



Primary Headwater Habitat Evaluation Form

Exhibit 18 **61**

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

SITE NAME/LOCATION S-JDV-19. FirstEnergy - Sammis-Star 345kV Rebuild.

SITE NUMBER N/A RIVER CODE 050301010804 RIVER BASIN Ohio River DRAINAGE AREA (mi²) 0.42

LENGTH OF STREAM REACH (ft) 200 LAT. 40.5536013877 LONG. -80.7655532 RIVER MILE N/A

DATE 2024-11-11 SCORER JDV COMMENTS _____

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

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

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

TYPE	PERCENT	TYPE	PERCENT
☐ BLDR SLABS [16 pts]	___	☐ SILT [3 pts]	<u>10</u>
☐ BOULDER (>256 mm) [16 pts]	___	☐ LEAF PACK/WOODY DEBRIS [3 pts]	<u>5</u>
☐ BEDROCK [16 pts]	___	☐ FINE DETRITUS [3 pts]	___
☒ COBBLE (65-256 mm) [12 pts]	<u>30</u>	☐ CLAY or HARDPAN [0 pts]	___
☒ GRAVEL (2-64 mm) [9 pts]	<u>45</u>	☐ MUCK [0 pts]	___
☐ SAND (<2 mm) [6 pts]	<u>10</u>	☐ ARTIFICIAL [3 pts]	___

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 30

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

21

TOTAL NUMBER OF SUBSTRATE TYPES:

5

**HHEI
Metric
Points**

Substrate
Max = 40

26

A + B

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

☐ > 30 centimeters [20 pts]	☒ > 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]

Pool Depth
Max = 30

15

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters):

7

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

☐ > 4.0 meters (> 13') [30 pts]	☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☐ ≤ 1.0 m (≤ 3' 3") [5 pts]
☒ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

Bankfull
Width
Max=30

20

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters):

2.8

This information must also be completed

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

RIPARIAN WIDTH

L	R	(Per Bank)
☒	☒	Wide >10m
☐	☐	Moderate 5-10m
☐	☐	Narrow <5m
☐	☐	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)	L	R	
☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	Fenced Pasture	☐	☐	Mining or Construction

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

☒ Stream Flowing	☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial)	☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

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

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? ☐ Yes ☒ No QHEI Score ____ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**☒ WWH Name: Yellow CreekDistance from Evaluated Stream 3.41 miles☐ CWH Name: ____

Distance from Evaluated Stream ____

☐ EWH Name: ____

Distance from Evaluated Stream ____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: See ReportNRCS Soil Map Page: See Report NRCS Soil Map Stream Order See ReportCounty: JeffersonTownship / City: Brush Creek**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 2024-11-10 Quantity: 0.3

Photo-documentation Notes: ____

Elevated Turbidity? (Y/N): N Canopy (% open): 20Were samples collected for water chemistry? (Y/N): Y Lab Sample # or ID (attach results): ____Field Measures: Temp (°C) 17.3 Dissolved Oxygen (mg/l) ____ pH (S.U.) 7.91 Conductivity (µmhos/cm) ____Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

Additional comments/description of pollution impacts:

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): ____Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): ____Salamanders Observed? (Y/N) N Species observed (if known): ____Aquatic Macroinvertebrates Observed? (Y/N) Y Species observed (if known): Caddisflies; scuds

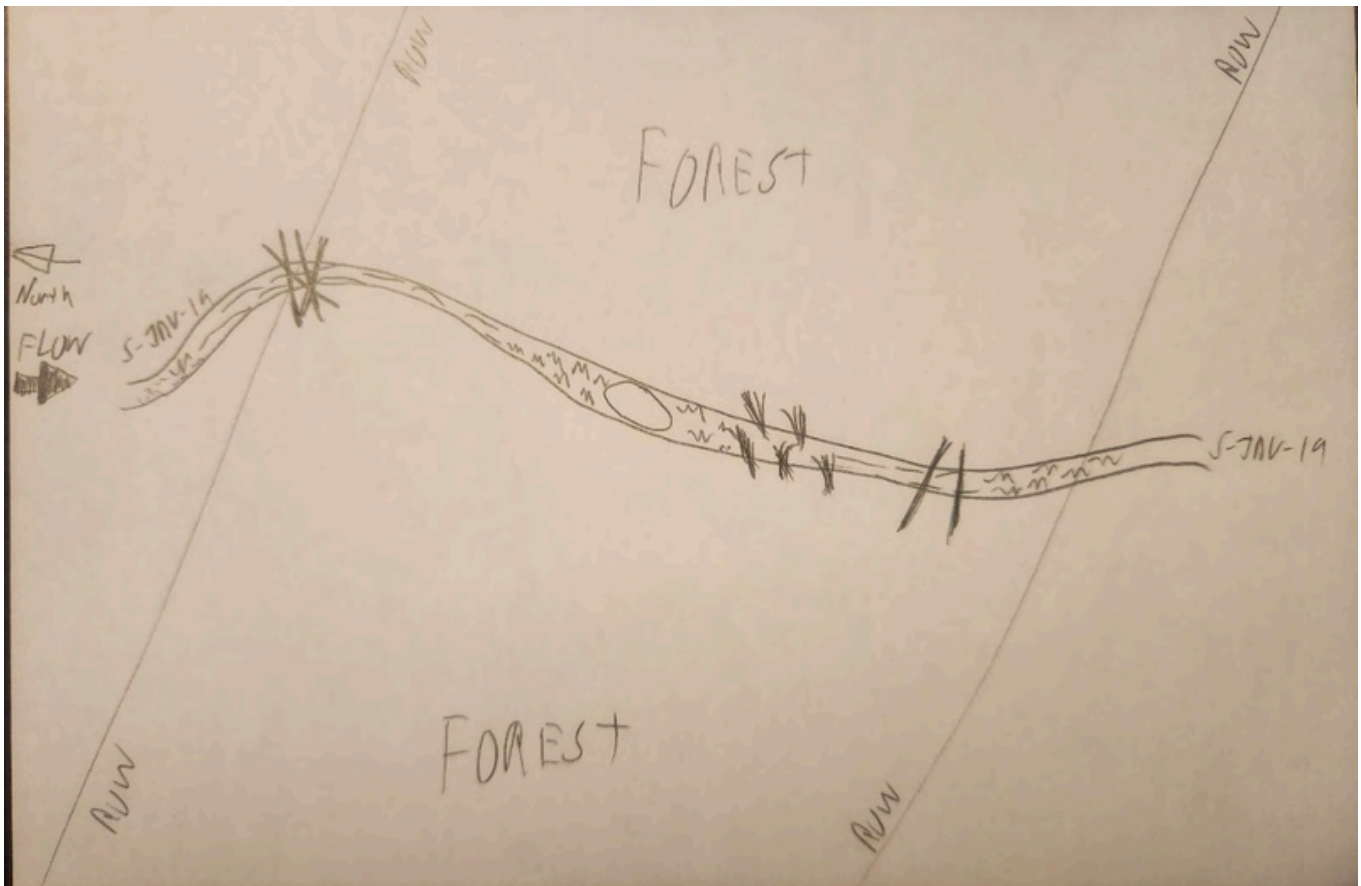
Comments Regarding Biology:

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 →

SEE PAGE 3





Primary Headwater Habitat Evaluation Form

Exhibit 18 **21**

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

SITE NAME/LOCATION S-JDV-20. FirstEnergy - Sammis-Star 345kV Rebuild.SITE NUMBER N/A RIVER CODE 050301010804 RIVER BASIN Ohio River DRAINAGE AREA (mi²) 0.001LENGTH OF STREAM REACH (ft) 200 LAT. 40.5530408 LONG. -80.764159 RIVER MILE N/ADATE 2024-11-11 SCORER JDV COMMENTS _____**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:** ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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

TYPE	PERCENT	TYPE	PERCENT
☐ BLDR SLABS [16 pts]	___	☒ SILT [3 pts]	<u>40</u>
☐ BOULDER (>256 mm) [16 pts]	___	☐ LEAF PACK/WOODY DEBRIS [3 pts]	<u>15</u>
☐ BEDROCK [16 pts]	___	☐ FINE DETRITUS [3 pts]	___
☐ COBBLE (65-256 mm) [12 pts]	<u>10</u>	☐ CLAY or HARDPAN [0 pts]	___
☒ GRAVEL (2-64 mm) [9 pts]	<u>35</u>	☐ MUCK [0 pts]	___
☐ SAND (<2 mm) [6 pts]	___	☐ ARTIFICIAL [3 pts]	___

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 10

(A)

(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):**

☐ > 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 (centimeters):

0Pool Depth
Max = 30**0**

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

☐ > 4.0 meters (> 13') [30 pts]	☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☒ ≤ 1.0 m (≤ 3' 3") [5 pts]
☐ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters):

0.7Bankfull
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)
☒	☒	Wide >10m
☐	☐	Moderate 5-10m
☐	☐	Narrow <5m
☐	☐	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)	L	R	
☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	Fenced Pasture	☐	☐	Mining or Construction

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

☐ Stream Flowing	☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial)	☒ Dry channel, no water (Ephemeral)

COMMENTS _____

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

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

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? ☐ Yes ☒ No QHEI Score ____ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**☒ WWH Name: Yellow CreekDistance from Evaluated Stream 3.4 miles☐ CWH Name: ____

Distance from Evaluated Stream ____

☐ EWH Name: ____

Distance from Evaluated Stream ____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: See ReportNRCS Soil Map Page: See Report NRCS Soil Map Stream Order See ReportCounty: JeffersonTownship / City: Brush Creek**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 2024-11-10 Quantity: 0.3

Photo-documentation Notes: ____

Elevated Turbidity? (Y/N): N Canopy (% open): 15Were samples collected for water chemistry? (Y/N): Y Lab Sample # or ID (attach results): _Field Measures: Temp (°C) 0 Dissolved Oxygen (mg/l) _ pH (S.U.) 0 Conductivity (µmhos/cm) _Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

Additional comments/description of pollution impacts:

No water in the stream bed at the time of observation**BIOLOGICAL OBSERVATIONS**

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _Salamanders Observed? (Y/N) N Species observed (if known): _Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _

Comments Regarding Biology:

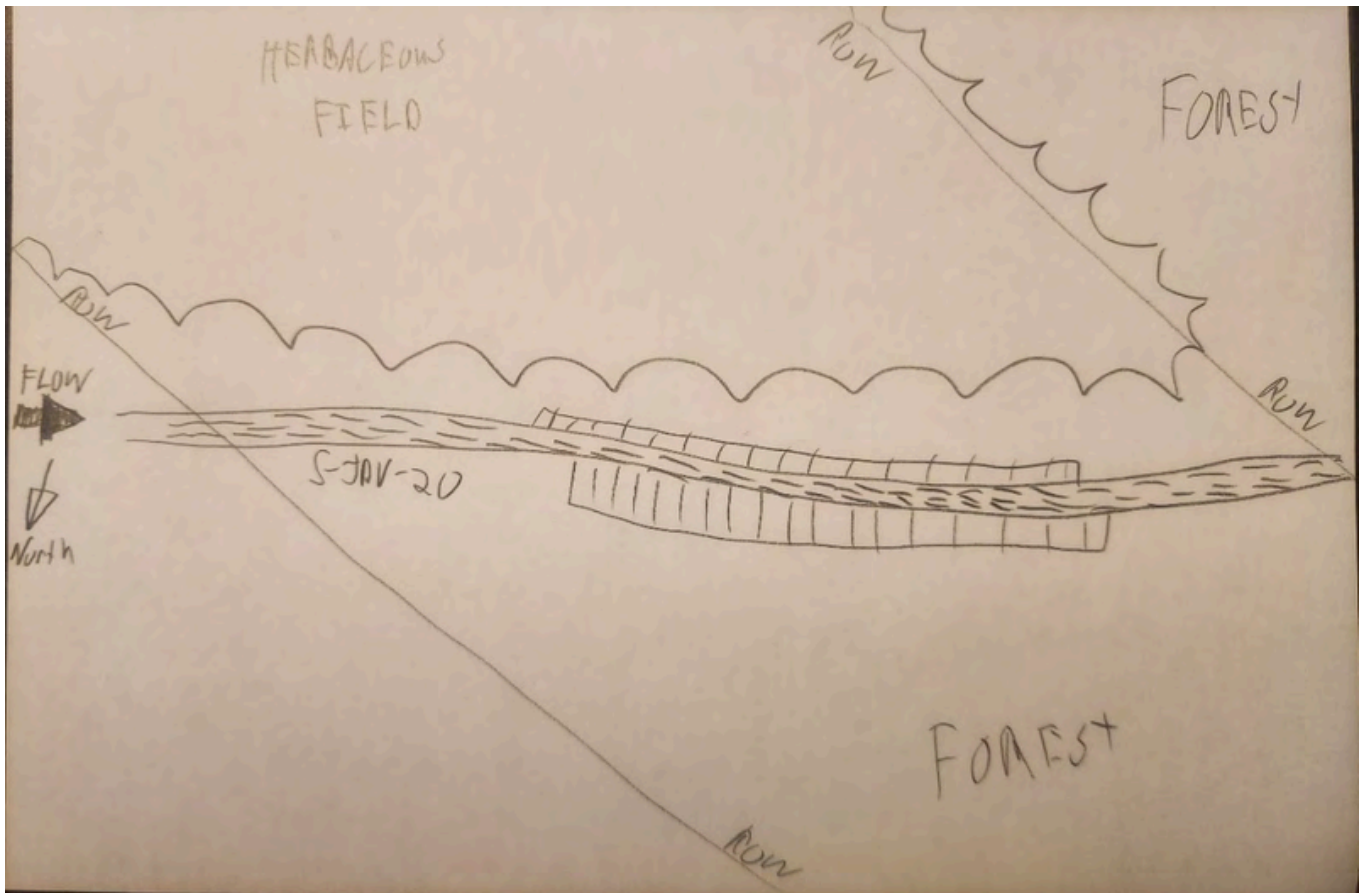
None observed

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 →

SEE PAGE 3





Primary Headwater Habitat Evaluation Form

Exhibit 18 **60**

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

SITE NAME/LOCATION S-JDV-21, FirstEnergy - Sammis-Star 345kV Rebuild.SITE NUMBER N/A RIVER CODE 050301010804 RIVER BASIN Ohio River DRAINAGE AREA (mi²) 0.12LENGTH OF STREAM REACH (ft) 200 LAT. 40.5514941877 LONG. -80.7588178 RIVER MILE N/ADATE 2024-11-11 SCORER JDV COMMENTS _____**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

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

TYPE	PERCENT	TYPE	PERCENT
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☐ BOULDER (>256 mm) [16 pts]	___	☐ LEAF PACK/WOODY DEBRIS [3 pts]	<u>5</u>
☐ BEDROCK [16 pts]	___	☐ FINE DETRITUS [3 pts]	___
☒ COBBLE (65-256 mm) [12 pts]	<u>35</u>	☐ CLAY or HARDPAN [0 pts]	___
☒ GRAVEL (2-64 mm) [9 pts]	<u>45</u>	☐ MUCK [0 pts]	___
☐ SAND (<2 mm) [6 pts]	___	☐ ARTIFICIAL [3 pts]	___

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 35

(A)

(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):

☐ > 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]

Pool Depth
Max = 30**15**

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters):

7

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

☐ > 4.0 meters (> 13') [30 pts]	☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
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☒ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

Bankfull
Width
Max=30**20**

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters):

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

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

RIPARIAN WIDTH

L	R	(Per Bank)
☒	☒	Wide >10m
☐	☐	Moderate 5-10m
☐	☐	Narrow <5m
☐	☐	None

COMMENTS _____

FLOODPLAIN QUALITY

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

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

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

☒ Stream Flowing	☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial)	☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

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

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? ☐ Yes ☒ No QHEI Score ____ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**☒ WWH Name: Yellow CreekDistance from Evaluated Stream 2.98 miles☐ CWH Name: ____

Distance from Evaluated Stream ____

☐ EWH Name: ____

Distance from Evaluated Stream ____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: See ReportNRCS Soil Map Page: See Report NRCS Soil Map Stream Order See ReportCounty: JeffersonTownship / City: Brush Creek**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 2024-11-10 Quantity: 0.3

Photo-documentation Notes: ____

Elevated Turbidity? (Y/N): N Canopy (% open): 15Were samples collected for water chemistry? (Y/N): Y Lab Sample # or ID (attach results): ____Field Measures: Temp (°C) 16.1 Dissolved Oxygen (mg/l) ____ pH (S.U.) 7.77 Conductivity (µmhos/cm) ____Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

Additional comments/description of pollution impacts:

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): ____Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): ____Salamanders Observed? (Y/N) N Species observed (if known): ____Aquatic Macroinvertebrates Observed? (Y/N) Y Species observed (if known): Scuds; caddisflies

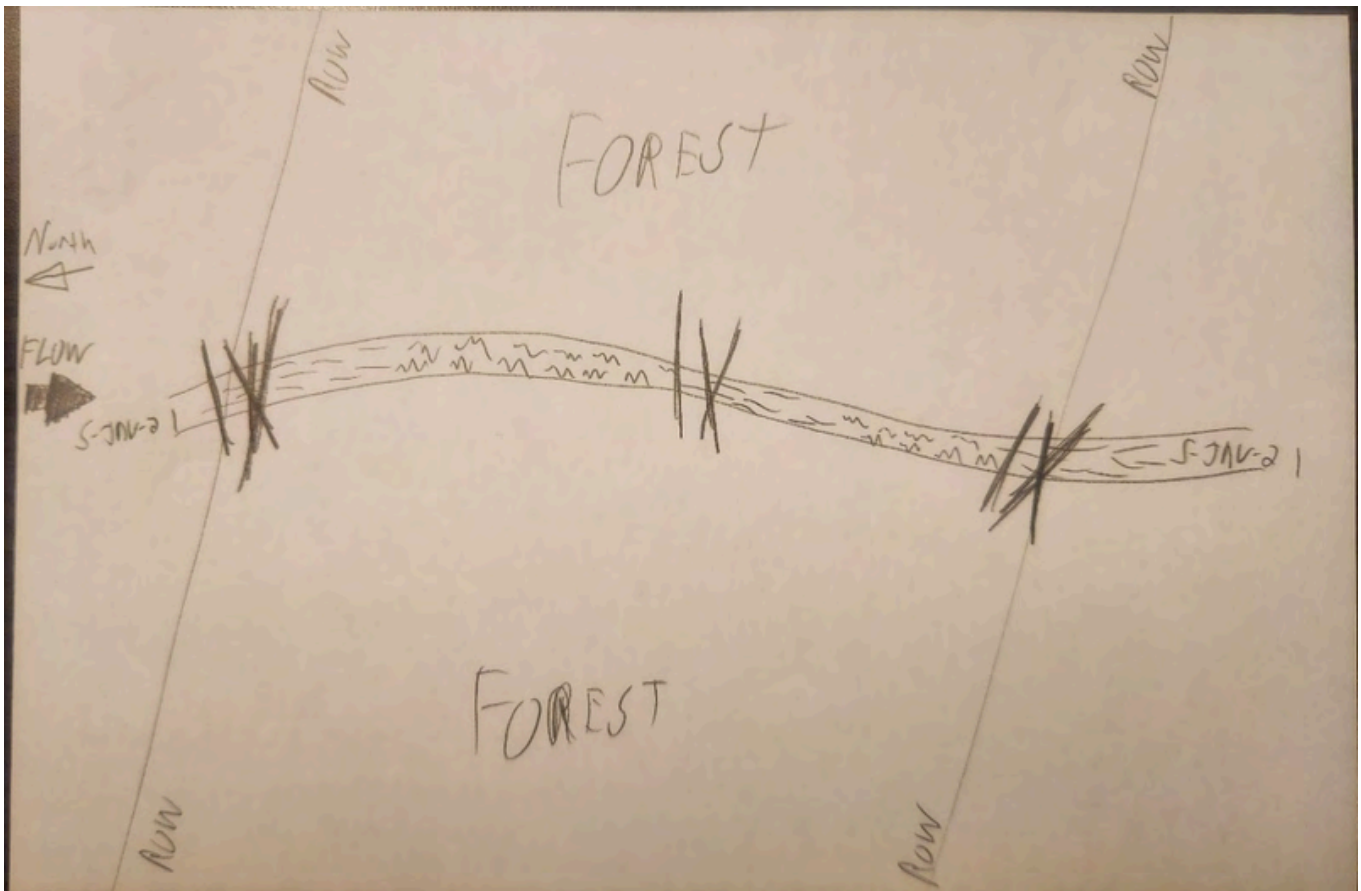
Comments Regarding Biology:

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 →

SEE PAGE 3





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

Exhibit 18
QHEI Score: 65.5

Stream & Location: Brush Creek (S-JDV-22)

RM: 2.17

Date: 2024-11-11

Saline Township, Jefferson County, Ohio

Scorers Full Name & Affiliation: Jeff Vandever, TRC

River Code: N/A

STORET #: N/A

Lat./Long.:
(NAD83 - decimal)

40.546737 / -80.745624

Office verified location ☒

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

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY	
☐ BLDR/SLABS [10]		☐ HARDPAN [4]		☐ POOL RIFFLE		☐ LIMESTONE [1]		☐ HEAVY [-2]	Substrate 14 Maximum 20

Comments

Cobble, gravel, silt

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

AMOUNT

Check ONE (Or 2 & average)

UNDERCUT BANKS [1]		POOLS > 70CM [2]		OXBOWS, BACKWATERS [1]		AMOUNT	
2		2		0		☒ MODERATE 25-75% [7]	Cover 14 Maximum 20

Comments

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

SINUOSITY		DEVELOPMENT		CHANNELIZATION		STABILITY	
☐ HIGH [4]		☐ EXCELLENT [7]		☐ NONE [6]		☒ HIGH [3]	Channel 13 Maximum 20

Comments

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

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
☐ NONE / LITTLE [3]		☒ WIDE > 50M [4]		☒ FOREST, SWAMP [3]	
☒ MODERATE [2]		☐ MODERATE 10-50M [3]		☐ SHRUB OR OLD FIELD [2]	
☐ HEAVY / SEVERE [1]		☐ NARROW 5-10M [2]		☐ RESIDENTIAL, PARK, NEW FIELD [1]	
		☐ VERY NARROW < 5M [1]		☐ FENCED PASTURE [1]	
		☐ NONE [0]		☐ OPEN PASTURE, ROWCROP [0]	

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

Comments

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH		CHANNEL WIDTH		CURRENT VELOCITY	
☐ > 1M [6]		☐ POOL WIDTH > RIFFLE WIDTH [2]		☐ TORRENTIAL [-1]	☒ SLOW [1]
☒ 0.7-<1M [4]		☒ POOL WIDTH = RIFFLE WIDTH [1]		☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ 0.4-<0.7 [2]		☐ POOL WIDTH < RIFFLE WIDTH [0]		☐ FAST [1]	☐ INTERMITTENT [-2]
☐ 0.2-<0.4M [1]				☐ MODERATE [1]	☐ EDDIES [1]
☐ < 0.2M [0]					

Indicate for reach - pools and riffles.

Comments

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

Check ONE (Or 2 & average).

RIFFLE DEPTH		RUN DEPTH		RIFFLE / RUN SUBSTRATE		RIFFLE / RUN EMBEDDEDNESS	
☒ BEST AREAS >10CM [2]		☒ MAXIMUM > 50CM [2]		☒ STABLE (E.G., COBBLE, BOULDER) [2]		☐ NONE [2]	Riffle / Run 6.5 Maximum 8

Comments

6] GRADIENT (37 ft/mi)		DRAINAGE AREA		%POOL:		%GLIDE:		Gradient Maximum	
		☐ VERY LOW - LOW [2-4]			60				4
		☐ MODERATE [6-10]			20				
		☒ HIGH - VERY HIGH [10-6]							

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

.07
meters

CANOPY

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

CLARITY

1st --sample pass-- 2nd

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

1st _____ cm

pass

2nd _____ cm

B) AESTHETICS☐ NUISANCE ALGAE☐ INVASIVE☐ MACROPHYTES☐ EXCESS TURBIDITY☐ DISCOLORATION☐ FOAM / SCUM☐ OIL SHEEN☒ TRASH / LITTER☐ NUISANCE ODOR☐ SLUDGE DEPOSITS☐ CSOS/SSOS/OUTFALLS**C) RECREATION**

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft**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) EJ ISSUES

WWTP / CSO / NPDES / INDUSTRY

HARDENED / URBAN / DIRT & GRIM

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 11m $\bar{x}$ depth 0.7m

max. depth 1.3m

 $\bar{x}$ bankfull width 18mbankfull $\bar{x}$ depth

W/D ratio 15.714

bankfull max. depth

floodprone x^2 width

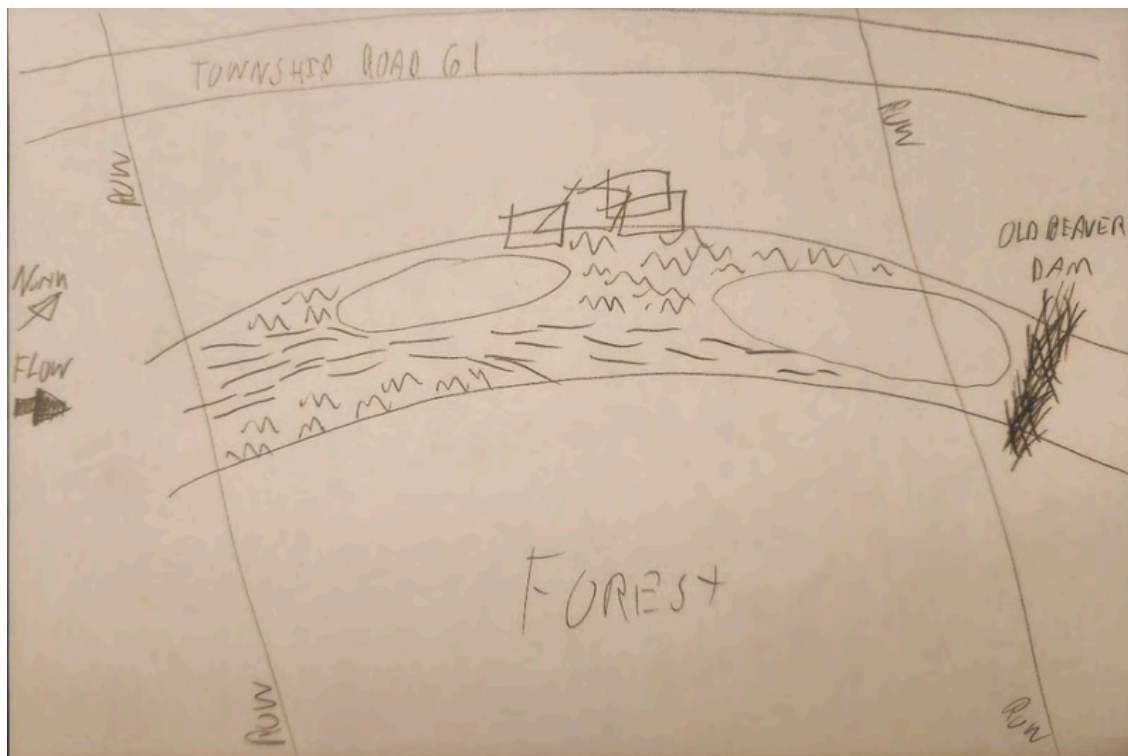
entrench. ratio

Legacy Tree:

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

S-JDV-22 (Brush Creek) parallels Township Road 61 and flows southwest to northeast; temperature = 18.8C; pH = 7.92

Exhibit 18

Stream Drawing:



Primary Headwater Habitat Evaluation Form

Exhibit 18 **30****HHEI Score (sum of metrics 1, 2, 3) :**SITE NAME/LOCATION S-TPT-01. FirstEnergy - Sammis-Star 345kV Rebuild Project.SITE NUMBER N/A RIVER CODE N/A RIVER BASIN Ohio River DRAINAGE AREA (mi²) 0.001LENGTH OF STREAM REACH (ft) 200 LAT. 40.5287604 LONG. -80.6761872 RIVER MILE N/ADATE 2025-11-12 SCORER TPT COMMENTS Ephemeral headwater running through culvert under access road**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
☐ BLDR SLABS [16 pts]	<u>0</u>	☐ SILT [3 pts]	<u>0</u>
☐ BOULDER (>256 mm) [16 pts]	<u>0</u>	☐ LEAF PACK/WOODY DEBRIS [3 pts]	<u>15</u>
☐ BEDROCK [16 pts]	<u>0</u>	☐ FINE DETRITUS [3 pts]	<u>0</u>
☒ COBBLE (65-256 mm) [12 pts]	<u>25</u>	☒ CLAY or HARDPAN [0 pts]	<u>60</u>
☐ GRAVEL (2-64 mm) [9 pts]	<u>0</u>	☐ MUCK [0 pts]	<u>0</u>
☐ SAND (<2 mm) [6 pts]	<u>0</u>	☐ ARTIFICIAL [3 pts]	<u>0</u>

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 25

(A)

(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):**

☐ > 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 No pools observed

MAXIMUM POOL DEPTH (centimeters):

0Pool Depth
Max = 30**0**

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

☐ > 4.0 meters (> 13') [30 pts]	☒ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☐ ≤ 1.0 m (≤ 3' 3") [5 pts]
☐ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS OHWM is 1.25 ft

AVERAGE BANKFULL WIDTH (meters):

1.5Bankfull
Width
Max=30**15****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆ NOTE: River Left (L) and Right (R) as looking downstream☆**RIPARIAN WIDTH**

L	R	(Per Bank)
☒	☒	Wide >10m
☐	☐	Moderate 5-10m
☐	☐	Narrow <5m
☐	☐	None

FLOODPLAIN QUALITY

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

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

COMMENTS Ephemeral channel running down a hillside in a mixed hardwood forest**FLOW REGIME (At Time of Evaluation) (Check ONLY one box):**

☐ Stream Flowing	☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial)	☒ Dry channel, no water (Ephemeral)

COMMENTS _____

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

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

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

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

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

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Ohio River

Distance from Evaluated Stream 0.22 miles

☐ CWH Name: ____

Distance from Evaluated Stream ____

☐ EWH Name: ____

Distance from Evaluated Stream ____

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

USGS Quadrangle Name: See Report

NRCS Soil Map Page: See Report NRCS Soil Map Stream Order See Report

County: Jefferson

Township / City: Saline

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 2025-11-09 Quantity: 0.25

Photo-documentation Notes: ____

Elevated Turbidity? (Y/N): N Canopy (% open): 25

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _

Field Measures: Temp (°C) 0 Dissolved Oxygen (mg/l) _ pH (S.U.) 0 Conductivity (µmhos/cm) _

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

Additional comments/description of pollution impacts:

Dry channel

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) _ Species observed (if known): _

Frogs or Tadpoles Observed? (Y/N) _ Species observed (if known): _

Salamanders Observed? (Y/N) _ Species observed (if known): _

Aquatic Macroinvertebrates Observed? (Y/N) _ Species observed (if known): _

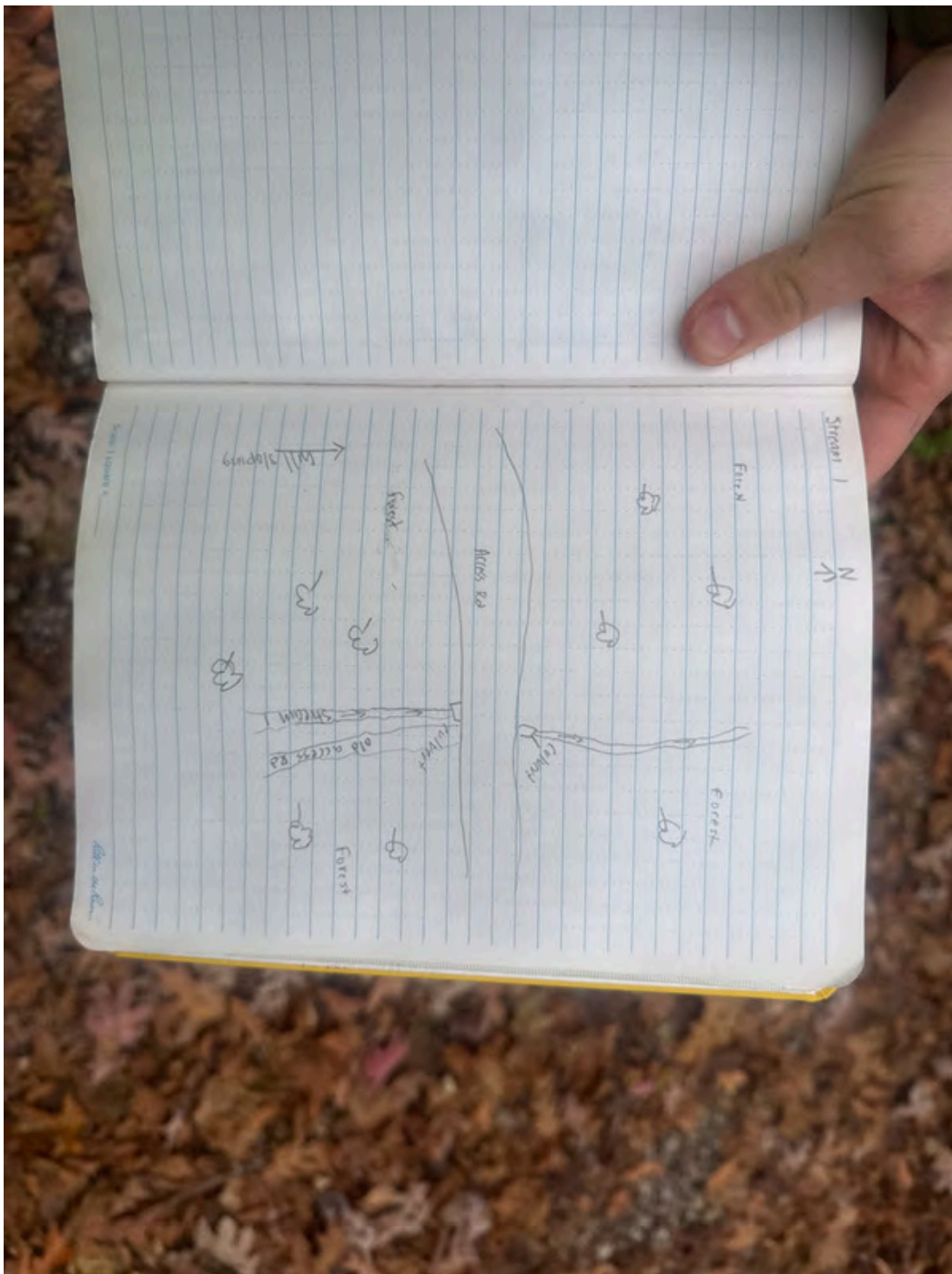
Comments Regarding Biology:

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 →

SEE PAGE 3





Primary Headwater Habitat Evaluation Form

Exhibit 18 **15****HHEI Score (sum of metrics 1, 2, 3) :**SITE NAME/LOCATION S-TMC-02. FirstEnergy - Sammis-Star 345kV Rebuild.SITE NUMBER N/A RIVER CODE N/A RIVER BASIN Ohio River DRAINAGE AREA (mi²) 0.001LENGTH OF STREAM REACH (ft) 200 LAT. 40.5303762 LONG. -80.6352738 RIVER MILE N/ADATE 2026-03-20 SCORER TMC COMMENTS _____**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:** ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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

TYPE	PERCENT	TYPE	PERCENT
☐ ☐ BLDR SLABS [16 pts]	___	☐ ☒ SILT [3 pts]	<u>25</u>
☐ ☐ BOULDER (>256 mm) [16 pts]	<u>5</u>	☒ ☐ LEAF PACK/WOODY DEBRIS [3 pts]	<u>60</u>
☐ ☐ BEDROCK [16 pts]	___	☐ ☐ FINE DETRITUS [3 pts]	___
☐ ☐ COBBLE (65-256 mm) [12 pts]	<u>10</u>	☐ ☐ CLAY or HARDPAN [0 pts]	___
☐ ☐ GRAVEL (2-64 mm) [9 pts]	___	☐ ☐ MUCK [0 pts]	___
☐ ☐ SAND (<2 mm) [6 pts]	___	☐ ☐ ARTIFICIAL [3 pts]	___

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 15

(A)

(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):

☐ > 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 (centimeters): **0**Pool Depth
Max = 30**0**

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

☐ > 4.0 meters (> 13') [30 pts]	☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☒ ≤ 1.0 m (≤ 3' 3") [5 pts]
☐ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters): **0.7**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)
☐	☐	Wide >10m
☒	☒	Moderate 5-10m
☐	☐	Narrow <5m
☐	☐	None

COMMENTS _____

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)	L	R	
☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	Fenced Pasture	☐	☐	Mining or Construction

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

☐ Stream Flowing	☒ Moist Channel, isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial)	☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

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

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

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

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

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Ohio River

Distance from Evaluated Stream 0.65 miles

☐ CWH Name: ____

Distance from Evaluated Stream ____

☐ EWH Name: ____

Distance from Evaluated Stream ____

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

USGS Quadrangle Name: See Report

NRCS Soil Map Page: See Report NRCS Soil Map Stream Order See Report

County: Jefferson

Township / City: Saline

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 2026-03-17 Quantity: 0.22 inches

Photo-documentation Notes: ____

Elevated Turbidity? (Y/N): N Canopy (% open): 10

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _

Field Measures: Temp (°C) 13.9 Dissolved Oxygen (mg/l) _ pH (S.U.) 7.81 Conductivity (µmhos/cm) _

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

Additional comments/description of pollution impacts:

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _

Salamanders Observed? (Y/N) N Species observed (if known): _

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _

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 →

SEE PAGE 3

