

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 21	
Date: November 13, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 21	
Date: November 13, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 21	
Date: November 13, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

15

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

SITE NUMBER **S-CBA-006** RIVER BASIN **Ohio** DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **56** LAT. **40.52963** LONG. **-81.00362** RIVER CODE RIVER MILE

DATE **11/13/18** SCORER **CBA/BJM** COMMENTS **Ephemeral begins at edge of ROW and flows into forest**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 70%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 10%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 10%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/> 10%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **10.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

6

TOTAL NUMBER OF SUBSTRATE TYPES:

4

HHEI Metric Points

Substrate Max = 40

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 storm water pipes) (Check *ONLY* one box):

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

COMMENTS **Dry channel; OHWM depth = 1 inch**

MAXIMUM POOL DEPTH (centimeters):

0

Pool Depth Max = 30

0

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" 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 **OHWM width = 2 feet**

AVERAGE BANKFULL WIDTH (meters):

0.90

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

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

FLOODPLAIN QUALITY

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

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

COMMENTS **Stream in young forest downslope of existing ROW. flows into NWI outside of study area**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 (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

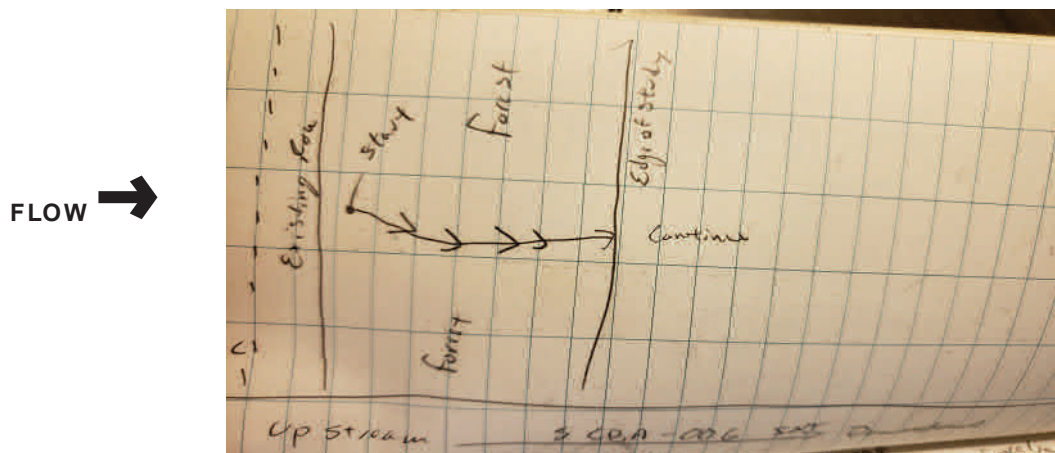
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> CWH Name:	UNT to Trail Run	Distance from Evaluated Stream	0.30
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Carrollton NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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 (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) NComments 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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 22	
Date: November 13, 2018	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 22	
Date: November 13, 2018	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 22	
Date: November 13, 2018	
Description: Ephemeral Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

32

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-008**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **58**LAT. **40.52963**LONG. **-81.00362**

RIVER CODE

RIVER MILE

DATE **11/13/18**SCORER **CBA/BJM**COMMENTS **Intermittent formed from seep in existing ROW****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**☐ NONE / NATURAL CHANNEL☐ RECOVERED☒ RECOVERING☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input checked="" type="checkbox"/> 30%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> BEDROCK [16 pt]	<input checked="" type="checkbox"/> 50%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **70.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **19**TOTAL NUMBER OF SUBSTRATE TYPES: **3****HHEI Metric Points**

Substrate Max = 40

22

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS **OHHM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **3**

Pool Depth Max = 30

5

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

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

COMMENTS **OHHM width = 2 feet**AVERAGE BANKFULL WIDTH (meters): **0.90**

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**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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"/>	<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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **Stream located entirely within existing electric transmission powerline ROW****FLOW REGIME** (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS **Intermittent formed from groundwater seep in hillside****SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

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

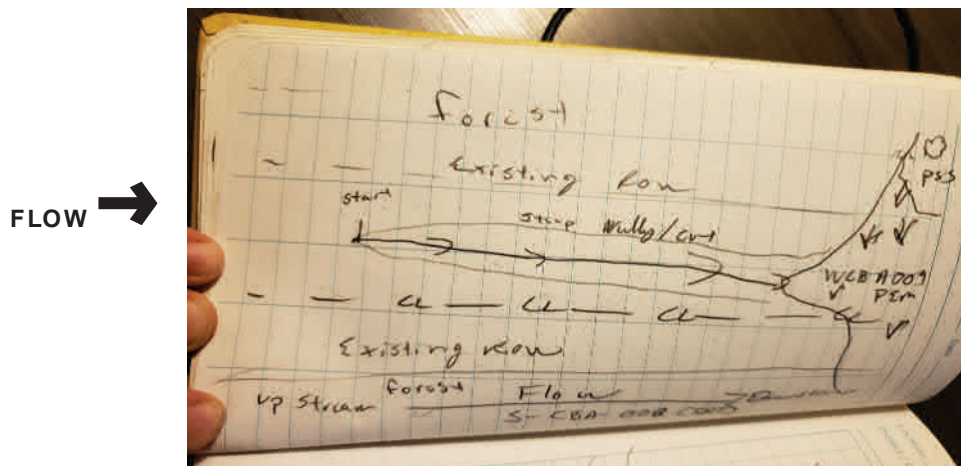
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☐ Moderate to Severe
 ☒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> CWH Name:	UNT to Trail Run	Distance from Evaluated Stream	0.00
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Carrollton NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40
Photograph Information: Upstream, downstream, and substrate
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 23	
Date: November 13, 2018	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 23	
Date: November 13, 2018	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 23	
Date: November 13, 2018	
Description: Intermittent Modified Small Drainage Warmwater Stream Substrate	



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 47.5
Stream & Location: AEP Carrollton-Gable / Carroll County, Ohio

RM: 1.13 **Date:** 11/13/2018

S-CBA-007 (Trail Run)

Scorers Full Name & Affiliation: C. Ashbaugh & B. Miller / AECOM

River Code: - - - **STORET #:** - - - **Lat./ Long.:** (NAD 83 - decimal °) 40.529226 18.1003382 **Office verified location** ☐
1] SUBSTRATE Check **ONLY** Two substrate **TYPE BOXES**; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: 40px; text-align: center;">15</div> Maximum 20
<input type="checkbox"/>	BLDR / SLABS [10]	<input type="checkbox"/>		<input type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [-2]	
<input type="checkbox"/>	BOULDER [9]	<input type="checkbox"/>		<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input type="checkbox"/>	TILLS [1]	<input type="checkbox"/>	MODERATE [-1]	
<input checked="" type="checkbox"/>	COBBLE [8]	<input type="checkbox"/>	35	<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
<input type="checkbox"/>	GRAVEL [7]	<input type="checkbox"/>	40	<input type="checkbox"/>	SILT [2]	<input type="checkbox"/>	10	<input type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [1]	
<input type="checkbox"/>	SAND [6]	<input type="checkbox"/>	5	<input type="checkbox"/>	ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [-2]	
<input type="checkbox"/>	BEDROCK [5]	<input type="checkbox"/>	10	(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	RIP/RAP [0]	<input checked="" type="checkbox"/>	MODERATE [-1]	
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]								<input type="checkbox"/>	LACUSTURINE [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
Comments								<input checked="" type="checkbox"/>	SHALE [-1]	<input type="checkbox"/>	NONE [1]	
								<input type="checkbox"/>	COAL FINES [-2]			

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

AMOUNT

Check ONE (Or 2 & average)

<input type="0"/>	UNDERCUT BANKS [1]	<input type="0"/>	POOLS > 70cm [2]	<input type="0"/>	OXBOWS, BACKWATERS [1]	<input type="checkbox"/>	EXTENSIVE >75% [11]
<input type="1"/>	OVERHANGING VEGETATION [1]	<input type="0"/>	ROOTWADS [1]	<input type="0"/>	AQUATIC MACROPHYTES [1]	<input type="checkbox"/>	MODERATE 25-75% [7]
<input type="0"/>	SHALLOWS (IN SLOW WATER) [1]	<input type="0"/>	BOULDERS [1]	<input type="1"/>	LOGS OR WOODY DEBRIS [1]	<input checked="" type="checkbox"/>	SPARSE 5-<25% [3]
<input type="0"/>	ROOTMATS [1]					<input type="checkbox"/>	NEARLY ABSENT <5% [1]

Comments
Cover
Maximum 20

6
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

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

Comments
Channel
Maximum 20

11
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for **EACH BANK** (Or 2 per bank & average)

River right looking downstream

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

Comments

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

Riparian
Maximum 10

7.5
5] POOL / GLIDE AND RIFFLE / RUN QUALITY
MAXIMUM DEPTH

Check ONE (ONLY!)

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

CHANNEL WIDTH

Check ONE (Or 2 & average)

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

CURRENT VELOCITY

Check ALL that apply

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

Indicate for reach - pools and riffles.

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

Comments
Pool / Current
Maximum 12

4

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

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
RUN DEPTH
RIFFLE / RUN SUBSTRATE
RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]
☐ BEST AREAS 5-10cm [1]
☒ BEST AREAS < 5cm [metric=0]

☐ MAXIMUM > 50cm [2]
☒ MAXIMUM < 50cm [1]

☐ STABLE (e.g., Cobble, Boulder) [2]
☐ MOD. STABLE (e.g., Large Gravel) [1]
☒ UNSTABLE (e.g., Fine Gravel, Sand) [0]

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

Comments
Riffle / Run
Maximum 8

0
6] GRADIENT (83.9 ft/mi)
DRAINAGE AREA
 (3.29 mi²)

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

 %POOL: 15 %GLIDE:
 %RUN: 26 %RIFFLE: 60

Gradient
Maximum 10

4

AJ SAMPLED REACH

Check ALL that apply

METHOD

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

DISTANCE

- 0.5 Km
 - 0.2 Km
 - 0.15 Km
 - 0.12 Km
 - OTHER
- .11 meters

CLARITY

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

CANOPY

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

CJ RECREATION

POOL: ☐ >100ft² ☐ >3ft

BJ AESTHETICS

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

DJ MAINTENANCE

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

EJ ISSUES

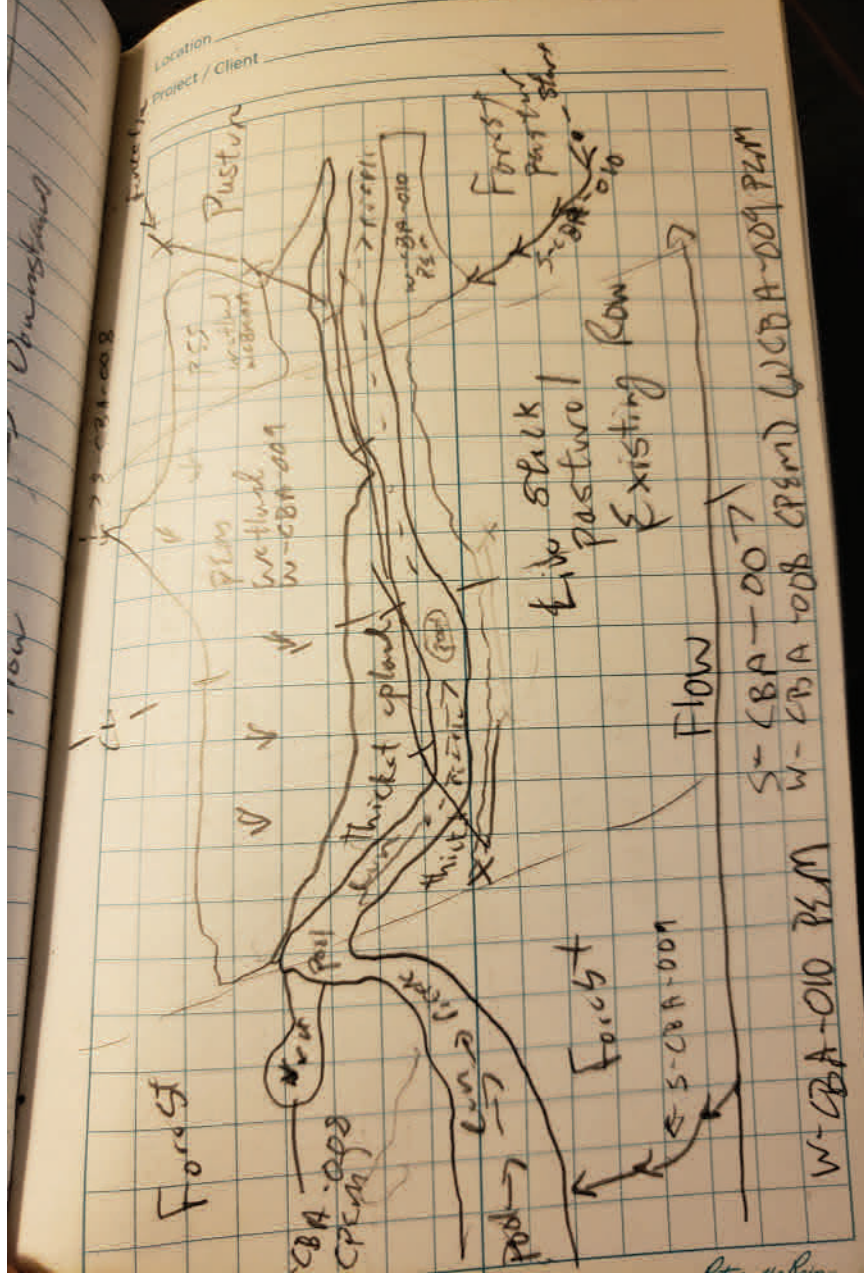
- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT&GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H₂O / TILE / H₂O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND STAGNANT
-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

FJ MEASUREMENTS

- x width
- x depth
- max. depth
- x bankfull width
- bankfull x depth
- W/D ratio
- bankfull max. depth
- floodprone x² width
- entrench. ratio

Legacy Tree:

Stream Drawing:





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 24	
Date: November 13, 2018	
Description: Perennial Trail Run OEPA Warmwater Habitat Facing Upstream	

Stream 24	
Date: November 13, 2018	
Description: Perennial Trail Run OEPA Warmwater Habitat Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 24	
Date: November 13, 2018	
Description: Perennial Trail Run OEPA Warmwater Habitat Substrate	



Primary Headwater Habitat Evaluation Form

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

32

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

SITE NUMBER **S-CBA-009** RIVER BASIN **Ohio** DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **107** LAT. **40.52887** LONG. **-81.00306** RIVER CODE RIVER MILE

DATE **11/13/18** SCORER **CBA/BJM** COMMENTS **Intermittent formed from seep in ROW, flows into forest**

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

STREAM CHANNEL MODIFICATIONS:

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> SILT [3 pt]	<input type="text" value="30%"/>
<input checked="" type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="50%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **70.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

19

TOTAL NUMBER OF SUBSTRATE TYPES:

3

HHEI Metric Points

Substrate Max = 40

22

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS **OHHM depth = 1 inch**

MAXIMUM POOL DEPTH (centimeters):

3

Pool Depth Max = 30

5

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

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

COMMENTS **OHHM width = 2 feet**

AVERAGE BANKFULL WIDTH (meters):

0.90

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m	<input type="checkbox"/>	<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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **Stream located in young forest, paralleling ROW**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS **Intermittent formed from groundwater seep in hillside**SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

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

STREAM GRADIENT ESTIMATE

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

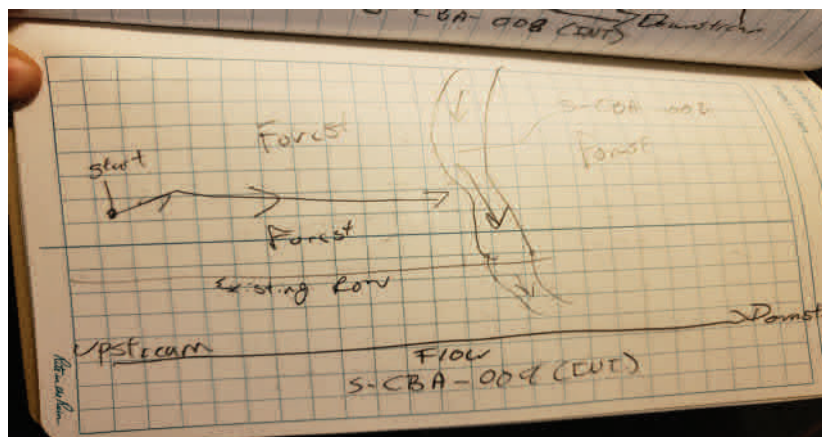
ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> CWH Name:	UNT to Trail Run	Distance from Evaluated Stream	0.00
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Carrollton NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated Turbidity? (Y/N): N Canopy (% open): 100%Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) NComments 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 →



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 25	
Date: November 13, 2018	
Description: Intermittent Small Drainage Warmwater Stream Facing Upstream	

Stream 25	
Date: November 13, 2018	
Description: Intermittent Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 25	
Date: November 13, 2018	
Description: Intermittent Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :
28

 SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

 SITE NUMBER **S-CBA-010**

 RIVER BASIN **Ohio**

 DRAINAGE AREA (mi²) **0.01**

 LENGTH OF STREAM REACH (ft) **70**

 LAT. **40.52929**

 LONG. **-81.00294**

RIVER CODE

RIVER MILE

 DATE **11/13/18**

 SCORER **CBA/BJM**

 COMMENTS **Intermittent located on young forest adjacent to ROW**
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL MODIFICATIONS:
☒ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☐ RECOVERING
 ☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 75%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 10%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/> 15%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

 Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **15.00%**

(A)

 Substrate Percentage Check **100%**

(B)

 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**

 TOTAL NUMBER OF SUBSTRATE TYPES: **3**
HHEI Metric Points

Substrate Max = 40

18

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

 COMMENTS **OHHM depth = 1 inch**

 MAXIMUM POOL DEPTH (centimeters): **3**

Pool Depth Max = 30

5

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

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

 COMMENTS **OHHM width = 2 feet**

 AVERAGE BANKFULL WIDTH (meters): **0.90**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<input checked="" 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"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

 COMMENTS **Stream located in young forest, paralleling ROW**
FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

 COMMENTS **Intermittent formed from groundwater seep in hillside**
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 checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

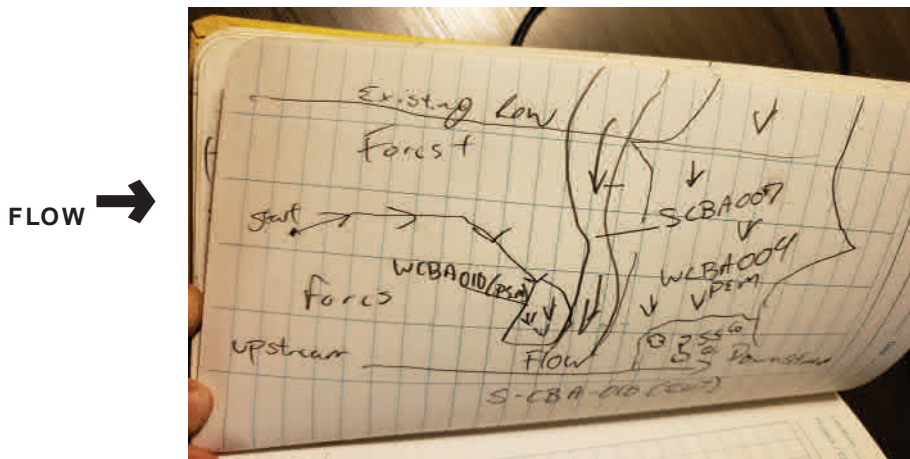
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☒ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> CWH Name:	UNT to Trail Run	Distance from Evaluated Stream	0.00
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Carrollton NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated Turbidity? (Y/N): N Canopy (% open): 100%Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 26	
Date: November 13, 2018	
Description: Intermittent Ephemeral Stream Facing Upstream	

Stream 26	
Date: November 13, 2018	
Description: Intermittent Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 26	
Date: November 13, 2018	
Description: Intermittent Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

24

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-011**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **147**LAT. **40.52028**LONG. **-81.99128**

RIVER CODE

RIVER MILE

DATE **11/14/18**SCORER **CBA/BJM**COMMENTS **Ephemeral channel draining from gravel swale in field****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="70%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="15%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="15%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **15.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **3****HHEI Metric Points**

Substrate Max = 40

9

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

0COMMENTS **OHHM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

15COMMENTS **OHHM width = 3 feet**AVERAGE BANKFULL WIDTH (meters): **1.22****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY**

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

RIPARIAN WIDTH**FLOODPLAIN QUALITY**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<input checked="" 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"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **located downslope of existing ROW and active hayfield****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 (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

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 checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

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

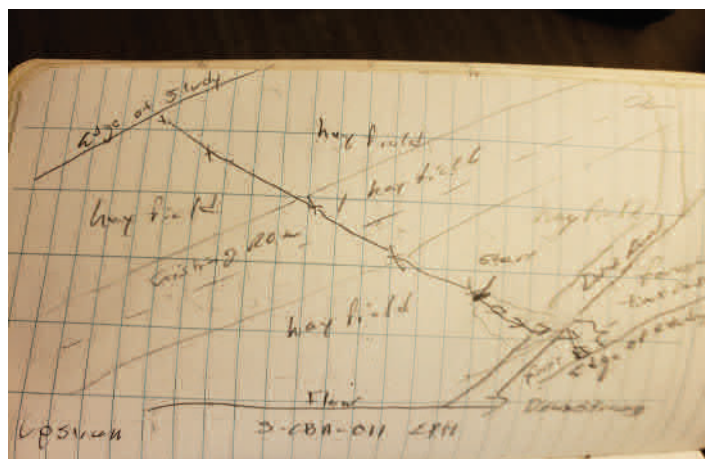
ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	1.50

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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 (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: **Stream starts at edge of hayfield below vegetated gravel swale, crosses farm road and drains into perennial stream S-CBA-012.**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) NComments 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 →





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 27	
Date: November 14, 2018	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 27	
Date: November 14, 2018	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 27	
Date: November 14, 2018	
Description: Ephemeral Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-012**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.31**LENGTH OF STREAM REACH (ft) **400**LAT. **40.51976**LONG. **-81.99020**

RIVER CODE

RIVER MILE

DATE **11/14/18**SCORER **CBA/BJM**COMMENTS **Perennial stream flowing across existing ROW****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input checked="" type="checkbox"/> 15%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 30%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input checked="" type="checkbox"/> 30%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input checked="" type="checkbox"/> 25%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

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

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **21**TOTAL NUMBER OF SUBSTRATE TYPES: **4****HHEI Metric Points**

Substrate Max = 40

25

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS **OHHM depth = 30 inches**MAXIMUM POOL DEPTH (centimeters): **13**

Pool Depth Max = 30

25

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

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

COMMENTS **OHHM width = 10.5 feet**AVERAGE BANKFULL WIDTH (meters): **3.65**

Bankfull Width Max=30

25**This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY**

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

RIPARIAN WIDTH**FLOODPLAIN QUALITY**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **Riparian width and Floodplain Quality in ROW are narrow and New Field, respectively****FLOW REGIME** (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS

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

<input 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 checked="" type="checkbox"/> 2.5	<input type="checkbox"/> >3

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

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 28	
Date: November 14, 2018	
Description: Perennial Spring Water Facing Upstream	

Stream 28	
Date: November 14, 2018	
Description: Perennial Spring Water Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 28	
Date: November 14, 2018	
Description: Perennial Spring Water Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-013**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **27** LAT. **40.51968** LONG. **-81.98982** RIVER CODE RIVER MILE DATE **11/14/18** SCORER **CBA/BJM** COMMENTS **Intermittent stream from groundwater seep on hill in R****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**
☐ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☐ RECOVERING
 ☒ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/> 25%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 50%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 25%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **25.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **21**TOTAL NUMBER OF SUBSTRATE TYPES: **3****HHEI Metric Points**

Substrate Max = 40

24

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

0COMMENTS **OHHM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

5COMMENTS **OHHM width = 2 feet**AVERAGE BANKFULL WIDTH (meters): **0.61****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY**

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

RIPARIAN WIDTH**FLOODPLAIN QUALITY**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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"/>	<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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **stream located entirely within existing ROW****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 (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

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

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

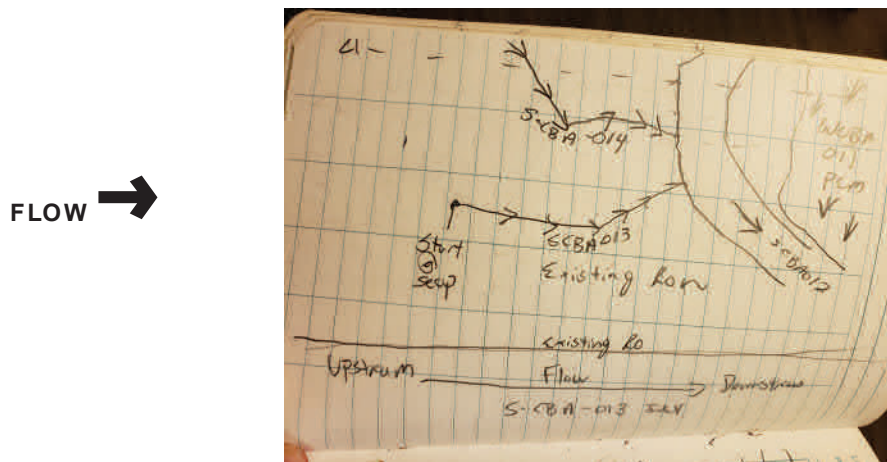
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☒ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	1.50

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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: Stream starts at groundwater seep in existing ROW and flows into perennial stream S-CBA-012Additional 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) NComments 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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 29	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Facing Upstream	

Stream 29	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 29	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

SITE NUMBER **S-CBA-014** RIVER BASIN **Ohio** DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **137** LAT. **40.51958** LONG. **-81.98995** RIVER CODE RIVER MILE

DATE **11/14/18** SCORER **CBA/BJM** COMMENTS **Intermittent stream originating off ROW**

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

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

- 1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pt]	10%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	5%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	30%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<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 **35.00%** (A)

Substrate Percentage Check **100%** (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 21 **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 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS **OHHM depth = 2 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 checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS **OHHM width = 3 feet** **AVERAGE BANKFULL WIDTH (meters): 1.22**

HHEI Metric Points

 Substrate
Max = 40

26

A + B

 Pool Depth
Max = 30

5

 Bankfull
Width
Max=30

15

This information must also be completed

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

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

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

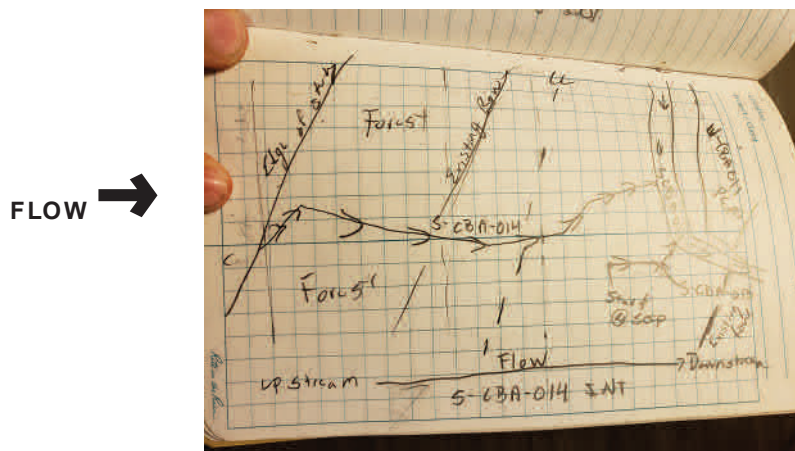
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☒ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	1.50

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated Turbidity? (Y/N): N Canopy (% open): 45%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: Stream starts in woods outside existing ROW and flows into perennial stream S-CBA-012Additional 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) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 30	
Date: November 14, 2018	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 30	
Date: November 14, 2018	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 30	
Date: November 14, 2018	
Description: Intermittent Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

10

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-015**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **41**LAT. **40.51620**LONG. **-81.98562**

RIVER CODE

RIVER MILE

DATE **11/14/18**SCORER **CBA/BJM**COMMENTS **Intermittent stream originating from wetland W-CBA-04****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**☐ NONE / NATURAL CHANNEL☐ RECOVERED☒ RECOVERING☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="75%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="25%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **3**TOTAL NUMBER OF SUBSTRATE TYPES: **2****HHEI Metric Points**

Substrate Max = 40

5

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

0COMMENTS **OHWM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

5COMMENTS **OHWM width = 2 feet**AVERAGE BANKFULL WIDTH (meters): **0.92****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY**

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

RIPARIAN WIDTH**FLOODPLAIN QUALITY**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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 type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

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

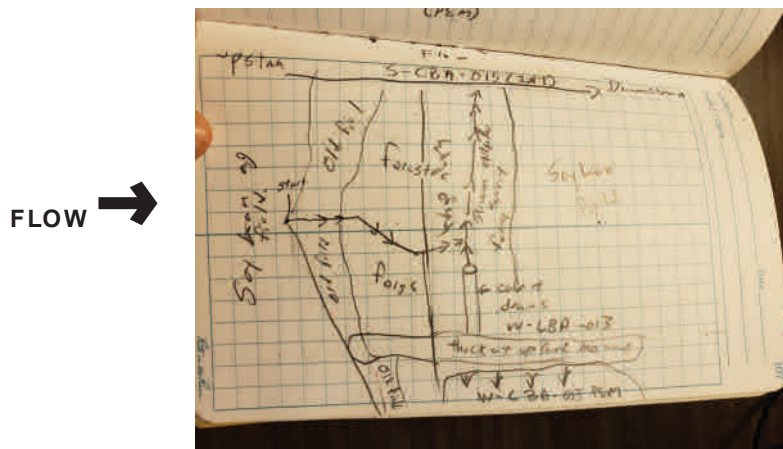
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
☐ Flat to Moderate
☒ Moderate (2 ft/100 ft)
☐ Moderate to Severe
☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.90

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated Turbidity? (Y/N): N Canopy (% open): 55%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: Stream originates in PEM wetland W-CBA-013 located at edge of ag field and flows into wooded areaAdditional 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) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 31	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Facing Upstream	

Stream 31	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 31	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

16
HHEI Score (sum of metrics 1, 2, 3) :

 SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

 SITE NUMBER **S-CBA-016**

 RIVER BASIN **Ohio**

 DRAINAGE AREA (mi²) **0.01**

 LENGTH OF STREAM REACH (ft) **63** LAT. **40.51165** LONG. **-81.97924** RIVER CODE RIVER MILE

 DATE **11/14/18** SCORER **CBA/BJM** COMMENTS **Ephemeral stream originating downslope of ROW at e**
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL MODIFICATIONS:
☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	75%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%
<input checked="" 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)

 Substrate Percentage Check **100%**
(B)

 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **9**

 TOTAL NUMBER OF SUBSTRATE TYPES: **2**
HHEI Metric Points

Substrate Max = 40

11
A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

0

 COMMENTS **OHHM depth = 1 inch**

 MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

5

 COMMENTS **OHHM width = 2 feet**

 AVERAGE BANKFULL WIDTH (meters): **0.92**
This information must also be completed
RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH
FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

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

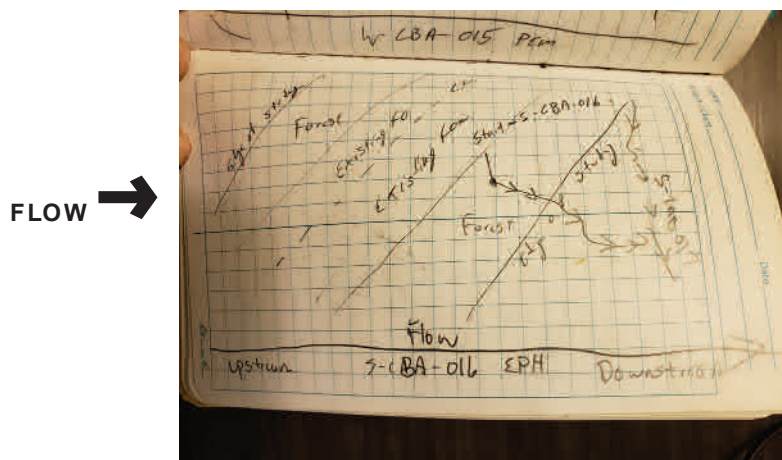
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.50

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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 (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N): Y If not, please explain: Stream originates downslope of existing ROW and flows into wooded areaAdditional 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): NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 32	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 32	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 32	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-017**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **218**LAT. **40.51162**LONG. **-81.97887**

RIVER CODE

RIVER MILE

DATE **11/14/18**SCORER **CBA/BJM**COMMENTS **Intermittent stream crossing ROW, deeply incised****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**
☐ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☒ RECOVERING
 ☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input checked="" type="checkbox"/> 25%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<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 checked="" type="checkbox"/> 15%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input checked="" type="checkbox"/> 40%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input checked="" type="checkbox"/> 20%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **15.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **4****HHEI Metric Points**

Substrate Max = 40

16

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

0COMMENTS **OHHM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

5COMMENTS **OHHM width = 3 feet**AVERAGE BANKFULL WIDTH (meters): **1.22****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY**

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

RIPARIAN WIDTH**FLOODPLAIN QUALITY**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

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

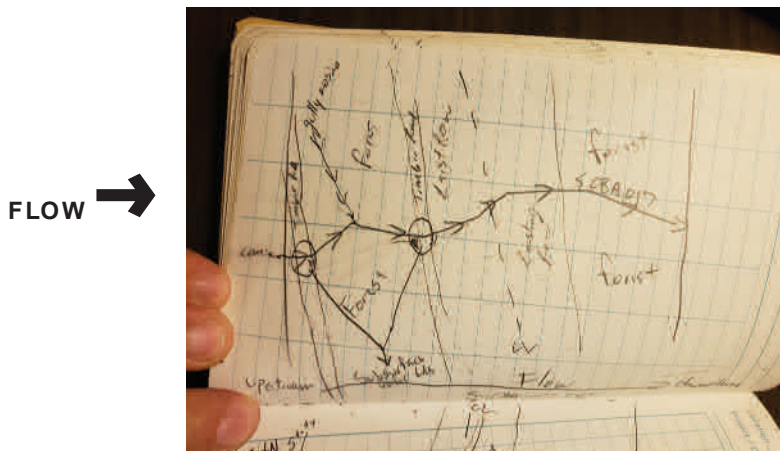
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☒ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.50

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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 (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Stream originates in wooded area to north of ROW, flows through ROW and continues south into wooded area, deeply cut channelAdditional 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) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 33	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Facing Upstream	

Stream 33	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 33	
Date: November 14, 2018	
Description: Intermittent Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

SITE NUMBER **S-CBA-018** RIVER BASIN **Ohio** DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **125** LAT. **40.51074** LONG. **-81.97777** RIVER CODE RIVER MILE

DATE **11/14/18** SCORER **CBA/BJM** COMMENTS **Ephemeral channel begins at edge of ROW**

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

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

- 1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	60%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	20%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

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

Substrate Percentage Check **100%** (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 **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):**

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

COMMENTS **OHHM depth = 1 inch** **MAXIMUM POOL DEPTH (centimeters): 0**

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" 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 **OHHM width = 2 feet** **AVERAGE BANKFULL WIDTH (meters): 0.61**

HHEI Metric Points
Substrate Max = 40
15
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		FLOODPLAIN QUALITY			
L	R	L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	(Per Bank)	(Most Predominant per Bank)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	Immature Forest, Shrub or Old Field	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m	Residential, Park, New Field	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	None	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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 (Interstitial)	<input checked="" type="checkbox"/>	Dry channel, no water (Ephemeral)

COMMENTS

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 checked="" type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3

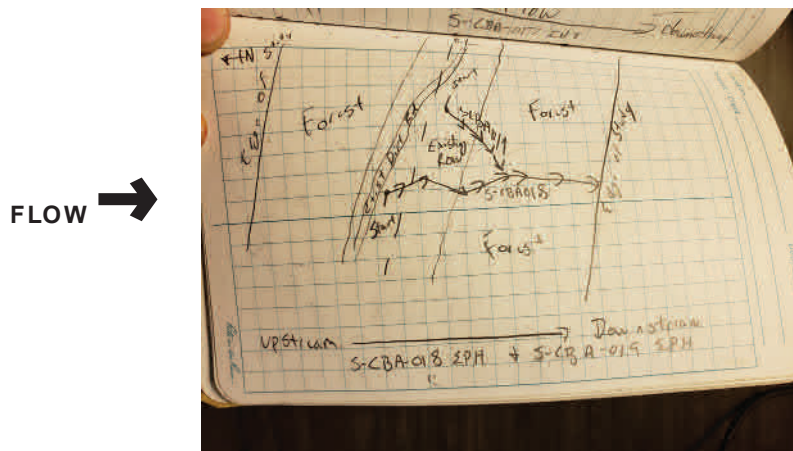
STREAM GRADIENT ESTIMATE ☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.35

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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: Stream originates at edge of existing ROW and flows south into wooded areaAdditional 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) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 34	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 34	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 34	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-019**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **65**LAT. **40.51066**LONG. **-81.97768**RIVER CODE RIVER MILE DATE **11/14/18**SCORER **CBA/BJM**COMMENTS **Ephemeral channel begins at edge of ROW****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**
☐ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☐ RECOVERING
 ☒ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input checked="" type="checkbox"/> 30%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input checked="" type="checkbox"/> 25%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<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 checked="" type="checkbox"/> 20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input checked="" type="checkbox"/> 25%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **45.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **4****HHEI Metric Points**

Substrate Max = 40

16

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

0COMMENTS **OHHM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

5COMMENTS **OHHM width = 2 feet**AVERAGE BANKFULL WIDTH (meters): **0.61****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY**

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

RIPARIAN WIDTH**FLOODPLAIN QUALITY**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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"/>	<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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **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 (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS **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 checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

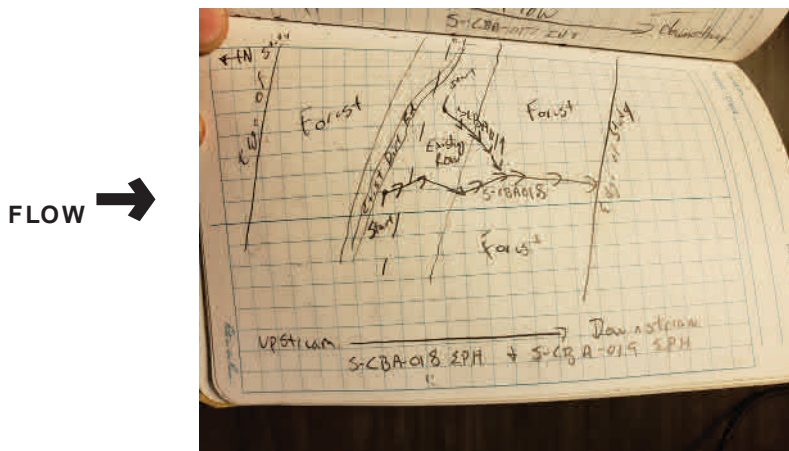
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☒ Moderate (2 ft/100 ft)
 ☐ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.35

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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: Stream originates at edge of existing ROW and flows into ephemeral stream S-CBA-018Additional 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) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 35	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 35	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 35	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

 SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

 SITE NUMBER **S-CBA-020**

 RIVER BASIN **Ohio**

 DRAINAGE AREA (mi²) **0.01**

 LENGTH OF STREAM REACH (ft) **245**

 LAT. **40.50958**

 LONG. **-81.97602**

RIVER CODE

RIVER MILE

 DATE **11/14/18**

 SCORER **CBA/BJM**

 COMMENTS **Ephemeral channel spanning the width of the ROW**
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL MODIFICATIONS:
☐ NONE / NATURAL CHANNEL

☐ RECOVERED

☒ RECOVERING

☐ RECENT OR NO RECOVERY

- 1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	50%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

 Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **20.00%**
(A)

 Substrate Percentage Check **100%**
(B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12
TOTAL NUMBER OF SUBSTRATE TYPES: 3
HHEI Metric Points

Substrate Max = 40

15
A + B

- 2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):**

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

 COMMENTS **OHHM depth = 1 inch**

 MAXIMUM POOL DEPTH (centimeters): **0**

Pool Depth Max = 30

0

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" 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 **OHHM width = 2 feet**

 AVERAGE BANKFULL WIDTH (meters): **0.61**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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"/>	<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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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 (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

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

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

STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)

☐ Flat to Moderate

☒ Moderate (2 ft/100 ft)

☐ Moderate to Severe

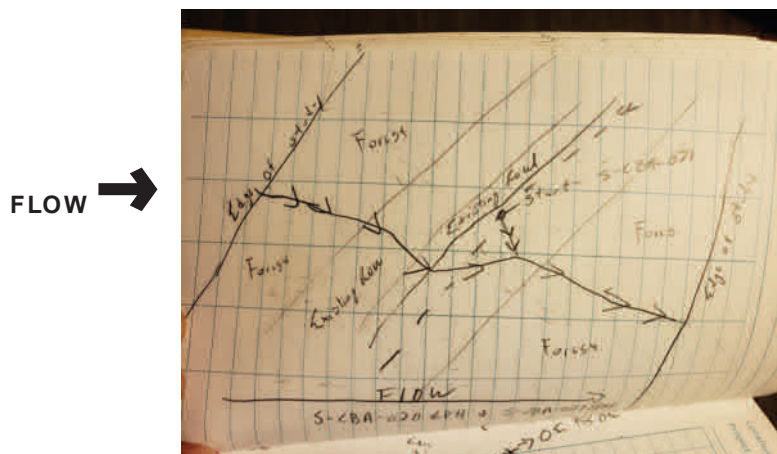
☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.25

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated Turbidity? (Y/N): N Canopy (% open): 65%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: Stream flows from wooded area across ROWAdditional 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) NComments 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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 36	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 36	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 36	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**SITE NUMBER **S-CBA-020**RIVER BASIN **Ohio**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **40**LAT. **40.50953**LONG. **-81.97597**

RIVER CODE

RIVER MILE

DATE **11/14/18**SCORER **CBA/BJM**COMMENTS **Ephemeral channel spanning the width of the ROW****NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**
☐ NONE / NATURAL CHANNEL
 ☐ RECOVERED
 ☒ RECOVERING
 ☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="45%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="15%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **35.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**TOTAL NUMBER OF SUBSTRATE TYPES: **4****HHEI Metric Points**

Substrate Max = 40

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 storm water pipes) (Check *ONLY* one box):

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

COMMENTS **OHHM depth = 1 inch**MAXIMUM POOL DEPTH (centimeters): **0**

Pool Depth Max = 30

0

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" 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 **OHHM width = 2 feet**AVERAGE BANKFULL WIDTH (meters): **0.61**

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**

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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"/>	<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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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 (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

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 checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

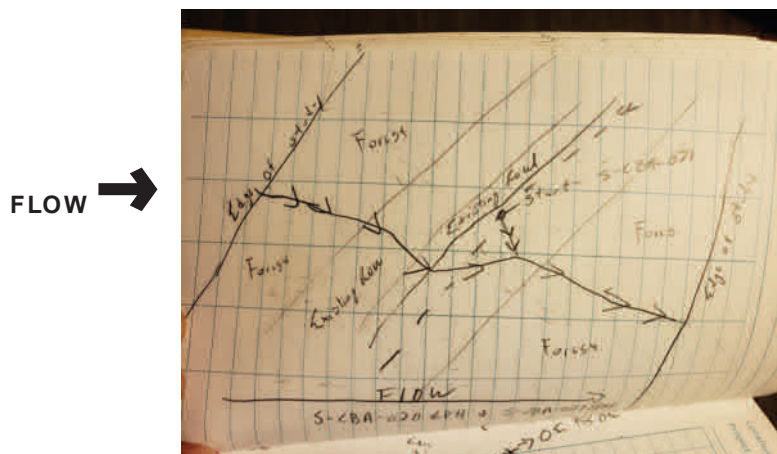
STREAM GRADIENT ESTIMATE
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☒ Moderate (2 ft/100 ft)
 ☐ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.25

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated 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: Entire stream reach contained to the existing ROWAdditional 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) NComments 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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 37	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 37	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 37	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

17

SITE NAME/LOCATION **AEP Carrollton-Gable / Carroll County, Ohio**

SITE NUMBER **S-CBA-022** RIVER BASIN **Ohio** DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **277** LAT. **40.50859** LONG. **-81.97468** RIVER CODE RIVER MILE

DATE **11/14/18** SCORER **CBA/BJM** COMMENTS **Ephemeral channel spanning the width of the ROW**

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

STREAM CHANNEL MODIFICATIONS:

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> SILT [3 pt]	<input type="text" value="25%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="55%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

9

TOTAL NUMBER OF SUBSTRATE TYPES:

3

HHEI Metric Points

Substrate Max = 40

12

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS **OHHM depth = 1 inch**

MAXIMUM POOL DEPTH (centimeters):

0

Pool Depth Max = 30

0

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" 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 **OHHM width = 2 feet**

AVERAGE BANKFULL WIDTH (meters):

0.92

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

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

COMMENTS

FLOODPLAIN QUALITY

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

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

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

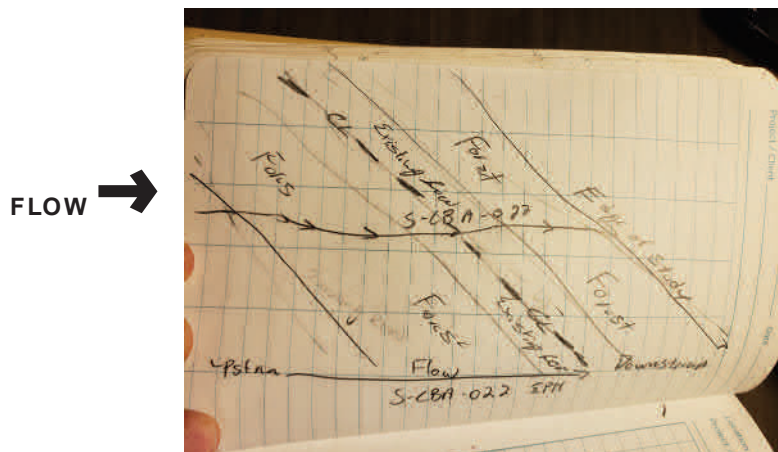
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	UNT to Elkhorn Creek	Distance from Evaluated Stream	0.15

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Bergholz NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Lee Township**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/09/18 Quantity: 0.40Photograph Information: Upstream, downstream, and substrateElevated Turbidity? (Y/N): N Canopy (% open): 45%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: Entire stream reach contained to the existing ROWAdditional 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) NComments 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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 38	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 38	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 38	
Date: November 14, 2018	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 48.5
Stream & Location: AEP Carrollton-Gable / Carroll County

RM: 6.5 **Date:** 11/23/18

S-CBA-023 (Elkhorn Creek)

Scorers Full Name & Affiliation: CBA (AECOM)

River Code: - **STORET #:** - **Lat./ Long.:** (NAD 83 - decimal °) 40.507168 18.0.972601 **Office verified location** ☐
1] SUBSTRATE Check **ONLY** Two substrate **TYPE BOXES**; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: 40px; text-align: center;">5</div> Maximum 20
<input type="checkbox"/> BLDR /SLABS [10]				<input type="checkbox"/> HARDPAN [4]		<input type="checkbox"/> LIMESTONE [1]		<input type="checkbox"/> SILT [1]		<input type="checkbox"/> HEAVY [-2]		
<input type="checkbox"/> BOULDER [9]				<input type="checkbox"/> DETRITUS [3]		<input checked="" type="checkbox"/> TILLS [1]		<input type="checkbox"/> WETLANDS [0]		<input type="checkbox"/> MODERATE [-1]		
<input type="checkbox"/> COBBLE [8]	5	5		<input type="checkbox"/> MUCK [2]		<input type="checkbox"/> SANDSTONE [0]		<input type="checkbox"/> RIP/RAP [0]		<input type="checkbox"/> NORMAL [0]		
<input type="checkbox"/> GRAVEL [7]	5	5		<input checked="" type="checkbox"/> SILT [2]	65	<input type="checkbox"/> ARTIFICIAL [0]		<input type="checkbox"/> LACUSTURINE [0]		<input type="checkbox"/> FREE [1]		
<input checked="" type="checkbox"/> SAND [6]	25	25						<input type="checkbox"/> SHALE [-1]		<input type="checkbox"/> EXTENSIVE [-2]		
<input type="checkbox"/> BEDROCK [5]								<input type="checkbox"/> COAL FINES [-2]		<input type="checkbox"/> MODERATE [-1]		
				(Score natural substrates; ignore sludge from point-sources)						<input type="checkbox"/> NORMAL [0]		
										<input type="checkbox"/> NONE [1]		

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

Comments

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

AMOUNT

Check ONE (Or 2 & average)

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

Comments

Cover
Maximum 20

6

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

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

Comments

Channel
Maximum 20

15

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

River right looking downstream

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

Comments

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

Riparian
Maximum 10

6.5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY
MAXIMUM DEPTH

Check ONE (ONLY!)

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

CHANNEL WIDTH

Check ONE (Or 2 & average)

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

CURRENT VELOCITY

Check ALL that apply

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

Indicate for reach - pools and riffles.

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

Pool / Current
Maximum 12

10

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

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

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

Comments

Riffle / Run
Maximum 8

2

6] GRADIENT (51.2 ft/mi) ☐ VERY LOW - LOW [2-4]
DRAINAGE AREA (8.15 mi²) ☐ MODERATE [6-10]
☒ HIGH - VERY HIGH [10-6]

%POOL: 25 **%GLIDE:** 0
%RUN: 50 **%RIFFLE:** 25
Gradient
Maximum 10

4

AJ SAMPLED REACH
Check ALL that apply

METHOD		STAGE	
<input type="checkbox"/>	BOAT	<input type="checkbox"/>	HIGH
<input type="checkbox"/>	WADE	<input type="checkbox"/>	UP
<input checked="" type="checkbox"/>	L. LINE	<input checked="" type="checkbox"/>	NORMAL
<input type="checkbox"/>	OTHER	<input type="checkbox"/>	LOW
	DISTANCE	<input type="checkbox"/>	DRY

<input type="checkbox"/> 0.5 Km		CLARITY	1st --sample pass--	2nd
<input type="checkbox"/> 0.2 Km			<input type="checkbox"/> < 20 cm	<input type="checkbox"/>
<input type="checkbox"/> 0.15 Km			<input type="checkbox"/> 20-<40 cm	<input type="checkbox"/>
<input type="checkbox"/> 0.12 Km			<input checked="" type="checkbox"/> 40-70 cm	<input type="checkbox"/>
<input type="checkbox"/> OTHER			<input type="checkbox"/> > 70 cm / CTB	<input type="checkbox"/>
			<input type="checkbox"/> SECHI DEPTH	<input type="checkbox"/>
				meters

CANOPY

☐ > 85%- OPEN

☐ 55%-~85%

☐ 30%-~55%

☐ 10%-~30%

☐ <10%- CLOSED

1st _____ cm

2nd _____ cm

C/ RECRE

[illegible]



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 39	
Date: November 14, 2018	
Description: Perennial Elkhorn Creek OEPA Exceptional Warmwater Habitat Facing Upstream	

Stream 39	
Date: November 14, 2018	
Description: Perennial Elkhorn Creek OEPA Exceptional Warmwater Habitat Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 39	
Date: November 14, 2018	
Description: Perennial Elkhorn Creek OEPA Exceptional Warmwater Habitat Substrate	



Primary Headwater Habitat Evaluation Form

34

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021219-02

SITE NUMBER **02**

RIVER BASIN

DRAINAGE AREA (mi²) **0.04**LENGTH OF STREAM REACH (ft) **200**LAT. **40.50689**LONG. **-80.97207**

RIVER CODE

RIVER MILE

DATE **02/12/19**SCORER **JTT, AEH**COMMENTS **Intermittent**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 35%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 5%
<input type="checkbox"/> BEDROCK [16 pt]	<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"/> 10%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 20%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 30%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **10.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **9**TOTAL NUMBER OF SUBSTRATE TYPES: **5**HHEI
Metric
PointsSubstrate
Max = 40

14

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH (Inches): **2.00**Pool Depth
Max = 30

15

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

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

COMMENTS

AVERAGE BANKFULL WIDTH (Feet): **1.50**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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS **current precip**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 checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

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

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

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

DOWNSTREAM DESIGNATED USE(S)

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

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

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

MISCELLANEOUS

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

Additional comments/description of pollution impacts:

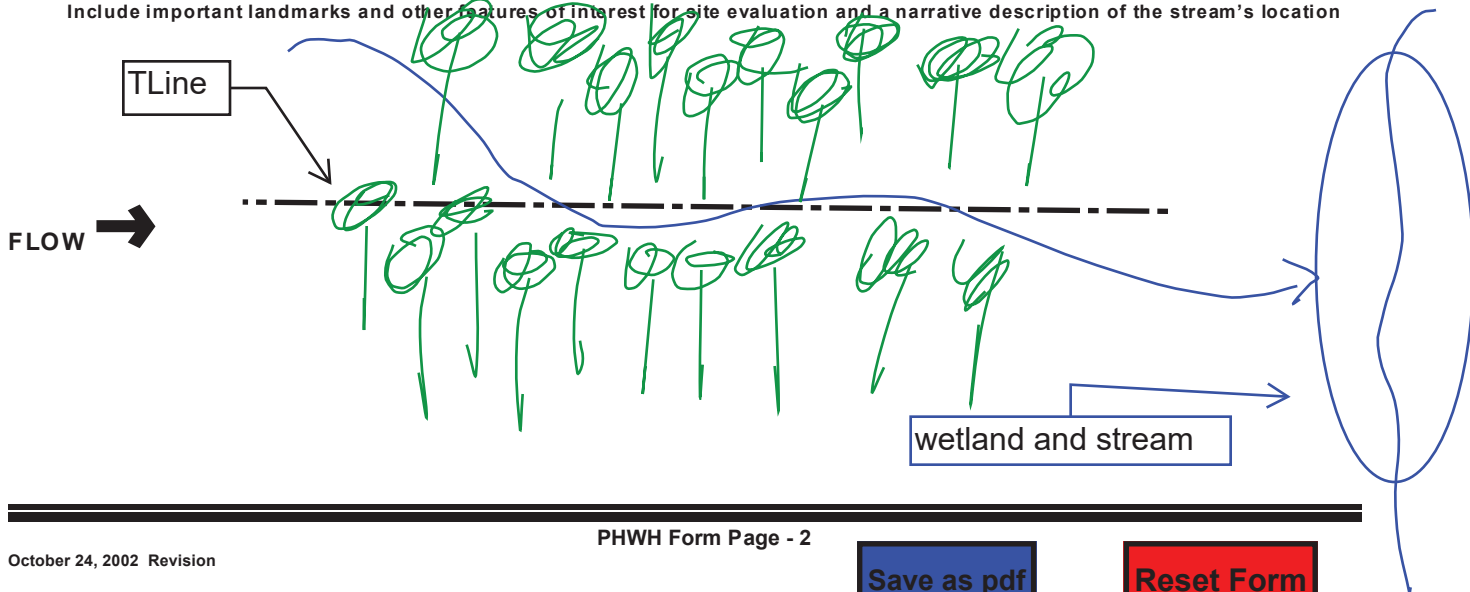
Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 40	
Date: February 12, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Upstream	

Stream 40	
Date: February 12, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 40	
Date: February 12, 2019	
Description: Intermittent Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

25

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021219-01

SITE NUMBER **01**

RIVER BASIN

DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **200**LAT. **40.50476**LONG. **-80.96893**

RIVER CODE

RIVER MILE

DATE **02/12/19**SCORER **JTT, AEH**COMMENTS **ephemeral**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 60%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 10%
<input type="checkbox"/> BEDROCK [16 pt]	<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 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 30%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **3**HHEI
Metric
PointsSubstrate
Max = 40

15

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH

(Inches): **1.00**Pool Depth
Max = 30

5

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

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

COMMENTS

AVERAGE BANKFULL WIDTH

(Feet): **1.50**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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

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

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

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

DOWNSTREAM DESIGNATED USE(S)

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

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

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

MISCELLANEOUS

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

Additional comments/description of pollution impacts:

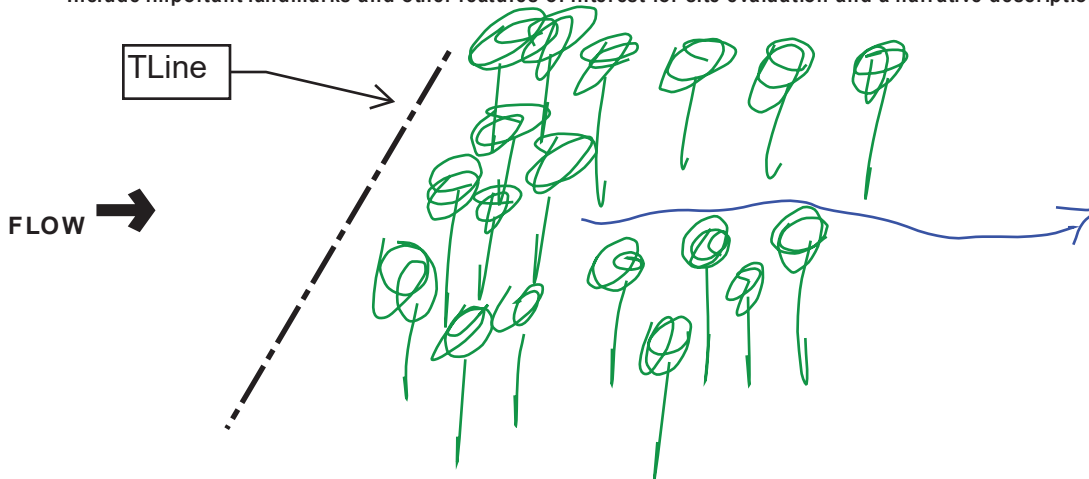
Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 41	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 41	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 41	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021119-03

SITE NUMBER **03**

RIVER BASIN

DRAINAGE AREA (mi²) **0.19**LENGTH OF STREAM REACH (ft) **200**LAT. **40.49777**LONG. **-80.95967**

RIVER CODE

RIVER MILE

DATE **02/11/19**SCORER **JTT, AEH**COMMENTS **perennial; Cox Creek (WWH)**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pt]	25%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	5%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	10%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<input type="checkbox"/> MUCK [0 pts]	0%
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	30%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **10.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**TOTAL NUMBER OF SUBSTRATE TYPES: **5**HHEI
Metric
PointsSubstrate
Max = 40**20**

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH (Inches): **15.00**Pool Depth
Max = 30**20**

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

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

COMMENTS

AVERAGE BANKFULL WIDTH (Feet): **3.00**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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

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

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

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

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

MISCELLANEOUS

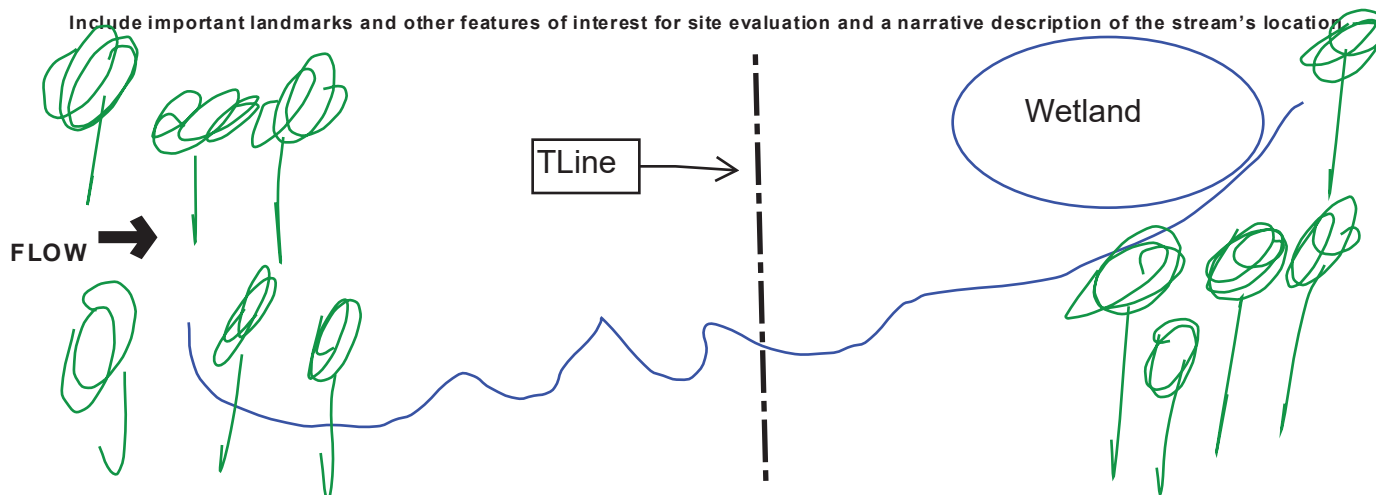
Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.)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

Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 42	
Date: February 11, 2019	
Description: Perennial Cox Creek OEPA Warmwater Habitat Facing Upstream	

Stream 42	
Date: February 11, 2019	
Description: Perennial Cox Creek OEPA Warmwater Habitat Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 42	
Date: February 11, 2019	
Description: Perennial Cox Creek OEPA Warmwater Habitat Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021119-02

SITE NUMBER **02**

RIVER BASIN

DRAINAGE AREA (mi²) **0.07**LENGTH OF STREAM REACH (ft) **200**LAT. **40.49523**LONG. **-80.95588**

RIVER CODE

RIVER MILE

DATE **02/11/19**SCORER **JTT, AEH**COMMENTS **intermittent**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	50%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	10%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	25%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	15%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **25.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**TOTAL NUMBER OF SUBSTRATE TYPES: **4**HHEI
Metric
PointsSubstrate
Max = 40**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 storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH (Inches): **3.00**Pool Depth
Max = 30**15**

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

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

COMMENTS

AVERAGE BANKFULL WIDTH (Feet): **2.00**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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

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

STREAM GRADIENT ESTIMATE

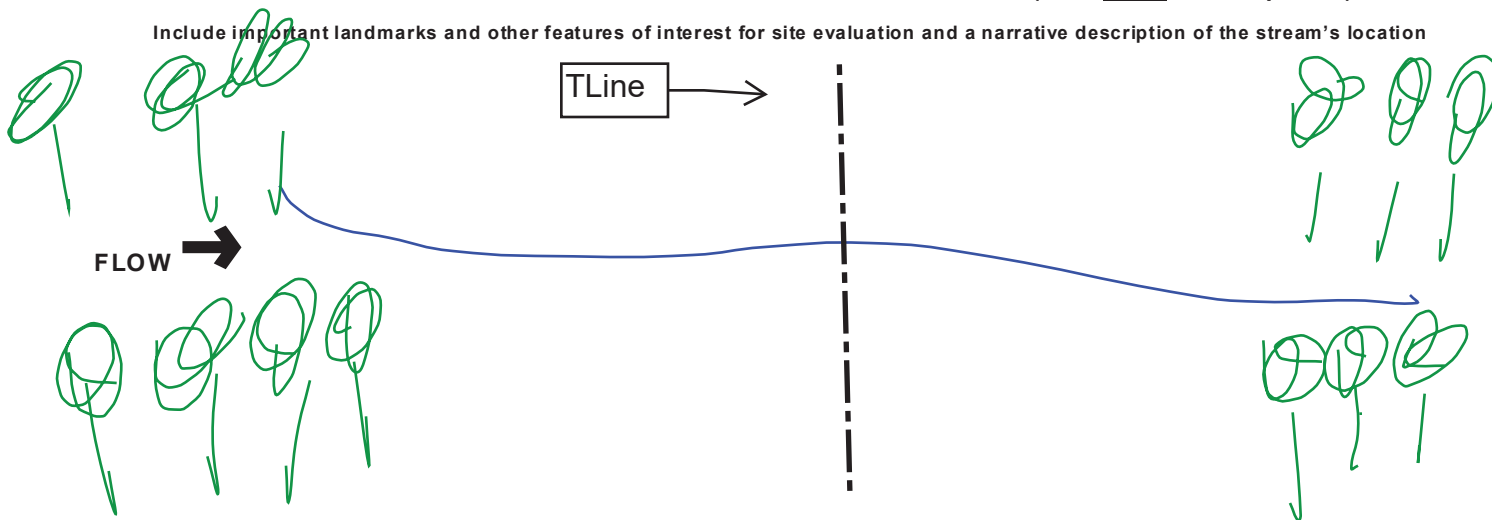
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☒ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain: Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 43	
Date: February 11, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Upstream	

Stream 43	
Date: February 11, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 43	
Date: February 11, 2019	
Description: Intermittent Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

20

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021119-01

SITE NUMBER **01**

RIVER BASIN

DRAINAGE AREA (mi²) **0.07**LENGTH OF STREAM REACH (ft) **200**LAT. **40.49213**LONG. **-80.95098**

RIVER CODE

RIVER MILE

DATE **02/11/19**SCORER **JTT, AEH**COMMENTS **ephemeral**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="55%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="20%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="15%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="10%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **15.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **4**HHEI
Metric
PointsSubstrate
Max = 40

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 storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH (Inches): **1.00**Pool Depth
Max = 30

5

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

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

COMMENTS

AVERAGE BANKFULL WIDTH (Feet): **1.50**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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS **current precip**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 checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

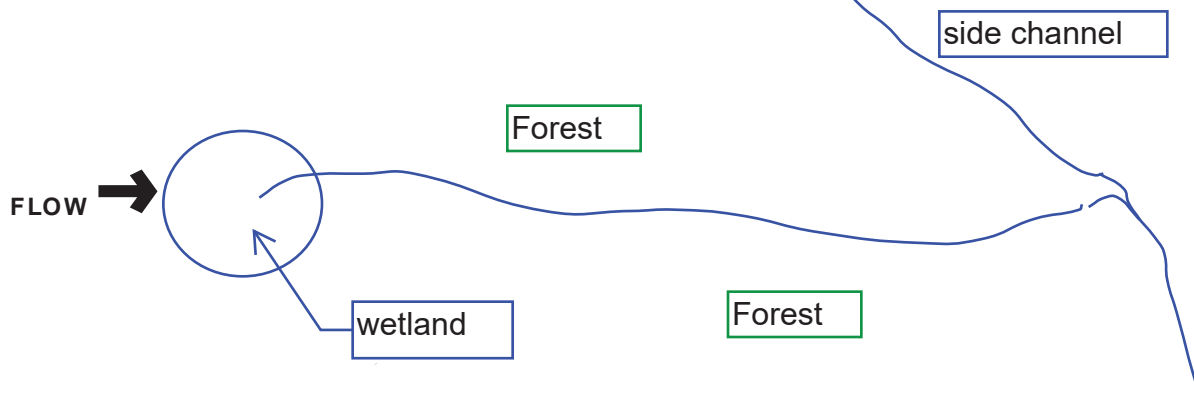
☐ Flat (0.5 ft/100 ft)
 ☐ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☒ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain: Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 44	
Date: February 11, 2019	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 44	
Date: February 11, 2019	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 44	
Date: February 11, 2019	
Description: Ephemeral Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

53

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

SITE NAME/LOCATION	Carrollton_Gable
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Field ID: hh-cms-021219-01 SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.00**

LENGTH OF STREAM REACH (ft) **81** LAT. **40.48240** LONG. **-80.94170** RIVER CODE RIVER MILE

DATE	02/12/19	SCORER	CMS, RM	COMMENTS	intermittent
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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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input checked="" type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input type="checkbox"/>	<input type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
		0%			0%
		5%			0%
		40%			0%
		20%			0%
		15%			0%
		20%			0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **65.00%**

(A)







Substrate Percentage Check	100%
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(B)

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 [30 pts]		< 5 cm [5 pts]
	> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS		MAXIMUM POOL DEPTH (Inches):	2.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R		(Per Bank)	L R		(Most Predominant per Bank)	L R		
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS _____

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

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

COMMENTS

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

Channel 1 (Number of bands per 0.1 m (200 ft) of channel)					Channel ONE2 (One box)				
<input type="checkbox"/>	None	<input type="checkbox"/>	1.0	<input type="checkbox"/>	2.0	<input type="checkbox"/>	3.0		
<input checked="" type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3		

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

Substrate
Max = 40

33

$$A + B$$

Pool Depth
Max = 30

15

**Bankfull
Width
Max=30**

5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	6,750.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** 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 (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

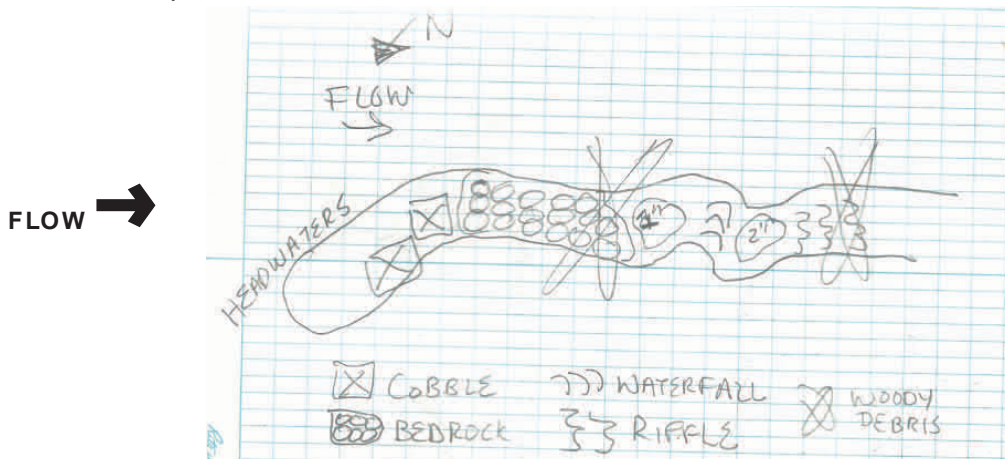
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

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

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

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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 45	
Date: February 12, 2019	
Description: Intermittent Small Drainage Warmwater Facing Upstream	

Stream 45	
Date: February 12, 2019	
Description: Intermittent Small Drainage Warmwater Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name:

AEP

Site Location:

Gable-Carrollton 138 kV Transmission Line Project

Project No.

60582598

Stream 45

Date:

February 12, 2019

Description:

Intermittent

Small Drainage
Warmwater

Substrate





Primary Headwater Habitat Evaluation Form

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

25

SITE NAME/LOCATION	AEP Carrollton-Gable 138 kV Transmission Line
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Field ID: hh-cms-021219-02 SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.00**

LENGTH OF STREAM REACH (ft) **59** LAT. **40.47930** LONG. **-80.93870** RIVER CODE RIVER MILE

DATE	02/12/19	SCORER	CMS, RM	COMMENTS	
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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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check	100%
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(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12

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):

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

COMMENTS		MAXIMUM POOL DEPTH (Inches):	1.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R		(Per Bank)	L R		(Most Predominant per Bank)	L R		
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

UNSUCCESSFUL (Number of bonds per 0.1 m (200 ft) of channel; 1 success ONE7 one box).							
<input type="checkbox"/>	None	<input type="checkbox"/>	1.0	<input type="checkbox"/>	2.0	<input type="checkbox"/>	3.0
<input checked="" type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

Substrate
Max = 40

15

A + B

Pool Depth
Max = 30

5

Bankfull
Width
Max=30

5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	6,100.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** 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 (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

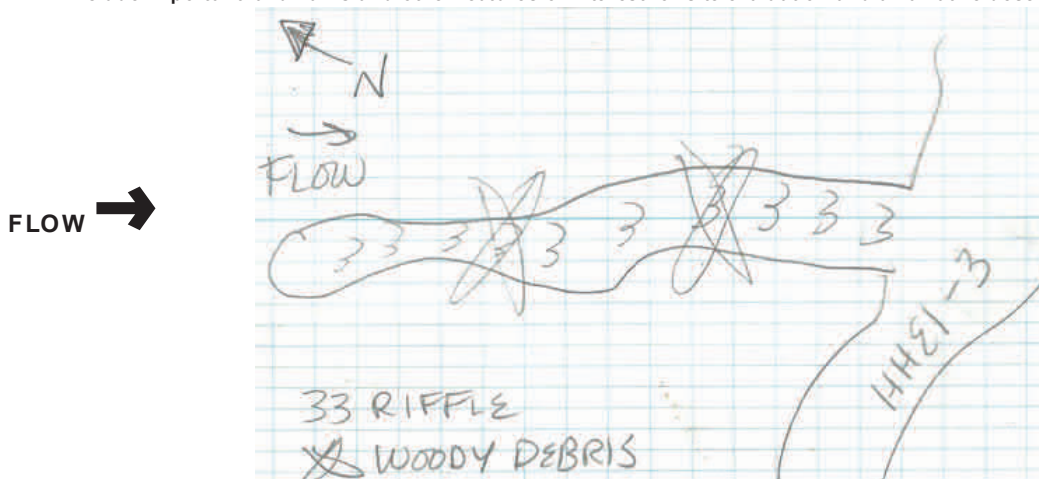
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

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

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

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 46	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 46	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name:

AEP

Site Location:

Gable-Carrollton 138 kV Transmission Line Project

Project No.

60582598

Stream 46

Date:

February 12, 2019

Description:

Ephemeral

Ephemeral Stream

Substrate





Primary Headwater Habitat Evaluation Form

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

32

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021219-04** SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.02**
 LENGTH OF STREAM REACH (ft) **42** LAT. **40.4788** LONG. **-80.93820** RIVER CODE RIVER MILE
 DATE **02/12/19** SCORER **CMS, RM** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
		0%			0%
		0%			33%
		0%			0%
		0%			34%
		33%			0%
		0%			0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check	100%
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(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):

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

COMMENTS		MAXIMUM POOL DEPTH (Inches):	2.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R		(Per Bank)	L R		(Most Predominant per Bank)	L R		
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction






COMMENTS

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

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

COMMENTS

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

UNSUCCESS 1 (Number of bands per 0.1 ml (200 ft) of channel) - Success ONE7 One Box:				
	None		1.0	
	0.5		1.5	
			2.0	
			2.5	
			3.0	
			>3	

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

**Substrate
Max = 40**

12

A + B

Pool Depth
Max = 30

15

**Bankfull
Width
Max=30**

5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	5,800.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee**

MISCELLANEOUS

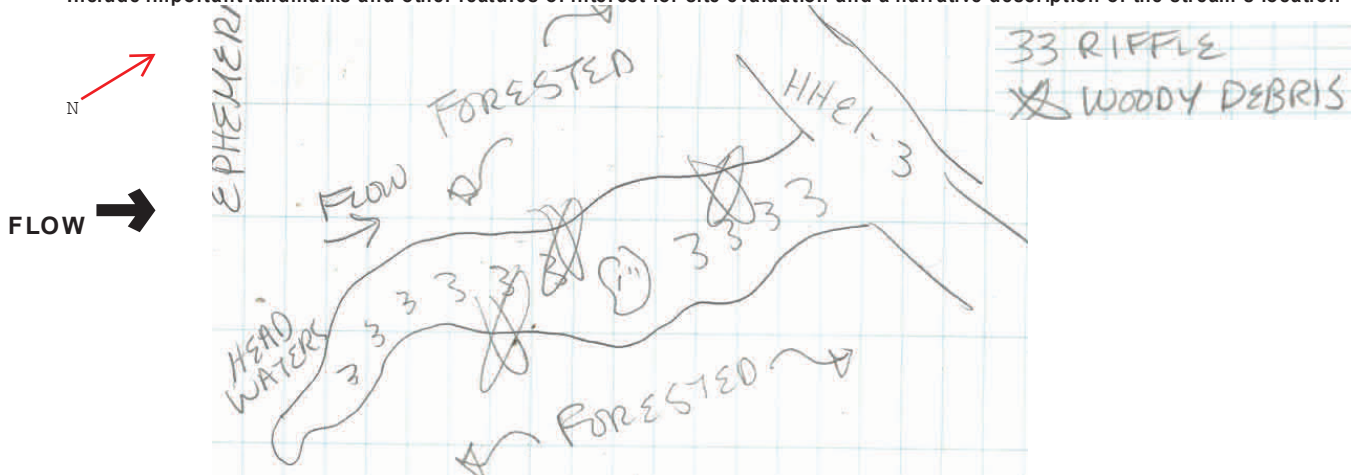
Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** Canopy (% open): **20%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

Additional comments/description of pollution impacts: **BIOTIC EVALUATION**

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

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

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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 47	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 47	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 47	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

42

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: hh-cms-021219-03 SITE NUMBER [] RIVER BASIN Ohio River DRAINAGE AREA (mi²) 0.04
LENGTH OF STREAM REACH (ft) 556 LAT. 40.47930 LONG. -80.93870 RIVER CODE [] RIVER MILE []
DATE 02/12/19 SCORER CMS, RM COMMENTS []

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

1. **SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.**

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
		0%			0%
		0%			0%
		5%			0%
		0%			50%
		45%			0%
		0%			0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **5.00%**

(A)

Substrate Percentage Check	100%
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(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):

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

COMMENTS		MAXIMUM POOL DEPTH (Inches):	4.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS: AVERAGE BANKFULL WIDTH (Feet): 3.00

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

HHEI Metric Points

**Substrate
Max = 40**

12

A + B

Pool Depth
Max = 30

25

**Bankfull
Width
Max=30**

5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	5,500.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee**

MISCELLANEOUS

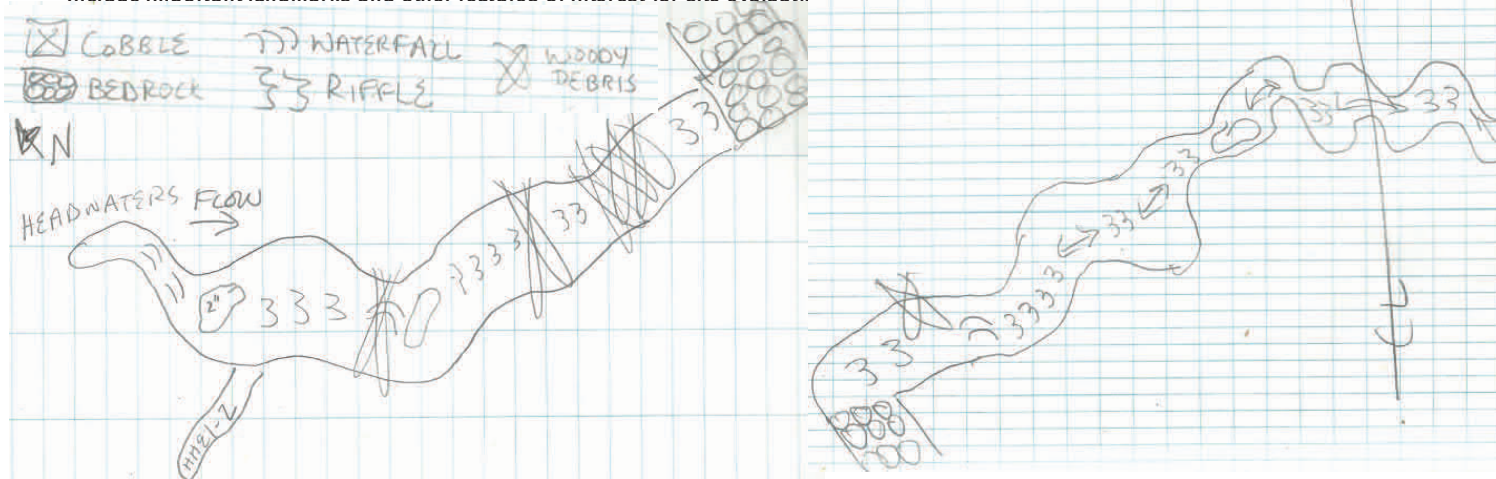
Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** Canopy (% open): **20%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

Additional comments/description of pollution impacts: **BIOTIC EVALUATION**

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

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

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 48	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 48	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 48	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

21

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021219-05** SITE NUMBER **100** RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.04**
 LENGTH OF STREAM REACH (ft) **100** LAT. **40.47740** LONG. **-80.93790** RIVER CODE **100** RIVER MILE **100**
 DATE **02/12/19** SCORER **CMS, RM** COMMENTS

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

1. SUBSTRATE (Estimate number percent of every type of substrate present. Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.			
TYPE		PERCENT	
<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input checked="" type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	ARTIFICIAL [3 pts]
		<input type="checkbox"/>	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		0.00%	(A)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:		9	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Substrate Percentage Check</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 10px;">100%</div>
			(B)
			TOTAL NUMBER OF SUBSTRATE TYPES: 2

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):			
<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	> 30 centimeters [20 pts]	<input type="checkbox"/>	> 5 cm - 10 cm [15 pts]
<input type="checkbox"/>	> 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/>	< 5 cm [5 pts]
<input type="checkbox"/>	> 10 - 22.5 cm [25 pts]	<input type="checkbox"/>	NO WATER OR MOIST CHANNEL [0 pts]
COMMENTS 		MAXIMUM POOL DEPTH (Inches): 1.00	

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):			
<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	> 4.0 meters (> 13') [30 pts]	<input type="checkbox"/>	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/>	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/>	≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/>	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		
COMMENTS 		AVERAGE BANKFULL WIDTH (Feet): 1.00	

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY





L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" 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"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

SUSPECT 1 (Number of bands per 0.1 ml (200 µl) of channel) - Suspect ONE7 One Box:							
	None		1.0		2.0		3.0
	0.5		1.5		2.5		>3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	4,500.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee****MISCELLANEOUS**Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** 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 (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) **N** Voucher? (Y/N) **N** Salamanders Observed? (Y/N) **N** Voucher? (Y/N) **N**
Frogs or Tadpoles Observed? (Y/N) **N** Voucher? (Y/N) **N** Aquatic Macroinvertebrates Observed? (Y/N) **N** Voucher? (Y/N) **N**
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 49	
Date: February 12, 2019	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 49	
Date: February 12, 2019	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 49	
Date: February 12, 2019	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021219-06** SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.01**
 LENGTH OF STREAM REACH (ft) **100** LAT. **40.47670** LONG. **-80.93740** RIVER CODE RIVER MILE
 DATE **02/12/19** SCORER **CMS, RM** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
		0%			33%
		0%			0%
		0%			0%
		0%			34%
		33%			0%
		0%			0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check	100%
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(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]
	> 22.5 - 30 cm [30 pts]		< 5 cm [5 pts]
	> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS		MAXIMUM POOL DEPTH (Inches):	3.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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 type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

UNSUCCESSFUL (Number of bonds per 0.1 m (200 ft) of channel; 1 success ONE7 one box).							
<input type="checkbox"/>	None	<input type="checkbox"/>	1.0	<input type="checkbox"/>	2.0	<input type="checkbox"/>	3.0
<input checked="" type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

**Substrate
Max = 40**

12

A + B

Pool Depth
Max = 30

15

**Bankfull
Width
Max=30**

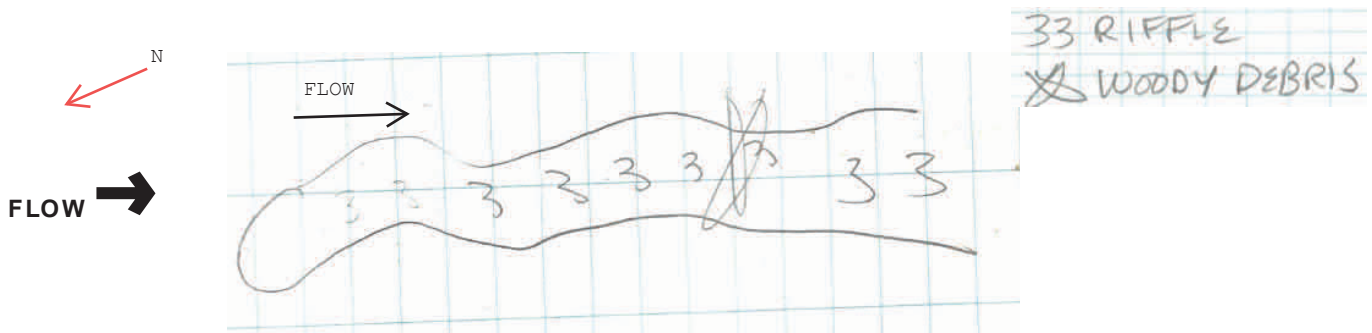
5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	3,990.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee****MISCELLANEOUS**Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
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 (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) **N** Voucher? (Y/N) **N** Salamanders Observed? (Y/N) **N** Voucher? (Y/N) **N**
Frogs or Tadpoles Observed? (Y/N) **N** Voucher? (Y/N) **N** Aquatic Macroinvertebrates Observed? (Y/N) **N** Voucher? (Y/N) **N**
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 50	
Date: February 12, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 50	
Date: February 12, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 50	
Date: February 12, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021219-07** SITE NUMBER **253** RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.01**
 LENGTH OF STREAM REACH (ft) **253** LAT. **40.47320** LONG. **-80.93440** RIVER CODE RIVER MILE
 DATE **02/12/19** SCORER **CMS, RM** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)







Substrate Percentage Check	100%
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(B)

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 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 [30 pts]		< 5 cm [5 pts]
	> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS **MAXIMUM POOL DEPTH** (Inches): **3.00**

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

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

COMMENTS **AVERAGE BANKFULL WIDTH (Feet): 3.50**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R		(Per Bank)	L R		(Most Predominant per Bank)	L R		
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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"/>	<input checked="" type="checkbox"/>	Residential, Park, New Field	<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

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

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

Substrate
Max = 40

1

A + B

Pool Depth
Max = 30

15

**Bankfull
Width
Max=30**

15

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Elk Lick	Distance from Evaluated Stream	1,800.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Carroll** Township / City: **Lee**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/12/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
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 (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

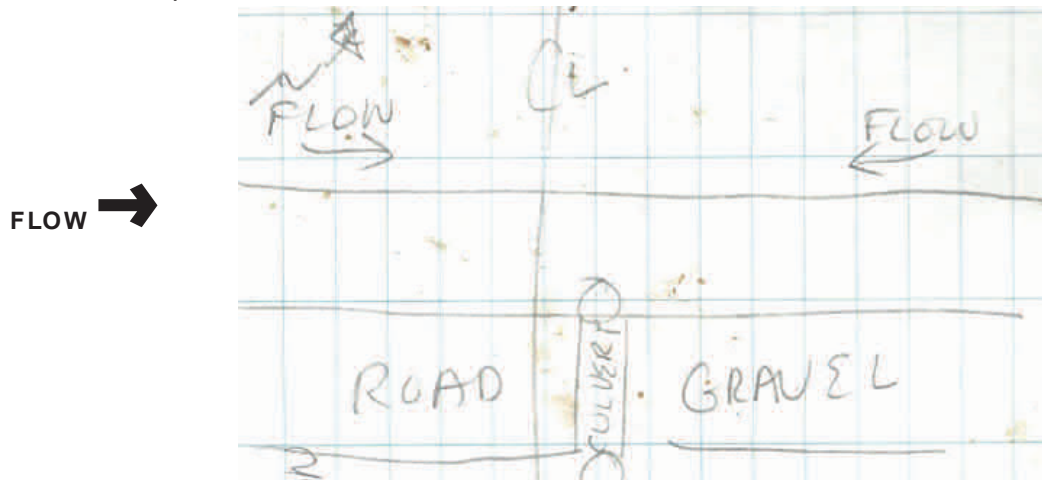
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

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

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

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 51	
Date: February 12, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 51	
Date: February 12, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 51	
Date: February 12, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Substrate	



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:

55

Stream & Location: AEP Carrollton-Gable 138 kV Transmission Line

RM: 0.3 **Date:** 02 / 12 / 19

QHEI-CMS-02122019-01

Scorers Full Name & Affiliation: Charlotte Stallone (AECOM)

River Code: - **STORET #:** - **Lat./ Long.:** (NAD 83 - decimal °) 40 . 4729 18 0 . 9342 **Office verified location** ☐
1] SUBSTRATE Check **ONLY** Two substrate **TYPE BOXES**; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate 11 Maximum 20
<input type="checkbox"/>	BLDR /SLABS [10]			<input checked="" type="checkbox"/>	HARDPAN [4]	40	50	<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [-2]	
<input type="checkbox"/>	BOULDER [9]			<input type="checkbox"/>	DETRITUS [3]			<input type="checkbox"/>	TILLS [1]	<input type="checkbox"/>	MODERATE [-1]	
<input type="checkbox"/>	COBBLE [8]	20	30	<input type="checkbox"/>	MUCK [2]			<input type="checkbox"/>	WETLANDS [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
<input checked="" type="checkbox"/>	GRAVEL [7]	40	20	<input type="checkbox"/>	SILT [2]			<input checked="" type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [1]	
<input type="checkbox"/>	SAND [6]			<input type="checkbox"/>	ARTIFICIAL [0]			<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [-2]	
<input type="checkbox"/>	BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	RIP/RAP [0]	<input type="checkbox"/>	MODERATE [-1]	
								<input type="checkbox"/>	LACUSTURINE [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]								<input type="checkbox"/>	SHALE [-1]	<input type="checkbox"/>	NONE [1]	
Comments								<input type="checkbox"/>	COAL FINES [-2]			

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

AMOUNT

Check ONE (Or 2 & average)

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

Comments
Cover
Maximum
20

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

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

Comments
Channel
Maximum
20

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

River right looking downstream

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

Comments
Riparian
Maximum
10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY
MAXIMUM DEPTH

Check ONE (ONLY!)

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

CHANNEL WIDTH

Check ONE (Or 2 & average)

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

CURRENT VELOCITY

Check ALL that apply

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

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact

(circle one and comment on back)

Comments
Pool / Current
Maximum
12

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

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
RUN DEPTH
RIFFLE / RUN SUBSTRATE
RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]
☒ BEST AREAS 5-10cm [1]
☐ BEST AREAS < 5cm [metric=0]

☐ MAXIMUM > 50cm [2]
☒ MAXIMUM < 50cm [1]

☐ STABLE (e.g., Cobble, Boulder) [2]
☒ MOD. STABLE (e.g., Large Gravel) [1]
☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

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

Comments
Riffle / Run
Maximum
8

6] GRADIENT (80 ft/mi)
DRAINAGE AREA
 (2.29 mi²)

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

%POOL:
%GLIDE:
Gradient
%RUN:
%RIFFLE:
Maximum

AJ SAMPLED REACH

Check ALL that apply

METHOD

- BOAT
- WADE
- L. LINE
- OTHER

STAGE

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

DISTANCE

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

CLARITY

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

meters

CANOPY

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

CJ RECREATION

POOL: <100ft² >3ft

BJ AESTHETICS

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

DJ MAINTENANCE

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

EJ ISSUES

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

FJ MEASUREMENTS

- width 6'
- depth 3'
- max. depth 3'
- bankfull width 6'
- bankfull x depth 3'
- W/D ratio
- bankfull max. depth
- floodprone x2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 52	
Date: February 12, 2019	
Description: Perennial Fair Warmwater Habitat Facing Downstream	

Stream 52	
Date: February 12, 2019	
Description: Perennial Fair Warmwater Habitat Substrate	

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 37



Stream & Location: AEP Carrollton-Gable 138 kV Transmission Line, Carroll County

RM: 30.4 Date: 02/12/19

Scorers Full Name & Affiliation: JTT, AEH / AECOM

River Code: - - - - - STORET #: Lat/Long: 40.469391, -80.931744

Office verified location

1] SUBSTRATE Check ONLY two substrate TYPE BOXES: estimate % or note every type present

1] SUBSTRATE

BEST TYPES	BLDR / SLABS [10]	<input type="checkbox"/>
	BOULDER [9]	<input type="checkbox"/>
	COBBLE [8]	<input type="checkbox"/>
	SAND [7]	<input checked="" type="checkbox"/>
	BEDROCK [5]	<input type="checkbox"/>

NUMBER OF BEST TYPES: ☐ 3 or less ☒ 4 or more ☐ 5 or more

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

OTHER TYPES	HARDPAN [4]	<input type="checkbox"/>
	DETritus [3]	<input type="checkbox"/>
	MUCK [2]	<input type="checkbox"/>
	SILT [2]	<input checked="" type="checkbox"/>
	ARTIFICIAL [0]	<input type="checkbox"/>

POOL RIFFLE

POOL RIFFLE	ARTIFICIAL [0]	5
	HARDPAN [0]	35
	WETLANDS [0]	40
	TILLS [1]	
	LIMESTONE [1]	

ORIGIN

EMBEDDEDNESS	LIMESTONE [1]	<input type="checkbox"/>
	COAL FINES [-2]	<input type="checkbox"/>
	SHALE [-1]	<input type="checkbox"/>
	RIP/RAP [0]	<input type="checkbox"/>
	LACUSTURINE [0]	<input type="checkbox"/>
	SANDSTONE [0]	<input type="checkbox"/>
	HARDPAN [0]	<input type="checkbox"/>
	WETLANDS [0]	<input type="checkbox"/>
	TILLS [1]	<input type="checkbox"/>
	LIMESTONE [1]	<input type="checkbox"/>

SILT

QUALITY	HEAVY [-2]	<input type="checkbox"/>
	MODERATE [-1]	<input type="checkbox"/>
	NORMAL [0]	<input type="checkbox"/>
	FREE [1]	<input type="checkbox"/>
	EXTENSIVE [-2]	<input checked="" type="checkbox"/>
	MODERATE [-1]	<input type="checkbox"/>
	NORMAL [0]	<input type="checkbox"/>
	NONE [1]	<input type="checkbox"/>

Check ONE (Or 2 & average)

2] INSTREAM COVER

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

Check ONE (Or 2 & average)

AMOUNT	EXTENSIVE >75% [1]	<input type="checkbox"/>
	MODERATE 25-75% [7]	<input type="checkbox"/>
	SPARSE 5-25% [3]	<input checked="" type="checkbox"/>
	NEARLY ABSENT <5% [1]	<input type="checkbox"/>

COVER

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"/>
POOLS > 70cm [2]	<input type="checkbox"/>
ROOTWADS [1]	<input type="checkbox"/>
BOULDERS [1]	<input type="checkbox"/>
LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/>
AQUATIC MACROPHYTES [1]	<input type="checkbox"/>
OXBOWS, BACKWATERS [1]	<input type="checkbox"/>

Check ONE (Or 2 & average)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

Sinuosity

HIGH [4]	<input type="checkbox"/>
MODERATE [3]	<input type="checkbox"/>
LOW [2]	<input type="checkbox"/>
NONE [1]	<input type="checkbox"/>

Development

EXCELLENT [7]	<input type="checkbox"/>
GOOD [5]	<input type="checkbox"/>
FAIR [3]	<input type="checkbox"/>
POOR [1]	<input type="checkbox"/>

Channelization

NONE [6]	<input type="checkbox"/>
RECOVERED [4]	<input type="checkbox"/>
RECOVERING [3]	<input type="checkbox"/>
RECENT OR NO RECOVERY [1]	<input type="checkbox"/>

Stability

HIGH [3]	<input type="checkbox"/>
MODERATE [2]	<input type="checkbox"/>
LOW [1]	<input type="checkbox"/>

Channel

Maximum	20
Channel	11

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

Erosion

WIDE > 50m [4]	<input type="checkbox"/>
MODERATE 10-50m [3]	<input type="checkbox"/>
NARROW 5-10m [2]	<input type="checkbox"/>
VERY NARROW < 5m [1]	<input type="checkbox"/>
NONE [0]	<input type="checkbox"/>

Riparian Width

FOREST, SWAMP [3]	<input type="checkbox"/>
SHRUB OR OLD FIELD [2]	<input type="checkbox"/>
RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/>
FENCED PASTURE [1]	<input type="checkbox"/>
OPEN PASTURE, ROWCROP [0]	<input type="checkbox"/>

Flood Plain Quality

CONSERVATION TILLAGE [1]	<input type="checkbox"/>
URBAN OR INDUSTRIAL [0]	<input type="checkbox"/>
MINING / CONSTRUCTION [0]	<input type="checkbox"/>

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

Riparian

Maximum	10
Riparian	3.5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

Check ONE (Or 2 & average)

Channel Width

POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/>
POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/>
POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/>

Current Velocity

TORRENTIAL [-1]	<input type="checkbox"/>
SLOW [1]	<input type="checkbox"/>
INTERSTITIAL [-1]	<input type="checkbox"/>
INTERMITTENT [-2]	<input type="checkbox"/>
EDDIES [1]	<input type="checkbox"/>

Indicate for reach - pools and riffles.

Pool / Current

Maximum	12
Pool / Current	4

6] GRADIENT

Check ONE (Or 2 & average)

Gradient

VERY LOW - LOW [2-4]	<input type="checkbox"/>
MODERATE [6-10]	<input type="checkbox"/>
HIGH - VERY HIGH [10-6]	<input type="checkbox"/>

%POOL: 10

%GLIDE: 20

%RIFFLE: 10

Gradient

Maximum	10
Gradient	4

Comments

BEST AREAS > 10cm [2]	<input type="checkbox"/>
BEST AREAS 5-10cm [1]	<input type="checkbox"/>
BEST AREAS > 50cm [1]	<input type="checkbox"/>
MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/>
STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/>
UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/>

Riffle / Run

Maximum	8
Riffle / Run	3.5

A) SAMPLED REACH

Check ALL that apply

METHOD

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

DISTANCE

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

STAGE

- ☐ HIGH
- ☒ UP
- ☐ NORMAL
- ☐ LOW
- ☐ DRY

CLARITY

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

B) AESTHETIC

D) MAINTENANCE

Circle some & COMMENT

E) ISSUES

F) MEASUREMENTS

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

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

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

- ☐ \bar{x} width
- ☐ \bar{x} depth
- ☐ max. depth 24 in
- ☐ \bar{x} bankfull width 25ft
- ☐ bankfull \bar{x} depth
- ☐ W/D ratio
- ☐ bankfull max. depth
- ☐ floodprone x^2 width
- ☐ entrench. ratio

CANOPY

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

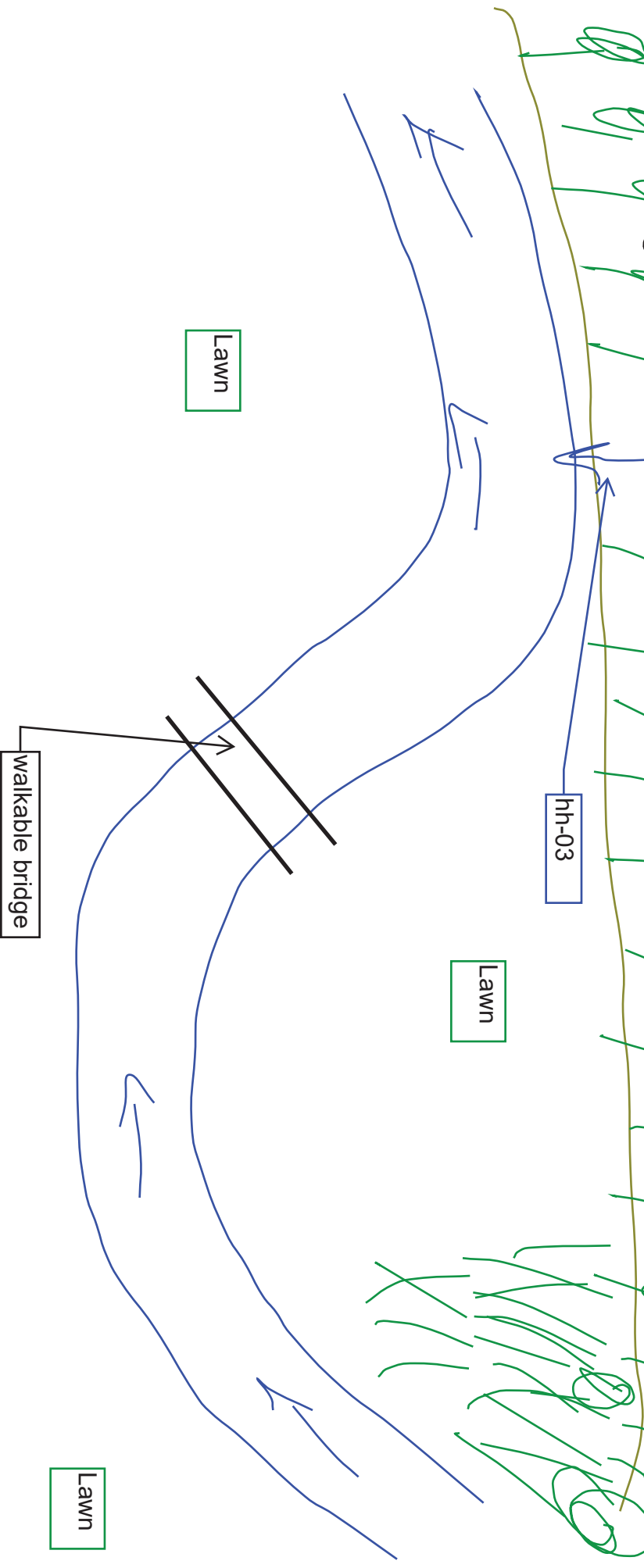
C) REC

- ☐ 1st
- ☐ 2nd
- ☐ cm
- ☐ cm

ION

- ☐ AREA
- ☐ DEPTH
- ☐ >100ft²
- ☐ >3ft

Stream Drawing:






PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 53	
Date: February 12, 2019	
Description: Perennial Yellow Creek OEPA Warmwater Habitat Facing Upstream	

Stream 53	
Date: February 12, 2019	
Description: Perennial Yellow Creek OEPA Warmwater Habitat Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 53	
Date: February 12, 2019	
Description: Perennial Yellow Creek OEPA Warmwater Habitat Substrate	



Primary Headwater Habitat Evaluation Form

25

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021219-03

SITE NUMBER **03**

RIVER BASIN

DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **200**LAT. **40.46905**LONG. **-80.93138**

RIVER CODE

RIVER MILE

DATE **02/12/19**SCORER **JTT, AEH**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:

Culverted

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 60%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 10%
<input type="checkbox"/> BEDROCK [16 pt]	<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 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 30%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

15

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH

(Inches): **1.50**

Pool Depth Max = 30

5

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

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

COMMENTS

AVERAGE BANKFULL WIDTH

(Feet): **1.00**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS **current precip**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 checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

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

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

MISCELLANEOUS

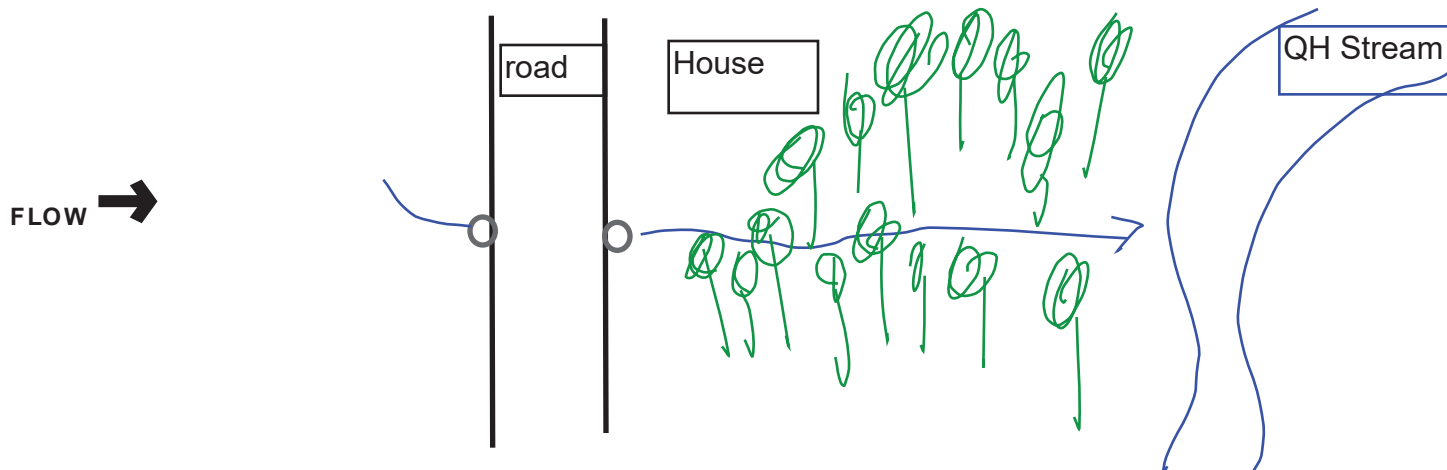
Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.)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

Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒**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






PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 54	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 54	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 54	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

25

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021219-05

SITE NUMBER **05**

RIVER BASIN

DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **200**LAT. **40.46876**LONG. **-80.93086**

RIVER CODE

RIVER MILE

DATE **02/12/19**SCORER **JTT, AEH**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:

channelized

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 60%
<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 pt]	<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 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 25%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

15

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH

(Inches): **1.00**

Pool Depth Max = 30

5

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

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

COMMENTS

AVERAGE BANKFULL WIDTH

(Feet): **1.00**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS **current precip**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 checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

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

USGS Quadrangle Name: Amsterdam NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Carroll Township / City: Loudon Township/Amsterdam

MISCELLANEOUS

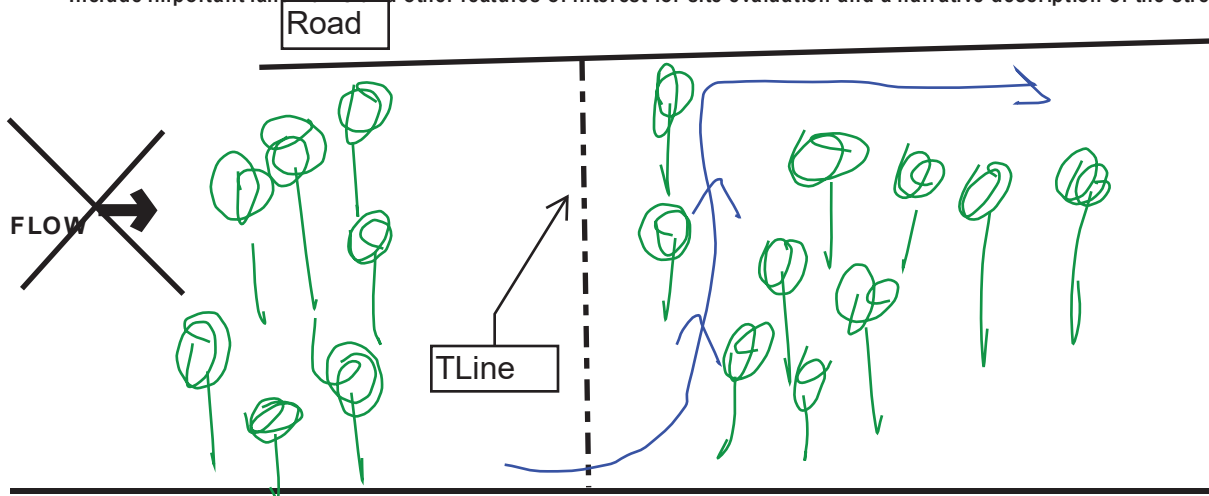
Base Flow Conditions? (Y/N): Y Date of last precipitation: 02/11/19 Quantity: 0.16
Photograph Information: 3 photos, upstream, downstream, substrate
Elevated Turbidity? (Y/N): N Canopy (% open): 60%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (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: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 55	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Upstream	

Stream 55	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 55	
Date: February 12, 2019	
Description: Ephemeral Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

38

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021319-04** SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.00**
 LENGTH OF STREAM REACH (ft) **275** LAT. **40.46590** LONG. **-80.92870** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **CMS, RM** COMMENTS

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

MODIFICATIONS: Ephemeral, culverted

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input checked="" type="checkbox"/>	<input type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		0.00%	(A)	Substrate Percentage Check 100%	

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]
	> 22.5 - 30 cm [30 pts]		< 5 cm [5 pts]
	> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS		MAXIMUM POOL DEPTH (Inches):	2.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.00
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HHEI Metric Points

**Substrate
Max = 40**

18

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction





COMMENTS _____

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

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

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

SUSPECT 1 (Number of bands per 0.1 ml (200 µl) of channel) - Suspect ONE7 One Box:							
	None		1.0		2.0		3.0
	0.5		1.5		2.5		>3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Goose Creek	Distance from Evaluated Stream	1,600.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Jefferson** Township / City: **Springfield**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/13/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** 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) **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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 56	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 56	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 56	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

38

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: hh-cms-021319-03	SITE NUMBER		RIVER BASIN	Ohio River	DRAINAGE AREA (mi ²)	0.04
LENGTH OF STREAM REACH (ft)	92	LAT.	40.46570	LONG.	-80.92860	RIVER CODE
DATE	02/13/19	SCORER	CMS, RM	COMMENTS		

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input checked="" type="checkbox"/>	<input type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		0.00%	(A)	Substrate Percentage Check 100%	

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):

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

COMMENTS **MAXIMUM POOL DEPTH** (Inches): **2.00**

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

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.50
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HHEI Metric Points

**Substrate
Max = 40**

18

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





L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

SUSPECT 1 (Number of bands per 0.1 ml (200 µl) of channel) - Suspect ONE7 One Box:							
	None		1.0		2.0		3.0
	0.5		1.5		2.5		>3

STREAM GRADIENT ESTIMATE

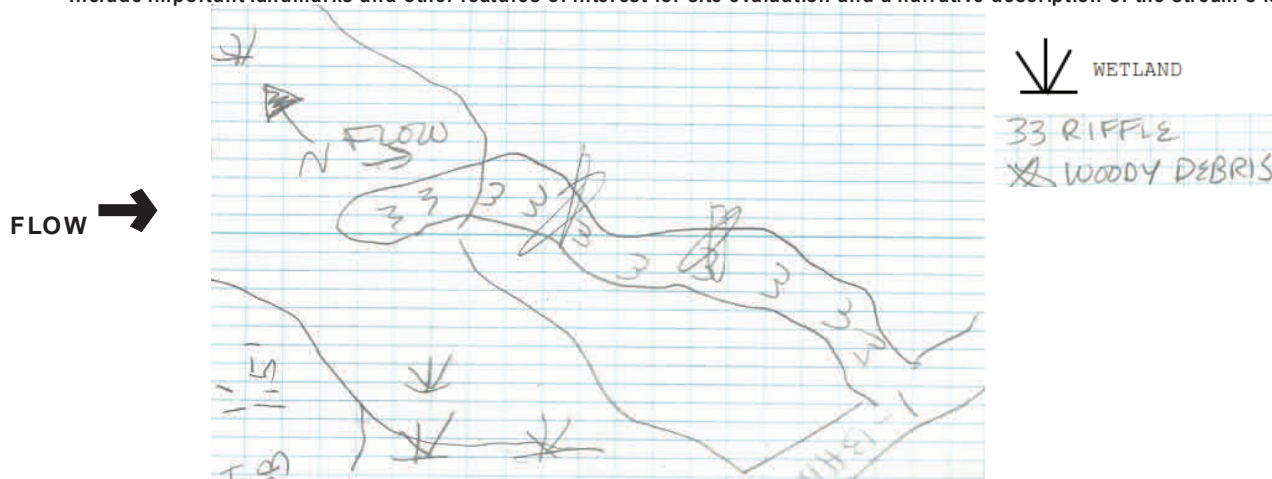
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☒ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Goose Creek	Distance from Evaluated Stream	1,600.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Jefferson** Township / City: **Springfield****MISCELLANEOUS**Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/13/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** Canopy (% open): **25%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) **N** Voucher? (Y/N) **N** Salamanders Observed? (Y/N) **N** Voucher? (Y/N) **N**
Frogs or Tadpoles Observed? (Y/N) **N** Voucher? (Y/N) **N** Aquatic Macroinvertebrates Observed? (Y/N) **N** Voucher? (Y/N) **N**
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 57	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 57	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 57	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

30

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021319-01** SITE NUMBER **246** RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.04**
 LENGTH OF STREAM REACH (ft) **246** LAT. **40.46560** LONG. **-80.92870** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **CMS, RM** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **15.00%**

(A)







Substrate Percentage Check	90%
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(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]	  	> 5 cm - 10 cm [15 pts]
	> 22.5 - 30 cm [30 pts]		< 5 cm [5 pts]
	> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS **MAXIMUM POOL DEPTH** (Inches): **2.00**

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

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	1.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

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

HHEI Metric Points

**Substrate
Max = 40**

10

A + B

Pool Depth
Max = 30

15

**Bankfull
Width
Max=30**

5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name: Goose Creek	Distance from Evaluated Stream	1,600.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: NRCS Soil Map Stream Order **1**
County: **Jefferson** Township / City: **Springfield**

MISCELLANEOUS

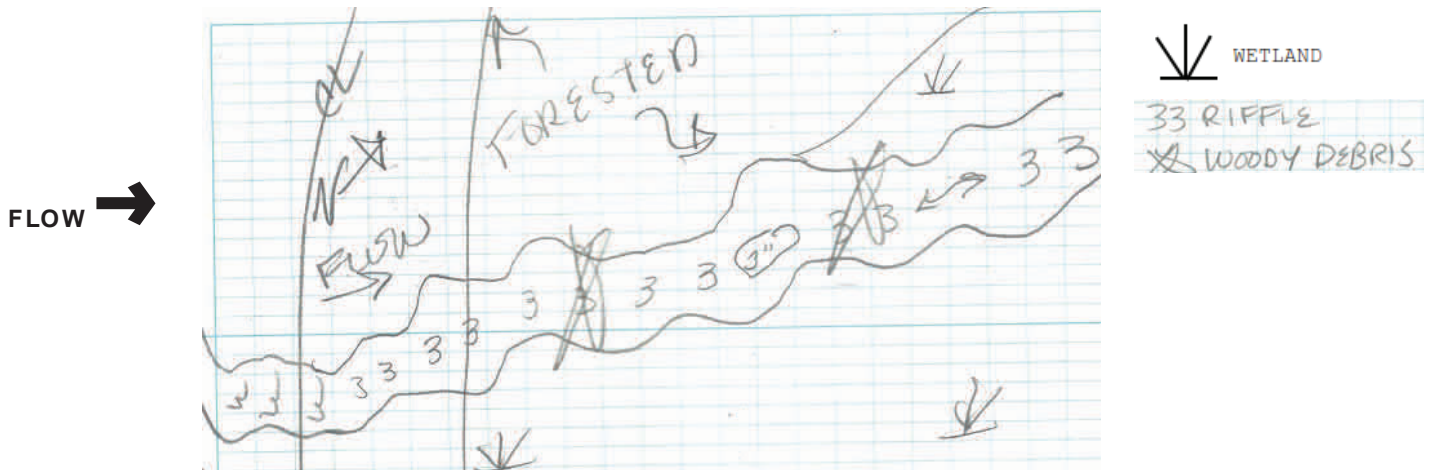
Base Flow Conditions? (Y/N): **N** Date of last precipitation: **02/13/19** Quantity: **1.00**
Photograph Information: **upstream, downstream, substrate**
Elevated Turbidity? (Y/N): **Y** Canopy (% open): **50%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

Additional comments/description of pollution impacts: **BIOTIC EVALUATION**

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

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

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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 58	
Date: February 13, 2019	
Description: Intermittent Modified Ephemeral Stream Facing Upstream	

Stream 58	
Date: February 13, 2019	
Description: Intermittent Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 58	
Date: February 13, 2019	
Description: Intermittent Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

32

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

Field ID: **hh-cms-021319-02** SITE NUMBER **112** RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.04**
 LENGTH OF STREAM REACH (ft) **112** LAT. **40.46550** LONG. **-80.92850** RIVER CODE **1** RIVER MILE **1**
 DATE **02/13/19** SCORER **CMS, RM** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
<input type="checkbox"/>	<input type="checkbox"/>	BLDR SLABS [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	SILT [3 pt]
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<input type="checkbox"/>	<input type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK [16 pt]	<input type="checkbox"/>	<input type="checkbox"/>	FINE DETRITUS [3 pts]
<input type="checkbox"/>	<input type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]
<input type="checkbox"/>	<input checked="" type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/>	<input type="checkbox"/>	MUCK [0 pts]
<input type="checkbox"/>	<input type="checkbox"/>	SAND (<2 mm) [6 pts]	<input type="checkbox"/>	<input type="checkbox"/>	ARTIFICIAL [3 pts]
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		0.00%	(A)	Substrate Percentage Check 100%	

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]
	> 22.5 - 30 cm [30 pts]		< 5 cm [5 pts]
	> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS		MAXIMUM POOL DEPTH (Inches):	2.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	2.00
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HHEI Metric Points

**Substrate
Max = 40**

12

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction





COMMENTS

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

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

COMMENTS

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

SUSPECT 1 (Number of bands per 0.1 ml (200 µl) of channel) - Suspect ONE7 One Box:							
	None		1.0		2.0		3.0
	0.5		1.5		2.5		>3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input checked="" type="checkbox"/> WWH Name:	Goose Creek	Distance from Evaluated Stream	1,600.00
<input type="checkbox"/> CWH Name:		Distance from Evaluated Stream	
<input type="checkbox"/> EWH Name:		Distance from Evaluated Stream	

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

USGS Quadrangle Name: Amsterdam NRCS Soil Map Page: NRCS Soil Map Stream Order 1
County: Jefferson Township / City: Springfield

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 02/13/19 Quantity: 1.00
Photograph Information: upstream, downstream, substrate
Elevated Turbidity? (Y/N): Y 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 (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

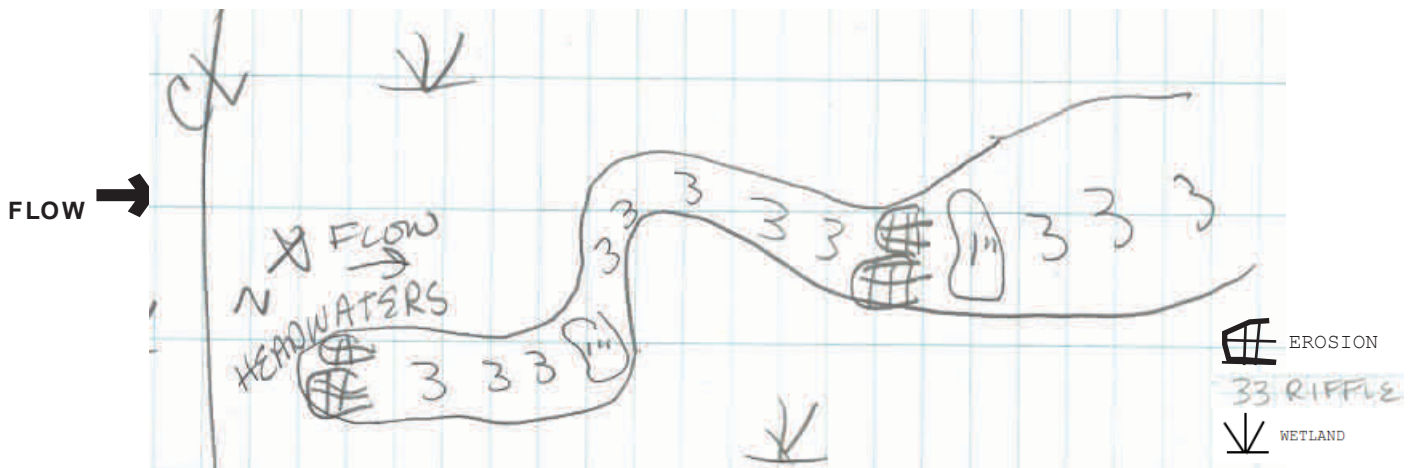
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

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

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

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






PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 59	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 59	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 59	
Date: February 13, 2019	
Description: Ephemeral Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

49

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

SITE NAME/LOCATION	AEP Carrollton-Gable 138 kV Transmission Line
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Field ID: hh-cms-021319-05 SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.18**

LENGTH OF STREAM REACH (ft) **280** LAT. **40.45970** LONG. **-80.92430** RIVER CODE RIVER MILE

DATE	SCORER	COMMENTS
02/13/19	CMS, RM	

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	7.00%
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(A)

Substrate Percentage Check	100%
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(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):

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

COMMENTS		MAXIMUM POOL DEPTH (Inches):	5.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	3.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R		(Per Bank)	L R		(Most Predominant per Bank)	L R		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" 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"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS _____

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

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

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

SINCE 2011 (Number of birds per 0.1 mi (200 ft) of channel) - Correct ONE (1) one box).							
<input type="checkbox"/>	None	<input type="checkbox"/>	1.0	<input checked="" type="checkbox"/>	2.0	<input type="checkbox"/>	3.0
<input type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

Substrate
Max = 40

19

 $A + B$

Pool Depth
Max = 30

15

Bankfull
Width
Max=30

15



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 60	
Date: February 13, 2019	
Description: Perennial Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 60	
Date: February 13, 2019	
Description: Perennial Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 60	
Date: February 13, 2019	
Description: Perennial Modified Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION	AEP Carrollton-Gable 138 kV Transmission Line
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Field ID: hh-cms-021319-06 SITE NUMBER RIVER BASIN **Ohio River** DRAINAGE AREA (mi²) **0.33**

LENGTH OF STREAM REACH (ft) **287** LAT. **40.45190** LONG. **-80.91850** RIVER CODE RIVER MILE

DATE	02/13/19	SCORER	CMS, RM	COMMENTS
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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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check	100%
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(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**

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):

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

COMMENTS		MAXIMUM POOL DEPTH (Inches):	4.00
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3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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

COMMENTS		AVERAGE BANKFULL WIDTH (Feet):	2.50
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This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R		(Per Bank)	L R		(Most Predominant per Bank)	L R		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" 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"/>	<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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

SUSPECT 1 (Number of bands per 0.1 ml (200 µl) of channel); Suspect ONE2 One box):				
None	1.0	2.0	3.0	
0.5	1.5	2.5	>3	

STREAM GRADIENT ESTIMATE

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

HHEI Metric Points

Substrate
Max = 40

18

$$A + B$$

Pool Depth
Max = 30

25

Bankfull
Width
Max=30

5

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

<input checked="" type="checkbox"/>	WWH Name:	Goose Creek	Distance from Evaluated Stream	2,300.00
<input type="checkbox"/>	CWH Name:		Distance from Evaluated Stream	
<input type="checkbox"/>	EWH Name:		Distance from Evaluated Stream	

USGS Quadrangle Name: **Amsterdam** NRCS Soil Map Page: **1** NRCS Soil Map Stream Order **2**

County: **Jefferson** Township / City: **Springfield**

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

Photograph Information:

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

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

Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)

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

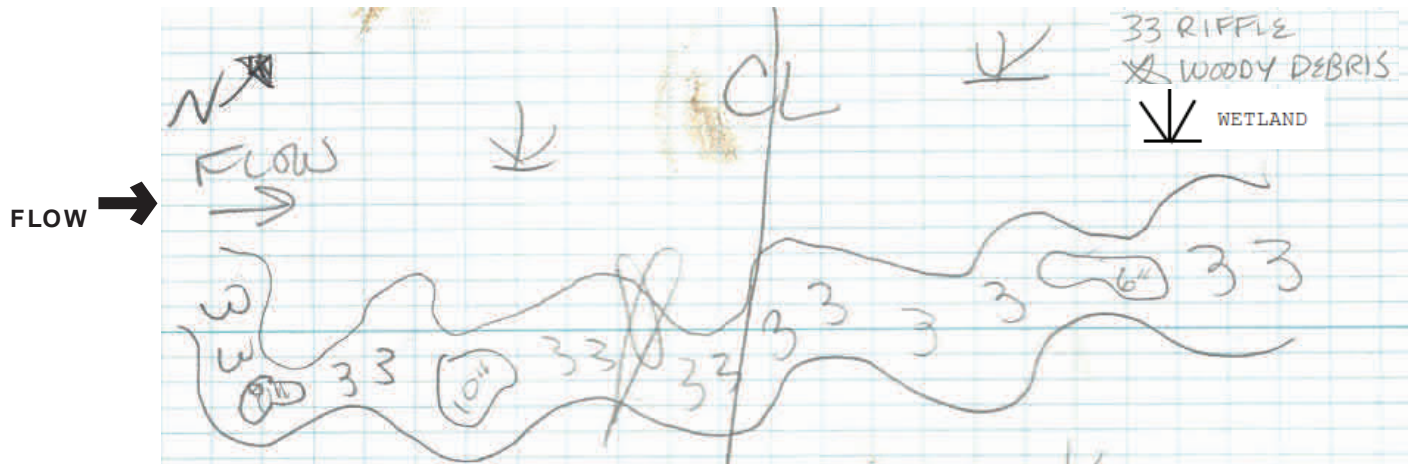
Additional comments/description of pollution impacts: _____

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:

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






PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 61	
Date: February 13, 2019	
Description: Perennial Small Drainage Warmwater Stream Facing Upstream	

Stream 61	
Date: February 13, 2019	
Description: Perennial Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 61	
Date: February 13, 2019	
Description: Perennial Small Drainage Warmwater Stream Substrate	

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 36.5



Stream & Location: AEP Carrollton-Gable 138 kV Transmission Line, Jefferson County RM: 0.10 Date: 02/13/19

qh-aeh-021319-01

Scores Full Name & Affiliation: JTT, AEH / AECOM

River Code: STORET #: Lat/Long: 40.441142, -80.910278

Office verified location

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

Best types, Pool riffle, Other types, Origin, Embeddness, Silts, Quality. Includes checkboxes for various substrate types and a table for silts.

Could not see substrate but assuming the above

2] INSTREAM COVER

Amount, Undercut banks, Overhanging vegetation, Shallows, Rootwads, Pools > 70cm, Oxbows, Backwaters, Aquatic macrophytes, Logs or woody debris. Includes checkboxes for cover types.

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

Sinuosity, Development, Channelization, Stability. Includes checkboxes for sinuosity and development levels.

Comments

Channel Maximum 20

8

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

Riparian width, Erosion, Flood plain quality. Includes checkboxes for riparian width and erosion levels.

Comments

Floodplain is within wetland area

Riparian Maximum 10

6

5] POOL / GLIDE AND RIFLE / RUN QUALITY

Maximum depth, Channel width, Current velocity. Includes checkboxes for pool and glide quality.

Comments

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

Rifle depth, Run depth, Riffle / Run substrate, Riffle / Run embeddness

Best areas > 10cm, Best areas 5-10cm, Best areas < 5cm. Includes checkboxes for riffle and run quality.

Comments

6] GRADIENT

Gradient, Pool, Riffle, Run. Includes checkboxes for gradient and flow characteristics.

A) SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
☐ WADE
☐ L. LINE
☒ OTHER

STAGE

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

DISTANCE

- ☐ 0.5 Km
☐ 0.2 Km
☐ 0.15 Km
☐ 0.12 Km
☒ OTHER
200 feet

CLARITY

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

CANOPY

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

CJ REC

- 1st pass cm
2nd pass cm

B) AESTHETIC

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

D) MAINTENANCE

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

Circle some & COMMENT

E) ISSUES

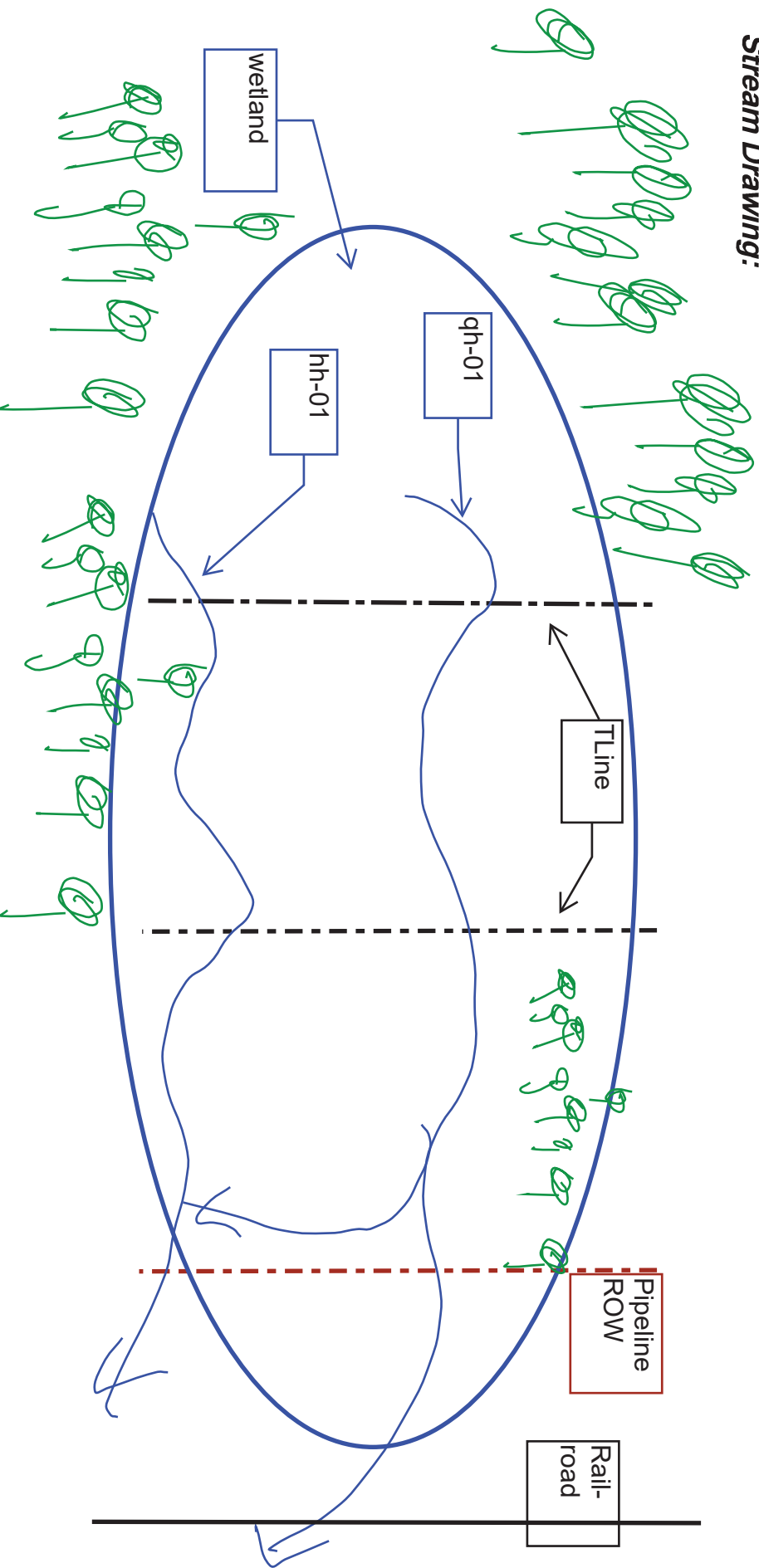
- WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs - ~~CONSTRUCTION~~ - SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF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

F) MEASUREMENTS

- \bar{x} width
 \bar{x} depth
max. depth 24 in
 \bar{x} bankfull width 8ft
bankfull \bar{x} depth
W/D ratio
bankfull max. depth
floodprone x^2 width
entrench. ratio

Le Tree:

Stream Drawing:





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 62	
Date: February 13, 2019	
Description: Perennial Poor Warmwater Habitat Facing Upstream	

Stream 62	
Date: February 13, 2019	
Description: Perennial Poor Warmwater Habitat Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 62	
Date: February 13, 2019	
Description: Perennial Poor Warmwater Habitat Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Jefferson County**
hh-aeH-021319-02 SITE NUMBER **01** RIVER BASIN DRAINAGE AREA (mi²) **0.10**
 LENGTH OF STREAM REACH (ft) **200** LAT. **40.44085** LONG. **-80.91025** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **JTT, AEH** 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* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	85%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	5%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	10%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **3**HHEI
Metric
PointsSubstrate
Max = 40

9

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS MAXIMUM POOL DEPTH (Inches): **6.00**

Pool Depth
Max = 30

25

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

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

COMMENTS AVERAGE BANKFULL WIDTH (Feet): **5.00**

Bankfull
Width
Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

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

FLOODPLAIN QUALITY

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

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

COMMENTS **stream flows through wetland**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

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

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

STREAM GRADIENT ESTIMATE

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

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

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

DOWNSTREAM DESIGNATED USE(S)

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

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

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

MISCELLANEOUS

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

Additional comments/description of pollution impacts:

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒

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

The diagram shows a stream reach with a blue line representing the stream. A black arrow labeled 'FLOW' points to the right. On the left bank, there is a 'wetland' area with green squiggly lines. Two points on the left bank are labeled 'qh-01' and 'hh-01'. A dashed line labeled 'TLine' runs vertically through the stream. A red dashed line labeled 'Pipeline ROW' is on the right bank. A solid black line labeled 'Railroad' is further to the right. Green circles and lines represent vegetation. The bottom of the page has a black bar with white text: 'October 24, 2002 Revision', 'PHWH Form Page - 2', 'Save as pdf', and 'Reset Form'.



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 63	
Date: February 13, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Upstream	

Stream 63	
Date: February 13, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 63	
Date: February 13, 2019	
Description: Intermittent Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Jefferson County**
hh-aeH-021319-03 SITE NUMBER **03** RIVER BASIN DRAINAGE AREA (mi²) **0.04**
 LENGTH OF STREAM REACH (ft) **200** LAT. **40.43888** LONG. **-80.90873** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **JTT, AEH** COMMENTS **Intermittent**

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	55%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	5%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	40%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **5.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

15

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH

(Inches): **1.00**

Pool Depth Max = 30

5

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

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

COMMENTS

AVERAGE BANKFULL WIDTH

(Feet): **1.00**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS **current precip**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 checked="" type="checkbox"/>	0.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	2.5	<input type="checkbox"/>	>3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

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

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

MISCELLANEOUS

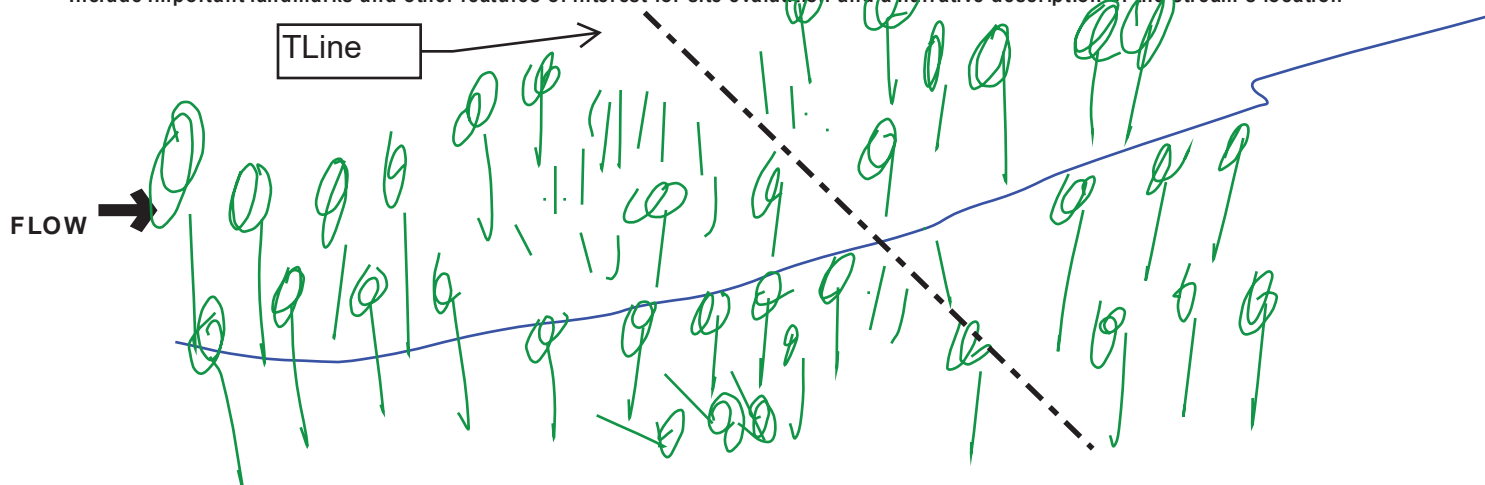
Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.)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

Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 64	
Date: February 13, 2019	
Description: Intermittent Ephemeral Stream Facing Upstream	

Stream 64	
Date: February 13, 2019	
Description: Intermittent Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name:

AEP

Site Location:

Gable-Carrollton 138 kV Transmission Line Project

Project No.

60582598

Stream 64

Date:

February 13, 2019

Description:

Intermittent

Ephemeral Stream

Substrate





Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Jefferson County**
hh-aeH-021319-04 SITE NUMBER **04** RIVER BASIN DRAINAGE AREA (mi²) **0.01**
 LENGTH OF STREAM REACH (ft) **200** LAT. **40.43648** LONG. **-80.90695** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **JTT, AEH** 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: **channelized**

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	90%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	10%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **2**HHEI
Metric
PointsSubstrate
Max = 40

8

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS MAXIMUM POOL DEPTH (Inches): **2.00**Pool Depth
Max = 30

5

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

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

COMMENTS AVERAGE BANKFULL WIDTH (Feet): **1.00**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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m	<input type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **nearby landfill, tline ROW, pipeline ROW**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

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

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

STREAM GRADIENT ESTIMATE

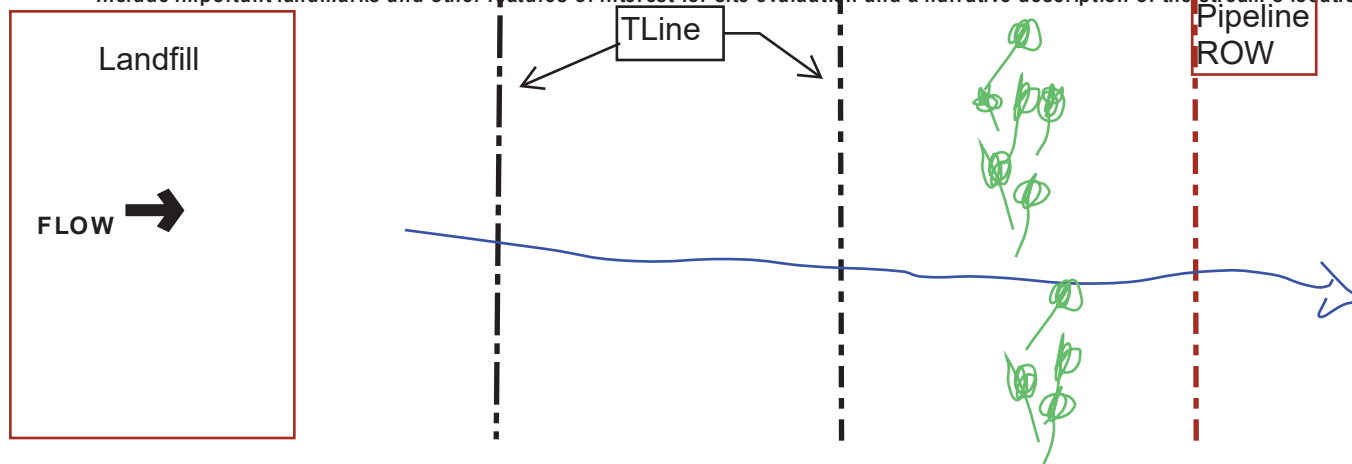
☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Amsterdam NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Jefferson Township / City: Springfield**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 02/12/19 Quantity: 1.07
Photograph Information: 3 photos, upstream, downstream, substrate
Elevated Turbidity? (Y/N): N Canopy (% open): 0%
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: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒**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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 65	
Date: February 13, 2019	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 65	
Date: February 13, 2019	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 65	
Date: February 13, 2019	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Harrison County**hh-aeh-20190219-5 SITE NUMBER **5** RIVER BASIN DRAINAGE AREA (mi²) **0.16**LENGTH OF STREAM REACH (ft) **200** LAT. **40.43219** LONG. **-80.90401** RIVER CODE RIVER MILE DATE **02/13/19** SCORER **AEH/JTT** 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: **culverted**

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	35%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	5%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	30%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	15%	<input type="checkbox"/> MUCK [0 pts]	10%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	5%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **3**TOTAL NUMBER OF SUBSTRATE TYPES: **6**HHEI
Metric
PointsSubstrate
Max = 40

9

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS **Recent heavy rain**MAXIMUM POOL DEPTH (Inches): **1.00**Pool Depth
Max = 30

5

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

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

COMMENTS AVERAGE BANKFULL WIDTH (Feet): **1.00**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

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

COMMENTS

FLOODPLAIN QUALITY

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

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

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

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

COMMENTS **Recent heavy rain**SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

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

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain: Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 66	
Date: February 13, 2019	
Description: Intermittent Ephemeral Stream Facing Upstream	

Stream 66	
Date: February 13, 2019	
Description: Intermittent Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 66	
Date: February 13, 2019	
Description: Intermittent Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Jefferson County**
hh-aeH-021319-06 SITE NUMBER **06** RIVER BASIN DRAINAGE AREA (mi²) **0.39**
 LENGTH OF STREAM REACH (ft) **200** LAT. **40.43217** LONG. **-80.90371** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **JTT, AEH** COMMENTS **Perennial**

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: **channelized**

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	35%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	25%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **20.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

9

TOTAL NUMBER OF SUBSTRATE TYPES:

4

HHEI
Metric
PointsSubstrate
Max = 40

13

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH

(Inches): **5.00**Pool Depth
Max = 30

25

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

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

COMMENTS

AVERAGE BANKFULL WIDTH

(Feet): **6.00**Bankfull
Width
Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

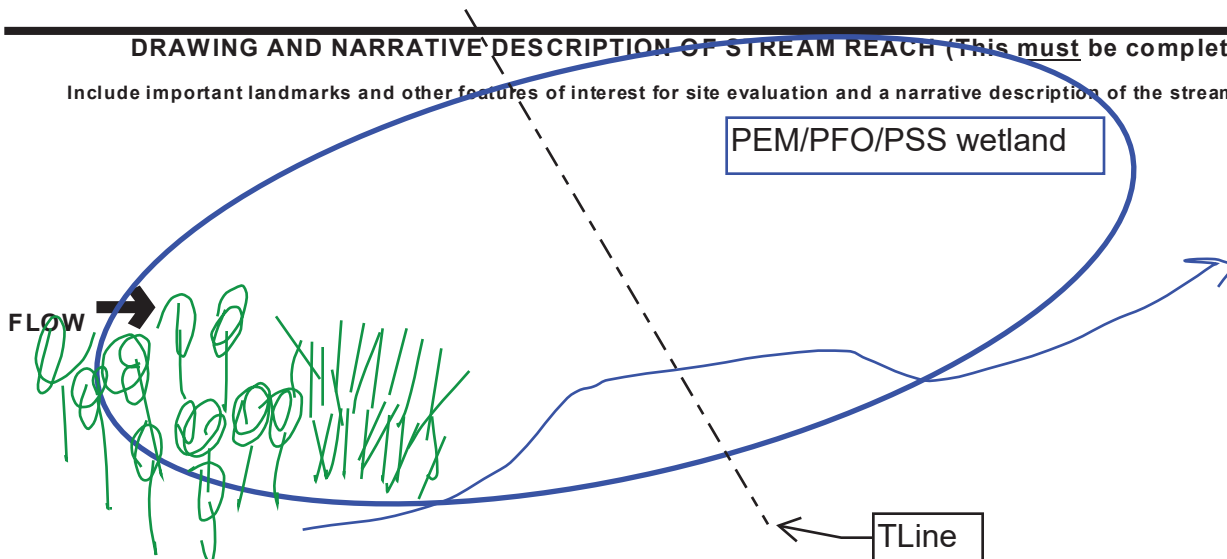
☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain: Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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






PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 67	
Date: February 13, 2019	
Description: Perennial Small Drainage Warmwater Stream Facing Upstream	

Stream 67	
Date: February 13, 2019	
Description: Perennial Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 67	
Date: February 13, 2019	
Description: Perennial Small Drainage Warmwater Stream Substrate	



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Jefferson County**
hh-aeH-021319-07 SITE NUMBER **07** RIVER BASIN DRAINAGE AREA (mi²) **1.24**
 LENGTH OF STREAM REACH (ft) **200** LAT. **40.42508** LONG. **-80.89836** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **JTT, AEH** 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, deforested**

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	80%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **2**HHEI
Metric
PointsSubstrate
Max = 40

8

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS MAXIMUM POOL DEPTH (Inches): **3.00**Pool Depth
Max = 30

15

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

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

COMMENTS AVERAGE BANKFULL WIDTH (Feet): **1.00**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

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

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

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

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

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

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

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

USGS Quadrangle Name: Amsterdam NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Jefferson Township / City: Springfield

MISCELLANEOUS

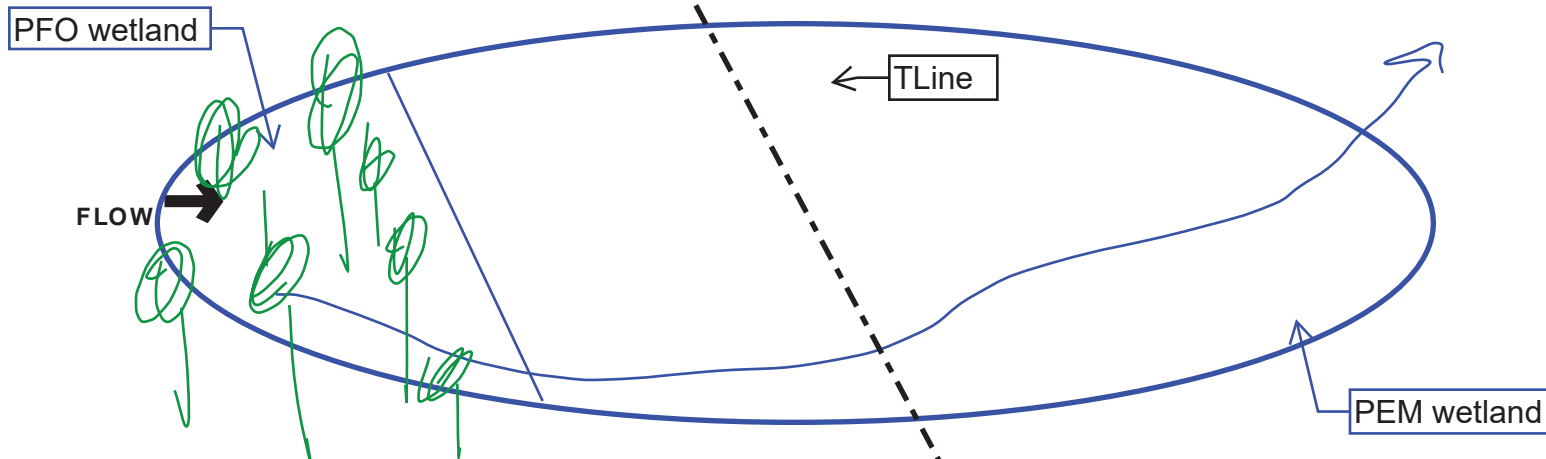
Base Flow Conditions? (Y/N): Y Date of last precipitation: 02/12/19 Quantity: 1.07
Photograph Information:
Elevated Turbidity? (Y/N): N Canopy (% open): 80%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (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: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐**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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 68	
Date: February 13, 2019	
Description: Intermittent Modified Ephemeral Stream Facing Upstream	

Stream 68	
Date: February 13, 2019	
Description: Intermittent Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 68
Date: February 13, 2019
Description: Intermittent Modified Ephemeral Stream Substrate





Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line**

hh-aeH-021219-06

SITE NUMBER **06**

RIVER BASIN

DRAINAGE AREA (mi²) **0.90**LENGTH OF STREAM REACH (ft) **200**LAT. **40.41884**LONG. **-80.89403**

RIVER CODE

RIVER MILE

DATE **02/12/19**SCORER **JTT, AEH**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:

Farmland, cow pasture, culverted

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="95%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="5%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **2**

HHEI Metric Points

Substrate Max = 40

8

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

Pool Depth Max = 30

25

COMMENTS

MAXIMUM POOL DEPTH (Inches): **6.00**

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

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

Bankfull Width Max=30

5

COMMENTS

AVERAGE BANKFULL WIDTH (Feet): **2.00**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" 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"/>	<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 type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field	<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **banks of stream are primarily within low quality wetland. There is no mature forest**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

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

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

STREAM GRADIENT ESTIMATE

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

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

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

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

County: **Harrison** Township / City: **German**

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

Photograph Information:

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

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

Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)

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

Overall Stability of BOTH Stream Banks (check one):	Stable <input type="checkbox"/>	Moderately Stable <input type="checkbox"/>	Unstable <input checked="" type="checkbox"/>
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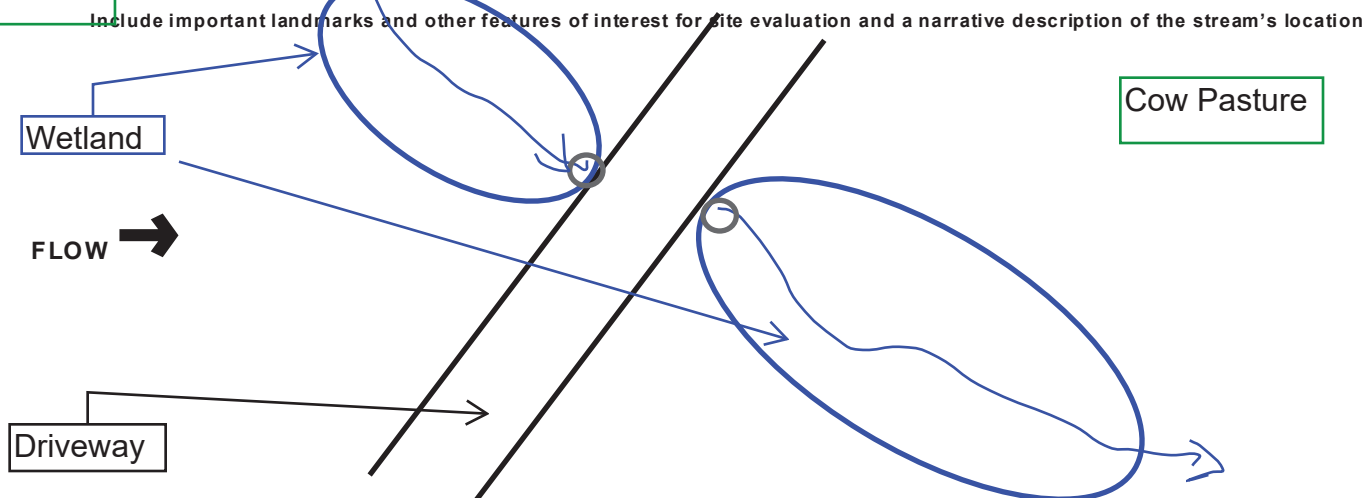
Performed? (Y/N): ☐ N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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:

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



Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 69	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Upstream	

Stream 69	
Date: February 12, 2019	
Description: Intermittent Modified Small Drainage Warmwater Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name:

AEP

Site Location:

Gable-Carrollton 138 kV Transmission Line Project

Project No.

60582598

Stream 69

Date:

February 12, 2019

Description:

Intermittent

Modified Small
Drainage Warmwater
Stream

Substrate





Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Harrison County**
hh-aeH-021319-08 SITE NUMBER **08** RIVER BASIN DRAINAGE AREA (mi²) **0.10**
 LENGTH OF STREAM REACH (ft) **100** LAT. **40.41093** LONG. **-80.88795** RIVER CODE RIVER MILE
 DATE **02/13/19** SCORER **JTT, AEH** 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: **channelized, graded**

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	90%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	10%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage
Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**TOTAL NUMBER OF SUBSTRATE TYPES: **2**HHEI
Metric
PointsSubstrate
Max = 40

8

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS MAXIMUM POOL DEPTH (Inches): **3.00**

Pool Depth
Max = 30

15

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

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

COMMENTS AVERAGE BANKFULL WIDTH (Feet): **1.00**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<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"/>	<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 type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

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

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

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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

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

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

MISCELLANEOUS

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

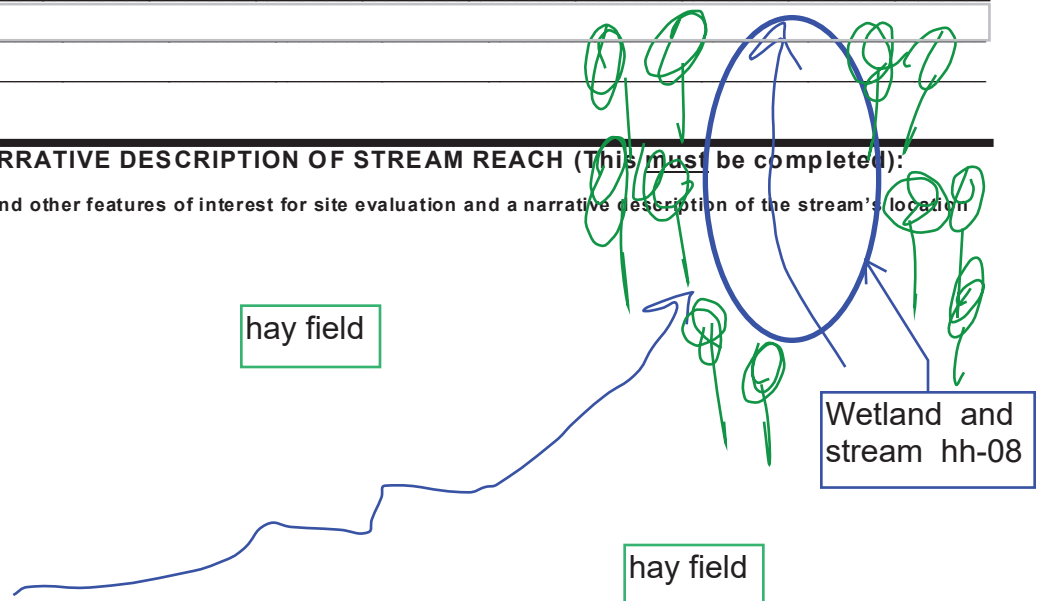
Additional comments/description of pollution impacts: Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒**BIOTIC EVALUATION**

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

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

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

FLOW →





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 70	
Date: February 13, 2019	
Description: Ephemeral Modified Ephemeral Stream Facing Upstream	

Stream 70	
Date: February 13, 2019	
Description: Ephemeral Modified Ephemeral Stream Facing Downstream	



PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
----------------------------	--	--------------------------------

Stream 70	
Date: February 13, 2019	
Description: Ephemeral Modified Ephemeral Stream Substrate	



Primary Headwater Habitat Evaluation Form

45

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

SITE NAME/LOCATION **AEP Carrollton-Gable 138 kV Transmission Line / Harrison County**

hh-aeH-021319-09

SITE NUMBER **09**

RIVER BASIN

DRAINAGE AREA (mi²) **0.15**LENGTH OF STREAM REACH (ft) **200**LAT. **40.41021**LONG. **-80.88755**

RIVER CODE

RIVER MILE

DATE **02/13/19**SCORER **JTT, AEH**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:

channelized

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="75%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="5%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **5.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

15

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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

COMMENTS

MAXIMUM POOL DEPTH

(Inches): **4.00**

Pool Depth Max = 30

25

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

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

COMMENTS

AVERAGE BANKFULL WIDTH

(Feet): **2.00**

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

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **Stream eventually flows towards more open canopy**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

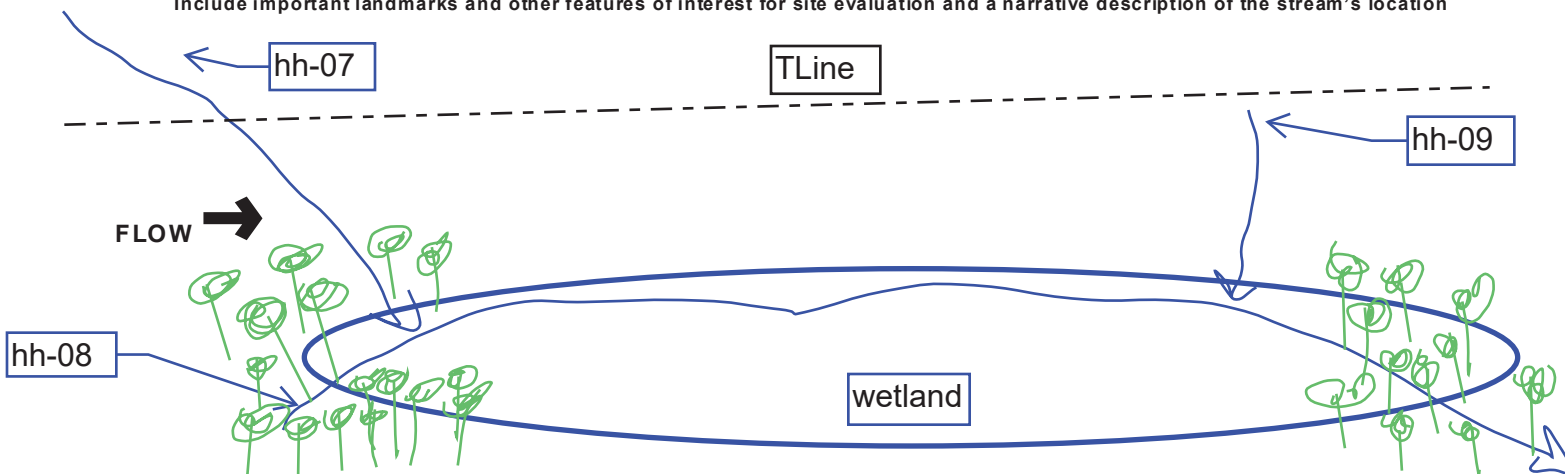
☐ Flat (0.5 ft/100 ft)
 ☒ Flat to Moderate
 ☐ Moderate (2 ft/100 ft)
 ☐ Moderate to Severe
 ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

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County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
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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





PHOTOGRAPHIC RECORD STREAMS

Client Name: AEP	Site Location: Gable-Carrollton 138 kV Transmission Line Project	Project No. 60582598
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Stream 71	
Date: February 13, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Upstream	

Stream 71	
Date: February 13, 2019	
Description: Intermittent Small Drainage Warmwater Stream Facing Downstream	

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

9/3/2021 6:15:23 PM

in

Case No(s). 21-0900-EL-BLN

Summary: Letter of Notification Letter of Notification Letter of Notification LON application for the Tidd-Sunnyside 138 kV Transmission Line Rebuild Project pages 1901-2100 electronically filed by Hector Garcia-Santana on behalf of AEP Ohio Transmission Company, Inc.