparian cut w/in ROW

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 6). Final metric score is sum of boxes A &amp; B.)

<input type="checkbox"/> TYPE	<input type="checkbox"/> PERCENT	<input type="checkbox"/> TYPE	<input type="checkbox"/> PERCENT
<input type="checkbox"/> BLDG SLABS (16 pts)	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT (3 pts)	<input type="checkbox"/> 40%
<input type="checkbox"/> BOULDER (>256 mm) (16 pts)	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pts)	<input type="checkbox"/> 15%
<input type="checkbox"/> BEDROCK (16 pts)	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS (3 pts)	<input type="checkbox"/> 0%
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)	<input type="checkbox"/> 0%	<input type="checkbox"/> CLAY or HARDPAN (0 pts)	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (25-65 mm) (9 pts)	<input type="checkbox"/> 10%	<input type="checkbox"/> MUCK (0 pts)	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) (6 pts)	<input type="checkbox"/> 85%	<input type="checkbox"/> ARTIFICIAL (3 pts)	<input type="checkbox"/> 0%

 Total Percentages of Bldg Slabs, Boulder, Cobble, Bedrock: 0.00% (A)

 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

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"/> > 10 - 22.5 cm (25 pts)
<input type="checkbox"/> > 22.5 - 30 cm (30 pts)	<input type="checkbox"/> < 5 cm (5 pts)	<input type="checkbox"/> NO WATER OR MOIST CHANNEL (0 pts)

 COMMENTS: Inches MAXIMUM POOL DEPTH (centimeters): 4

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' - 5' (15 pts))
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' - 13' (25 pts))	<input type="checkbox"/> < 1.0 m (< 3' (5 pts))
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' - 9' (20 pts))	

 COMMENTS: In feet AVERAGE BANKFULL WIDTH (meters): 2.50

This information must also be completed

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

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

 COMMENTS: Intermittent

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

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

 COMMENTS: Intermittent

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

<input 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"/> > 3.0

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat to Slight (1)	<input type="checkbox"/> Moderate (2 to 100)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 to 100)
---	--	---	---

PHWH Form Page - 1

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

 QHEI PERFORMED? ☒ Yes ☐ No QHEI Score: 60 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

 WWH Name: Good Hope-Harrison Distance from Evaluated Stream: 0.1

 CWI Name: Good Hope-Harrison Distance from Evaluated Stream: 0.1

 EWH Name: Good Hope-Harrison Distance from Evaluated Stream: 0.1

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

 USGS Quadrangle Name: Franklin NRCS Soil Map Page: 1 NRCS Soil Map Stream Order: 1

 County: Franklin Township / City: Franklin

MISCELLANEOUS

 Base Flow Conditions? (Y/N): Y Date of last precipitation: 03/24/16 Quantity: 0.00

 Photograph Information: 2 photos

 Elevated Turbidity? (Y/N): Y Canopy (% open): 70%

 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: 0

 Field Measures: Temp (°C): 15 Dissolved Oxygen (mg/L): 5.0 pH (S.U.): 7.0 Conductivity (µmhos/cm): 150

 Is the sampling reach representative of the stream? (Y/N): Y If not, please explain: recently cut scrub/shrub

 Additional comments/description of pollution impacts: recently cut scrub/shrub

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: recently cut scrub/shrub

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

hh-bao-032415-04

recently cut scrub/shrub

FLOW

existing ROW

wooded

PHWH Form Page - 2

# OhioEPA Primary Headwater Habitat Evaluation Form

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

33

SITE NAME/LOCATION: AEP Good Hope-Harrison

SITE NUMBER: RIVER BASIN: DRAINAGE AREA (mi<sup>2</sup>):

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

DATE: 03/24/16 SCORER: BAO/JBL COMMENTS: Intermittent; hh-bao-032416-03

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

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

riparian cut w/in ROW

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 5). Final metric score is sum of boxes A &amp; B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	40%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	15%
<input type="checkbox"/> BEDROCK [16 pts]	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 pts]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	25%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

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 [10 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: in inches MAXIMUM POOL DEPTH (centimeters): 3

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

COMMENTS: in feet AVERAGE BANKFULL WIDTH (meters): 2.00

HHEI Metric Points

Substrate Max = 40

13

A + B

Pool Depth Max = 30

15

Bankfull Width Max = 30

5

This information must also be completed

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

RIPARIAN WIDTH

(Per Bank)

Wide &gt;10m

Moderate 5-10m

Narrow &lt;5m

None

COMMENTS:

FLOODPLAIN QUALITY

(Most Predominant per Bank)

Mature Forest, Wetland

Immature Forest, Shrub or Old Field

Residential, Park, New Field

Fenced Pasture

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 (Intermittent)

COMMENTS: intermittent

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

&gt;3

STREAM GRADIENT ESTIMATE

☐ Flat (0 to 1:100 ft)☐ Flat to Moderate☐ Moderate (2 to 100 ft)☐ Moderate to Severe☐ Severe (10 to 100 ft)

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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: Franklin Township / City:

MISCELLANEOUS

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

Photograph Information: 2 photos

Elevated Turbidity? (Y/N): Y Canopy (% open): 70%

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 (3.13): 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)

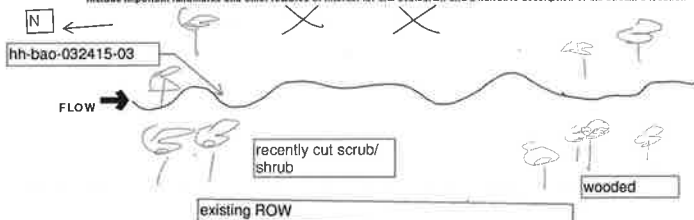
Fish Observed? (Y/N): N Voucher? (Y/N): N Salamanders Observed? (Y/N): N Voucher? (Y/N): N

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



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PWHH Form Page - 2

Save Map

Reset Form

# OhioEPA Primary Headwater Habitat Evaluation Form

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

23

SITE NAME/LOCATION: AEP Good Hope-Harrison

SITE NUMBER: RIVER BASIN: DRAINAGE AREA (mi<sup>2</sup>):

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

DATE: 03/24/16 SCORER: BAO/JBL COMMENTS: ephemeral; hh-bao-032416-02

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

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

regularly maintained lawn

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 5). Final metric score is sum of boxes A &amp; B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	40%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	15%
<input type="checkbox"/> BEDROCK [16 pts]	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 pts]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [8 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	25%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

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 [10 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: in inches MAXIMUM POOL DEPTH (centimeters): 1

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

COMMENTS: in feet AVERAGE BANKFULL WIDTH (meters): 1.00

HHEI Metric Points

Substrate Max = 40

13

A + B

Pool Depth Max = 30

5

Bankfull Width Max = 30

5

This information must also be completed

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

RIPARIAN WIDTH

(Per Bank)

Wide &gt;10m

Moderate 5-10m

Narrow &lt;5m

None

COMMENTS:

FLOODPLAIN QUALITY

(Most Predominant per Bank)

Mature Forest, Wetland

Immature Forest, Shrub or Old Field

Residential, Park, New Field

Fenced Pasture

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 (Intermittent)

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

&gt;3

STREAM GRADIENT ESTIMATE

☐ Flat (0 to 1:100 ft)☐ Flat to Moderate☐ Moderate (2 to 100 ft)☐ Moderate to Severe☐ Severe (10 to 100 ft)

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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: Franklin Township / City:

MISCELLANEOUS

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

Photograph Information: 2 photos

Elevated Turbidity? (Y/N): Y Canopy (% open): 90%

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 (3.13): 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)

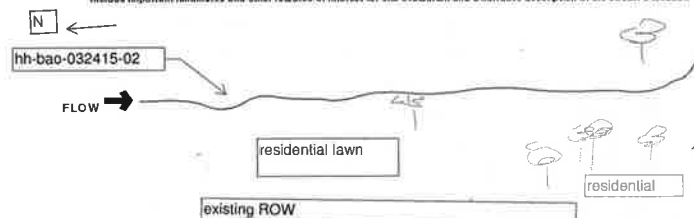
Fish Observed? (Y/N): N Voucher? (Y/N): N Salamanders Observed? (Y/N): N Voucher? (Y/N): N

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



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PWHH Form Page - 2



## Primary Headwater Habitat Evaluation Form

33

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

SITE NAME/LOCATION: AEP Good Hope-Harrison

SITE NUMBER: RIVER BASIN: DRAINAGE AREA (mi<sup>2</sup>):

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

DATE: 03/24/16 SCORER: BAO/JBL COMMENTS: Ephemeral; hh-bao-032416-01

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 one 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 pls)	0%	<input type="checkbox"/> SILT (3 pls)	40%
<input type="checkbox"/> BOULDER (>256 mm) (16 pls)	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pls)	15%
<input type="checkbox"/> BEDROCK (16 pls)	0%	<input type="checkbox"/> FINE DETRITUS (3 pls)	0%
<input type="checkbox"/> COBBLE (65-256 mm) (12 pls)	0%	<input type="checkbox"/> CLAY or HARDPAN (0 pls)	0%
<input type="checkbox"/> GRAVEL (2-64 mm) (9 pls)	15%	<input type="checkbox"/> MUCK (0 pls)	0%
<input type="checkbox"/> SAND (<2 mm) (6 pls)	30%	<input type="checkbox"/> ARTIFICIAL (3 pls)	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

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 pls)	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") (15 pls)
<input type="checkbox"/> > 22.5 - 30 cm (30 pls)	<input type="checkbox"/> < 5 cm (5 pls)
<input type="checkbox"/> > 10 - 22.5 cm (25 pls)	<input type="checkbox"/> NO WATER OR MOIST CHANNEL (0 pls)

COMMENTS: In inches: MAXIMUM POOL DEPTH (centimeters): 3

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

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

COMMENTS: in feet: AVERAGE BANKFULL WIDTH (meters): 1.00

HHEI Metric Points

Substrate

Max = 40

13

A + B

Pool Depth

Max = 30

15

Bankfull

Width

Max=30

5

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

COMMENTS:

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

Stream Flowing ☒ Moist Channel, isolated pools, no flow (intermittent)

Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (Ephemeral)

COMMENTS: 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 (< 5:100) ☐ Flat to Moderate ☒ Moderate (2 to 100) ☐ Moderate to Severe ☐ Severe (> 100 to 1000) ☐

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PWH Form Page - 1

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

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

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Distance from Evaluated Stream

CWH Name: Distance from Evaluated Stream

EWI 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: Hocking Township / City:

MISCELLANEOUS

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

Photograph Information: 2 photos

Elevated Turbidity? (Y/N): Y Canopy (% open): 90%

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 (5-14): Conductivity (µmhos/cm):

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

Additional comments/description of pollution impacts:

pasture runoff, algae concerns

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)

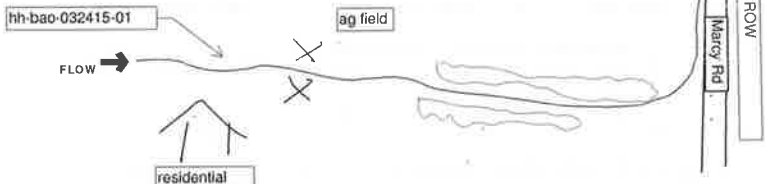
Fish Observed? (Y/N): Voucher? (Y/N): Salamanders Observed? (Y/N): Voucher? (Y/N):

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



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PWH Form Page - 2



## Primary Headwater Habitat Evaluation Form

54

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

SITE NAME/LOCATION: AEP Good Hope-Harrison

SITE NUMBER: RIVER BASIN: DRAINAGE AREA (mi<sup>2</sup>):

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

DATE: 03/25/16 SCORER: BAO/JBL COMMENTS: Intermittent; hh-bao-032516-01

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 one 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 pls)	0%	<input type="checkbox"/> SILT (3 pls)	30%
<input type="checkbox"/> BOULDER (>256 mm) (16 pls)	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pls)	5%
<input type="checkbox"/> BEDROCK (16 pls)	0%	<input type="checkbox"/> FINE DETRITUS (3 pls)	0%
<input type="checkbox"/> COBBLE (65-256 mm) (12 pls)	10%	<input type="checkbox"/> CLAY or HARDPAN (0 pls)	0%
<input type="checkbox"/> GRAVEL (2-64 mm) (9 pls)	20%	<input type="checkbox"/> MUCK (0 pls)	0%
<input checked="" type="checkbox"/> SAND (<2 mm) (6 pls)	35%	<input type="checkbox"/> ARTIFICIAL (3 pls)	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 10.00% (A) (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5

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 pls)	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") (15 pls)
<input type="checkbox"/> > 22.5 - 30 cm (30 pls)	<input type="checkbox"/> < 5 cm (5 pls)
<input type="checkbox"/> > 10 - 22.5 cm (25 pls)	<input type="checkbox"/> NO WATER OR MOIST CHANNEL (0 pls)

COMMENTS: In inches: MAXIMUM POOL DEPTH (centimeters): 12

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

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

COMMENTS: in feet: AVERAGE BANKFULL WIDTH (meters): 8.00

HHEI Metric Points

Substrate

Max = 40

14

A + B

Pool Depth

Max = 30

20

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

COMMENTS:

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

Stream Flowing ☒ Moist Channel, isolated pools, no flow (intermittent)

Subsurface flow with isolated pools (intermittent) ☐ Dry channel, no water (Ephemeral)

COMMENTS: intermittent

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 (< 5:100) ☐ Flat to Moderate ☒ Moderate (2 to 100) ☐ Moderate to Severe ☐ Severe (> 100 to 1000) ☐

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

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

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Distance from Evaluated Stream

CWH Name: Distance from Evaluated Stream

EWI 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: Hocking Township / City:

MISCELLANEOUS

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

Photograph Information: 2 photos

Elevated Turbidity? (Y/N): Y Canopy (% open): 60%

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 (5-14): Conductivity (µmhos/cm):

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

Additional comments/description of pollution impacts:

ag runoff, algae concerns

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)

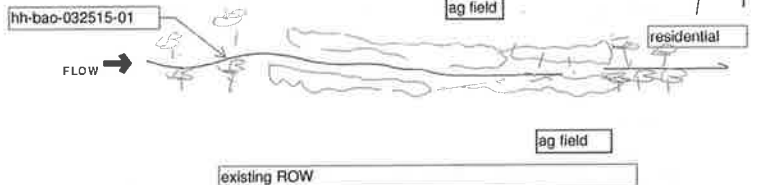
Fish Observed? (Y/N): Voucher? (Y/N): Salamanders Observed? (Y/N): Voucher? (Y/N):

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



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# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 85

Stream & Location: ALP, Huron and Hope R# --- Date: 2/22/06

Scorer's Full Name & Affiliation: M. Thompson Office verified location: ---

River Code: --- STORET #: --- Date: ---

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present. Check ONE (Or 2 & average) QUALITY

BEST TYPES	POOL RIFFLE	OTHER TYPES	POOL RIFFLE	ORIGIN	QUALITY
<input type="checkbox"/> BLDR (SLABS) [10]	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> LESTONE [1]	<input type="checkbox"/> LESTONE [1]	<input type="checkbox"/> HEAVY [-2]	
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> CORBEL [8]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> NORMAL [0]	
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> SILT [1]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> FREE [1]	
<input type="checkbox"/> SAND [6]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> EXTENSIVE [-2]	
<input type="checkbox"/> BEDROCK [5]		<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> MODERATE [-1]	
		<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NORMAL [0]	
		<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> NONE [1]	

NUMBER OF BEST TYPES: 4 or more [2] Sludge from point-sources 0 or less [0]

Comments: ---

2) INSTREAM COVER Indicate presence 0 to 3; 0-Absent; 1-Very small amounts; 2-Moderate amounts; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter logs in stable, well-developed rootbed in deep, fast water, or deep, well-defined, functional pools). Check ONE (Or 2 & average) AMOUNT

COVER	AMOUNT
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> EXTENSIVE >75% [1]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> SPARSE 5-25% [2]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> NEARLY ABSENT <5% [1]

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 [8]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [6]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [5]	<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: ---

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"/> WIDE > 50m [4]	<input type="checkbox"/> CONSERVATION TILLAGE [1]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
	<input type="checkbox"/> VERY NARROW < 5m [1]	
	<input type="checkbox"/> NONE [0]	

Comments: ---

5) POOL / GLIDE AND RIFFLE / RUN QUALITY Check ONE (Or 2 & average) CURRENT VELOCITY

POOL / GLIDE	RIFFLE / RUN	CURRENT VELOCITY
<input type="checkbox"/> > 1m [8]	<input 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 type="checkbox"/> VERY FAST [1]
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> INTERSTITIAL [-1]
<input 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"/> EDDIES [1]

Comments: ---

6) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

7) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

8) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

9) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

10) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

11) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

12) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

13) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

14) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

15) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

16) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

17) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

18) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

19) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

20) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

21) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

22) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

23) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

24) GRADIENT / DRAINAGE AREA 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 [0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments: ---

25) GRADIENT / DRAINAGE AREA 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 &			





## Ohio EPA Primary Headwater Habitat Evaluation Form

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

35

SITE NAME/LOCATION: 2100 River Road  
 SITE NUMBER: 01 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (sq mi): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 8/24/2010 SCORER: Mike Beck COMMENTS: Intermittent

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: Channelized

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY one predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input checked="" type="checkbox"/> SILT (3 pts)	5
<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)	15
<input type="checkbox"/> COBBLE (65-256 mm) (12 pts)		<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	30	<input type="checkbox"/> MUCK (8 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)		<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Blt Slabs, Boulder, Cobble, Bedrock: 0 (A) 12 (B) 3  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 3  
 A + B = 15

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 (20 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: Intermittent MAXIMUM POOL DEPTH (meters): 4"

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

<input type="checkbox"/> > 4.0 meters (> 13') (20 pts)	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' - 4') (15 pts)
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' - 12') (25 pts)	<input type="checkbox"/> < 1.0 m (< 3') (5 pts)
<input type="checkbox"/> > 1.6 m - 3.0 m (> 4' - 9') (20 pts)	

COMMENTS: Intermittent AVERAGE BANKFULL WIDTH (meters): 2'

This information must also be completed

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

RIPARIAN ZONE AND FLOODPLAIN QUALITY

RIPARIAN WIDTH (Per Bank)

<input type="checkbox"/> Wide >10m	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Narrow <5m	<input checked="" type="checkbox"/> None
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FLOODPLAIN QUALITY (Most Predominant per Bank)

<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Immature Forest, Shrub or Old Field	<input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/> Fenced Pasture
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COMMENTS: Intermittent

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 (Intermittent)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS: Intermittent

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

<input checked="" type="checkbox"/> None 0.5	<input type="checkbox"/> 1.0	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.0	<input type="checkbox"/> 2.5	<input type="checkbox"/> 3.0	<input type="checkbox"/> >2
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STREAM GRADIENT ESTIMATE (Flat < 0.5% to 1%) ☐ Flat to Moderate ☐ Moderate (1.0% to 6.0%) ☐ Moderate to Severe ☐ Severe (>6.0%)

PHWH Form Page - 1

## ADDITIONAL STREAM INFORMATION (This Information Must Also Be Completed)

GHEI PERFORMED? ☐ Yes ☒ No GHEI Score: \_\_\_\_\_ (If Yes, Attach Completed GHEI 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) N Date of last precipitation: 8/24/2010 Quantity: UnknownPhotograph Information: 2Elevated Turbidity? (Y/N) N Canopy (% open): 100Were 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) NFrogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Invertebrates 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

FLOW → Intermittent  
Intermittent

PHWH Form Page - 2

## Ohio EPA Primary Headwater Habitat Evaluation Form

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

49

SITE NAME/LOCATION: 2100 River Road  
 SITE NUMBER: 01 RIVER BASIN: \_\_\_\_\_ DRAINAGE AREA (sq mi): \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft): 200 LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ RIVER CODE: \_\_\_\_\_ RIVER MILE: \_\_\_\_\_  
 DATE: 8/24/2010 SCORER: Mike Beck COMMENTS: Intermittent

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: Channelized along property line

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY one predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)		<input type="checkbox"/> SILT (3 pts)	10
<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 type="checkbox"/> COBBLE (65-256 mm) (12 pts)	5	<input type="checkbox"/> CLAY or HARDPAN (8 pts)	
<input type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	70	<input type="checkbox"/> MUCK (8 pts)	
<input type="checkbox"/> SAND (<2 mm) (8 pts)	15	<input type="checkbox"/> ARTIFICIAL (3 pts)	

Total of Percentages of Blt Slabs, Boulder, Cobble, Bedrock: 5 (A) 15 (B) 19  
 SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 4  
 A + B = 19

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 (20 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: Intermittent MAXIMUM POOL DEPTH (meters): 5"

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

<input type="checkbox"/> > 4.0 meters (> 13') (20 pts)	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' - 4') (15 pts)
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' - 12') (25 pts)	<input type="checkbox"/> < 1.0 m (< 3') (5 pts)
<input type="checkbox"/> > 1.6 m - 3.0 m (> 4' - 9') (20 pts)	

COMMENTS: Intermittent AVERAGE BANKFULL WIDTH (meters): 2.5'

This information must also be completed

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

RIPARIAN ZONE AND FLOODPLAIN QUALITY

RIPARIAN WIDTH (Per Bank)

<input type="checkbox"/> Wide >10m	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/> Narrow <5m	<input checked="" type="checkbox"/> None
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FLOODPLAIN QUALITY (Most Predominant per Bank)

<input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> Immature Forest, Shrub or Old Field	<input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/> Fenced Pasture
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COMMENTS: Intermittent

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 (Intermittent)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS: Intermittent

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

<input checked="" type="checkbox"/> None 0.5	<input type="checkbox"/> 1.0	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.0	<input type="checkbox"/> 2.5	<input type="checkbox"/> 3.0	<input type="checkbox"/> >2
--	------------------------------	------------------------------	------------------------------	------------------------------	------------------------------	-----------------------------

STREAM GRADIENT ESTIMATE (Flat < 0.5% to 1%) ☐ Flat to Moderate ☐ Moderate (1.0% to 6.0%) ☐ Moderate to Severe ☐ Severe (>6.0%)

PHWH Form Page - 1

## ADDITIONAL STREAM INFORMATION (This Information Must Also Be Completed)

GHEI PERFORMED? ☐ Yes ☒ No GHEI Score: \_\_\_\_\_ (If Yes, Attach Completed GHEI 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) N Date of last precipitation: 8/24/2010 Quantity: UnknownPhotograph Information: 2Elevated Turbidity? (Y/N) N Canopy (% open): 90Were 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) NFrogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Invertebrates 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

FLOW → Intermittent  
Intermittent

PHWH Form Page - 2



Qualitative Habitat Evaluation Index  
and Use Assessment Field Sheet

QHEI Score: 37

Stream & Location: St. Charles - Cold Spring RM: 1 Date: 6/1/06River Code: 10 STORE# 10 Lat/Long: 10 Office verified location ☐

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

Check ONE (Or 2 &amp; average) QUALITY

BEST TYPES POOL RIFFLE OTHER TYPES POOL RIFFLE ORIGIN

☐ BLDR SLABS [10] ☐ BOULDER [8] ☐ COBBLE [6] ☐ GRAVEL [7] ☐ SAND [8] ☐ BEDROCK [5]

☐ HARDPAN [4] ☐ DETRITUS [3] ☐ MUCK [2] ☐ SILT [2] ☐ ARTIFICIAL [8]

☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [8] ☐ SANDSTONE [6] ☐ RIPRAP [10] ☐ LAGUSTRINE [8] ☐ SHALE [1-1] ☐ COAL FINES [2]

☐ HEAVY [2] ☐ MODERATE [1-1] ☐ NORMAL [8] ☐ EXTENSIVE [1-2] ☐ MODERATE [1-1] ☐ NORMAL [2] ☐ NONE [1]
NUMBER OF BEST TYPES: ☐ 4 or more ☐ 2 or less ☐ 1 or less

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 / fast water, large diameter log that is stable, well developed rootwads in deep / fast water, or deep, well-defined, functional pools)

☐ UNDERCUT BANKS [1] ☐ POOLS > 70cm [2] ☐ OXBOWS, BACKWATERS [1] ☐ MODERATE 25-75% [1] ☐ SPARSE 5-25% [1] ☐ NEARLY ABSENT <5% [1]

☐ OVERHANGING VEGETATION [1] ☐ ROOTWADS [1] ☐ AQUATIC MACROPHYTES [1] ☐ LOGS OR WOODY DEBRIS [1]

☐ SHALLOWS (IN SLOW WATER) [1] ☐ BOULDERS [1]

☐ ROOTMATS [1]

Comments

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

SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY

☐ HIGH [4] ☐ EXCELLENT [7] ☐ NONE [6] ☐ HIGH [3] ☐ MODERATE [3] ☐ GOOD [5] ☐ RECOVERED [4] ☐ MODERATE [2] ☐ LOW [2] ☐ FAIR [3] ☐ RECOVERING [3] ☐ LOW [1] ☐ NONE [1] ☐ POOR [1] ☐ RECENT OR NO RECOVERY [1]

Comments

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

EROSION RIPARIAN WIDTH FLOOD PLAIN QUALITY

☐ NONE / LITTLE [3] ☐ MODERATE 10-50m [2] ☐ WIDE > 50m [4] ☐ FOREST, SWAMP [3] ☐ CONSERVATION TILLAGE [1] ☐ MODERATE [2] ☐ NARROW 5-10m [1] ☐ SHRUB OR OLD FIELD [2] ☐ URBAN OR INDUSTRIAL [8] ☐ HEAVY / SEVERE [1] ☐ VERY NARROW < 5m [1] ☐ RESIDENTIAL, PARK, NEW FIELD [1] ☐ MINING / CONSTRUCTION [8] ☐ NONE [8] ☐ OPEN PASTURE, ROWCROP [3] ☐ FENCED PASTURE [1] ☐ INDICATE PREEXISTING AND CURED ☐ OPEN PASTURE, ROWCROP [3] ☐ FENCED PASTURE [1] ☐ INDICATE PREEXISTING AND CURED

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH CHANNEL WIDTH CURRENT VELOCITY

☐ > 1m [8] ☐ POOL WIDTH > RIFFLE WIDTH [2] ☐ TORRENTIAL [1-1] ☐ BLOW [1] ☐ 0.7-1.1m [4] ☐ POOL WIDTH > RIFFLE WIDTH [1] ☐ VERY FAST [1] ☐ INTERMITTENT [1-1] ☐ 0.4-0.7m [2] ☐ POOL WIDTH > RIFFLE WIDTH [0] ☐ FAST [1] ☐ INTERMITTENT [2] ☐ 0.2-0.4m [1] ☐ < 0.2m [0] ☐ MODERATE [1] ☐ EDDIES [1]

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: ☐ NO RIFFLE (metric=0)
☐ BEST AREAS > 10cm [2] ☐ MAXIMUM > 50cm [2] ☐ STABLE (e.g., Cobble, Boulder) [2] ☐ NONE [2] ☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☐ LOW [1] ☐ BEST AREAS < 5cm [0] ☐ UNSTABLE (e.g., Fine Gravel, Sands) [0] ☐ MODERATE [0] ☐ EXTENSIVE [1-1]

Comments

6) GRADIENT 4 ft/mi VERY LOW - LOW [2-4] %POOL: 10 %GLIDE: 5 Gradient Maximum 10DRAINAGE AREA 5.36 mi<sup>2</sup> MODERATE [6-10] %RUN: 70 %RIFFLE: 72 Gradient Minimum 0

Comments

7) MAINTENANCE

☐ PUBLIC PROPERTY / ROAD / NA ☐ YOUNG SUCCESSION-OLD ☐ MODIFIED / DIPPED OUT / NA ☐ RELOCATED / CUTOFFS ☐ MOVING BEDDING / STABLE ☐ ISLANDS / SCOURED ☐ IMPROVED / RELOCATED ☐ FLOOD CONTROL / DRAINAGE

☐ PERMANENCE ALGAE ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FLOW / SCUM ☐ OIL / GREASE ☐ NUISANCE ODORS ☐ NUISANCE DEPOSITS ☐ CROSSLAND / OUTFALLS ☐ AREA DEPTH ☐ POOL: ☐ > 1000' ☐ > 50'

☐ BOAT ☐ FISH ☐ NORMAL ☐ LOW ☐ DRY

☐ CLARITY ☐ 0-15 cm ☐ 15-30 cm ☐ 30-45 cm ☐ 45-60 cm ☐ 60-75 cm ☐ 75-90 cm ☐ 90-105 cm ☐ 105-120 cm ☐ 120-135 cm ☐ 135-150 cm ☐ 150-165 cm ☐ 165-180 cm ☐ 180-195 cm ☐ 195-210 cm ☐ 210-225 cm ☐ 225-240 cm ☐ 240-255 cm ☐ 255-270 cm ☐ 270-285 cm ☐ 285-300 cm ☐ 300-315 cm ☐ 315-330 cm ☐ 330-345 cm ☐ 345-360 cm ☐ 360-375 cm ☐ 375-390 cm ☐ 390-405 cm ☐ 405-420 cm ☐ 420-435 cm ☐ 435-450 cm ☐ 450-465 cm ☐ 465-480 cm ☐ 480-495 cm ☐ 495-510 cm ☐ 510-525 cm ☐ 525-540 cm ☐ 540-555 cm ☐ 555-570 cm ☐ 570-585 cm ☐ 585-600 cm ☐ 600-615 cm ☐ 615-630 cm ☐ 630-645 cm ☐ 645-660 cm ☐ 660-675 cm ☐ 675-690 cm ☐ 690-705 cm ☐ 705-720 cm ☐ 720-735 cm ☐ 735-750 cm ☐ 750-765 cm ☐ 765-780 cm ☐ 780-795 cm ☐ 795-810 cm ☐ 810-825 cm ☐ 825-840 cm ☐ 840-855 cm ☐ 855-870 cm ☐ 870-885 cm ☐ 885-900 cm ☐ 900-915 cm ☐ 915-930 cm ☐ 930-945 cm ☐ 945-960 cm ☐ 960-975 cm ☐ 975-990 cm ☐ 990-1005 cm ☐ 1005-1020 cm ☐ 1020-1035 cm ☐ 1035-1050 cm ☐ 1050-1065 cm ☐ 1065-1080 cm ☐ 1080-1095 cm ☐ 1095-1110 cm ☐ 1110-1125 cm ☐ 1125-1140 cm ☐ 1140-1155 cm ☐ 1155-1170 cm ☐ 1170-1185 cm ☐ 1185-1200 cm ☐ 1200-1215 cm ☐ 1215-1230 cm ☐ 1230-1245 cm ☐ 1245-1260 cm ☐ 1260-1275 cm ☐ 1275-1290 cm ☐ 1290-1305 cm ☐ 1305-1320 cm ☐ 1320-1335 cm ☐ 1335-1350 cm ☐ 1350-1365 cm ☐ 1365-1380 cm ☐ 1380-1395 cm ☐ 1395-1410 cm ☐ 1410-1425 cm ☐ 1425-1440 cm ☐ 1440-1455 cm ☐ 1455-1470 cm ☐ 1470-1485 cm ☐ 1485-1500 cm ☐ 1500-1515 cm ☐ 1515-1530 cm ☐ 1530-1545 cm ☐ 1545-1560 cm ☐ 1560-1575 cm ☐ 1575-1590 cm ☐ 1590-1605 cm ☐ 1605-1620 cm ☐ 1620-1635 cm ☐ 1635-1650 cm ☐ 1650-1665 cm ☐ 1665-1680 cm ☐ 1680-1695 cm ☐ 1695-1710 cm ☐ 1710-1725 cm ☐ 1725-1740 cm ☐ 1740-1755 cm ☐ 1755-1770 cm ☐ 1770-1785 cm ☐ 1785-1800 cm ☐ 1800-1815 cm ☐ 1815-1830 cm ☐ 1830-1845 cm ☐ 1845-1860 cm ☐ 1860-1875 cm ☐ 1875-1890 cm ☐ 1890-1905 cm ☐ 1905-1920 cm ☐ 1920-1935 cm ☐ 1935-1950 cm ☐ 1950-1965 cm ☐ 1965-1980 cm ☐ 1980-1995 cm ☐ 1995-2010 cm ☐ 2010-2025 cm ☐ 2025-2040 cm ☐ 2040-2055 cm ☐ 2055-2070 cm ☐ 2070-2085 cm ☐ 2085-2100 cm ☐ 2100-2115 cm ☐ 2115-2130 cm ☐ 2130-2145 cm ☐ 2145-2160 cm ☐ 2160-2175 cm ☐ 2175-2190 cm ☐ 2190-2205 cm ☐ 2205-2220 cm ☐ 2220-2235 cm ☐ 2235-2250 cm ☐ 2250-2265 cm ☐ 2265-2280 cm ☐ 2280-2295 cm ☐ 2295-2310 cm ☐ 2310-2325 cm ☐ 2325-2340 cm ☐ 2340-2355 cm ☐ 2355-2370 cm ☐ 2370-2385 cm ☐ 2385-2400 cm ☐ 2400-2415 cm ☐ 2415-2430 cm ☐ 2430-2445 cm ☐ 2445-2460 cm ☐ 2460-2475 cm ☐ 2475-2490 cm ☐ 2490-2505 cm ☐ 2505-2520 cm ☐ 2520-2535 cm ☐ 2535-2550 cm ☐ 2550-2565 cm ☐ 2565-2580 cm ☐ 2580-2595 cm ☐ 2595-2610 cm ☐ 2610-2625 cm ☐ 2625-2640 cm ☐ 2640-2655 cm ☐ 2655-2670 cm ☐ 2670-2685 cm ☐ 2685-2700 cm ☐ 2700-2715 cm ☐ 2715-2730 cm ☐ 2730-2745 cm ☐ 2745-2760 cm ☐ 2760-2775 cm ☐ 2775-2790 cm ☐ 2790-2805 cm ☐ 2805-2820 cm ☐ 2820-2835 cm ☐ 2835-2850 cm ☐ 2850-2865 cm ☐ 2865-2880 cm ☐ 2880-2895 cm ☐ 2895-2910 cm ☐ 2910-2925 cm ☐ 2925-2940 cm ☐ 2940-2955 cm ☐ 2955-2970 cm ☐ 2970-2985 cm ☐ 2985-3000 cm ☐ 3000-3015 cm ☐ 3015-3030 cm ☐ 3030-3045 cm ☐ 3045-3060 cm ☐ 3060-3075 cm ☐ 3075-3090 cm ☐ 3090-3105 cm ☐ 3105-3120 cm ☐ 3120-3135 cm ☐ 3135-3150 cm ☐ 3150-3165 cm ☐ 3165-3180 cm ☐ 3180-3195 cm ☐ 3195-3210 cm ☐ 3210-3225 cm ☐ 3225-3240 cm ☐ 3240-3255 cm ☐ 3255-3270 cm ☐ 3270-3285 cm ☐ 3285-3300 cm ☐ 3300-3315 cm ☐ 3315-3330 cm ☐ 3330-3345 cm ☐ 3345-3360 cm ☐ 3360-3375 cm ☐ 3375-3390 cm ☐ 3390-3405 cm ☐ 3405-3420 cm ☐ 3420-3435 cm ☐ 3435-3450 cm ☐ 3450-3465 cm ☐ 3465-3480 cm ☐ 3480-3495 cm ☐ 3495-3510 cm ☐ 3510-3525 cm ☐ 3525-3540 cm ☐ 3540-3555 cm ☐ 3555-3570 cm ☐ 3570-3585 cm ☐ 3585-3600 cm ☐ 3600-3615 cm ☐ 3615-3630 cm ☐ 3630-3645 cm ☐ 3645-3660 cm ☐ 3660-3675 cm ☐ 3675-3690 cm ☐ 3690-3705 cm ☐ 3705-3720 cm ☐ 3720-3735 cm ☐ 3735-3750 cm ☐ 3750-3765 cm ☐ 3765-3780 cm ☐ 3780-3795 cm ☐ 3795-3810 cm ☐ 3810-3825 cm ☐ 3825-3840 cm ☐ 3840-3855 cm ☐ 3855-3870 cm ☐ 3870-3885 cm ☐ 3885-3900 cm ☐ 3900-3915 cm ☐ 3915-3930 cm ☐ 3930-3945 cm ☐ 3945-3960 cm ☐ 3960-3975 cm ☐ 3975-3990 cm ☐ 3990-4005 cm ☐ 4005-4020 cm ☐ 4020-4035 cm ☐ 4035-4050 cm ☐ 4050-4065 cm ☐ 4065-4080 cm ☐ 4080-4095 cm ☐ 4095-4110 cm ☐ 4110-4125 cm ☐ 4125-4140 cm ☐ 4140-4155 cm ☐ 4155-4170 cm ☐ 4170-4185 cm ☐ 4185-4200 cm ☐ 4200-4215 cm ☐ 4215-4230 cm ☐ 4230-4245 cm ☐ 4245-4260 cm ☐ 4260-4275 cm ☐ 4275-4290 cm ☐ 4290-4305 cm ☐ 4305-4320 cm ☐ 4320-4335 cm ☐ 4335-4350 cm ☐ 4350-4365 cm ☐ 4365-4380 cm ☐ 4380-4395 cm ☐ 4395-4410 cm ☐ 4410-4425 cm ☐ 4425-4440 cm ☐ 4440-4455 cm ☐ 4455-4470 cm ☐ 4470-4485 cm ☐ 4485-4500 cm ☐ 4500-4515 cm ☐ 4515-4530 cm ☐ 4530-4545 cm ☐ 4545-4560 cm ☐ 4560-4575 cm ☐ 4575-4590 cm ☐ 4590-4605 cm ☐ 4605-4620 cm ☐ 4620-4635 cm ☐ 4635-4650 cm ☐ 4650-4665 cm ☐ 4665-4680 cm ☐ 4680-4695 cm ☐ 4695-4710 cm ☐ 4710-4725 cm ☐ 4725-4740 cm ☐ 4740-4755 cm ☐ 4755-4770 cm ☐ 4770-4785 cm ☐ 4785-4800 cm ☐ 4800-4815 cm ☐ 4815-4830 cm ☐ 4830-4845 cm ☐ 4845-4860 cm ☐ 4860-4875 cm ☐ 4875-4890 cm ☐ 4890-4905 cm ☐ 4905-4920 cm ☐ 4920-4935 cm ☐ 4935-4950 cm ☐ 4950-4965 cm ☐ 4965-4980 cm ☐ 4980-4995 cm ☐ 4995-5010 cm ☐ 5010-5025 cm ☐ 5025-5040 cm ☐ 5040-5055 cm ☐ 5055-5070 cm ☐ 5070-5085 cm ☐ 5085-5100 cm ☐ 5100-5115 cm ☐ 5115-5130 cm ☐ 5130-5145 cm ☐ 5145-5160 cm ☐ 5160-5175 cm ☐ 5175-5190 cm ☐ 5190-5205 cm ☐ 5205-5220 cm ☐ 5220-5235 cm ☐ 5235-5250 cm ☐ 5250-5265 cm ☐ 5265-5280 cm ☐ 5280-5295 cm ☐ 5295-5310 cm ☐ 5310-5325 cm ☐ 5325-5340 cm ☐ 5340-5355 cm ☐ 5355-5370 cm ☐ 5370-5385 cm ☐ 5385-5400 cm ☐ 5400-5415 cm ☐ 5415-5430 cm ☐ 5430-5445 cm ☐ 5445-5460 cm ☐ 5460-5475 cm ☐ 5475-5490 cm ☐ 5490-5505 cm ☐ 5505-5520 cm ☐ 5520-5535 cm ☐ 5535-5550 cm ☐ 5550-5565 cm ☐ 5565-5580 cm ☐ 5580-5595 cm ☐ 5595-5610 cm ☐ 5610-5625 cm ☐ 5625-5640 cm ☐ 5640-5655 cm ☐ 5655-5670 cm ☐ 5670-5685 cm ☐ 5685-5700 cm ☐ 5700-5715 cm ☐ 5715-5730 cm ☐ 5730-5745 cm ☐ 5745-5760 cm ☐ 5760-5775 cm ☐ 5775-5790 cm ☐ 5790-5805 cm ☐ 5805-5820 cm ☐ 5820-5835 cm ☐ 5835-5850 cm ☐ 5850-5865 cm ☐ 5865-5880 cm ☐ 5880-5895 cm ☐ 5895-5910 cm ☐ 5910-5925 cm ☐ 5925-5940 cm ☐ 5940-5955 cm ☐ 5955-5970 cm ☐ 5970-5985 cm ☐ 5985-6000 cm ☐ 6000-6015 cm ☐ 6015-6030 cm ☐ 6030-6045 cm ☐ 6045-6060 cm ☐ 6060-6075 cm ☐ 6075-6090 cm ☐ 6090-6105 cm ☐ 6105-6120 cm ☐ 6120-6135 cm ☐ 6135-6150 cm ☐ 6150-6165 cm ☐ 6165-6180 cm ☐ 6180-6195 cm ☐ 6195-6210 cm ☐ 6210-6225 cm ☐ 6225-6240 cm ☐ 6240-6255 cm ☐ 6255-6270 cm ☐ 6270-6285 cm ☐ 6285-6300 cm ☐ 6300-6315 cm ☐ 6315-6330 cm ☐ 6330-6345 cm ☐ 6345-6360 cm ☐ 6360-6375 cm ☐ 6375-6390 cm ☐ 6390-6405 cm ☐ 6405-6420 cm ☐ 6420-6435 cm ☐ 6435-6450 cm ☐ 6450-6465 cm ☐ 6465-6480 cm ☐ 6480-6495 cm ☐ 6495-6510 cm ☐ 6510-6525 cm ☐ 6525-6540 cm ☐ 6540-6555 cm ☐ 6555-6570 cm ☐ 6570-6585 cm ☐ 6585-6600 cm ☐ 6600-6615 cm ☐ 6615-6630 cm ☐ 6630-6645 cm ☐ 6645-6660 cm ☐ 6660-6675 cm ☐ 6675-6690 cm ☐ 6690-6705 cm ☐ 6705-6720 cm ☐ 6720-6735 cm ☐ 6735-6750 cm ☐ 6750-6765 cm ☐ 6765-6780 cm ☐ 6780-6795 cm ☐ 6795-6810 cm ☐ 6810-6825 cm ☐ 6825-6840 cm ☐ 6840-6855 cm ☐ 6855-6870 cm ☐ 6870-6885 cm ☐ 6885-6900 cm ☐ 6900-6915 cm ☐ 6915-6930 cm ☐ 6930-6945 cm ☐ 6945-6960 cm ☐ 6960-6975 cm ☐ 6975-6990 cm ☐ 6990-7005 cm ☐ 7005-7020 cm ☐ 7020-7035 cm ☐ 7035-7050 cm ☐ 7050-7065 cm ☐ 7065-7080 cm ☐ 7080-7095 cm ☐ 7095-7110 cm ☐ 7110-7125 cm ☐ 7125-7140 cm ☐ 7140-7155 cm ☐ 7155-7170 cm ☐ 7170-7185 cm ☐ 7185-7200 cm ☐ 7200-7215 cm ☐ 7215-7230 cm ☐ 7230-7245 cm ☐ 7245-7260 cm ☐ 7260-7275 cm ☐ 7275-7290 cm ☐ 7290-7305 cm ☐ 7305-7320 cm ☐ 7320-7335 cm ☐ 7335-7350 cm ☐ 7350-7365 cm ☐ 7365-7380 cm ☐ 7380-7395 cm ☐ 7395-7410 cm ☐ 7410-7425 cm ☐ 7425-7440 cm ☐ 7440-7455 cm ☐ 7455-7470 cm ☐ 7470-7485 cm ☐ 7485-7500 cm ☐ 7500-7515 cm ☐ 7515-7530 cm ☐ 7530-7545 cm ☐ 7545-7560 cm ☐ 7560-7575 cm ☐ 7575-7590 cm ☐ 7590-7605 cm ☐ 7605-7620 cm ☐ 7620-7635 cm ☐ 7635-7650 cm ☐ 7650-7665 cm ☐ 7665-7680 cm ☐ 7680-7695 cm ☐ 7695-7710 cm ☐ 7710-7725 cm ☐ 7725-7740 cm ☐ 7740-7755 cm ☐ 7755-7770 cm ☐ 7770-7785 cm ☐ 7785-7800 cm ☐ 7800-7815 cm ☐ 7815-7830 cm ☐ 7830-7845 cm ☐ 7845-7860 cm ☐ 7860-7875 cm ☐ 7875-7890 cm ☐ 7890-7905 cm ☐

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Summary: Letter of Notification - Part 8 of 10 electronically filed by Mr. Hector Garcia on behalf of AEP Ohio Transmission Company