

ATTACHMENT E
Level 1 Ecological Survey Report

LEVEL 1 ECOLOGICAL SURVEY REPORT (v.05-18)



OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF ENVIRONMENTAL SERVICES
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Project C-R-S / Name:	HAM-SR 32-6.82 / Intersection Improvement and Landslide Repair
Project Identification Number (PID):	110991
Report Type:	Level 1 ESR
Report Author(s):	Michael de Villiers and Rohini Vembar
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Date of Submission:	April 7, 2020

Certification *(Must be acknowledged by a responsible party)*

☒ I certify that I have personally examined and am familiar with the information in this report and all attachments, and that the data collection was supervised by an individual(s) prequalified to conduct ecological surveys for ODOT or by trained ODOT Environmental staff. Based on my inquiry of those persons immediately responsible for obtaining the information contained in the report, I believe that the information has been collected in accordance with the ODOT Ecological Manual current at the time of the report preparation, and is true, accurate, and complete.

Name: Kim Carter

Date: 4/7/2020

Title: Project Manager

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by ODOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated [June 6, 2018], and executed by FHWA and ODOT.

GENERAL PROJECT INFORMATION					
ODOT District:	District 8	County(ies):	Hamilton	Township(s):	Anderson
Latitude (DD.dddd):	39.116819	Study Area Size (ac):	22.4	Area of Construction Limits (ac):	7.71
Longitude (-DD.dddd):	-84.316088				
Date(s) of Survey Work (mm/dd/yyyy):	3/17/2020	USGS Quadrangle(s):	Withamsville	HUC 12:	050902021405
On the ODOT Major Program Projects list:	Yes (List Group): 01) MNC; 043 Clermont/Hamilton Eastern Corridor	Impacting or Adjacent to ODNR Property :	No	Project Includes Federal Funding:	YES
Within the Coastal Zone Management Area :	NO	Within the Oak Openings Region :	NO		
<p>Project Description (include a detailed description of the construction activities):</p> <p>The proposed intersection improvement and landslide repair project is located in Hamilton County, Ohio (see Figure 1.1 and Figure 1.2). The project is sponsored by Ohio Department of Transportation (ODOT) – District 8. The project is identified by ODOT as HAM-SR 32-6.82, PID 110991. The project area occurs at the bottom of a steep hill along SR 32 at the intersection of SR 32 and Eight Mile Road. The total length of the project including improvements to SR 32, Eight Mile Road, slide repair, and maintenance of traffic is approximately 0.82 mile.</p> <p>The proposed project includes installation of a signalized Green T intersection at SR 32 and Eight Mile Road and improvements to the profile grade on Eight Mile Road. The proposed project also includes repair of a landslide on the west side of southbound SR 32. The project will utilize state and federal funds. Project cost is estimated at \$3,852,561. Construction is anticipated to begin in January 2023.</p> <p>The proposed project is expected to impact five (5) potentially jurisdictional streams – Stream 3, Stream 4, Stream 5, Stream 6, and Stream 8, one (1) potentially jurisdictional wetland – Wetland A, and one (1) potentially jurisdictional ditch – Ditch 1. All impacted streams are primary headwater habitat streams with small drainage areas (<1 mi²) and located in the Dry Run-Little Miami River watershed (HUC-12 050902021405). The entire project area occurs within an OEPA Nationwide Permit “Possibly Eligible” area. Wetland A is a small palustrine, emergent, Category 1 feature. There is 1.38 acres of suitable wooded habitat (SWH) for the federal endangered Indiana bat (<i>Myotis sodalis</i>) and federal threatened northern long-eared bat (<i>Myotis septentrionalis</i>), in the form of steep sloped, scrubby Upland Forest (UF) and a small area of Floodplain Forest (FF) adjacent to Dry Run, located within the preliminary construction limits. All 1.38 acres of SWH occurs within 100 feet of existing edge of pavement. No potential maternity roost trees (PMRT) are located within the preliminary construction limits. No suitable habitat for the federal species of concern bald eagle (<i>Haliaeetus leucocephalus</i>), the federal endangered running buffalo clover (<i>Trifolium stoloniferum</i>), or the federal endangered fanshell (<i>Cyprogenia stegaria</i>), pink mucket pearly mussel (<i>Lampsilis orbiculata</i>), rayed bean mussel (<i>Villosa fabalis</i>), sheepnose (<i>Plethobasus cyphus</i>), and snuffbox (<i>Epioblasma triquetra</i>) occurs within the preliminary construction limits. Marginal suitable habitat for the state threatened Kirtland’s snake (<i>Clonophis kirtlandii</i>) occurs within the preliminary construction limits. Construction of the HAM-SR 32-6.82 project is considered “Not Likely To Impact” Kirtland’s snake. No suitable habitat for the state threatened Sloan’s crayfish (<i>Orconectes sloanii</i>) or the state endangered cave salamander (<i>Eurycea lucifuga</i>), American bittern (<i>Botaurus lentiginosus</i>), or lark sparrow (<i>Chondestes grammacus</i>) occurs within the preliminary construction limits. No colony nesting birds or peregrine falcon were observed within the HAM-SR 32-6.82 project study area during field surveys conducted on 3/17/2020.</p>					

VEGETATIVE COMMUNITIES AND LAND COVER			
Vegetative Communities and Land Cover found within the Construction Limits:	Degree of Man Induced Ecological Disturbance	Unique, Rare, or High Quality?	Within Project Impact Area (total should equate to area of construction limits)
Developed High Intensity (DH) - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to100 % of the total cover.	Extreme Disturbance/Ruderal Community (dominated by opportunistic invaders or native highly tolerant taxa)	NO	3.56 acres
Developed Open Space - DS - (mown right-of-way, large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes)	High Disturbance (dominated by widespread taxa not typical of a particular community)	NO	2.13 acres
Upland Forest - UF - (uplands dominated by trees)	Intermediate Disturbance (dominated by plants that typify a stable phase of a native community that persists under some disturbance)	NO	1.33 acres
Floodplain Forest - FF- (floodplain dominated by trees)	Intermediate Disturbance (dominated by plants that typify a stable phase of a native community that persists under some disturbance)	NO	0.05 acre

VEGETATIVE COMMUNITIES AND LAND COVER			
Vegetative Communities and Land Cover found within the Construction Limits:	Degree of Man Induced Ecological Disturbance	Unique, Rare, or High Quality?	Within Project Impact Area (total should equate to area of construction limits)
Scrub/Shrub - SS - (true shrubs, and young trees in an early successional stage)	Intermediate Disturbance (dominated by plants that typify a stable phase of a native community that persists under some disturbance)	NO	0.55 acre
Open Water - All areas of open water, generally with less than 25% cover of vegetation or soil.	Intermediate Disturbance (dominated by plants that typify a stable phase of a native community that persists under some disturbance)	NO	0.03 acre
Marsh - MA - (wetland dominated by submergent, floating, and/or emergent vegetation)	Intermediate Disturbance (dominated by plants that typify a stable phase of a native community that persists under some disturbance)	NO	0.06 acre

Additional Information:

The project study area was surveyed for vegetative communities on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar). Developed High Intensity (DH) and Developed Open Space (DS) vegetative communities account for approximately 46 percent and 28 percent of the land cover within the project impact area (preliminary construction limits), respectively. Approximately 17 percent of the land cover within the project impact area (preliminary construction limits) is Upland Forest (UF). This Upland Forest vegetative community consists primarily of hackberry (*Celtis occidentalis*), sugar maple (*Acer saccharum*), white oak (*Quercus alba*), and black walnut (*Juglans nigra*) with some black locust (*Robinia pseudoacacia*) and hickory (*Carya* sp.). The shrub layer in the Upland Forest consists of Ohio buckeye (*Aesculus glabra*), box-elder (*Acer negundo*), and dense scrubby amur honeysuckle (*Lonicera maackii*). Approximately half (0.5) of a percent of the land cover within the project impact area (preliminary construction limits) is Floodplain Forest (FF) within the 100-year floodplain of Dry Run. This Floodplain Forest vegetative community consists primarily of Eastern cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), and box-elder. The shrub layer in the Floodplain Forest consists primarily of dense scrubby amur honeysuckle. Approximately seven (7) percent of the land cover within the project impact area (preliminary construction limits) is Scrub/Shrub (SS) vegetative community. This Scrub/Shrub vegetative community consists primarily of dense scrubby amur honeysuckle, Eastern red-cedar (*Juniperus virginiana*), black locust, black walnut, and multi-flora rose (*Rosa multiflora*). The remaining approximately one and a half (1.5) percent of land cover is comprised of Open Water (OW) and Marsh (Wetland A) (see Figure 2 in Appendix 1 and Photographs 31 through 47 in Appendix 2).

STREAMS		Present? YES			Impacts? YES		Total Impact to all Streams: 779 feet							
Stream ID	Photograph #(s):	Drainage Area (mi ²)	OEPA River Mile (if applicable)	*Stream Hydrology Type: ①	* USACE Flow Characteristics: ①	Habitat Assessment ① pH Value	Aquatic Macro-inverts Observed: (Required for Class III PHWH Only) ①	Ohio EPA Aquatic Life Use Designation: ①	Antidegradation Designation : ①	401 WQC for Nationwide Permit Eligibility	Scenic River :	Designation for Potential In-water Work Restriction : ①	Length In Study Area (ft.)	Impact Length (ft.)
Name: Stream 1 (Dry Run)	1, 2, 3	4.31	3.2	P	RPW-Perennial	QHEI	Not Surveyed	WWH	GHQW	Possibly Eligible	No	None Applicable	Total: 411	Total: 0
Lat: 39.119121						62.25							Open: 411	Permanent: (If Known)
Lon: -84.318757						pH: 7.99							Culverted: 0	Temporary: (If Known)
How the stream connects to a TNW: Stream 1 (Dry Run) flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Water Quality Measurements: Temperature = 7.46 °C; Dissolved Oxygen = 12.9 mg/L; pH = 7.99; Conductivity = 708 µmhos/cm.														
Name: Stream 2	4, 5, 6	<1.0	NA	E	Non-RPW	HHEI	Not Surveyed	*Mod Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 219	Total: 0
Lat: 39.119641						53							Open: 105	Permanent: (If Known)
Lon: -84.318274						pH: 8.16							Culverted: 114	Temporary: (If Known)
How the stream connects to a TNW: Stream 2 flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Water Quality Measurements: Temperature = 10.1 °C; Dissolved Oxygen = 11.9 mg/L; pH = 8.16; Conductivity = 548 µmhos/cm.														
Name: Stream 3	7, 8, 9	<1.0	NA	I	RPW-Seasonal	HHEI	Not Surveyed	*Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 326	Total: 102
Lat: 39.118705						69							Open: 142	Permanent: (If Known)
Lon: -84.317172						pH: 7.85							Culverted: 184	Temporary: (If Known)
How the stream connects to a TNW: Stream 3 flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Of the 102 feet of total impact, 68 feet are within existing culvert. Water Quality Measurements: Temperature = 10.39 °C; Dissolved Oxygen = 11.8 mg/L; pH = 7.85; Conductivity = 650 µmhos/cm.														

STREAMS		Present? YES		Impacts? YES		Total Impact to all Streams: 779 feet								
Stream ID	Photograph #(s):	Drainage Area (mi ²)	OEPA River Mile (if applicable)	*Stream Hydrology Type: ①	* USACE Flow Characteristics: ①	Habitat Assessment ① pH Value	Aquatic Macro-inverts Observed: (Required for Class III PHWH Only) ①	Ohio EPA Aquatic Life Use Designation: ①	Antidegradation Designation: ①	401 WQC for Nationwide Permit Eligibility	Scenic River :	Designation for Potential In-water Work Restriction: ①	Length In Study Area (ft.)	Impact Length (ft.)
Name: Stream 4	10, 11, 12	<1.0	NA	I	RPW-Seasonal	HHEI	Not Surveyed	*Mod Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 596	Total: 133
Lat: 39.117408						59							Open: 462	Permanent: (If Known)
Lon: -84.316101						pH: 7.94							Culverted: 134	Temporary: (If Known)
How the stream connects to a TNW: Stream 4 flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Of the 133 feet of total impact, 128 feet are within existing culvert. Water Quality Measurements: Temperature = 9.13 °C; Dissolved Oxygen = 11.36 mg/L; pH = 7.94; Conductivity = 716 µmhos/cm.														
Name: Stream 5	13, 14, 15	<1.0	NA	I	RPW-Seasonal	HHEI	Not Surveyed	*Mod Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 747	Total: 425
Lat: 39.115692						68							Open: 313	Permanent: (If Known)
Lon: -84.316998						pH: 8.3							Culverted: 434	Temporary: (If Known)
How the stream connects to a TNW: Stream 5 flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Of the 425 feet of total impact, 274 feet are within existing culvert. Water Quality Measurements: Temperature = 7.73 °C; Dissolved Oxygen = 13.3 mg/L; pH = 8.30; Conductivity = 1,211 µmhos/cm.														
Name: Stream 6	16, 17, 18	<1.0	NA	E	Non-RPW	HHEI	Not Surveyed	*Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 274	Total: 67
Lat: 39.114947						65							Open: 126	Permanent: (If Known)
Lon: -84.316778						pH: 7.98							Culverted: 148	Temporary: (If Known)
How the stream connects to a TNW: Stream 6 flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Of the 67 feet of total impact, 51 feet are within existing culvert. Water Quality Measurements: Temperature = 8.93 °C; Dissolved Oxygen = 11.56 mg/L; pH = 7.98; Conductivity = 1,875 µmhos/cm.														
Name: Stream 7	19, 20, 21	<1.0	NA	E	RPW-Seasonal	HHEI	Not Surveyed	*Mod Class I	GHQW	Possibly Eligible	No	None Applicable	Total: 111	Total: 0
Lat: 39.114539						20							Open: 111	Permanent: (If Known)
Lon: -84.316240						pH: 8.06							Culverted: 0	Temporary: (If Known)
How the stream connects to a TNW: Stream 7 flows into Stream 5, which flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Water Quality Measurements: Temperature = 9.40 °C; Dissolved Oxygen = 11.70 mg/L; pH = 8.06; Conductivity = 1,945 µmhos/cm.														
Name: Stream 8	22, 23, 24	<1.0	NA	E	Non-RPW	HHEI	Not Surveyed	*Mod Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 140	Total: 52
Lat: 39.115221						34							Open: 140	Permanent: (If Known)
Lon: -84.315462						pH: NA							Culverted: 0	Temporary: (If Known)
How the stream connects to a TNW: Stream 8 flows into Stream 9, which flows into Stream 5, which flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: All 52 feet of impact occur in open, deeply entrenched gully parallel to SR 32. Stream 8 was dry at the time of survey; no water quality readings taken.														
Name: Stream 9	25, 26, 27	<1.0	NA	E	Non-RPW	HHEI	Not Surveyed	*Mod Class II	GHQW	Possibly Eligible	No	None Applicable	Total: 393	Total: 0
Lat: 39.115364						56							Open: 373	Permanent: (If Known)
Lon: -84.315271						pH: 7.80							Culverted: 20	Temporary: (If Known)
How the stream connects to a TNW: Stream 9 flows into Stream 5, which flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.														
Details on stream impact (if known) and any additional information: Water Quality Measurements: Temperature = 8.74 °C; Dissolved Oxygen = 9.02 mg/L; pH = 7.80; Conductivity = 940 µmhos/cm.														
*P = Perennial, I= Intermittent, E = Ephemeral *Subject to verification by the USACE (TNW=Traditional Navigable Water, RPW=Relatively Permanent Water) ** Indicates Provisional designations based on habitat assessment forms and/or HMFEL.														

WETLANDS		Present? YES		Impacts? YES			Total Impact: 0.055 acre	
Wetland ID	Photo #	Hydrologic Connection:	ORAM Score	Wetland Category ①	Wetland Type (Cowardin)	Est. Total Size (ac.)	Est. Size In Study Area (ac.)	Impact Area (ac.)
Name: Wetland A	28	Abutting	23	Category 1	Palustrine - Emergent Wetland Persistent	0.141	0.141	Total: 0.055
Lat: 39.114657								Permanent: (If Known)
Lon: -84.317178								Temporary: (If Known)
How the wetland connects to Traditional Navigable Water (TNW): Wetland A is located on both sides of Stream 6, which flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.								
Details on wetland impact (if known) and any additional information: Widening of Eight Mile Road encroaches on two separate areas of Wetland A located on either side of Stream 6.								

DITCHES		Present? YES			Impacts? YES			Total Impact: 0.007 acre	
Ditch ID	Photo #	*USACE Flow Characteristics ①	OHWM Present?	Constructed in or Drains a wetland?	Constructed Through Hydric Soils?	Flows between two or more potential waters of the US?	Wetted Width (ft.)	Length within project area (ft.)	Impact Area (ac.)
Name: Ditch 1	29,30	RPW-Seasonal	YES	NO	NO	NO	2.0	313	Total: 0.007 acre
Lat: 39.116547									Permanent: (If Known)
Lon: -84.315558									Temporary: (If Known)
Additional Information: How the ditch connects to a TNW and details on impact type (if known, and any additional information): Ditch 1 flows into Stream 4, which flows into Stream 1 (Dry Run), which flows approximately 3 miles before its confluence with the Little Miami River, which is a TNW.									
*Subject to verification by the USACE (TNW=Traditional Navigable Water, RPW=Relatively Permanent Water)									

PONDS, LAKES, RESERVOIRS, RETENTION/DETENTION BASINS	Present? NO	Impacts? NO	Total Impact: 0 acre
Additional Information: How the water body connects to a TNW, details on impact type (if known), and any additional information: The project study area was surveyed for Ponds, Lakes, Reservoirs, Retention/Detention Basins on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and no Ponds, Lakes, Reservoirs, Retention/Detention Basins were found.			

MUSSELS	Streams ≥ 10 mi ² ? No - Stream(s) are not likely suitable for mussel populations. Complete table below only if mussels are observed during other survey activities.			
Stream Name: N/A	Group Listing: Not Listed	Evidence of Mussels: None	Level of Effort: N/A	Documentation Attached: N/A
Summary of Results: The study area was surveyed on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and although limited suitable habitat for mussels was observed in Stream 1 (Dry Run), no mussels were observed. In addition, no mussels or suitable mussel habitat were observed in any of the other eight streams within the study area.				

FEDERALLY LISTED SPECIES ①		
Species Name: Indiana Bat (<i>Myotis sodalis</i>) and Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Listing Status: Endangered/Threatened	Effect Determination (Completed by ODOT-OES): (Choose)
Consultation Category (Completed by ODOT-OES):	(Choose)	
Suitable Habitat: The 2016 PBO defines suitable wooded habitat (SWH) for these species as any tree covered area that is 0.5 ac or larger, containing any potential roots (i.e., live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities) greater than 13 ft tall and at least 3 in dbh, or any patch of trees with these characteristics that is less than ½ acre in size but is within 1,000 feet of or connected by a travel corridor to a PMRT, ½-acre or larger stand of SWH, or any patch of wooded riparian buffer. Additionally, these species may use bridges over streams as summer roosting habitat. During the winter months these species inhabit hibernacula (typically caves, or abandoned mines that provide cool, humid, stable conditions for hibernation). Complete Indiana Bat and Northern Long-eared Bat Field Habitat Assessment Checklist and the ODOT Bridge Bat Inspection Form (if applicable) and provide a brief discussion including impacts to suitable habitats or evidence of bats roosting on a bridge structure: The Ohio Department of Natural Resources, Division of Wildlife (ODNR-DOW) Natural Heritage Database check conducted on March 10, 2020 found no records for Indiana bat or northern long-eared bat capture locations or hibernacula within a one mile radius of the project (see Appendix 4). According to a United States Fish and Wildlife Service (USFWS) email information request response on March 9, 2020, the project is not located within a bat buffer (see Appendix 4). Field surveys of the study area by Stantec on 3/17/2020 did not identify any portals, openings, cracks, or crevices in rock outcrops that may be an entrance to a cave or mine that would be considered suitable winter hibernacula for Indiana bat or northern long-eared bat. There are no bridges within the study area. The proposed work would impact 1.38 acres of SWH (see Habitat Assessment Checklist in Appendix 4). All 1.38 acres of SWH occurs within 100 feet of existing edge of pavement. No potential maternity roost trees (PMRT) are located within the preliminary construction limits. The suitable wooded habitat within the preliminary construction limits occurs as predominantly steep sloped, scrubby Upland Forest and a small area of Floodplain Forest adjacent to Dry Run. Representative photographs of SWH within the preliminary construction limits are provided in Appendix 2 (see Photographs 31, 34-40, 43, 44, and 47).		
Species Name: Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Listing Status: Species of Concern	Effect Determination (Completed by ODOT-OES): (Choose)

Is a known nest (based on NHDB or other source) located within 0.5 mile of the project?:	NO	Will the project require blasting?:	NO
Based on field surveys and/or a NHDB record search, is a nest within 660 ft. and/or visible from the project or activity area? If yes, indicate proximity to construction limits:	NO		
<p>Suitable Habitat: The bald eagle is protected under the Bald and Golden Eagle Protection Act which prohibits taking bald eagles, including disturbance. The preferred habitat includes mature forests adjacent to open water for nesting and foraging.</p> <p>Discussion Including Impacts to Suitable Habitat: According to the ODNr Natural Heritage Database search, there are no known bald eagle nests located within a one-mile radius of the project (see Appendix 4). No suitable habitat for bald eagle (as described above) occurs within the preliminary construction limits; and, no bald eagle or bald eagle nests were observed.</p>			
Species Name: Running Buffalo Clover (<i>Trifolium stoloniferum</i>)	Listing Status: Endangered (Proposed to be delisted)	Effect Determination (Completed by ODOT-OES): (Choose)	
<p>Suitable Habitat Description: Running buffalo clover requires periodic disturbance and a somewhat open habitat to successfully flourish, but it cannot tolerate full-sun, full-shade, or severe disturbance. Historically running buffalo clover was found in rich soils in the ecotone between open forest and prairie. Those areas were probably maintained by the disturbance caused by bison. Today, the species is found in partially shaded woodlots, mowed areas (lawns, parks, cemeteries), and along streams and trails (USFWS, January 2020).</p> <p>Discussion Including Impacts to Suitable Habitat: Although mowed areas (front lawns, grassy right-of-way) do occur within the preliminary construction limits, most of these areas are either too frequently mowed (severe disturbance) and/or are located in areas with too much full-sun or full-shade. No suitable habitat for running buffalo clover, as described above, occurs within the preliminary construction limits.</p> <p>In addition, the USFWS is proposing to remove Endangered Species Act protection for the running buffalo clover. The proposed rule to delist running buffalo clover was published in the <i>Federal Register</i> on August 27, 2019, which opened a 60-day public comment period, which closed on October 28, 2019.</p>			
Species Name: Fanshell (<i>Cyprogenia stegaria</i>)	Listing Status: Endangered	Effect Determination (Completed by ODOT-OES): (Choose)	
<p>Suitable Habitat Description: Found in medium to large rivers. It buries itself in sand or gravel in deep water of moderate current, with only the edge of its shell and its feeding siphons exposed (USFWS, January 2020).</p> <p>Discussion Including Impacts to Suitable Habitat: The study area was surveyed on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and although limited suitable habitat for mussels was observed in Stream 1 (Dry Run), no mussels were observed and no impacts to this limited suitable habitat are expected. In addition, no mussels or suitable mussel habitat were observed in any of the other eight streams within the study area.</p>			
Species Name: Pink Mucket Pearly Mussel (<i>Lampsilis orbiculata</i>)	Listing Status: Endangered	Effect Determination (Completed by ODOT-OES): (Choose)	
<p>Suitable Habitat Description: This mussel is found in mud and sand and in shallow riffles and shoals swept free of silt in major rivers and tributaries. This mussel buries itself in sand or gravel, with only the edge of its shell and its feeding siphons exposed (USFWS, January 2020).</p> <p>Discussion Including Impacts to Suitable Habitat: The study area was surveyed on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and although limited suitable habitat for mussels was observed in Stream 1 (Dry Run), no mussels were observed and no impacts to this limited suitable habitat are expected. In addition, no mussels or suitable mussel habitat were observed in any of the other eight streams within the study area.</p>			
Species Name: Rayed bean mussel (<i>Villosa fabalis</i>)	Listing Status: Endangered	Effect Determination (Completed by ODOT-OES): (Choose)	
<p>Suitable Habitat Description: The rayed bean generally lives in smaller, headwater creeks, but it is sometimes found in large rivers and wave-washed areas of glacial lakes. It prefers gravel or sand substrates and is often found in and around roots of aquatic vegetation. Adults spend their entire lives partially or completely buried in substrate, filtering water through their gills to remove algae, bacteria, detritus, microscopic animals, and dissolved organic material for food (USFWS, January 2020).</p> <p>Discussion Including Impacts to Suitable Habitat: The study area was surveyed on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and although limited suitable habitat for mussels was observed in Stream 1 (Dry Run), no mussels were observed and no impacts to this limited suitable habitat are expected. In addition, no mussels or suitable mussel habitat were observed in any of the other eight streams within the study area.</p>			
Species Name: Sheepnose (<i>Plethobasus cyphus</i>)	Listing Status: Endangered	Effect Determination (Completed by ODOT-OES): (Choose)	
<p>Suitable Habitat Description: Sheepnose mussels live in larger rivers and streams where they are usually found in shallow areas with moderate to swift currents that flow over coarse sand and gravel. However, they have also been found in areas of mud, cobble and boulders, and in large rivers they may be found in deep runs (USFWS, January 2020).</p> <p>Discussion Including Impacts to Suitable Habitat: The study area was surveyed on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and although limited suitable habitat for mussels was observed in Stream 1 (Dry Run), no mussels were observed and no impacts to this limited suitable habitat are expected. In addition, no mussels or suitable mussel habitat were observed in any of the other eight streams within the study area.</p>			
Species Name: Snuffbox (<i>Epioblasma triquetra</i>)	Listing Status: Endangered	Effect Determination (Completed by ODOT-OES): (Choose)	
<p>Suitable Habitat Description: The snuffbox is usually found in small- to medium-sized creeks, inhabiting areas with a swift current, although it is also found in Lake Erie and some larger rivers. Adults often burrow deep in sand, gravel or cobble substrates, except when they are spawning or the females are attempting to attract host fish. They are suspensionfeeders, typically feeding on algae, bacteria, detritus, microscopic animals, and dissolved organic material (USFWS, January 2020).</p> <p>Discussion Including Impacts to Suitable Habitat: The study area was surveyed on 3/17/2020 by Stantec (Michael de Villiers and Rohini Vembar) and although limited suitable habitat for mussels was observed in Stream 1 (Dry Run), no mussels were observed and no impacts to this limited suitable habitat are expected. In addition, no mussels or suitable mussel habitat were observed in any of the other eight streams within the study area.</p>			
Additional Information:			

STATE LISTED SPECIES		
List all of the endangered, threatened, and potentially threatened species records from the Ohio Natural Heritage Database for any animal species located within 1 mile of the project, and any plant species records within 0.5 mile of the project. Note the date of the ONHDB check: 03/10/2020		
The ODNR Division of Wildlife has no records of rare or endangered species in the HAM-SR 32-6.82 study area, including a one-mile radius for animal species and a half-mile radius for plant species.		
List all of the state endangered and threatened species of animals that are of concern to the Ohio Division of Wildlife that are known or suspected of being within the county . Do not include species that have already been included in the Federally Listed Species Table.		
Kirtland's snake (<i>Clonophis kirtlandii</i>), cave salamander (<i>Eurycea lucifuga</i>), American bittern (<i>Botaurus lentiginosus</i>), lark sparrow (<i>Chondestes grammacus</i>), Sloan's crayfish (<i>Orconectes sloanii</i>).		
List the state listed species that are noted above for which there is <u>no</u> suitable habitat within construction limits of the project area. ①		
cave salamander (<i>Eurycea lucifuga</i>), American bittern (<i>Botaurus lentiginosus</i>), lark sparrow (<i>Chondestes grammacus</i>), Sloan's crayfish (<i>Orconectes sloanii</i>).		
In the table below discuss any state listed species that are listed above for which there <u>is</u> suitable habitat within construction limits of the project area. Make an impact determination for each species based on anticipated impacts to the species and/or suitable habitats.		
Species Name: Kirtland's snake (<i>Clonophis kirtlandii</i>)	Listing Status: Threatened	Impact Determination: Not Likely To Impact
<p>Suitable Habitat Description: Although encountered only occasionally, Kirtland's snake ranges throughout the glaciated western half of Ohio, and into a few glacial out wash-filled valleys in southwestern Ohio. Its secretive nature and marked preference for wet meadows makes it difficult to find. It is most common in the vicinity of Lucas and Hamilton counties, wherever wet fields remain. This snake prefers to eat earthworms and slugs.</p> <p>Discussion Including Impacts to Suitable Habitat: Marginal suitable habitat for Kirtland's snake is present in the study area and is expected to be impacted by the proposed project. Following ODOT's technical guidance "General Determination Process for Impacts to State Endangered, Threatened, and Potentially Threatened Species" (ODOT: TG-ECO-04-16), presence of Kirtland's snake in the project construction limits is assumed. However, since the species mobility is "Medium" and there is suitable habitat for Kirtland's snake located adjacent to the proposed project that will not be impacted, the proposed project is not likely to impact Kirtland's snake.</p>		
Additional Information:		

BIRDS NESTING ON BRIDGES OR CULVERTS	Note any colony nesting birds or any peregrine falcon sightings on bridges or culverts. If evidence colony nesting birds or peregrine falcon are observed, note the structure's C-R-S and discuss the observation, including the number of nests, their locations, the species present (if known), and whether the nests will be impacted by the project activities.
No colony nesting birds or peregrine falcon were observed within the HAM-SR 32-6.82 project study area during field surveys conducted on 3/17/2020.	

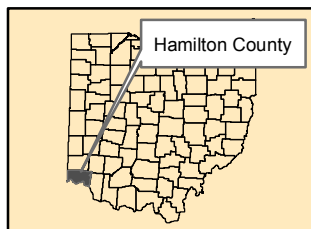
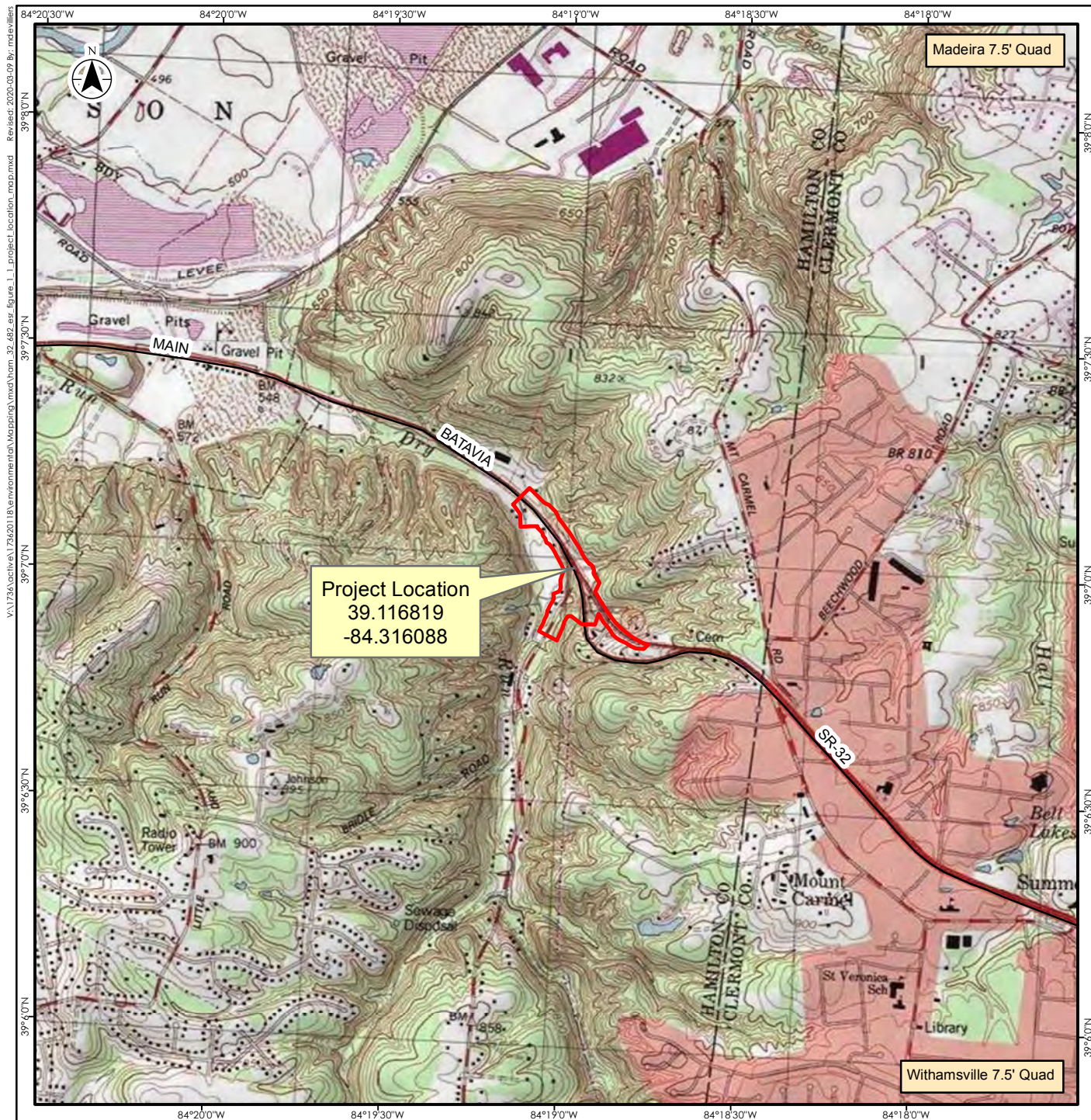
APPENDICES			
Appendix 1: Mapping	Appendix 2: Photo Log	Appendix 3: Plans	Appendix 4: Forms
<input checked="" type="checkbox"/> Topographic Map*	<input checked="" type="checkbox"/> Photo Location Map*	<input type="checkbox"/> Plan and Profile	<input checked="" type="checkbox"/> QHEI*
<input checked="" type="checkbox"/> County Map	<input checked="" type="checkbox"/> Project Photos*	<input type="checkbox"/> Bridge Detail	<input checked="" type="checkbox"/> HHEI*
<input checked="" type="checkbox"/> Aerial Photo*	<input checked="" type="checkbox"/> Bat Habitat Photos*	<input checked="" type="checkbox"/> Other**	<input type="checkbox"/> HMFEL (required on all streams assessed as Class III)*
<input checked="" type="checkbox"/> Water Resource Map*	<input type="checkbox"/> Other		<input checked="" type="checkbox"/> Wetland Delineation*
<input type="checkbox"/> SWH (only required for SWH impacts beyond 100 ft. from EOP)*			<input checked="" type="checkbox"/> ORAM*
<input type="checkbox"/> Other			<input checked="" type="checkbox"/> NHDB Review*
			<input checked="" type="checkbox"/> USFWS Information Request*
			<input type="checkbox"/> Ohio Mussel Habitat Assessment Form*
			<input checked="" type="checkbox"/> Bat Habitat Worksheets*

* Required (if applicable resource is present).

** Plans currently under development (see Figure 2 in Appendix 1 for study area and preliminary construction limits).

Appendix 1

Mapping



0 1,000 2,000
Feet
1:24,000 (at original document size of 8.5x11)



Project Location 173620118
Prepared by MDV on 2020-03-09

Anderson Township,
Hamilton County, Ohio

Client/Project
HAM-SR 32-6.82
PID 110991
Level 1 Ecological Survey Report

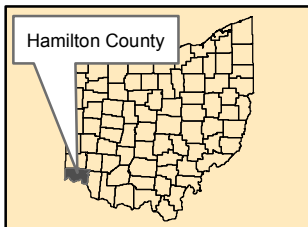
Figure No.
1.1
Title

- Notes**
1. Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet
 2. Base features produced from project design elements.
 3. Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap

Project Location Map



Project Location
39.116819
-84.316088



Notes

1. Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet
2. Base features produced from project design elements.
3. Service Layer Credits: ODOT Mapping Services (2014)



Project Location 173A20118
Anderson Township, Hamilton County, Ohio Prepared by MDV on 2020-03-18

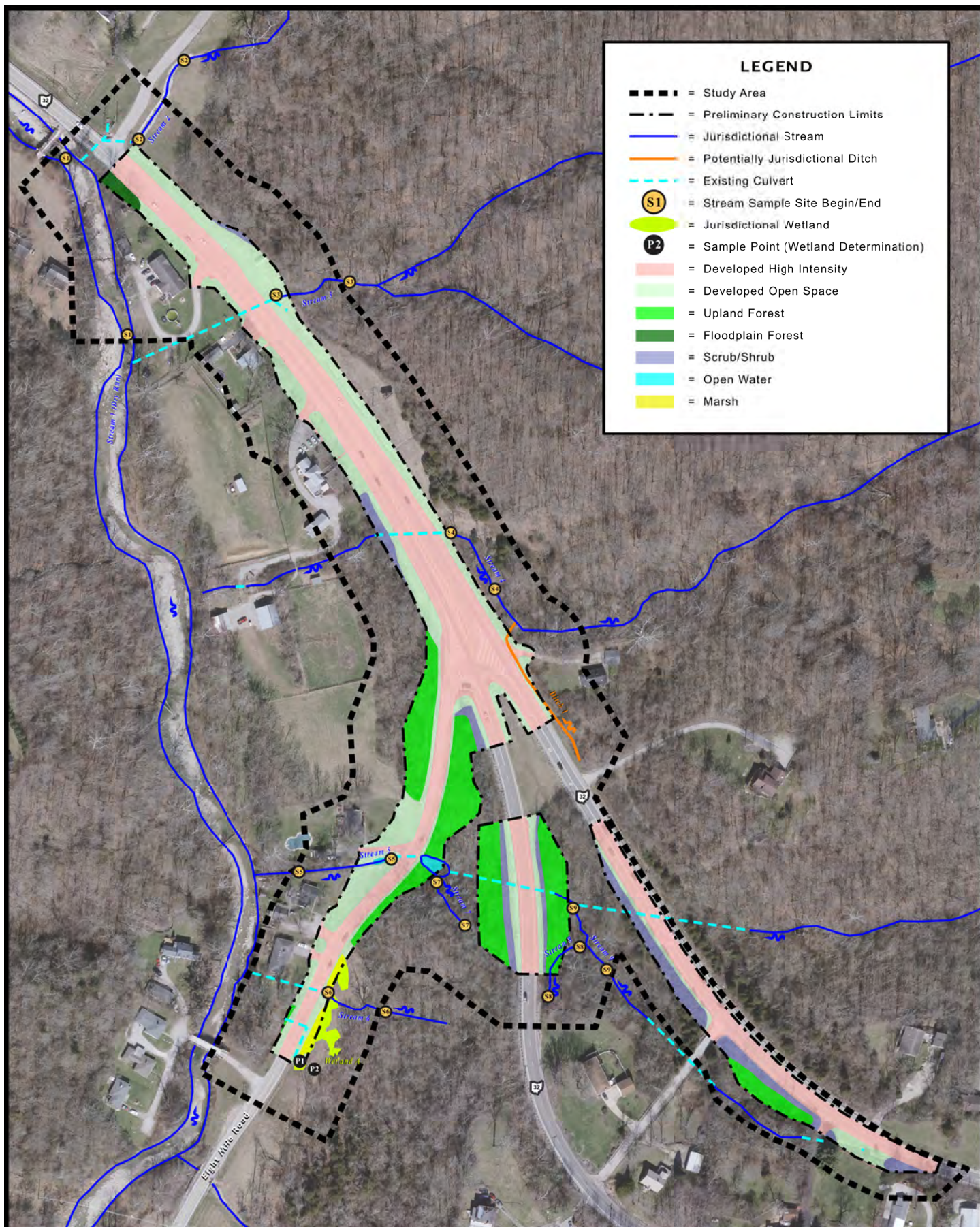
Client/Project
HAM-SR 32-6.82
PID 110991
Level 1 Ecological Survey Report

Figure No.

1.2

Title

**Project Location Map
County Roadway Map Base**



0 50 100 200 FEET
March 2020

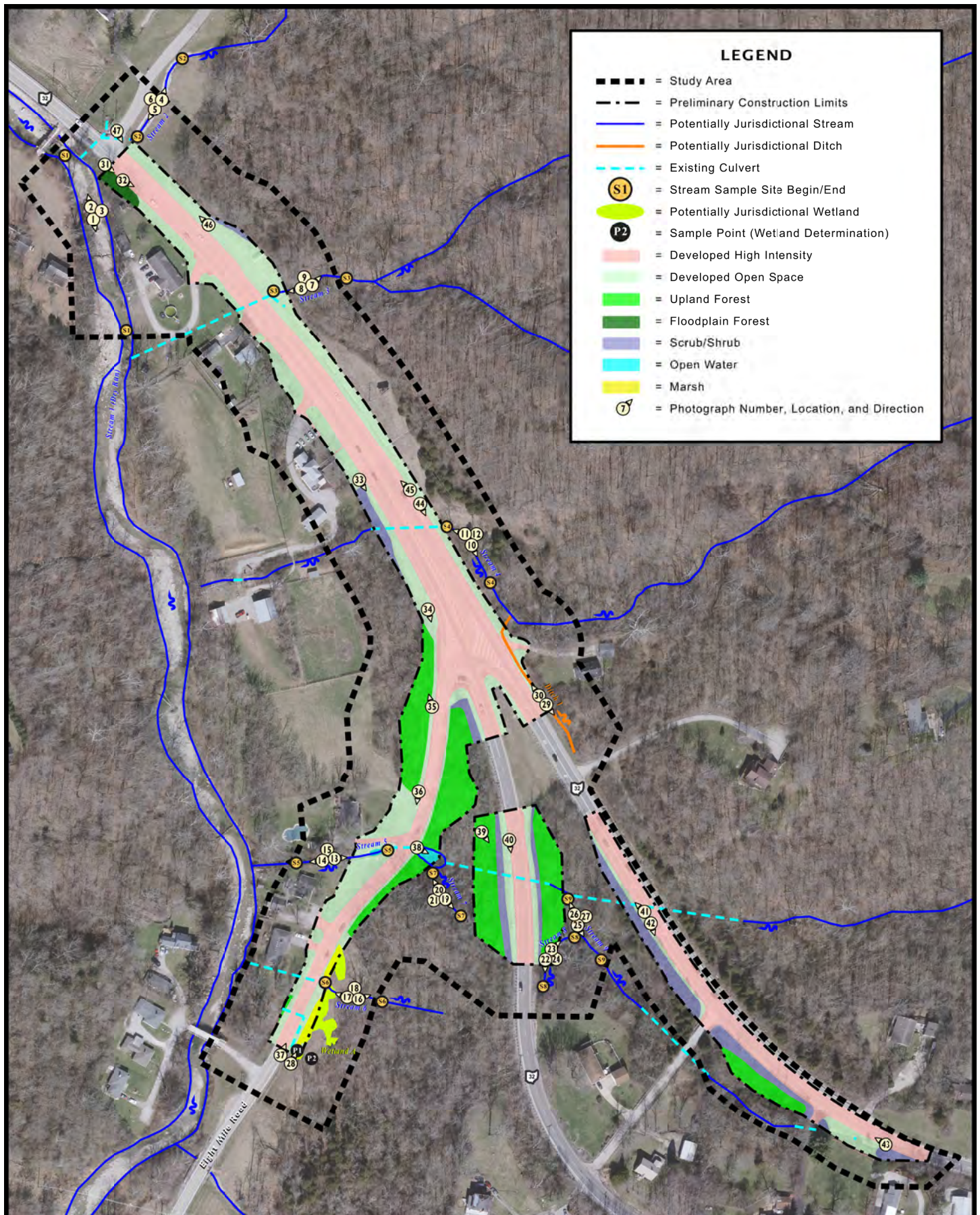


Level 1 Ecological Survey Report
Intersection Improvement, Hamilton County, Ohio
HAM-SR 32-6.82; PID 110991

Figure 2
Ecological Resources

Appendix 2

Photo Log



0 50 100 200 FEET
March 2020



Level 1 Ecological Survey Report

Intersection Improvement, Hamilton County, Ohio
HAM-SR 32-6.82; PID 110991

Appendix 2

Photograph
Location Map



Photo 1: Stream 1, Dry Run, facing upstream, south.



Photo 2: Stream 1, Dry Run, facing downstream, north.



Photo 3: Stream 1, Dry Run, typical substrates.



Photo 4: Stream 2, facing upstream, northeast.



Photo 5: Stream 2, facing downstream, southwest.



Photo 6: Stream 2, typical substrates.



Photo 7: Stream 3, facing upstream, northeast.



Photo 8: Stream 3, facing downstream, southwest.



Photo 9: Stream 3, typical substrates.



Photo 10: Stream 4, facing upstream, southeast.



Photo 11: Stream 4, facing downstream, west.



Photo 12: Stream 4, typical substrates.



Photo 13: Stream 5, facing upstream, east.



Photo 14: Stream 5, facing downstream, west.



Photo 15: Stream 5, typical substrates.



Photo 16: Stream 6, facing upstream, east.



Photo 17: Stream 6, facing downstream, west.



Photo 18: Stream 6, typical substrates.



Photo 19: Stream 7, facing upstream, southeast.



Photo 20: Stream 7, facing downstream, north.



Photo 21: Stream 7, typical substrates.



Photo 22: Stream 8, facing upstream, south.



Photo 23: Stream 8, facing downstream, northeast.



Photo 24: Stream 8, typical substrates.



Photo 25: Stream 9, facing upstream, southeast.



Photo 26: Stream 9, facing downstream, northwest.



Photo 27: Stream 9, typical substrates.



Photo 28: Wetland A, facing north.



Photo 29: Ditch 1, facing upstream, southeast.



Photo 30: Ditch 1, facing downstream, northwest.



Photo 31: Developed High Intensity (DH), Developed Open Space (DS), and Floodplain Forest (FF) vegetative communities, facing southeast.



Photo 32: Developed High Intensity (DH), Developed Open Space (DS), and Scrub/Shrub (SS) vegetative communities, facing southeast.



Photo 33: Developed High Intensity (DH), Developed Open Space (DS), and Scrub/Shrub (SS) vegetative communities, facing southeast.



Photo 34: Developed High Intensity (DH), Developed Open Space (DS), Scrub/Shrub (SS), and Upland Forest (UF) vegetative communities, facing southeast.



Photo 35: Developed High Intensity (DH) and Upland Forest (UF) vegetative communities, facing north.



Photo 36: Developed High Intensity (DH), Developed Open Space (DS), and Upland Forest (UF) vegetative communities, facing south.



Photo 37: Developed High Intensity (DH), Developed Open Space (DS), Upland Forest (UF), and Marsh (MA) vegetative communities, facing northeast.

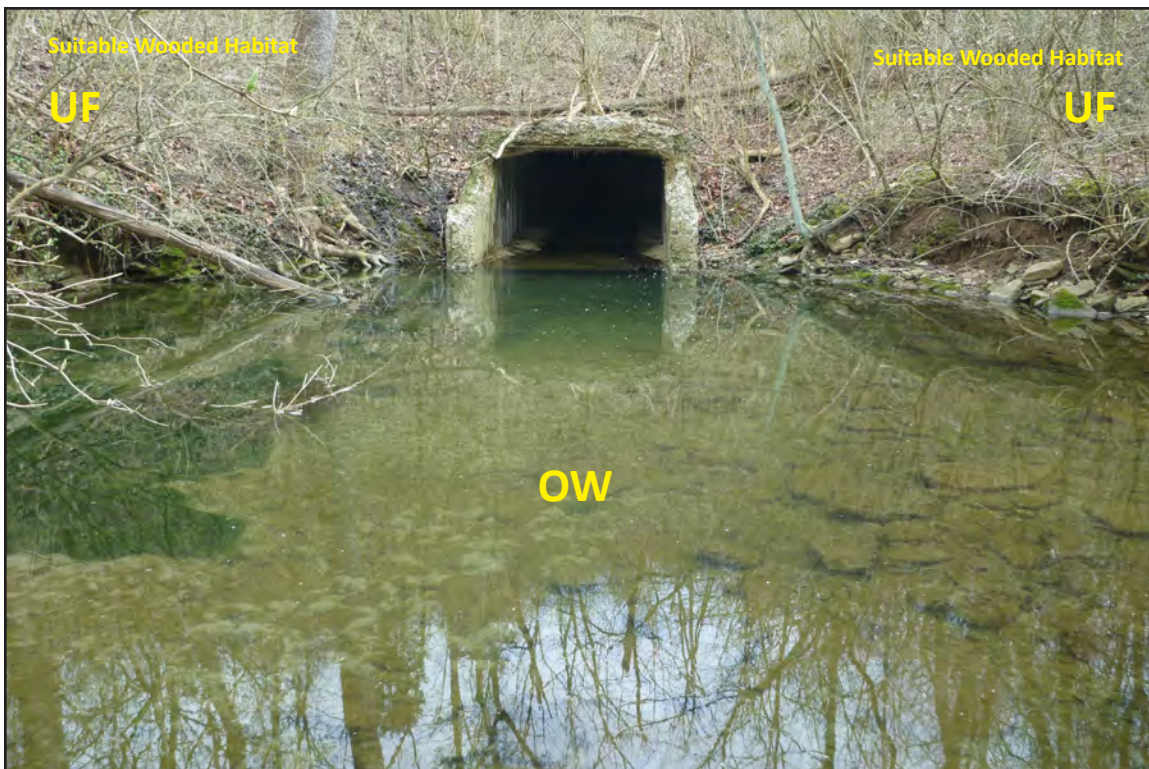


Photo 38: Open Water (OW) and Upland Forest (UF) vegetative communities, facing east.



Photo 39: Upland Forest (UF) vegetative community, facing southeast.



Photo 40: Developed High Intensity (DH), Developed Open Space (DS), Scrub/Shrub (SS), and Upland Forest (UF) vegetative communities, facing south.



Photo 41: Developed High Intensity (DH), Developed Open Space (DS), and Scrub/Shrub (SS) vegetative communities, facing northeast.



Photo 42: Developed High Intensity (DH), Developed Open Space (DS), and Scrub/Shrub (SS) vegetative communities, facing southeast.



Photo 43: Developed High Intensity (DH), Developed Open Space (DS), Scrub/Shrub (SS), and Upland Forest (UF) vegetative communities, facing west.



Photo 44: Developed High Intensity (DH), Developed Open Space (DS), and Upland Forest (UF) vegetative communities, facing south.



Photo 45: Developed High Intensity (DH) and Developed Open Space (DS) vegetative communities, facing northwest.



Photo 46: Developed Open Space (DS) and Scrub/Shrub (SS) vegetative communities, facing northwest.



Photo 47: Developed High Intensity (DH), Developed Open Space (DS), and Floodplain Forest (FF) vegetative communities, facing southeast.

Appendix 3

Plans

PLANS UNDER DEVELOPMENT

(see Figure 2 in Appendix 1
for study area and preliminary construction limits)

Appendix 4

Forms

Stream and Wetland Data Forms

Stream & Location: Stream 1 (Dry Run) - HAM-32-6.82, PID 110991

RM: 3.2 Date: 3 / 17 / 20

Scorers Full Name & Affiliation: Michael de Villiers, Rohini Vembar (Stantec)

River Code: - STORET #: Lat./ Long.: 39.119121 184.318757 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 17 Maximum 20
<input type="checkbox"/> BLDR /SLABS [10]	<input type="checkbox"/> present	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> present	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> HEAVY [-2]	<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> present	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> MODERATE [-1]	<input checked="" type="checkbox"/> NORMAL [0]	SILT EMBEDDEDNESS	
<input checked="" type="checkbox"/> COBBLE [8]	<input type="checkbox"/> present	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> present	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> FREE [1]	<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> present	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> EXTENSIVE [-2]	<input checked="" type="checkbox"/> MODERATE [-1]		
<input type="checkbox"/> SAND [6]	<input type="checkbox"/> present	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> present	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> NORMAL [0]	<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> present	<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> NONE [1]	<input type="checkbox"/> COAL FINES [-2]		
				(Score natural substrates; ignore)								

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

Comments

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

AMOUNT

Check ONE (Or 2 & average)

<input 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 checked="" type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input checked="" type="checkbox"/> SPARSE 5-<25% [3]
<input type="checkbox"/> ROOTMATS [1]			<input type="checkbox"/> NEARLY ABSENT <5% [1]

Comments

Cover
Maximum
20
12

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

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

Comments

Channel
Maximum
20
10

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

River right looking downstream

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY		CONSERVATION TILLAGE	
<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 checked="" 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 checked="" type="checkbox"/> NARROW 5-10m [2]	<input checked="" 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 checked="" type="checkbox"/> NONE [0]	<input type="checkbox"/> OPEN PASTURE, ROWCROP [0]					

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

Comments

Riparian
Maximum
10
4.25

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
9

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

Comments

Riffle /
Run
Maximum
8
66] GRADIENT (43.48 ft/mi) ☒ VERY LOW - LOW [2-4]
DRAINAGE AREA (4.24 mi²) ☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]%POOL: 20.00 %GLIDE: 20.00
%RUN: 15.00 %RIFFLE: 45.00Gradient
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

CLARITY

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

meters

CANOPY

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

CJ RECREATION

POOL: ☐ >100R2 ☒ >3ft

Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc. reference reach is representative, recreation is inferred, urban trash, gradient exceeds upper bound of "very high" category

temp: 7.46 degC; DO: 12.9 mg/L; pH:7.99; conductivity: 708 uS

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-SUCCESION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

EJ ISSUES

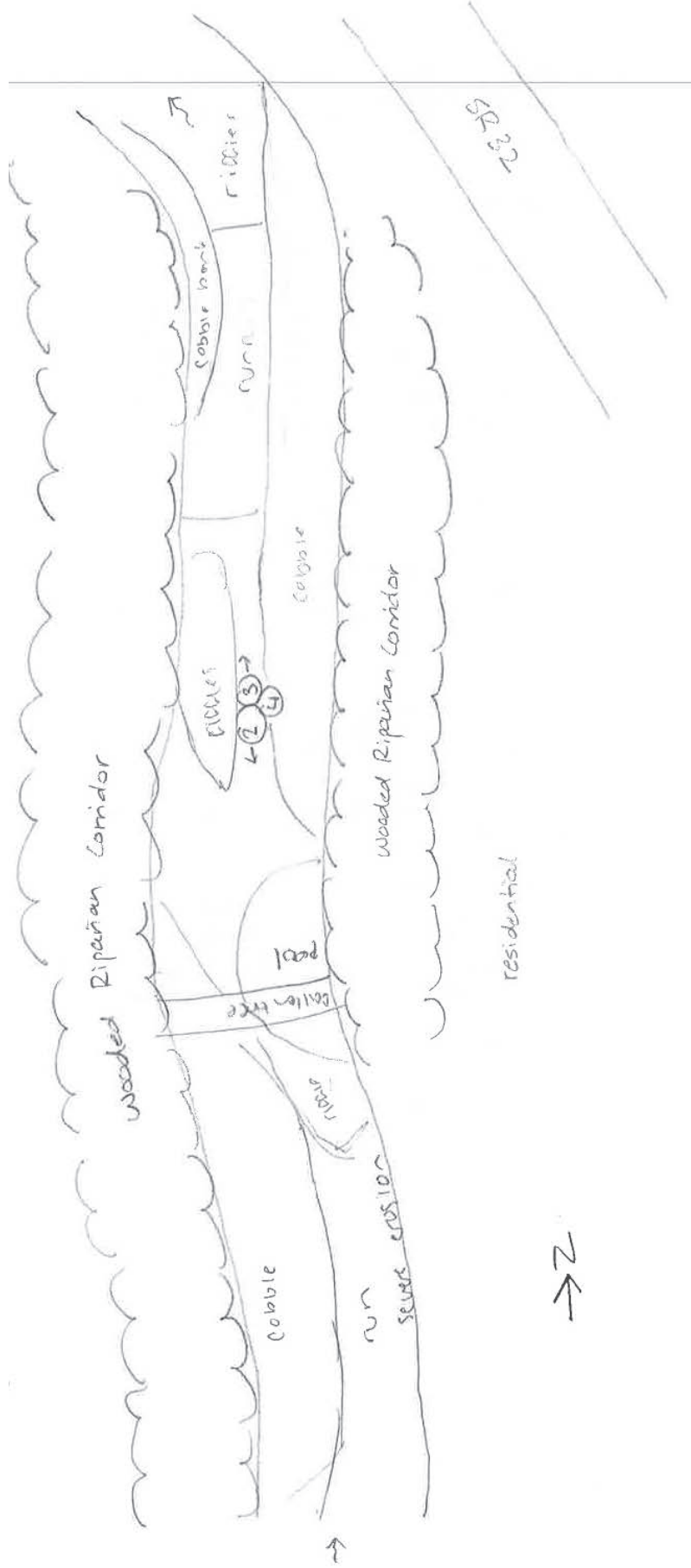
- WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN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

FJ MEASUREMENTS

- \bar{x} width 48 feet
 \bar{x} depth 1.0 feet
max. depth > 3.0 feet
 \bar{x} bankfull width
bankfull \bar{x} depth
W/D ratio
bankfull max. depth
floodprone \bar{x}^2 width
entrench. ratio

Legacy Tree:

Stream Drawing:





Primary Headwater Habitat Evaluation Form

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

53

SITE NAME/LOCATION **HAM-32-6.82, PID 110991**

SITE NUMBER **Stream 2**

RIVER BASIN **Little Miami River**

DRAINAGE AREA (mi²) **0.07**

LENGTH OF STREAM REACH (ft) **200**

LAT. **39.119641**

LONG. **-84.318274**

RIVER CODE RIVER MILE **0.02**

DATE **03/17/20**

SCORER **R. Vembar**

COMMENTS **channelization, artificial substrate**

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 type="checkbox"/> SILT [3 pt]	<input type="text" value="0%"/>
<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 checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="25%"/>	<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 checked="" type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="65%"/>

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: **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 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]

Pool Depth Max = 30

15

COMMENTS MAXIMUM POOL DEPTH (centimeters): **6**

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]	

Bankfull Width Max=30

20

COMMENTS AVERAGE BANKFULL WIDTH (meters): **2.10**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

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

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 type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

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

COMMENTS **stream flows parallel and adjacent to driveway**

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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.02
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **2**
County: **Hamilton** Township / City: **Anderson Township**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 84 upstream, 85 downstream, 86 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: **N/A**
Field Measures: Temp (°C) **10.10** Dissolved Oxygen (mg/l) **11.90** pH (S.U.) **8.16** Conductivity (µmhos/cm) **548**
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





Primary Headwater Habitat Evaluation Form

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

69

SITE NAME/LOCATION **HAM-32-6.82, PID 110991**

SITE NUMBER **Stream 3**

RIVER BASIN **Little Miami River**

DRAINAGE AREA (mi²) **0.05**

LENGTH OF STREAM REACH (ft) **200**

LAT. **39.118705**

LONG. **-84.317172**

RIVER CODE

RIVER MILE **0.05**

DATE **03/17/20**

SCORER **R. Vembar**

COMMENTS

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

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL

☒ RECOVERED

☐ RECOVERING

☐ RECENT OR NO RECOVERY

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> SILT [3 pt]	<input type="text" value="10%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="10%"/>	<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 checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="40%"/>	<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 checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **50.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **18**

TOTAL NUMBER OF SUBSTRATE TYPES: **6**

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

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]	

Bankfull Width Max=30

20

COMMENTS **AVERAGE BANKFULL WIDTH (meters): 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

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

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 **no riparian zone for 40% of sampled reach**

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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.05
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **1**
County: **Hamilton** Township / City: **Anderson Township**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 78 upstream, 79 downstream, 80 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **40%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **10.39** Dissolved Oxygen (mg/l) **11.80** pH (S.U.) **7.85** Conductivity (µmhos/cm) **650**
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

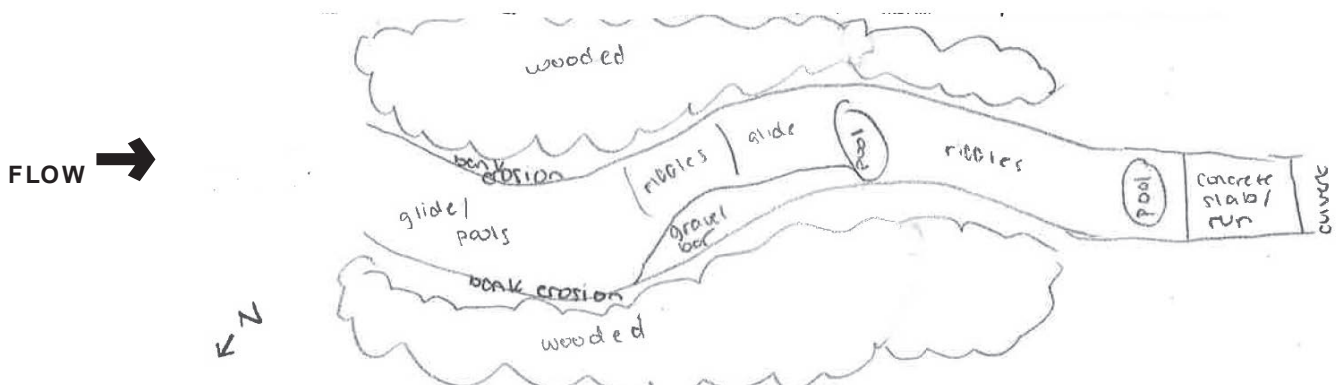
Additional comments/description of pollution impacts:

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





Primary Headwater Habitat Evaluation Form

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

59

SITE NAME/LOCATION **HAM-32-6.82, PID 110991**SITE NUMBER **Stream 4**RIVER BASIN **Little Miami River**DRAINAGE AREA (mi²) **0.07**LENGTH OF STREAM REACH (ft) **200** LAT. **39.117408** LONG. **-84.316101** RIVER CODE RIVER MILE **0.10**DATE **03/17/20** SCORER **R. Vembar** COMMENTS **previously culverted upstream, culvert blown out**

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="60%"/>
<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 checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="25%"/>	<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="10%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="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 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 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]

Pool Depth Max = 30

20

COMMENTS MAXIMUM POOL DEPTH (centimeters): **39**

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]	

Bankfull Width Max=30

20

COMMENTS AVERAGE BANKFULL WIDTH (meters): **1.60**

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 **left descending bank of sampled reach adjacent and parallel to SR-32**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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.10
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **2**
County: **Hamilton** Township / City: **Anderson Township**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 70 upstream, 71 downstream, 72 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **20%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **9.13** Dissolved Oxygen (mg/l) **11.36** pH (S.U.) **7.94** Conductivity (µmhos/cm) **716**
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

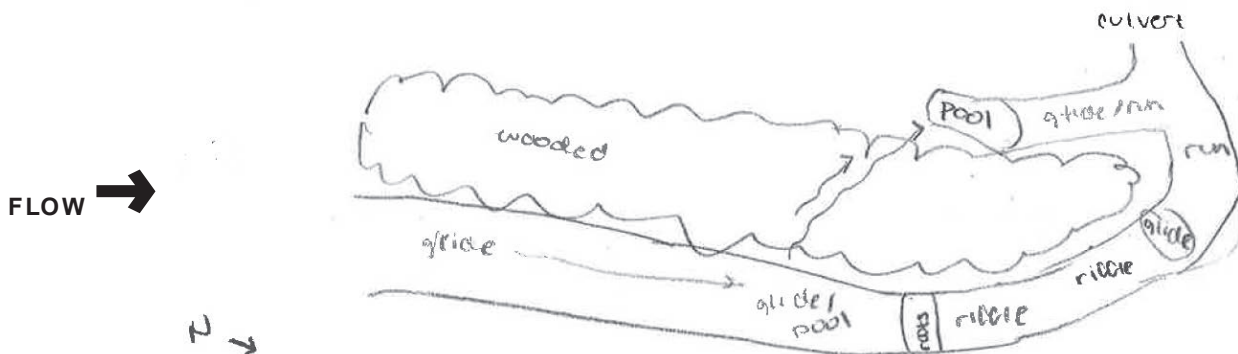
Additional comments/description of pollution impacts:

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





Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **HAM-32-6.82, PID 110991**SITE NUMBER **Stream 5**RIVER BASIN **Little Miami River**DRAINAGE AREA (mi²) **0.11**LENGTH OF STREAM REACH (ft) **200** LAT. **39.115692** LONG. **-84.316998** RIVER CODE RIVER MILE **0.04**DATE **03/17/20** SCORER **R. Vembar** COMMENTS **heavy siltation, channelization**

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 type="checkbox"/> SILT [3 pt]	<input type="text" value="30%"/>
<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="10%"/>
<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="10%"/>	<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="30%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="5%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="15%"/>

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

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **6**

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 checked="" 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]

Pool Depth Max = 30

30COMMENTS MAXIMUM POOL DEPTH (centimeters): **23**

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]	

Bankfull Width Max=30

20COMMENTS AVERAGE BANKFULL WIDTH (meters): **2.60**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

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

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

COMMENTS **No riparian width at upstream end of reach**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

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

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

STREAM GRADIENT ESTIMATE

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

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

<input checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.04
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **2**
County: **Hamilton** Township / City: **Anderson Township**

MISCELLANEOUS

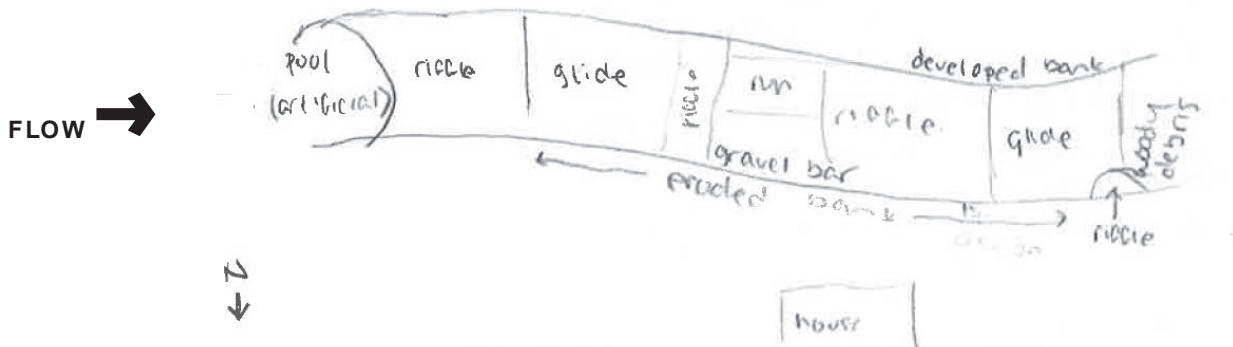
Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 19 upstream, 20 downstream, 21 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **30%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **7.73** Dissolved Oxygen (mg/l) **13.30** pH (S.U.) **8.30** Conductivity (µmhos/cm) **1,211**
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain:

Additional comments/description of pollution impacts: **Lots of urban trash; heavy siltation****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





Primary Headwater Habitat Evaluation Form

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

65

SITE NAME/LOCATION **HAM-32-6-82, PID 110991**SITE NUMBER **Stream 6**RIVER BASIN **Little Miami River**DRAINAGE AREA (mi²) **0.09**LENGTH OF STREAM REACH (ft) **200** LAT. **39.114947** LONG. **-84.316778** RIVER CODE RIVER MILE **0.03**DATE **03/17/20** SCORER **R. Vembar** COMMENTS

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

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

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input 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 checked="" 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 checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 50%	<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"/> 20%	<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 **50.00%**

(A)

Substrate Percentage
Check **100%**

(B)

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

Pool Depth
Max = 30

25

COMMENTS MAXIMUM POOL DEPTH (centimeters): **11**

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

15

COMMENTS AVERAGE BANKFULL WIDTH (meters): **1.20**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input 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 **no riparian zone for 50% of sampled reach**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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.03
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **1**
County: **Hamilton** Township / City: **Anderson Township****MISCELLANEOUS**Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 37 upstream, 38 downstream, 39 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **50%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **8.93** Dissolved Oxygen (mg/l) **11.56** pH (S.U.) **7.98** Conductivity (µmhos/cm) **1,875**
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





Primary Headwater Habitat Evaluation Form

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

20

SITE NAME/LOCATION **HAM-32-6.82**

SITE NUMBER **Stream 7**

RIVER BASIN **Little Miami River**

DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **200**

LAT. **39.115539**

LONG. **-84.316240**

RIVER CODE

RIVER MILE **0**

DATE **03/17/20**

SCORER **R. Vembar**

COMMENTS **Heavy siltation**

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="30%"/>
<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="50%"/>
<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="10%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="10%"/>
<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 **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

Pool Depth Max = 30

5

Bankfull Width Max=30

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 **MAXIMUM POOL DEPTH (centimeters): 4**

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 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 (meters): 0.97**

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 type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input 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

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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.07
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **1**
County: **Hamilton** Township / City: **Anderson Township**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 43 upstream, 44 downstream, 45 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **30%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **9.40** Dissolved Oxygen (mg/l) **11.70** pH (S.U.) **8.06** Conductivity (µmhos/cm) **1,945**
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





Primary Headwater Habitat Evaluation Form

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

34

SITE NAME/LOCATION **HAM-32-6.82, PID 110991**SITE NUMBER **Stream 8**RIVER BASIN **Little Miami River**DRAINAGE AREA (mi²) **0.01**LENGTH OF STREAM REACH (ft) **200** LAT. **39.115221** LONG. **-84.315462** RIVER CODE RIVER MILE **0**DATE **03/17/20** SCORER **R. Vembar** COMMENTS **Erosion and scour**

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 type="checkbox"/> SILT [3 pt]	<input type="text" value="10%"/>
<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="50%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<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="30%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="10%"/>
<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 **30.00%**

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

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

COMMENTS AVERAGE BANKFULL WIDTH (meters): **1.09**Bankfull
Width
Max=30**15**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input checked="" 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 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

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

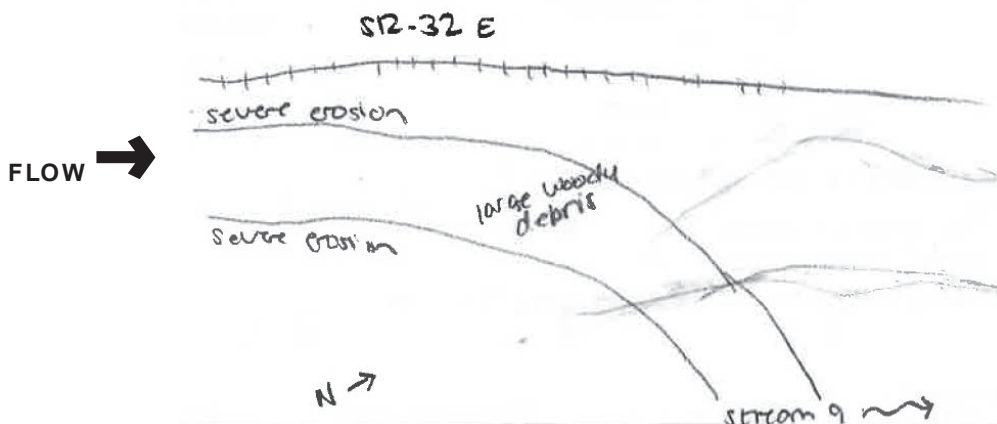
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☒ Moderate to Severe ☐ Severe (10 ft/100 ft)

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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.14
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **1**
County: **Hamilton** Township / City: **Anderson Township****MISCELLANEOUS**Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 51 upstream, 52 downstream, 53 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **30%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **Dry** Dissolved Oxygen (mg/l) **Dry** pH (S.U.) **Dry** Conductivity (µmhos/cm) **Dry**
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





Primary Headwater Habitat Evaluation Form

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

56

SITE NAME/LOCATION **HAM-32-6.82**

SITE NUMBER **Stream 9**

RIVER BASIN **Little Miami River**

DRAINAGE AREA (mi²) **0.01**

LENGTH OF STREAM REACH (ft) **200**

LAT. **39.115364**

LONG. **-84.315271**

RIVER CODE

RIVER MILE **0**

DATE **03/17/20**

SCORER **R. Vembar**

COMMENTS **Heavy siltation**

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 type="checkbox"/> SILT [3 pt]	<input type="text" value="30%"/>
<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="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="20%"/>	<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="30%"/>	<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 **20.00%**

(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

Pool Depth Max = 30

25

Bankfull Width Max=30

15

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

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [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 (centimeters): **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 checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS AVERAGE BANKFULL WIDTH (meters): **1.10**

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 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

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 checked="" type="checkbox"/> WWH Name: Dry Run	Distance from Evaluated Stream	0.12
<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: **Withamsville** NRCS Soil Map Page: **48** NRCS Soil Map Stream Order **1**
County: **Hamilton** Township / City: **Anderson Township**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **03/15/20** Quantity: **0.01**
Photograph Information: **Field photos: 54 upstream, 55 downstream, 56 substrate**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **50%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: **N/A**
Field Measures: Temp (°C) **8.74** Dissolved Oxygen (mg/l) **9.02** pH (S.U.) **7.80** Conductivity (µmhos/cm) **940**
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



Project/Site: HAM-32-6.82, PID 110991	Stantec Project #: 173620118	Date: 03/17/20
Applicant: Ohio Department of Transportation		County: Hamilton
Investigator #1: Michael de Villiers	Investigator #2: Rohini Vembar	State: Ohio
Soil Unit: Urban land-Haplic Udarents-Genesee complex, occasionally flooded	NWI/WWI Classification: N/A	Wetland ID: Wetland A
Landform: Toeslope	Local Relief: Linear	Sample Point: P1
Slope (%): 1%	Latitude: 39.114657 Longitude: -84.317178 Datum: NAD83	Community ID: Emergent
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) <input type="checkbox"/> Yes <input type="checkbox"/> No		Section: Virginia Military Reserve
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Township: Anderson
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		Range: N/A Dir: --

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: Stream 6 flows through Wetland A, field photos: 29 North, 30 East, 31 South, 32 West

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present) : <input type="checkbox"/>		Secondary:
Primary: <ul style="list-style-type: none"> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery 	<ul style="list-style-type: none"> <input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B14 - True Aquatic Plants <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks) 	<ul style="list-style-type: none"> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input type="checkbox"/> D5 - FAC-Neutral Test

Field Observations:	Wetland Hydrology Present? <input type="checkbox"/> Yes <input type="checkbox"/> No
Surface Water Present? <input type="checkbox"/> Yes <input type="checkbox"/> No Depth: -- (in.) Water Table Present? <input type="checkbox"/> Yes <input type="checkbox"/> No Depth: 16 (in.) Saturation Present? <input type="checkbox"/> Yes <input type="checkbox"/> No Depth: 0 (in.)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks: water at 16"

SOILS

Map Unit Name: Urban land-Haplic Udarents-Genesee complex, occasionally flooded	Series Drainage Class: well drained
Taxonomy (Subgroup):	

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Mottles			Type	Location	Texture (e.g. clay, sand, loam)
			Color (Moist)		%	Color (Moist)		%			
0	2	--	10YR	4/2	98	10YR	3/6	2	C	PL	silt loam
2	10	--	10GY	5/1	90	10YR	3/6	10	C	PL	silty clay
10	16	--	10Y	5/1	90	10YR	3/6	10	C	M	silty clay
--	--	--	--	--	--	--	--	--	--	--	--
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NRCS Hydric Soil Field Indicators (check here if indicators are not present) : <input type="checkbox"/>		Indicators for Problematic Soils ¹
<input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A10 - 2 cm Muck (LRR N) <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Muck Mineral (LRR N, MLRA 147, 148) <input type="checkbox"/> S4 - Sandy Gleyed Matrix	<input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface <input type="checkbox"/> S8 - Polyvalue Below Dark Surface (MLRA 147, 148) <input type="checkbox"/> S9 - Thin Dark Surface (MLRA 147, 148) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<input type="checkbox"/> F12 - Iron-Manganese Masses (LRR N, <input type="checkbox"/> <input type="checkbox"/> F13 - Umbric Surface (MLRA 122, 136) <input type="checkbox"/> <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA <input type="checkbox"/> <input type="checkbox"/> F21 - Red Parent Material (MLRA 127, 147) <input type="checkbox"/> <input type="checkbox"/> A10 - 2cm Muck (MLRA 147) <input type="checkbox"/> A16 - Coast Prairie Redox (MLRA 147, 148) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 136, 147) <input type="checkbox"/> TF12 - Very Shallow Dark Surface Other (Explain in Remarks)

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: None Depth:	Hydric Soil Present? <input type="checkbox"/> Yes <input type="checkbox"/> No
--	--

Remarks: soil saturated throughout

Project/Site: **HAM-32-6.82, PID 110991**

Wetland ID: **Wetland A** Sample Point **P1**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 30 ft radius)

	Species Name	% Cover	Dominant	Ind. Status
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		0		

Sapling/Shrub Stratum (Plot size: 15 ft radius)

1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		0		

Herb Stratum (Plot size: 5 ft radius)

1.	<i>Typha angustifolia</i>	40	Y	OBL
2.	<i>Cyperus strigosus</i>	30	Y	FACW
3.	<i>Juncus effusus</i>	30	Y	FACW
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		100		

Woody Vine Stratum (Plot size: 30 ft radius)

1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		

Remarks: *Typha angustifolia* is invasive and naturally problematic

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet

Total % Cover of:	Multiply by:
OBL spp. <u>40</u>	x 1 = <u>40</u>
FACW spp. <u>60</u>	x 2 = <u>120</u>
FAC spp. <u>0</u>	x 3 = <u>0</u>
FACU spp. <u>0</u>	x 4 = <u>0</u>
UPL spp. <u>0</u>	x 5 = <u>0</u>
Total <u>100</u> (A)	<u>160</u> (B)
Prevalence Index = B/A = <u>1.600</u>	

Hydrophytic Vegetation Indicators:

Yes ☒ No ☐ Rapid Test for Hydrophytic Vegetation
Yes ☒ No ☐ Dominance Test is > 50%
Yes ☒ No ☐ Prevalence Index is ≤ 3.0 *
Yes ☐ No ☐ Morphological Adaptations (Explain) *
Yes ☐ No ☐ Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☒ Yes ☐ No

Additional Remarks:

Project/Site: HAM-32-6.82, PID 110991		Stantec Project #: 173620118		Date: 03/17/20
Applicant: Ohio Department of Transportation		Investigator #1: Michael de Villiers		County: Hamilton
Investigator #2: Rohini Vembar		Investigator #2: Rohini Vembar		State: Ohio
Soil Unit: Urban land-Haplic Udarents-Genesee complex, occasionally flooded	NW1/WW1 Classification: N/A		Wetland ID: Wetland A	
Landform: Toeslope	Local Relief: Convex		Sample Point: P2	
Slope (%): 2%	Latitude: 39.114615	Longitude: -84.317079	Community ID: Upland	
Datum: NAD83			Section: Virginia Military Reserve	
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) <input type="checkbox"/> Yes <input type="checkbox"/> No				Township: Anderson
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?		Are normal circumstances present? <input type="checkbox"/> Yes <input type="checkbox"/> No		Range: N/A Dir: --
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?				

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input type="checkbox"/> Yes <input type="checkbox"/> No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present) : ☐

Primary:

- ☐ A1 - Surface Water
- ☐ A2 - High Water Table
- ☐ A3 - Saturation
- ☐ B1 - Water Marks
- ☐ B2 - Sediment Deposits
- ☐ B3 - Drift Deposits
- ☐ B4 - Algal Mat or Crust
- ☐ B5 - Iron Deposits
- ☐ B7 - Inundation Visible on Aerial Imagery

- ☐ B9 - Water-Stained Leaves
- ☐ B13 - Aquatic Fauna
- ☐ B14 - True Aquatic Plants
- ☐ C1 - Hydrogen Sulfide Odor
- ☐ C3 - Oxidized Rhizospheres on Living Roots
- ☐ C4 - Presence of Reduced Iron
- ☐ C6 - Recent Iron Reduction in Tilled Soils
- ☐ C7 - Thin Muck Surface
- ☐ Other (Explain in Remarks)

Secondary:

- ☐ B6 - Surface Soil Cracks
- ☐ B8 - Sparsely Vegetated Concave Surface
- ☐ B10 - Drainage Patterns
- ☐ B16 - Moss Trim Lines
- ☐ C2 - Dry Season Water Table
- ☐ C8 - Crayfish Burrows
- ☐ C9 - Saturation Visible on Aerial Imagery
- ☐ D1 - Stunted or Stressed Plants
- ☐ D2 - Geomorphic Position
- ☐ D3 - Shallow Aquitard
- ☐ D4 - Microtopographic Relief
- ☐ D5 - FAC-Neutral Test

Field Observations:

Surface Water Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Depth: -- (in.)
Water Table Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Depth: -- (in.)
Saturation Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	Depth: -- (in.)

Wetland Hydrology Present? ☐ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

SOILS

Map Unit Name: **Urban land-Haplic Udarents-Genesee complex, occasionally flooded** Series Drainage Class: **well drained**

Taxonomy (Subgroup):

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Mottles				Texture	
			Color (Moist)	%		Color (Moist)	%	Type	Location	(e.g. clay, sand, loam)	
0	4	--	5Y	4/1	98	5Y	3/6	2	C	M	silty clay
--	--	--	--	--	--	--	--	--	--	--	--
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NRCS Hydric Soil Field Indicators (check here if indicators are not present) : ☐

- ☐ A1 - Histosol
- ☐ A2 - Histic Epipedon
- ☐ A3 - Black Histic
- ☐ A4 - Hydrogen Sulfide
- ☐ A5 - Stratified Layers
- ☐ A10 - 2 cm Muck (LRR N)
- ☐ A11 - Depleted Below Dark Surface
- ☐ A12 - Thick Dark Surface
- ☐ S1 - Sandy Muck Mineral (LRR N, MLRA 147, 148)
- ☐ S4 - Sandy Gleyed Matrix
- ☐ S5 - Sandy Redox
- ☐ S6 - Stripped Matrix
- ☐ S7 - Dark Surface
- ☐ S8 - Polyvalue Below Dark Surface (MLRA 147, 148)
- ☐ S9 - Thin Dark Surface (MLRA 147, 148)
- ☐ F2 - Loamy Gleyed Matrix
- ☐ F3 - Depleted Matrix
- ☐ F6 - Redox Dark Surface
- ☐ F7 - Depleted Dark Surface
- ☐ F8 - Redox Depressions

Indicators for Problematic Soils ¹

- ☐ F12 - Iron-Manganese Masses (LRR N, ☐
- ☐ F13 - Umbric Surface (MLRA 122, 136) ☐
- ☐ F19 - Piedmont Floodplain Soils (MLRA ☐
- ☐ F21 - Red Parent Material (MLRA 127, 147) ☐
- ☐ A10 - 2cm Muck (MLRA 147)
- ☐ A16 - Coast Prairie Redox (MLRA 147, 148)
- ☐ F19 - Piedmont Floodplain Soils (MLRA 136, 147)
- ☐ TF12 - Very Shallow Dark Surface
- ☐ Other (Explain in Remarks)

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: rock Depth: 4"	Hydric Soil Present? <input type="checkbox"/> Yes <input type="checkbox"/> No
--	--

Remarks: **mixed fill in top 4"**

Project/Site: **HAM-32-6.82, PID 110991**

Wetland ID: **Wetland A** Sample Point **P2**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 30 ft radius)

	Species Name	% Cover	Dominant	Ind. Status
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		0		

Sapling/Shrub Stratum (Plot size: 15 ft radius)

1.	<i>Platanus occidentalis</i>	5	N	FACW
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		5		

Herb Stratum (Plot size: 5 ft radius)

1.	<i>Platanus occidentalis</i>	5	N	FACW
2.	<i>Trifolium repens</i>	10	N	FACU
3.	<i>Setaria parviflora</i>	10	N	FAC
4.	<i>Setaria faberi</i>	10	N	UPL
5.	<i>Juniperus virginiana</i>	2	N	FACU
6.	<i>Bignonia capreolata</i>	5	N	FAC
7.	<i>Lolium perenne</i>	2	N	FACU
8.	<i>Rosa multiflora</i>	5	N	FACU
9.	<i>Festuca arundinacea</i>	50	Y	FACU
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		99		

Woody Vine Stratum (Plot size: 30 ft radius)

1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		

Remarks:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet

Total % Cover of:	Multiply by:
OBL spp. <u>0</u>	x 1 = <u>0</u>
FACW spp. <u>10</u>	x 2 = <u>20</u>
FAC spp. <u>15</u>	x 3 = <u>45</u>
FACU spp. <u>69</u>	x 4 = <u>276</u>
UPL spp. <u>10</u>	x 5 = <u>50</u>
Total <u>104</u> (A)	<u>391</u> (B)
Prevalence Index = B/A = <u>3.760</u>	

Hydrophytic Vegetation Indicators:

Yes ☐ No ☒ Rapid Test for Hydrophytic Vegetation
 Yes ☐ No ☒ Dominance Test is > 50%
 Yes ☐ No ☒ Prevalence Index is ≤ 3.0 *
 Yes ☐ No ☐ Morphological Adaptations (Explain) *
 Yes ☐ No ☐ Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

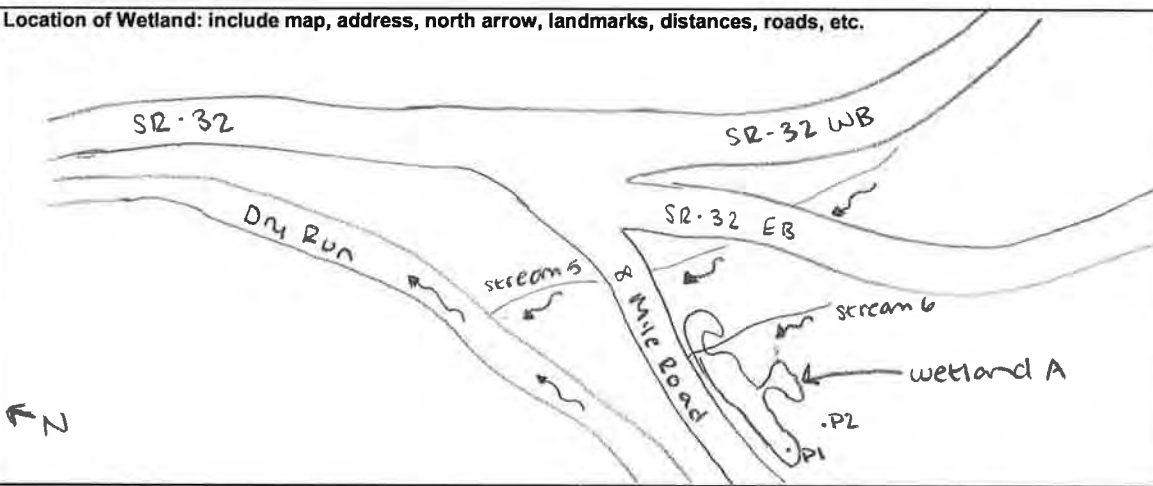
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☐ Yes ☒ No

Additional Remarks:

Background Information

Name: Rohini Vembar	
Date: 3/17/2020	
Affiliation: Skantec Consulting Services, Inc	
Address: 11687 Lebanon Rd, Cincinnati, OH 45241	
Phone Number: (513) 619-6460	
e-mail address: Rohini.Vembar@skantec.com	
Name of Wetland: 8 Mile Green Tee - Wetland A	
Vegetation Community(ies): PEM	
HGM Class(es): Slope	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
	
Lat/Long or UTM Coordinate	39.114986, -84.317031
USGS Quad Name	Withamsville
County	Hamilton
Township	Anderson
Section and Subsection	N/A
Hydrologic Unit Code	050902021405 - Dry Run-Little Miami River
Site Visit	3/17/2020
National Wetland Inventory Map	N/A
Ohio Wetland Inventory Map	N/A
Soil Survey	Urban land-Haplic Udorants-Genesee Complex, 0-2%, occasionally flooded UHGXAD
Delineation report/map	Level I Ecological Survey Report

Name of Wetland: Wetland A	
Wetland Size (acres, hectares): 0.14 acres	
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.	
<p>The sketch depicts a wetland area labeled 'Wetland A' situated between a stream and a road. The stream flows vertically, with a culvert crossing it under the '8 Mile Road'. The wetland area contains several points labeled 'P1', 'P2', and 'DEM'. A 'well / unknown structure' is also indicated near P2. The surrounding areas are labeled 'forested'.</p>	
Comments, Narrative Discussion, Justification of Category Changes:	
Final score : 23	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	X	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	<input checked="" type="radio"/> NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	<input checked="" type="radio"/> NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	<input checked="" type="radio"/> NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	<input checked="" type="radio"/> NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	<input checked="" type="radio"/> NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	<input checked="" type="radio"/> NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	<input checked="" type="radio"/> NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	<input checked="" type="radio"/> NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland A	Rater(s): R. Vemper, M. deVilliers	Date: 3/17/20
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1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

7	8
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☒ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

10	18
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3)
- ☐ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- ☐ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input

- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☒ other well/structure

4	22
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants

- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ sedimentation
- ☐ dredging
- ☐ farming
- ☐ nutrient enrichment

22
subtotal this page

Site: <u>Wetland A</u>	Rater(s): <u>R. Vembar, M. DeVilliers</u>	Date: <u>3/17/20</u>
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22

subtotal first page

0	22
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max 10 pts.

subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

1	23
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max 20 pts.

subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale

- ☐ Aquatic bed
- ☒ Emergent
- ☒ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other

6b. horizontal (plan view) Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☒ Coarse woody debris >15cm (6in)
- ☒ Standing dead >25cm (10in) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

23

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 1.
	Question 6. Bogs	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 7. Fens	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3
Question 11. Relict Wet Prairies	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	10	
	Metric 4. Habitat	4	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersed, microtopography	1	
	TOTAL SCORE	23	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	<u>NO</u>	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	<u>NO</u>	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	<u>NO</u>	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	<u>YES</u> Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	<u>NO</u>	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	<u>NO</u> Wetland is assigned to category as determined by the ORAM	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Choose one Category 1 Final Category Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

NHDB Review



Ohio Department of Natural Resources

MIKE DeWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Jeff Johnson, Chief
Division of Natural Areas & Preserves
2045 Morse Rd, Building A
Columbus, Ohio 43229

10 March 2020

Michael de Villiers
Stantec Consulting Services, Inc.
11687 Lebanon Rd.
Cincinnati, OH 45241

Dear Mr. de Villiers,

After reviewing the Natural Heritage Database, I find we have no records of rare or endangered species in the HAM-SR32-6.82 (PID 110991) project area, including a half mile radius for plants and a one mile radius for all other features, in Anderson Township, Hamilton County, Ohio. We are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state nature preserves, parks, wildlife areas or forests, national wildlife refuges, parks or forests or other protected natural areas within a one-mile radius of the project area.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. This letter only represents a review of rare species and natural features data within the Ohio Natural Heritage Database. It does not fulfill coordination under the National Environmental Policy Act (NEPA) or the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S. C. 661 et seq.) and does not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

A handwritten signature in blue ink that reads "Debbie Woischke".

Debbie Woischke
Ohio Natural Heritage Program

USFWS Information Request

de Villiers, Michael

From: Korfel, Lindsey M <lindsey_korfel@fws.gov>
Sent: Monday, March 09, 2020 12:51 PM
To: de Villiers, Michael; Hallberg, Karen I
Subject: Re: Bat buffer request for ODOT project HAM-SR 32-6.82 (PID 110991)

Hi Michael,

Please see my response below. Have a wonderful day!

Best regards,

Please note my new phone extension is "129"

Lindsey Korfel

Wildlife Biologist
Transportation Liaison
U.S. Fish and Wildlife Service
Ohio Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230
614.416.8993 ext. **129**

From: de Villiers, Michael <Michael.deVilliers@stantec.com>
Sent: Monday, March 9, 2020 12:18 PM
To: Hallberg, Karen I <Karen_Hallberg@fws.gov>; Korfel, Lindsey M <lindsey_korfel@fws.gov>
Subject: [EXTERNAL] Bat buffer request for ODOT project HAM-SR 32-6.82 (PID 110991)

Karen/Lindsey,

This project is a federal aid highway project, and will be coordinated with your office (if coordination is required) through the ODOT-OES Ecological MOA process and PBO. This is a request for bat buffer information only, and a technical guidance letter is not required.

Project coordinates:

Northwest Terminus	Southeast Terminus
Lat: 39.119521	Lat: 39.114135
Long: -84.318868	Long: -84.312696

The project is located within the following bat buffer:

- ___ BLUE (IBAT hibernaculum)
- ___ PURPLE (NLEB hibernaculum)
- ___ RED (IBAT swarming location)
- ___ YELLOW (Acoustic IBAT detection)
- ___ GOLD (IBAT maternity colony)

___ BROWN (NLEB maternity roost)
___ GREEN (Male/Non-repro female IBAT)
x Project is not located within a bat buffer

Respectfully,

- Michael

Michael de Villiers

Senior Environmental Specialist

Direct: 513 619-6463

Fax: 513 761-1728

Michael.deVilliers@stantec.com

Stantec

11687 Lebanon Road

Cincinnati OH 45241-2012



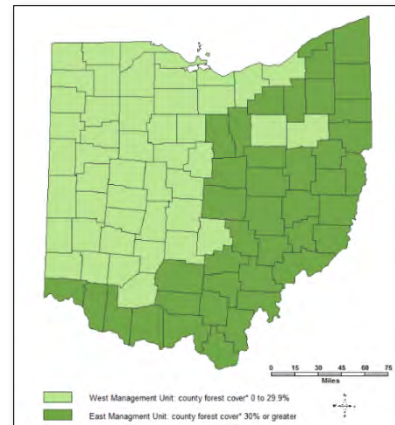
The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Bat Habitat Worksheet

Indiana Bat and Northern Long-eared Bat Field Habitat Assessment Checklist

PROJECT INFORMATION			
CRS:	HAM-SR 32-6.82	PID:	110991
Date:	3/17/2020		

MANAGEMENT UNIT	
Eastern MU	<input type="checkbox"/>
Western MU	<input checked="" type="checkbox"/>



BAT RECORD SEARCH		
Is project in a known bat buffer?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Record type(s) (color)?		
Additional Info including date of records request: A bat buffer request for ODOT project HAM-SR 32-6.82 (PID 110991) was completed on 03/10/2020. The project is not located within a bat buffer.		

BRIDGE HABITAT ASSESSMENT		
Will Project Impact a Bridge over a stream?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Bridge Inspection Conducted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Results of Inspection including date:		

SUITABLE WOODED HABITAT ASSESSMENT		
Will Project Impact Suitable Wooded Habitat (SWH)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Is all SWH to be impacted within 100 feet of the edge of pavement (EOP)? If yes, just fill out Line 1 (and Line 1a, if impacts ≤ 0.10 ac). If no, fill out Lines 1, 2, 3 and 4.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Line 1. Acreage of SWH within 100 feet of EOP	1.38 acres	
Line 1a. For SWH impacts ≤ 0.10 ac within 100 feet of EOP, do any of the trees contain roosting habitat?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Line 2. Acreage of impacted SWH within 50 feet of a perennial stream but outside 100 feet of EOP.	0 acre	
Line 3. Acreage of impacted SWH between 100 feet and 300 feet of the EOP, and not located within 50 feet of a perennial stream.	0 acre	
Line 4. Acreage of impacted SWH further than 300 feet of EOP	0 acre	
Line 5. Number of impacted PMRTs further than 100 feet of the EOP. Fill out PMRT table if PMRTs will be impacted.	0	

ATTACHMENT F
Build Alternative Cost Estimate

Estimate 8MileGreenTee

Estimated Cost:\$2,164,758.40

Contingency: 9.75%

Estimated Total: \$2,375,822.34

HAM-32-6.82

Base Date: 02/15/20

Spec Year: 19

Unit System: E

Work Type: ASPHALT

Highway Type: 448

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: HAMILTON

Latitude of Midpoint: 390612

Longitude of Midpoint: 841747

District: 08

Federal/State Project Number: 110991

Estimate Type: C1 for Stage 1 Submission

Prepared by Stantec on 04/17/20

Checked by Paul Durham on 04/19/20

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Group 0003: Excavation - Soil

0003	203E10000	6,459.000	CY	\$15.96262	\$103,102.56
EXCAVATION					

Total for Group 0003:\$103,102.56

Group 0005: Fill - Embankment

0005	203E20000	12,500.000	CY	\$10.77575	\$134,696.88
EMBANKMENT					

Total for Group 0005:\$134,696.88

Group 0010: Subgrade Treatment - Cement

0010	A-MC-RDWY	4,423.000	SY	\$3.00000	\$13,269.00
MAJOR COST DRIVERS, ROADWAY					

Total for Group 0010:\$13,269.00

Group 0012: Other Roadway Costs

0012	201E11000	1.000	LS	\$12,000.00000	\$12,000.00
CLEARING AND GRUBBING					

0112	202E35100	480.000	FT	\$19.24716	\$9,238.64
PIPE REMOVED, 24" AND UNDER					

0113	202E38000	575.000	FT	\$2.19103	\$1,259.84
GUARDRAIL REMOVED					

0114	202E58100	1.000	EACH	\$533.26936	\$533.27
CATCH BASIN REMOVED					

0115	202E58200	2.000	EACH	\$422.49570	\$844.99
INLET REMOVED					

0116	202E53100	6.000	EACH	\$42.38045	\$254.28
MAILBOX REMOVED					

0117	609E18000	449.000	FT	\$30.06000	\$13,496.94
COMBINATION CURB AND GUTTER, TYPE 3					

0118	606E15050	1,275.000	FT	\$17.44144	\$22,237.84
GUARDRAIL, TYPE MGS					

0119	606E26150	4.000	EACH	\$2,291.42552	\$9,165.70
ANCHOR ASSEMBLY, MGS TYPE E					

0120	606E26550	1.000	EACH	\$919.17516	\$919.18
ANCHOR ASSEMBLY, MGS TYPE T					

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

0121	609E24510	922.000	FT	\$25.22453	\$23,257.02
CURB, TYPE 4-C					

0122	609E50000	443.000	SY	\$75.00000	\$33,225.00
4" CONCRETE TRAFFIC ISLAND					

0126	690E50100	6.000	EACH	\$182.82491	\$1,096.95
SPECIAL - MAILBOX SUPPORT SYSTEM, SINGLE					

Total for Group 0012:\$127,529.65

Group 0013: Seeding & Mulching / Sodding

0013	B-MC-ERCO	19,971.000	SY	\$3.00000	\$59,913.00
MAJOR COST DRIVERS, EROSION CONTROL					

Total for Group 0013:\$59,913.00

Group 0014: Rock Channel Protection

0014	B-MC-ERCO	20.000	CY	\$160.00000	\$3,200.00
MAJOR COST DRIVERS, EROSION CONTROL					

Total for Group 0014:\$3,200.00

Group 0015: Erosion Control - Item 832

0015	832E15000	1.000	LS	\$7,500.00000	\$7,500.00
STORM WATER POLLUTION PREVENTION PLAN					

0086	832E30000	40,000.000	EACH	\$1.00000	\$40,000.00
EROSION CONTROL					

Total for Group 0015:\$47,500.00

Group 0016: Other Erosion Control Costs

0123	601E37500	350.000	FT	\$49.88997	\$17,461.49
PAVED GUTTER, TYPE 1-2					

Total for Group 0016:\$17,461.49

Group 0017: Underdrains

0017	605E11100	3,655.000	FT	\$11.27759	\$41,219.59
6" SHALLOW PIPE UNDERDRAINS					

Total for Group 0017:\$41,219.59

Group 0022: BMP's

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

0022	C-MC-DRNG	1.000	LS	\$10,000.00000	\$10,000.00
	MAJOR COST DRIVERS, DRAINAGE				

Total for Group 0022:\$10,000.00

Group 0023: Closed Storm System

0023	602E20000	35.540	CY	\$1,250.00000	\$44,425.00
	CONCRETE MASONRY				

0090	611E05900	450.000	FT	\$85.17136	\$38,327.11
	15" CONDUIT, TYPE B				

0091	611E26000	63.000	FT	\$492.95684	\$31,056.28
	72" CONDUIT, TYPE A				

0094	611E98150	2.000	EACH	\$3,723.48360	\$7,446.97
	CATCH BASIN, NO. 3				

0124	611E98760	1.000	EACH	\$4,000.00000	\$4,000.00
	INLET, NO. 2-16				

0125	611E98780	1.000	EACH	\$5,000.00000	\$5,000.00
	INLET, NO. 2-20				

Total for Group 0023:\$130,255.36

Group 0029: Full Depth Pavement

0030	D-MC-PVMT	4,423.000	SY	\$45.00000	\$199,035.00
	MAJOR COST DRIVERS, PAVEMENT				

Total for Group 0029:\$199,035.00

Group 0034: Salvage Pavement (Mill & Fill)

0035	D-MC-PVMT	5,486.000	SY	\$14.00000	\$76,804.00
	MAJOR COST DRIVERS, PAVEMENT				

Total for Group 0034:\$76,804.00

Group 0038: Driveways

0039	D-OC-PVMT	669.000	SY	\$90.00000	\$60,210.00
	OTHER COSTS, PAVEMENT				

Total for Group 0038:\$60,210.00

Group 0046: Signs

0050	J-MC-TRAF	0.500	MILE	\$100,000.00000	\$50,000.00
	MAJOR COST DRIVERS, TRAFFIC CONTROL				

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Total for Group 0046:\$50,000.00

Group 0047: Pavement Marking

0051	644E00100	0.400	MILE	\$2,878.96016	\$1,151.58
EDGE LINE, 4"					
0096	644E00104	0.410	MILE	\$3,642.10448	\$1,493.26
EDGE LINE, 6"					
0099	644E00300	0.510	MILE	\$4,620.59187	\$2,356.50
CENTER LINE					
0100	644E00404	2,684.000	FT	\$1.61655	\$4,338.82
CHANNELIZING LINE, 12"					
0101	644E00500	66.000	FT	\$6.97347	\$460.25
STOP LINE					
0103	644E00700	173.000	FT	\$5.38114	\$930.94
TRANSVERSE/DIAGONAL LINE					
0104	644E01300	13.000	EACH	\$87.61015	\$1,138.93
LANE ARROW					
0106	644E01510	901.000	FT	\$1.42884	\$1,287.38
DOTTED LINE, 6"					

Total for Group 0047:\$13,157.66

Group 0049: Signals - Intersections

0053	K-MC-SGNL	1.000	EACH	\$200,000.00000	\$200,000.00
MAJOR COST DRIVERS, SIGNALS					
<i>New Signal</i>					

Total for Group 0049:\$200,000.00

Group 0061: Portable Concrete Barrier (PCB)

0067	622E41000	500.000	FT	\$18.64287	\$9,321.44
PORTABLE BARRIER, 32"					

Total for Group 0061:\$9,321.44

Group 0062: Impact Attenuators

0068	614E12336	2.000	EACH	\$2,365.37749	\$4,730.75
WORK ZONE IMPACT ATTENUATOR (UNIDIRECTIONAL)					

Total for Group 0062:\$4,730.75

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Group 0067: Other MOT Costs

0073	614E11110	60.000	HOUR	\$70.46417	\$4,227.85
LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE					
0111	614E18600	8.000	SNMT	\$1,012.74416	\$8,101.95
PORTABLE CHANGEABLE MESSAGE SIGN					
2 Signs					

Total for Group 0067:\$12,329.80

Group 0069: Misc. Costs

0076	614E11000	1.000	LS	\$500,000.00000	\$500,000.00
MAINTAINING TRAFFIC					
Based on MOT Evaluation					
0077	619E16020	8.000	MNTH	\$2,327.77778	\$18,622.22
FIELD OFFICE, TYPE C					
0109	623E10000	1.000	LS	\$10,000.00000	\$10,000.00
CONSTRUCTION LAYOUT STAKES AND SURVEYING					
Approx 0.75% of total project cost (\$1,332,000)					
0110	624E10000	1.000	LS	\$40,000.00000	\$40,000.00
MOBILIZATION					
from CMS Item 624 for total project cost (\$1,332,000)					

Total for Group 0069:\$568,622.22

Group 0070: Design Contingency Costs

0078	V-MC-CNTG	1.000	LS	\$282,400.00000	\$282,400.00
MAJOR COST DRIVERS, CONTINGENCY COSTS					
PDP Design Contingency (Stage 1): Approx. 15% of total construction cost					

Total for Group 0070:\$282,400.00

CY 2020-2024 Business Plan Inflation Calculator:

[Not sure if you have the latest calculator? Click here.](#)

Last Modified: 1/29/2020

Today's Date:

April 19, 2020

Please Enter Values in the Yellow Areas Only:

Estimation Start Date:

Less than or Equal to Today's Date
(mm/dd/yyyy)

2/15/2020

Start Date:

Enter Construction Mid-Point Date:

(cannot exceed 04/19/2045)
(mm/dd/yyyy)

5/15/2023

Construction Mid-Point Date:

Present-Day Estimated Cost:

\$2,164,758.40

Estimated Dollar Amount:

Estimate Start Date to Construction Mid-Point Date:

39

Months

Inflation - Start to Mid-Point of Construction:

(compounded growth rate)

Inflated Dollar Amount:

Business Plan

9.7%

\$2,375,698.24

Estimator's Name: Stantec

County - Route - Section:

HAM-32-6.82

PID:

110991

Estimator's Notes: Stage 1 Submission