Type II / III Variance Request

UPS TRABUE ROAD EXPANSION

Project Number - 60504396

Columbus, Ohio

AECOM

277 West Nationwide Blvd
5th Floor
Columbus, OH 43215

August 17, 2016

AECOM

277 West Nationwide Boulevard
Columbus, OH 43215-2566
www.aecom.com

614 464 4500 tel
614 464 0588 fax

August 19, 2016

Mr. Greg Fedner, PE
Private Development Section Manager
Division of Sewer and Drainage
910 Dublin Road
Columbus, OH 43215

RE: Type II/III Variance Request
UPS Trabue Road Expansion: Project Number 60504396

Project Name: UPS Trabue Road Expansion Project
Project Address: 5101 Trabue Road, Columbus OH 43228
PID: 245-266292; 570-204326-00; 560-205289-00
Primary Contact: United Parcel Service (UPS)
Attn: Jeff McBride
(614)-870-4237
Email: Jwmcbride@ups.com

On behalf of United Parcel Service, Inc. (UPS), AECOM is submitting an application for a Type II / III variance regarding section 1.3.2 of the Columbus Storm Water Drainage Manual, allowing for encroachment into an existing stream corridor protection zone. This variance will allow for the construction activities associated with the expansion of UPS' Trabue Road parcel processing facility located within the City of Columbus, Franklin County, Ohio.

UPS owns and operates an existing 330,000 square foot parcel sortation facility located on approximately 60.74 acres at 5101 Trabue Road, Columbus, OH 43228. Due to increased shipping rates, and the UPS requires an expansion of the facility to meet the growth demand of the Greater Columbus area. The planned expansion consists of a 230,000 square feet sortation expansion combined with 20.42 acres of new pavement and parking areas.

The expansion will result in 1,065 linear feet of linear wetland being culverted and relocated. The proposed construction activities encroach on the existing stream corridor protection zone, facilitating the need for a variance. The application has been submitted as a Type II/III as the Corps has classified the conveyance channel as a linear wetland and not a stream and the wetland removal is being covered under a Nationwide Permit versus and Individual Permit. The Permit was submitted on July 27, 2016 and is expected to be approved and permitted no later than September 9, 2016.

Sincerely,
AECOM Technical Services, Inc.

John Ortli

John Ortli
Project Manager
John.Ortli@aecom.com
(614) 600-5904

Type II / III Variance Application
Stream Corridor Protection Zone
Leib and Parker Ditch

Table of Contents

Introduction

On behalf of United Parcel Service, Inc. (UPS), AECOM is submitting an application for a type II or type III variance of the Columbus Stormwater Drainage Manual (CSDM). Specifically, a variance on section 1.3.2 and the established stream corridor protection zones (SCPZ) to allow for construction activities to take place for a site expansion project.

To begin, it is ambiguous as to what type of variance is applicable to the site. It is debatable as to whether a SCPZ should be applied to the Leib-Parker ditch. Although a SCPZ already exists for the Leib-Parker ditch, it has been classified by the US Army Corps of Engineers as a linear wetland, and is noted on the US Fish and Wildlife Services' wetland map as a Riverine Wetland. Because it is classified as a wetland, the Leib-Parker Ditch should not be subject to the same rules and regulations as a stream. The construction activities would fall under the purview of the US Army Corps Nationwide Permit 39 for Commercial and Institutional Developments. (This Army Corps permit has been applied for, and the submitted site information can be found in appendix 2.)

Project and Site Information

UPS owns and operates an existing 330,000 square foot parcel sortation facility located on approximately 60.74 acres at 5101 Trabue Road, Columbus, OH 43228. Due to increased shipping rates, UPS is planning an expansion of the parcel facility to meet the growth demand of the Greater Columbus area. The planned expansion project consists of a 231,000 square feet building expansion to house an internal conveyor belt system used for parcel sorting. The project also adds 20.42 acres of new pavement and parking areas to the site.

The construction of the proposed expansion project would encroach on the established SCPZ, and would result in the need for 1,065 linear feet of linear wetland being culverted and relocated on site, thus requiring the need for a variance. Specifically, a variance on section 1.3.2 is being requested, to allow for construction activities to take place in the SCPZ. The existing ditch/wetland stormwater runoff will be redirected into a 60-inch diameter reinforced concrete pipe. The pipe will contain a headwall formed into a proposed retaining wall, two type f manholes and one custom precast junction chamber. The length of new piping is 1084 feet of which 39 feet are proposed to be reinforced concrete radius pipe with a 50 foot design radius. The radius pipe is being proposed to provide a smooth hydraulic curve versus an abrupt turn through a structure.

The construction of the overall project will consist in multiple phases, and different construction activities will occur in different parts of the site. The total site area is 69.32 Acres, and the total site disturbance of the construction activities of the expansion project is 25.60 acres. The construction project would encroach on approximately 1.6 acres of SCPZ. The current SCPC is calculated to be 100 feet wide, and 1100 feet long, and contains shrubs and small tree saplings. The total SCPZ area is 2.53 acres.

Appendix A contains figures showing the current site conditions, the preferred site layout, and the minimal impact option. Appendix B contains site information such as the HHEI report, photos, soil maps, site location maps, and so on.

Section 1- Reason Variance is Requested

UPS has sought to avoid and minimize environmental impacts to the existing on-site linear wetland. However, due to the proximity of delineated ecological features to the planned construction, impacts to this wetland and the established SCPZ are unavoidable. Therefore, a variance is necessary to allow for construction activities to take place.

Alternatives to the desired construction plans were considered, but deemed to be insufficient to achieving the goals of the project. Because no alternative plans were viable options, a variance must be requested. To begin, it is not possible to avoid construction of an expanded facility. Construction of a new greenfield facility was considered not feasible because of the lack of available property within the region that provides the necessary logistical access for a parcel distribution center, and because of the adverse environmental impacts of constructing a new facility.

Second, it is not possible to construct the proposed building expansion elsewhere on the existing property, as one contiguous building is necessary for the internal conveyer system layout. Due to the topography and layout of the site, the only available space for the building expansion is on the north side of the existing building, where the expansion would encroach into the existing SCPZ.

Lastly, is not possible to reduce the size of the building expansion to avoid encroachment into the SPCZ and still meet the goals of the project. The building footprint is dictated by the size of the interior conveyor belt system, and this interior conveyor belt system was designed to allow the facility to meet the necessary anticipated shipping rates. Reducing the size of the building would mean reducing the size of the conveyor system, which would have adverse economic ramifications and is not the ideal course of action.

Therefore, to meet the goals of the project, it will be necessary to engage in construction activities inside the SCPZ, and to culvert and relocate the existing linear wetland on site. The construction will impact 0.073 acres of linear wetland. The encroachment into the SCPZ will necessitate a variance of section 1.3.2.

Section 2 – Development Alternatives

No Impact/Degradation Development Alternative:

The only no impact option available to still meet the goals of the project would be to develop a new facility at an off-site location. This was not considered to be a viable alternative, due to the logistics and environmental impact of developing a new site. Construction of a new greenfield facility requires a site that has a minimum of 60 acres and a property configuration such that it can accommodate the necessary facility layout, adjacent loading/unloading areas, trailer staging areas, employee parking areas, and other supporting facilities. It was determined that there was not another available property in the region that could fit the needs of the project.

Minimal Impact/Degradation Development Alternative Plan:

The minimal impact option would be to limit the extents of construction such that it does not encroach into the existing SPCZ. This minimal impact option would expand the existing parcel facility by 134,531 square feet, as opposed to the 231,581 square foot expansion in the Preferred Option layout. The minimal impact build option reduces the effective area of the building expansion by 57%, limiting the overall shipping capacity of the facility, and preventing UPS from meeting its targeted shipping goals.

In addition, the minimal impact build would mean that the proposed north trailer staging lot could not be built, resulting in a 31% loss of "long trailer" (65 feet long) staging spots, and a 40% loss of "short trailer" (28 feet long) spots. Effective trailer staging layout is an integral part to the UPS facility, and such a loss in staging area would have severe impacts to the effectiveness of the facility to deliver parcels. Furthermore, the layout of the site is such that this staging area cannot be absorbed anywhere else. Due to the substantial loss of building and parking area, the minimal impact alternative does not meet the needs of the project.

Preferred Development Plan:

Because the alternative build options are either not feasible or do not meet the needs of the project, the preferred option is to go forward with the full project buildout. The proposed layout meets the goals of the project and allows UPS to achieve its targeted shipping rates. The environmental impacts of this development can be mitigated and compensated for, as will be discussed in section 3.

The preferred option design has approximately 10 acres of paved area to the north of the building expansion to be used as a staging and parking area for shipping trailers. Also, it will expand the existing shipping facility by 231,581 square feet, allowing the future anticipated shipping rates to be met.

UPS has performed expansion studies for the central Ohio market with the conclusion that further investment in this facility is the correct business plan. The current facility is positioned near vital highway interchanges as well as the population center of the city, and this close proximity allows UPS to service the region and local metro area in an efficient manner.

Section 3 – Demonstration of Adequate Mitigation

Impact to Stream:

By using proper stormwater mitigation techniques, there should be no adverse impact to the water quality of the discharged stormwater. In order to mitigate effects of construction, a stormwater pollution prevention plan (SWP3) has been developed for the project prior to start of construction activities. The plan includes provisions for placement of sediment and erosion controls such as the creation of temporary storm water detention basins, the placement of silt fencing along areas of disturbance, the placement of stormwater inlet protection where applicable.

UPS is committed to the use of appropriate Best Management Practices (BMPs) to minimize any erosion/sedimentation-related impacts on stormwater discharge at the site after construction. It can be assured that the stormwater runoff will be treated per Ohio EPA standards. Two underground extended detention basin systems will be constructed to detain and filter storm water runoff generated on the expanded pavement areas on site. These treatment systems will involve pretreatment with a hydrodynamic separator to filter out suspended solids and oils from the storm water runoff. Then, this pretreated runoff will then pass through an extended detention basin outfitted with an Austin sand filtration system. The treated effluent will discharge into the existing storm channel on the north east portion of the site.

Ultimately, the encroachment into the SCPZ and the relocation of the Leib-Parker ditch will not adversely impact the quality or quantity of storm water runoff being discharged off site. Developing a SWP3 plan and implementing BMPs means that the environmental impact of the construction and operation of the proposed project will be minimized.

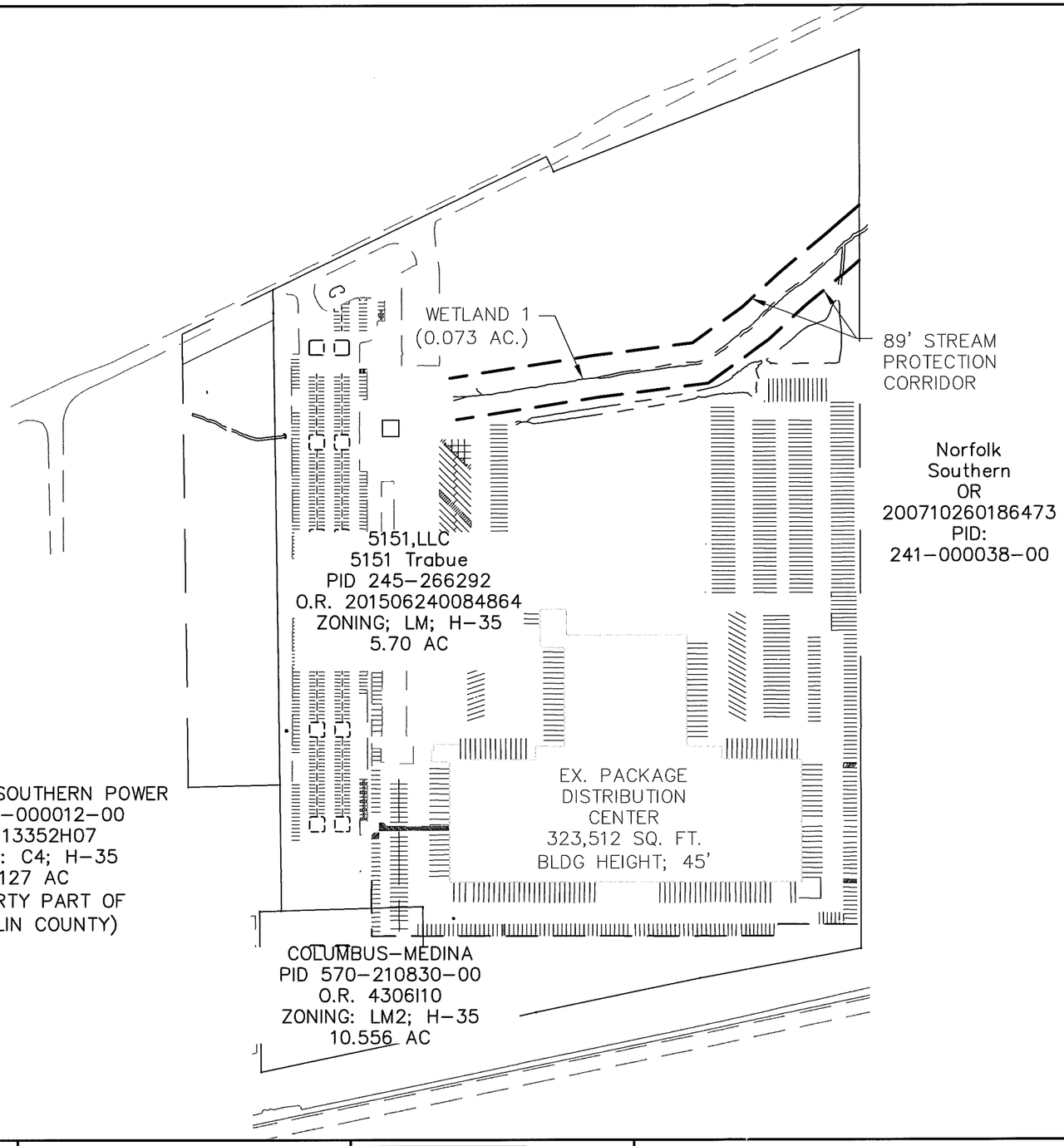
Impact to SCPZ:

As previously stated, it is debatable as to whether the current stream corridor protection zone is applicable to the Leib-Parker ditch, as it has been classified by the US Army Corps of Engineers as a linear wetland. The current existing SCPZ is calculated to be 89 feet wide, and 1100 feet long, and contains shrubs and small trees. The total SCPZ area is 2.27 acres.

If it is found that the SCPZ is applicable to the existing site, then it will be necessary to provide equivalent mitigation SCPZ, as the proposed construction will encroach on the existing SPCZ. According to Section 1.3 of the City of Columbus Stormwater Drainage Manual, if the impact of a project is to a SCPZ, "mitigation shall be considered sufficient if additional equivalent SCPZ is created at the following ratio […] Same County: 1 to 3."

The existing project site does not contain any other streams or areas where a SCPZ can be created, so the mitigation SCPZ will be achieved in an off-site location in the same county. UPS owns a property that has suitable areas for use as mitigation SCPZ, and is also located in Franklin County. Based on the Section 1.3 guidelines, 6.81 acres of SCPZ will be needed off site. The specific methods of implementing this off-site plan are still being discussed.

Appendix A – Existing, Proposed and Minimal Impact Site Layouts



EASEMENT REFERENCE			REVISIONS		
CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR	NO.	DESCRIPTION	APPROVAL/DATE

AECOM
277 W. Nationwide Blvd.
Columbus, OH 43215
United States
P: 614-464-4500
F: 614-464-0588

FIGURE 1

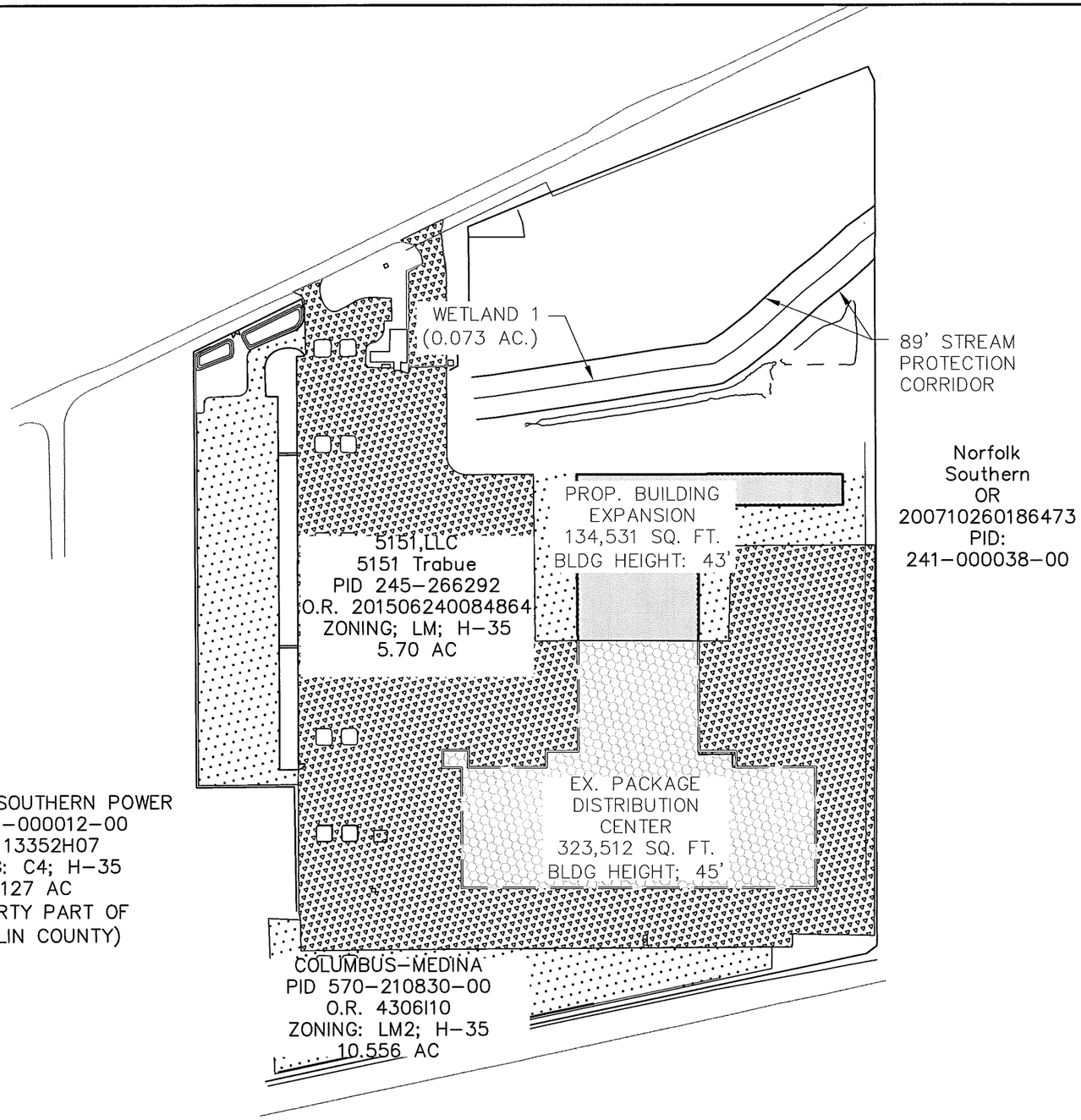
EXISTING SITE OVERVIEW MAP

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER					
	CONTRACTOR					
	INSPECTOR				SCALE:	SHEET: 1 OF 3
	AGREEMENT		COMPLETED			
	RPD	CKD	CLD	CON. DR.	CONTRACT DRAWING NO.	RECORD PLAN NO.
			DATE 7/25/2016			

FILE NAME AND DATE



LEGEND

NEW PAVEMENT – 11.05 ACRES

EXISTING PAVEMENT – 24.35 ACRES

NEW BUILDING ADDITION – 3.09 ACRES

EXISTING BUILDING – 7.50 ACRES

NORTH

0 300 600 900

SCALE: 1"=300'

EASEMENT REFERENCE				REVISIONS		
CITY NO.	COUNTY RECORDER		GRANTOR	NO.	DESCRIPTION	APPROVAL/DATE
	VOL.	PAGE				

FILE NAME AND DATE

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Columbus, OH 43215
United States
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F: 614-464-0588

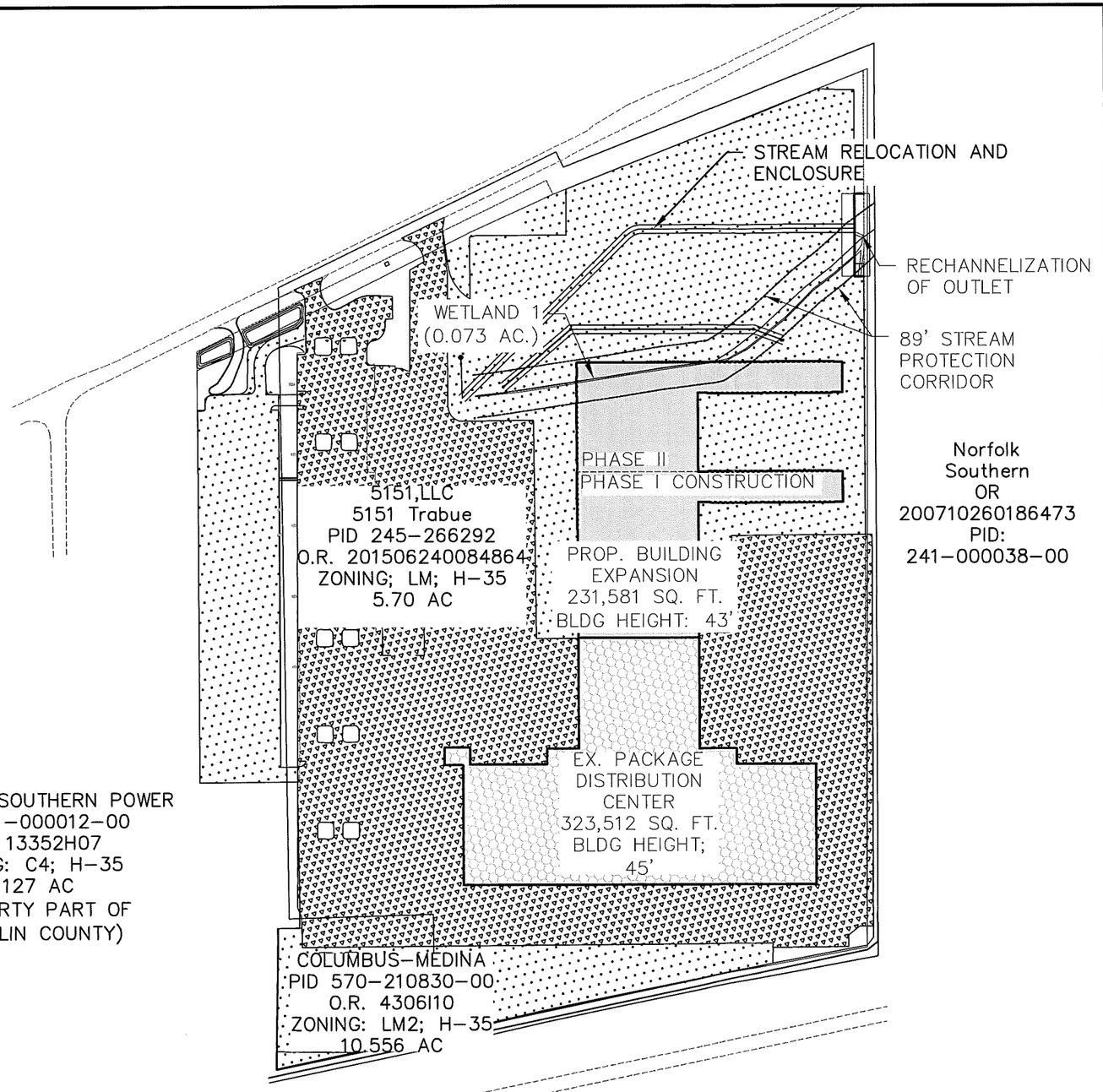
FIGURE 2

MINIMAL IMPACT OPTION

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER				SCALE:	SHEET: 2 OF 3
	CONTRACTOR					
	INSPECTOR					
	AGREEMENT		COMPLETED			
	RPD	CKD	CLD	CON. DR.	CONTRACT DRAWING NO.	RECORD PLAN NO.
			DATE 7/25/2016			



LEGEND

NEW PAVEMENT – 20.42 ACRES

EXISTING PAVEMENT – 24.86 ACRES

NEW BUILDING ADDITION – 5.36 ACRES

EXISTING BUILDING – 7.50 ACRES

NORTH

0 300 600 900

SCALE: 1"=300'

EASEMENT REFERENCE				REVISIONS		
CITY NO.	COUNTY RECORDER		GRANTOR	NO.	DESCRIPTION	APPROVAL/DATE
	VOL.	PAGE				

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Columbus, OH 43215
United States
P: 614-464-4500
F: 614-464-0588

FIGURE 3

PROPOSED WORK

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER					
	CONTRACTOR					
	INSPECTOR					
	AGREEMENT		COMPLETED			
	RPD	CKD	CLD	CON. DR.		
	DATE 7/25/2016					

SCALE:

SHEET: **3 OF 3**

CONTRACT DRAWING NO.

RECORD PLAN NO.

FILE NAME AND DATE

Appendix B – Copy of the Preconstruction Notification to the US Army Corps of Engineers Under Section 404 Nationwide Permit

PRE-CONSTRUCTION NOTIFICATION TO THE U.S. ARMY CORPS OF ENGINEERS UNDER SECTION 404 NATIONWIDE PERMIT 39

UPS OHTRA Expansion Project Columbus, Ohio

July 2016

Prepared by:
AECOM

Prepared for:
United Postal Service, Inc.

AECOM

July 26, 2016

Ms. Crystal Chambers
Permits
United States Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701

Subject: **United Parcel Service, Inc. (UPS), OHTRA Expansion Project; City of Columbus, Franklin County, Ohio**
Nationwide Permit 39 Pre-Construction Notification

Dear Ms. Chambers,

Transmitted on behalf of United Parcel Service, Inc. (UPS), is a Pre-Construction Notification (PCN) to U.S. Army Corps of Engineers (USACE) for coverage under Nationwide Permit 39 - Commercial and Institutional Developments (NWP 39) for construction activities within jurisdictional areas on UPS' property for the OHTRA Expansion Project (Project). The Project is located at 5101 Trabue Road in Columbus, Franklin County, Ohio. The Project is within the Southwest Columbus and Galloway, Ohio U.S. Geological Survey 7.5" topographical quadrangle. The Project location is depicted on the Overview Map (Figure 1 - Attachment A).

The UPS Trabue Road processing facility was originally constructed in 1986 to handle parcel distribution needs for the central Ohio area. Due to an increase in e-commerce and the population growth of the greater Columbus area, the existing facility can no longer meet target shipping rates and will need to be expanded. The existing Trabue Road facility encompasses approximately 42 acres of the approximately 61 acre property. The remaining 18 acres of undeveloped area currently exists as greenspace rough graded for either future expansion plans or topsoil/soil stockpile areas. The proposed expansion involves the following components:

- 230,000 square foot building expansion including excavation, foundations, floor slabs and building structure.
- Renovation and reconfiguration of the existing 330,000 square foot building.
- 20 acres of new or reconfigured asphalt and concrete to create tractor, trailer, and employee parking areas.
- Utilities: Fire/Water Services, sanitary sewer service, electrical service, storm sewers.
- Stormwater Management Facilities: storm sewers, underground detention facilities, stormwater quality facilities.

The limit of disturbance (30.64 acres) for the expansion is shown in Figure 2 in Attachment A. Figure 3 in Attachment A provides a detailed look at the specific expansion components of the Project.

AECOM
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202
Tel: 513.651.3440
Fax: 877.660.7727

In early June 2015 approximately 18 acres of UPS' property was evaluated for the presence of wetland, streams and ponds, which resulted in the evaluation of one intermittent stream totaling 1,065 linear feet and two stormwater ponds totaling 0.76-acre. The property survey is summarized in the Wetland Delineation and Stream Assessment Report provided in Attachment B.

In mid-July 2016 USACE staff conducted a jurisdictional determination and determined that the stream had enough hydrophytic vegetation to classify the feature as a linear palustrine emergent (PEM) wetland totaling 0.073-acre. Following the USACE field visit, an AECOM ecologist collected wetland and upland determination forms, completed an Ohio Environmental Protection Agency (OEPA) Ohio Rapid Assessment Method (ORAM) form, and created a photo log which can be found in Attachment C.

UPS considered other options for the Project that may have reduced the impacts to Wetland 1, however the other options were either not feasible or did not meet the needs of the Project. The layout shown in Figure 3 in Attachment A meets the goals of the Project to expand the building facility and the surrounding parking area for trailer staging, and is economically feasible. The Project was designed to avoid Wetland 1 as much as practical, however 0.073-acre must be filled and rerouted. Figure 4 in Attachment A shows the rerouted wetland in a 60-inch reinforced concrete culvert.

Although impacting Wetland 1 was unavoidable, the total impact of 0.073-acre will not exceed the 0.50-acre NWP 39 limit as shown in Table 1 and in Figure 2 in Attachment A. The portion of Wetland 1 that is not impacted beyond the LOD will be protected with orange barrier fence (or something similar) to prevent accidental impact beyond what is necessary and permitted. UPS will also implement and follow a stormwater pollution prevention plan to further minimize and avoid unnecessary impacts to more of the wetland on site.

Initial agency coordination letters were sent to the United States Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources-Division of Real Estate (ODNR). Both agencies provided responses in late April 2016. Copies of the letters to the agencies are provided in Attachment D. Both agencies commented on tree clearing restrictions for Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). UPS intends conduct tree clearing during the recommended window between October 1st and March 31st. ODNR also commented that the Project is within the range of 15 mussel species and eight fish species, however since there is no in-stream work, the Project is not likely to impact these species. ODNR's final comment was that the Project is within the range of the upland sandpiper (*Bartramia longicauda*) a state endangered bird that utilizes grasslands for nesting between April 15th and July 31st. Based on the current construction schedule, the areas that are currently covered with herbaceous vegetation, will be devoid of potential nesting habitat during the bird's nesting period, so it is anticipated that the Project will have no impacts on the species.

To address Section 107 requirements, AECOM archaeologists conducted a literature review and Phase I archaeological survey in March 2016. A copy of the Phase I report and correspondence

to the Ohio State Historic Preservation (OHPO) sent on May 19, 2016, along with OHPO's response on June 16, 2016 are provided in Attachment E.

Project details are provided in the enclosed Application Engineering Form 4345 (Attachment F). AECOM and UPS are of the understanding that USACE will provide a Jurisdictional Determination to support Project authorization based on their site visit in mid-July 2016 and supplemental information provided in Attachment C.

Since the Project permanent impacts are 0.073-acre, the mitigation threshold of 0.10-acre for NWP 39 will not be exceeded; therefore UPS is not required to provide compensatory mitigation.

The scope of the Project appears to fall within the activities and thresholds described under NWP 39 for Commercial and Institutional Developments. UPS is requesting authorization to proceed with the Project as described herein and within the attachments.

Please call Matt Thomayer at (513) 419-3449, if you have any questions or require additional information.

Sincerely,

AECOM

Matthew D. Thomayer
Senior Ecologist
Matt.thomayer@aecom.com

John Ortli
Project Manager
John.ortli@aecom.com

CC: Jeff McBride, UPS

Attachments

Table 1: Delineated Wetlands Located Within UPS OHTRA Expansion Project 18 Acre Survey Limits

Attachment A: Figures

Figure 1: Overview Map

Figure 2: Limit of Disturbance

Figure 3: Proposed Work

Attachment B: Wetland Delineation and Stream Assessment Letter Report

Attachment C: Wetland 1 Addendum

Attachment D: Initial Threatened and Endangered Species Agency Letters

Attachment E: Phase I Archaeological Survey Report, OHPO Submittal, and OHPO Response

Attachment F: Application Engineering Form 4345

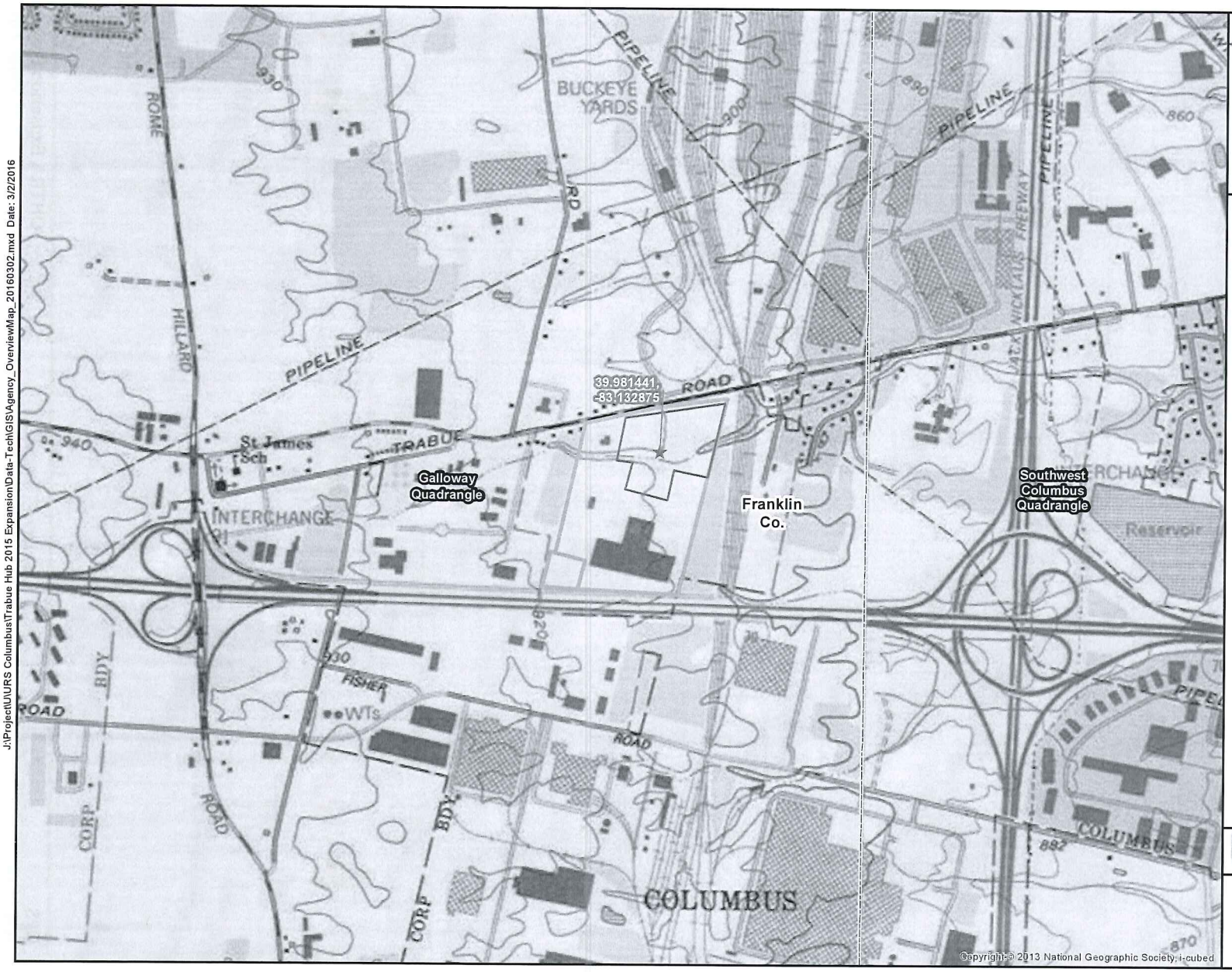
TABLE 1
DELINEATED WETLANDS LOCATED WITHIN UPS OHTRA EXPANSION PROJECT 18 ACRE SURVEY LIMITS

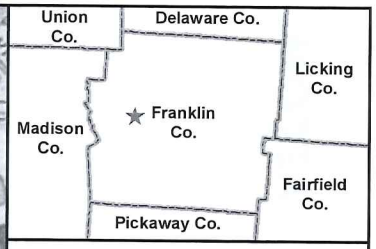
Report Name	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Survey Area	Acreage within Limit of Disturbance
Wetland 1	PEM	21.5	1	0.07	0.07
Total: 1 Wetland				**0.07**	**0.07**

Cowardin Wetland Type[a] : PEM = palustrine emergent,

ATTACHMENT A

FIGURES





LEGEND:

- ★ Project Coordinates
- Trabue Road Expansion Project Area
- Franklin County Auditor Parcel Boundaries
- USGS 7.5" Topographical Quadrangle

N

0 1,000 2,000

Scale in Feet

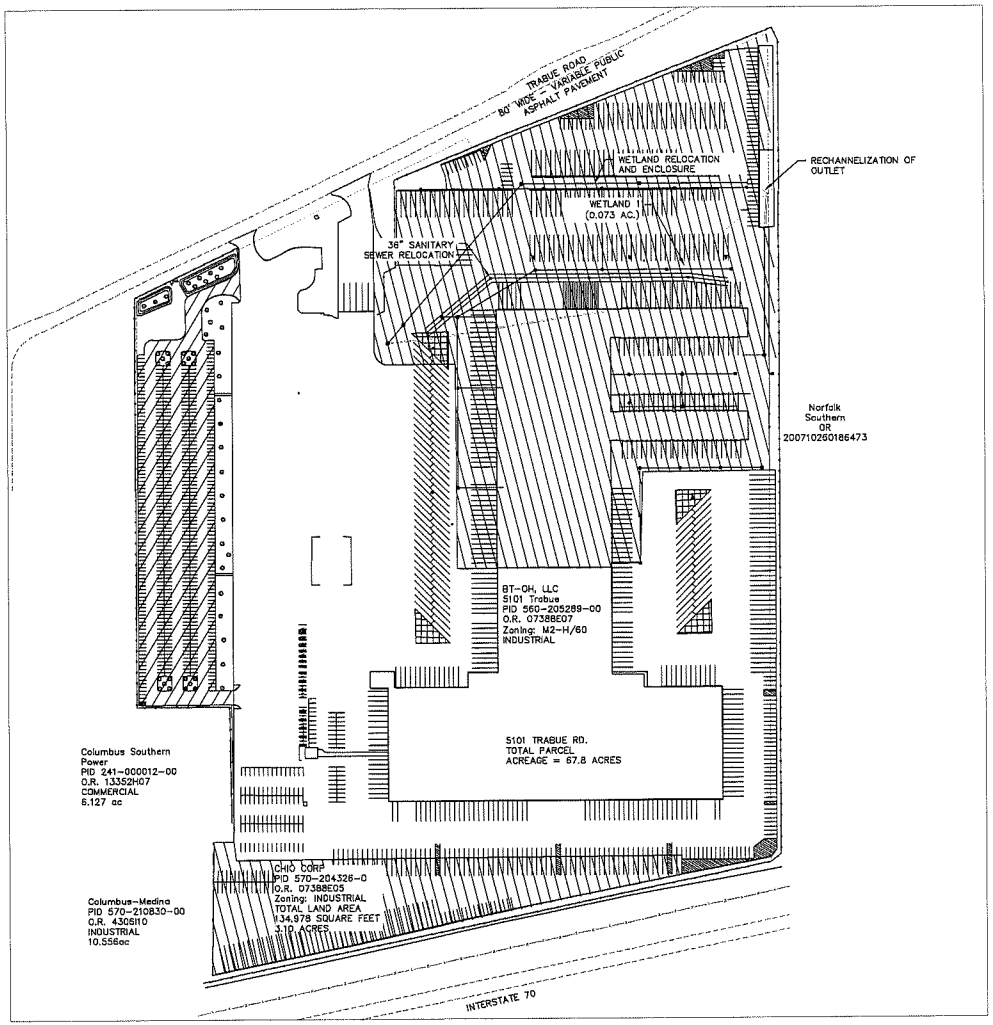
BASE MAP SOURCE:
http://goto.arcgisonline.com/maps/USA_Topo_Maps

UPS Trabue Road Expansion Project

FIGURE 1
PROJECT OVERVIEW

AECOM

J:\Project\UURS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Agency_OverviewMap_20160302.mxd Date: 3/2/2016



LIMIT OF DISTURBANCE FOR PROPOSED CONSTRUCTION (30.66 ACRES)

NORTH

0 150 300 450

SCALE: 1"=150'

EASEMENT REFERENCE				REVISIONS		
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277 W. Nationwide Blvd.
Columbus, OH 43215
United States
P: 614-464-4500
F: 614-464-0588

FIGURE 2
LIMIT OF DISTURBANCE

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER	
	CONTRACTOR	
	INSPECTOR	
	AGREEMENT	COMPLETED
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	DATE 7/19/2016	

SCALE:
SHEET: 2 OF 4
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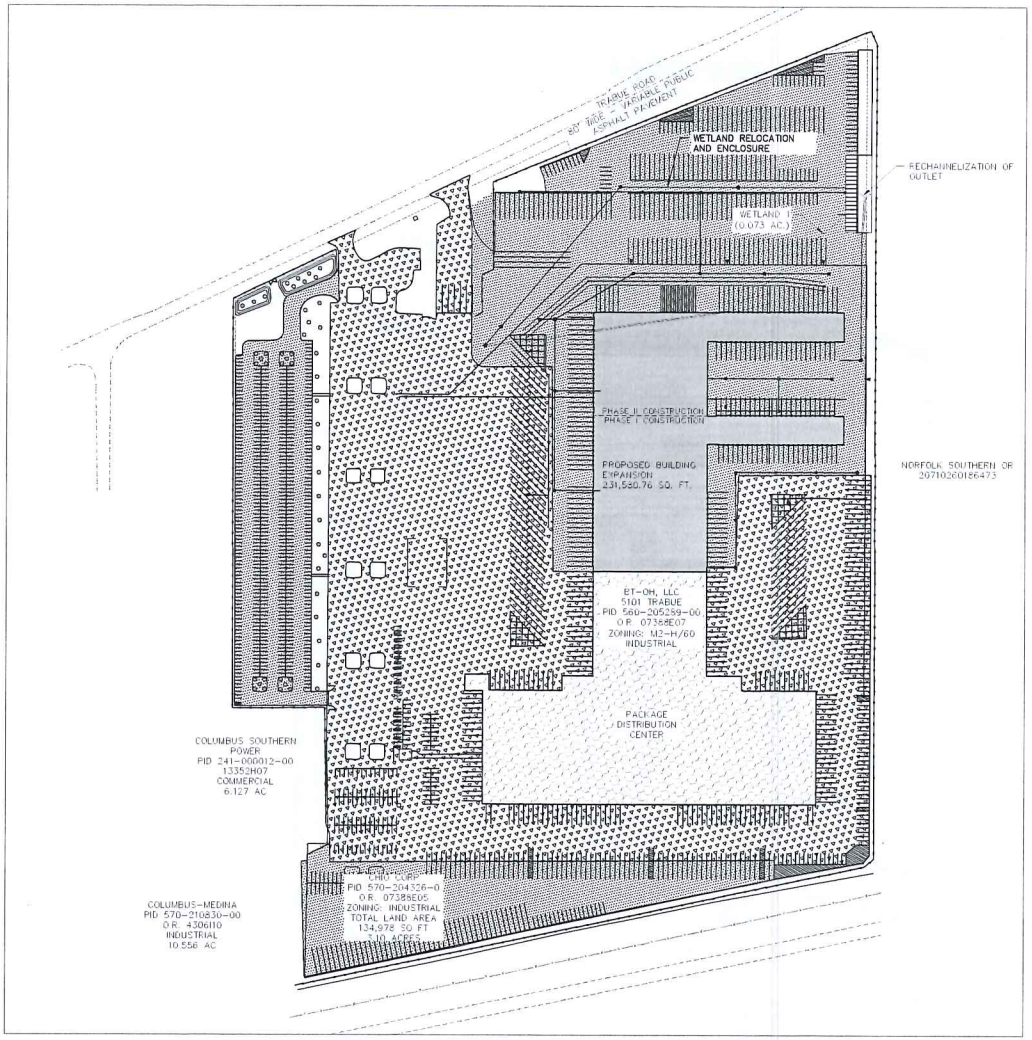
RECORD PLAN NO.



LEGEND

- NEW PAVEMENT – 20.42 ACRES
- EXISTING PAVEMENT – 24.86 ACRES
- NEW BUILDING ADDITION – 5.36 ACRES
- EXISTING BUILDING – 7.50 ACRES

NORTH

0 150 300 450

SCALE: 1"=150'

EASEMENT REFERENCE			
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REVISIONS		
NO	DESCRIPTION	APPROVAL/DATE

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United States
P: 614-464-4500
F: 614-464-0588

FIGURE 3
PROPOSED WORK

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

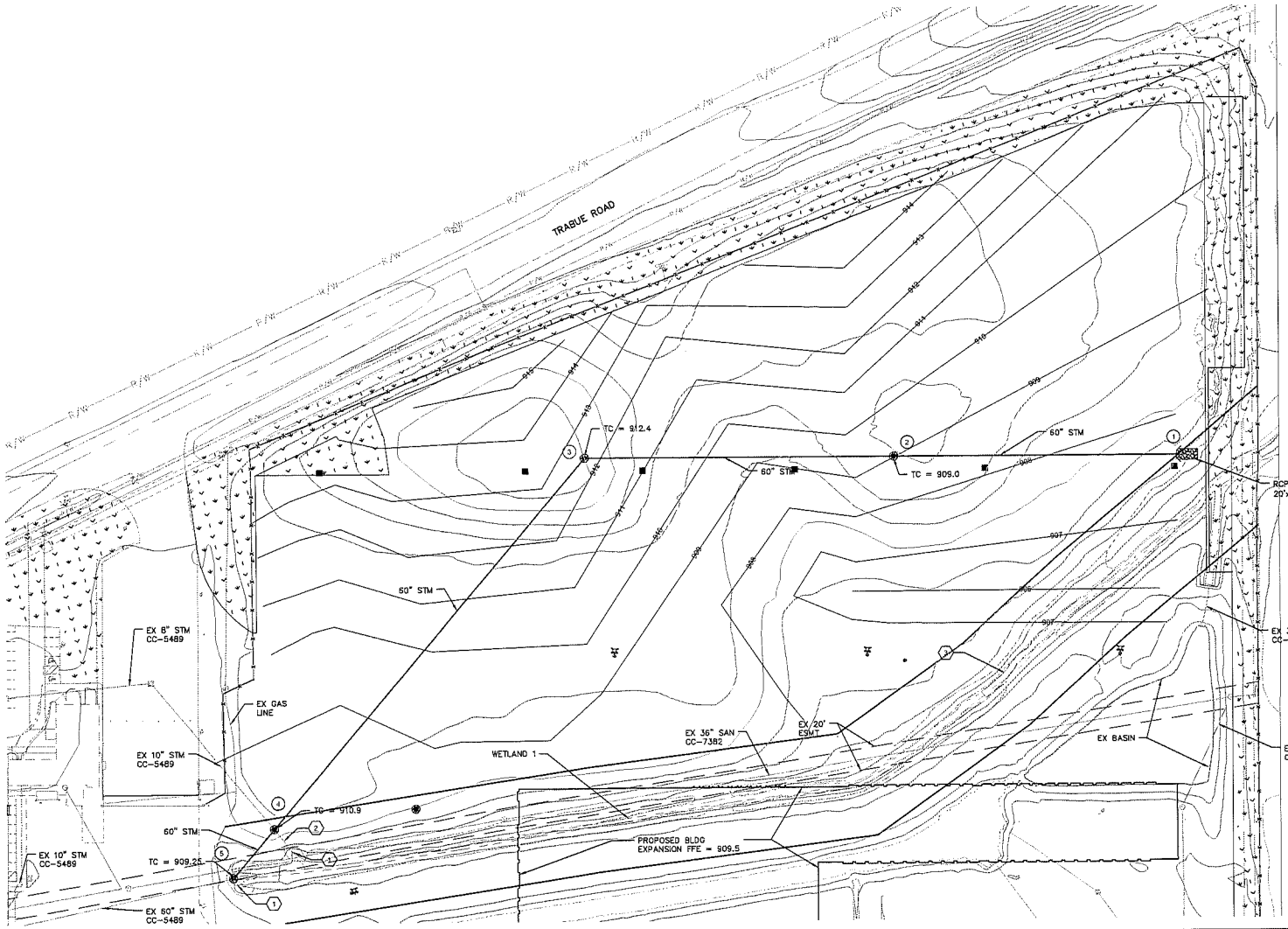
DIVISION USE ONLY | OWNER | CONTRACTOR | INSPECTOR | AGREEMENT | COMPLETED | PPD | O.B. | CLD. | CON. DR. | DATE 7/19/2016

SCALE:

SHEET: 3 OF 4

CONTRACT DRAWING NO.

RECORD PLAN NO.



CODED NOTES:

1. EX HEADWALL TO BE REMOVED
2. 28 L.F. OF EX 10" STM TO BE REMOVED. REMAINING 10" STM SHALL OUTLET INTO PROPOSED STRUCTURE 4.
3. EXISTING WETLAND TO BE FILLED.

NORTH

0 50 100 150

SCALE: 1"=50'

EASEMENT REFERENCE			
CITY NO.	COUNTY RECORDER VOL.	PAGE	GRANTOR

REVISIONS		
NO.	DESCRIPTION	APPROVAL/DATE

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FIGURE 4
WETLAND RELOCATION PLAN

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	ORDER
	CONTRACTOR
	INSPECTOR
	ASPECOUNT / COMPLETED
	APD / CAD / CLD / CDD / DA
	DATE 7/19/2016

SCALE:
SHEET: 4 OF 4
CONTRACT DRAWING NO.
RECORD PLAN NO.

ATTACHMENT B

WETLAND DELINEATION AND STREAM ASSESSMENT LETTER REPORT

UPS TRABUE ROAD EXPANSION PROJECT

WETLAND DELINEATION AND STREAM ASSESSMENT REPORT

Prepared for:
United Parcel Service, Inc.
29855 Schoolcraft Rd.
Livonia, Michigan 48150

AECOM

525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

June 2015

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS and ABBREVIATIONS

CWA	Clean Water Act
DBH	Diameter at Breast Height
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
HUC	Hydrologic Unit Code
IBI	Index of Biotic Integrity
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate Wetland
OEPA	Ohio Environmental Protection Agency
OHWM	Ordinary High Water Mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine Emergent
PHWH	Primary Headwater Habitat
POW	Palustrine Open Water
PSS	Palustrine Scrub/Shrub
PUB	Palustrine Unconsolidated Bottom
QHEI	Qualitative Habitat Evaluation Index
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

United Parcel Service, Inc. (UPS) is proposing to expand their existing Trabue Road shipping facility to increase their parcel processing and shipping capacity. The proposed Project will be located in Columbus, Franklin County, Ohio, and encompasses approximately 17.65 acres. The Project is referred to as the Trabue Road Expansion Project (Project). The proposed Project is illustrated on Figure 1.

Land uses encompassed by the Project survey area were assigned a general classification based upon the principal land characteristics of the location as observed from within a given area, aerial photograph review, and field surveys. General land use types within the Project survey area include maintained commercial lawn with limited shrub/sapling coverage, and maintained infrastructure associated with the existing Trabue Road facility.

AECOM conducted a wetland delineation to identify ecological features within the Project survey area. This document will outline the methodologies used and the results of the wetland delineation conducted on June 2, 2015.

2.0 METHODOLOGY

The purpose of the field survey was to assess whether wetlands and other "waters of the U.S." exist within the Project survey area. Prior to conducting field surveys, digital and published county Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological Survey (USGS) 7.5-minute topographic maps were reviewed as an exercise to identify the occurrence and location of potential wetland areas.

During the field survey on June 2, 2015 the physical boundaries of observed water features were recorded using sub-decimeter accurate Trimble Global Positioning System (GPS) units. The GPS data was then imported in to ArcMap GIS software where the data was then reviewed and edited for errors.

2.1 WETLANDS

The Project survey corridor was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers (USACE) *1987 Wetland Delineation Manual* (*1987 Manual*) (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (*Regional Supplement*) (USACE, 2010). The *Regional Supplement* was released in August 2010 by the USACE to address regional wetland

characteristics and improve the accuracy and efficiency of wetland delineation procedures. The *1987 Manual and Regional Supplement* define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

Since quantitative data were not available for wetlands in the vicinity of the Project, AECOM utilized the routine delineation method described in the *1987 Manual* and *Regional Supplement* that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance. The methodology used to examine each parameter is described in the following sections.

2.1.1 SOILS

Soils were examined using a shovel to extract soil samples. The soils were examined for hydric soil characteristics. A *Munsell Soil Color Chart* (Kollmorgen Corporation, 2000) was used to identify the hue, value, and chroma of the matrix and mottles of the soils. Generally, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less are considered to exhibit hydric soil characteristics (Environmental Laboratory, 1987).

2.1.2 HYDROLOGY

The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands). The *Regional Supplement* states that the growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature (12-in. depth) is 41 degree Fahrenheit (^{o}F) or higher as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplement* also states that if onsite data gathering is not practical, the growing season can be approximated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28^{o}F air temperature in the spring and fall, respectively. The National Weather Service WETS data obtained from the NRCS National

Water and Climate Center reveals that in an average year, this period lasts from April 9 to October 30, or 204 days. In the Project area, five percent of the growing season equates to approximately 10 days (USDA 2015).

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed historical hydrological data of the project site. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplement.* Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as, drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2010).

2.1.3 VEGETATION

Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the U.S. Army Corps of Engineers *2014 National Wetland Plant List: Midwest Region,* which encompasses the entire Project area. An area is determined to have hydrophytic vegetation when, under normal circumstances, 50 percent or more of the composition of the dominant species are OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when more than 50 percent of the composition of the dominant species was FACU and/or UPL species. In addition to the dominance test, the FAC-Neutral test and prevalence tests can be used to determine if a wetland has a predominance of hydrophytic vegetation.

Recent USACE guidance indicates that to the extent possible, the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season in a normal rainfall year (USACE, 2011).

2.1.4 WETLAND CLASSIFICATIONS

Wetlands were classified based on the naming convention found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*, 1979). Typically, wetlands in this region of Ohio fall into one of the following categories:

- ***PEM*** – Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

- ***PSS*** – Scrub/shrub wetlands are characterized by woody vegetation that is less than three inches diameter at breast height (DBH), and greater than 3.28 feet tall. The woody angiosperms (i.e. small trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

- ***PFO*** – Forested wetlands are characterized by woody vegetation that is 3 inches or more DBH, regardless of height. The woody angiosperms (i.e. trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

- ***POW*** - Open water wetlands are characterized by a body of water with unknown depth and no indication of vegetation.

- ***PUB*** – Unconsolidated bottom wetlands are characterized by a body of water with up to 30% vegetative cover.

2.1.5 OHIO RAPID ASSESSMENT METHOD v. 5.0

The ecological function and integrity of wetlands in Ohio is assessed using the OEPA prescribed Ohio Rapid Assessment Method (ORAM), v. 5.0 for wetlands (Mack 2001). The ORAM is an assessment tool that evaluates wetlands and groups them into categories based on their functions and integrity. These categories are used by OEPA to determine project water quality impacts for Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v. 5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, according to the OEPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001).

Category 1 Wetlands

Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and do not provide for or contain critical habitats for threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited

potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to be a resource that has been severely degraded or has a limited potential for restoration, or is of low ecological functionality.

Category 2 Wetlands

Category 2 wetlands "...support moderate wildlife habitat, or hydrological or recreational functions," and as wetlands which are "...dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." Category 2 wetlands constitute the broad middle category of "good" quality wetlands, and can be considered a functioning, diverse, healthy water resource that has ecological integrity and human value. Some Category 2 wetlands are lacking in human disturbance and considered to be naturally of moderate quality; others may have been Category 3 wetlands in the past, but have been degraded to Category 2 status.

Category 3 Wetlands

Wetlands that are assigned to Category 3 have "...superior habitat, or superior hydrological or recreational functions." They are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide. It is important to stress that a wetland may be a Category 3 wetland because it exhibits one or all of the above characteristics. For example, a forested wetland located in the flood plain of a river may exhibit "superior" hydrologic functions (e.g. flood retention, nutrient removal), but not contain mature trees or high levels of plant species diversity.

2.2 STREAMS

Regulatory activities under the Clean Water Act (CWA) provide authority for states to issue water quality standards and "designated uses" to all waters of the U.S. upstream to the highest reaches of the tributary streams. In addition, the Federal Water Pollution Control Act of 1972 and its 1977 and 1987 amendments require knowledge of the potential fish or biological communities that can be supported in a stream or river, including upstream headwaters. Streams were identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM). The USACE defines OHWM as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial

vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (USACE, 2005).

Stream assessments were conducted using the methods described in the OEPA's Methods for Assessing Habitat in Flowing Waters: Using OEPA's *Qualitative Habitat Evaluation Index* (Rankin, 2006) and *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams, Version 3* (Davic, 2012).

2.2.1 OEPA QUALITATIVE HABITAT EVALUATION INDEX

The qualitative habitat evaluation index (QHEI) is designed to provide a rapid determination of habitat features that correspond to those physical factors that most affect fish communities and which are generally important to other aquatic life (*e.g.,* macroinvertebrates). The quantitative measure of habitat used to calibrate the QHEI score are Indices (or Index) of Biotic Integrity (IBI) for fish. In most instances the QHEI is sufficient to give an indication of habitat quality, and the intensive quantitative analysis used to measure the IBI is not necessary. It is the IBI, rather than the QHEI, that is directly correlated with the aquatic life use designation for a particular surface water.

The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one square mile, if natural pools are greater than 40 cm, or if the water feature is shown as blue-line waterways on USGS 7.5-minute topographic quadrangle maps. In order to convey general stream habitat quality to the regulated public, the OEPA has assigned narrative ratings to QHEI scores. The ranges vary slightly for headwater streams (H are those with a watershed area less than or equal to 20 square miles) versus larger streams (L are those with a watershed area greater than 20 square miles). The Narrative Rating System includes: Very Poor (<30 H and L), Poor (30 to 42 H, 30 to 44 L), Fair (43 to 54 H, 45 to 59 L), Good (55 to 69 H, 60 to 74 L) and Excellent (70+ H, 75+ L).

2.2.2 OEPA PRIMARY HEADWATER HABITAT EVALUATION INDEX

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or "branches") and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to

headwater streams can have a cascading effect on the downstream water quality and habitat value. The headwater habitat evaluation index (HHEI) is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a "defined bed and bank, with either continuous or periodically flowing water, with watershed area less than or equal to 1.0 mi^2 (259 ha), *and* a maximum depth of water pools equal to or less than 15.75 inches (40 cm)" (Davic, 2012).

Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessments result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into "Class 1 PHWH Streams", 30 to 69.9 are "Class 2 PHWH Streams", and 70 to 100 are "Class 3 PHWH Streams". Technically, a stream can score relatively high, but actually belong in a lower class, and vice-versa. According to the OEPA, if the stream score falls into a class and the scorer feels that based on site observations that score does not reflect the actual stream class, a decision-making flow chart can be used to determine appropriate PHWH stream class using the HHEI protocol (Davic, 2012). Evidence of anthropogenic alterations to the natural channel will result in a "Modified" qualifier for the stream.

Class 1 PHWH Streams: Class 1 PHWH Streams are those that have "normally dry channels with little or no aquatic life present" (Davic, 2012). These waterways are usually ephemeral, with water present for short periods of time due to infiltration from snowmelts or rainwater runoff.

Class 2 PHWH Streams: Class 2 PHWH Streams are equivalent to "warm-water habitat" streams. This stream class has a "moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis" (Davic, 2012). These species communities are composed of vertebrates (fish and salamanders) and/or benthic macroinvertebrates that are considered pioneering, headwater temporary, and/or temperature facultative species.

Class 3 PHWH Streams: Class 3 PHWH Streams usually have perennial water flow with cool-cold water adapted native fauna. The community of Class 3 PHWH Streams is comprised of vertebrates (either cold water adapted species of headwater fish and or obligate aquatic species of salamanders, with larval stages present), and/or a diverse community of benthic cool water adapted macroinvertebrates present in the stream continuously (on an annual basis).

Results of the HHEI assessments are discussed in Section 3.2.3 of this report.

3.0 RESULTS

Within the Project survey area, AECOM delineated one stream and two ponds. No wetlands were identified in the Project survey area. The identified water features are discussed in detail in the following sections.

3.1 WETLANDS

No wetlands were identified in the Project survey area during the field evaluation.

3.1.1 Preliminary Soils Evaluation

Soils in the Project survey area were observed and documented as part of the delineation methodology. Four map units from three soil series are mapped within the Project survey area (USDA, 1980). According to the USDA/NRCS Web Soil Survey of Franklin County, Ohio (NRCS 2015), and the NRCS Hydric Soils List of Ohio, all three of the identified soil series are mapped with hydric inclusions (NRCS, 2014). Table 1 provides a detailed overview of all soil series and soil map units within the Project survey area. Soil map units located within the Project survey area are shown on Figure 2.

3.1.2 National Wetland Inventory Map Review

National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation, and which have typically not been field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. The USFWS website states that the NWI maps are not intended or designed for jurisdictional wetland identification or location. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. NWI maps are, however, useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI map of the Galloway, Ohio quadrangle, the Project survey area contains no mapped NWI wetlands.

3.2 STREAM CROSSINGS

AECOM identified one stream, totaling 1,065-feet, within the Project survey area that is described below in Table 3.2.1. The stream was assessed using the HHEI methodology (drainage area less than 1 mi^2), and was classified as intermittent. The location of the stream is shown on Figure 3.

AECOM has preliminarily determined that the stream appears to be jurisdictional (i.e., a water of the U.S.), as it appears to be a tributary that flows into or combines with another stream (water of the U.S).

TABLE 3.2.1

DELINEATED STREAMS WITHIN THE TRABUE ROAD EXPANSION PROJECT SURVEY AREA

Report Name	Waterbody	Flow Regime	Form Used[a]	Score	Class or Narrative Description	Bankfull Width (feet)	Maximum Pool Depth (inches)	Linear Feet within Survey Area
Stream 1	Unnamed tributary to unnamed tributary to Scioto River	Intermittent	HHEI	37	Modified Class 2	3	8	1,065
Total: 1								**1,065**

Form Used[a] : QHEI = Qualitative Habitat Evaluation Index, HHEI = Headwater Habitat Evaluation Index, NA = Not Assessed (default to the State of Ohio's assessment)
* = Narrative description is based on Ohio Environmental Protection Agency's ranking. See Ohio Administrative Code 3745-1-09.

3.2.1 USGS Watersheds

Review of USGS watershed data indicates that the Project is located within the Upper Scioto (05060001) Hydrologic Unit Code (HUC) 8 watershed (USGS, 2015). Within the Upper Scioto watershed, the Project will cross one minor (HUC 12) watershed: Dry Run-Scioto River (050600011205).

3.2.2 Qualitative Habitat Evaluation Index

The field survey within the Project survey area did not identify any QHEI-assessed streams.

3.2.3 Primary Headwater Habitat Evaluation Index

The field survey within the Project survey area identified one headwater stream (Stream 1) totaling 1,065- linear feet as shown on Figure 3. A Completed HHEI form for Stream 1 is provided in Appendix A. Color photographs were taken of the stream during the field survey and are provided in Appendix B1.

The stream was classified as a Modified Class 2 headwater stream. Stream 1 received a score of 37 and was classified as intermittent. The substrate mainly consisted of silt and clay with a lesser amount of cobble and gravel. The stream contained evidence of stream channel modifications (channelized and lined with riprap). These modifications resulted in the stream receiving a Modified Class 2 designation. The maximum pool depth is eight inches, and bank full width did not exceed three feet.

3.3 PONDS

Two ponds totaling 0.76 acres were identified within the Project survey area. Both ponds appear to be man-made and part of UPS' stormwater management. The locations of ponds identified within the Project survey corridor are shown on Figure 3. Color photographs were taken of the ponds during the field survey and are provided in Appendix B2.

4.0 SUMMARY

The delineation of the Project survey area did not identify any wetlands.

There was one intermittent stream identified within the Project survey area totaling 1,065 linear feet. The stream was assessed using the HHEI methodology (drainage area less than 1 mi^2).

Two ponds totaling 0.76 acres were identified within the Project survey area and appear to be man-made and part of stormwater management.

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which AECOM is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of AECOM.

The information contained in this wetland delineation is generally for a study area that is typically much larger than the actual Project limits-of-disturbance; therefore, lengths and acreages listed in this report may not necessarily constitute the actual impacts of the Project. If necessary, a separate report and/or permit(s) that identifies Project impacts will be provided with agency submittals.

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TABLE 1

TRABUE ROAD EXPANSION PROJECT: SOIL MAP UNITS AND DESCRIPTIONS

Soil Series	Symbol	Map Unit Description	Percent of Survey Area by Series	Topographic Setting	Hydric	Hydric Component (%)
Celina	CeB	Celina silt loam, 2 to 6 percent slopes	37.15	Convex ridgetops, side slopes above steeper areas, and along well-defined waterways	Hydric Inclusions	Kokomo (5%)
Crosby	CrA	Crosby silt loam, 0 to 2 percent slopes	19.64	Narrow to broad upland areas, low knolls, ridges, and depressions	Hydric Inclusions	Kokomo (8%)
	CrB	Crosby silt loam, 2 to 6 percent slopes	38.65	Narrow to broad upland areas, low knolls, ridges, depressions, and along waterways	Hydric Inclusions	Kokomo (8%)
Lewisburg	LeB	Lewisburg-Crosby complex, 2 to6 percent slopes	4.56	Low knolls, ridges, depression	Hydric Inclusions	Kokomo (15%)

Data sources include:

USDA, NRCS. 2015 Soil Survey Geographic (SSURGO) Database. Avialable online at: http://soildatamart.nrcs.usda.gov/

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LEGEND:
Trabue Road Expansion Survey Area

N

0 1,400 2,800
Scale in Feet

BASE MAP SOURCE:
National Geographic Society; USA Topo Maps

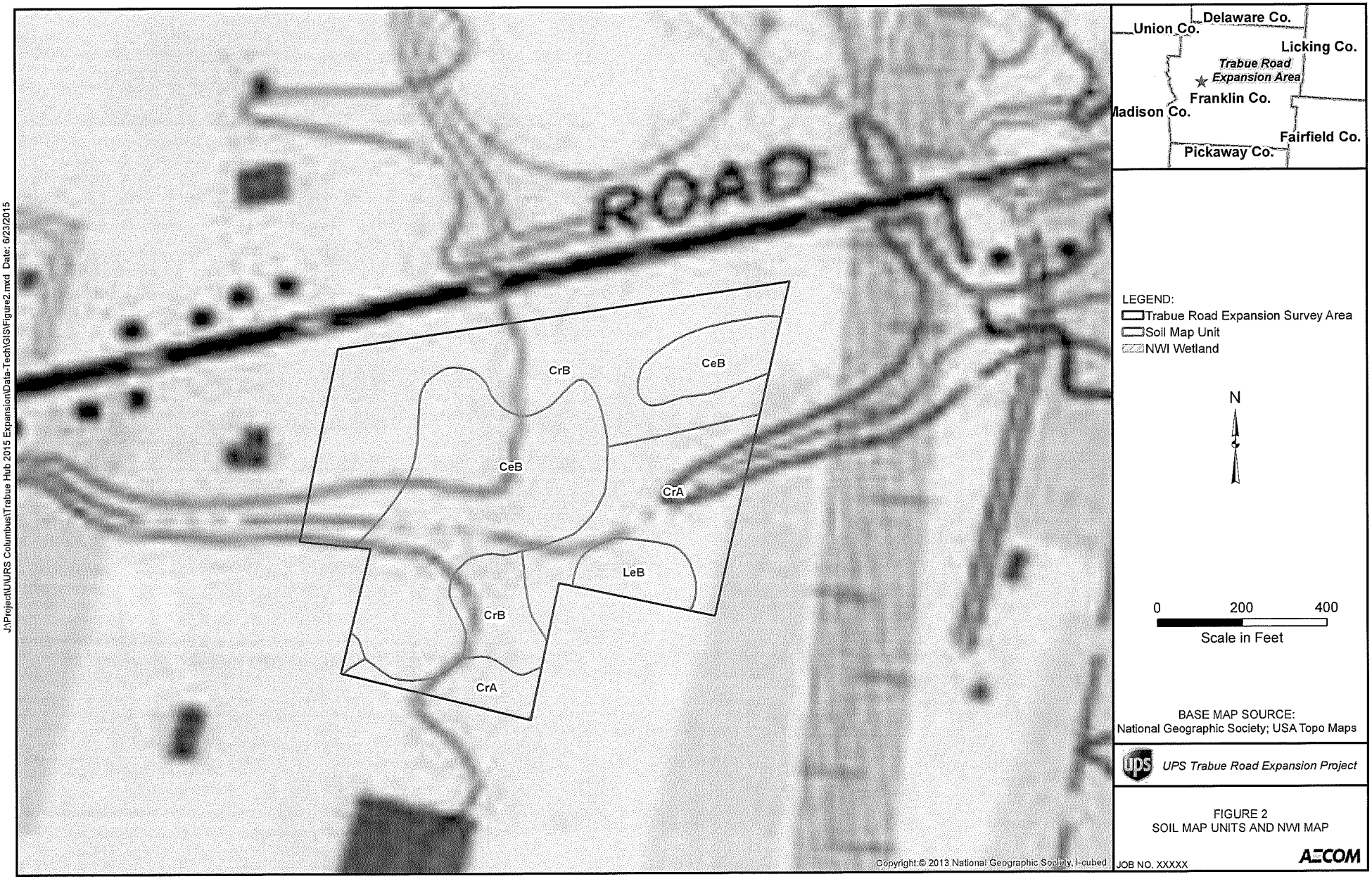
UPS Trabue Road Expansion Project

FIGURE 1
OVERVIEW MAP

JOB NO. XXXXX

AECOM

J:\Project\NU\URS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Figure1.mxd Date: 6/23/2015



J:\Project\UU\RS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Figure2.mxd Date: 6/23/2015

LEGEND:
- Trabue Road Expansion Survey Area
- Delineated Stream
- Delineated Pond

N

0 200 400
Scale in Feet

BASE MAP SOURCE:
ArcGIS Online; Bing Maps Hybrid

UPS Trabue Road Expansion Project

FIGURE 3
WETLAND DELINEATION MAP

JOB NO. XXXXX

AECOM

J:\Project\UU\URS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Figure3.mxd Date: 6/23/2015

APPENDIX A

OEPA HHEI STREAM FORMS

Mainstem 6/2/15-1

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 37

SITE NAME/LOCATION 125 Ireland Rd

Mainstem 6/2/15-1 SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 2 June 2015 SCORER MDT, BAO COMMENTS Intermittent

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 and lined with riprap, or moderately sloped banks

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

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☒	SILT [3 pt]	40
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☒	COBBLE (65-256 mm) [12 pts]	5	☒	CLAY or HARDPAN [0 pt]	50
☒	GRAVEL (2-64 mm) [9 pts]	5	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5 (A) 3 (B) 4

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

HHEI Metric Points

Substrate Max = 40: 7

A + B

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

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

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 8.5

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

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 3

Bankfull Width Max=30: 5

This information must also be completed

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

RIPARIAN WIDTH (Per Bank) L	R	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	☒	Moist Channel, isolated pools, no flow (Intermittent)
☐	Subsurface flow with isolated pools (Interstitial)	☐	Dry channel, no water (Ephemeral)

COMMENTS pooling throughout, little flow

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

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

STREAM GRADIENT ESTIMATE

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

thurs 10/2/2015

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

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

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

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

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: _____

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

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)

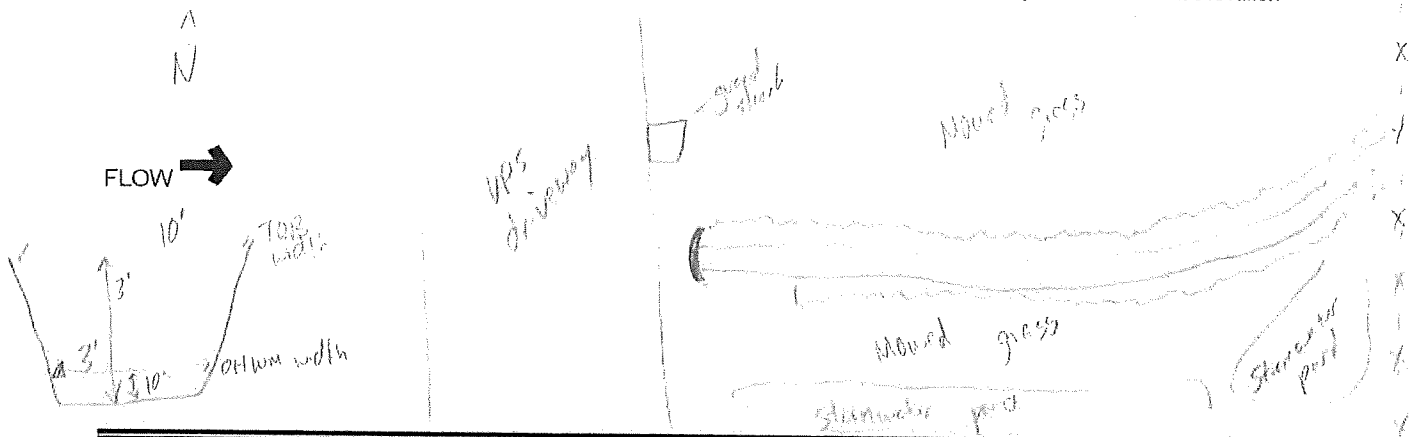
Fish Observed? (Y/N) N Voucher? (Y/N)_____ Salamanders Observed? (Y/N) N Voucher? (Y/N)_____

Frogs or Tadpoles Observed? (Y/N) Y Voucher? (Y/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



APPENDIX B

DELINEATED FEATURES PHOTOGRAPHS

B1 – HHEI STREAMS

AECOM

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
UPS	Trabue Road Expansion Project	TBD

Photo No. 1

Date:

June 2, 2015

Description:

Stream 1

Intermittent Stream

Facing downstream

Photo No. 2

Date:

June 2, 2015

Description:

Stream 1

Intermittent Stream

Facing upstream

B2 – PONDS

AECOM

PHOTOGRAPHIC RECORD
Ponds

Client Name:	Site Location:	Project No.
UPS	Trabue Road Expansion Project	TBD

Photo No. 1	
Date: June 2, 2015	
Description: Pond 1 Facing southwest	

Photo No. 2	
Date: June 2, 2015	
Description: Pond 2 Facing west	

ATTACHMENT C

WETLAND 1 ADDENDUM

LEGEND:
- Trabue Road Expansion Survey Area
- Upland Data Point
- Toe-of-Slope
- Wetland Data Point
- Delineated Wetland

N

0 50 100
Scale in Feet

BASE MAP SOURCE:
ArcGIS Online; Bing Maps Hybrid

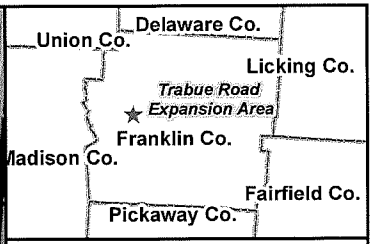
UPS Trabue Road Expansion Project

FIGURE 5A
WETLAND DELINEATION MAP

JOB NO. 60437479

AECOM

J:\Project\UURS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Figure1_DelineationResults.mxd Date: 7/25/2016



LEGEND:
- Trabue Road Expansion Survey Area
- Upland Data Point
- Toe-of-Slope
- Wetland Data Point
- Delineated Wetland

N

0 50 100
Scale in Feet

BASE MAP SOURCE:
ArcGIS Online; Bing Maps Hybrid

UPS Trabue Road Expansion Project

FIGURE 5B
WETLAND DELINEATION MAP

JOB NO. 60437479

AECOM

J:\Project\UURS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Figure1_DelineationResults.mxd Date: 7/25/2016

Background Information

Name	Benjamin Otto	7/21/2016
Afilliation	AECOM	
Address	525 Vine Street, Suite 1800 Cincinnati, OH 45202	
Phone Number:	(513) 419-3481	
Email address:	benjamin.otto@aecom.com	
Name of Wetland:	**Wetland 1**	
Vegetation Communities (USFWS)		
HGM Class		
Location of Wetland include map, address if available, north arrow, landmarks, distances, roads, etc.	See attached map	

		Sources of information used Check all that apply	
Lat/Long or UTM Coordinate	39.981377, -83.134232	Site Visit	x
USGS Quad Name	Galloway	USGS Topo Map	x
County	Franklin	National Wetland Inventory Map	x
Township	NA	Ohio Wetland Inventory Map	x
Section and Subsection	NA	Soil Survey	x
Hydrologic Unit Code	5060001	Delineation report/map	x
Wetland Size (acres, hectares	Approximately 0.07-acres		

Name: Wetland 1		7/21/2016
sketch (include north arrow, relationship with other surface waters, vegetation zones, etc.)		Site: UPS Trabue Rd Expansion Project
See attached map		
Notes/Comments/Narrative		
Final Score	21.5	Provisional Wetland Category	1

Wetland 1

Site: UPS Trabue Rd Expansion Project	Rater(s): B. Otto;	Date: 7/21/2016

Field Id: w-bao-07/21/16-1

Metric 1. Wetland Area (size).

2 | 2 — 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)
- [x] 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)

0.07 acres

Metric 2. Upland buffers and surrounding land use.

1 | 3 — 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)
- [ ] 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)
- [x] 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), shrubland, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

14.0 | 17.0 — max 30 pts. | subtotal

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

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

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)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select one.

- [ ] >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)
- [x] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] 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)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

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

Metric 4. Habitat Alteration and Development.

4.5 | 21.5 — max 20 pts. | subtotal

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

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

Check all disturbances observed

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

21.5 — subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland 1

Site: UPS Trabue Rd Expansion Project	Rater(s): B. Otto;	Date: 7/21/2016

Field Id: w-bao-07/21/16-1

21.5 subtotal this page

0 | 21.5 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 Praires (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 5 Qualitative Rating (-10)

0 | 21.5 max 20pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.

Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [x] Low (1)
- [ ] None (0)

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

- [ ] Extensive >75% cover (-5)
- [x] 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 hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [1] 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 spp diversity and/or predominance of nonnative or low disturbance tolerant native species
Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generallyw/o presence of rare threatened or endangered spp to
A predominance of native species, with nonnative spp high 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

Category 1

21.5 **GRAND TOTAL(max 100 pts)**

Wetland 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 Unit 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 mitigation 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	

Wetland 1

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 a 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 Reynoldsburg 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	(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	(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	(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	(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 *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, 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	(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 *Sphagnum* 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	(NO) Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is the 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	(NO) Go to Question 8a

#	Question	Circle one	
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	(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 9d	(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 9d
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, Erie County, and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, 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	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

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

Wetland 1

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted.	YES (NO)	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES (NO)	If yes, Category 3
	Question 11. Relict Wet Prairies	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	14	
	Metric 4. Habitat	4.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	0	
	TOTAL SCORE Consult most recent score calibration report at http://www.epa.ohio.gov/dsw/401/index.aspx to determine the wetland's category based on its quantitative score	21.5	Category based on score breakpoints Category 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Wetland 1

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	(NO)	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* 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	(NO)	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	(NO)	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* 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?	(YES) 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 an 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	(NO)	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 *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* 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	(NO) 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.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Trabue Rd Expansion Project | City/County: Columbus/Franklin | Sampling Date: 21-Jul-16

Applicant/Owner: UPS | State: OH | Sampling Point: **upl-bao-7/21/2016-01A**

Investigator(s): BAO | Section, Township, Range: S ____ T ____ R ____

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

Slope: 0.0% 0.0 ° | Lat.: 39.981327494 | Long.: -83.134260452 | Datum: NAD 83

Soil Map Unit Name: CrB- Crosby silt loam | NWI classification: NA

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 ◉ 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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉	
Wetland Hydrology Present?	Yes ○ No ◉	

Remarks:
upland area located adjacent to paved area and to the south of wetland point 01a for w-bao-072116-01

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: ____)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: ____)			
1. Poa sp.	65	☑ 59.1%	UPL
2. Solanum dulcamara	15	☐ 13.6%	FAC
3. Daucus carota	10	☐ 9.1%	UPL
4. Asclepias syriaca	5	☐ 4.5%	FACU
5. Trifolium pratense	15	☐ 13.6%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	110	= Total Cover	
Woody Vine Stratu (Plot size: ____)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

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 species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	20	x 4 =	80
UPL species	75	x 5 =	375
Column Totals:	110 (A)		500 (B)

Prevalence Index = B/A = 4.545

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 ◉

Remarks: (Include photo numbers here or on a separate sheet.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

SOIL

Sampling Point: upl-bao-7/21/2016-01A

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
0-10	10YR 4/3	100					Silt Loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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 Muck 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 ◉

Remarks:

Soil appeared to have been historically disturbed

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 ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Trabue Rd Expansion Project City/County: Columbus/Franklin Sampling Date: 21-Jul-16

Applicant/Owner: UPS State: OH Sampling Point: **upl-bao7/21/2016-01C**

Investigator(s): BAO Section, Township, Range: S T R

Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): flat

Slope: 0.0% 0.0 ° Lat.: 39.9812668229944 Long.: -83.1329124910229 Datum: NAD 83

Soil Map Unit Name: CeB-Celina Silt Loam NWI classification: NA

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 ◉ 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 ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
upland area located to the south of the wetland point w-bao-072116-01C

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size:)			
1. Poa sp.	65	☑ 65.0%	UPL
2. Toxicodendron radicans	10	☐ 10.0%	FAC
3. Trifolium pratense	20	☑ 20.0%	FACU
4. Asclepias syriaca	5	☐ 5.0%	FACU
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratu (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species	65	x 5 =	325
Column Totals:	100 (A)		455 (B)

Prevalence Index = B/A = 4.550

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 ◉

Remarks: (Include photo numbers here or on a separate sheet.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

SOIL

Sampling Point: upl-bao7/21/2016-01C

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
0-16	10YR 5/3	100					Silt Loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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 Muck 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 ◉

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 ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

may be under water during flash rain events, but only for a short duration

Wetland 1- wetland point a

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: UPS Trabue Rd Expansion Project | City/County: Franklin | Sampling Date: 21-Jul-16

Applicant/Owner: UPS | State: OH | Sampling Point: **w-bao-072116-01a**

Investigator(s): BAO | Section, Township, Range: S ____ T ____ R ____

Landform (hillslope, terrace, etc.): Channel (active) | Local relief (concave, convex, none): concave

Slope: 0.0% 0.0 ° | Lat.: 39.981377 | Long.: -83.134232 | Datum: NAD 83

Soil Map Unit Name: CrB- Crosby silt loam | NWI classification: NA

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 ◉ 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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

Remarks:
PEM wetland within maintained stream channel that crosses commerical facility property. Wetland vegetation including small amount of shrubs has been recently mowed

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: ____)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Salix nigra	10	☑ 66.7%	OBL
2. Rubus allegheniensis	5	☑ 33.3%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	15	= Total Cover	
Herb Stratum (Plot size: ____)			
1. Typha angustifolia	70	☑ 70.0%	OBL
2. Impatiens capensis	10	☐ 10.0%	FACW
3. Apocynum cannabinum	5	☐ 5.0%	FAC
4. Solanum dulcamara	15	☐ 15.0%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratu (Plot size: ____)			
1. Vitis riparia	5	☐ 100.0%	FACW
2.	0	☐ 0.0%	
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	15	x 2 =	30
FAC species	20	x 3 =	60
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	120 (A)		190 (B)

Prevalence Index = B/A = 1.583

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 ○

Remarks: (Include photo numbers here or on a separate sheet.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Wetland 1- wetland point a

SOIL

Sampling Point: w-bao-072116-01a

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
0-18	10YR 2/1	100					Sandy Loam	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining. M=Matrix.

Hydric Soil Indicators:

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [x] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Muck 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)
- [x] 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 ( )

Remarks:

sediment accumulation from plunge pool from stream culvert

HYDROLOGY

Wetland Hydrology Indicators:

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

- [x] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [x] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [x] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [x] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
- [x] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [x] 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)
- [x] 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)
- [x] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes (•) No ( ) Depth (inches): 7

Water Table Present? Yes (•) No ( ) Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes (•) No ( ) Depth (inches): 0

Wetland Hydrology Present? Yes (•) No ( )

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

Remarks:

Wetland 1- wetland point b

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: UPS Trabue Rd Expansion Project | City/County: Franklin | Sampling Date: 06-Jul-16

Applicant/Owner: UPS | State: OH | Sampling Point: **w-bao-072116-01b**

Investigator(s): BAO | Section, Township, Range: S ____ T ____ R ____

Landform (hillslope, terrace, etc.): Channel (active) | Local relief (concave, convex, none): concave

Slope: 0.0% 0.0 ° | Lat.: 39.981352 | Long.: -83.133779 | Datum: NAD 83

Soil Map Unit Name: CeB- Celina silt loam | NWI classification: NA

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 ◉ 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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

Remarks:
PEM wetland within maintained stream channel that crosses commerical facility property. Wetland vegetation including small amount of shrubs has been recently mowed

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: ____)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Salix nigra	15	☑ 60.0%	OBL
2. Lonicera japonica	5	☑ 20.0%	FACU
3. Acer saccharinum	5	☑ 20.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	25	= Total Cover	
Herb Stratum (Plot size: ____)			
1. Typha angustifolia	50	☑ 66.7%	OBL
2. Solanum dulcamara	10	☐ 13.3%	FAC
3. Persicaria maculosa	10	☐ 13.3%	FACW
4. Apocynum cannabinum	5	☐ 6.7%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	75	= Total Cover	
Woody Vine Stratu (Plot size: ____)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	15	x 2 =	30
FAC species	15	x 3 =	45
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A = 1.600

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 ○

Remarks: (Include photo numbers here or on a separate sheet.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Wetland 1- wetland point b

SOIL

Sampling Point: w-bao-072116-01b

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
0-18	10YR 3/1	90	7.5YR 3/4	10	D	PL	Silty Clay	garbage within soil

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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 Muck 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)
- [x] 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 ( )

Remarks:

various pieces of trash within soil sample including pieces of plastic and metal cans

HYDROLOGY

Wetland Hydrology Indicators:

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

- [x] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [x] Sediment Deposits (B2)
- [x] Drift Deposits (B3)
- [x] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [x] 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)
- [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)
- [ ] Geomorphic Position (D2)
- [x] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes (•) No ( ) Depth (inches): 3

Water Table Present? Yes (•) No ( ) Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes (•) No ( ) Depth (inches): 6

Wetland Hydrology Present? Yes (•) No ( )

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

Remarks:

Wetland 1- wetland point c

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: UPS Trabue Rd Expansion Project | City/County: Franklin | Sampling Date: 06-Jul-16

Applicant/Owner: UPS | State: OH | Sampling Point: **w-bao-072116-01c**

Investigator(s): BAO | Section, Township, Range: S T R

Landform (hillslope, terrace, etc.): Channel (active) | Local relief (concave, convex, none): concave

Slope: 0.0% 0.0 ° | Lat.: 39.981303934 | Long.: -83.132951815 | Datum: NAD 83

Soil Map Unit Name: CeB-Celina Silt Loam | NWI classification: NA

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 ◉ 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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

Remarks:
PEM wetland within maintained stream channel that crosses commerical facility property. Wetland vegetation including small amount of shrubs has been recently mowed

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. Salix nigra	15	☑ 50.0%	OBL
2. Lonicera japonica	10	☑ 33.3%	FACU
3. Fraxinus pennsylvanica	5	☐ 16.7%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	30	= Total Cover	
Herb Stratum (Plot size:)			
1. Typha angustifolia	15	☑ 18.8%	OBL
2. Phalaris arundinacea	25	☑ 31.3%	FACW
3. Impatiens capensis	5	☐ 6.3%	FACW
4. Asclepias syriaca	5	☐ 6.3%	FACU
5. Cirsium vulgare	5	☐ 6.3%	FACU
6. Ambrosia artemisiifolia	5	☐ 6.3%	FACU
7. Equisetum hyemale	10	☑ 12.5%	FACW
8. Carex spp	10	☑ 12.5%	FAC
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratu (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	45	x 2 =	90
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	110	(A)	250 (B)

Prevalence Index = B/A = 2.273

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 ○

Remarks: (Include photo numbers here or on a separate sheet.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Wetland 1- wetland point c

SOIL

Sampling Point: w-bao-072116-01c

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
0-4	10YR 3/2	100					Silty Clay Loam	
4-16	2.5YR 4/2	70	10YR 5/8	30	C	M	Clay	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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 Muck 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 ○

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 ○ Depth (inches): 8

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

AECOM

PHOTOGRAPHIC RECORD
Wetlands

Client Name:	Site Location:	Project No.
UPS	Trabue Road Expansion Project	TBD

Photo No. 1
Date: July 21, 2016
Description: Wetland 1- wetland point a PEM Wetland Facing East

Photo No. 2
Date: July 21, 2016
Description: Wetland 1- wetland point c PEM Wetland Facing West

ATTACHMENT D

INITIAL THREATENED AND ENDANGERED SPECIES AGENCY LETTERS

Thomayer, Matt

From: susan_zimmermann@fws.gov on behalf of Ohio, FW3 <ohio@fws.gov>
Sent: Thursday, April 21, 2016 10:48 AM
To: Wilburn, Beth; Thomayer, Matt; jwmcbride@ups.com
Cc: Jenny Norris; nathan.reardon@dnr.state.oh.us
Subject: UPS Trabue Road Expansion Project; Franklin Co. OH

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

TAILS# 03E15000-2016-TA-0979

Dear Ms. Wilburn,

We have received your recent correspondence requesting information about the subject proposal. There are no federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area. The following comments and recommendations will assist you in fulfilling the requirements for consultation under section 7 of the Endangered Species Act of 1973, as amended (ESA).

The U.S. Fish and Wildlife Service (Service) recommends that proposed developments avoid and minimize water quality impacts and impacts to high quality fish and wildlife habitat (e.g., forests, streams, wetlands). Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. All disturbed areas should be mulched and revegetated with native plant species. Prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

FEDERALLY LISTED SPECIES COMMENTS: All projects in the State of Ohio lie within the range of the federally endangered **Indiana bat** (*Myotis sodalis*) and the federally threatened **northern long-eared bat** (*Myotis septentrionalis*). In Ohio, presence of the Indiana bat and northern long-eared bat is assumed wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities), as well as linear features

such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves and abandoned mines.

Should the proposed site contain trees ≥3 inches dbh, we recommend that trees be saved wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend that removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is being recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.

If implementation of this seasonal tree cutting recommendation is not possible, summer surveys may be conducted to document the presence or probable absence of Indiana bats within the project area during the summer. If a summer survey documents probable absence of Indiana bats, the 4(d) rule for the northern long-eared bat could be applied. Surveys must be conducted by an approved surveyor and be designed and conducted in coordination with the Endangered Species Coordinator for this office. Surveyors must have a valid federal permit. Please note that summer surveys may only be conducted between June 1 and August 15.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend that the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the ESA, and are consistent with the intent of the National Environmental Policy Act of 1969 and the Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Dan Everson
Field Supervisor

cc: Nathan Reardon, ODNR-DOW

Jennifer Norris, ODNR-DOW

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldridge, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

April 28, 2016

Beth Wilburn
AECOM
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

Re: 16-219; UPS Trabue Road Expansion Project

Project: The proposed project involves the expansion of the current UPS facility located on Trabue Road.

Location: The proposed project is located in the City of Columbus, Franklin County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do 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.

Natural Heritage Database: The Natural Heritage Database has no data at or within a one mile radius of the project area:

A review of the Ohio Natural Heritage Database indicates there are no records of state endangered or threatened plants or animals within the project area. There are also no records of state potentially threatened plants, special interest or species of concern animals, or any federally listed species. In addition, we are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state nature preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas within the project area. The review was performed on the project area you specified in your request as well as an additional one mile radius. Records searched date from 1980.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the DOW recommends a net survey be conducted between June 1 and August 15, prior to any cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the purple cat's paw (*Epioblasma o. obliquata*), a state endangered and federally endangered mussel, the clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, the northern rifflesheIl (*Epioblasma torulosa rangiana*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel species, the rabbitsfoot (*Quadrula cylindrica cylindrica*), a state endangered and federal candidate mussel, the snuffbox (*Epioblasma triquetra*), a state endangered and federal endangered mussel, the long solid (*Fusconaia maculata maculata*), a state endangered mussel, the Ohio pigtoe (*Pleurobema cordatum*), a state endangered mussel, the pocketbook (*Lampsilis ovata*), a state endangered mussel, the washboard (*Megalonaias nervosa*), a state endangered mussel, the elephant-ear (*Elliptio crassidens crassidens*), a state endangered mussel, the black sandshell (*Ligumia recta*), a state threatened mussel, the threehorn wartyback (*Obliquaria reflexa*), a state threatened mussel, the pondhorn (*Uniomerus tetralasmus*), a state threatened mussel, and the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the Scioto madtom (*Noturus trautmani*), a state endangered and federally endangered fish, the popeye shiner (*Notropis ariommus*), a state endangered fish, the northern brook lamprey (*Ichthyomyzon fossor*), a state endangered fish, the spotted darter (*Etheostoma maculatum*), a state endangered fish, the shortnose gar (*Lepisosteus platostomus*), a state endangered fish, the tonguetied minnow (*Exoglossum laurae*), a state threatened fish, the paddlefish (*Polyodon spathula*) a state threatened fish, and the Tippecanoe darter (*Etheostoma tippecanoe*), a state threatened fish. The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

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ATTACHMENT E

PHASE I ARCHAEOLOGICAL SURVEY REPORT, OHPO SUBMITTAL, AND OHPO RESPONSE

AECOM

PHASE I ARCHAEOLOGICAL SURVEY FOR THE UPS COLUMBUS HUB EXPANSION AND MODERNIZATION PROJECT, PRAIRIE TOWNSHIP, FRANKLIN COUNTY, OHIO

PREPARED FOR: UPS

MAY 2016

CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE

Phase I Archaeological Survey for the UPS Columbus Hub Expansion and Modernization Project, Prairie Township, Franklin County, Ohio

Prepared for:

UPS

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CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE

MAY 2016

ABSTRACT

In March 2016, archaeologists from the Cincinnati office of AECOM, on behalf of United Parcel Service, Inc. (UPS), conducted the Phase I archaeological survey for the Columbus Hub Expansion and Modernization Project (the Project) in Franklin County, Ohio. UPS plans to construct an addition to its facility by further developing 23.83 acres of the existing site. Site configuration will involve approximately 5.17 acres to expand the building, and an additional 18.66 acres of parking and staging. The archaeological investigation of the 23.83 acres of combined work area was undertaken as part of the Section 106 process for the Project, to support a Nationwide Permit filing with the United States Army Corps of Engineers (USACE), and initiate consultation with the Ohio Historic Preservation Office (OHPO). The enclosed report therefore details the archaeological fieldwork and analyses conducted by AECOM for the Project.

The AECOM Phase I archaeological field reconnaissance detailed herein visually examined the entirety of the proposed Project Area of Potential Effect (APE), measuring approximately 23.83 total acres in size. This pedestrian walkover was supplemented through the excavation of shovel tests within the Project APE, in an effort to document any cultural resources, historic or prehistoric, present within the Project footprint. The excavated shovel tests encountered near-total levels of disturbance to the soil stratigraphy within the Project APE, and the visual examination confirmed the extent of modern disturbance. No archaeological materials or resources were identified within the Project APE as a result of these investigations. As the Project is anticipated to involve the installation of additional infrastructure similar in size/scale to the existing UPS facility, no impacts to the surrounding viewshed are anticipated as a result of the Project. No additional cultural resources investigations are therefore proposed for the UPS Trabue Road Expansion prior to construction.

CONTENTS

TABLES

APPENDICES

1.0 INTRODUCTION

On behalf of United Parcel Service, Inc. (UPS), AECOM conducted a Phase I archaeological resources survey for the Columbus Hub Expansion and Modernization Project (the Project), located in Prairie Township, Franklin County, Ohio (see **Appendix A, Figure 1**). As part of this Project, UPS plans to construct an addition to its existing facility through further development of 23.83 acres of the existing site. Site configuration will include approximately. 5.17 acres to expand the existing building, and an additional 18.66 acres of parking and staging. The following report details the Phase I survey conducted across the Project area in March 2016. The lead Federal agency for the Project is the United States Army Corps of Engieneers (USACE).

The purpose of the cultural resources investigation was to locate and identify archaeological material within the Project Area of Potential Effects (APE). These investigations were accomplished using the guidelines set forth by the Ohio Historic Preservation Office (OHPO), in their 1994 document entitled *Archaeology Guidelines*. Identification of resources allowed for an assessment to be made of their significance in light of the criteria for inclusion in the National Register of Historic Places (NRHP). Recommendations were then formulated for avoidance or mitigation procedures of any culturally sensitive or significant properties.

These activities are stipulated within legislation enacted over the past nearly 50 years, including the National Historic Preservation Act of 1966 (and its subsequent amendments) and the regulations (36 CFR Part 800) outlined by the Advisory Council on Historic Preservation. To accomplish this, several research strategies were employed:

- Background research, specifically a literature and physiographic review, at the OHPO in Columbus, Ohio; and,

- Field reconnaissance of the direct APE, which included surface inspection of exposed soils and fixed-interval shovel testing in areas not previously disturbed.

The entirety of of the 23.83 acre APE was considered for cultural resources and investigated through shovel test excavations and pedestrian visual examination. A discussion of investigation methods is presented in **Chapters 2.0, Research Design**, and **5.0 Field Methods**.

The Phase I archaeological field reconnaissance of the Project was conducted in March 2016, by AECOM Archaeologist Suzanne M. Ostyn, under the supervision of Principal

Investigator Christopher G. Leary. The Phase I survey was conducted using the methodology established by the OHPO (as referenced above), and included fixed-interval shovel testing and visual pedestrian survey of the Project area (see **Chapter 5.0**).

All cultural resources identified within the direct APE by the AECOM Phase I survey were subject to appropriate analyses and assessed with regard to their eligibility for listing in the NRHP. NRHP eligibility determinations were dependent upon the application of the recovered data set to the following criteria:

- *The capacity of a particular resource to make a significant contribution to the broad patterns of American history (Criterion A);*
- *The degree to which the property is associated with a significant person or persons from the nation's past (Criterion B);*
- *The degree to which a particular property exhibits distinctive characteristics of design or construction representative of a particular architectural style, or having high artistic value such as the work of a master (Criterion C); and,*
- *The potential of a particular resource in regard to providing important information pertaining to an understanding of prehistory or history (Criterion D).*

1.1 PROJECT DESCRIPTION

All stages of a cultural resources study rely on an explicit *Area of Potential Effect*, which reflects an agreement by key parties as to what constitutes the physical footprint of the undertaking, as well as the zone within which a suite of potential ancillary effects may be experienced. The APE for a given project has two components: the direct APE, or zone of ground-disturbance, and the viewshed or indirect APE that is concerned with visual effects. With regard to cultural resources, the APE for this Project consists of land requirements that will be directly impacted by ground disturbance during construction, referred to hereafter as the direct APE.

The APE for direct effects is limited to the areas of likely ground disturbance in the planned area of improvements and in associated easements. Direct effects in these areas may affect archaeological or architectural resources if present. The APE for indirect effects includes areas where visual, noise, or other effects caused by the project occur outside the footprint of the project area. Indirect effects may affect architectural resources, certain types of archaeological resources, or other cultural resources if present.

1.2 REPORT ORGANIZATION

The environmental and cultural contexts developed by AECOM for the Project are provided respectively in **Chapters 3.0 and 4.0**. **Chapter 5.0** presents the results of archival research conducted to identify previous research and previously recorded

cultural resources in the Project vicinity. The field methods employed in the survey are described in **Chapter 6.0**. The results of the field investigations are described and discussed in **Chapter 7.0**. The report concludes with the summary and recommendations section, presented in **Chapter 8.0**.

2.0 RESEARCH DESIGN

The Project will involve the expansion of the existing UPS facility in Prairie Township, Franklin County, Ohio (see **Appendix A, Figure 1**), and will require an Individual 401/404 Permit. As the lead federal agency is the USACE, portions of the Project will require consideration for cultural resources as part of the USACE review process. In order to address the anticipated concerns of the OHPO, AECOM conducted Phase I survey in accordance with OHPO guidelines across the 23.83 acre APE. This survey entailed a combination of pedestrian walk-over and shovel test excavations. As a result of this methodology, the entirety of the Project APE was considered for cultural resources. Further discussion of the field metholodology employed durng the Phase I investigation is presented in **Chapter 6.0**.

In an effort to efficiently and effectively complete a Phase I archaeological survey of the Project land requirements, a Research Design was developed to guide the field reconnaissance. This Research Design was assembled by examining a variety of factors relevant to the Project. The factors involved in this analysis include: existing and prehistoric environmental conditions and vegetation patterns; the known archaeological record of the region, both prehistoric and historic; previous archaeological and Cultural Resource Management (CRM)-related experience of the staff of AECOM; and the modern land use and development of the area immediate to the Project. These various factors are discussed in greater detail in subsequent chapters; this chapter will synthesize those factors into the Research Design. Through the development of the Research Design, several questions can be posed, relevant to the survey, which can then be answered by the actual field reconnaissance of the Project land requirements.

The Project is located outside the I-270 beltway loop (milepost 8) within the western margins of the city of Columbus, and is surrounded by modern commercial development/infrastructure and interstate highways. Physiographically, the Project area is situated within the Till Plains Section of Ohio, more specifically the Columbus Lowlands and Darby Plains. This region is characterized by rolling hills that transition to level low-lying relief toward the Scioto River Valley. The Project is underlain by the ground moraines of Wisconsinan glacial till. The soils across this glacial landscape are primarily comprised of loamy silts and clays, with pockets of high gravel content resultant from glacial outwash. The soils in the Project area are predominately Alfisols. These soils are known to be generally fertile and are typically conducive to historic-era occupation. Beginning with the settlement of the Franklin County, the landsurface has been converted into agricultural land; a practice that continues into the modern era. The Project area is located within the Scioto and Olentangy River watersheds, tributary

systems of which extend across central Franklin County and into counties to the north and south. The primary streams in the vicinity include a small unnamed intermittent stream that bisects the Project area, Big Darby Creek, and Clover Groff Run.

The archival research conducted for the Project revealed a moderate amount of inventoried cultural resources and CRM-related projects within one mile of the Project. The review of the OHPO online cultural data in March 2016 revealed that:

- No properties or districts have been listed in the NRHP within one mile of the Project, nor have any been previously determined eligible for (but not yet listed in) the NRHP;
- A total of three OAI-listed archaeological resources have been inventoried within one mile of the Project, the most proximal of which, site 33FR1324, is situated approximately 1322 feet (403 meters) from the Project APE;
- Four OHI-listed aboveground structural resources have been inventoried within one mile of the Project;
- One historic-era cemetery, St. James Lutheran Cemetery, is listed by the OHPO within one mile of the Project; and,
- Seven CRM-related reports have been filed which address/examine landforms situated within one mile of the Project.

These data reveal that archaeological resources have been recorded in this portion of Franklin County as the result of CRM-related surveys similar in scope to the current AECOM investigations. As a result of these previous surveys, approximately 300 acres of land have been subject to archaeological investigations within one mile of the Project, which has resulted in the inventory of three historic-era archaeogical resources with the OHPO. These previously documented resources would suggest there is a potential to encounter historic archaeological material within the Project footprint. While no prehistoric resources were identified within the one mile buffer drawn around the APE, numerous sites have been recorded within 1.5 miles of the Project. Specifically, a cluster of prehistoric resources have been documented east of I-270 in the vicinity of Hartley Mound (OHPO ID #1516). The possibility of recovering material of a similar nature within the APE does therefore exist, despite the intensive modern urban development of the area surrounding the Project.

With regard to the potential for encountering historic-era archaeological deposits, the available historic mapping indicates the presence of a structure, likely a house, from the mid-nineteenth century until the late twentieth century within the direct APE of the Project. Mapping and aerial photography confirm the house and associated outbuildings were demolished around the time the UPS facility was constructed. Currently, the only

visible remnants of this homestead are the faint remains of a possible driveway and a stand of old trees. No structural above-ground features, such as foundations, or architectural debris were encountered during AECOM's recent survey.

The syntheses of the data outlined above (and discussed further in this volume) provide the foundation for defining the research potential of cultural resource investigations at the Project location. The potential for encountering both prehistoric and historic resources is moderate, given the record of prehistoric and historic activity inventoried previously with the OHPO. The most effective method for testing the land requirements of the Project is the standard 15-meter-interval shovel testing (as recommended by the OHPO), in addition to visual pedestrian inspection of all Project land requirements.

2.1 RESEARCH QUESTIONS

The above factors, when analyzed in conjunction with the scope of the field reconnaissance, assist in generating specific research questions to guide the Project and therefore enhance the research potential of the results collected by the AECOM Phase I survey. These questions include:

1. *What types of prehistoric sites can be expected to be found within the direct APE of the Project, and, if identified, how do these prehistoric resources fit into the archaeological record of prehistoric activity in Franklin County?*

2. *Based on the distribution of the cultural materials collected during the Phase I Investigations, what conclusions can be drawn about site integrity?*

3. *The historic-era landscape within this portion of Franklin County is most appropriately characterized as rural agrarian, with sporadic residential, agricultural, and commercial structures scattered along the primary road networks. Is there any evidence of historic-era activity within or in close proximity to margins of the Project, particularly in light of the extensive urbanization of this area in the latter half of the twentieth century?*

4. *The archival research conducted prior to fieldwork identified the presence of a, now demolished, structure within the Project APE, as evidenced by historic mapping and aerial photos. Are there any potentially eligible archaeological remains within the APE?*

5. *Are there any archaeological resources present within the Project land requirements that are eligible, or potentially eligible, for the NRHP?*

3.0 ENVIRONMENTAL SETTING

The following discussion outlines the various environmental factors which influence the location and analysis of identified archaeological sites. Such considerations are invaluable to the development of a context for understanding the location and preservation of cultural resources. Environmental conditions, including climate, and the related floral and faunal communities, significantly influenced the type and extent of prehistoric settlement and subsistence patterns.

3.1 PHYSIOGRAPHY, GEOGRAPHY AND HYDROLOGY

The Project area is located in the United States Interior Plains in the Central Lowland Province on the Till Plains Section, an area that encompasses most of central and western Ohio. The Till Plains are a glacial landscape, and can be characterized by gently rolling hills, which are usually a series of moraines that can be up to 100 feet (30 meters) high and six miles (9.7 kilometers) wide. These moraines are generally associated with boulder belts between flat-lying ground moraines incised by steep valleys with large streams. Stream valleys are filled with outwash and alternate between broad floodplains and narrows (Brockman 1998). This region is underlain by the ground and end moraine of Wisconsinan glacial till, deposited across this portion of central Ohio between 14,000 and 24,000 years ago over Silurian and Devonian-age geologic deposits.

The Project area in Franklin County is located along the transition between the Darby Plains and Columbus Lowlands physiographic regions. Boundaries for these sections include the Berea/Allegheny Escarpments to the east and south; the Reesville and Cable Moriane complexes to the west; and the Powell Moraine to the north. Landforms in this region change from mounded ground moraines intersected by poorly drained swales in the west to lowlands that gradually slope east to the Scioto River Valley. The moderately low relief of the Darby Plains with elevations of 750 to 1100 feet is considered an upland when compared to the low lying land surface found further east between 600 and 850 feet. Water sources, such as streams, are more numerous in the eastern Columbus Lowland region. The glacial till that covers the land surface is a remnant of the final Laurentide Glacial advance and retreat of the Wisconsinan Glacial Advance. The tills found in this section of central Ohio are described as loamy, high-lime Wisconsinan-aged till and sparse outwash above erosion resistant carbonate rock from the Silurian and Devonian Ages and Ohio Shale formations. Closer to the Scioto Valley, outwash is more extensive and overlies deep siltstones, shales, and carbonate rock from the Devonian and Mississippian eras.

The modern-era land surface of Ohio is the result of past orogenic and glacial processes spanining thousands of years. The Appalachian Mountains were formed by bending,

folding, and uplifting of the earth's crust, geologic deformation of the the North American Plate resulted in the bedrock of Ohio bowing up into a low arch known as the Cincinnati Arch. This arch has shaped the subsurface geology of the region.

The Cincinnati Arch, a geologic anticlinal (archlike) structure influential during the Paleozoic Era (542 million to 251 million years ago), existed as a persistent low-lying land area flanked by seas covering a large part of the continent while connected with the ocean. The axis of the Cincinnati Arch extends southward from Ohio to Tennessee. Separated by a structural saddle, its southward extension is known as the Nashville Dome. On the north, the Cincinnati Arch has two branches; one, trending west-northwest, is known as the Kankakee Arch. The other branch, trending north-northeast, is known as the Findlay Arch. Ordovician rocks occur on the crest of the Cincinnati Arch, whereas Pennsylvanian strata can be found in the flanking basinal areas. The Cincinnati Arch began to form during the Middle Ordovician (472 million to 461 million years ago), and was distinctive by the Silurian Period (444 million to 416 million years ago). Uplift occurred in the Middle Devonian time (398 million to 385 million years ago), during which considerable erosion took place. Broad doming and uplift reoccurred in post-Mississippian time, after which the arch was again submerged. Uplift once again affected the arch in post-Pennsylvanian time.

Sedimentary rocks from 446 to 450 million years ago were formed during the Ordovician era. These rocks are known to be sedimentary limestones and shale of marine origins. Ordvician formations are more fossiliferous than the younger overlying Silurian formations. In the Study Area, Sularian formations exposed in quaries and river valleys include the moderately fossiliferous Dayton Formation. Sularian formations are not as fossiliferous as the older Ordovician sedimentary layers. Additionally, Silurian era formations of marine, restricted marine, and marginal marine input formed fossiliferous sedimentary rocks that include: dolomite, anhydrite, gypsum, salt, and shale.

By the time the Ice Age began about two million years ago, what is now western Ohio had been eroded away to a relatively flat plain, offering little resistance to the advancing Laurentide continental glacier. Consequently, most of the hills or landforms in the Till Plains are glacially deposited rather than bedrock, as in the eastern half of our state where the more erosion resistant sandstone bedrock hills slowed and stopped the spread of glacial ice. Within the Till Plains, bedrock is typically covered by a thick blanket of glacially deposited soil known as till, which reshaped and smoothed the Till Plains into a comparatively smooth rolling landscape. The very fertile glacial soils of the Till Plains provide some of the richest farmland. During pre-settlement times, these same soils supported extensive tall grass prairie remnants, surrounded by forests dominated mostly by Beech and Sugar Maple trees. Today, approximately 95 percent of the Till Plains are

farmland and urban development. Below the Bellefontaine Outlier, fast-flowing meltwater from the glacier filled valleys south of the ice front with sand and gravel. These buried valleys of porous outwash materials provide some of the most extensive groundwater sources in the state. In a select few places within West-central Ohio, where ground water emerges at the surface, fens or alkaline bogs such as Cedar Bog and Prairie Road Fen nature preserves can be found. Some of Ohio's rarest and most unusual plants, living relicts of the Ice Age, grow in these fens.

Franklin County is located within the prehistoric Main Teays Valley drainage. The Teays River was a north- and northwest-flowing river existing prior to the Pleistocene Ice Ages – before 2.5 million years ago. The Teays flowed through southwest West Virginia, between Kentucky and Ohio, and northwest across Ohio. It then flowed under what is present-day Lafayette, Indiana and just north of Champaign, Illinois, and likely was coincident with the lower present-day Illinois River. The Teays River was dissected and largely wiped away by advancing glaciers and their meltwater. These glaciers were the massive continental ice sheets that began to cover large parts of Ohio and other states downstream (west) of Ohio between 2.5 and 3 million years ago. Their presence caused lakes (Glacial Lake Tight, Glacial Lake Monongahela, etc.) to form along the Teays and associated rivers. Overflow of these lakes into nearby, lower valleys caused large floods and new rivers to form. These new rivers, formed about 2 million years ago, included the present-day Ohio and Scioto Rivers, which are associated with the most direct evidence of the Teays. Present-day remnant till thickness can range between 51 to 726 feet. Sediments contained in these till deposits include sand, silt, pebbles, cobbles, and boulders. These sediments were deposited by fluvial, aoelian, and gravity. These glacial sediments deposited during the final glacial retreat are the foundation material in which the soils of the study area have formed over time.

3.2 SOILS

Specific soils found at different localities can represent data helpful towards extrapolating land-use patterns by prehistoric and historic occupations. Two dominant soil types are present within the Project APE (see **Table 3-1**), primarily Crosby silt loam (0 to 2 percent and 2 to 6 percent slopes) and Celina silt loam (2 to 6 percent slopes). Crosby soils are created in high-lime glacial till situated on upland landforms (McLoda and Parkinson 1980). They are found deeply buried, and are classified as slowly permeable and poorly drained. Celina series soils are usually located in proximity to Crosby soils, and have similar characteristics. In contrast, however, Celina soils are moderately well drained (McLoda and Parkinson 1980). A third soil type, Lewisburg-Crosby complex, is found in small quantities in the eastern portion of the APE. At the time of survey, soils within the Project area were heavily mottled, containing significant amounts of gravel. Ground that has been graded and modified typically displays this evidence of disturbance.

Table 3-1. Soil Types Present Within the Direct APE of the Project

Soil Type		Percent Slope
CeB	Celina silt loam	2-6%
CrA	Crosby silt loam, Southern Ohio Till Plain	0-2%
CrB	Crosby silt loam, Southern Ohio Till Plain	2-6%
LeB	Lewisburg-Crosby complex	2-6%

3.1 FLORA, FAUNA AND PALEOENVIRONMENT

During the Late Pleistocene, this portion of Ohio was covered in a coniferous forest consisting of spruce and fir trees. These trees were suited for the cool, moist climate (Braun 1950:464). At some time in the Late Pleistocene, there was a dry, warmer period that caused a shift from spruce and fir tree forests to pine and oak forests (Braun 1950:464).

Around 8000 B.P., there was a warming/drying trend. During this period, oak and hickory dominated the landscape. At the end of the warming trend, around 4000 B.P., Braun (1950) characterizes the project area as belonging to the Beech Maple Forest region. The Beech Maple Forest region dominated much of the Till Plains, and is characterized by forests with beech trees (*Fagus grandifolia*) in the upper canopy and sugar maple (*Acer saccharum*) in the understory (Braun 1950:305). In some areas where there are poorly drained soils at lower elevations, there are hydro-mesophytic trees including swamp white oak (*Quercus bicolor*) and American elm (*Ulmus americana*). Higher elevations with better drained soils often have beech, sugar maple, and American basswood (*Tilia americana*) (Braun 1950:316).

Most of this region was originally covered in woodlands, with oak, hickory, walnut, ash, birch and sugar maple being the dominant species. Agriculture is the primary land use in Clark County. Naturally occurring plants consist of perennial grasses and weeds in areas that were prairie. Some smaller low swampy areas, known as muck, may have originally supported sedges, rushes, and possibly other wetland vegetation.

During the Late Pleistocene, the development of open grazing lands and boreal forests would have supported a wide array of mammals adapted to cool climates. Evidence suggests that these types of biomes along the glacier's southern margins were exploited by megafauna indigenous to these areas, specifically the woodland musk ox (*Ovibos moschatus*), mastodon, woolly mammoth (*Mammut* sp.), barren ground caribou (*Rangifer*

tarandus), giant beaver (*Castoroides* sp.), and moose-elk (*Cervacles scotti*) (Cleland 1966:91-92; Prufer and Baby 1963:55; Ritchie and Funk 1973).

Over the course of several hundred years, climatic moderation gradually altered the glacial-boreal ecosystem in the Midwest. This trend, which has usually been assigned to some indeterminate time period beginning around 9000 B.P., was typified by a warmer climate with predominantly drier seasons. The megafauna of the Late Pleistocene suffered massive extinction and was replaced by smaller animals that filled the opening faunal ecological niches. These smaller animals are similar to contemporary species.

Contemporary faunal resources within the project area include both openland and woodland wildlife. Openland wildlife consists of several bird species such as pheasants, quail, meadowlarks, field sparrows, and doves, and mammal species such as cottontail rabbits (*Sylvilagus floridanus*), red foxes (*Vulpes vulpes*), and woodchucks (*Marmota monax*) (Meeker et al. 1973:15). Woodland wildlife consists of bird species such as ruffed grouse (*Bonasa umbellus*), woodcock (*Philohela minor*), thrushes, vireos, tanagers, and woodpeckers, and mammal species such as squirrels (*Sciurus* sp.), gray foxes (*Urocyon cinereoargenteus*), white-tailed deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), and opossum (*Didelphis virginiana*) (Meeker et al 1973:15). Several large mammals that were important to prehistoric subsistence patterns that have been subsequently hunted into local extinction include elk or wapiti (*Cervus elaphas*), bison (a possible Late Prehistoric species), cougar (*Felis concolor*), black bear (*Ursus americanus*), and wolves (*Canis* sp.).

A cool spruce pine forest with patches of grassland areas dominated the Late Glacial environment of Ohio, while deciduous trees were found in particularly favorable areas. These three elements were arranged in a mosaic pattern determined by local edaphic factors forming a parkland ecological setting not found in the region today. Grasslands increased in the glaciated section (including the areas effected by glacial outwash) of the state and deciduous elements were most common in the south. With the warming of the Late Glacial period, the region was becoming a more closed coniferous forest but the shrinking of the parkland was at least slowed or stabilized during the Younger Dryas, from 11,500 B.P. to 10,250 B.P. After this period (10,250 B.P.), the forests of the Middle Atlantic region were first dominated by pine and hemlock, and after 9000 B.P. they became more deciduous in character. This occurred rapidly in the non-glaciated regions and more slowly in the glaciated region. For example, the oak forest did not dominate southern New England until well after 8000 B.P. During Paleoindian and Early Archaic times, riverine environments would have offered the most food resources for humans. After 8800 B.P., human food resources in the oak forest also would have been available in a variety of upland settings.

Since the structure of vegetation controls the character and species composition of animal populations, it is "fundamental to hunting communities in determining their life style" (Evans 1978:4). This is also true for early Euro-American communities for whom vegetational patterns determined, in large part, the choice of settlement sites (Gordon 1969; Hulbert 1930). For example, Gordon (1969:41) reports that "stands of mixed oak, walnut, basswood, and black (sugar) maple had a high priority among the Woodland Indians and the early buyers of land for farming. They soon learned that the forest soils that supported such magnificent forests were possessed of extraordinary natural fertility."

The floral and concomitant faunal reconstructions are based on two types of evidence: palynological and early land survey records. The former indicates the types and frequencies of floral species present in an assemblage, while the latter data indicate the distribution of natural forest types prior to European settlement. The earliest vegetational patterns of the post-glacial succession and subsequent shifts in climax forest constituents are derived primarily from palynological evidence. More recent forest types (post-Hypsithermal) are assumed to have been quite similar to those present at the time of contact. Work done by Yarnell (1964:47) reveals that, "the climate probably remained much the same for the past 4,000 years... except for relatively minor fluctuations and the general vegetational patterns have not changed much during this period." With a stable climate, vegetational patterns over the past 4000 years in most of the eastern United States have also remained fairly consistent. Consequently, direct historic reconstruction can be based provisionally on vegetation patterns observed at the time of the first European pioneers.

Knowledge of past climate is based predominantly on palynological evidence that indicates broad floral patterns sensitive to specific climatic characteristics. Eastern United States climatic trends in Late Pleistocene times were shaped by the glaciers that penetrated well into the project area from points originating in northern Canada. This sequence developed in the Late Pleistocene, when a moist, cool climate succeeded a drier, cooler period.

Around 8000 B.P., a warming/drying trend occurred which is often referred to as the "Hypsithermal" or "Altithermal". This trend profoundly affected vegetation patterns until 4000 B.P. Modern floral patterns were in place sometime after 4000 B.P., by the end of the Hypsithermal period. Warm air masses from the Gulf of Mexico influenced the vegetation and climactic patterns of the region. The major climatic event during the late Holocene is the "Little Ice Age" or the Neo-Boreal episode, which dates from 348 B.P. to 50 B.P. or ca. A.D. 1600 to A.D. 1900. This shift to a cooler climate may have had a dramatic effect on local prehistoric populations, perhaps resulting in a shorter

growing season. The impact on Late Prehistoric populations is poorly understood, but some researchers suggest changes in community size and plans, as well as social organization, were a result of this phenomenon (Henderson 1998).

3.2 CLIMATE

The modern climate of Franklin County can be variable. Winters are described as cold, with an average daily temperature of 31 degrees Fahrenheit (F). Seasonal snowfall averages 28 inches. This accumulation results in moist spring soils minimizing summer drought. Summer in Franklin County is "uncomfortably warm (McLoda and Parkinson 1980)." Temperatures during summer average 72 degrees F.

A typical growing season in Franklin County lasts from April to September. More than half of the annual 22 inch precipitation falls during this period. This amount is sufficient for crops well-adapted to the climate of the region. Rain is most likely to occur during the summer months. Severe weather is infrequent, but can occur in the form of thunderstorms and tornadoes. Average windspeed is 11 miles per hour, and trends from the south-southwest (McLoda and Parkinson 1980).

4.0 CULTURAL OVERVIEW

The following overview provides a synthesis of various sources regarding the known prehistoric and early historic cultures of central Ohio. The compilation and analysis of the pertinent regional data, both archaeological and archival, can provide an intellectual framework for the assessment and synthesis of identified cultural resources within the current project area, especially through the development of cogent research questions which can be applied to each of the identified resources. In that framework, the choice of specific dates for dividing one cultural period from another is somewhat arbitrary, since continuity of occupation for most areas in the eastern United States is well documented (Broyles 1971; Michels and Smith 1967). In addition, regional variations can make such dates approximations at best. For ease of communication, however, it is convenient to use an accepted, standardized timeline which is based on significant distinctions among artifact assemblages. This pertinent regional information can provide a framework for addressing the problem of site significance, as well as suggest certain research questions concerning the area's cultural resources.

4.1 PALEOINDIAN OCCUPATION (14,000 to 8000 B.C.)

Some researchers believe that the Americas were populated before the more accepted Paleoindian occupation. In the Northeast United States, the earliest date for cultural material is found at the Meadowcroft Rockshelter in Pennsylvania, with C14 dates (SI-2345) between 16,225 B.P. and 13,300 B.P. (Adovasio et al. 1990). At Meadowcroft, a Miller lanceolate projectile point which dated to 12,000 B.P. was recovered, and below this projectile point were firepits dating to 15,000 B.P. Within these levels, artifacts recovered included bone, wood, basketry, shell, and cordage (Adovasio and Page 2002:157). Stone tools and debitage manufactured from high-quality raw material were also identified such as rhomboidal knives, unifacial choppers and scrapers, sharp-pointed knives, microengravers, and small blades (Adovasio and Page 2002:158). Meadowcroft Rockshelter is one of the few "Preclovis" sites identified in North and South America.

The Paleoindian cultural tradition is recognized as part of a widespread, homogenous, conservative New World culture typified by a distinctive lithic artifact assemblage. The most visible and diagnostic item in this assemblage is the fluted projectile point. Other artifact types, which remain consistent from the Holcombe Beach site in Michigan (Fitting et al. 1966) to the Debert site in Nova Scotia (MacDonald 1968), represent predominantly hunting, butchering, and hide-working activities. The lack of non-lithic artifacts in Paleoindian assemblages can most likely be attributed to conditions unfavorable for their preservation, although it is assumed that bone tools and ornaments were utilized. For example, a culturally-modified mastodon (*Mammut americanum*) rib

was recovered at the Hiscock site in western New York. This artifact has been radiocarbon dated between 11,140 B.P. and 11, 240 B.P. (Laub et al. 1996).

Paleoindian sites are reported from the American Southwest to Nova Scotia, with very little interregional variation in material culture. Because sites from this period reflect areas where small groups of people performed specific tasks for a short time, they maintain low archaeological profiles. Most information about this earliest cultural development must therefore be inferred from sparse surface recoveries of artifacts, and considered in conjunction with relevant paleoecological and geomorphological data.

Based on the available information, post-Pleistocene subsistence strategies must have been geared for coping with a harsh and rapidly changing environment. Evidence suggests that open grazing lands and boreal forests along the glacier's margins were exploited for woodland musk ox, mastodon, barren ground caribou (*Rangifer tarandus*), woolly mammoth, giant beaver, and moose-elk (*Cervacles scotti*) (Cleland 1966: 91-92; Prufer and Baby 1963:55; Ritchie and Funk 1973). In western New York, remains of the American mastodon, caribou, moose-elk, and California condor (*Gymnogyps californianus*) have been recovered at a site dating from 9140 B.C. to 9240 B.C. (Laub et al. 1996).

In the Midwest and Northeast, Paleoindian sites are typically located on hilltops and bluffs overlooking open portions of main river valleys and larger tributary valleys, and frequently occur at the confluence of rivers on high Wisconsin-age terraces. Seeman and Prufer (1982) have identified three variables which they believe influence the location and recovery of Paleoindian artifacts: 1) fluted points tend to be recovered in major stream valleys and at confluences, 2) they often occur in close proximity to the sources of good quality cherts, and 3) Paleoindian fluted points are rarely found in swampy bottomlands or rugged highlands such as the unglaciated portions of southeastern Ohio.

Around 9000 B.C., climatic moderation gradually altered the glacial-boreal ecosystem in the Midwest. The warming climate and eventually drier conditions initiated an increase of deciduous forest elements which by 5000 B.C. had become established as the dominant forest type (Cleland 1966:20-23). Cyclical plants developed and smaller animals filled the opening faunal ecological niches. These climatic changes forced changes in human behavior. The emergence of more specialized ecological adaptations marks the end of the Paleoindian period, and the beginning of the Archaic.

The examination of the Archival Study Area conducted as part of this Phase I survey regimen did not result in the identification of any evidence of Paleoindian activity within one mile of the Project.

4.2 ARCHAIC OCCUPATION (8000 to 1000 B.C.)

4.2.1 Early Archaic

While the later period of the Archaic in Ohio is well-documented, the prehistoric landscapes present during the earliest 3000 years of Archaic activity has been significantly less well documented. Purtill (2009:568) suggests that while early contexts for prehistory in Ohio identify a largely-empty Early and Middle Archaic landscape, archaeological research has helped illuminate these temporal periods, especially in north and central regions of the state. As of December 2004, absolute dates of occupation had been established for five Early Archaic occupations (Purtill 2009:569), none of which occur within ten miles of the Project. Purtill (2009) identifies 2890 site locations which contain material diagnostic to the Early Archaic, almost all of which occur across the Till and Lake Plain regions of Ohio; the unglaciated uplands in southeastern Ohio are almost entirely devoid of Early Archaic activity.

During the Early Archaic period, circa 8000-6000 B.C., the expanding deciduous forests produced a more favorable habitat for game species, particularly the white-tailed deer (Cleland 1966:92). Concurrently, there was a shift from the Paleoindian lanceolate fluted points to smaller more diversified types such as bifurcates including the MacCorkle, LeCroy, and Kanawha points or knives. Woodworking and milling tools were added to the assemblage, including axes, gouges, drills, and grinding stones (Chapman 1975:6; Jennings 1978:12). Small mobile groups gradually became more geographically restricted as seasonally oriented hunting and gathering activities were focused on smaller, more well exploited territories (Potter 1978:17). A narrow yet nutritious spectrum of plant foods seems to have been utilized, with deer hunting being the major subsistence activity (Chapman 1975:232-233; Cleland 1966:92). Occupational preferences appear to have centered on the uplands. Early Archaic sites tend to be small and scattered, limited to surface discoveries, and usually located in uplands near secondary stream valleys (Benchley 1975).

Purtill's recent (2009:565-605) re-analysis of the Early Archaic period in Ohio updated a relative timeline for Ohio, within which five Early Archaic contexts have produced absolute dates. The theoretical framework updated by Purtill establishes an occupational range for the Early Archaic in Ohio extending from approximately 10,950 B.P. through 8450 B.P., manifest archaeologically, in chronological order, through the presence of "hafted-biface horizons", including Early Side Notched, Charleston, Thebes, Kirk/Palmer, Kirk Stemmed, Large Bifurcate and Small Bifurcate. Purtill notes that Early Archaic lithic assemblages often contain unifacial and bifacial tools in context with diagnostic PPK specimens.

At least three distinct areas of specific lithic resource utilization have been defined for the Early Archaic in Ohio. In the northern half of the state, across the Lake and Till Plains and Glaciated Plateau, an Upper Mercer chert industry has been documented across a wide swath of sites in the region. Bowen (1994) defines an Upper Mercer "lithic supply zone" for northern Ohio, as identified through the presence of over 90 percent of Large Bifurcate Upper Mercer tools from archaeological deposits across the region. Several researchers (notably Stothers 1996 and Bowen 1991) have identified a second supply zone focused on exploiting natural outcrops of Pipe Creek in northern Ohio, which extends around the shores of Lake Erie as far north as southern Ontario. A third zone has been defined in the southwestern corner of the state, centered around the Miami River watersheds, which displays chert bifaces fashioned from Harrison County chert (Bowen 1994, Litfin 1993). Purtill (2009) postulates a possible fourth supply zone present within the southern limits of the state, along the Ohio River watershed, dominated by the exploitation of Paoli chert from outcrops across the river on the uplands of northern Kentucky. Interestingly, Purtill indicates that the latter stages of the Early Archaic in Ohio contain evidence of increased abandonment from these primary chert resource zones, towards the exploitation of smaller localized outcrops of raw material, correspondent with a shift away from the Large Bifurcate-biface tradition to the Small Bifurcate-horizon biface trends which extend into the Middle Archaic (Purtill 2009:571-572).

The archival research conducted for the Project did not identify any evidence of Early Archaic activity recorded within one mile of the Project.

4.2.2 Middle Archaic

During the Middle Archaic period, circa 6000-3000 B.C., the continuing improvement in the climate led to a greater variety of available resources. The diversification of subsistence-related activities increased, and an emphasis on the exploitation of seasonal resources began to grow in importance. The Middle Archaic economy became more diffuse with an emphasis still on deer hunting, but with utilization of a wider variety of plant foods (Cleland 1966:92-93). Specialization in certain activities generated a more complex social structure within the band network as evidenced by what Griffin (1978:229) calls the early indication of "status differentiation among the band members." The material remnants of Middle Archaic culture expanded to reflect the increasingly sophisticated technology adapted to the intensive exploitation of forest and riverine biomes. The Early Archaic bifurcate point types in Ohio appear to have been replaced by a widespread tradition of large side-notched points including types such as the Raddatz or Godar (Fitzhugh 1972:8; Justice 1987:60-71). There was an increase of ground and polished stone tools, full grooved axes, pendants, and winged and cylindrical

bannerstones used as atlatl weights. Bone tools begin to appear in the artifact assemblage (Chapman 1975:6; Griffin 1978:133), although it is almost certain that bone tools were in use previously, but are only found in significant numbers after the Middle Archaic for taphonomic reasons.

In parts of the Central Ohio Valley, the Middle Archaic sites are usually found along major waterways where artifacts reflect a reliance on aquatic resources and an unusually high number of bone tools are often present. Floral and faunal remains indicate that nuts, white-tailed deer, turkey, and passenger pigeon (*Ectopistes migratorius*) predominated in the diet (Cantley and Novick 1980).

Purtill's 2009 analysis of the Ohio Archaic identified a total of 452 Middle Archaic sites inventoried with the OHPO as of 2004, a significantly lower number than the 2890 Early Archaic and 3661 Late Archaic inventoried occupations. The steep decline in site frequency across the glaciated portions of the state appears to begin in the latter stages of the Early Archaic, as the trend away from the large zones of raw material exploitation towards localized chert-resource extraction coincides with the abandonment of the large hafted biface toolkit to smaller PPK and tool types. Purtill (2009:582-583) postulates that these are the archaeological manifestations of rapid population decline across the region, which would rebound dramatically into the subsequent Late Archaic period.

Not surpisingly, there has not yet been any material evidence of Middle Archaic activity documented within one mile of the Project.

4.2.3 Late Archaic

In the Late Archaic period, circa 3000-900 B.C., the expansion of deciduous forest reached its most northern limit around 2000 B.C., and the climate was warmer than present day (Cleland 1966:93). Coinciding with an increase of territorial permanence was the appearance of regional cultural adaptations exemplified by the Glacial Kame, Red Ochre, and Old Copper cultures (Cleland 1966). A wider array of specialized objects were utilized during the Late Archaic such as steatite and sandstone bowls, stone tubes and beads, polished plummets, net sinkers, whistles and rattles, birdstones, boatstones, and bone awls, needles, and perforators (Chapman 1975:6). Ceremonialism became increasingly important as evidenced through more elaborate, formalized mortuary practices and the presence of exotic burial goods which were procured through emerging trade networks (Chapman and Otto 1976:20).

The generally accepted model for Late Archaic settlement and subsistence patterns is that of mobile, hunter-gatherers with a band level social structure (Jobe 1983). The size and composition of these mobile groups would vary in accordance to the distribution and

availability of resources across the landscape and through the seasons (Boisvert 1986). During the spring and summer, the exploitation of shellfish, fish, turtles, migratory birds, and other aquatic resources produced concentrations of sites that can be characterized as small camps on slight knolls. Winter camp sites were situated above the valleys for the effective exploitation of upland game such as deer, other medium-sized mammals, and birds.

The first evidence of cultigens is associated with this time period. In Missouri and Kentucky, they occur as early as 2300 B.C. (Chomko and Crawford 1978:405). At Salts Cave, chenopodium (*Chenopodium* spp.), sunflower (*Helianthus annuus*), and yellow flowered gourd squash seed (*Cucurbita pepo*) were reported dating approximately to 1500 B.C. (Yarnell 1973). Sumpweed (*Iva annua*), sunflower, chenopodium, and maygrass (*Phalaris caroliniana*) remains were recovered from human paleofeces dating to 1150 B.C. at Hooton Hollow, a rockshelter in eastern Kentucky (Gremillion 1996).

The archival research did not identify any recorded Late Archaic archaeological sites within one mile of the Project.

4.3 WOODLAND OCCUPATION (1000 B.C. to A.D. 1000)

4.3.1 Early Woodland

The Early Woodland period, circa 900-100 B.C., appears to represent a cultural expansion of the Late Archaic, and is characterized by a greater tendency toward territorial permanence, as well as an increasing elaboration of ceremonial exchange and mortuary rituals. Burial practices, which formed the core around which Early Woodland mortuary complexes evolved, were, in fact, extant throughout the Archaic, and persisted into the Early Woodland (Webb 1947; Griffin 1968:133-134). Evidence that the Early Woodland diet was supplemented by domestication of various native and non-native cultigens like sunflower and chenopodium (Struever and Vickery 1973:11-19), should be amended to note the earlier use of these cultivated garden crops in the Archaic (Yarnell 1973).

In Ohio, the local Early Woodland expression was the Adena culture, noted for the use of pottery and the use of constructed conical mounds for interment (Chapman and Otto 1976:21). Ritualized status, rank burials, and construction of burial mounds probably had their origins in previous Late Archaic ceremonial complexes. Similar to the Late Archaic, the Adena were a semi-sedentary people, however, they were more territorially restrictive, which was in part evidenced through the occurrence of semi-permanent village sites and the first manufacture of pottery (Chapman and Otto 1976:21). Several types of ceramics are commonly associated with the Adena: Fayette Thick, Adena plain, and Montgomery incised. However, Fayette Thick ceramics recovered at the West

Runway site (15Be391), located at the Greater Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky dated to 640 B.C. (Duerksen et al. 1995), which predates the generally accepted timeframe for Adena. Rather than being associated with Adena, therefore, Fayette thick ceramics are contemporary to the Marion Thick wares from Indiana and are associated with the pre-Adena Early Woodland in the Central Ohio Valley. These recent investigations have resulted in researchers in Kentucky considering the Adena a Middle Woodland phenomenon (Railey 1990; Duerksen et al. 1995).

Finely manufactured leaf-shaped blades and a variety of stemmed projectile points such as Cresap, Robbins, and Adena were manufactured (Chapman and Otto 1976:21). Copper was used to fashion ornaments such as beads, bracelets, rings, gorgets, and reels (Potter 1978). Other typical artifacts included tubular pipes, quadraconcave gorgets, pendants of banded slate materials, full grooved axes, hematite celts, and incised stone tablets (Chapman and Otto 1976:210).

The archival research did not identify any Early Woodland occupations inventoried within one mile of the Project.

4.3.2 Middle Woodland

The Middle Woodland period, circa 100 B.C. – A.D. 500, represents a period of complex sociocultural integration across regional boundaries via networks of trade. This concept has been described as the Hopewell Interaction Sphere by Caldwell (1964) and Struever (1964). The designation "Hopewell" has been applied to a particular archaeological assemblage that has been found from western New York to western Missouri and from the Gulf of Mexico to Lake Huron. Mayer-Oakes (1955:15) and Griffin (1978:246) recognized two dominant complexes existing during the Middle Woodland: one, known as Hopewell, in southern Ohio, and the other, comprising the Havana societies, in the Illinois River valley and adjacent areas. Both are regarded as Hopewell, but the Ohio focus, a culmination of Late Archaic and Early Woodland trends, is more elaborate in terms of stylistic traits, mortuary ceremonialism, and complexity of earthworks.

Hopewell is characterized by elaborate geometric earthworks, enclosures, and mounds that are often associated with multiple burials and a wide array of exotic ceremonial goods. Ceremonially, the Hopewell appear to represent a continuation of the Adena, but on a more expanded and elaborate scale (Dragoo 1962:13). Hopewellian trade networks were more extensive and materials used in the manufacture of ceremonial objects were acquired from various regions of North America: copper and silver from the Upper Great Lakes; quartz crystals and mica from the Lower Allegheny mountain region; obsidian and grizzly bear teeth from the west; shark and alligator teeth, marine shell, and pearls from

the Gulf Coast region (Prufer and Baby 1964:75). Some of the ceremonial artifacts that were produced include obsidian knives and blades; stone platform pipes with human and animal effigies; copper breast plates, ear spools, and celts; mica zoomorphic and geometric shapes; and highly decorated ceramic vessels (Jennings 1978:233). Lithic types attributed to the Hopewell are Snyders points, Hopewell leaf-shaped blades, small side-notched points without basal grinding, prismatic bladelets and associated polyhedral cores, and flake knives, most of which were manufactured from high grade flint, another important trade commodity (Chapman and Otto 1976:23; Mayer-Oakes 1955:15).

Middle Woodland subsistence was based on hunting and collecting, and small scale agriculture, probably more accurately described as horticulture. Wymer (1997) has posited that 60 to nearly 90 percent of seeds recovered from Ohio Hopewell sites are components of the Eastern Agricultural Complex - maygrass, erect knotweed (*Polygonum erectum*), and chenopodium. Other significant cultigens include sumpweed, sunflower, and yellow flowered gourd squash. Significant wild species include hickory nuts (*Carya* spp.), black walnut (*Juglans nigra*), butternut (*Juglans cinera*), acorn (*Quercus* spp.), and hazelnut (*Corylus americanus*). Horticultural and plant gathering activities provided for the majority of the Middle Woodland diet, but were complimented by hunting, fishing, and gathering focused on the white-tailed deer. Other notable animal species taken include black bear, elk or wapiti, beaver (*Castor canadensis*), various fish species and mussels (Griffin 1968).

Settlement patterns in the Middle Woodland have been described as a series of vacant ceremonial centers surrounded by outlying, inhabited farming villages (Prufer 1964). This "Vacant Center - Dispersed Agricultural Hamlet," model is based on the Mesoamerican Vacant Ceremonial Center-Dispersed Agricultural Hamlet pattern, wherein the ceremonial center is the focus of settlement, but is, itself, not a center of domestic activity (Dancey and Pacheco 1997). This model has recently been updated by Dancey and Pacheco (1997), and referred to as the "Dispersed Sedentary Community Model." The model is still based on the concept of isolated households dispersed across the landscape, usually organized around regional drainages. These small settlements are widely dispersed to allow for a subsistence strategy, which combines horticulture and hunting and collecting. Other components of the settlement pattern include: "outlying camps, public works, and symbolic places" (Dancey and Pacheco 1997:8). The hamlets belong to a "ritual precinct," a ceremonial center of burial mounds and earthworks which provide a focus for ceremonial activities, and, possibly, trade and interaction with groups of other "ritual precincts."

The ebb of the Middle Woodland cultural florescence marked the beginning of the Late Woodland period, circa A.D. 500 – A.D. 1000. From 100 B.C. to A.D. 500, the Scioto

Hopewell had reached a cultural apex (Shane and Murphy 1967:144). Around the sixth century A.D., a decline and realignment took place, the exact causes of which are unknown. Much speculation has been put forth on the causes of this change. Cleland (1966:94-95) theorized the breakdown of territories and intergroup contacts was due to the concentration upon one subsistence activity, a focal agricultural economy. Farnsworth (1973) also suggests a similar hypothesis that a new subsistence strategy based on maize agriculture resulted in greater dietary self-sufficiency and less reliance on an exchange-redistributive network. Dancey (1996) explains the breakdown as the result of a redirection of energy toward intensification of labor and community aggregation.

The archival research did not identify any evidence of a Middle Woodland occupation within one mile of the Project.

4.3.3 Late Woodland

Regardless of the reasons, it is evident that by A.D. 700, major changes in subsistence and settlement were occurring, and that there was more diversity in occupation patterns. Ceremonial centers were abandoned, trade networks dissipated, and less emphasis was placed on burial ceremonialism.

Much of the characterization of the central and southern Ohio Late Woodland has been based on ceramic assemblages (Murphy 1975:232). Several different pottery types, distinguished by their primary tempering technique, are used to define these assemblages (Murphy 1975). Southern Ohio ceramic ware is characterized by the Peters series, which is primarily cordmarked and tempered with flint/chert, and the Chesser series, which is cordmarked and tempered with limestone (Prufer and Baby 1964:12; Prufer and McKenzie 1966:241). Lithic assemblages are represented by triangular projectile points, Raccoon notched, and Chesser notched points.

In the Hocking Valley of southeastern Ohio, Late Woodland Chesser Phase settlements were large, semi-permanent farm villages located on Illinoian and Wisconsinan terraces of the main river valley with satellite fall and winter hunting stations in rockshelters along nearby tributary valleys (Shane and Murphy 1967:333).

An increase in population would have put stress on resources. The utilization of upland and bottomland sites during the Late Woodland is suggestive of the dichotomous settlement system documented for early historic groups in the Plains and northeast United States. This system is composed of two distinct types of sites occupied on a seasonally interchangeable basis. During the summer, a base camp or village is established with habitation structures and cultivated fields and is reoccupied from year to year. After the harvest, these sites would be temporarily abandoned for hunting camps in the nearby

forests. This major territorial reorganization, between the Middle and Late Woodland periods, indicated the gradual restriction of the total catchment area, thus suggesting more spatially confined and more autonomous social units.

The archival research did not identify any evidence of a Late Woodland occupation within one mile of the Project.

4.4 LATE PREHISTORIC OCCUPATION (A.D. 1000 to Contact)

After A.D. 1000, the Middle Ohio Valley from roughly the mouth of the Muskingum to the Falls of the Ohio (Henderson 2008) was inhabited by groups of village-dwelling farmers and hunters known as the Fort Ancient culture. In contrast to the preceding Late Woodland patterns, Fort Ancient is marked by an increase in village size and an intensified focus on cultivation of staple domesticates: corn, beans, squash, and sunflower. Although contemporaneous with classic Mississippian manifestations observed further to the west, Fort Ancient lacks the monumental earthwork architecture and complex settlement hierarchy exhibited by these societies. Farming appears to have supplied the bulk of the Fort Ancient diet (Lewis 1996:127). Animal exploitation appears to have consisted entirely of hunting and trapping, and the keeping of domesticated dogs (Henderson 2008).

The Fort Ancient culture appeared in southern Ohio from A.D. 960 - A.D. 1000, its emergence from a Late Woodland base stimulated by an increasing reliance on maize agriculture, an increase in sedentism, and the influx of southern Mississippian influences (Essenpreis 1978). The stylistic diffusion of ceramic attributes such as thick strap handles, incised guilloche designs, and the use of shell-tempering were probably the earliest Mississippian influences to enter the Ohio Valley. New architectural styles, new crops (beans), and Mississippian ceremonialism were also introduced after this time. However, according to Henderson (1992), Fort Ancient cultures of the Ohio Valley differ from Mississippian cultures in several aspects. For example, beans are a staple in the Fort Ancient community, but are virtually absent from contemporary Mississippian sites. In addition, Fort Ancient peoples reduced their consumption of starchy-oily seeds while Mississippian communities continued to exploit these resources. Finally, elk or wapiti and bear were an integral part of the Fort Ancient diet, but were exploited to a lesser degree by the Mississippian people.

The 750 year period during which this tradition lasted has been divided by archaeologists into three sub-periods: Early, Middle, and Late. The earliest stages of Fort Ancient developments apparently involved the in situ selection by small, dispersed local groups of subsistence strategies that persist throughout the period. The household was often the basic node in the settlement system during the Early Fort Ancient, and Pollack and

Henderson (1992) have compared this level of organization with the family/hamlet pattern proposed by Johnson and Earle (1987). The latter sub-periods saw a gradual concentration of local populations into larger and larger settlements, with circular organization becoming the norm in the eastern portions of the cultural range. This level of social organization is thought to be analogous with Johnson and Earle's (1987) "acephalous local group" construct, in which political power is weak and ephemeral, and factionalism/fragmentation frequent (Pollack and Henderson 1992).

There is evidence that after 1400 A.D. a seasonal cycle of congregation in large villages during the summer and dispersing into smaller camps during the winter may have been followed (Fitting and Cleland 1969). Status differentiation among individuals becomes more pronounced with time as indicated by materials interred with burials as grave-goods. Concurrently, over time traits differentiating local Fort Ancient manifestations recede as wider regional traits gain emphasis. Extraregional trade becomes more pronounced. These developments are concurrent with the emergence of Late Fort Ancient. Pollack and Henderson (1992) propose that the larger Late Fort Ancient villages were the result of two or more smaller villages typical to the Middle Fort Ancient period combining into one larger community. Inherent to this construct is the perception that political power becomes more focused and permanent, analogous to the classic Big Man Society (Johnson and Earle 1987).

Chipped stone triangular projectile points; well-fired, thin-walled ceramics tempered with shell or grit, stone discs bifacially chipped from non-cryptocrystaline raw material (typically limestone), and a variety of bone implements are common materials recovered from Fort Ancient sites in the region.

4.5 PROTO-HISTORIC AND HISTORIC OHIO

The Ohio Valley prehistory phased into the historic period as items of metal and glass appear at Late Fort Ancient sites in the region dating to the early seventeenth century (Pollack and Henderson 1983). Such items occurring at these times are interpreted as reflecting indirect trading contacts with Europeans to the east and south, with direct contact between Europeans and Native Americans in the Middle Ohio Valley occurring somewhat later.

The relationships of specific Native American groups to their lands in central Ohio at the time of earliest European documentation is unclear. This obscurity may be attributed to the general assumption that even before direct contact with Europeans had occurred in the Middle Ohio Valley, the repercussions of the colonial presence in the New World had unbalanced to some extent all portions of the sociocultural network that had adapted over millennia across eastern North America. It has been proposed that smallpox appeared in

the Southeast in the last few years of the seventeenth century (Milner 1980) initiating rapid, tumultuous period of regional epidemics that decimated, dispersed, and demoralized native populations. Traditional accounts that Kentucky was explicitly maintained as an intertribal game preserve at this time, uninhabited except for transient Iroquois and Cherokee hunting parties, are almost certainly overly simplistic expressions of a complex reality (Jennings 1984), but probably do reflect the disrupted aftermath of disease and the ravages of trade-based conflicts. These pressures influenced another documented source of this historical obscurity: the voluntary, sometimes temporary, migration of groups towards newly established hubs of European trade.

The earliest of regional accounts by French and British sources reflect a high degree of band mobility up and down the length of the Ohio River (Jennings 1984), often in reaction to various positive and negative pressures from the European powers. For instance, Donehoo (1928) reports that a single band of Shawnee, known by the French to be living on the Ohio River near its confluence with the Mississippi River in 1682, settled two years later on the Delaware River in Eastern Pennsylvania in the company of Arnold Viele, a Dutch Trader from Albany who is reputed to be the first European to navigate the Ohio River. It is not surprising, therefore, that the understanding of the tribal territories of that period remains so ephemeral and incomplete.

Prior to the last half of the seventeenth century, several Native American tribes were occupying the region now known as present day Ohio. These tribes included the Mosopela of southwestern Ohio, the Oniassenthe of southeastern Ohio, and possibly the Erie, whose cultural center was known to, geographically, be in western New York and northern Pennsylvania region. However, their subsistence range may have extended into northeastern Ohio (Wheeler-Voegelin 1974:2-4, 63-64). Two other groups that were displaced westward by the influx of Northern Europeans, the Shawnee and Delaware, are known to have settled in Ohio. Originally, the Shawnee territorial lands were located in Southern Ohio. Conquered by the Iroquois in 1672, subsequent resettlement "brought them [Shawnee] into association with a variety of different tribes," such as the Delaware and Creek Tribes (Callender 1978:622). They [Shawnee] settled with the Delaware in eastern Pennsylvania. Later, both groups were displaced into the Ohio River Valley, arriving in western Pennsylvania and central Ohio between 1720 and 1745. Shawnee villages were typically semi-permanent settlements composed of bark-covered lodges, sweathouses, and communal structures used for ritual and secular celebrations (Clark 1974:85-90). During the summer months, crops were tended in fields near the towns and, in the fall, the inhabitants dispersed to winter camps in sheltered valleys to hunt and trap (Clark 1974).

It is recorded that the Shawnee at around 1738 established their main village, Sonontio, (Lower Shawnee Town) near the mouth of the Scioto River, a short distance to the west of present-day Portsmouth, Ohio. French and British traders vied for access to this vibrant population center, which served as home or waypoint for a large number of representatives of tribes from across the midcontinent. Lower Shawnee Town was located at the mouth of the Licking River and settled in 1739. A large flood in 1758 prompted many of the Shawnee to move up the Scioto River to one of the five villages in Ohio known as Chillicothe. The Shawnee moved west from present day Portsmouth, Ohio sometime between 1729 and 1764 and established the town of "Old Chillicothee" on the Little Miami, about three miles north of Xenia. A town was also established 12 miles north on the Mad River at Piqua, where Tecumseh was born. Both Old Chillicothe and Piqua were destroyed in 1780 by an expedition led by George Rogers Clark. The Shawnee then retired to the fifth Chillicothe village on the Great Miami River (Clark 1974).

British colonial records indicate European trade missions during the later decades of the seventeenth century descending the Ohio River, and possibly continuing up the Mississippi as far as the confluence with the Missouri River (Jennings 1984). By the early eighteenth century British traders had established trading posts at several points within the Ohio valley, including a strong presence at Lower Shawnee Town, located in the vicinity of present-day Portsmouth, Ohio. In 1749 these same Englishmen were directly challenged as trespassers on French territory by Celeron de Bienville, as he and his mission laid claim to the Ohio watershed on behalf of their government.

On August 20, 1794, an American army under the command of Anthony Wayne defeated a Native American force led by Blue Jacket of the Shawnee at the Battle of Fallen Timbers. In January 1795, representatives from the Wyandot, Delaware, Shawnee, Miami, Eel River, Wea, Chippewa, Potawatomi, Kickapoo, Piankashaw, and Kaskaskiamet tribes met with Wayne at Fort Greene Ville. On August 3, 1795, after eight months of negotiations between the United States Government and the tribes, the Treaty of Greeneville was formally signed. The natives agreed to cede claims to land south and east of a boundary that began roughly at the mouth of the Cuyahoga River; southward to Fort Laurens; westward to Fort Loramie and Fort Recovery; and southward to the Ohio River. Those few Shawnee who were not in agreement with the Treaty of Greenville joined Tecumseh and resisted the United States Government until after the War of 1812.
A small group of Shawnee fought for the United States during the War of 1812, and in compensation for their service, these Shawnee were awarded lands in the vicinity of Wapakoneta and Hog Creek near present-day Lima, Ohio. By 1830, the Shawnee were confined to two small reservations in northern Ohio.

In 1817 the United States government signed The Fort Meigs, or Maumee Rapids, Treaty, with several aboriginal tribes including the Seneca Indians. This treaty bound the Seneca tribe to cede all claims to land north of the Greenville Treaty line, and in return they received a 40,000 acre reservation at Lower Sandusky (Fremont). Beginning in 1830, with a policy of Indian removal developed by the administration of Andrew Jackson, and by 1832, all Shawnee lands east of the Missouri River were ceded to the U.S. Government and all the Shawnee were removed to west of the Mississippi.

The Treaty of Greenville formally marked the beginning of permanent Euro-American possession of most of the lands north and west of the Ohio River, although several settlements like Marietta and City of the Seven Hills (Cincinnati) were founded as early as 1788. Likewise, the Land Ordinance of 1785 and the 1787 Northwest Ordinance had already delineated how the western lands would be surveyed and governed respectively. In fact, as early as 1785, a survey of the first seven ranges (vertical rows of townships) of eastern Ohio was undertaken, tracts of which were sold in 1787 (Sherman 1925:52).

As has been noted previously, access to permanent, reliable water resources was vital to Native American settlements, like-wise settlers to the region relied on use of natural waterways for settlement, transportation, and economic development of the region. Settlers successfully used the Ohio and its tributaries, together with various Indian trails, as a means of gaining access to the new territory. Based on historic maps and historic documents, aboriginal trails, as well as the primary water ways, were extensively used by the first settlers as transportation routes into the frontier lands. These aboriginal trails served to direct the movements of settlers and also were the foundation for many of the roadways built in later decades (Wallace 1971). The trails connected geographic points, usually villages or towns and generally traversed relatively dry, level land. These trails provided the first access to desirable lands and later guided engineers in constructing stable, permanent road systems. In Ohio, the primary aboriginal trail, the Scioto Trail, trended north to south through central Ohio, between Sandusky Bay on present-day Lake Erie and the mouth of the Scioto River. From the Sandusky River, to the Scioto River, to the confluence with the Ohio River, the Scioto Trail joined the famous "Warriors' Path," leading far into the southland. Combined, these trails constituted one of the greatest war paths of the western country. The principal towns along the Scioto Trail included: the Sandusky towns on Lake Erie; Wyandot town, in the vicinity of the upper rapids of the Sandusky river; Mingo and Delaware towns in Delaware County; Old Salt Lick town and Mingo town in Franklin County; Maguck and the Chil- lieothe towns in Pickaway and Ross Counties, Chillicothe on the Ohio or Lower Shawnee town, at the mouth of the Scioto River.

Indian-European occupational continuity can be easily documented; since historic-era maps clearly illustrate several major overland routes have been constructed on known aboriginal trail-systems, as are many modern cities are constructed on the foot-print of aboriginal village locales (Hulbert 1930:48-59). Historically, documentation of the earliest road building efforts notes that Zane's Trace, which primarily connected Wheeling, West Virginia, and Maysville, Kentucky, ran partially across Ohio through Zanesville on the Muskingum, Lancaster on the Hocking, and Chillicothe on the Scioto Rivers.

While the late 1700s were dominated by the establishment of homesteads, self-sufficient farms and related pursuits, the groundwork was also being laid for better transportation and the beginnings of commerce and industry in the area. For the first 50 years most farms were located on bottomlands and terraces along the Ohio River. As farms increased the number of cultivated acres, concerted timber harvests of the indigenous eastern hardwood forests produced surplus lumber and surplus foodstuffs. Timber harvest as a commercial venture occurred in the post-Civil War years. In areas with river transportation, sawmills were economically feasible. Boat building, especially in the Ohio Valley, and milling developed in conjunction with agricultural production (Buck and Buck 1939:300). Keelboats and flatboats were used to ship timber and agricultural produce downriver to New Orleans. Pittsburgh, the focus of this river commerce, grew to a town of 1565 inhabitants by 1800. Local roads were improved and extended to make wagon traffic more practical, although wagon transportation was not common until after 1790.

In addition to roads, canals were also constructed to transport people, livestock, and goods. The canal building heyday was primarily limited to the 30-year span between 1825 and 1855, when two major systems totaling over 800 miles of canal were excavated: the Miami and Erie systems (Powell 1975:121). Although canals encouraged a burgeoning agricultural and commercial market, they ultimately failed because their operations were both parochial and seasonal, and because the capacity of their technology was soon outstripped by that of railway transport (Powell 1975:122). The boom in railroad development lasted throughout the next 30 years, from 1850 to 1880, and caused a concomitant surge in economic growth.

4.5.1 FRANKLIN COUNTY

Franklin County, named for Benjamin Franklin, is located in central Ohio. The first settlement in the region, Franklinton, was established in 1797 by Kentucky surveyor, Lucas Sullivant (Caldwell 1872), at the confluence of the Scioto and Olentangy Rivers. Prior to the Treaty of Greenville, the Wyandot Indians were known to have lived and farmed in this location (Howe 1888). The outpost became a hub for those looking for the

opportunity to begin a new life on the frontier. Sullivant encouraged settlers to move west by giving away parcels of land (Caldwell 1872). The ammenities in town were limited, and "luxury" goods, like newspapers, had to be acquired 60 miles downriver in Chilicothe. This isolation did not deter individuals attracted by the lure of land and prosperity. Satellite encampments were formed along Darby and Alum Creeks, as well as other local waterways. At the turn of the centruy, a small store and mill were constructed to accomodate the needs of the growing population. Eventually, the town built a log cabin jail and a courthouse made of "brick pressed from the clay of a mound that had entombed the bones and beads of chiefs, squaws and pappooses (Howe 1888)."

It was around this time that Ohio would be granted statehood, and required a proper capital. Chilicothe and Zanesville had their turns as meeting place for the legislature, but both were deemed rough and unrefined frontier towns. Lucas Sullivant campaigned for the capital to be moved north to Franklinton (Lentz 2003). A more centralized location was appealing, but ultimately, Sullivant's choice to found his town on the low-lying, flood-prone west bank of the Scioto River would be the reason Franklinton was rejected as the seat of government (Historical Publishing Company 1901). The decision was made to create a capital from scratch on the high and dry east bank of the Scioto River, across the water from Franklinton. In 1812, surveyors began plotting the grid for Columbus, and four years later the capital was officially moved (Lentz 2003).

The history of Franklin County is very much the history of Columbus. It was not long until the capital became the metropolitan city the legislature was seeking. Columbus was bustling with many shops, churches, banks, and newspapers. Several institutions were built, including an assylum for lunatics and a large penitentiary. The National Road reached Columbus in 1836, and headed west to Indianapolis. The Sandusky Turnpike connected the capital to the north, and the 307 mile Ohio Canal linked Lake Erie to the Ohio River (Howe 1888). The Ohio Agricultural and Mechanical College was founded in 1873, which soon changed its name to The Ohio State University (Ohio History Central 2013). By this time, the population of Franklin County neared 90,000 residents, and Franklinton was consumed by Columbus' expanding city limits (Howe 1888).

Factories and workshops flourished in Columbus making the capital a center of commerce. Manufacturing of buggies became a prominent business, and the Columbus Buggy Company run by C.D. Firestone made central Ohio the "buggy capital of the world (Lentz, 2003)." Brewing also took off in Columbus, in part due to the city's large German population. Companies like L. Hoster Brewing, Schlee Brewery, and Born Brewery were very successful thanks to the invention of refrigeration and the capital's healthy railroad network (Lentz 2003). The fertile farmland that first brought settlers to Franklin County continued to produce, making agriculture a profitable industry.

5.0 ARCHIVAL RESEARCH

Prior to and during the field reconnaissance of the Project land requirements, AECOM conducted archival research in an effort to develop a context for the prehistoric and historic landscape documented across this portion of Franklin County, Ohio. This research involved the identification of all OHPO-inventoried cultural resources located within one mile (1.6 kilometers) of the Project, a buffer that is hereafter referred to as the *Archival Study Area*. Previously-defined cultural resources are contained within: the Ohio Archaeology Inventory (OAI) database of archaeological sites, the Ohio Historic Inventory (OHI) of extant above-ground historic resources, and the National Register of Historic Places (NRHP). In conjunction with the resource-inventory research, an examination was undertaken of previous Cultural Resource Management (CRM)-related reports which were completed within the townships containing portions of the Project. The synthesis of these data provides a clearer picture of cultural resource sensitivity across the landforms within the direct APE of the Project. The following section details the results of the cultural resources literature review conducted by AECOM for the Project, which:

- Defines the documented historic-era and prehistoric cultural contexts archived with the OHPO;
- Identifies inventoried cultural resources located within the Archival Study Area for the Project; and,
- Develops a context for assessing the Section 106 requirements (if any) for the Project.

AECOM consulted the OHPO online mapping system prior to the initiation of fieldwork in March 2016, in effort to locate cultural resources inventoried within one mile (1.6 kilometers) of the Project. The following table quantifies the data collected from the archival research, separated into resources/reports archived within the one mile study buffer, and also within 300 feet of the proposed Project APE.

Table 5-1. OHPO-Inventoried Cultural Data Relative to the Project APE

OHPO Data	Within One Mile	Within 300 Feet
NRHP-Listed Properties/ Districts	0	0
DOE Properties	0	0
OAI-Listed Archaeological Sites	3	0
OHI-Listed Aboveground Resources	4	0
OHPO-Recorded Cemeteries	1	0
Previous CRM-Related Surveys	7	0

In summary:

- A total of three OAI-listed archaeological resources have been inventoried within the Archival Study Area for the Project;
- A total of four OHI-listed aboveground structural resources have been inventoried within one mile of the Project;
- No properties or districts within one mile of the Project are currently listed in the NRHP;
- One historic-era cemetery has been inventoried with the OHPO within one mile of the Project; and,
- Seven CRM-related surveys have been conducted within one mile of the Project, including one extensive historic survey (OHPO ID #H00105).

Appendix A, Figures 2A/B illustrates the location of the cultural resources identified through the OHPO online mapping system review.

5.1 INVENTORIED ARCHAEOLOGICAL RESOURCES

The archival research for the Project identified three previously-recorded OAI resources within one mile of the Project. All resources are documented as historic finds, and none are located within the Project APE. The following table lists the archaeological resources inventoried within one mile of the Project.

Table 5-2. OAI-Listed Archaeological Sites Inventoried Within One Mile of the Project

Site ID	Temporal Period	Site Type	Distance to Project
33FR1324	Unassigned Historic	Open site, type unknown	1322 feet/ 403 meters
33FR1319	Unassigned Historic	Open site, type unknown	2407 feet/ 734 meters
33FR1322	Unassigned Historic	Open site, type unknown	2948 feet/ 899 meters

These historic resources are defined on the OHPO online mapping system as unassigned historic, with no indication given as to a specific historic-period association. None of the archaeological sites listed within one mile of the Project have been recommended for listing on the NRHP, as they do not fulfill the determination criteria outlined in **Chapter 1.1** of this report.

5.2 INVENTORIED ABOVE-GROUND RESOURCES

A total of four OHI-listed aboveground structural resources have been inventoried within one mile of the Project. The following table outlines the characteristics of these aboveground resources, relative to the Project.

Table 5-3. OHI-Listed Resources Inventoried Within One Mile of the Project

Resource ID	Type/ Description	Date	Distance to Project
FRA0687608	Rich and Cathy Bennett House – Private Residence	1930	1688 feet/ 515 meters
FRA0687708	Unnamed – Private Residence	1940	1787 feet/ 545 meters
FRA0847028	James Phillippi Farm – Private Residence	1925	3740 feet/ 1140 meters
FRA0192608	St. James Lutheran Church - Church	1871	4230 feet/ 1289 meters

Three of the four documented above-ground resources are characterized as private residences. The Rich and Cathy Bennett House, erected in 1930, is located northwest of the Project area on Walcutt Road. The style of architecture used to describe this structure is Tudor/English revival. Approximately 160 feet south, an unnamed residence was recorded and listed on the OHI. This building was constructed in 1940 and classified as a Craftsman/Arts and Crafts home, but has since been demolished. Southwest of the Project area, the James Phillipi Farm has been documented along Hilliard-Rome Road East. The residence at this location contains elements of colonial revial architecture and was built in 1925. Numerous outbuildings and barns are also present on the property.

The fourth OHI-listed above-ground resource located within the one-mile Archival Study Area is Saint James Lutheran Church, sometimes referred to as Saint James-Jacob Lutheran Church. The present church was constructed in 1871 in the Gothic Revival genre of architecture. The structure consists of a chapel with a steeple and large annex. The original church was a log building assembled by church members in 1848 (St. James Lutheran Church 2013).

Few OHI-listed aboveground resources are found within the vicinity of the Project. This is likely due to the extensive modern commercial and residential development that has taken place in the area. Construction of new homes, facilities and highways has no doubt led to the demolition of older structures, and yet, these modern projects, such as road realignments and improvements, have been the catalysts for the documentation of many historic above-ground resources.

5.3 OHPO-LISTED CEMETERIES

One historic-era cemetery, Saint James Cemetery (OHPO ID #3619), has been listed by the OHPO within the Archival Study Area examined for the Project. The cemetery is situated off Trabue Road, approximately 4296 feet (1309 meters) west of the existing UPS facility, and is bordered by Hilliard Rome Road to the west, and Renner Road to the north.

Saint James Cemetery dates to 1848, the same year the affiliated Saint James Lutheran Church was founded (Gustafson and Gustafson, 2003). At that time, the congregation was comprised of exclusively German immigrants. Services were conducted in their native tongue, which is reflected in the names and language found on the gravestones. The western portion of the cemetery is considered the oldest, but contains some of the church's youngest members. The half-acre cemetery is located north of the chapel and consists of over 200 headstones. It is still in use by its modern, now English-speaking, congregants.

5.4 PREVIOUS CULTURAL RESOURCE SURVEYS

The archival research identified seven previous cultural resources survey reports on file with the OHPO for land requirements within one-mile of the Project, as indicated in **Table 5-4**.

Table 5-4. Summary of Prior Cultural Resource Surveys Conducted Within One Mile of the Project

NADB/HADB ID	Date	Author(s)	Title	Survey Area
12749	1992	Minichillo and Jackson	*Cultural Resources Survey of the Proposed 1992 Mainline Project, Project 1: Line A Replacement, Project 2: West Columbus Supply Project, Clark, Franklin, and Madison Counties, Ohio*	96 acres
15277	2003	Weller	*Phase I Archaeological Survey for a Proposed 4.4 ha (10 ac) Housing Development in Norwich Township, Franklin County, Ohio*	7 acres
11060	1989	Kreinbrink	*Cultural Resources Survey of a Proposed 0.7 Mile Gas Pipeline Replacement, Franklin County, Ohio*	6 acres
14872	2001	Keener	*Phase I Cultural Resource Management Survey of the Proposed AT&T Cell Tower (Hilliard Rome & Fisher Site CO-117-01) in Prairie Township, Franklin County, Ohio*	< 1 acre
H00105	1995	Mitchell	*Norwich Township. An Historical and Architectural Assessment of the Hilliard-Rome Road Widening Project, Norwich Township, Franklin County, Ohio*	67 acres

NADB/HADB ID	Date	Author(s)	Title	Survey Area
12035	1994	Weller Von Molsdorff and Mollenkopf	*Phase I Archaeological Investigations for the Widening of Hilliard-Rome Road Between the I-70 Interchange and Cemetery Road in Norwich Township, Franklin County, Ohio*	157 acres
17227	2006	Derick	*Phase I Cultural Resources Management Investigations for the Approximately 4.8 ha (12 a.) Proposed Target Store in the City of Hilliard (Norwich Twp.), Franklin County, Ohio*	11 acres

These previous surveys have collectively studied over 300 acres at the Phase I archaeological and architectural history level. The basis for each of these surveys indicates the growth of the greater Columbus area and the ongoing infrastructure projects taking place in Franklin County.

5.5 HISTORIC MAPPING

Concurrent with the examination of the OHPO archival data, AECOM reviewed available historic-era mapping resources which illustrate the Project APE, in an effort to define the extent of historic activity and occupation within the limits of the Project. The following table lists these mapping resources.

Table 5-5. Historic-Era Mapping Resources Depicting the Project APE

Date	Author(s)	Title	Description
1804	Samuel Lewis	*Ohio*	Early Ohio Country with Virginia Donation and Indian Territory
1814	Mathew Carey	*The State of Ohio with part of Upper Canada*	Early Ohio with County Lines and Indian Lands
1823	Henry S. Tanner	*Ohio and Indiana*	Ohio and Indiana with County Lines
1842	H.F. Wheeler	*1842 Franklin County Land Ownership*	Franklin County with Property Lines
1872	J.A. Caldwell and H.T. Gould	*Franklin County and Columbus 1872: Prairie Township*	Prairie Township with Property Lines
1914	William C. Mills	*Archaeological Atlas of Ohio, Franklin County*	Archaeological Sites in Franklin County
1923	USGS	*U.S. Geological Survey, West Columbus*	Topography of Prairie Township
1973	USGS	*U.S. Geological Survey, Galloway*	Topography of Prairie Township
1994	USGS	*U.S. Geological Survey, Galloway*	Topography of Prairie Township

Based on the Project area's proximity to the state capital of Columbus, there are numerous historic documents that map the growth of this region of Ohio. The majority of mappping focuses on the city proper, east of the Scioto River, but as the city expanded, areas west of the River, including the Project APE, appear more frequently.

At the turn of the nineteenth century, Ohio was still considered frontier land with few established settlements, as can be seen in Samuel Lewis' 1804 map, *Ohio*. In 1814, Franklin County is depicted as a tract of land along Ohio's northern border with Indian Territory (Carey 1814). Franklinton, the predecessor town to Columbus, appears on mapping at this time. By 1823, Ohio extended north to Lake Erie, county lines were drawn, and Columbus was instituted as the state capital (Tanner 1823).

H.F. Wheeler's 1842 map, entitled *Franklin County Land Ownership*, shows property lines, and lists landowners. The map indicates the Project area was owned by M.L. Sullivant, son of Franklinton founder, Lucas Sullivant. The Caldwell and Gould 1872 map of Prairie Township indicates that the parcel was then under the ownership of Fred Dellinger, and depicts a structure on the property in the approximate location of the Project APE (Caldwell 1872). The 1914 *Archaeological Atlas of Ohio, Franklin County* describes two mounds and one burial in Prairie Township, none of which are located within the Project APE (Mills 1914). The building indicated within the Project area on the 1872 map remains present at the same approximate location on mapping throughout the twentieth century. The USGS topographic map of 1973 shows the railyard east of the APE, as well as highways I-70 and I-270 (USGS 1973). By 1994, aerial photography and mapping indicate the presence of the current UPS facility, and no evidence for any other structures (USGS 1994).

6.0 FIELD AND ANALYTICAL METHODOLOGIES

In the conduct of the Phase I survey detailed herein, AECOM followed the guidelines established for survey work in Ohio, as detailed in *Archaeological Guidelines* (OHPO 1994). The following section details these methodologies, as applied to the collection and processing of data from the AECOM Phase I survey. The primary analytical methodology utilized for the Project can be found in the Research Design (**Chapter 2.0**) prepared by AECOM prior to the initiation of fieldwork.

6.1 FIELD METHODS

Prior to entering the field, electronically created mapping files based on geo-referenced boundaries of the direct APE of the Project were generated. The entire direct APE was then overlain by a GIS created transect grid of sample loci (SL), spaced at the standard 15-meter (50-foot) testing interval as recommended by the OHPO. Each SL represents a point from which data regarding topography, ground surface conditions, and soil descriptions are recorded and a sample of the landscape is examined for cultural materials.

The particular testing method used for an individual SL is determined by the character of the topography and ground surface observed at each locality. Individual shovel tests measured at least 0.57 meters in diameter, and were excavated to a minimum of 10 centimeters into sterile soil deposits (where possible). All soil removed from each shovel test was screened through ¼-inch mesh hardware cloth in an effort to recover relatively small artifacts. The focus of shovel testing was to determine if these locations contained any buried artifacts, features, buried soils, and to access soil stratigraphy, congruent with the 1994 OHPO guidelines (see pages 62 and 70, especially, of the OHPO's 1994 publication *Archaeology Guidelines*). All artifacts identified in the shovel testes were retained for analysis. In areas with standing water, visual pedestrian survey was used regardless of the degree of surface visibility, although careful scrutiny of the ground surface was maintained in order to identify above-ground cultural resources.

The spatial location of all areas within the survey unit containing cultural material scatters was recorded, and in-field (working) polygons were created on the sub-meter-accurate Trimble GPS for each scatter. Isolated findspots (locations where a single or a group of cultural material was identified) were recorded as a single point in the GPS data. In conjunction with the spatial data collection for each artifact or group, cultural materials were collected, assigned a surface find number, bagged in sample bags, and documented. Locations of sample loci, as well as all identified cultural resources, were recorded with

sub-meter-accurate GPS equipment. The data collected in this way forms the basis of the mapping by which the survey is presented in this report.

6.1.1 Global Positioning Satellite (GPS) Data Recording

Mapping of the Project Area derived from the client's project description was utilized to create map files accessible in the field using a Trimble TDS 1 (GPS) with a Geo XH receiver. The boundaries of the direct APE for the Project were depicted on these files and, prior to entering the field, were superimposed with a grid of data points that relate to sample loci (SL) in the field spaced at the standard 20-meter interval. In the field, the real-time navigation function of the GPS receiver enabled the archaeologists to locate, with sub-meter precision, each SL represented on the electronic grid. In some cases, based on the discretion of the Field Director, shovel tests were offset to test specific locations with high potential for cultural resources, and were recorded with the GPS. This pre-determination of survey design enhances the regularity and efficiency of the survey, especially compared with, for instance, the alternative method of pacing distances between SL and recording their positions on project mapping in the field.

Within the files loaded onto the hand-held GPS receivers, each of the pre-determined data points is associated with a number of electronic value fields. These value fields relate to: the survey methodology used at a specific SL; presence or absence of archaeological resources; and the general character of artifacts collected (historic/prehistoric). These data were directly input into the receiver. Additional data regarding topography, vegetation, and previous disturbance at the specific SLs were recorded by hand on paper forms; the observed soil stratigraphic sequences also were documented on those forms.
In addition to the navigation and recording functions described above, the GPS receivers were used to map archaeological resources encountered and landscape features of relevance to the survey.

7.0 PHASE I ARCHAEOLOGICAL SURVEY RESULTS

The Project APE considered for archaeological resources consists of land adjacent to the existing UPS facility. The larger portion of the Project is bordered by Trabue Road to the north, a CSX railyard to the east, and the UPS facility to the south and west (**Appendix B, Plates 1-4**). The smaller section of the Project is located between the parking lot behind the existing UPS facility and Interstate 70 (**Appendix B, Plate 5**). The sequence of photographs provided in **Appendix B, Plates 1-23**, provide a view of the ground conditions within the Project area and adjacent landscape at the time of survey. Shovel testing within the APE was conducted at the OHPO-suggested interval of 15 meters, along transects placed 15 meters apart, creating a survey grid. The survey results mapping, depicted in **Appendix A (Figures 3A/B and 4A/4B),** displays the 15-meter-interval grid superimposed across the entire Project APE.

The Project APE to the north of the UPS facility is a moderately level commercial lawn with a slight rise situated along Trabue Road (**Appendix B, Plate 6**). A small unnamed stream/drainage runs east-west through the APE, and south of this waterway are two manmade retention ponds (**Appendix B, Plates 7 and 8**). Currently, there are no pre-modern buildings extant within the Project APE. In discussions with the facility personnel, the entirety of the Project APE was described as having been cut, filled and graded during installation of the existing commercial buildings, and the current topography of the APE was entirely the result of this intensive disturbance. There exists a high amount of gravel content visible on the ground surface of the APE (**Appendix B, Plates 9 and 10**). Shovel testing confirmed this disturbance, suggesting the Project area has been previously graded and covered with fill soil and gravel. SL R3 was located in a low lying area in the northeast region of the Project, approximately 45 meters east of the UPS entrance (**Appendix B, Plate 11**). The soil profile for R3 was composed of brown (10YR 4/3) silty clay mottled with light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) silty clay to a depth of 30 centimeters below ground surface. Soils were documented as wet and containing dense gravels (**Appendix B, Plate 12**). Further west, toward the center of the APE, shovel test L5 revealed similar soils, and filled with water during excavation. Large cobbles were noted within this shovel test. SL C4 was placed along the eastern section of the Project, approximately 50 meters west of the railyard. It also contained disturbed soils, dense gravels, and what appeared to be pulverized concrete. The majority of SL along the margins of the Project area were identified as disturbed due to various circumstances, including large push piles of modern trash and vegetation (**Appendix B, Plate 13**), paved roadways and parking lots (**Appendix B, Plate 14**), utilities (**Appendix B, Plate 15**), and improved drainages (**Appendix B, Plate 16**).

A small stand of trees is present in the center of the Project APE north of the existing facility (**Appendix B, Plates 17 and 18**). The review of the historic mapping resources (see **Section 5.5**) suggests that a structure, likely a residential house, once occupied this approximate location. AECOM performed a thorough visual investigation of the area, in an attempt to identify any evidence of a pre-modern occupation (such as building depressions, above-ground features or architectural debris); no evidence of a structure or archaeological deposit was encountered. Two shovel tests, J8 and I10, excavated in this area were negative for cultural materials, and displayed a significantly disturbed soil profile, composed of mottled soils and high gravel content. The soil profile for shovel test J8 consisted of a dark brown (10YR 3/3) silty clay mottled with a light yellowish brown (10YR 6/4) to a depth of 22 centimeters below ground surface (**Appendix B, Plate 19**).

Between the drainage and ponds exists a thin strip of land approximately 15 meters wide (**Appendix B, Plate 20**). Shovel test excavations in this area revealed disturbed soils likely from grading and construction of the two retention ponds. SL J12 was excavated to a depth of 25 centimeters below ground surface and was comprised of a brown (10YR 4/3) silty clay mottled with a light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6). Gravels were recorded throughout the shovel test, as well as one piece of redware drainage tile which was not collected. South of the ponds is a small area of grass surrounded by paved parking lot on three sides (**Appendix B, Plate 21**). This portion of the Project appeared graded and disturbed. Shovel test L15 was excavated in this location, and contained mottled, rocky soils that confirmed this disturbance.

The second portion of the Project APE, located behind the UPS facility, was a wedge-shaped area of maintained grass that may be used as a temporary parking lot. The western half of this area contained significantly large berms and piles, likely associated with the construction of I-70 or the UPS facility (**Appendix B, Plate 22**). Numerous utilities were marked and visible in this area of the Project (**Appendix B, Plate 23**). Based on the level of modern disturbance and proximity to utilities, AECOM conducted a visual pedestrian survey of this portion of APE. No cultural material was observed within this 6.18 acre section of the Project footprint.

As a result of the AECOM Phase I archaeological field reconnaissance, no archaeological resources were identified within the Project APE. A total of 437 SL were examined, 13 excavated shovel tests, all of which were determined to be disturbed upon investigation. An additional 424 SL were pedestrian-inspected, due to either significant modern disturbance (associated with the existing UPS facilities), standing water/waterbody, or slope (see field forms in **Appendix C**). The following table lists the Phase I survey results within the Project APE.

Table 7-1. Phase I Survey Metrics

Survey Type	Count
Pedestrian, Disturbed	386
Pedestrian, Slope	8
Pedestrian, Wet	30
Shovel Test	0
Shovel Test, Disturbed	13
Shovel Test, Wet	0
TOTAL	**437**

8.0 CONCLUSIONS AND RECOMMENDATIONS

This report has detailed the Phase I archaeological survey conducted by AECOM for the UPS Columbus Hub Expansion and Modernization Project, located in Prairie Township, Franklin County, Ohio. This archaeological investigation was undertaken in an effort to identify resources within the 23.83 acre Project area, to meet both the requirements of the USACE as part of a Nationwide Permit filing, and Section 106 consultation with the OHPO for the Project.

8.1 ARCHIVAL RESEARCH RESULTS

The archival research conducted for the Project identified a total of three previously recorded archaeological sites, four aboveground resources, one cemetery and seven prior CRM-related reports on file with the OHPO within one mile of the Project APE. None of these cultural resources or previous surveys occur within the limits of the Project APE. An examination of historic-era mapping and twentieth century/modern aerial imagery available for this portion of Franklin County indicated the potential presence of a structure, likely a residential house, within the Project APE. Analysis of the archival data suggests that the Project contains some potential for containing both prehistoric and historic resources, based on prior survey results within one mile, and the number of recorded archaeological sites documented within the entirety of Franklin County.

8.2 PHASE I ARCHAEOLOGICAL FIELD RECONNAISSANCE RESULTS

In March 2016, the AECOM Phase I archaeological field reconnaissance examined the entirety of the 23.83 acre Project APE through a combination of shovel testing and visual pedestrian inspection. In total, 437 sample loci, placed at the OHPO-standard 15 meter survey interval, were examined within the APE, of which 13 were excavated shovel tests. A thorough investigation was conducted around the approximate location of a structure depicted within the Project APE on historic mapping and aerial imagery. Pedestrian survey and shovel testing of this area did not encounter any cultural materials or evidence of any intact soils. The extensive level of disturbance referenced by client personnel within the APE was confirmed through visual examination and shovel testing, and is evident within the photographic attachment to this volume and modern aerial mapping. The Phase I field survey of the Project area was negative for archaeological materials and cultural resources.

8.3 RESEARCH QUESTIONS

In addition to the analysis of the results obtained, these results can be applied to the research questions developed as part of the Research Design for the Project (detailed in full as Chapter 2.0 of this volume). These questions are restated here, with an attempt made to address each based on the data collected by the AECOM Phase I survey:

1. *What types of prehistoric sites can be expected to be found within the direct APE of the Project, and, if identified, how do these prehistoric resources fit into the archaeological record of prehistoric activity in Franklin County?*
   Based on previous archaeological surveys conducted in the vicinity of the Project, a limited potential for encountering small prehistoric sites or isolated findspots exists. Currently, no such sites have been identified within one-mile of the Project APE. Due to the long occupation of Franklin County, the possibility of uncovering a small or isolated prehistoric site should not be overlooked. When encountered, because of their size, these resources usually lack some kind of temporal association and often do not contribute any new or significant information to the archaeological record.

2. *Based on the distribution of the cultural materials collected during the Phase I Investigations, what conclusions can be drawn about site integrity?*
   No archaeological resources were identified during the Phase I survey of the Project APE, and therefore no conclusions can be developed to address this research question. The intensive modern disturbance of the Project APE was, however, documented through visual pedestrian inspection and shovel-test excavations, which suggests that any prehistoric or historic-era archaeological deposits would have been destroyed by modern utilization and urban development.

3. *The historic-era landscape within this portion of Franklin County is most appropriately characterized as rural agrarian, with sporadic residential, agricultural, and commercial structures scattered along the primary road networks. Is there any evidence of historic-era activity within or in close proximity to margins of the Project?*
   Historic mapping and aerial imagery indicated a structure was present in the location of the Project APE into the modern era. The Phase I archaeological field reconnaissance of the Project APE was negative for cultural materials or features, and no evidence for any sustained historic-era occupation was encountered.

4. *The archival research conducted prior to fieldwork identified the potential presence of an historic-era structure within the Project APE, as evidenced by historic mapping and aerial photos. Are there any potentially eligible archaeological remains within the APE?*
   No historic-era material was observed or recovered during the AECOM survey of the Project area.

5. *Are there any archaeological resources present within the Project land requirements that are eligible, or potentially eligible, for the NRHP?*
   The AECOM Phase I archaeological field reconnaissance did not identify any archaeological resources within the Project APE.

8.4 RECOMMENDATIONS

The systematic shovel testing and visual inspection of the 23.83 acre Project APE by AECOM resulted in the identification of no archaeological sites, or evidence for intact subsurface soil horizons which could contain archaeological deposits. Based on the field survey and gathered archival data, no additional archaeological investigations of the Project APE are recommended prior to the proposed construction of additional UPS facilities. Additionally, as the Project is anticipated to involve the installation of additional infrastructure similar in size/scale to the existing UPS facility, no impacts to the surrounding viewshed are anticipated as a result of the Project. No additional cultural resources investigations are therefore proposed for the UPS Trabue Road Expansion Project undertaking, prior to construction of the new infrastructure at this location.

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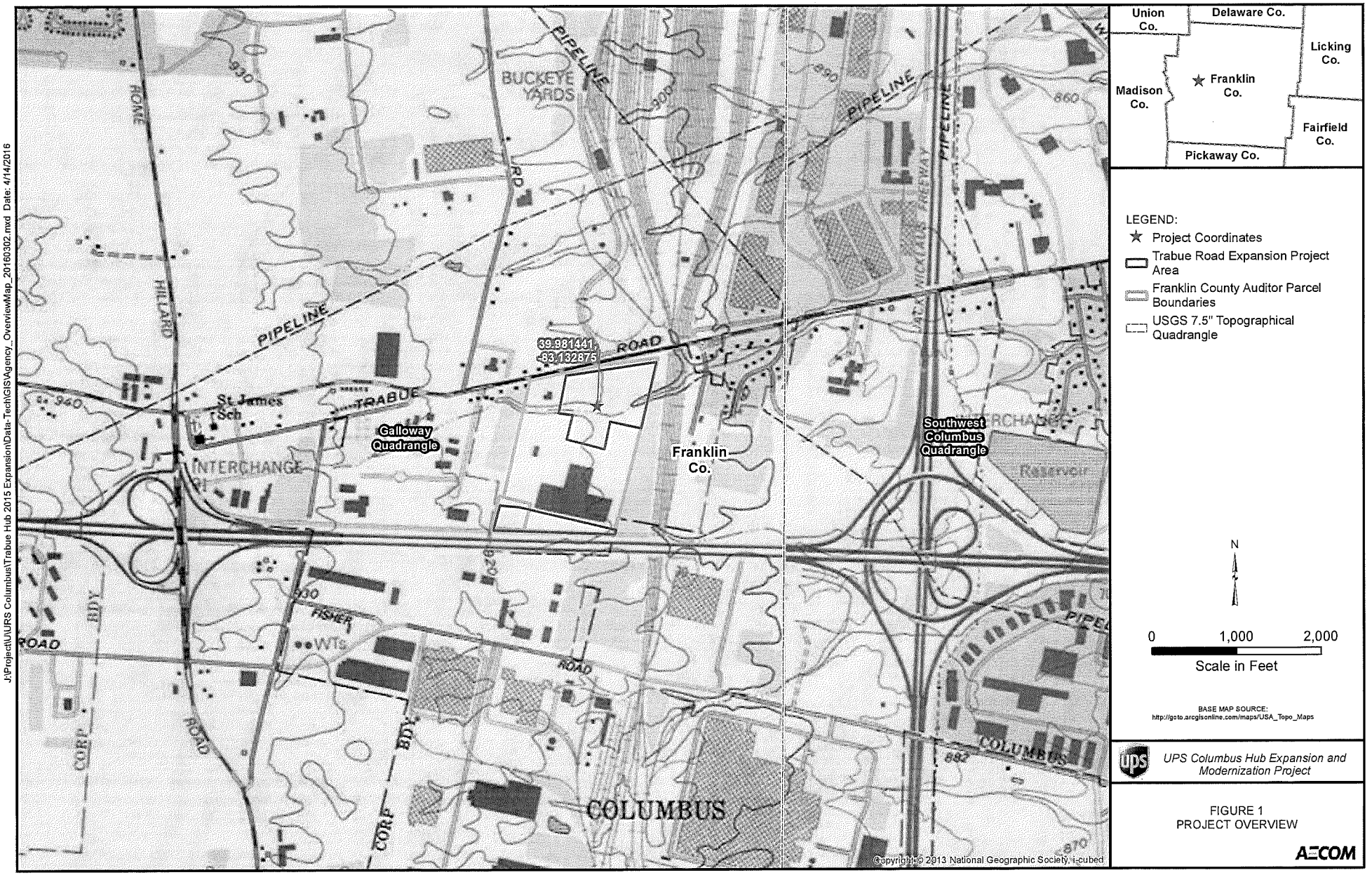
APPENDIX A

REPORT FIGURES



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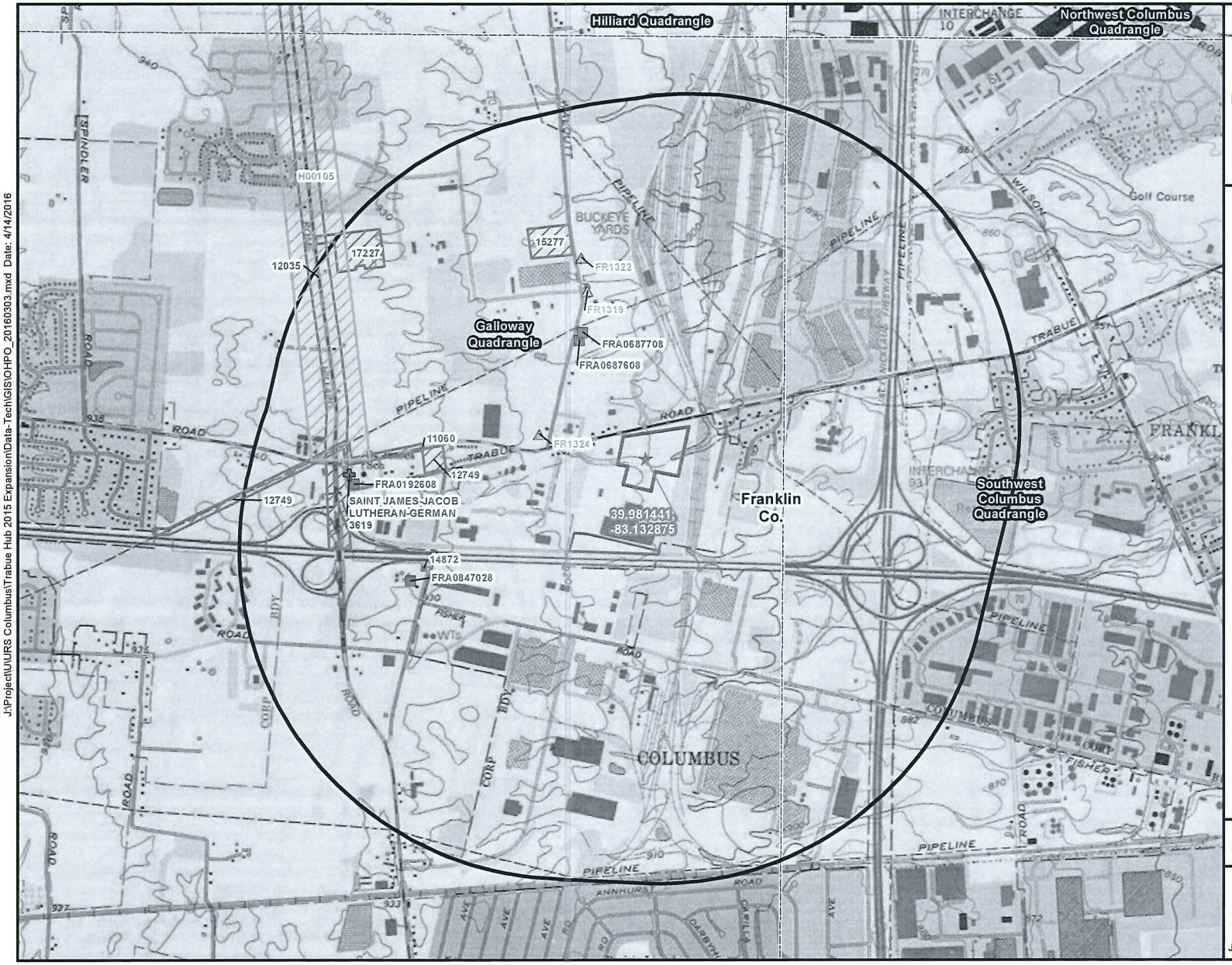
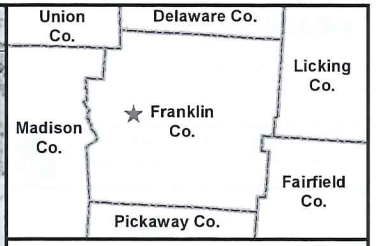
UPS Columbus Hub Expansion and Modernization Project

FIGURE 1
PROJECT OVERVIEW

AECOM





LEGEND:

- Project Coordinates
- Trabue Road Expansion Project Area
- 1-Mile Buffer
- Archaeological Site
- Historic Structure
- Cemetery
- Historic Previously Surveyed Areas
- Previously Surveyed Archaeological Area - Phase I
- USGS 7.5" Topographical Quadrangle

N

0 1,500 3,000

Scale in Feet

BASE MAP SOURCE:
http://goto.arcgisonline.com/maps/USA_Topo_Maps

UPS Columbus Hub Expansion and Modernization Project

FIGURE 2A
ARCHIVAL RESEARCH RESULTS

JOB NO. 60437479

AECOM

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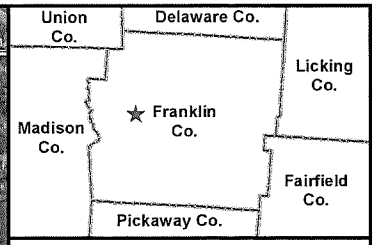


LEGEND:

- ★ Project Coordinates
- Trabue Road Expansion Project Area
- 1-Mile Buffer
- △ Archaeological Site
- ■ Historic Structure
- ✚ Cemetery
- Historic Previously Surveyed Areas
- Previously Surveyed Archaeological Area - Phase I
- USGS 7.5" Topographical Quadrangle

N

0 1,500 3,000

Scale in Feet

BASE MAP SOURCE:
http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html

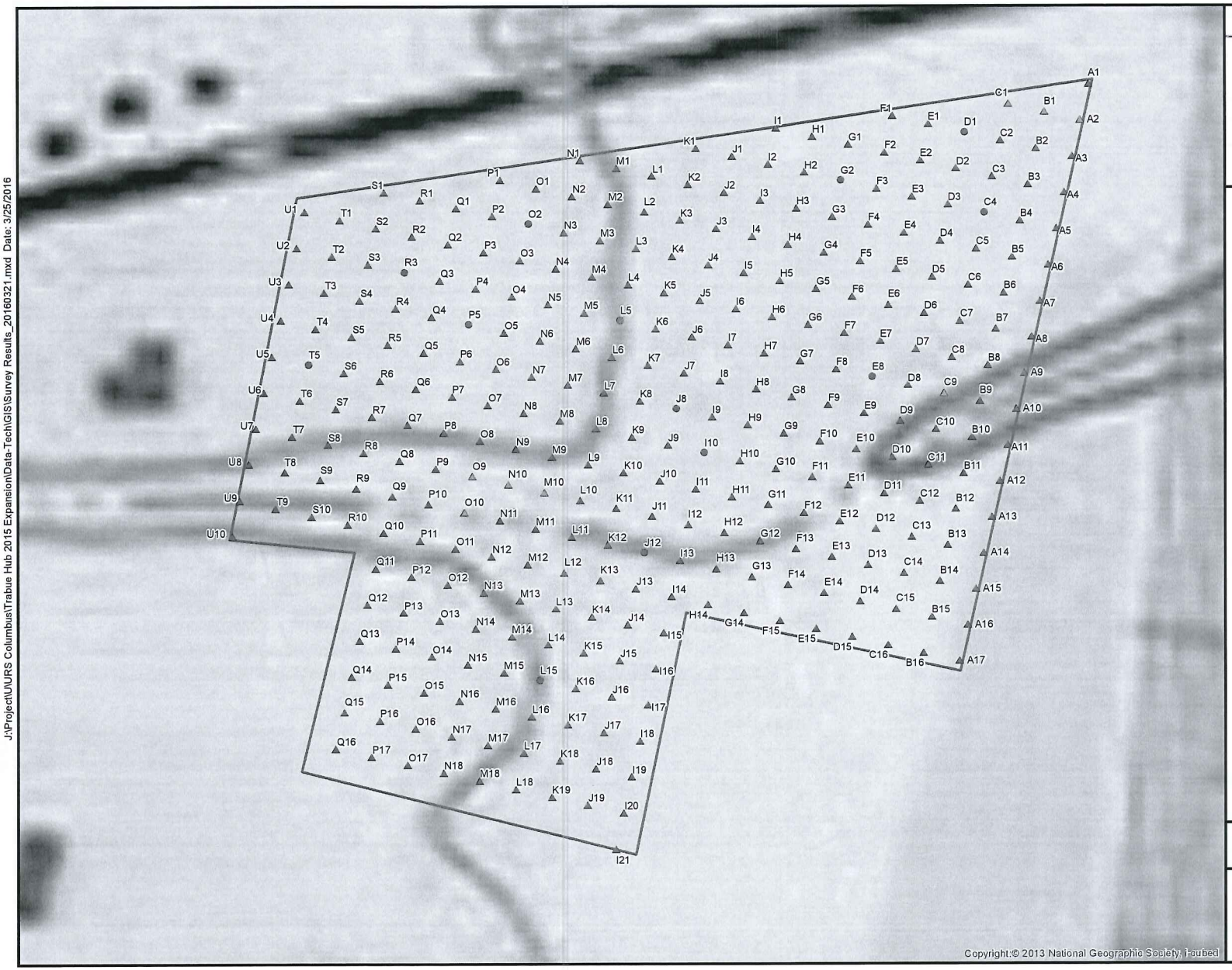
UPS Columbus Hub Expansion and Modernization Project

FIGURE 2B
ARCHIVAL RESEARCH RESULTS

JOB NO. 60437479

AECOM

J:\Project\URS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\OHPO_20160303.mxd Date: 4/14/2016

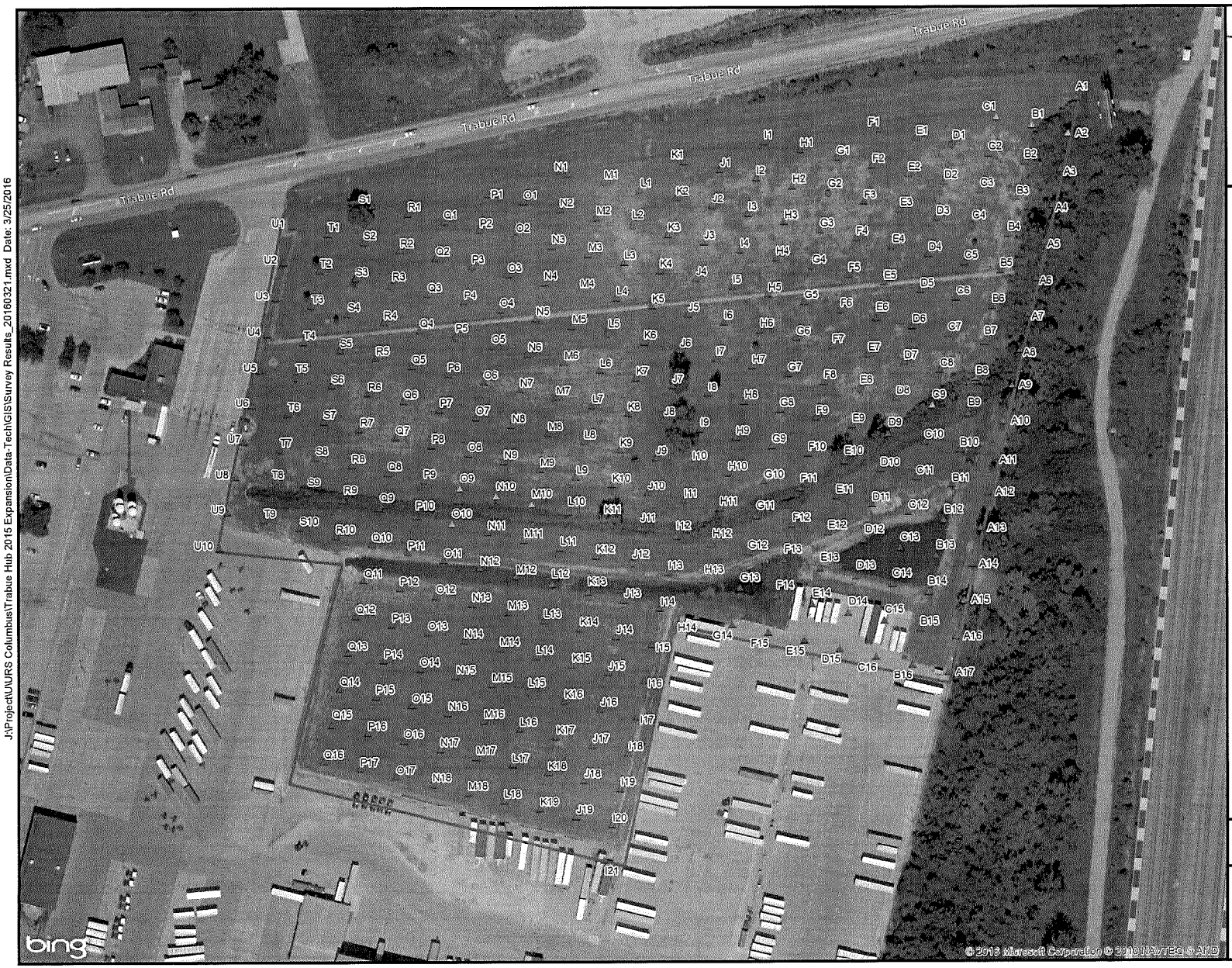


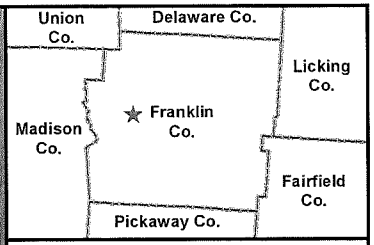
J:\Project\NURS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Survey Results_20160321.mxd Date: 3/25/2016

UPS Columbus Hub Expansion and Modernization Project

FIGURE 3A
ARCHAEOLOGY SURVEY RESULTS

AECOM





LEGEND:

- Project Area

Sample Loci:

- ▲ Ped, Disturbed
- △ Ped, Slope
- ▲ Ped, Wet
- ● ST, Disturbed

N

0 150 300

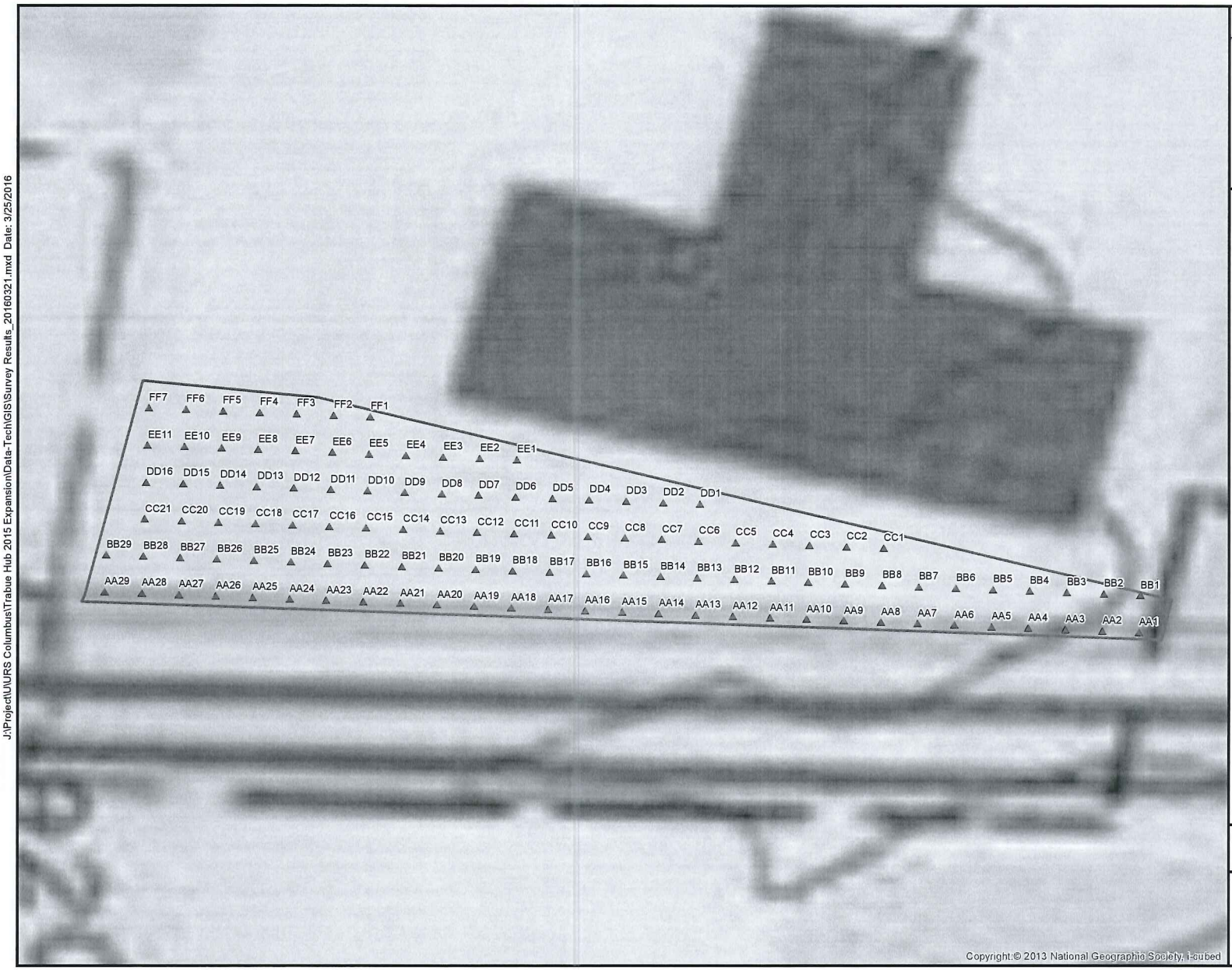
Scale in Feet

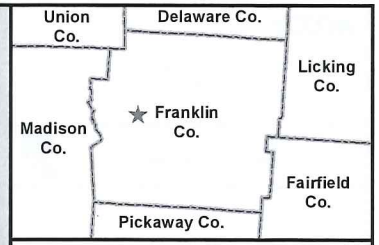
UPS Columbus Hub Expansion and Modernization Project

FIGURE 3B
ARCHAEOLOGY SURVEY RESULTS

AECOM

J:\Project\AURS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Survey Results_20160321.mxd Date: 3/25/2016





LEGEND:

Project Area

Sample Loci:

- Ped, Disturbed
- Ped, Slope
- Ped, Wet
- ST, Disturbed

N

0 150 300

Scale in Feet

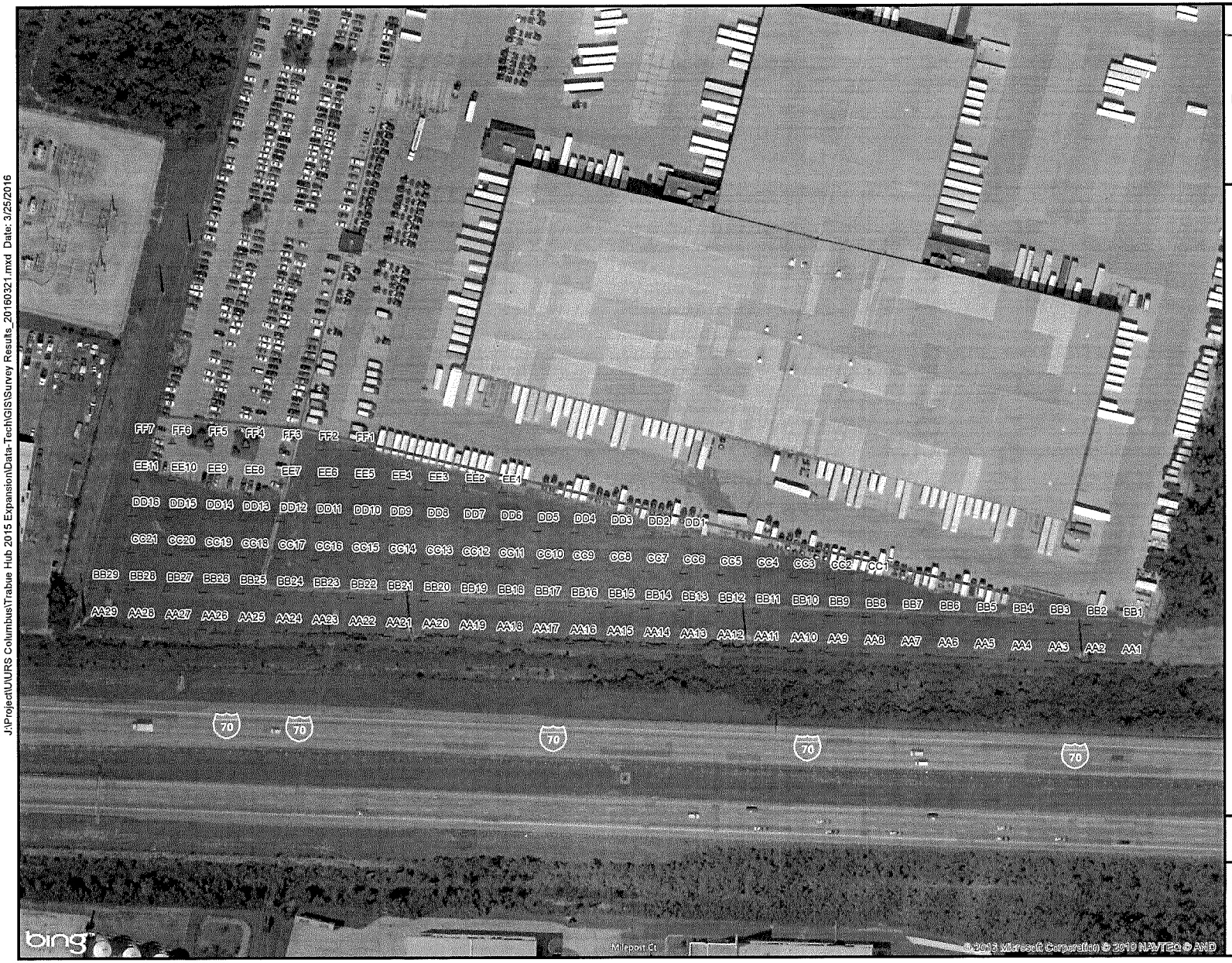
BASE MAP SOURCE:
http://goto.arcgisonline.com/maps/USA_Topo_Maps

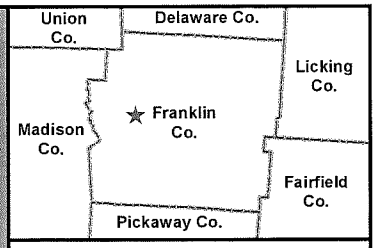
UPS Columbus Hub Expansion and Modernization Project

FIGURE 4A
ARCHAEOLOGY SURVEY RESULTS

AECOM

J:\Project\UU\URS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Survey Results_20160321.mxd Date: 3/25/2016





LEGEND:

- Project Area

Sample Loci:

- Ped, Disturbed
- Ped, Slope
- Ped, Wet
- ST, Disturbed

N

0 150 300

Scale in Feet

UPS Columbus Hub Expansion and Modernization Project

FIGURE 4B
ARCHAEOLOGY SURVEY RESULTS

AECOM

J:\Project\UU\URS Columbus\Trabue Hub 2015 Expansion\Data-Tech\GIS\Survey Results_20160321.mxd Date: 3/25/2016

APPENDIX B

REPORT PHOTOGRAPHY

Plate 1. Project APE North of Facility, Facing East From SL T1

Plate 2. Project APE North of Facility, Facing East From SL A1

Plate 3. Project APE Facing South From SL H7, Existing Facility in Background

Plate 4. Project APE North of Facility Facing West From SL O2

Plate 5. Project APE South of UPS Facility, Facing East

Plate 6. Project APE North of UPS Facility, Facing West From SL G2

Plate 7. Drainage Facing East Frm SL S9

Plate 8. Project APE Facing East From SL J12

Plate 9. Ground surface at SL E6

Plate 10. Ground surface at SL J14

Plate 11. Project APE Facing West From SL R3

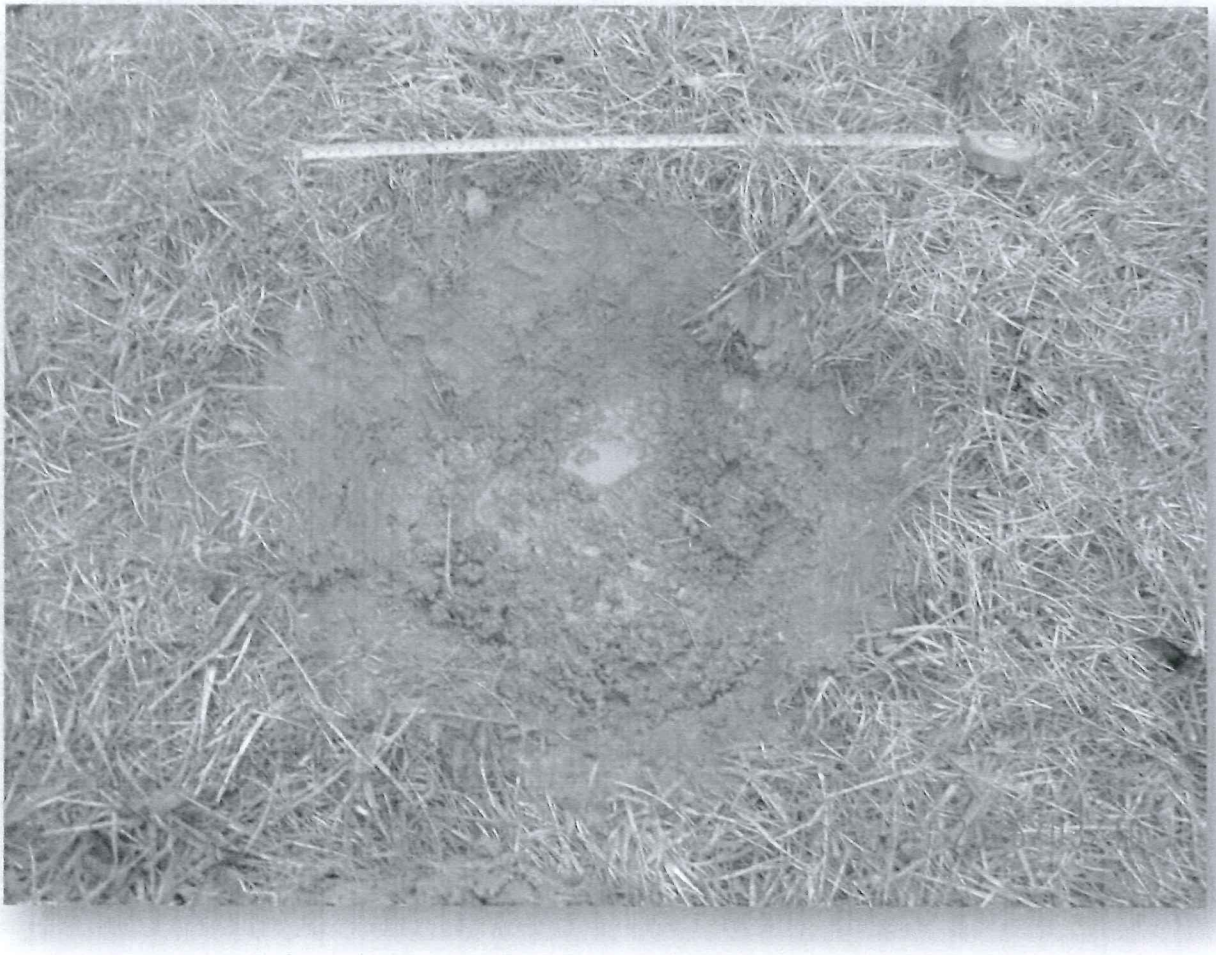


Plate 12. Shovel Test Profile, SL R3

Plate 13. Overview of Trash and Push Piles Near SL B7

Plate 14. Overview of Parking Lot Facing South From SL T5

Plate 15. Project APE Facing East From SL A17

Plate 16. Overview of Improved Drainage Facing South

Plate 17. Project APE Facing North, SL J12

Plate 18. Project APE Facing Southwest, SL H7

Plate 19. Shovel Test Profile, SL J8

Plate 20. Project APE Facing West, North of SL J12

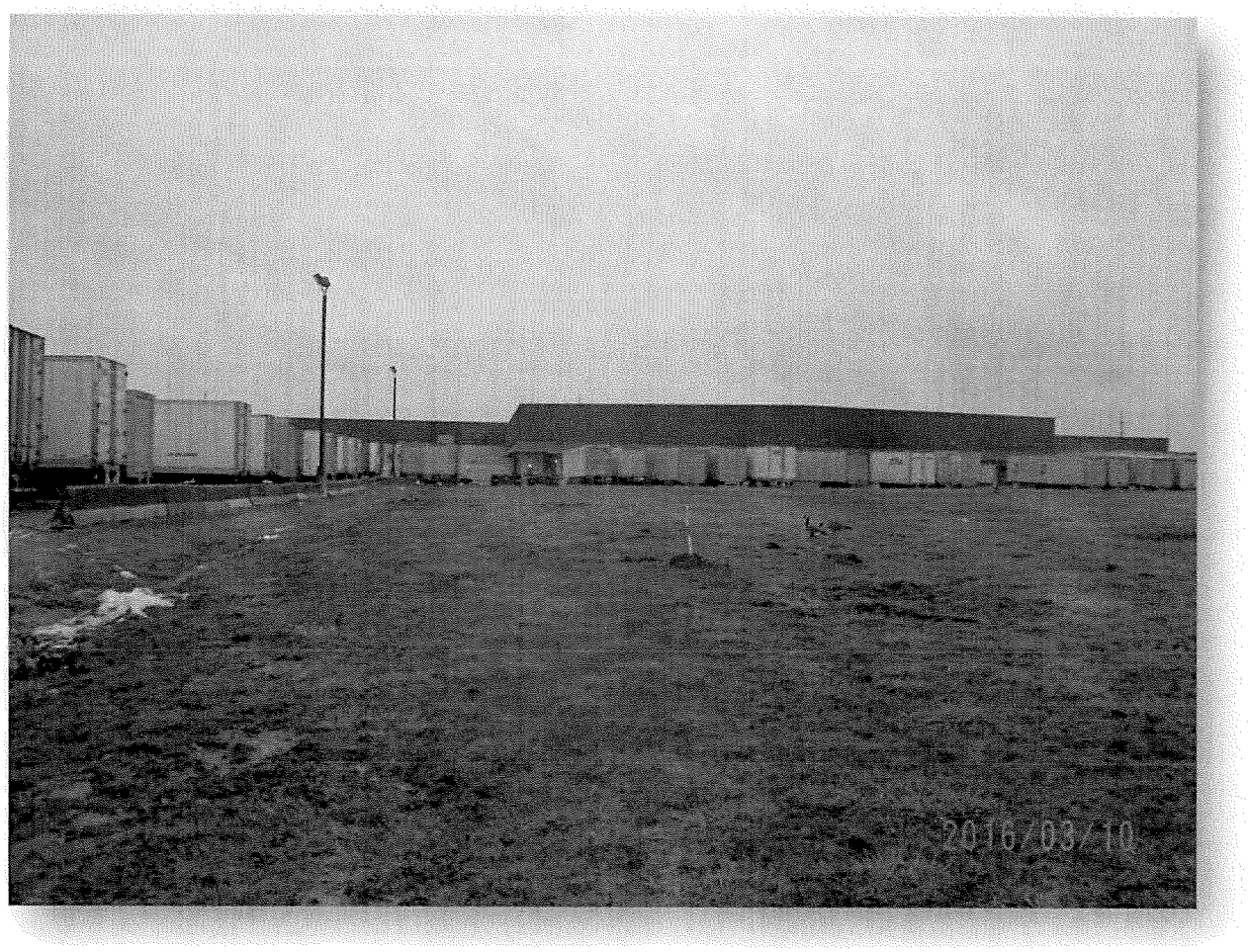


Plate 21. Project APE Facing South From SL I14

Plate 22. Project APE South of UPS Facility, Facing East

Plate 23. Project APE South of UPS Facility, Facing West (I-70 to Left of Frame)

APPENDIX C

FIELD FORMS

AECOM

Sample Loci (SL) Form

Project Name and Number UPS - Trabue Rd 60437479.1
Recorder SMO, KSJ
Date 3/10/16

Segment
Transect
Location

SL #	SL Type*	Distance from Previous SL	Vegetation/ Topography	Strat	Depth	Soil Profile (Color and Texture)	Artifacts** (Type, Count)	Comments
C4	E/D	15m grid, GPS location	Moderately level, grassy field, ±50m W of RR	I	0-26cm	10YR 5/4 S:Cl heavily mottled w/ 10YR 6/4-6 S:Cl-lg. rocks, pulverized concrete	∅	Gravels= concentrated w/ in top 10cm.
D1	E/D	"	Mod. level, grass, ±40 m S of road	I	0-28cm	" "	∅	More heavily mottled than SL C4.
G2	E/D	"	Mod. level, grass, vis. rubble on surf.	I	0-20cm	" " (pulverized concrete + brick) w/ lg. rocks/cobbles	∅	Increased gravel content ~ 50%.
O2	E/D	"	level rise in grassy field ±60m S of road	I	0-25cm	10YR 4/3 S:Cl mottled w/ 10YR 6/4-6 w/ gravel + rock	∅	—
R3	E/D	"	low lying grassy area E of UPS entrance	I	0-30cm	" "	∅	Very wet soil, dense gravel @ base.
T5	E/D	"	mod. level, grass, ±20m E of UPS entrance	I	0-27cm	10YR 4/3 S:Cl mot. w/ 10YR 6/6 w/ gravel + rock	∅	H_2O infilling
P5	E/D	"	mod. level, grass, ±8m S of fence	I	0-23cm	" "	∅	"
L5	E/D	"	mod. level, grass, NW of stand of trees	I	0-35cm	" "	∅	H_2O infilling, lg. cobbles
I10	E/D	"	mod. level, grass, SE of stand of trees	I	0-19cm	10YR 3/3 S:Cl mot. w/ 10YR 6/4 w/ gravel	∅	Dense gravel layer
E9	E/D	"	mod. level grass, E of stand of trees	I	0-15cm	" "	∅	*No structural or domestic debris

Graded/pushed, fill gravel and dirt.

***Use one code only.** **E**= Excavated Shovel Test, **P**= Pedestrian, **D**= Disturbed, **W**= Wet, **S**= Slope
****P**= Prehistoric, **H**=Historic, **M**= Modern

AECOM

Sample Loci (SL) Form

Project Name and Number UPS - Trabue Rd 60437479.1
Recorder SMO | KSJ
Date 3/10/16

Segment
Transect
Location

Graded/paved, gravel/dirt

SL #	SL Type*	Distance from Previous SL	Vegetation/ Topography	Strat	Depth	Soil Profile (Color and Texture)	Artifacts** (Type, Count)	Comments
J8	E|D	15m grid, GPS location	grass, W of stand of trees	I	0-22cm	10YR 3/3 SiCl mot. w/ 10YR 6/4 w/ gravel	∅	*No structural or domestic debris
J12	E|D	"	grass, level berm b/w pond + drainage	I	0-25cm	10YR 4/3 SiCl mot w/ 10YR 6/4-6 w/ gravel	Not collected - redware drainage tile frag.	—
L15	E|D	"	level grass b/w parking lots, S of pond	I	0-27cm	10YR 4/3 SiCl mot w/ 10YR 6/4 w/ gravel	∅	Wet soil, gravel + rock
A1	P|D	"	Rutted two-track at base of embankment S of road					In two-track.
C1, B1, A2	P|S	"	grass, road embankment					S facing road embankment
L2	P|D	"	mod. level grass, exposed gravel on surf.				≥10m N	Gravel visible on surface. Exposed blacktop remains - possibly portion of historic driveway
E6	P|D	"	mod. level, grass, exposed gravel on surf.					Debris/gravels visible on surface
B7	P|D	"	E edge of field, treeline/ brush					Pushed brush pile - modern debris + mow clippings
A10	P|W	"	Sloped drainage w/ reeds + brush					In drainage to stream
A12-17	P|D	"	Eastern edge of parcel along fenceline					Buried utilities - fiber optics

***Use one code only.** **E=** Excavated Shovel Test, **P=** Pedestrian, **D=** Disturbed, **W=** Wet, **S=** Slope
****P=** Prehistoric, **H=**Historic, **M=** Modern

AECOM

Sample Loci (SL) Form

Project Name and Number UPS - Trabue Rd 60437479.1
Recorder SMO (KS)
Date 3/10/16

Segment_____
Transect_____
Location_____

SL #	SL Type*	Distance from Previous SL	Vegetation/ Topography	Strat	Depth	Soil Profile (Color and Texture)	Artifacts** (Type, Count)	Comments
F11	P/W	15m grid, GPS location	Sloped drainage w/ reeds + brush					In drainage.
G11	P/W	"	"					"
O9, N10, M10, C9	P/S	"	"					On drainage slope.
L10, K11, J11, I12, H12	P/W	"	"					In drainage.
A9, B9, D9, E10	P/W	"	"					"
E14, D14, C15, F15, E15, D15,	P/D	"	Paved parking lot					W/in or along edge of parking lot.
C16, B16	I21, H14							
U10	P/D	"	UPS entrance/ parking lot					In parking lot.
Q15	P/D	"	level grass b/w parking lots					Proximity to buried utilities.
U1-U4	P/D	"	E edge of UPS entrance, fenceline					Edge of paved entrance, buried utilities, fenceline
B12-B14 C13, C14 D12, D13	E13, F13-14, G13, H13, K13, L12	P/W	"	Manmade ponds				W/in or along edge of para.

***Use one code only.** **E**= Excavated Shovel Test, **P**= Pedestrian, **D**= Disturbed, **W**= Wet, **S**= Slope

****P**= Prehistoric, **H**=Historic, **M**= Modern

OHIO HISTORY CONNECTION

In reply to
2016-FRA-35327

June 16, 2016

Christopher G. Leary and Suzanne M. Ostyn
AECOM
525 Vine Street
Suite 1800
Cincinnati, OH 45202

Mr. Leary and Ms. Ostyn

Re: Columbus Hub Expansion and Modernization Project, Franklin County, Columbus, Ohio.

This letter is in response to your correspondence, received May 19, 2016 (Sent May 17, 2016), regarding the Columbus Hub Expansion and Modernization Project. My comments are in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

The project involves the expansion of the existing UPS Facility in Prairie Township. With the correspondence you included the report, *Phase I Archaeological Survey for the UPS Columbus Hub Expansion and Modernization Project, Prairie Township, Franklin County, Ohio* (Ostyn et. al 2016). The report documents survey of the 23.83 acre APE. No archaeological deposits were identified during this investigation.

Based on the information submitted, it is my opinion that the proposed undertaking will have no adverse effect on properties listed or eligible for listing on the National Register of Historic Places. No further coordination is necessary unless the project changes or archaeological remains are discovered during the course of the project. In such a situation, this office should be contacted as per 36 CFR 800.13. Thank you for your cooperation.

Sincerely,

Jennifer Bellville Marrion, Project Reviews Coordinator
Resource Protection and Review

Ser. 1063626

ATTACHMENT F

APPLICATION ENGINEERING FORM 4345

U.S. ARMY CORPS OF ENGINEERS **APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT** *(33 CFR 325)*	OMB APPROVAL NO. 0710-0003 EXPIRES: 31 AUGUST 2012

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Jeff Middle - Last - McBride	First - Matt Middle - Last - Thomayer
Company - United Parcel Service (UPS)	Company - AECOM
E-mail Address - jwmcbride@ups.com	E-mail Address - Matt.Thomayer@AECOM.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 5101 Trabue Road	Address- 525 Vine Street
City - Columbus State - Ohio Zip - 43228 Country - USA	City - Cincinnatti State - OH Zip - 45202 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax
614-870-4220	513-419-3449

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Matthew Thomayer to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT — DATE 7/25/16

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
UPS Trabue Road OHTRA Expansion Project

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Upper Scioto River	Address 5101 Trabue Road
15. LOCATION OF PROJECT Latitude: N 39°58'49.0" N Longitude: W 83°08'00.2" W	City - Columbus State- OH Zip- 43228

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality
Section - Township - Range -

17. DIRECTIONS TO THE SITE
(See supplemental response, Block 17, Directions to Site)

18. Nature of Activity (Description of project, include all features)
(See supplemental response, Block 18, Nature of Activity)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)
(See supplemental response, Block 19, Project Purpose)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge
(See supplemental response, Block 20, Reason for discharge / type of materials discharged.)

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
See Supplemental Response	See Supplemental Response	See Supplemental Response

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)
Acres 0.0?-acre; also see Supplemental Response Block 22
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)
See Supplemental Response, Block 23, Description of Avoidance, Minimization and Compensation

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

No work associated with this project has been completed at this time.

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list)

a. Address- (See Supplemental Response, Block 25. Addresses of Adjoining Property Owners, Lessees, Etc.)

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

7/25/16 — SIGNATURE OF APPLICANT — DATE

7/25/16 — SIGNATURE OF AGENT — DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 17. DIRECTIONS TO SITE

Driving directions from USACE Huntington District office (502 Eighth Street, Huntington, WV 25701) to 5101 Trabue Road, Columbus, Ohio 43228

- Head north on Eighth Street
- Turn left onto 3rd Avenue
- Slight right onto WV-527 N
- Continue onto OH-7 S
- Turn right onto OH-139 N/Harrisonville Avenue
- Turn left onto Rosemount Road
- Turn right onto Old Scioto Trail
- Turn right onto US-23 N
- Take I-279 W toward I-70
- Take I-70 W toward Indianapolis
- Take exit 91B for Hilliard Rome Road N
- Turn right onto Trabue Road

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 18. NATURE OF ACTIVITY

UPS owns and operates an existing 330,000 square foot facility located on approximately 61 acres at 5101 Trabue Road, Columbus OH 43228, used for parcel sortation. The planned design (Figure 3 in Attachment A) for the hub consists of a 230,000 square feet building expansion to house new sorting facilities. The design also includes approximately 20 acres of paving for expanded employee parking and trailer staging areas.

The expansion would allow for the facility to meet growing shipping demands for the Greater Columbus Area. UPS has performed expansion studies for the Central Ohio market, and concluded that further investment into this facility is the correct business plan due to its strategic geographic location, and that expansions of other existing facilities are not a good economic investment. Construction of a new greenfield facility is not feasible due to the lack of available property within the region that would allow for necessary logistical access, and due to the environmental impacts that would be caused by construction of a new facility.

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 19. PROJECT PURPOSE

As previously mentioned in Block 18, the goal of the expansion project is to increase the shipping capacity of the existing UPS packaging facility to meet anticipated peak hour rates. To accomplish this, an extension to the existing building will be constructed along with new pavement areas for parking and trailer staging.

An anticipated project schedule for the UPS OHTRA expansion is provided below.

UPS Trabue Road Expansion Project Schedule

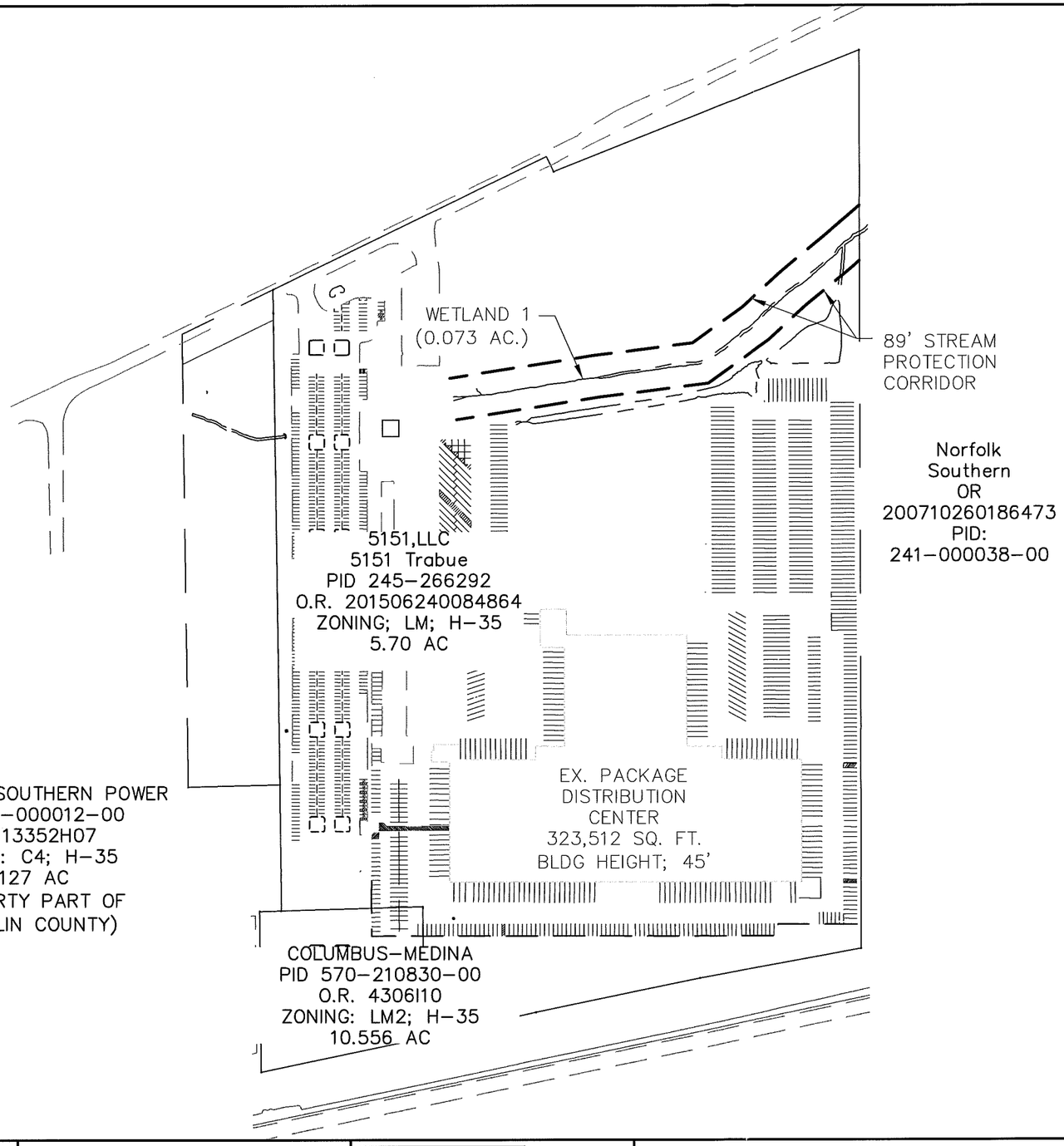
		2016							2017												2018											
		J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
Permit																																
June 2016	Aug 2016																															
Design																																
June 2016	Oct 2016																															
Construction																																
Aug 2016	Aug 2017																															

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCKS 20/21. REASON FOR DISCHARGE/TYPE OF MATERIALS DISCHARGED

The planned building and staging expansions will encroach on the existing PEM wetland, requiring 0.073-acre of Wetland 1 to be filled, relocated and culverted. The proposed building expansion has a large, unique layout in order to meet the necessary demands of the project. It was determined that the building footprint and configuration could not be modified or reduced due to the design of the interior conveyor belt system necessary to meet targeted peak hourly shipping rates.

UPS will need to undertake construction activities that require discharge of earthen fill materials (approximately 750 Cubic Yards) into Wetland 1, which is determined to be a jurisdictional wetland. The construction activities will also require the two stormwater ponds to be filled, which are determined to not be jurisdictional. Figure 4 in Attachment A shows the relocated wetland.



EASEMENT REFERENCE			REVISIONS		
CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR	NO.	DESCRIPTION	APPROVAL/DATE

AECOM
277 W. Nationwide Blvd.
Columbus, OH 43215
United States
P: 614-464-4500
F: 614-464-0588

FIGURE 1

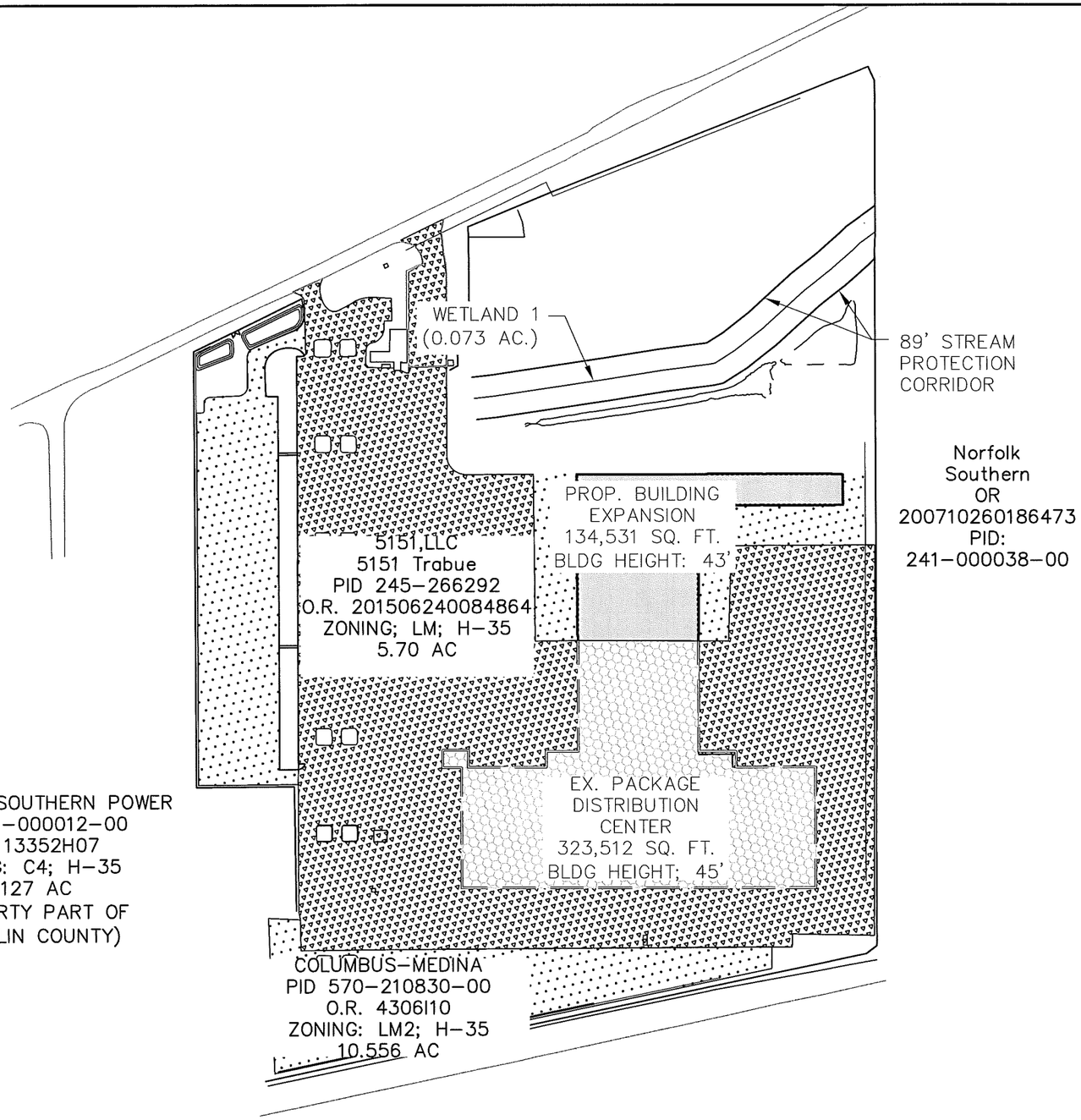
EXISTING SITE OVERVIEW MAP

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER					
	CONTRACTOR					
	INSPECTOR				SCALE:	SHEET: 1 OF 3
	AGREEMENT		COMPLETED			
	RPD	CKD	CLD	CON. DR.	CONTRACT DRAWING NO.	RECORD PLAN NO.
			DATE 7/25/2016			

FILE NAME AND DATE



LEGEND

NEW PAVEMENT – 11.05 ACRES

EXISTING PAVEMENT – 24.35 ACRES

NEW BUILDING ADDITION – 3.09 ACRES

EXISTING BUILDING – 7.50 ACRES

NORTH

0 300 600 900

SCALE: 1"=300'

EASEMENT REFERENCE				REVISIONS		
CITY NO.	COUNTY RECORDER		GRANTOR	NO.	DESCRIPTION	APPROVAL/DATE
	VOL.	PAGE				

FILE NAME AND DATE

AECOM
277 W. Nationwide Blvd.
Columbus, OH 43215
United States
P: 614-464-4500
F: 614-464-0588

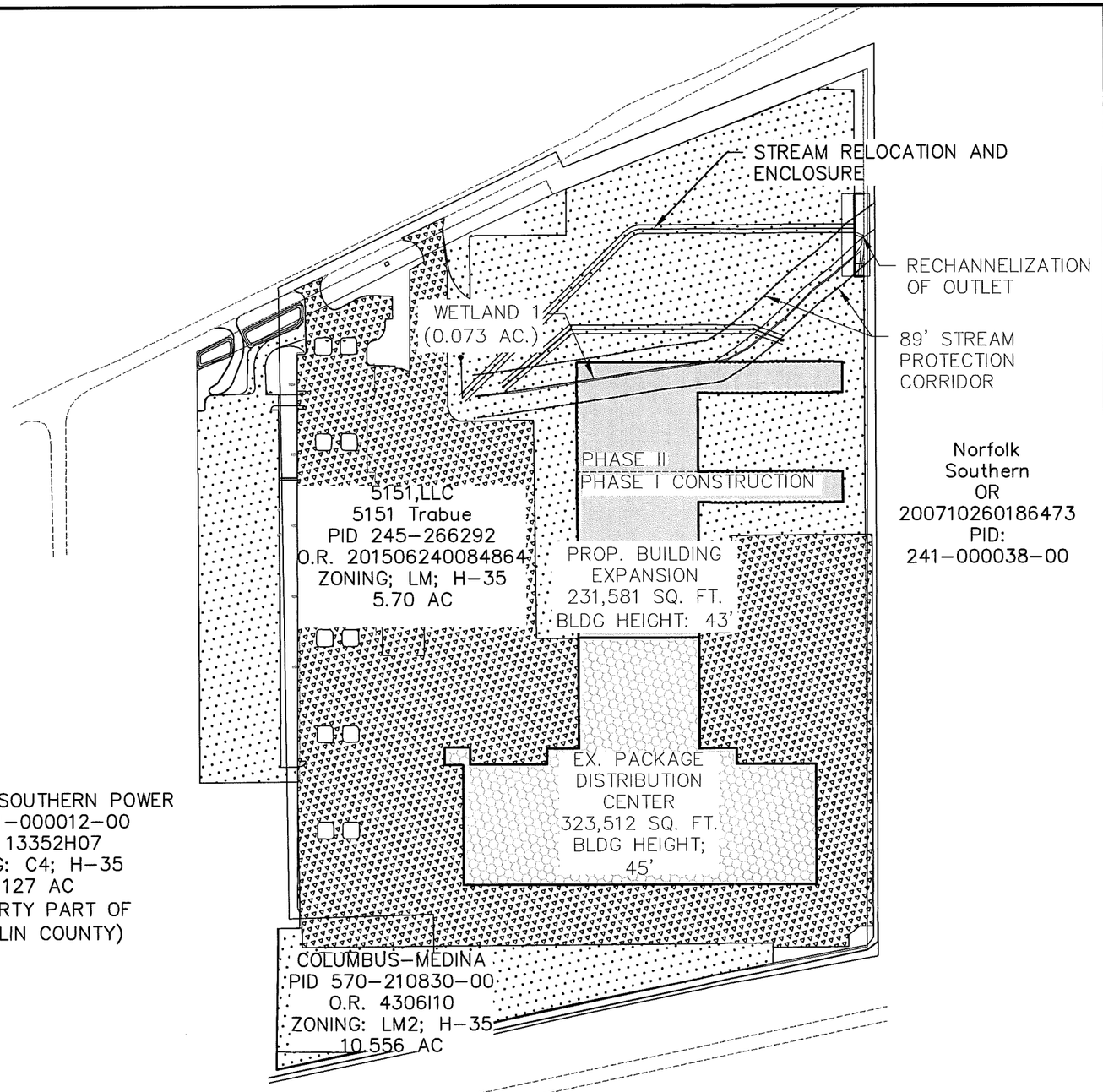
FIGURE 2

MINIMAL IMPACT OPTION

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER				SCALE:	SHEET: 2 OF 3
	CONTRACTOR					
	INSPECTOR					
	AGREEMENT		COMPLETED			
	RPD	CKD	CLD	CON. DR.	CONTRACT DRAWING NO.	RECORD PLAN NO.
			DATE 7/25/2016			



LEGEND

NEW PAVEMENT – 20.42 ACRES

EXISTING PAVEMENT – 24.86 ACRES

NEW BUILDING ADDITION – 5.36 ACRES

EXISTING BUILDING – 7.50 ACRES

NORTH

0 300 600 900

SCALE: 1"=300'

EASEMENT REFERENCE				REVISIONS		
CITY NO.	COUNTY RECORDER		GRANTOR	NO.	DESCRIPTION	APPROVAL/DATE
	VOL.	PAGE				

AECOM
277 W. Nationwide Blvd.
Columbus, OH 43215
United States
P: 614-464-4500
F: 614-464-0588

FIGURE 3

PROPOSED WORK

PROJECT TITLE:
UPS OHTRA EXPANSION
5101 TRABUE ROAD
COLUMBUS, OHIO 43228

CITY OF COLUMBUS

DIVISION USE ONLY	OWNER					
	CONTRACTOR					
	INSPECTOR					
	AGREEMENT		COMPLETED			
	RPD	CKD	CLD	CON. DR.		
	DATE 7/25/2016					

SCALE:

SHEET: **3 OF 3**

CONTRACT DRAWING NO.

RECORD PLAN NO.

FILE NAME AND DATE

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 22. SURFACE AREAS IN ACRES OF WETLANDS/OTHER WATERS FILLED

The layout shown in Figure 3 in Attachment A meets the goals of the Project to expand the building facility and the surrounding parking area for trailer staging, and is economically feasible. The Project was designed to avoid Wetland 1 as much as practical, however 0.073-acre must be filled and rerouted. An overview of the limits of disturbance (LOD) for the project and locations of delineated features within this area are illustrated on Figures 2 and 3 in Attachment A.

Table 1 provided after the project summary provides a list of the wetland identified within the Project survey boundary, and gives information regarding various parameters and the acreage to be impacted. Table 2 below provides a list of the stormwater ponds and their delineated acreage and acreage within the LOD.

TABLE 2
DELINEATED PONDS WITHIN THE PROJECT SURVEY AREA

Pond Name	Acreage within Survey Corridor	Impacted Acreage within Limits of Disturbance[b]
Pond 1	0.32	0.32
Pond 2	0.44	0.44
Total: 2 Ponds	**0.76**	**0.76**

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 23. DESCRIPTION OF AVOIDANCE, MINIMIZATION, AND COMPENSATION

The goal of the expansion is to expand the shipping capacity of the existing facility in order to meet anticipated peak hour demand for the Greater Columbus Region. UPS has sought to avoid and minimize environmental impacts to the existing on-site wetland and stormwater ponds. However, due to the nature of the Project and the proximity of delineated ecological features, impacts to Wetland 1 are unavoidable. The unique circumstances of the construction Project mean that it is not viable to avoid or minimize the environmental impact of construction.

To begin, it is not possible to avoid construction of an expanded facility. UPS has performed expansion studies within the Central Ohio market, and concluded that further investment in this facility is the correct business plan, and that expansion of other existing facilities is not feasible in accordance with a sound business model. Construction of a new greenfield facility was considered not feasible due to the lack of available property within the region that provides the necessary logistical access and because of the adverse environmental impact that would be caused by a combination of construction and development on a new property, increased air pollution caused by longer truck travel, and the abandonment of an existing manufacturing property that would have little value for other businesses or redevelopment.

Second, it is not possible to construct the expansion elsewhere on the existing property. The northern 20 acres of the property is undevelopable with regard to a building expansion, as one contiguous building is necessary for the conveyer system and sortation layout.

Lastly, is not possible to minimize the impact on the existing stream because of the unique layout and size requirement of the expansion and still meet the goals of the project. The building footprint is driven by the layout of the interior conveyor system, and the conveyor system cannot be reduced in size because of the need to meet future anticipated peak hour shipping rates. Reducing the size of the building would have adverse economic ramifications, and is not the ideal course of action.

The construction will impact approximately 0.073-acre of existing Wetland 1 and two detention basis totaling 0.76 acres within the 22.95 acre LOD. Approximately 50 linear feet of wetland will be regarded near the eastern edge of the property to provide proper outlet channels for the relocated storm sewer and new storm sewer outlets. The above ground stormwater ponds will be replaced with underground stormwater management system that will provide stormwater quality and quantity treatment meeting Local, State, and Federal post construction regulations and best management practices.

Expansion of the site will result in unavoidable 0.073-acre of wetland impacts that are below the 0.10-acre mitigation threshold, therefore no mitigation is proposed for the Project.

To mitigate effects to the stream during construction, a stormwater pollution prevention plan (SWP3) will be developed for the project prior to start of construction activities. The plan will include provisions for placement of sediment and erosion controls at all locations where soil disturbance will occur. These erosion controls will be designed to prevent sediment laden water from flowing offsite into adjacent waterways. Such controls include the placement of silt fencing along areas of disturbance and the placement of stormwater inlet protection where applicable.

UPS is committed to the use of appropriate Best Management Practices (BMPs) to minimize stormwater pollution and any erosion/sedimentation-related impacts at the site. As a result of developing the SWP3 plan and implementing BMPs, the environmental impact of the construction and operation of the proposed project will be reduced.

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 25. ADJOINING PROPERTY OWNERS/LESSEES

TABLE 3
ADJACENT PROPERTY OWNERS

Property Index	Name	Address	City, State, Zip	Telephone Number	Source
200710260186473	Norfolk Southern				
201506240084864	5151, LLC	5151 Trabue Road	Columbus, OH 43228		
13352H07	Columbus Southern Power	Tax Dept. 27th Fl, PO Box 16428	Columbus, OH, 43216		
O.R. 4306I10	Columbus-Medina Properties LLC	1250 Walcutt Road	Columbus, OH, 43228		

ENGINEERING FORM 4345 SUPPLEMENTAL RESPONSE

BLOCK 26. OTHER AGENCIES APPROVALS/PERMITS NEEDED

UPS has not started any portion of the expansion activities to date. The expansion activities are currently in the design stage. Listed below are the anticipated environmental permit applications that UPS will obtain for construction.

TABLE 4
LIST OF OTHER CERTIFICATES AND APPROVALS

AGENCY/PERMIT	TYPE APPROVAL	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
NPDES/SWP3	Permit		July 2016		
Permit to Install (PTI)	Sanitary Sewer Relocation		Anticipated in August 2016		
US Fish and Wildlife Service (USFWS) Section 7 of Endangered Species Act Consultation	Concurrence	03E15000-2016-TA-0979	3/15/2016	4/21/2016	
Ohio Division of Natural Resources	Concurrence	16-219	3/15/2016	4/28/2016	
Ohio Historical Preservation Office (OHPO) Section 106 of the National Historic Preservation Act Consultation	Concurrence	2016-FRA-35327	5/17/2016	6/16/2016	