Colliers Engineering & Design

Wetland Delineation Report

University Project

Colliers Engineering & Design Project Number: 21004202A

May 31, 2024

Prepared for:

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Prepared by:

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APPENDICES

EXECUTIVE SUMMARY

On behalf of NiSource Inc., Colliers Engineering & Design (CED) conducted field delineations for the University Project within Franklin County, Ohio (hereinafter described as "Survey Corridor"). The Survey Corridor is located at latitudinal coordinates 40.010495 N and longitudinal coordinates -83.014039 W. The Survey Corridor is located approximately 3 miles north of Columbus, Ohio. Access to the Survey Corridor can be achieved from Ackerman Road, N Star Road, Kenny Road, Ridgeview Road, Brandon Road.

The Project Study Area is comprised of a 100-foot wide survey corridor centered on the proposed pipeline alignment for 2.15 miles. The Project Study Area or "Survey Corridor" includes the proposed installation of 2.15 miles of 20-inch pipeline and additional workspaces. The additional workspaces are located along the alignment in the central and eastern end of the alignment. The Survey Corridor was investigated to identify potential jurisdictional Waters of the U.S. (WOTUS) and wetlands subject to Federal or State regulatory jurisdiction. The delineation methodologies developed by the USACE and the USEPA, as described in the *1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0*) and the subsequently issued USACE regulatory guidance regarding the identification of jurisdictional stream channels through the recognition of field indicators of an ordinary high-water mark within drainage features (Environmental Laboratory, 1987; USACE 2012; USACE 2005) were utilized during our investigation. The location and size of jurisdictional areas delineated are shown on the attached Figure 5. Delineation Results (**Appendix A**).

Based on the field investigations, two (2) stream features and one (1) wetland feature were delineated within the Survey Corridor by CED on March 2nd & 3rd, 2022 and May 19th, 2023. A total of 2,552 linear feet of perennial (R3) stream, 562 linear feet of intermittent (R4) stream, and 0.23 acres of palustrine emergent (PEM) wetland were delineated. It is CED's professional opinion that Stream Features "1" and "2", and the proximal wetland, are considered jurisdictional WOTUS since they drain into the Olentangy River and Scioto River. These stream features can be considered jurisdictional WOTUS since they connect and/or are directly connected to the Olentangy River and Scioto River. The location and size of jurisdictional areas delineated are shown on Figure 5. Delineation Results (**Appendix A**).

1.0 PROJECT INFORMATION

Project Name	University Project
Project Location	Ackerman Road, N Star Road, Kenny Road, Ridgeview Road, Brandon Road,
Municipality	Columbus
County	Franklin
State	Ohio
Latitude/Longitude	40.010495 N / -83.014039 W
Subject Property Size	+/- 3.7 mi/LF 100 feet wide survey corridor
U.S.G.S. Quadrangle	Northwest Columbus OH
Potential Jurisdictional Waters of the U.S. (WOTUS) and wetlands	See Aquatic Resource Area Summary Table on Page 8
River Basin (HUC) & sub-watershed	Upper Scioto Basin: 8 Digit HUC Code 05060001
Nearest Stream	Olentangy River and Scioto River
Navigable Water Nexus	Stream and wetland features delineated on the Survey Corridor would be considered jurisdictional WOTUS and wetlands since these features drain towards the Olentangy River and Scioto River.
Isolated Wetlands/Waters Present (Yes/No)	No

2.0 INTRODUCTION

On behalf of NiSource Inc., Colliers Engineering & Design (CED) conducted field delineations for the University Project located in the greater North Columbus area within Franklin County, Ohio (hereinafter described as "Survey Corridor"). The Survey Corridor is located at latitudinal coordinates 40.010495 N and longitudinal coordinates -83.014039 W. The Survey Corridor is located approximately 3 miles north of Columbus, Ohio. Access to the Survey Corridor can be achieved from Ackerman Road, N Star Road, Kenny Road, Ridgeview Road, Brandon Road. The Survey Corridor is bordered by residential homes, commercial properties, agricultural land, and forested areas. There are unnamed tributaries located within the Survey Corridor that eventually drain to Olentangy River and Scioto River.

The Survey Corridor was investigated to identify potential jurisdictional Waters of the U.S. (WOTUS) and wetlands subject to Federal or State regulatory jurisdiction. According to the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) regulations described in Section 404 of the Clean Water Act (33 CFR Section 328.3 and 40 CFR Section 230.3) respectively, wetlands are "...areas that are inundated or saturated with surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

3.0 PROPERTY DESCRIPTION

The Survey Corridor is located within the Upper Scioto River Basin (8 Digit HUC Code 05060001). Access to the Survey Corridor can be achieved from Ackerman Road, N Star Road, Kenny Road, Ridgeview Road, and Brandon Road. The western section of the Survey Corridor drains south towards the Scioto River, and the eastern section of the Survey Corridor drains east towards the Olentangy River. The Survey Corridor does not contain floodways or floodplains according to FEMA Floodplain Panel Maps 39049C0164K, 39049C0168K, and 39049C0169K (eff. 6/17/2008). The Survey Corridor contains approximately 20% forested communities and 80% residential properties and commercial properties. The forested areas are comprised of a mixture of oak, tulip poplar, red maple, pine, and sweetgum species that dominate the canopy layer. The Olentangy River is located east of the Survey Corridor and Scioto River is located west of the Survey Corridor and drain north to south. Unnamed tributaries can be found in the western and eastern sections of the Survey Corridor eventually discharging into the Olentangy River and Scioto River.

4.0 BACKGROUND INFORMATION

Prior to on-site field investigations, several publicly available sources of information were reviewed to determine the likelihood of wetlands and surface waters occurring within Survey Corridor. These mapping resources generally include, but are not limited to, the United States Geological Survey (USGS) maps (Figure 1. Project Location Map, **Appendix A**), the U.S. Department of Agriculture - Natural Resource Conservation Service (NRCS) soils database (Figure 2. Soil Series Map, **Appendix A**), National Hydrography Dataset (NHD), and the U.S. Fish & Wildlife Service National Wetlands Inventory (NWI) database (Figure 3. National Wetlands Inventory Map, **Appendix A**).

4.1 U.S. Geological Survey Map

The Survey Corridor appears on the *Northwest Columbus OH* Quadrangle USGS Maps (Figure 1. Project Location Map, **Appendix A**) and is depicted as developed properties which contains approximately 20% forested areas and 80% residential and commercial properties. The USGS also depicts unnamed tributaries located within western and eastern sections. Residential and forested areas are located within the vicinity of the Survey Corridor to the north, south, east, and west. Elevations at the Survey Corridor range from 750 to 950 feet above mean sea level (MSL) based on the USGS map.

4.2 Soil Survey

The NRCS Web Soil Survey depicts the following Table Soil Series map units within the Survey Corridor and provides a description of the properties and qualities of each soil:

Table 1. Soils Section for University Project

Map Unit Symbol	Map Unit Name	Drainage Class	Runoff Class	Depth to Water Table
CfB	Celina-Urban land complex, 2 to 6 percent slopes	Moderately Well Drained	Medium	About 18 to 36 inches
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	Somewhat Poorly Drained	Medium	About 6 to 24 inches
CsA	Crosby-Urban land complex, 0 to 2 percent slopes	Somewhat Poorly Drained	Medium	About 6 to 24 inches
CsB	Crosby-Urban land complex, 2 to 6 percent slopes	Somewhat Poorly Drained	High	About 12 to 36 inches
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	Very Poorly Drained	Negligible	About 0 to 6 inches

Map Unit Symbol	Map Unit Name	Drainage Class	Runoff Class	Depth to Water Table
Ut	Udorthents-Urban land complex, gently rolling	-	-	More than 80 inches

Of the six (6) mapped soil units in the Survey Corridor, one (1) soil unit (Kokomo silty clay loam) is listed as being hydric.

5.0 WETLAND & SURFACE WATER DELINEATION METHODOLOGY

The wetland delineation methodologies developed by the USACE and the USEPA, as described in the 1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: *Midwest Region* (Version 2.0) and subsequently issued USACE regulatory guidance regarding the identification of jurisdictional stream channels through the recognition of field indicators of an ordinary high-water mark within drainage features (Environmental Laboratory, 1987; USACE 2012; USACE 2005), were utilized during our investigation. These methodologies generally involve the review of three parameters (vegetation, soils, hydrology) when making a wetland or non-wetland determination.

The Survey Corridor was walked, community types were characterized, and wetland and surface water boundaries were flagged. Sample stations were established along the boundaries to examine vegetation, soils, and hydrology. Using this data, boundaries were established based on changes in vegetation, soils, hydrology, and surface water characteristics.

6.0 WETLAND AND SURFACE WATER DELINEATION RESULTS

6.1 WETLAND AND SURFACE WATER SUMMARY

On-site field investigations of the Survey Corridor were conducted by CED on March 2nd & 3rd, 2022 and May 19, 2023. The on-site delineation did verify the presence of surface waters within Survey Corridor. A summary of the aquatic resources identified within the Survey Corridor is provided below in Table 2: Aquatic Resource Summary. The location and size of the aquatic resources delineated are shown on Figure 5. Delineation Results (**Appendix A**).

Table 2: Aquatic Resource Area Summary Table

Aquatic Resource	PFO Area (AC)	PEM Area (AC)	Aquatic Resource	PUB Area (AC)	Aquatic Resource	R3 Length (LF)	R4 Length (LF)
W-1	-	0.23	-	-	S-1	254	-
-	-	-	-	-	S-2	2298	562
Total Wetlands by Class (AC)	-	0.23	Total Pond (AC)	-	Total Stream by Class (LF)	2,552	562
Total Wetlands (AC)	0.23				Total Stream (LF)	3,114	

Note 1: Cowardin Class PEM = palustrine emergent wetland, R3 = perennial stream, R4 = intermittent stream

6.2 VEGETATION

One (1) wetland was observed within the project boundaries. Representative plant species within the wetland areas include the following: red maple (*Acer rubrum*), American elm (*Ulmas americana*), green ash (*Fraxinus pennsylvanica*), sugar maple (*Acer saccharum*), eastern cottonwood (*Populus deltoides*), amur honeysuckle (*Lonicera mackaii*), spotted touch-me-not (*Impatiens capensis*), Canadian clearweed (*Pilea pumila*), common blue violet (*Viola papilionacea*), jumpseed (*Persicaria virginiana*), yellow iris (*Iris psuedacorus*), poison ivy (*Toxicodendron radicans*), and rice cutgrass (*Leersia oryzoides*).

Representative plant species within the upland areas include the following: northern red oak (*Quercus rubra*), sugar maple, American beech (*Fagus grandifolia*), amur honeysuckle, eastern hemlock (*Tsuga canadensis*), and poison ivy.

6.3 SOILS

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil (USDA 2003). The soils in the wetland areas were variable, but for the most part, exhibited low chroma matrices with redoximorphic features. Soils within the wetland areas on-site exhibit low chroma matrix colors and concentrations that are characteristic of reducing anaerobic conditions associated within the formation of hydric soils. Wetland soils were typically black (10YR 2/1), dark yellowish brown (10YR 4/6), and brown (10YR 5/2) within the upper 16 inches. Jurisdictional soils were generally underlain dark yellowish brown (10YR 4/6), and brown (10YR 5/2) down to 16 inches. Redox concentrations greater than 3% were observed between 0 and 16 inches below soil surface and are typically dark yellowish brown (10YR 4/6). Soils within jurisdictional areas meet the F3 Depleted Matrix hydric

soil indicator. Textures within the jurisdictional areas included loam. The upland soils were dark brown (10YR 3/3) within the upper 16 inches. Soil textures included loam.

6.4 HYDROLOGY

On-site field investigations of the Survey Corridor were conducted by CED on March 2nd & 3rd, 2022 and May 19, 2023. The USACE Antecedent Precipitation Tool (APT) was utilized for the Survey Corridor and is provided in **Appendix C**. Based the USACE APT tool, the on-site field investigations were conducted in "Wetter than Normal" precipitation conditions with a 30-day rolling total during the March 2nd & 3rd, 2022 investigations. The on-site field investigations were conducted in "Drier than Normal" precipitation conditions for the May 19th, 2023 investigation.

Indicators of wetland hydrology are largely absent in upland areas.

7.0 WETLAND DELINEATION CONCLUSION

Two (2) stream features and one (1) wetland feature were delineated within the Survey Corridor by CED on March 2nd & 3rd, 2022 and May 19th, 2023. A total of 2,552 linear feet of perennial (R3) stream, 562 linear feet of intermittent (R4), and 0.23 acres of palustrine emergent (PEM) wetland were delineated. Field investigations were conducted in accordance with the manuals, methodologies, and regulatory guidance procedures as stated in Section 5.0 Wetland and Surface Water Delineation Methodology.

It is CED's professional opinion that Stream Features "1" and "2" are considered jurisdictional WOTUS since they drain into the Olentangy River and the Scioto River. The wetland can be considered jurisdictional WOTUS since it drains directly to the unnamed tributary to the Olentangy River and the Scioto River. The location and size of jurisdictional areas delineated are shown on Figure 5. Delineation Results (**Appendix A**).

8.0 REFERENCES

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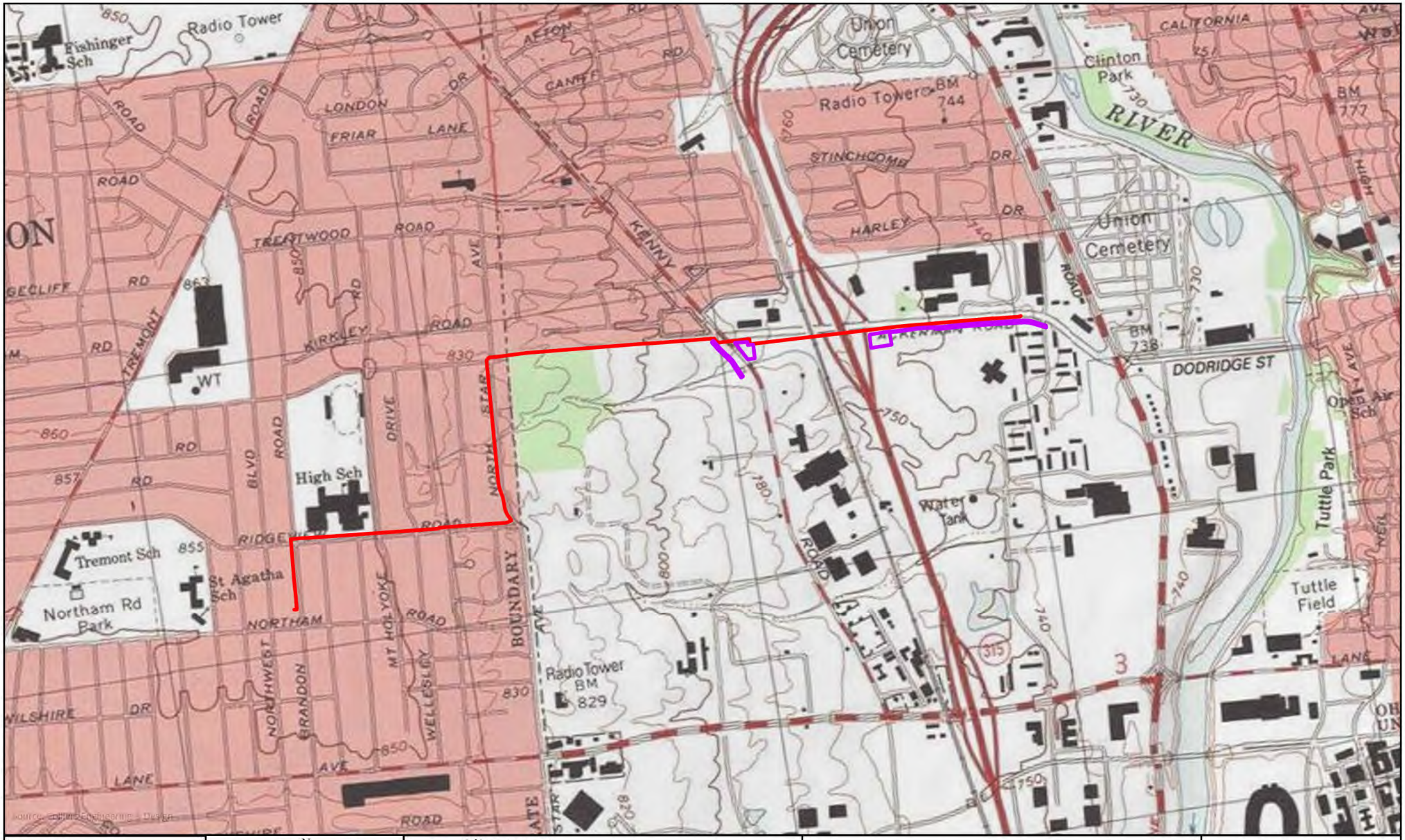
Appendix

Appendix A | Figures



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Miles
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Kilometers

Scale: 1:18,000

Alignment
Workspaces

Vicinity Map

University

Franklin County, Ohio

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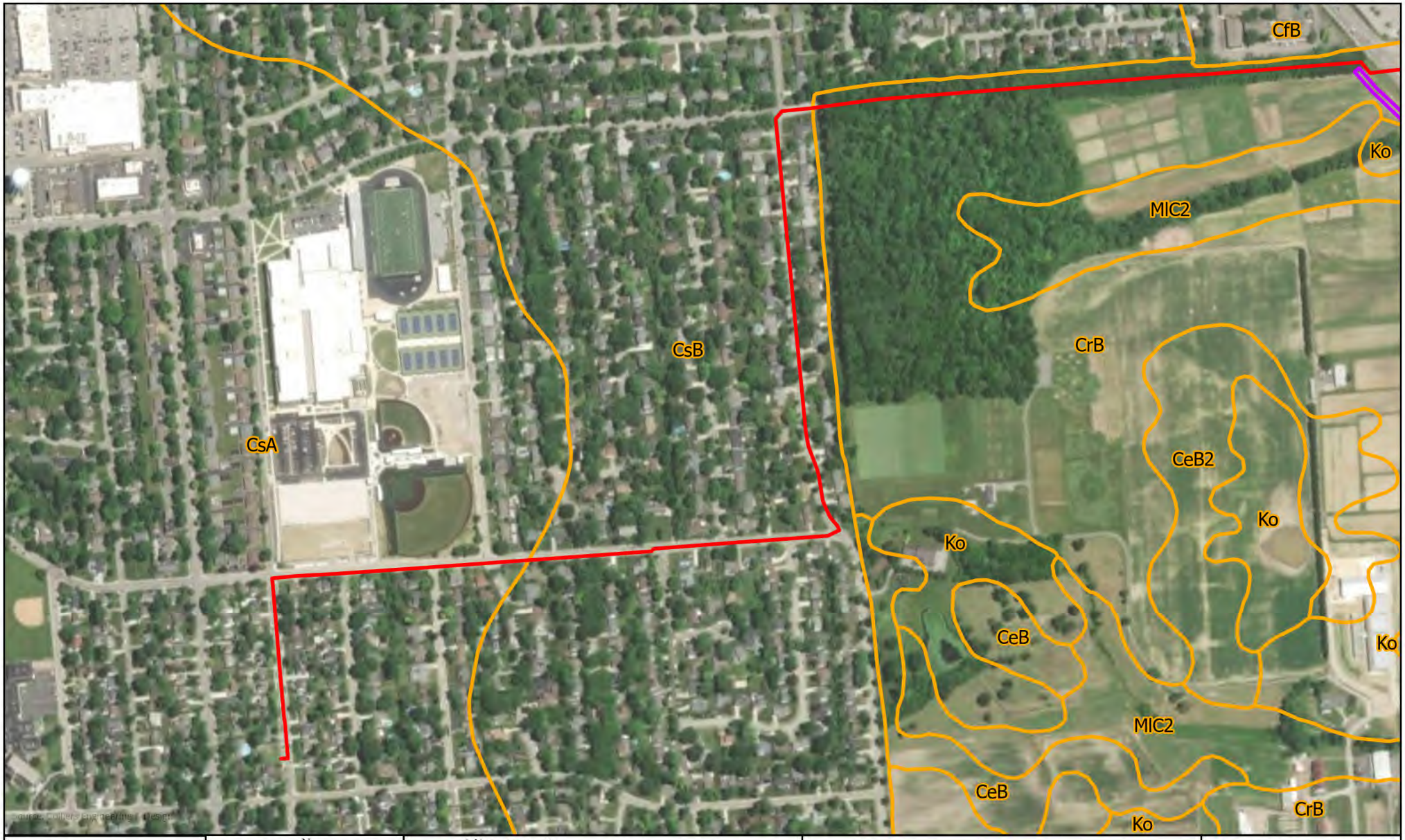
Figure 1



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- Alignment
- Workspaces
- Soil Units (SSURGO)

Soil Series Map

University

Franklin County, Ohio

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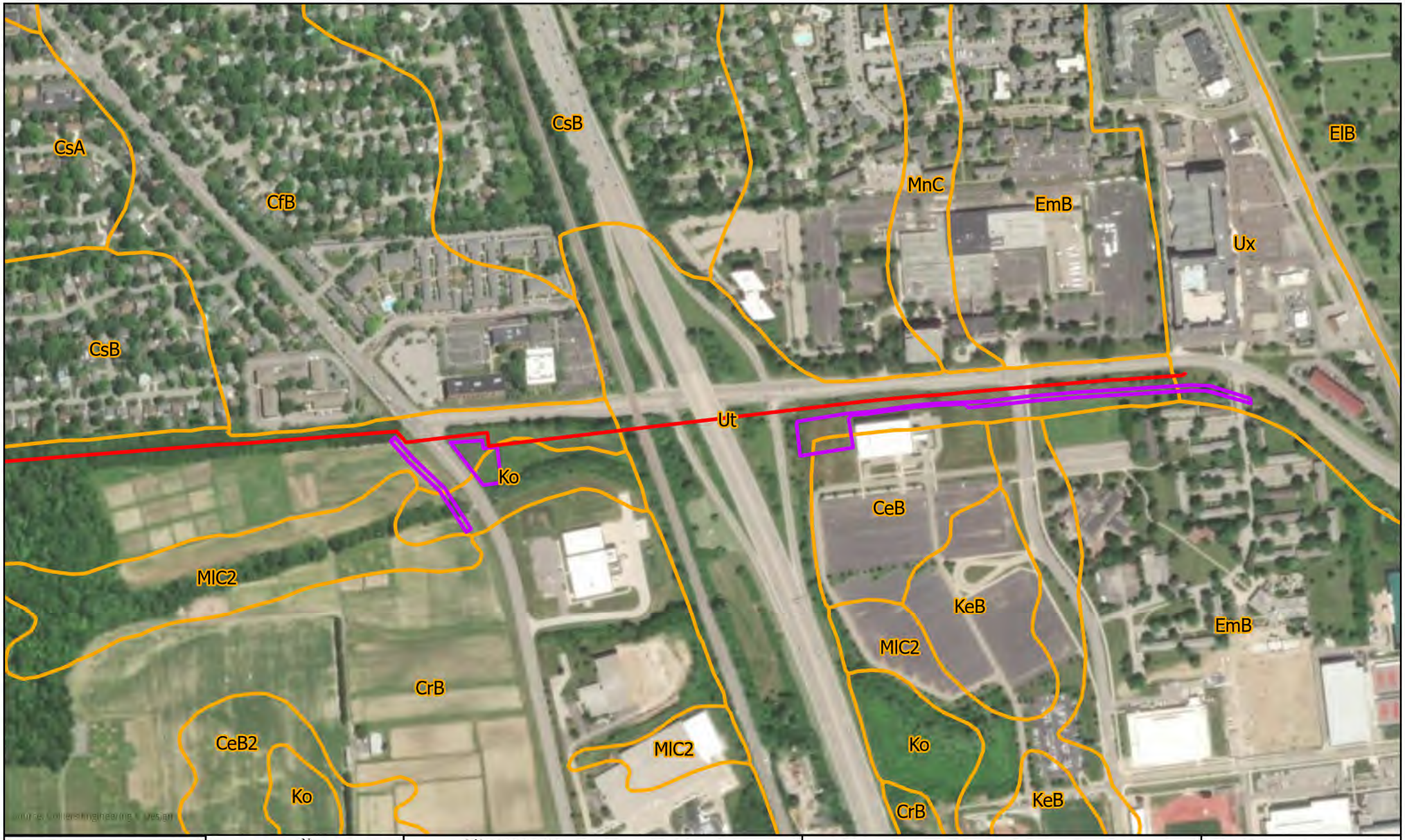

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Soil Series Map

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Project Data
- Alignment
- Workspaces

Background Data
- Flowline (NHD)
- Waterbody (NHD)

National Wetlands Inventory
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

NWI Series Map

University

Franklin County, Ohio

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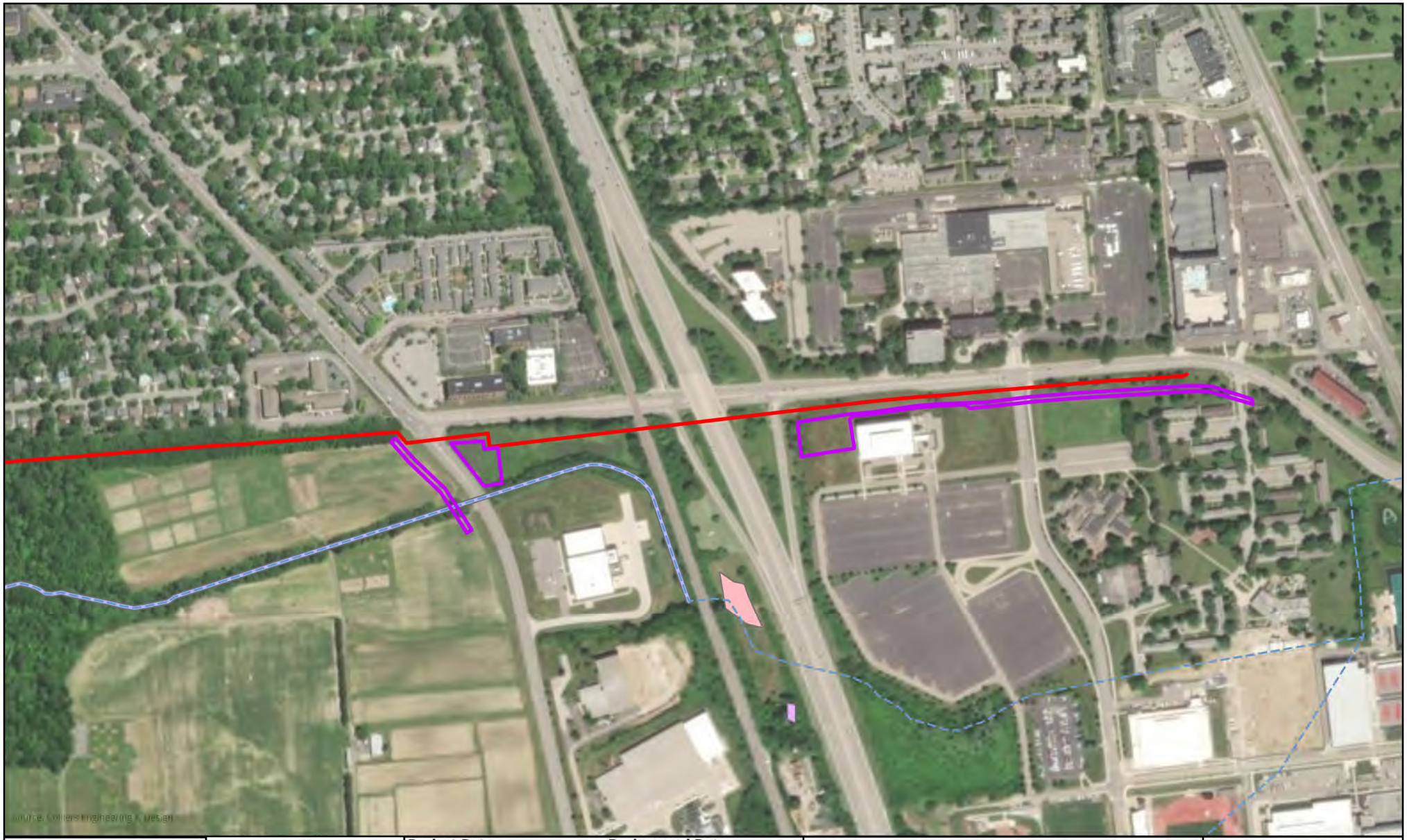
Figure 3 - Page 1



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Project Data
- Alignment
- Workspaces

Background Data
- Flowline (NHD)
- Waterbody (NHD)

National Wetlands Inventory
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

NWI Series Map

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Figure 3 - Page 2

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Scale: 1:18,000

- Alignment
- Workspaces
- 100-year floodplain

Floodplain Series Map

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Figure 4

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Scale: 1:7,000

Project Data

- Alignment
- Workspaces

Survey Data

- Culvert
- Stormwater Erosions
- PEM Wetland (W-#)
- Intermittent Stream (S-#)
- Perennial Stream (S-#)

Delineation Results

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Franklin County, Ohio

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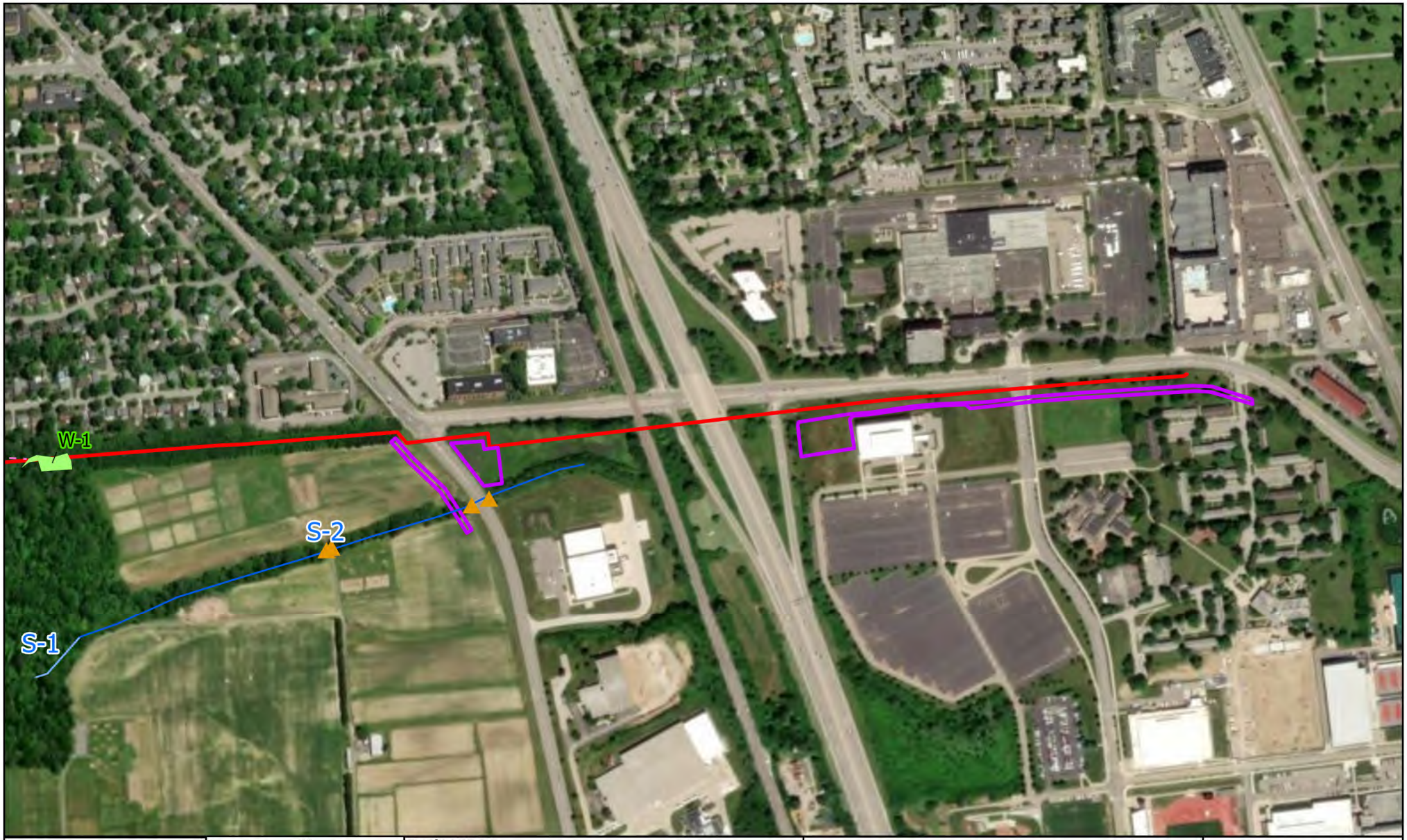
Figure 5 - Page 1



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Project Data

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Delineation Results

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Figure 5 - Page 2

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Appendix B | Data Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: NCHP City/County: Columbus / Franklin Sampling Date: 5/19/23

Applicant/Owner: NiSource/Campos State: OH Sampling Point: W001-PEM

Investigator(s): REK Section, Township, Range: T1N R18W

Landform (hillslope, terrace, etc.): Slight depression Local relief (concave, convex, none): Concave

Slope (%): 5 Lat: 40.018808 Long: -83.044274 Datum: NAD 83

Soil Map Unit Name: Crosby silt loam, Southern Ohio Till Plain, 2-6% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:
PEM rep to W001. Taken in forested area, wet understory with upland canopy coverage

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30x30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	N	FAC
2. Ulmus americana	20	Y	FACW
3. Fraxinus pennsylvanica	10	N	FACW
4. Acer saccharum	15	N	FACU
5. Populus deltoides	20	Y	FAC
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15x15)			
1. Lonicera mackaii*	(15)	-	NL*
2. Franxinus pennsylvanica	10	Y	FACW
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5x5)			
1. Impatiens capensis	35	Y	FACW
2. Pilea pumila	60	Y	FACW
3. Viola papilionacea	(5)	-	NL*
4. Persicaria virginiana	2	N	FAC
5. Iris pseudacorus	3	N	OBL
6. Toxicodendron radicans	10	N	FAC
7. Leersia oryzoides	15	N	OBL
8.			
9.			
10.			
	125	= Total Cover	
Woody Vine Stratum (Plot size: 30x30)			
1. Absent			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
*Not listed in Midwest plant list, not included in hydric veg calcs

Upland trees in canopy layer, outside of wetland boundaries.

SOIL

Sampling Point: W001-P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0.8	10 YR 2/1	100					Loam	
8-16	10 YR 2/1	90	10 YR 4/6	8	C	M/PL	Loam	
			10 YR 5/2	2	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 8"

Wetland Hydrology Present? Yes X No _____

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

Remarks:

linear drainge feature inlet to wetland

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: NCHP City/County: Columbus / Franklin Sampling Date: 5/19/23

Applicant/Owner: NiSource/Campos State: OH Sampling Point: W001-UPL

Investigator(s): REK Section, Township, Range: T1N R18W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 40.018832 Long: -83.044912 Datum: NAD 83

Soil Map Unit Name: Crosby silt loam, Southern Ohio Till Plain, 2-6% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	
Hydric Soil Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Wetland Hydrology Present?	Yes _____	No X	

Remarks:
Upland rep to W001. Taken upslope of wetland, in woodlot

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30x30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	30	Y	FACU
2. Acer saccharum	35	Y	FACU
3. Fagus grandifolia	15	N	FACU
4.			
5.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15x15)			
1. Lonicera mackaii	80	-	NL*
2. Tsuga canadensis	5	Y	FACU
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5x5)			
1. Lonicera mackaii	15	-	NL*
2. Toxicodendron radicans	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20	= Total Cover	
Woody Vine Stratum (Plot size: 30x30)			
1. Absent			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	-	x 1 =	-
FACW species	-	x 2 =	-
FAC species	20	x 3 =	60
FACU species	85	x 4 =	340
UPL species	-	x 5 =	-
Column Totals:	105 (A)		400 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
*Not listed in Midwest plant list, not included in hydric veg calcs

SOIL

Sampling Point: W001UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/3	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

N/A

Remarks:

No primary or secondary indicators observed

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: NCHP City/County: Columbus / Franklin Sampling Date: 5/19/23

Applicant/Owner: NiSource/Campos State: OH Sampling Point: STP001

Investigator(s): REK Section, Township, Range: T1N R18W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None

Slope (%): 0 Lat: 40.018755 Long: -83.041464 Datum: NAD 83

Soil Map Unit Name: Crosby silt loam, Southern Ohio Till Plain, 2-6% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	
Hydric Soil Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Wetland Hydrology Present?	Yes _____	No X	

Remarks:
Reprsentative upland habitat - taken in woodlot between residential and agriculture uses

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30x30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	60	Y	FACU
2. Ulmus rubra	25	Y	FAC
3. Fagus grandifolia	10	N	FAC
4. Acer saccharum	5	N	FACU
5.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15x15)			
1. Lonicera mackaii	90	-	NL*
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5x5)			
1. Absent			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		= Total Cover	
Woody Vine Stratum (Plot size: 30x30)			
1. Absent			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	-	x 1 =	-
FACW species	-	x 2 =	-
FAC species	35	x 3 =	105
FACU species	65	x 4 =	260
UPL species	-	x 5 =	-
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
*Not listed in Midwest plant list, not included in hydric veg calcs

SOIL

Sampling Point: STP001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/3	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

N/A

Remarks:

No primary or secondary indicators observed

Site: NISOURCE -NCHP	Rater(s): REK	Date: 5/19/23

W001 (PEM)

Metric 1. Wetland Area (size).

1	1
max 6 pts.	subtotal

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)
- [x] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

7	8
max 14 pts.	subtotal

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)
- [x] 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)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

7	15
max 30 pts.	subtotal

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

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

3b. Connectivity. Score all that apply.

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

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)
- [x] <0.4m (<15.7in) (1)

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

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

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

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

9	24
max 20 pts.	subtotal

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

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

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

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [x] 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)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [x] selective cutting
- [x] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

24
subtotal this page

last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: N. Source - NCHP	Rater(s): REK	Date: 5/19/23

24
subtotal first page

WOO1 (PEM)

Metric 5. Special Wetlands.

0 max 10 pts. | 24 subtotal

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)

Metric 6. Plant communities, interspersion, microtopography.

7 max 20 pts. | 31 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [2] Emergent
- [1] Shrub
- 4 [1] Forest
- [3] Mudflats
- [0] Open water
- [0] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [X] 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)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] 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

31

Cat 1/2 gray tree

End of Quantitative Rating. Complete Categorization Worksheets.

5019

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 60

SITE NAME/LOCATION NCHP

SITE NUMBER 5019 RIVER BASIN Scioto DRAINAGE AREA (mi²) 0.17mi²

LENGTH OF STREAM REACH (ft) 200' LAT 40.01778 LONG: 83.04058 RIVER CODE _____ RIVER MILE _____

DATE 3/3/22 SCORER REK 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 — Culverted Rd xing

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

TYPE		PERCENT	TYPE		PERCENT
☐☐	BLDR SLABS [16 pts]		☐☒	SILT [3 pt]	20
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	13
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	5	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [9 pts]	10	☐☐	MUCK [0 pt]	
☒☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	10

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5 (A) 9 (B) 6

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

HHEI Metric Points

Substrate Max = 40 15

A + B

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

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☒ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (centimeters):** 26.3

Pool Depth Max = 30 25

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

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

COMMENTS _____ **AVERAGE BANKFULL WIDTH (meters)** 2.5

Bankfull Width Max=30 20

This information must also be completed

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

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

COMMENTS _____

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

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

COMMENTS _____

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

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

STREAM GRADIENT ESTIMATE

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

October 24, 2002 Revision

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

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

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Olentangy River Distance from Evaluated Stream 1.1 mi.

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

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

County: Franklin Township / City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 2/25/22 Quantity: 0.8"

Photograph Information: _____

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: _____

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

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

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

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

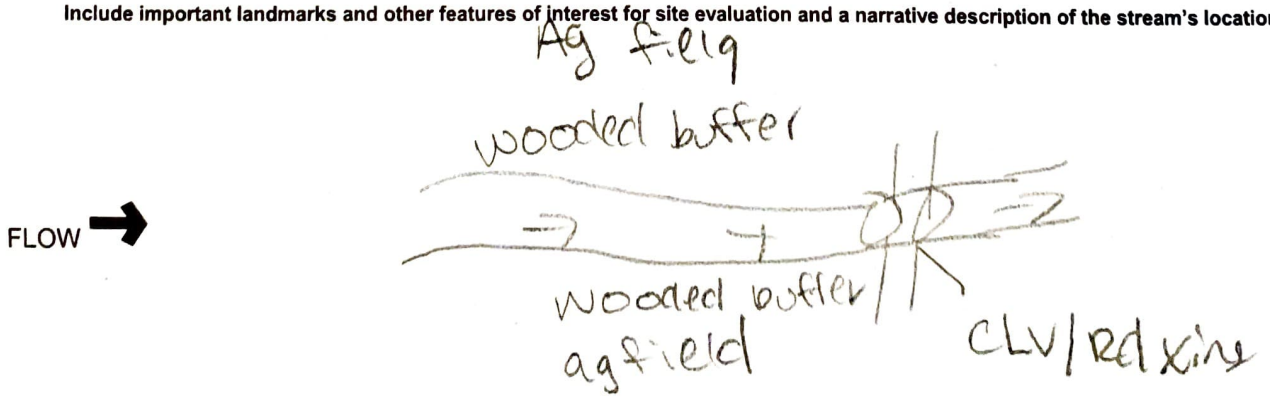
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) ____

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



OhioEPA Primary Headwater Habitat Evaluation Form

SO20

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

SITE NAME/LOCATION NCHP

SITE NUMBER SO20 RIVER BASIN Scioto DRAINAGE AREA (mi²) 0.55mi²

LENGTH OF STREAM REACH (ft) 200' LAT. 40.007917 LONG. -83.0732 RIVER CODE _____ RIVER MILE _____

DATE 3/3/22 SCORER REK 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

Channelized, concrete lined, SW inputs

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

TYPE		PERCENT	TYPE		PERCENT
☐☐	BLDR SLABS [16 pts]		☐☐	SILT [3 pt]	10
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	3	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [9 pts]	2	☐☐	MUCK [0 pts]	
☐☒	SAND (<2 mm) [6 pts]	15	☒☐	ARTIFICIAL [3 pts]	70

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 3 (A) 9

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 5

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40 14

A + B

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

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☒ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30 15

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

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

COMMENTS _____ **AVERAGE BANKFULL WIDTH (meters)** 1.8

Bankfull Width Max=30 20

This information must also be completed

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

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

COMMENTS _____

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

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

COMMENTS _____

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

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

STREAM GRADIENT ESTIMATE

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

October 24, 2002 Revision

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

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

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Scioto River Distance from Evaluated Stream 1.1 mi

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

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

County: Franklin Township / City: Upper Arlington

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 2/25/22 Quantity: 0.8"

Photograph Information: _____

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

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

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

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

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

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

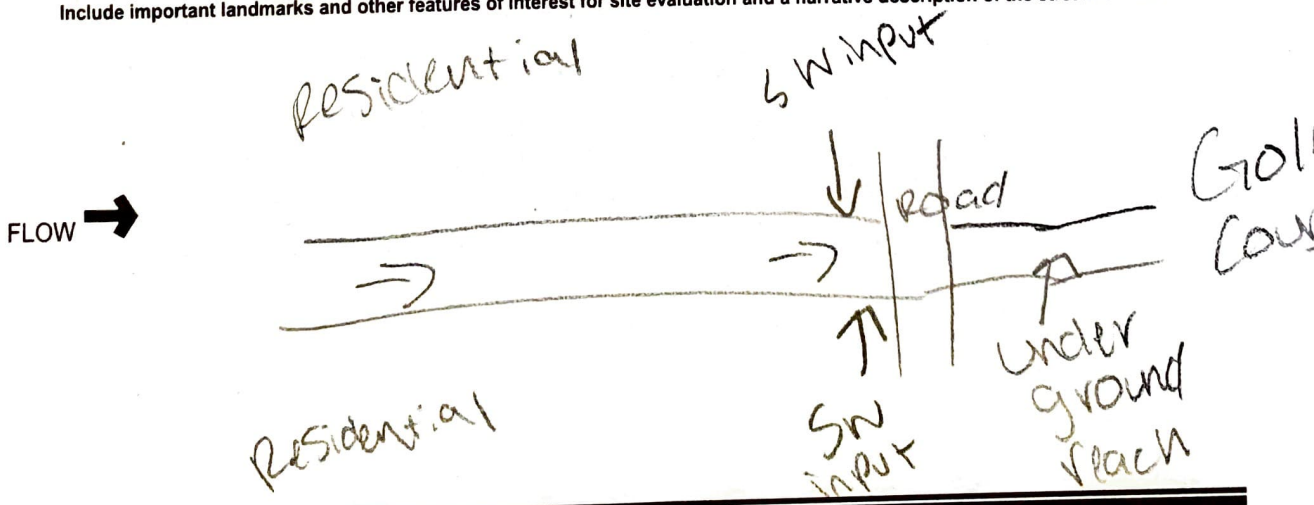
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

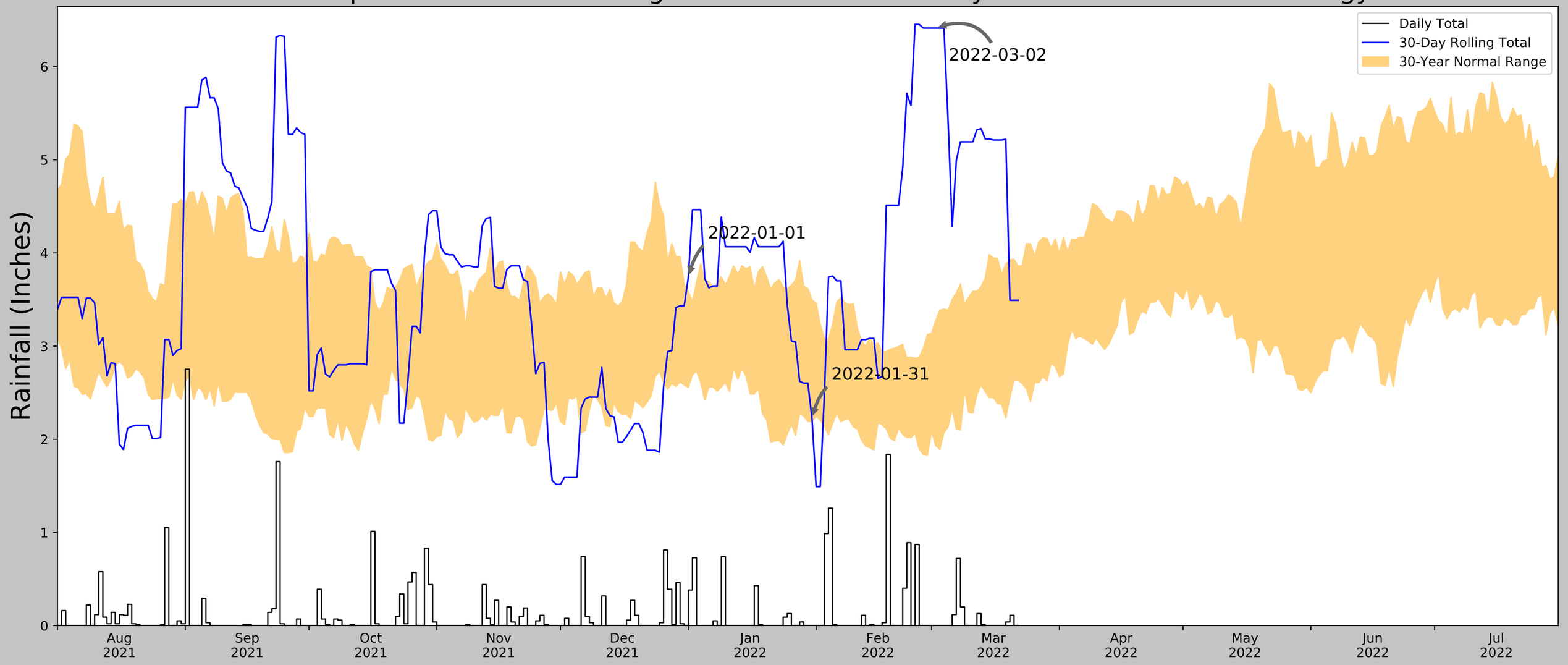
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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



Colliers Engineering & Design

Appendix C | USACE Antecedent Precipitation Tool



Coordinates	40.011997, -82.572119
Observation Date	2022-03-02
Elevation (ft)	1094.88
Drought Index (PDSI)	Severe wetness (2022-02)
WebWIMP H_2O Balance	Wet Season

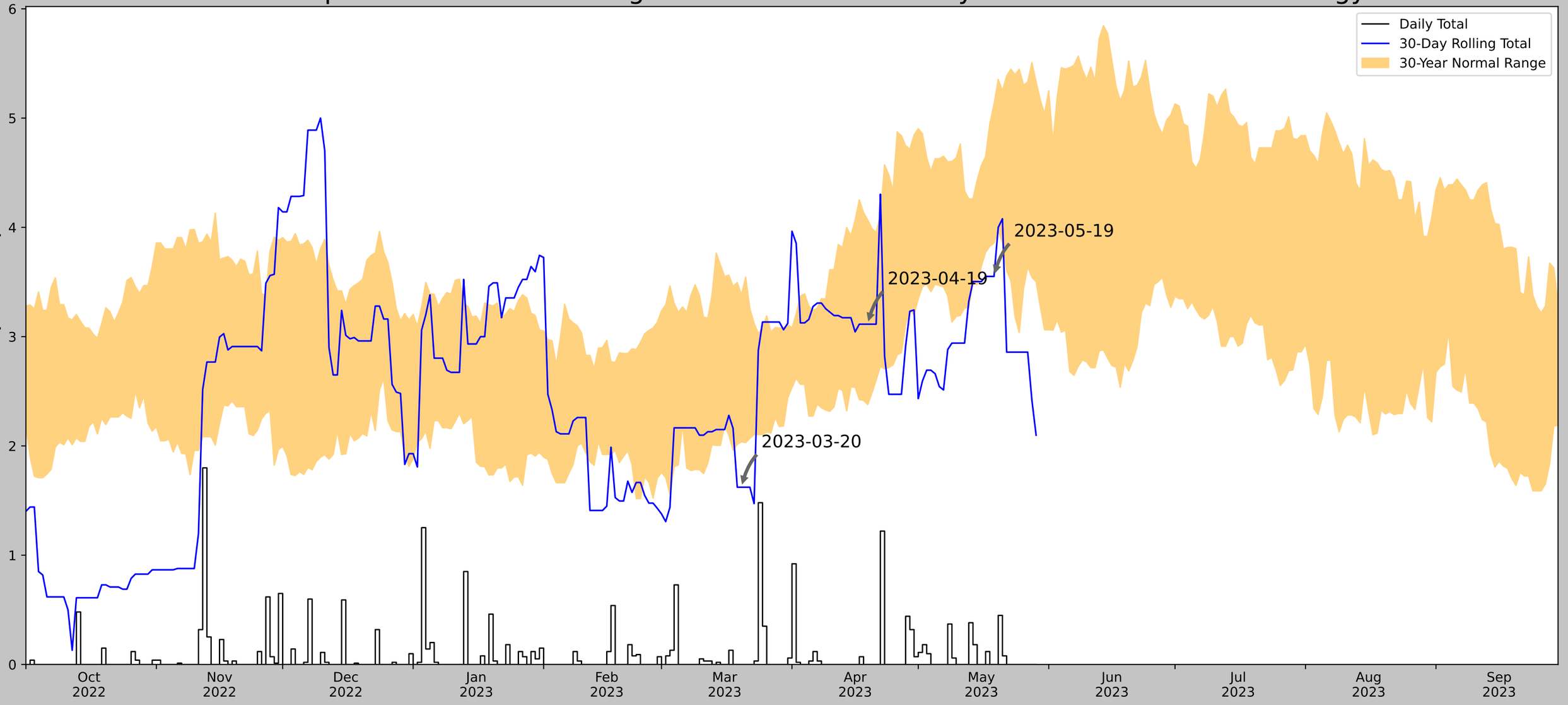
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-02	1.933071	3.275197	6.413386	Wet	3	3	9
2022-01-31	2.189764	3.494882	2.220473	Normal	2	2	4
2022-01-01	2.555906	3.585433	3.736221	Wet	3	1	3
Result							Wetter than Normal - 16

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
BUCKEYE LAKE 1 N	39.9522, -82.4819	888.123	6.315	206.757	4.148	11082	90
KIRKERSVILLE 3.3 N	39.998, -82.5986	1075.131	1.703	19.749	0.8	8	0
PATASKALA 3.2 E	39.998, -82.6136	1074.147	2.399	20.733	1.129	7	0
GRANVILLE 2.6 WSW	40.0527, -82.5445	1064.961	3.169	29.919	1.521	10	0
PATASKALA 2.1 ENE	40.013, -82.6381	1171.916	3.492	77.036	1.841	1	0
PATASKALA 2.0 NE	40.024, -82.6511	1216.864	4.261	121.984	2.437	36	0
ALEXANDRIA 2.1 NNW	40.1182, -82.6265	1080.053	7.881	14.827	3.663	32	0
NEWARK HEATH AP	40.0228, -82.4625	883.858	5.848	211.022	3.866	3	0
UTICA 4 WSW	40.2061, -82.52	1134.843	13.691	39.963	6.708	1	0
NEWARK WTR WKS	40.0875, -82.4128	834.974	9.911	259.906	7.036	173	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	40.021777, -82.950994
Observation Date	2023-05-19
Elevation (ft)	834.369
Drought Index (PDSI)	Mild wetness (2023-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-19	3.856299	5.127953	3.551181	Dry	1	3	3
2023-04-19	2.378347	4.067717	3.114173	Normal	2	2	4
2023-03-20	2.038583	3.383858	1.622047	Dry	1	1	1
Result							Drier than Normal - 8

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
LAURELVILLE	39.4706, -82.7344	759.843	39.783	74.526	20.867	11080	90
LANCASTER 4.2 SSE	39.668, -82.5636	800.853	16.394	41.01	8.05	15	0
CIRCLEVILLE	39.6103, -82.9556	674.869	15.234	84.974	8.15	227	0
LANCASTER	39.7156, -82.6072	827.1	18.232	67.257	9.431	29	0
LANCASTER FAIRFIELD CO AP	39.7572, -82.6633	849.081	20.161	89.238	10.872	2	0

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